Lesson plans for

PRIMARY
Mathematics

3
CLASS

1
TERM

Foreword

Our country's future lies in the education of our children. The Government of Sierra Leone is committed to doing whatever it takes to secure this future.

As Minister of Education, Science and Technology since 2007, I have worked every day to improve our country's education. We have faced challenges, not least the Ebola epidemic which as we all know hit our sector hard. The Government's response to this crisis – led by our President – showed first-hand how we acted decisively in the face of those challenges, to make things better than they were in the first place.

One great success in our response was the publication of the Accelerated Teaching Syllabi in August 2015. This gave teachers the tools they needed to make up for lost time whilst ensuring pupils received an adequate level of knowledge across each part of the curriculum. The Accelerated Teaching syllabi also provided the pedagogical resource and impetus for the successful national radio and TV teaching programs during the Ebola epidemic.
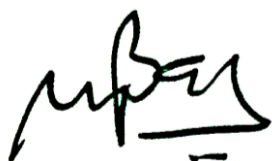
It is now time to build on this success. I am pleased to issue new lesson plans across all primary and JSS school grades in Language Arts and Mathematics. These plans give teachers the support they need to cover each element of the national curriculum. In total, we are producing 2,700 lesson plans – one for each lesson, in each term, in each year for each class. This is a remarkable achievement in a matter of months.

These plans have been written by experienced Sierra Leonean educators together with international experts. They have been reviewed by officials of my Ministry to ensure they meet the specific needs of the Sierra Leonean population. They provide step-by-step guidance for each learning outcome, using a range of recognised techniques to deliver the best teaching.

I call on all teachers and heads of schools across the country to make best use of these materials. We are supporting our teachers through a detailed training programme designed specifically for these new plans. It is really important that these Lesson Plans are used, together with any other materials you may have.

This is just the start of education transformation in Sierra Leone. I am committed to continue to strive for the changes that will make our country stronger.

I want to thank our partners for their continued support. Finally, I also want to thank you – the teachers of our country – for your hard work in securing our future.

Dr. Minkailu Bah

Minister of Education, Science and Technology

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Introduction
to the Lesson Plan Manual

These lesson plans are based on the National Curriculum
and meet the requirements established
by the Ministry of Education, Science and Technology.

1   The lesson plans will not take the whole term, so use spare time to review material or prepare for exams

2   Teachers can use other textbooks alongside or instead of these lesson plans.

3   Read the lesson plan before you start the lesson. Look ahead to the next lesson, and see if you need to tell pupils to bring materials for next time.

4   Make sure you understand the learning outcomes, and have teaching aids and other preparation ready – each lesson plan shows these using the symbols on the right.

5   Quickly review what you taught last time before starting each lesson.

6   Follow the suggested time allocations for each part of the lesson. If time permits, extend practice with additional work.

7   Lesson plans have a mix of activities for the whole class and for individuals or in pairs.

8   Use the board and other visual aids as you teach.

9   Interact with all students in the class – including the quiet ones.

10   Congratulate pupils when they get questions right! Offer solutions when they don't, and thank them for trying.

Learning outcomes

Teaching aids

Preparation

Lesson Title: Counting forward in multiples of 1, 2, 5, 10 up to 100 using a number line	**Theme:** Knowing and understanding numbers up to 100	
Lesson Number: M-03-001	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to: 1. Count forward from 0-100 from any number. 2. Recognise numbers up to 100.	**Teaching Aids** 1. 0-100 number line at the end of the plan. 2. Ball or a ball made from paper.	**Preparation** 1. Draw a 0-100 number line, at the end of the plan, on the board. 2. Find a ball or make one out of paper.

Opening *(2 minutes)*

1. **Say:** Today we will begin looking at numbers up to 100.
2. **Ask:** About how many pupils are in this class? Listen to all guesses.
3. **Say:** Raise your hand if you can count to 10.
4. Wait for pupils to raise their hands.
5. **Say:** Turn to the pupil next to you and take turns counting to 10.

Introduction to the New Material *(10 minutes)*

1. **Ask:** How many ways can we count to 100? (Answer: in 1s, 2s, 5s 10s and so on.)
2. **Say:** Today we are going to count to 100 in 4 different ways.
3. Point to the 50 on the number line. **Say:** Tell the pupil next to you what number I am pointing to.
4. Give them a few seconds to answer.
5. **Say**: Everyone tell me what number I am pointing to. (Answer: 50)
6. Notice which pupils do not give the correct answer. If most pupils do not give the correct answer, repeat steps 3 and 4 with the numbers 25, 44 and 87.
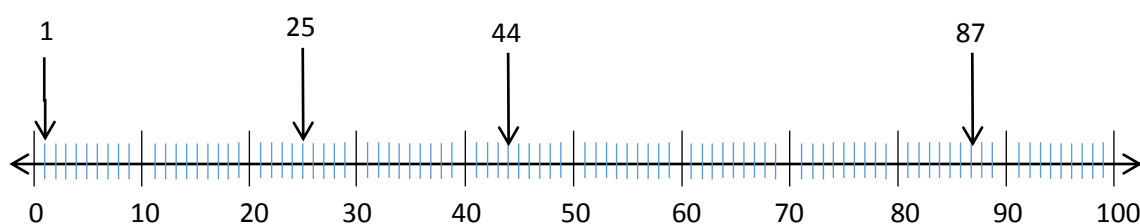
7. Ask for a volunteer to come to the front of the class. **Say:** Let's help our friend point to the number 1.
8. **Say:** Let's count in 1s together. 1, 2, 3, 4, 5, 6, 7, 8… Encourage the volunteer to move along the number line as the class counts.
9. Ask for another volunteer to come to the front of the class. **Say:** Let's count together again.
10. The whole class counts from 1-100 while the volunteer moves along the number line.

Guided Practice *(10 minutes)*

1. **Say:** Now we are going to try something more difficult.
2. Point to the 10 on the large number line in the front of the room.
3. **Say:** I will count in 10s to get to 100. That means I will count every 10 numbers. 10, 20, 30, 40, 50, 60, 70, 80, 90, 100.
4. Ask for a volunteer to come to the front of the class. **Say:** Let's help our friend point to the number 10.
5. **Say:** Let's count in 10s together. 10, 20, 30, 40, 50, 60, 70, 80… Encourage the volunteer to jump along the number line as the class counts.
6. Point to the 5 on the number line.
7. **Say:** Listen as I count in 5s. 5, 10, 15, 20, 25.
8. **Ask:** What will come next? (Answer: 30)
9. **Say:** Good. Count with me in 5s until we get to 100. (Answer: 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100)
10. Ask for a volunteer to come to the front of the class. **Say:** Let's help our friend point to the number 5.
11. **Say:** Let's count together in 5s one more time. Encourage the volunteer to jump along the number line as the class counts.

Independent Practice *(10 minutes)*

1. Check pupils have an exercise book and a pencil. If they don't, tell pupils to work together with somebody who has. Or give a piece of chalk to some pupils and they can work at the board or a slate.
2. **Say:** Now that you know how to count to 100 in 10s and 5s, you will count in 2s.
3. **Say:** Draw a number line from 0-100 in your book. Give pupils 3 minutes to draw.
4. **Say:** Use your number line to help you count in 2s to 100. Write your answers on your number line. (Answer: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100)
5. While pupils are working, go to the ones you noticed getting incorrect answers and check their work. If a pupil is still getting the wrong answers, support them to write the correct numbers.
6. **Ask:** What other ways can you count to 100? (Example answers: 4, 20, 25, 50)

Closing *(3 minutes)*

1. **Say:** Stand up if you can count in 10s for the class. **Say:** I will throw the ball to one volunteer, if you catch the ball, count in 10s! **Say:** The rest of the class will clap as you count.
2. Throw the ball to one volunteer. Point to the numbers as they count and encourage the class to clap as the pupil counts.
3. **Say:** Stand up if you can count in 5s for the class. **Say:** I will throw the ball to one volunteer, if you catch the ball, count in 5s! **Say:** The rest of the class will clap as you count.
4. Throw the ball to one volunteer. Point to the numbers as they count and encourage the class to clap as the pupil counts.

5. **Say:** Let's count together in 2s.
6. Point to the numbers on the number line as the class counts in 2s.
7. **Ask:** How many ways did we count to 100 today? (Answer: 4 ways. We counted in 1s, 2s, 5s and 10s.)
8. **Ask:** Are there other ways to count to 100? (Answer: Yes. 4s, 20s, 25s, 50s.)

[0-100 NUMBER LINE]
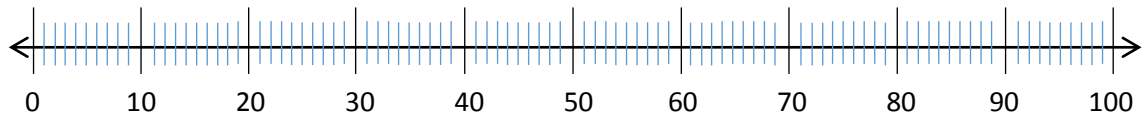
Lesson Title: Counting backwards in multiples of 1, 2, 5, 10 up to 100 using a number line	**Theme:** Knowing and understanding numbers up to 100	
Lesson Number: M-03-002	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	Teaching Aids	Preparation
By the end of the lesson, pupils will be able to count backwards 100-0 from any number.	1. 0-100 number line at the end of the plan. 2. Ball or a ball made from paper.	1. Draw a 0-100 number line, at the end of the plan, on the board. 2. Find a ball or make one out of paper.

Opening *(2 minutes)*

1. **Say:** Today we will continue looking at numbers up to 100. Raise your hand if you can count to 100 in 10s.
2. Wait for pupils to raise hands. Call on one pupil to count in 10s.
3. **Say:** Turn to a friend sitting next to you and count in 5s together. One pupil says one number and then the next pupil says the next number. Stop when you get to 100.

Introduction to the New Material *(10 minutes)*

1. **Ask:** Do you think you can count backwards from 10?
2. **Say:** Turn to your neighbour and count from 10 backwards to 0. You can use the number line to help you.
3. **Ask:** How did you count backwards from 10?
4. Ask A pupil who has raised their hand. (Answer: 10, 9, 8, 7 ,6 ,5, 4, 3, 2, 1, 0)
5. **Say:** Now let's all count backwards from 10 together. Ready? 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0
6. Notice if pupils have difficulty. If they do, you can ask those who understand to help those who do not. Then, try counting as a whole class again.

Guided Practice *(10 minutes)*

1. **Say:** Now we are going to try something more difficult. Point to the 100 on your number line. We are going to count backwards in 10s all the way from 100 to 0! As we count, I will show our jumps on the number line.
2. Point to the 100 on the large number line on the board.
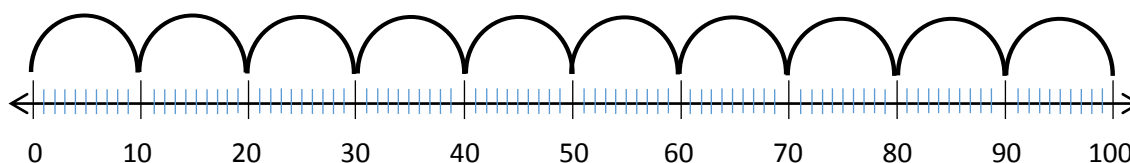
3. **Say:** 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0
4. **Say:** Everyone who is sitting on the left side of the room, count backwards in 10. Use the number line for help. Ready? 100, 90…

5. Let the pupils continue counting without your help.
6. **Say:** Now it is time for the right side of the room to count backwards in 10s. Use the number line for help. Ready? 100, 90…
7. **Say:** If you like plantains, count in 10s backwards from 100. Ready? 100, 90…
8. **Say**: In your book, write the numbers you say when you count in 10s backwards from 100 to 0. Use the number line for help. (Answer: 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0)
9. Give pupils 2 minutes to write.
10. **Say:** Now we are going to try to count backwards in 5s. Let's start with 20.


```
0   5   10  15  20  25  30  35  40  45  50  55  60  65  70  75  80  85  90  95  100
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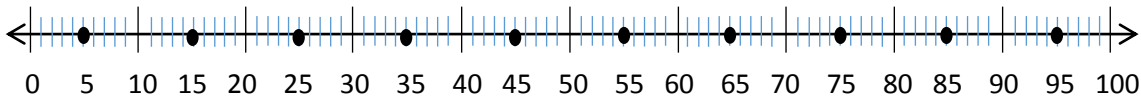
11. Point to the 20 on the number line.
12. **Ask:** What comes next? (Answer: 15)
13. Write the 15 on the board below the number line.
14. **Ask:** What is next? (Answer: 10)
15. **Ask:** Then what? (Answer: 5)
16. **Ask:** And finally, where do we land? (Answer: 0)
17. **Say**: Take turns counting with your neighbour. Start at 100 and count backwards in 5s. Use the number line for help.
18. Give pupils about 5 minutes to practice with their groups. Help the groups who are having difficulty.
19. **Say:** We are going to count backwards in 5s from 100 as a class.
20. Count with the pupils from 100 to 0. (Answer: 100, 95, 90, 85, 80, 75, 70, 65, 60, 55, 50, 45, 40, 35, 30, 25, 20, 15, 10, 5, 0)
21. **Say:** In your book, write the numbers you say when you count in 5s backwards from 100 to 0. Use the number line for help.

Independent Practice *(10 minutes)*

1. **Say:** Now that you know how to count backwards from 100 in 10s and 5s, you will count in 2s. Use the number line to help you count in 2s from 100 to 0. Write your answers on your paper.
2. While pupils are working, go to the pupils you notice having difficulty. Check their work. If a pupil is still getting the wrong answers, support them to write the correct number.
3. Give pupils 7 minutes to write.
4. **Say:** Look at your neighbour's paper. Are they correct? If not, please help your friend. Pupils can help each other correct their mistakes. (Answer: 100, 98, 96, 94, 92, 90, 88, 86, 84, 82, 80, 78, 76, 74, 72, 70, 68, 66, 64, 62, 60, 58, 56, 54, 52, 50, 48, 46, 44, 42, 40, 38, 36, 34, 32, 30, 28, 26, 24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2, 0)

Closing *(3 minutes)*

1. **Say:** Stand up if you can count backwards in 10s for the class. **Say:** I will throw the ball to one volunteer, if you catch the ball, count backwards from 50 to 0 in 10s! **Say:** The rest of the class will clap as you count.
2. Throw the ball to one volunteer. Point to the numbers as they count and encourage the class to clap as the pupil counts.
3. **Say:** Stand up if you can count backwards in 2s for the class. **Say:** I will throw the ball to one volunteer, if you catch the ball, count backwards from 20 to 0 in 2s! **Say:** The rest of the class will clap as you count.
4. Throw the ball to one volunteer. Point to the numbers as they count and encourage the class to clap as the pupil counts.
5. **Say:** Let's count backwards from 100 to 0 in 5s together.
6. Point to the numbers on the number line as the class counts backwards in 5s.
7. **Say:** Well done! Thank you class. Pupils say: Thank you.

[0-100 NUMBER LINE]

0   10   20   30   40   50   60   70   80   90   100
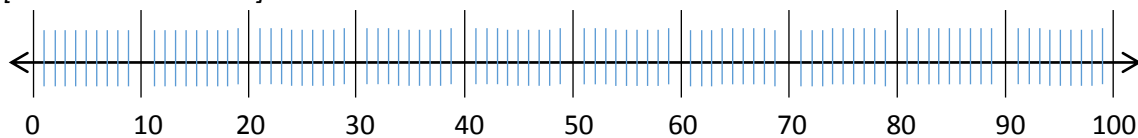
Lesson Title: Reading and Writing Numerals in Words 0-100	**Theme:** Knowing and Understanding Numbers up to 100	
Lesson Number: M-03-003	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to read and write numbers up to 100 in words.	**Teaching Aids** 1. 100 chart at the end of the plan. 2. Number word matching game at the end of the plan.	**Preparation** 1. Draw the 100 chart, at the end of the plan, on the board. 2. Write the number words 'one' to 'ten' on the board. 3. Write the number words for multiples of 10 on the board. 4. Write the number word matching game on the board.

Opening *(1 minute)*

1. **Say:** In previous lessons, we counted forward and backward up to 100. Today we will learn how to read and write those numbers up to 100.

Introduction to the New Material *(10 minutes)*

1. Point to the 23 on the 100 chart.
2. **Ask:** What number is this? (Answer: 23)
3. **Say:** Look at the number words on the board.
4. **Ask:** Who can find the word that says 20? (Answer: twenty)
5. **Ask:** What is the other word we need to make 23? (Answer: three)
6. **Ask:** Who can find the word that says 3? (Answer: three)
7. Continue asking for volunteers to locate number words for: 33 (thirty-three), 43 (forty-three), 53(fifty-three), 63 (sixty-three), 73 (seventy-three), 83 (eighty-three) and 93 (ninety-three).

Guided Practice *(5 minutes)*

1. **Say:** I need 2 pupils to help me.
2. Ask 2 pupils (1 boy and 1 girl) to come to the front of the room.
3. **Say:** Each choose a number between 0 and 9.
4. **Say:** Put your numbers together to make a 2-digit number. For example, if one pupil chose 7 and one pupil chose 2, this would make 72.
5. Tell the 2 pupils to write their 2-digit number on the board.
6. **Ask:** What number did we make? (Answer: in this example, 72)
7. **Say:** I need 2 more pupils to help me.
8. Ask 2 pupils (1 boy and 1 girl) to come to the front of the room.
9. **Say:** Each one of you must point to a number word that helps us say the number that we made. (Answer: in this example, it would be seventy and two)
10. **Say:** Please repeat the number. (Answer: in this example, 72)

Independent Practice *(14 minutes)*

1. **Say:** Now you are going to play this game at your seats in pairs. You will each choose a number between 0 and 9. Then you will put them together to make a 2-digit number.
2. **Say:** When you have your 2-digit number, you must each find the correct words to match the 2-digit number. Write down the numbers and number words in your exercise book. See how many 2-digit numbers you can make.
3. Give pupils 5 minutes to write down as many numbers and matching words as possible.
4. **Say:** Now you are going to match number words with the 2-digit numbers.
5. **Say:** Copy the number word matching game on the board into you book.
6. **Say:** Draw a line from one of the words to the number that it says.
7. Demonstrate drawing a line from eleven to 11.
8. Give pupils 10 minutes to match the number words to numerals.
9. Ask pupils to hold up their work for you to see.

Closing *(5 minutes)*

1. **Say:** When I write the numbers in words on the board, turn to your partner and tell them the number.
2. Write the following number words on the board, one at a time: twelve, sixty-four, ninety-three. Allow a few seconds between each for pupils to talk to their partners.
3. **Say:** Great job class! Tomorrow, we will write numbers in a different way.

[NUMBER WORD MATCHING GAME]   *[100 CHART]*

eleven	14
twenty-four	86
eighty-six	79
fourteen	97
fifty	31
thirty-one	24
seventy-nine	50
forty-five	62
sixty-two	45
ninety-seven	11

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Lesson Title: Writing numerals in words 0-100 as numerals using place value	**Theme:** Knowing and understanding numbers up to 100	
Lesson Number: M-03-004	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to write numbers in words 0-100 as numerals using place value.	**Teaching Aids** 1. 100 Chart at the end of the plan. 2. Place Value Chart at the end of the plan. 3. 100 sticks and string to make bundles 10 sticks.	**Preparation** 1. Draw the 100 chart, at the end of the plan, on the board. 2. Draw the Place Value Chart, at the end of the plan, on the board. 3. Gather 100 sticks and some string.

Opening *(2 minutes)*

1. **Say:** Yesterday, we learned and practised how to read and write numbers up to 100. Today we are going to write numbers in a different way. But first, let's count in 10s.
2. **Ask:** To count in 10s, what number do we start with? (Answer: 10)
3. **Say:** Let's count in 10s together. Point to the numbers on the 100 chart as you count with the pupils.

Introduction to the New Material *(10 minutes)*

1. **Ask**: How many 10s did it take to count to 20? (Answer: 2)
2. **Say:** So we can say that 20 is 2 groups of 10 or 2 tens.
3. Show that 20 is 2 groups of 10. Point to the 10 and then 20 on the 100 Chart.
4. Ask for a volunteer to come to the front of the class. **Ask:** Can you count 20 sticks? Count out loud so we all can hear.
5. **Say:** How did our friend count the sticks? (Possible answers: in 1s, in 2s, in 5s)
6. **Ask:** Who can show us how to count 20 sticks in a different way?
7. Invite 2 different pupils (1 boy and 1 girl) to count 20 sticks in different ways
8. **Ask:** If you had to take 100 bananas to the market in Kenema, would it be easier to put them in groups of 10 bananas, or to count them in 1s?
9. **Say:** Turn and talk to your neighbour and decide which way is easier.

Guided Practice *(15 minutes)*

1. **Say:** I am going to make a bundle of 10 sticks. Now I will show the number 15 with my sticks. (Answer: 1 bundle of ten and 5 sticks). We can show that on a Place Value Chart.
2. Write the numerals in the Place Value Chart on the board.

Hundreds	Tens	Ones
	1	5

3. **Say:** Now I am going to make 48 using as many bundles of 10 as I can. **Ask:** How many bundles of ten do I need? (Answer: 4) **Ask:** How many ones do I need? (Answer: 8)
4. Ask a volunteer to put 48 in the place value chart on the board.
5. **Say:** Draw a place value chart in your book. Then put the following numbers in your chart: 26, 52, 30, 7. Draw bundles of 10 to help you if you need to.
6. Allow pupils to work for 2 minutes.
7. **Say:** Look at your neighbour's paper. Do you have the same answers?
8. **Say:** Let's look at how we can write these numbers without the chart. I know that 15 is made up of 1 ten and 5 ones.
9. Write 1 ten and 5 ones on the board.
10. **Say:** This is place value form.
11. **Ask:** What is 48 made up of? (Answer: 4 tens and 8 ones)
12. **Ask:** Who can write 48 in place value form on the board?
13. Pupil will write 4 tens and 8 ones on the board.

Independent Practice *(5 minutes)*

1. Write the following numbers on the board:
       26, 52, 30, 77
2. **Say:** Now write 26 (2 tens and 6 ones), 52 (5 tens and 2 ones), 30 (3 tens and 0 ones, or 3 tens), and 7 (7 ones or 0 tens and 7 ones) in place value form on your Place Value Chart.
3. If there is a pupil who finishes early, give them 3-digit numbers to put into the Place Value Chart. They can also write those numbers in place value form. For example, 135 would be 1 hundred, 3 tens and 5 ones.

Closing *(3 minutes)*

1. **Say:** Write down a 2-digit number. Give your paper to your neighbour. Ask him or her to write the number in place value form. Give the papers back. Check each other's answers.
2. **Ask:** Do you remember the question I asked at the beginning of the lesson? If you had to take 100 bananas to the market in Kenema, would you rather count out 100 bananas or count out groups of 10?
3. **Ask:** How many bundles of ten bananas would you need to make 100 bananas? (Answer: 10)
4. **Ask:** How many single bananas would you have? (Answer: 0)
5. **Say:** Bundling in groups of 10 makes it easier to count. When you get to the market, your customer will trust how many bananas you have.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Hundreds	Tens	Ones

Lesson Title: Order whole numbers from 0-100 using place value	Theme: Knowing and understanding numbers up to 100	
Lesson Number: M-03-005	Class/Level: Class 3	Time: 35 minutes

Learning Outcomes	Teaching Aids	Preparation
By the end of the lesson, pupils will be able to order numbers 0-100.	1. 100 Chart at the end of the plan. 2. Place Value Chart at the end of the plan. 3. 20 sticks	1. Draw the 100 Chart, at the end of the plan, on the board. 2. Draw the Place Value Chart, at the end of the plan, on the board. 3. Gather 20 sticks.

Opening (*4 minutes*)

1. **Say:** We learned how to read and write numbers in 2 different word forms. We learned to write numbers in all words and in place value form.
2. Ask a pupil to come to come to the board and write 75 in words. (Answer: Seventy-five)
3. Ask a different pupil to come to the board and write 75 in place value form. (Answer: 7 tens and 5 ones) **Say:** Today we're going to use these skills to put numbers in order.

Introduction to the New Material *(10 minutes)*

1. Point to the 100 chart. **Ask:** Do the numbers get bigger or smaller when you go down the chart? (Answer: bigger)
2. **Ask:** Which number is bigger: 56 or 65? Tell your neighbour. (Answer: 65)
3. **Say:** I'm going to make a bundle of 10 sticks. I'm going to put 3 single sticks next to it. Demonstrate making a bundle of 10 and 3 single sticks.
4. **Ask:** How many sticks do I have? (Answer: 13)
5. **Say:** If you think the 1 bundle is worth more than the 3 sticks, put 1 finger in the air. If you think the 3 sticks is worth more than the 1 bundle, put 3 fingers in the air. (Answer: 1 bundle is more than 3 sticks, 1 finger in the air.)
6. **Say:** That's right, 1 bundle has 10 sticks, and 10 is more than 3.
7. **Say:** Now we're going to look at numbers in the Place Value Chart.
8. **Ask:** How long does it take you to walk to school? Invite one pupil to answer.
9. **Ask:** How long does it take for you to walk to school? Invite a second pupil to answer.
10. **Ask:** Who has a longer walk?
11. **Say:** Raise your hand if you think (first pupil's name) has the longest walk.
12. **Say:** Raise your hand if you think (second pupil's name) has the longest walk.
13. Invite 2 pupils (1 boy and 1 girl) to put the numbers into the Place Value Chart.
14. For example, if it takes the first pupil 12 minutes to walk to school and the second pupil 21 minutes, then the chart would look like this:

Hundreds	Tens	Ones
	1	2
	2	1

15. **Ask:** Who has a longer walk? (Example answer: the second pupil in this example.)
16. **Ask:** How do you know? (Example answer: The first pupil only has a 1 in the 10s place and the second pupil has a 2 in the 10s place.)
17. **Ask:** Do you look at the 10s or 1s digit first to work out which number is bigger? (Answer: 10s)
18. **Ask:** Why should you look at the 10s digit first? (Answer: 10s are worth more than 1s.)
19. If pupils do not understand, remind them of the bundles they made with sticks. 1 bundle was made of up 10 sticks, so 1 bundle was much more than 1 stick.

Guided Practice *(10 minutes)*

1. Invite 4 pupils to come to the front of the classroom.
2. Tell each of the 4 pupils to think of a number between 0-9. Tell the first 2 pupils to make a 2-digit number by writing their numbers on the board. (For example, if they choose the numbers 3 and 2, they write 32). Tell the other 2 pupils to do the same. Now, there are two 2-digit numbers on the board.
3. **Ask:** Which number is bigger? How do you know? (Answer: Look at the digits in the 10s place. One number has more 10s than the other number. The number with more 10s is bigger. Or, if the 10s digits are the same, look at the 1s place to decide which number is bigger.)
4. **Say:** Work with your neighbour. Each of you will pick 2 numbers between 0 and 9. Each of you will put these numbers together to make a 2-digit number. Then, you will decide whose number is bigger. Give pupils 5 minutes to repeat the activity.
5. **Say:** Now we will make it more difficult. You and your partner will make two 2-digit numbers each, so together you have 4 numbers. Then put all 4 numbers in order from smallest to largest. Give pupils about 5 minutes to complete the task.
6. When they are finished, ask one pair to come to the board and write their numbers on the board in order from smallest to largest. **Ask:** Are these numbers in the correct order?

Independent Practice *(8 minutes)*

1. As you write the following numbers on the board, **Say:** Write these numbers in your exercise book: 82, 100, 61, 27, 95, 9, 66, 83
2. **Say:** Now, put the numbers in order from smallest to largest. Write the numbers in order in your exercise book. You may use a Place Value Chart or the 100 Chart to help. (Answer: 9, 27, 61, 66, 82, 83, 95, 100)
3. **Say:** When you have finished, check to see that you have the same answers as your neighbour. If not, tell each other what you think. Decide together what the correct order is.

Closing *(3 minutes)*

1. Choose one volunteer. **Say:** Tell us a small number.
2. After the pupil tells you a number, invite another pupil to give you a number that is bigger. Continue calling on volunteers and tell them to give a bigger number each time. Keep going until you get a number bigger than 100.
3. **Say:** Well done.

[100 CHART]

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

[PLACE VALUE CHART]

Hundreds	Tens	Ones

Lesson Title: Locate Numbers from 0-100 on a number line	**Theme:** Knowing and Understanding Numbers up to 1000	
Lesson Number: M-03-006	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to locate numbers up to 100 on the number line.	**Teaching Aids** 1. Blank 0-100 number line at the end of the plan. le 2. 100 Chart at the end of the plan.	**Preparation** 1. Draw the blank 0-100 number line, at the end of the plan, on the board. 2. Draw the 100 Chart, at the end of the plan, on the board.

Opening *(3 minutes)*

1. Write the following numbers on the board.
2. **Say:** Write these numbers in order from smallest to largest: 34, 12, 48, 99, 46, 23, 56
3. **Say:** Share your answers with your neighbour. Agree on the correct order. (Answer: 12, 23, 34, 46, 48, 56, 99)

Introduction to the New Material *(5 minutes)*

1. **Say:** Now that you know how to put numbers in order, we are going to put numbers on the 100 Chart and number line where they belong. **Say:** Look at the number line on the board.
2. **Ask:** What do the long lines mean? (Answer: They are the numbers when you count by 10s.)
3. **Ask:** How do you find the number 11? (Answer: Count 1 of the long lines, which is 10. Add 1 short line to get to 11.)
4. **Say:** Let's all count by 10s as I point to the long lines. 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. Write the numbers on the number line as the class counts.
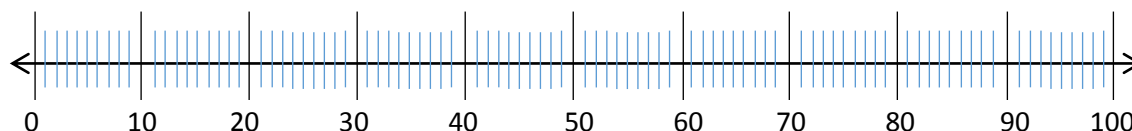
5. **Say:** Now, let's look at the 100 Chart.
6. **Ask:** Where are the numbers on the chart when we count by 10s? (Answer: in the last column)
7. **Say:** Count with me by 10s and I will point to the numbers on the 100 Chart. 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. **Say:** We can think of these numbers on a 100 chart and the long lines on a number line as 'guides' that help us find other numbers.

Guided Practice *(10 minutes)*

1. Rub out most of the numbers of the 100 chart, leaving one or 2 random numbers on each line and the final number.
2. **Say:** Look at the incomplete 100 Chart. Let's fill in the 'guide' numbers on the chart.
3. **Ask:** What should we start with? (Answer: 10)
4. **Say:** Let's do all the numbers that end in 0.

5. Ask a volunteer to fill in the last column of the 100 chart. **Say**: Let's help our friend by saying the numbers that end in 0: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
6. **Ask**: What are other numbers that are helpful 'guides'? (Answer: numbers that end in 5)
7. Ask a volunteer to fill in the 5s column on the 100 chart.
8. **Say**: Let's help our friend by saying the numbers that end in 5: 5, 15, 25, 35, 45, 55, 65, 75, 85, 95.
9. **Say:** Now that you have all the 'guide numbers' written on your chart, let's write the rest of the numbers. Every box in the 100 Chart should be filled in.
10. **Say:** Say the numbers as I write.
11. **Say:** How can we check to see if our chart is correct? (Answer: Start at the beginning and count from 1 to 100.)

Independent Practice *(15 minutes)*

1. **Say:** We can also use our 'guides' on a number line.
2. **Say:** Draw a number line in your book.
3. **Ask:** What are our 'guides' on the number line? (Answer: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100)
4. Point to the line that represents 12 on the number line on the board.
5. **Ask:** What number am I pointing to? (Answer: 12)
6. **Say:** Turn to your neighbour. Tell them how you knew that it was 12 without counting from 0. (Answer: I know the first long line is 10, and the teacher went 2 short lines past that.)
7. Invite a pupil to share his or her answer with the whole class.
8. **Say:** Let's play a game! Choose two numbers between 0 and 9 to make a 2-digit number. Put the number on the number line where it belongs. See how many 2-digit numbers you can make and put on the number line.
9. Give pupils 10 minutes to work.
10. **Say:** Switch papers with a friend sitting near you. Check their answers. If you think they are wrong, tell them and decide who is correct.

Closing *(2 minutes)*

1. Draw the following incomplete number line on the board:

27   28   31   34   35
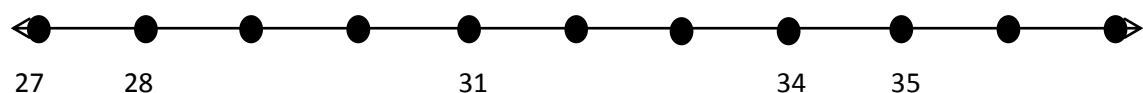
2. **Say:** This is another type of number line.
3. Invite 6 volunteers (3 boys and 3 girls) to fill in the missing numbers on the number line. (Answer: 29, 30, 32, 33, 36, 37)
4. **Say:** Clap for your friends if they wrote the correct number. Well done class.

[BLANK 0-100 NUMBER LINE]

[100 CHART]

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Lesson Title: Compare numbers up to 100 using a number line and place value	Theme: Knowing and Understanding Numbers up to 1000	
Lesson Number: M-03-007	Class/Level: Class 3	Time: 35 minutes

Learning Outcomes	Teaching Aids	Preparation
By the end of the lesson, pupils will be able to compare numbers up to 100.	1. 0-100 number line at the end of the plan. 2. Place Value Chart at the end of the plan. 3. Blank 100 chart at the end of the plan.	1. Draw a 0-100 number line, at the end of the plan, on the board. 2. Draw a blank 100 chart, at the end of the plan, on the board. 3. Draw the Place Value Chart, at the end of the plan, on the board.

Opening (5 *minutes)*

1. **Say:** Draw a blank 100 chart like the one I have on the board. Fill out your chart by going from top to bottom one column at a time. (Example: Pupils will start at 1, then move down the chart and fill out 11, 21, 31, 41, 51, 61, 71, 81, and 91. Then they will move to another column.)

Introduction to the New Material *(5 minutes)*

1. **Say:** Today we are 'comparing' numbers. Turn to your neighbour and tell them what 'compare' means. Let pupils talk for about 30 seconds.
2. **Ask:** What does 'compare' mean? (Example answers: telling how 2 numbers are related to each other; telling which number is bigger, smaller, telling if they are the same)
3. **Say:** When we compare numbers, we use special symbols. They look like this.
4. Write the symbols on the board: '<' and '>'
5. **Ask:** If you are a hungry crocodile, will you open your mouth to the spot where there are the most fish or the least fish? (Answer: the most fish)
6. **Say:** Look at the symbols. The symbols have their mouths open like crocodile mouths. If I have 2 numbers, I can write them on the board and put the crocodile mouth between them. I will open the mouth to the largest number because the crocodile wants to eat the most fish!

Guided Practice *(10 minutes)*

1. Write the following numbers on the board next to each other with space between them like this: 26   58
2. **Say:** Find the 26 and 58 on your number line. Tell your neighbour which number is bigger.
3. **Ask:** Which number should the crocodile's mouth be open to? (Answer: 58)
4. Then add the '<' symbol between the numbers on the board. It should look like this: 26 < 58
5. Write the following numbers on the board next to each other with space between them like this: 77   67
6. **Say:** Find the 77 and 67 on your 100 Chart. Tell your neighbour which number is bigger.
7. **Ask:** Which number should the crocodile's mouth be open to? (Answer: 77)

8. Then add the '>' symbol between the numbers on the board. It should look like this: 77 > 67
9. Write the following numbers on the board next to each other with space between them like this:
   88   8
10. **Say:** Write 88 and 8 in your Place Value Chart.

Hundreds	Tens	Ones
	8	8
		8

11. **Ask:** Which one is bigger? (Answer: 88)
12. **Ask:** How do you know 88 is bigger than 8? (Answer: 88 has more 10s)
13. **Ask:** What symbol do we write on the board between the 88 and the 8?
14. Ask a pupil to write the symbol correctly on the board. (Answer: 88 > 8)

Independent Practice *(10 minutes)*

1. **Say:** You will play this game with your neighbour. Each of you will choose 2 numbers between 0 and 9. With those numbers, you will form a 2-digit number. Decide with your partner whose number is smaller and whose is larger. Write both numbers with the symbol between them. You may use your number line, 100 chart or Place Value Chart if you need to. Play the game as many times as you can in 10 minutes.

Closing *(5 minutes)*

1. Choose 2 volunteers (1 boy and 1 girl) to stand on opposite sides of the room.
2. **Say:** You 2 will be fish. The rest of the class will be crocodiles. The fish each will pick a 2-digit number. When the fish tell us their numbers, the crocodiles will turn to the fish with the larger number and open their mouths.
3. Repeat the game several times with new volunteers.
4. **Say:** Well done!

[BLANK 100 CHART]
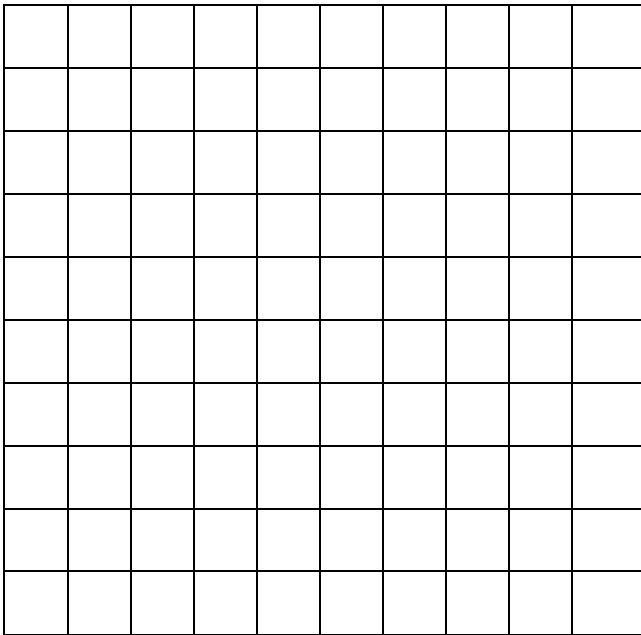
[PLACE VALUE CHART]

Hundreds	Tens	Ones

[0-100 NUMBER LINE]

Lesson Title: Counting forward in multiples of 1, 2, 5, 10 up to 1000 using a number line	Theme: Knowing and understanding numbers up to 1000.	
Lesson Number: M-03-008	Class/Level: Class 3	Time: 35 minutes

Learning Outcomes the end of the lesson pupils will be able to: 1. Count forward from 0-1000 from any number. 2. Recognise numbers to 1000.	Teaching Aids 1. 0-1000 number line at the end of the plan. 2. Counting Chart at the end of the plan.	Preparation 1. Draw the 0-1000 number line, at the end of the plan, on the board. 2. Draw the Counting Chart, at the end of the plan, on the board.

Opening *(2 minutes)*

1. **Say:** Today we will look at numbers up to 1000.
2. **Say:** Please raise your hand if you can count to 100 in 10s. Let's count together.
3. **Say:** Now turn to your partner and take turns counting in 5s. Stop when you get to 100.

Introduction to the New Material *(8 minutes)*

1. **Say:** Please look at the number line on the board. Listen as I count in 100s from 0 to 1000. Point to each number as you count. 0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200.

| 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
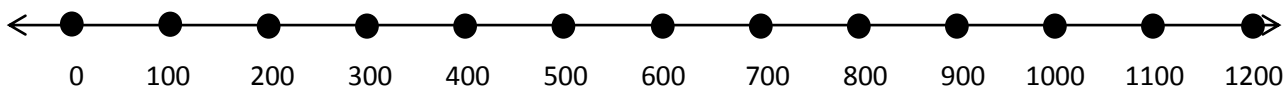
2. **Say:** Take turns with your partner and count in 100. Use the number line if you need help.
3. **Say:** Let's count in 100s together?
4. **Say:** Now we are going to count in 50s. We can start with any hundred and count up to 1000.
5. Erase the numbers on the number line.
6. **Say:** Please count with me as I write the numbers on the number line. Ready? 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800.

| 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
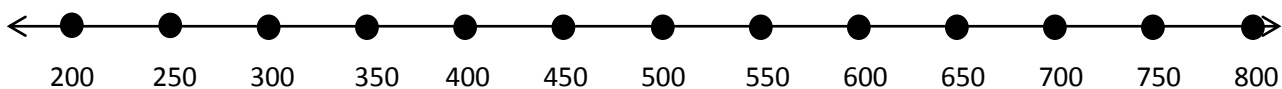
7. **Ask:** Who thinks they can continue counting in 50s until you get to 1000?
8. Ask a volunteer to count aloud. (Answer: 850, 900, 950, 1000)

Guided Practice *(10 minutes)*

1. **Say:** Last week, you counted forward and backward in 10 up to 100. Today we are going to extend that up to 1000. If I start at 800, what comes next when I count in 10s?
2. Give pupils 30 seconds to think. Then **Say:** Tell your neighbour what number comes next.
3. Give pupils a few seconds. **Ask:** What comes next? (Answer: 810)
4. **Say:** Tell your partner what comes after 810. Take turns and let your partner tell you the next number. Count in 10s with your partner until you get to 1000.

5. Give pupils about 2 minutes to work. While they work, erase the numbers on the number line. Make it 8 spots longer if you have room.
6. **Say:** Now we are going to count in 10s together. I need a pupil to write the numbers on the number line as we count.
7. Call a volunteer to the board and support them to write the numbers as the class counts. When they are finished, the number line should look like this: (If you made it longer, the rest of the numbers should be: 930, 940, 950, 960, 970, 980, 990, 1000).

800   810   820   830   840   850   860   870   880   890   900   910   920
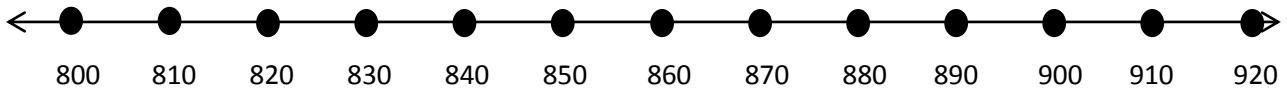
Independent Practice *(12 minutes)*

1. **Say:** We have practiced counting in 100s, 50s and 10s. Please copy the chart you see on the board and fill in the rest. The first column is counting in 1s. The second column is counting in 2s. The third column is counting in 5s. I wrote the first two numbers in each column for you. You may work with a partner if you need help.

Count in 1s	Count in 2s	Count in 5s	Count in 10s	Count in 50s	Count in 100s
657	342	775	470	150	0
658	344	780	480	200	100
(659)	(346)	(785)	(490)	(250)	(200)
(660)	(348)	(790)	(500)	(300)	(300)
(661)	(350)	(795)	(510)	(350)	(400)
(662)	(352)	(800)	(520)	(400)	(500)
(663)	(354)	(805)	(530)	(450)	(600)

2. Walk around to support those pupils who are having difficulty. Ask pupils who have finished and have the correct answers to help the others.

Closing *(3 minutes)*

1. **Say:** Please look at your chart. We are going to count together in 1s. Who can lead us?
2. **Say:** Who can write the numbers on our chart as we count?
3. **Say:** Check your chart as we go along. Start at 657. Ready? (Answer: 657, 658, 659, 660, 661, 662, 663)
4. Write the numbers in the chart on the board as the pupil says them.
5. Call on two volunteers (1 boy and 1 girl) to help with each column. Remind pupils to check their charts as you go along.

[0-1000 NUMBER LINE]

0   100   200   300   400   500   600   700   800   900   1000   1100   1200
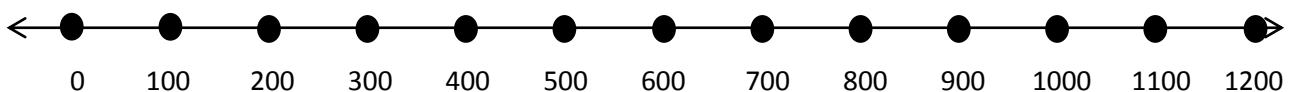
[COUNTING CHART]

Count in 1s	Count in 2s	Count in 5s	Count in 10s	Count in 50s	Count in 100s
657	342	775	470	150	0
658	344	780	480	200	100

Lesson Title: Counting backwards in multiples of 1, 2, 5, 10, 50 and 100 up to 1000 using a number line.	**Theme:** Knowing and understanding numbers up to 1000.	
Lesson Number: M-03-009	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to count backwards from 0-1000 from any number.	**Teaching Aids** 0-1000 number line at the end of the plan.	**Preparation** 1. Draw the 0-1000 number line, at the end of the plan, on the board. 2. Draw 5 small blank number lines on the board.

Opening *(2 minutes)*

1. **Say:** This week we started counting to 1000. Let's review in counting in 100s up to 1000. (Answer: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000)
2. **Say:** Now let's start at 700 and count in 50s. (Answer: 700, 750, 800, 850, 900, 950, 1000)
3. **Say:** Today we're going to practice counting backwards.

Introduction to the New Material *(8 minutes)*

1. **Say:** Think back to yesterday's lesson. This is almost the same. But we are counting backward on the number line instead of forward. When we count backward, we start at the right side of the number line. Do our numbers get larger or smaller as we count? If you think they get larger, put your thumb up. If you think they get smaller as we count backwards, put your thumb down.

   👍 Thumbs up   👎 Thumbs down

2. Check to see that most pupils put their thumbs pointing down.
3. **Ask:** Is 5 smaller or larger than 6? (Answer: smaller) When we count backwards, the numbers get smaller.
4. **Say:** Let's start at 1000 and count backwards in 100s. I will point to the number on the number line as you count. (Answer: 1000, 900, 800, 700, 600, 500, 400, 300, 200, 100, 0)
5. **Say:** Please take turns with your partner. Count backwards in 100s from 1000.

Guided Practice *(10 minutes)*

1. **Say:** We are going to play a game. There are some numbers on my number line that are missing. I need your help to find them. Please copy this number line in your book.
2. Look at the pattern. What are we counting in? (Answer: 50s) What numbers are missing? (Answer: 100, 50, 0)

   150   200

3. **Say:** Write those numbers on your number line.
4. Give pupils 1 minute to write the numbers on their number line.
5. **Say:** Now let's try the game with a different number. Please copy this number line in your book. Look at the pattern. What are we counting in?

   620   630
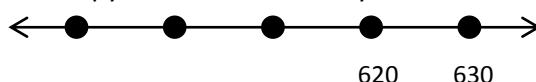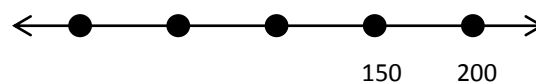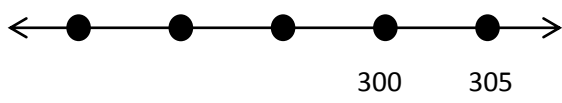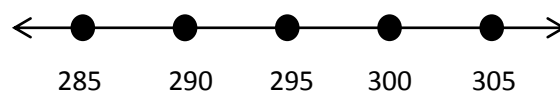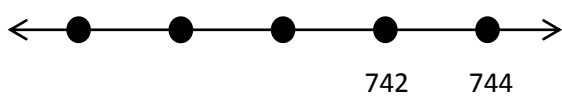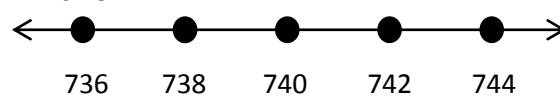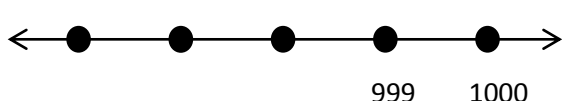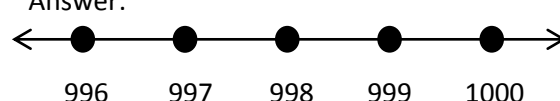
(Answer: 10s) What numbers are missing? (Answer : 610, 600, 590)

6. **Ask:** Tell your partner how you knew that 590 was the last number to fill in.
7. Let them talk for a minute.
8. **Say:** Raise your hand if you'd like to tell the class how you knew 590 was the last number you found. (Example answer: I knew that the 500s come before the 600s. The number had to be smaller than 600 because we were counting backward. If I start at 590 and count forward in 10s, I get to 600.)
9. **Say:** Please write those numbers on your number line.
10. Give pupils 1 minute to write the numbers on their number line.

Independent Practice *(10 minutes)*

1. **Say:** Work with your partner. Find the missing numbers and write them on the number line, I counted backward on these number lines:

Draw on board:

Answer:

			300	305

285	290	295	300	305

Answer:

			742	744

736	738	740	742	744

Answer:

			999	1000

996	997	998	999	1000

2. After about 7 minutes, ask for three volunteers who have the correct answers to write their answers on the board.

Closing *(5 minutes)*

1. **Say:** Let's find out how well we did. We will all say the numbers on each number line together. Start with the largest number and count backwards. As we count, look at your answers. Please make changes if you had different answers. Let's begin: 305, 300, 295, 290, 285. Read the second one. 744, 742, 740, 738, 736. Let's try the third one. 1000, 999, 998, 997, 996. Great work class!

[0-1,000 NUMBER LINE]

0	100	200	300	400	500	600	700	800	900	1000	1100	1200

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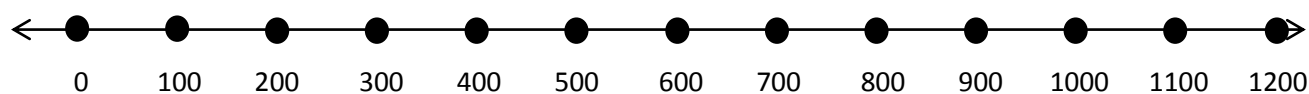
Lesson Title: Writing Numbers in Words 0-1000 as Numerals using Place Value	**Theme:** Knowing and Understanding Numbers up to 1000	
Lesson Number: M-03-010	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to identify the place value of 3-digit numbers.	**Teaching Aids** 1. 100 Chart at the end of the plan. 2. Place Value Chart at the end of the plan. 3. Blank Place Value Chart at the end of the plan. 4. 100 sticks in bundles of 10. 5. String to bundle sticks.	**Preparation** 1. Draw the 100 Chart, at the end of the plan, on the board. 2. Draw the Place Value Chart, at the end of the plan, on the board. 3. Draw a blank Place Value Chart on the board. 4. Gather 100 sticks and make 10 bundles of 10.

Opening *(3 minutes)*

1. **Say:** This week we started counting numbers up to 1000. Let's review by counting in 100s backwards from 1000. 1000, 900, 800, 700, 600, 500, 400, 300, 200, 100, 0.
2. **Say:** Now let's start at 700 and count backwards in 50s. 700, 650, 600, 550, 500, 450, 400, 350, 300, 250, 200, 150, 100, 50, 0.
3. **Say:** Count in 2s backwards from 1000 to 970. 1000, 998, 996, 994, 992, 990, 988, 986, 984, 982, 980, 978, 976, 974, 972, 970.

Introduction to the New Material *(5 minutes)*

1. **Say:** Today we're going to learn how to write big numbers using place value.
2. **Say:** Copy the blank Place Value Chart in your book. Write forty-three in the correct boxes.
3. Let pupils work for a minute.
4. **Say:** Check your neighbour's chart. Is it correct?
5. Write it in the chart on the board.
6. **Ask:** How do we write 43 in place value form? (Answer: 4 tens, 3 ones)

Place Value Chart

Thousands	Hundreds	Tens	Ones
		4	3
	1	1	6
	5	7	4
	3	9	8
	9	0	1
	4	2	3
	7	8	2
	6	0	0

Guided Practice *(15 minutes)*

1. **Ask:** In the number one hundred and sixteen, how many 100s are there? (Answer: 6)
2. **Ask:** In the number one hundred and sixteen, how many 10s are there? (Answer: 1)
3. **Say:** I need 11 bundles. Help me count them.
4. **Ask:** Does anyone know what I can do with my 11 bundles to make it easier to count them? (Answer: Put together 10 of them.)
5. **Ask:** When I put together 10 tens, what do I make? (Answer: a hundred)

27

6. **Say**: That's right. Look at the 100 Chart. If we count in 10s, it takes us 10 rows to get to 100. So instead of writing 11 tens, we can write 1 ten and 1 hundred.
7. **Say:** Write one hundred and sixteen in your Place Value Chart. (See answer in the chart.)
8. **Ask:** How many hundreds do we have? (Answer: 1)
9. **Say:** Now, write 116 in place value form on your paper. (Answer: 1 hundred, 1 ten and 6 ones)
10. **Say:** Write the following numbers in your place value chart: 574, 398, 901, 423, 782, 600.
11. **Say:** Check your neighbour's chart. See you if you have the same answers. If you have different answers, talk with your neighbour and decide who is correct.
12. Let pupils work for 5 minutes. Then, have volunteers come to the board to write the numbers in the Place Value Chart on the board.

Independent Practice *(9 minutes)*

1. **Say:** Now take those numbers and write them in place value on your paper. Ask your neighbour or raise your hand if you need help.
a. 574 (Answer: 5 hundreds, 7 tens and 4 ones)
b. 398 (Answer: 3 hundreds, 9 tens and 8 ones)
c. 901 (Answer: 9 hundreds, 0 tens and 1 one or 9 hundreds and 1 one)
d. 423 (Answer: 4 hundreds, 2 tens and 3 ones)
e. 782 (Answer: 7 hundreds, 8 tens and 2 ones)
f. 600 (Answer: 6 hundreds or 6 hundreds, 0 tens and 0 ones)

Closing *(3 minutes)*

1. **Ask:** Mary collected 43 mangoes on Monday and 116 mangoes on Tuesday. How many mangoes did she have after 2 days?
2. **Say:** We can break the numbers apart into place value form. This makes the numbers easier to add.
3. Invite 2 volunteers (1 boy and 1 girl) to write the 2 numbers in place value form. (Answer: 43 is 4 tens and 3 ones; 116 is 1 hundred, 1 ten and 6 ones.)
4. **Say:** How many hundreds do we have altogether? Hold up your fingers to show how many. (Answer: 1)
5. **Ask:** How many 10s do we have altogether? (Answer: 5)
6. **Ask:** How many 1s do we have altogether? (Answer: 9)
7. As the pupils tell you how many of each they have. Write the numbers on the board (Answer: 1 hundred, 5 tens, 9 ones)
8. **Ask:** So how many mangoes did Mary collect? (Answer: 159)
9. **Say:** During the next 2 weeks, we will see how this can help us.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Hundreds	Tens	Ones

Lesson Title: Order whole numbers from 0-1000 using place value	**Theme:** Knowing and understanding numbers up to 1000	
Lesson Number: M-03-011	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes		Teaching Aids		Preparation
	By the end of the lesson, pupils will be able to identify the place value of 3-digit numbers.		1. 100 Chart at the end of the plan. 2. Place Value Chart at the end of the plan. 3. 20 sticks		1. Draw the 100 chart at the end of the plan, on the board. 2. Draw the Place Value Chart, at the end of the plan, on the board. 3. Gather 20 sticks.

Opening *(3 minutes)*

1. Write the following numbers on the board: 35, 53, 68, 8, 20, 57, 86, 12.
2. **Say:** Let's put the numbers in order from largest to smallest. (Answer: 86, 68, 57, 53, 35, 20, 12, 8)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to put even bigger numbers in order.
2. **Ask:** If I take my sticks and put them in bundles of 10 sticks, how many bundles do I need to get to 100 sticks?
3. **Say:** Let's use our 100 Chart to help us. Look at the first row of the chart.
4. **Ask:** How many bundles is this first row the same as? (Answer: 1)
5. **Say:** Let's count down the chart to see how many 10s it takes to get to 100.
6. **Ask:** How many 10s does it take to get to 100? (Answer: 10)
7. **Ask:** Are Hundreds or Tens worth more? Would you rather have 1 Hundred Leone or Ten Leone? (Answer: 1 Hundred Leone)
8. **Say:** Aminata is going to the market to sell her beads. Aminata has 329 beads of all different colours. Her sister, Fatmata has 341 beads.
9. Write 'Aminata: 329' and 'Fatmata: 341' on the board.
10. **Ask:** Who has more beads, Aminata or Fatmata?
11. **Say:** If you think Aminata has more, put your hands in the air. If you think Fatmata has more, tap your desk. If you aren't sure, tap your nose.
12. Wait for a few seconds for all pupils to make their choices.
13. Ask for 2 pupils to put the numbers in the Place Value Chart on the board.
14. **Ask:** Should you look at the Hundreds, Tens or Ones digit first to figure out which number is bigger? (Answer: Hundreds)
15. **Ask:** Why should we look at the Hundreds? (Answer: Because it takes 10 Tens to equal 1 Hundred. So we know that Hundreds are bigger.)
16. **Ask:** Who has more Hundreds? (Answer: Neither)
17. **Ask:** Who has more Tens? (Answer: Fatmata)
18. **Ask:** Who has more Ones? (Answer: Aminata)

Place Value Chart		
Hundreds	Tens	Ones
3	2	9
3	4	1

19. **Ask:** Who has more beads? (Answer: Fatmata)
20. **Say:** If you think Aminata has more, put your hands in the air. If you think Fatmata has more, tap your desk. If you aren't sure, tap your nose. (Answer: All pupils should be tapping their desks.)
21. Call on one pupil to explain how she knew that it was Fatmata. (Answer: They had the same amount of Hundreds, so I looked at the Tens. Fatmata had 4 Tens, but Aminata only had 2 Tens. Even though she had more ones, they aren't worth as much as the Tens.)

Guided Practice *(10 minutes)*

1. Ask 6 volunteers (3 boys and 3 girls) to choose a number between 0 and 9. Tell the first 3 pupils to make a 3-digit number by writing each of their numbers on the board. (For example, if they chose the numbers 6, 3 and 2, they write 632.) Tell the other 3 pupils to do the same. Now you should have two 3-digit numbers on the board.
2. Choose 2 more volunteers (1 boy and 1 girl) to put the two 3-digit numbers in the Place Value Chart on the board. **Say:** Put your hands on your head if you agree with your friends.
3. **Ask:** Which number is bigger? How do you know? (Answer: They looked at the Hundreds place digits. They saw that one number had more Hundreds than the other number. If the Hundreds digits were the same, they looked at the Tens place to decide which was bigger.)
4. **Say:** Work with your neighbour. Each of you will pick a 3-digit number. Decide which number is bigger. Write them in a Place Value Chart in your book.
5. Let pupils repeat the task for 5 minutes.
6. **Say:** Now we will make it more difficult. Each partner will think of two 3-digit numbers. Then together you will put all the numbers in order from smallest to largest.
7. Give pupils about 5 minutes to complete the task. When they are finished, ask one group to write their numbers on the board in order from smallest to largest.
8. **Ask:** Are these numbers in the correct order?

Independent Practice *(10 minutes)*

1. Write the following numbers on the board: 842, 100, 601, 327, 852, 495, 9, 606, 83. **Say:** Write the following numbers down on your paper in order from smallest to largest. You may use your Place Value chart to help. (Answer: 9, 83, 100, 327, 495, 601, 606, 842, 852)
2. **Say:** Check to see that you and your neighbour have the same answers. If not, tell each other what you think and decide together what the correct order is.

Closing *(2 minutes)*

1. Choose one volunteer. **Say:** Tell us a small number.
2. After the pupil tells you their number, ask another volunteer to give you a number that is bigger. Continue calling on pupils. Tell them to give a bigger number each time. Keep going until you get a number bigger than 1000.

                                                                     [PLACE VALUE CHART]

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Hundreds	Tens	Ones

Lesson Title: Locate numbers from 0-1000 on a number line	Theme: Knowing and understanding numbers up to 1000	
Lesson Number: M-03-012	Class/Level: Class 3	Time: 35 minutes

	Learning Outcomes		Teaching Aids		Preparation
	By the end of the lesson, pupils will be able to locate numbers up to 1000 on the number line.		Blank 0-1000 number line at the end of the plan.		Draw the blank 0-1000 number line, at the end of the plan, on the board.

Opening *(3 minutes)*

1. **Say:** We are going to count in 10s.
2. **Ask:** What number do we start with? (Answer: 10)
3. **Say:** Let's count together in 10s to 500.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today, we are going to continue looking at 3-digit numbers.
2. **Ask:** Can someone give me an example of a 3-digit number? (Answer: Any number between 100 and 999.)
3. **Ask:** What were our 'guide' numbers on a number line up to 100? (Answer: 10, 20, 30, 40, 50, 60, 70, 80, 90)
4. **Say**: That's right. We used those numbers to 'guide' us to find numbers in between.
5. **Ask**: 55 is between which two 'guide' numbers? (Answer: 50 and 60)
6. **Say:** Look at the number line on the board. **Ask:** If we want this number line to show us numbers all the way to 1000, what should our 'guide' numbers be?
7. **Say:** Turn to your neighbour and tell them.
8. **Ask**: Who thinks they know the answer? (Answer: 0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000)

Guided Practice *(10 minutes)*

1. **Say:** Draw a blank number line like I have on the board.
2. **Say:** Let's all count in 100s as I point to the long lines: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000. Write the numbers on the long lines on your number lines.
3. Write the numbers on the number line on the board.

| 0 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
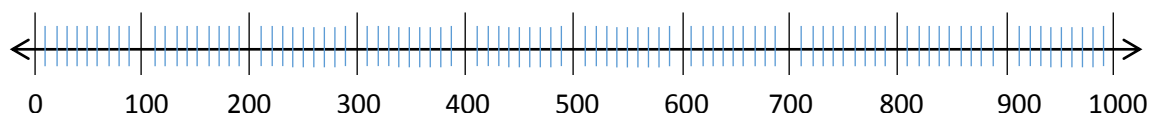
4. **Say:** Trade papers with your neighbour. Check your neighbour's paper. If their number line is not correct, help them to correct it.
5. **Say:** Now let's use our 'guides' on the number line.
6. Point to the line that stands for 240 on the number line on the board.

7. **Ask:** What number am I pointing to? (Answer: 240)
8. **Say:** Turn to your neighbour. Tell them how you know that it was 240 without counting from 0.
9. Choose a pupil to share their answer with the class. (Answer: I know the long line is 10 and you went 4 short lines past that.)
10. **Ask:** What if we had 243? Where would that go? (Answer: Between the 240 and 250 lines.)

Independent Practice *(15 minutes)*

1. **Say:** With your neighbour, think of a 3-digit numbers. Put it on the number line where it belongs. Remember that your number may go in between two lines. Keep placing 3-digit numbers on your number line. Give pupils 10 minutes to work.
2. **Say:** Switch books with another pair. Check their answers. If you think they are wrong, tell them and decide who is correct.

Closing *(2 minutes)*

1. Draw the following incomplete number line on the board:
2. **Say:** This is another type of number line you may see.
3. Ask 6 volunteers to fill in the missing numbers on the number line. (Answer: 377, 379, 380, 382, 384, 385)

375   376   378   381   383
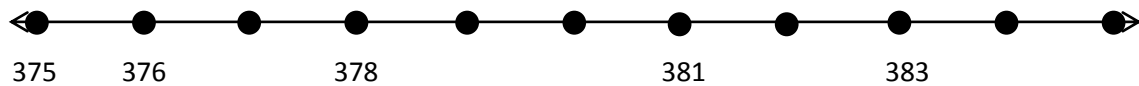
4. Well done! Today you located 3 digit numbers on the number line.

[BLANK 0-100 NUMBER LINE]
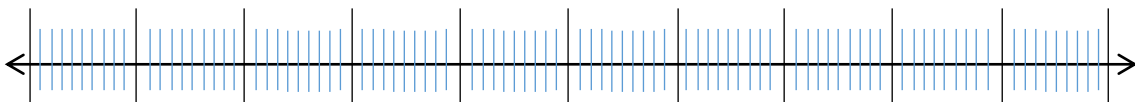
Lesson Title: Compare numbers up to 1000 using a number line and place value	**Theme:** Knowing and understanding numbers up to 1000	
Lesson Number: M-03-013	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to compare numbers up to 1000.	**Teaching Aids** 1. 0-1000 number line at the end of the plan. 2. Place Value Chart at the end of the plan.	**Preparation** 1. Draw a 0-1000 number line, at the end of the plan, on the board with 425, 430 and 435 labelled. 2. Draw the Place Value Chart, at the end of the plan, on the board.

Opening *(4 minutes)*

1. Write the following numbers on the board: 789, 699, 756, 715, 748, 931.
2. **Say:** There are 6 schools in the district. Let's put them in order from smallest to largest?
3. **Say:** Write the numbers in order from smallest to largest. (Answer: 699, 715, 748, 756, 789, 931)

Introduction to the New Material *(5 minutes)*

1. **Say:** Today we are comparing big numbers. **Ask:** Who can tell the class what 'compare' means? (Example answer: To tell which number is bigger, smaller or if they are the same.)
2. **Ask:** Who can write the 2 symbols we use when we compare numbers on the board? Have a volunteer write them on the board. (Answer: < and >)
3. **Ask:** How do we know which symbol to use? (Answer: The 'crocodile mouth' opens to the most 'fish' or the largest number.)
4. **Say:** These symbols have a name. They are 'greater than' or 'less than'. If the first number is bigger, we say, 'greater than'
5. Write '35 > 10' on the board. **Say:** If I write this on the board, I would say, '35 is greater than 10'.
6. Write 49 > 5 on the board. **Ask:** How do you think I say this? (Answer: 49 is greater than 5.)
7. **Say:** If the first number is smaller, then I say 'less than'.
8. Write 4 < 97 on the board. **Ask:** How do I say this? (Answer: 4 is less than 97.)

Guided Practice *(13 minutes)*

1. Write the following numbers on the board: 434, 429, 427, 431
2. **Say:** We can use a number line to help us compare numbers.
3. **Ask:** Where should I write the numbers that I want to compare? Write them on your number line. (Answer: See numbers in ( ) below)

425   (427)   (429)   430   (431)   (434)   435
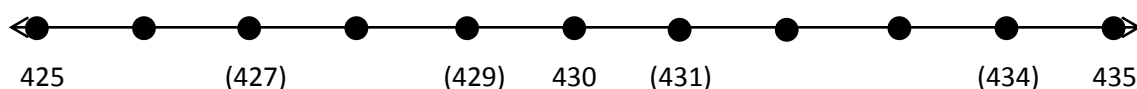
4. Call on a pupil to write the numbers on the number line on the board.

5. **Say:** Now we are going to put all the numbers in our Place Value Chart. Work with your partner to put all 7 numbers in your chart.

Thousands	Hundreds	Tens	Ones
	4	2	5
	4	2	7
	4	2	9
	4	3	0
	4	3	1
	4	3	4
	4	3	5

6. Give pupils 2 minutes to put the numbers in the chart. Write them in the chart on the board.
7. **Ask:** How can we use the Place Value Chart to help us compare numbers? (Answer: Look at the thousands place, then the hundreds place and then the tens place to find out which is smallest. Next, look at the ones place to compare.)
8. Write 425   429 on the board. **Ask:** If I want to compare 425 and 429, which symbol do I use? (Answer: <)
9. **Ask:** How do I read it out loud? (Answer: 425 is less than 429.) **Say:** Everyone repeat that together: '425 is less than 429'.
10. Write the following numbers on the board next to each other with space between them like this:

434 429	427 431	435 425
427 425	434 435	

11. **Say:** Copy these sets of numbers on your paper. Compare the 2 numbers in each set. Write the correct symbol between them**.**
12. Give pupils a few minutes to work. **Say:** Let's compare the number sets. Repeat after me: 434 is greater than 429. 427 is less than 431. 435 is greater than 425. 427 is greater than 425. 434 is less than 435.
13. As you read them out loud, write in the correct symbols on the board:

434 > 429	427 < 431	435 > 425
427 > 425	434 < 435	

Independent Practice *(10 minutes)*

1. Write the following numbers on the board: 122, 125, 118, 128.
2. **Say:** Copy these numbers on your paper. Put them on a number line. Put them in a Place Value Chart. Then write 4 greater-than or less-than statements.

Closing *(3 minutes)*

1. Ask different pupils to read one of their greater-than or less-than statements out loud. Tell the other pupils to make a thumbs up if the pupil is correct and make a thumbs down if they are not correct.

[100 CHART]

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

[PLACE VALUE CHART]

Hundreds	Tens	Ones

Lesson Title: Write numbers up to 100 in expanded form	**Theme:** Knowing and understanding numbers up to 1000	
Lesson Number: M-03-014	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to write numbers up to 100 in expanded form.		**Teaching Aids** Place Value Chart at the end of the plan.		**Preparation** Draw the Place Value Chart, at the end of the plan, on the board.

Opening *(3 minutes)*

1. Choose 2 pupils to stand on opposite sides of the room.
2. **Say:** You are going to be fish. The rest of the class will be crocodiles. The fish each will pick a 3-digit number. The fish will tell us their numbers. Then the crocodiles will turn to the fish with the larger number and open their mouths. Change the fish for 2 new pupils. Repeat the game.
3. **Say:** Today we are going to use our place value skills to write numbers in expanded form.

Introduction to the New Material *(5 minutes)*

1. Write the following numbers on the board: 34, 46, 75, 12, 50.
2. **Say:** Write these numbers in the Place Value Chart.
3. Ask a volunteer to come to the board and write the numbers in the Place Value Chart on the board.
4. **Ask:** What is the 4 worth in 34? How many sticks would we need? (Answer: 4)
5. **Ask:** What is the 3 worth in the number 34? (Answer: 30)
6. **Ask:** Why is the 3 worth 30? (Answer: It is in the Tens place so it is like when we bundled sticks together. It took 10 sticks to make 1 Ten. So it takes 30 sticks to make 3 Tens)
7. **Ask:** What is the 4 worth in 46? (Answer: The 4 is worth 40 because it is in the Tens place. That means there are 4 groups of 10 which is 40.)

Place Value Chart

Hundreds	Tens	Ones
	3	4
	4	6
	7	5
	1	2
	5	0

Guided Practice *(15 minutes)*

1. **Say:** We are going to write numbers in 'expanded form'. Let's think about the number 34. We already know what the digits are worth. We know the 3 is worth (pause and let the pupils say '30') and the 4 is worth (pause and let the pupils say '4'). So, 30 and 4 is 34. We can write that like this: 30 + 4
2. Write 30 + 4 on the board.
3. **Say:** We write what each digit is worth and then add them together. This is called 'expanded form'.
4. Write the following numbers on the board: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90. **Say:** Write these numbers in your book.

5. **Say:** I will write a number on the board. You think about the value of each number. Point to the 2 numbers in your book that has those values. In the example of 34, you would point to 30 and 4. Use the Place Value Chart to help you.
6. **Say:** Then we will write the number in 'expanded form'. Let's try it with 46.
7. **Ask:** Which numbers will you point to? (Answer: 40 and 6.)
8. **Ask:** How do we write 46 in expanded form?
9. Call on one volunteer to write the answer on the board. (Answer: 40 + 6.)
10. Call out the following numbers one at a time and have pupils point to the values in their book.

75 (Answer: 70 and 5)   12 (Answer: 10 and 2)   50 (Answer: 50 and 0)   94 (Answer: 90 and 4)
29 (Answer: 20 and 9)   68 (Answer: 60 and 8)   33 (Answer: 30 and3)   86 (Answer: 80 and 6)
47 (Answer: 40 and 7)   71 (Answer: 70 and 1)

11. **Say:** How do we write each number in expanded form?
12. Call on volunteers to write the answers on the board:

75 =70 + 5   12= 10 + 2   50 = 50 + 0   94 = 90 + 4
29 = 20 + 9   68 = 60 + 8   33 = 30 + 3   86 = 80 + 6
74 = 40 + 7   71 = 70 + 1

Independent Practice *(10 minutes)*

1. Write the following numbers on the board: 5, 13, 24, 49, 58, 36, 70
2. **Say:** Copy these numbers in your book. Then write the numbers in expanded form.
3. Give pupils 5-6 minutes to work.
   (Answer: 5 = 0 + 5, 13 = 10 + 3, 24 = 20 + 4, 49 = 40 + 9, 58 = 50 + 8, 36 = 30 + 6, 70 = 70 + 0)
4. **Say:** Swap your book with a pupil sitting next to you and check their work

Closing *(2 minutes)*

1. **Say:** Today we learned how to write numbers in expanded form. **Ask:** How do you write 99 in expanded for? (Answer: 90 + 9)

[PLACE VALUE CHART]

Hundreds	Tens	Ones

Lesson Title: Write numbers up to 1000 in expanded form	**Theme:** Knowing and understanding numbers up to 1000	
Lesson Number: M-03-015	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to write numbers up to 1000 in expanded form.		**Teaching Aids** Place Value Chart at the end of the plan.		**Preparation** Draw the Place Value Chart, at the end of the plan, on the board.

Opening *(3 minutes)*

1. Choose 2 pupils to come to the front of the room.
2. **Say:** Pick two 2-digit number. Then, write those numbers on the board.
3. **Say**: Now, write those numbers in expanded form.
4. **Say:** Today we're going to write bigger numbers in expanded form.

Introduction to the New Material *(5 minutes)*

1. Write the following numbers on the board: 356, 209, 780, 141.
2. **Say:** Write these numbers in the Place Value Chart.
3. Call on a pupil to come to the board and write them in the Place Value Chart on the board.

Hundreds	Tens	Ones
3	5	6
2	0	9
7	8	0
1	4	1

4. **Ask:** What is the 6 worth in 356? (Answer: 6)
5. **Ask:** What is the 5 worth in the number 356? (Answer: 50)
6. **Say:** Why is the 5 worth 50? (Answer: It is in the place so it takes 5 to make 50.)
7. **Ask:** What is the 3 worth in 356? (Answer: The 3 is worth 300 because it is in the Hundreds place. That means there are 3 groups of 100, which is 300.)
8. If pupils are having trouble, have them count in Hundreds. Each time they say a number, hold up a finger. They should have 3 fingers when they get to 300 because it is 3 Hundreds.

Guided Practice *(10 minutes)*

1. **Say:** Today, we are going to write larger numbers in 'expanded form'. We already know what the digits are worth. In the number 356, we know the 3 is worth (pause and let the pupils say '300'), the 5 is worth (pause and let the pupils say '50') and the 6 is worth (pause and let the pupils say '6'). We can write that like this: 300 + 50 +6.
2. Write 300 + 50 +6 on the board.

3. **Say:** We write what each digit is worth and then add them together. Who can tell me what we call this form? (Answer: expanded form.)
4. **Say:** In your book, write the expanded form of the following numbers: 209, 780, 141. (Answer: 209 = 200 + 0 + 9, 780 = 700 + 80 + 0, 141 = 100 + 40 + 1)
5. Ask 3 volunteers to write the numbers in expanded form on the board. Point to the first one.
6. **Say:** Give a Thumbs up if this is correct. Give a Thumbs down if it is not.

Independent Practice *(15 minutes)*

1. **Say:** Copy these numbers on your paper: 735, 608, 489, 321, 270, 500. Then write the numbers in expanded form. (Answers: 735 = 700 +30 + 5, 608 = 600 + 0 + 8, 489 = 400 + 80 + 9, 321 = 300 + 20 + 1, 270 = 200+ 70 + 0, 500 = 500 + 0 + 0)
2. Give pupils 10 minutes to work.
3. **Say:** Swap books with a pupil sitting next to you and check their work

Closing *(2 minutes)*

1. On the board write: 198 = 100 + 9 + 8

    643 = 60 + 40 + 30

    709 = 700 + 90
2. **Say:** I wrote these numbers in expanded form. But I was in a hurry, and I think I made some mistakes!
3. **Ask:** How many mistakes can you find?
4. **Ask:** How do we correct the mistakes?
5. Call on three pupils to correct them on the board.   198 = 100 + 9**0** + 8
    643 = 6**00** + 40 + **3**
    709 = 700 + **0** + **9**
6. **Say:** Well done!

[PLACE VALUE CHART]

Hundreds	Tens	Ones

Lesson Title: Revising addition of whole numbers 0 to 100 by using a number line	**Theme:** Addition of whole numbers up to 100	
Lesson Number: M-03-016	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to solve addition sums up to 100 using a number line.	**Teaching Aids** 1. Number line at the end of the plan. 2. Ball or ball made of paper.	**Preparation** 1. Draw a number line, at the end of the plan, on the board. 2. Write the numbers 0-9 on the board. 3. Find or make a small ball.

Opening *(3 minutes)*

1. **Say:** I will call out an addition sum. Stand up if you know the answer, then I will throw the ball to someone who is standing up. If you catch it, answer the sum. If you need help, ask your neighbour. Let's begin! 2 + 3
2. Throw the ball to a pupil standing up. The pupil who catches it, answers 5. When they answer correctly all pupils sit down. Continue to play for 3-4 minutes calling out simple sums that only add 1-digit numbers. Sample sums you can use are: 6 + 4 = 10, 1 + 5 = 6, 7 + 8 = 15, 6 + 7 = 13, 3 + 1 = 4, 8 + 4 = 12

Introduction to the New Material *(10 minutes)*

1. **Say:** This week we will talk about different ways to add big numbers. Today we will look at a number line. Please copy the number line on your paper.
2. **Say:** Put your finger on the 20. Jump to the next dot. What number is that? (Answer: 25) Let's count from 20 to 70 on our number line and call out the number for each dot. (Answer: 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70). Please label all numbers.
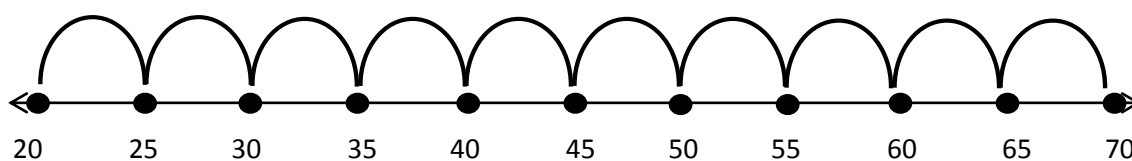
3. **Ask:** If I had 20 pupils in the classroom and 5 more came in, how many would I have now? Look at your number line. Start at the 20 and jump 5 numbers. How many dots is that? (Answer: 1) Where do I end up? (Answer: 25) Turn to your neighbour and tell them what 20 + 5 is. (Answer: 25)
4. Give pupils about 30 seconds to talk. **Ask:** Who can tell me what 20 + 5 is? (Answer: 25)
5. **Say:** Ok, let's try a harder one. I have 25 pupils in the class, 15 more come in. How many do I have now? Take a guess and tell your neighbour.
6. Give them about a minute to talk.
7. **Say:** Let's look at the number line. Put your finger on the 25. We are going to count up 15 by 5s because each dot is 5 numbers. Are you ready? 5 (point to the 30), 10 (point to the 35), 15 (point to the 40). Where did we end up? (Answer: 40) What is 25 + 15? (Answer: 40)
8. On the board, write 25 + 15 = 40

9. **Say:** On your paper, please write the addition sum, 25 + 15 = 40

Guided Practice *(10 minutes)*

1. **Say:** Let's start at 45 and add 10. Work with your neighbour and your number line.
2. **Ask:** Who can come to the board and write our addition sum? (Answer: 45 + 10 = 55)
3. **Say:** Good job! Can you explain how you did this sum? (Example answer: I started on the 45. I know that each dot is 5 numbers. I know that two 5s are 10. So I jumped 2 dots. I ended at 55.)
4. **Say:** Let's do one more together. Please add 30 and 25. You may work with your neighbour and use your number line to help.
5. **Ask:** Who can come to the board and write our addition sum? (Answer: 30 + 25 = 55)
6. **Say:** Very good! Can you explain how you did this sum? (Example answer: I started on the 30. I know that each dot is 5 numbers. I counted by 5s until I got to 25. I ended at 55.)

Independent Practice *(10 minutes)*

1. Write the following addition sums on the board:
   60 + 5 = (Answer: 65)   25 + 20 = (Answer: 45)   45 + 10 = (Answer: 55)
   20 + 20 = (Answer: 40)   50 + 15 = (Answer: 65)   55 + 15 = (Answer: 70)
   30 + 35 = (Answer: 65)   25 + 35 = (Answer: 60)

2. **Say:** Copy these addition sums in your book. Solve them by using your number line.
3. Give pupils 8 minutes to complete the sums then write the answers on the board.
4. **Say:** I have written the answers on the board. Please check your answers.
5. Give them 1 minute to check their answers.
6. **Say:** Please show me with your fingers how many you got correct. If you got two correct, put 2 fingers in the air.
7. Check to see if most pupils got at least 5 correct.

Closing *(2 minutes)*

1. **Say:** Let's try a difficult one. What is 60 + 25? Think about your number line if it continues past 70. (Answer: 85)
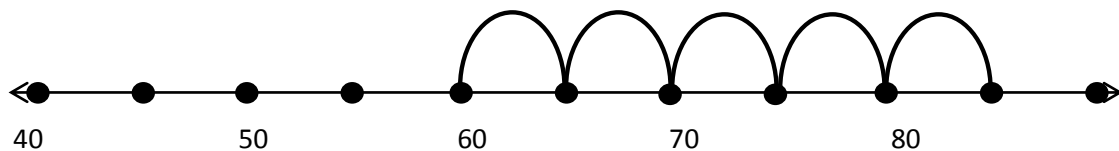
2. **Say:** Good job today!

[NUMBER LINE]
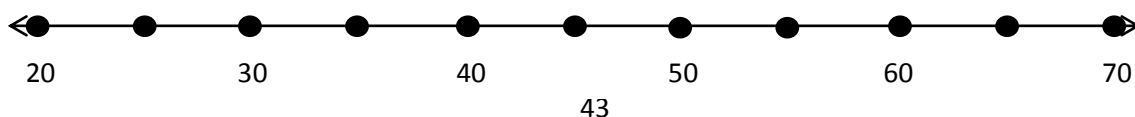
Lesson Title: Addition of 2-digit numbers using place value without renaming	**Theme:** Addition of whole numbers up to 100	
Lesson Number: M-03-017	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to add 2-digit numbers without renaming.	**Teaching Aids** 1. Place Value Chart at the end of the plan. 2. 50 sticks.	**Preparation** 1. Draw the Place Value Chart, at the end of the plan, on the board. 2. Gather 50 sticks.

Opening *(3 minutes)*

1. **Say:** I will call out an addition sum. Write the answer in your book and hold it up for me to see. Let's begin. 1 + 5 = (Answer: 6).
2. Wait until most pupils have raised their answer. If most are correct, call out a new sum. If not, ask one of the pupils to explain the correct answer.
3. Call out simple sums that only add 1-digit numbers. Sample sums you can use are:

4 + 6 = (Answer: 10)	9 + 2 = (Answer: 11)	7 + 1 = (Answer: 8)	5 + 6 = (Answer: 11)
4 + 3 = (Answer: 7)	8 + 3 = (Answer: 11)	2 + 5 = (Answer: 7)	7 + 8 = (Answer: 15)
9 + 7 = (Answer: 17)	8 + 6 = (Answer: 14)	2 + 4 = (Answer: 6)	1 + 5 = (Answer: 6)

Introduction to the New Material *(10 minutes)*

1. **Say:** Yesterday, we added numbers using a number line. Today we will add numbers without using a number line.
2. Make a pile of 15 sticks **Say:** I have 15 sticks.
3. Make another pile of 12 sticks. **Say:** I have 12 sticks.
4. **Ask:** How can I work out the total number of sticks? (Example answer: count all the sticks by 1s) **Ask:** Is there an easier way to count them instead of counting each one until you get to the answer? (Possible answer: You can bundle them in groups of ten.)
5. Take the pile of 15 sticks and split it into a bundle of 10 sticks and 5 loose sticks. **Say:** I have made a bundle of 10 and I have 5 loose sticks.
6. Take the pile of 12 sticks and split it into a bundle of 10 sticks and 2 loos sticks. **Ask:** What did I do with the 12 sticks? (Answer: Bundled one group of 10 and left 2 sticks loose.)
7. **Ask:** How many bundles do I have now? (Answer: 2) How many sticks is that? (Answer: 20) How many loose sticks do you have? (Answer: 7) How many sticks do you have altogether? (Answer: 27)
8. **Say:** We can write this sum like this.
9. Write the following number sentence on the board: 15 + 12 = 27

Guided Practice *(10 minutes)*

1. **Say:** Let's try to add two different numbers.
2. Ask a volunteer to make a pile of 23 sticks. Encourage the class to count along as the volunteer makes the pile.

3. Ask another volunteer to make a pile of 16 sticks. Encourage the class to count along.
4. **Say:** Now, let's make bundles of 10 sticks in each pile.
5. Ask 2 volunteers (1 boy and 1 girl) to make bundles of 10 in each pile.
6. **Say:** Show me with your fingers how many bundles of 10 we have altogether. (Answer: Pupils hold up 3 fingers.)
7. **Ask:** How do you know what the answer is 3? (Example answer: There are 2 bundles in the pile of 23 and 1 bundle in the pile of 16.)
8. **Say:** Please show me with your fingers how many single sticks we have? (Answer: 9. There are 3 in the first pile and 6 in the second pile.)
9. **Ask:** Who can come to the board and fill in our Place Value Chart to show how many Tens and how many Ones we have? (Answer: 3 Tens 9 Ones)
10. **Say:** While your classmate is writing the answer on the board, please write how many sticks there are all together. (Answer: 39)
11. When the pupil sits down, ask all pupils to hold up their answers to show you.
12. **Ask:** Who can write the number sentence on the board for this sum? While our friend is writing on the board, everyone else needs to it in their book.
13. Give them about 30 seconds and then **Say:** Please hold up your answers. (Answer: 23 + 16 =39 or 16 + 23 = 39)

Independent Practice *(10 minutes)*

1. Write the following addition sums on the board:
   24 + 13 = (Answer: 37)   25 + 53 = (Answer: 78)   81 + 16 = (Answer: 97)
   36 + 22 = (Answer: 58)   17 + 71 = (Answer: 88)
2. **Say:** Copy these addition sums in your book.
3. **Say:** Draw a Place Value Chart and write how many Tens and how many Ones for each answer. Then write the answer to the addition sentence.
4. Ask for 5 volunteers to write the answers on the board.
5. **Say:** Please switch papers with your partner. Now, check the answers.
6. **Say:** Please show me with your fingers how many you got correct. If you got two correct, put 2 fingers in the air.

Closing *(2 minutes)*

1. **Say:** Let's try one more sum. What is 12 + 26?
2. Give pupils a minute to work.
3. **Ask:** Who can tell me the answer? (Answer: 38) Please raise your hand if you got the correct answer. Excellent!

[PLACE VALUE CHART]

Tens	Ones

45

Lesson Title: Addition of 2-digit number using place value with renaming	**Theme:** Addition of whole numbers up to 100	
Lesson Number: M-03-018	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to add 2-digit numbers with renaming.	Teaching Aids 1. Place Value Chart at the end of the plan. 2. 100 sticks.	Preparation 1. Draw the Place Value Chart, at the end of the plan, on the board. 2. Gather 100 sticks.

Opening *(3 minutes)*

1. **Say:** In pairs, write the numbers 0-9 in your book. Take turns pointing to 2 numbers and adding them together as quickly as you can.
2. **Say:** Yesterday, we added large numbers using sticks and Place Value Charts. Today we are going to make it a little bit more difficult.

Introduction to the New Material *(10 minutes)*

1. Make a pile of 15 sticks and a pile of 17 sticks.
2. **Ask:** Is there an easy way to work out how many sticks I have altogether instead of counting each one until you get to the answer? (Possible answer: You can bundle them in groups of ten.)
3. Take the pile of 15 sticks and split them into a bundle of 10 sticks and 5 loose sticks. **Say:** I have made a bundle of 10 and 5 loose sticks.
4. Take the pile of 17 sticks and split them into a bundle of 10 sticks and 7 loose sticks. **Ask:** What did you do with the 17 sticks? (Answer: Bundled one group of 10 and left 7 sticks loose.)
5. Put your loose sticks together. **Ask:** What can I do with these? (Answer: Make another bundle of 10) How many loose sticks do I now have leftover? (Answer: 2)
6. **Ask:** How many bundles do we have now? (Answer: 3) How many sticks is that? (Answer: 30) How many loose sticks do you have? (Answer: 2) How many sticks do you have altogether? (Answer: 32)
7. **Say:** We can write this math sum like this.
8. Write the following number sentence on the board: 15 + 17 = 32

Guided Practice *(10 minutes)*

1. **Say:** Let's try to add two different numbers.
2. Ask 2 volunteers to make a pile of 18 sticks and a pile of 22 sticks. Encourage pupils to count along.
3. **Say:** Let's make bundles of 10 sticks in each pile if we can. If we have any loose sticks, let's try to use them to make a bundle of ten.
4. Ask a volunteer to make bundles of ten while the class count aloud.
5. **Say:** Show me with your fingers how many bundles of 10 we made. (Answer: Pupils hold up 4 fingers.)

6. **Ask:** Who can come to the board and fill in our Place Value Chart to show how many tens and how many ones we have? (Answer: 4 tens 0 ones)
7. **Say:** While your classmate is writing the answer on the board, everyone else please write how many sticks there are all together. (Answer: 40)
8. When the pupil sits down, ask all pupils to hold up their answers to show you.
9. **Ask:** Who can write the number sentence on the board for this sum? While our friend is writing it on the board, everyone else needs to write it in your book.
10. Give them about 30 seconds to write.
11. **Say:** Hold up your answers. (Answer: 18 + 22 = 40 or 22 + 18 = 40)

Independent Practice *(10 minutes)*

1. Write the following addition sums on the board:

   29 + 12 = (Answer: 41)   26 + 38 = (Answer: 64)   74 + 17 = (Answer: 91)
   55 + 35 = (Answer: 90)   63 + 29 = (Answer: 92)

2. **Sa**y: Copy these addition sums in your book and draw a Place Value Chart.
3. **Say:** Please write how many Tens and how many Ones for each answer. Then write the answer to the addition sentence.
4. **Say:** Please switch papers with a partner and check the answers.
5. While pupils check their partner's answers, write the answers on the board.
6. **Say:** I have written the answers on the board. Please check your answers.
7. Give them 1 minute.
8. **Say:** Show me with your fingers how many you got correct. If you got two correct, put 2 fingers in the air.
9. Check to see if most pupils got at least 4 correct.

Closing *(3 minutes)*

1. Say: Let's do one more.
2. Write 48 + 25 on the board. **Ask:** Who can tell me the answer? (Answer: 73)

[PLACE VALUE CHART]

Tens	Ones

Lesson Title: Using mental strategies for addition up to 100	**Theme:** Addition of whole numbers up to 100	
Lesson Number: M-03-019	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to solve simple addition sums up to 100 mentally.	**Teaching Aids** Place Value Chart at the end of the plan.	**Preparation** Draw the Place Value Chart, at the end of the plan, on the board.

Opening *(2 minutes)*

1. **Say:** Let's do some quick mental maths.
2. **Say:** Hold up the correct number of fingers to show the answer. I'm going to say the sums very quickly!
3. Call out simple addition sums up to 10.

Introduction to the New Material *(10 minutes)*

1. **Say:** When we have 2-digit numbers that we want to add, we can break them apart to make them easier to add in our heads. We have to remember our bundles and Place Value Charts.
2. Write 15 + 23 = on the board.
3. **Say:** We're going to add 15 + 23
4. **Say:** If I want to add 15 + 23, I can break 15 apart to help me. How can we break the number 15 apart? (Answer: 1 Ten and 5 ones)
5. Write 15 = 10 + 5 on the board.
6. Write 23 + 10 = on the board. **Say:** Now I can add 23 + 10. What do I get when I add another Ten to 23? (Answer: 33)
7. Write in 33. **Say:** What do I still have to add? (Answer: 5 more)
8. Write 33 + 5 = on the board. **Say:** What do we have now? (Answer: 38)
9. Write in 38
10. **Say:** So 15 + 23 = 38
11. Write 15 + 23 + 38
12. **Say:** Another way I could do this sum in my head would be to break both numbers into Tens and Ones. We did this before when we worked with our bundles.

Tens	Ones
1	5
2	3
3	8

13. Fill out the Place Value Chart as you **Say:** If I break 15 and 23 into bundles of Tens, how many Tens do I have altogether? (Answer: 3). How many Ones do I have? (Answer: 8) So my answer is 38.

Guided Practice *(10 minutes)*

1. **Say:** Let's try this with another addition sum. Write 16 + 12 on your paper. Work with a partner to solve this addition sum in one of the ways we just did. Write everything down as you do it just like we did on the board.

2. Give pupils about 5 minutes to do the sum.
3. **Ask:** Who can tell us how you solved the sum by breaking the numbers apart? Come to the board and explain it to us as you write it up. (Answer: 12 = 10 + 2, 16 + 10 = 26, 26 + 2 = 28)
4. **Ask:** Who can solve the sum using place value? Come to the board and explain it to us as you write it in the Place Value Chart.

Independent Practice *(10 minutes)*

1. Write the following addition sums on the board:
   50 + 42 = (Answer: 92)   37 + 19 = (Answer: 56)   55 + 15 = (Answer: 70)
   44 + 12 = (Answer: 56)

2. **Say:** Please write these addition sums on your paper. Solve them using one of the methods we learned today. Now write down the steps you used in your head to solve the sums.
3. As pupils work, check on the pupils whom had difficulty during the Guided Practice section.

Closing *(3 minutes)*

1. **Say:** In pairs, choose four numbers between 0 and 9. Using those 4 numerals, make two 2-digit numbers. Try to make numbers that add close to 100. For example, if you choose 5, 7, 2 and 3, you can make 35 + 72. That is close to 100 because 30 + 70 = 100.
2. This is a game you can call 'Close to 100' and you can play it anytime you have a few minutes.
3. Let them play for 2 minutes.
4. **Say:** Well done.

[PLACE VALUE CHART]

Tens	Ones

Lesson Title: Word problems using addition up to 100	**Theme:** Addition of whole numbers up to 100	
Lesson Number: M-03-020	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to solve word problems using addition up to 100.		**Teaching Aids** Word problems 1-3 at the end of the plan.		**Preparation** Write the word problems, at the end of the plan, on the board.

Opening *(3 minutes)*

1. **Say:** Tell me two numbers that you can add together to equal 100. As pupils tell you, write them on the board**.**
2. **Say:** Is this correct? If you think it is, give me the thumbs up. If you think it is wrong, give me the thumbs down.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to solve word problems. We sometimes call them story problems because they are like very short stories. Here is an example:
2. Point to Word Problem 1. **Say:** I am going to read the problem out loud. Please follow along.
3. **Say:** Zinab and Mity are cutting cane into strips so their mother can make baskets. Zinab has 36 strips and Mity has 53 strips. How many strips do they have altogether?
4. Read it again and ask them to read loud.
5. **Ask:** What are we trying to find out? (Answer: How many strips they have altogether.) Who can underline those words for us?
6. Ask a volunteer to underline 'How many strips did they have altogether?'
7. **Say**: Turn to your partner and tell them what you need to do to solve the problem.
8. Give pupils 1 minute to talk.
9. **Ask:** Who can tell me what your partner said? (Example answer: We must add 36 and 53.) How did you know we needed to add? (Example answer: The problem asked us how many 'altogether'. That means we have to put all the strips together to find out the total.)
10. **Say:** Solve the problem with your partner. When you have the answer, write it in your book and hold it up. (Answer: 89)

Guided Practice *(10 minutes)*

1. **Say:** We are all going to do a word problem together now. Please copy this problem in your book.
2. Point to the Word Problem 2 on the board. Give pupils 3 minutes to write the word problem.
3. **Say:** Abdul and Musa were counting motorbikes that passed by. Abdul counted 23 bikes going south and Musa counted 29 going north. How many motorbikes passed the boys?
4. **Say:** Please underline what you are trying to find out. Give pupils about 30 seconds to underline the question.

5. **Ask:** What did you underline? (Answer: How many motorbikes passed the boys?)
6. Underline that question on the board.
7. **Say:** Tell your partner what to do next. (Answer: Add 23 and 29)
8. **Say:** Work with your partner to add 23 + 29. You may use any method you know. Think about the bundles, the Place Value Charts, or breaking numbers apart. When you are finished, write it in your book and hold it up. (Answer: 52)
9. **Ask:** How did you solve the problem? (Example answer: I added 2 tens and 2 tens and got 4 tens. Then I added 3 ones and 9 ones and got 12. So I had 5 tens or 50 and 2 ones. I got 52. Another example answer: I broke 23 into 20 and 3. I added 29 + 20 and got 49. Then I added 3 more from the 23. I got 52.)

Independent Practice *(10 minutes)*

1. Point to Word Problem 3.
2. **Say:** Sao and Mary were making cakes of soap to sell at the market. Sao made 41 cakes and Mary made 47 cakes. How many did they make altogether?
3. **Say:** Write the problem in your book. Write how you solved the problem. (Answer: 41 + 47 = 88 I added 4 tens and 4 tens and got 8 tens which is 80. Then I added 1 and 7 and got 8 ones. 80 and 8 is 88. Another example answer: I started at 41 and counted by tens 4 times because 47 has 4 tens. That got me to 81. Then I added the 7 ones from the 47. I ended at 88.)
4. If some pupils finish early, they may write an addition word problem. Have them use 2-digit numbers. They may switch papers with another pupil who is finished and solve his word problem.

Closing *(3 minutes)*

1. **Say:** Please work with your partner. Write as many sums as you can that equal 100. (Example answers: 35 + 65, 70 + 30, 48 + 52, 99 + 1, 13 + 87, 50 + 50)
2. **Say:** Well done.

[WORD PROBLEM 1]
Zinab and Mity are cutting cane into strips so their mom can make baskets. Zinab has 36 strips and Mity has 53 strips. How many strips do they have altogether?

[WORD PROBLEM 2]
Abdul and Musa were counting motorbikes that passed by. Abdul counted 23 bikes going south and Musa counted 29 going north. How many motorbikes passed the boys?

[WORD PROBLEM 3]
Sao and Mary were making cakes of soap to sell at the market. Sao made 41 cakes and Mary made 47 cakes. How many did they make altogether?

| Lesson Title: Revising subtraction of numbers 0 to 100 by using a number line	Theme: Subtraction of whole numbers up to 100	
Lesson Number: M-03-021	Class/Level: Class 3	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to solve subtraction sums up to 100 using a number line.		Teaching Aids Number line at the end of the plan.		Preparation Draw a number line, at the end of the plan, on the board.

Opening *(3 minutes)*

1. **Say:** I will call out a subtraction sum. Please hold up the number of fingers for the answer. Are you ready? 5 – 4 =   (Pupils should raise 1 finger)
2. Call out simple sums that only subtract 1-digit numbers.
3. **Say:** When I call out the subtraction sum again, say the answer. Are you ready? 5 - 4 = (Pupils should all say 1.)
4. Sample sums include:
   10 – 6 = (Answer: 4) 12 – 9 = (Answer: 3) 6 – 1 = (Answer: 5) 15 – 8 = (Answer: 7)
   11 – 5 = (Answer: 6) 8 – 1 = (Answer: 7)

Introduction to the New Material *(10 minutes)*

1. **Say:** Now that you know how to subtract simple numbers, we are going to learn how to subtract bigger numbers. This week we will talk about different ways to subtract big numbers. Your knowledge of adding will help you when we subtract. Today we will look at a number line. Copy the number line in your book.
2. **Say:** Put your finger on the 65. Jump back one dot. What number is it? (Answer: 60) Let's count backwards from 70 to 20 on our number line and call out the number for each dot. 70, 65, 60, 55, 50, 45, 40, 35, 30, 25, 20. How much did we subtract each time we jumped one dot back? (Answer: 5)


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20    25    30    35    40    45    50    55    60    65    70
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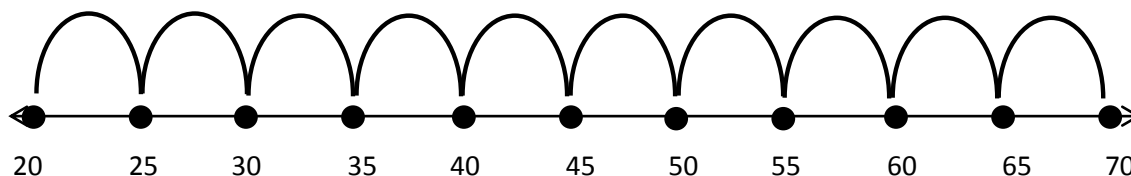
3. **Say:** If I had 70 pupils in the classroom and 15 left, how many would I have now? Look at your number line. Start at the 70 and jump backwards 15 numbers. How many dots is that? (Answer: 3) Where do I end up? (Answer: 55) Turn to your neighbour and tell them what 70 – 15 equals. (Answer: 55). Allow pupils to briefly discuss the answer.
4. **Ask:** Who can tell me what 70 – 15 equals? (Answer: 55)
5. **Say:** Ok, let's try a harder one. Now that I have 55 pupils in the class, 20 more leave. How many do I have now? Take a guess and tell your neighbour. Give pupils a minute to discuss.
6. **Say:** Let's look at the number line. Please put your finger on the 55. We are going to count down 20 by 5s because each dot is 5 numbers. Are you ready? 5 (point to the 50), 10 (point to

the 45), 15 (point to the 40), 20 (point to the 35). Where did we end up? (Answer: 35) What is 55 – 20? (Answer: 35)

7. On the board, write 55 – 20 = 35
8. **Say:** On your paper, please write the subtraction sentence, 55 – 20 = 35
9. Give pupils 30 seconds to write their subtraction sentence.
10. **Say:** There is an easy way to check your subtraction answers. Add your answer to the number you subtracted. Does it equal the top number? If so, you are correct. If we add our answer, 35, to the number we subtracted, 20, we should end up with 55. 35 + 20 is 55, so we are correct.

Guided Practice *(10 minutes)*

1. **Say:** Let's start at 35 and subtract 10. Work with your neighbour and your number line.
2. Give them 1 minute to work.
3. **Ask:** Who can come to the board and write our subtraction sentence? (Answer: 35 – 10 = 25) Good. Can you explain how you did this sum? (Example answer: I started on the 35. I know that each dot is 5 numbers. I know that two 5s are 10. So I jumped backwards 2 dots. I ended at 25.)
4. **Ask:** Did anyone think about it a different way? (Example answer: I started at 35 and counted back by 5s. When I got to 10, I stopped. I landed on 25.)
5. **Say:** Let's do one more together. Subtract 70 - 5. You may work with your neighbour and use your number line for help.
6. **Ask:** Who can come to the board and write our subtraction sentence? (70 – 5 = 65) While our friend is writing the subtraction sentence on the board, everyone else please write it in your book.
7. **Ask:** Can you explain how you solved this sum? (Example answer: I started on the 70. I know that each dot is 5 numbers. I counted back one 5 and I ended at 65.)

Independent Practice *(10 minutes)*

1. Write the following subtraction sums on the board:

60 - 5 = (Answer: 55)   45 - 20 = (Answer: 25)   55 - 10 = (Answer: 45)   70 - 20 = (Answer: 50)
50 - 15 = (Answer: 35)   35 - 15 = (Answer: 20)   65 - 40 = (Answer: 25)   30 - 5 = (Answer: 25)

2. **Say:** Copy these subtraction sums in your book. Solve them by using your number line.
3. Let them work for 8 minutes. **Say:** Check your answers on the board.
4. **Say:** Please show me with your fingers how many you got correct.

Closing *(2 minutes)*

1. **Say:** Now let's try a hard one. What is 40 - 25? Think about your number line if it started before 20. Give pupils a minute to work.
2. **Say:** Turn to your partner and tell her what the answer is.
3. **Ask:** Raise your hand if you both had the same answer.
4. Call on someone who raised their hand. **Ask:** What is the answer? (Answer: 15)

[NUMBER LINE]

| **Lesson Title:** Subtraction of 2-digit numbers using place value without renaming	**Theme:** Subtraction of whole numbers up to 100	
Lesson Number: M-03-022	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to subtract 2-digit numbers without renaming.		**Teaching Aids** 1. Part-part-whole model at the end of the plan. 2. 100 sticks.		**Preparation** 1. Draw the part-part-whole model, at the end of the plan on the board. 2. Gather 100 sticks.

Opening *(2 minutes)*

1. **Say:** Lets' put 40 of our sticks in bundles of Tens.
2. Ask a volunteer to bundle the sticks as the class counts.
3. **Ask:** How many bundles of 10 did we make with 40 sticks? (Answer: 4)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to continue working on subtraction of bigger numbers. Let's look at this sum. I need 25 bananas. I already picked 11. How many more do I need? Think about it as a part-part-whole model. Point to the model.
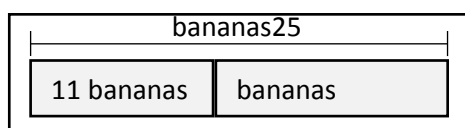
2. **Say:** 25 is the total that I need. 11 is the part that I already have. The other block is the part that I need. The two parts equal the whole.
3. **Ask:** How do I write this as a subtraction sum? (Answer: 25 – 11 =)
4. Write 25 – 11 = on the board.
5. **Say:** Let's make 25 with our sticks. We need to remember to use bundles of Tens.
6. Ask a volunteer to bundel 25 sticks as the class counts.
7. **Ask:** How many bundles do you have? (Answer: 2) How many loose sticks do you have? (Answer: 5)
8. **Ask:** If I want to subtract 11, how many bundles do I take away? Show me on your fingers. (Answer: Students raise 1 finger.) How many loose sticks do I take away? Show me on your fingers. (Answer: Students raise 1 finger.)
9. **Say**: Take 11 away from your 25. Please write down what you have left at the end of your subtraction sum.
10. Give pupils 30 seconds to work.
11. **Ask:** How many bundles do we have left? (Answer: 1) How many loose sticks do you have left? (Answer: 4) What did you write on your paper? (Answer: 25 – 11 = 14)
12. Write the complete subtraction sum on the board. (Answer: 25 – 11 = 14)

Guided Practice *(10 minutes)*

1. **Say:** Now let's practise. Please write 47 – 23 = on your paper.
2. **Say:** Expand the numbers. (Answer: (40 + 7)– (20 + 3))
3. Give pupils 2 minutes to write the sum on their paper. Write each step on the board as you say it.
4. **Say:** Now take away the Ones and Tens. How many are left in the Tens? (Answer: 20) How many are left in the Ones? (Answer: 4) What is our answer to 47 – 23? (Answer: 24)

Independent Practice *(10 minutes)*

1. Write the following subtraction sums on the board:

   78 – 17 = (Answer: 61)   96 – 84 = (Answer: 12)
   69 – 30 = (Answer: 39)   38 – 6 = (Answer: 32)

2. **Say:** Please answer the following sums. You may work with your partner and you can use any of the subtraction strategies you know.
3. Give students 7 minutes to work. While they are working, ask volunteers to come to the board and write their answers. Make sure they are correct.
4. **Say:** Please check your answers with those on the board. Raise your hand and show me with your fingers how many you got correct.

Closing *(3 minutes)*

1. **Say:** Now, work with your partner. Each of you should choose a number between 1 and 20. Find the difference between them. For example, if I am working with Gabriel. He chooses 15 and I choose 17. What is the difference between how many he has and how many I have? (Answer: 2)
2. Let them play for about 3 minutes.
3. **Say:** Well done.

[PART-PART-WHOLE MODEL]
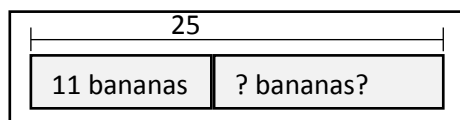
Lesson Title: Subtraction of 2-digit numbers using place value with renaming	**Theme:** Subtraction of whole numbers up to 100	
Lesson Number: M-03-023	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to subtract 2-digit numbers with renaming.	**Teaching Aids** 50 sticks.	**Preparation** Gather 50 sticks.

Opening *(3 minutes)*

1. **Say:** I am going to ask some questions. I will give you a few seconds to think. Then I will ask you all to answer. Please do not answer until I tell you to.
2. Give pupils a few seconds to think before you tell them to answer. As the sums get more difficult, give them more time to think.
3. **Ask:** How many ones are in 10? Think… Answer. (Answer: 10). How many tens are there in 100? Think… Answer (Answer: 10). How many ones are there in 23? Think… Answer. (Answer: 23) How many tens are there in 23? Think… Answer (Answer: 2)
4. **Ask:** How many ones does the 2 in the tens place stand for? (Answer: 20)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to continue working on subtraction of bigger numbers. Let's look at this sum. I had 43 sticks, but I lost 16 of them. How many do I have left? How do I write this in a subtraction sum? (Answer: 43 – 16 =)
2. Write 43 – 16 = on the board.
3. **Say:** I need some pupils to help me. I need Pupil A to come and bring me 40 sticks. How many bundles of Ten sticks will that be? (Answer: 4)
4. **Say:** Now, I need Pupil B to come to the front with 3 sticks.
5. **Say:** Now I have 43 sticks here. To solve my subtraction sum, I need to subtract 16.
6. **Say:** Pupil B, please put 6 sticks down because we are trying to subtract the 6 ones in 16. (S/he should say that s/he only has 3.)
7. **Ask:** If s/he only has 3 sticks, where can s/he get more? (Answer: From the Pupil A's 40 sticks)
8. **Say:** Pupil A, please give him one of your bundles. How many sticks does he have now? (Answer: 13) How many bundles does the first pupil have left? (Answer: 3) How many sticks is that? (Answer: 30)
9. **Say:** Pupil B, now put down 6 sticks because we have to subtract the 6 ones in 16. How many sticks does pupil B now have? (Answer: 7)
10. **Say:** Pupil A, please put 1 bundle down because we have to subtract the 1 Ten in 16. How many bundles does s/he have left? (Answer: 2) How many sticks is that? (Answer: 20)
11. **Ask:** Pupil A has 2 bundles and Pupil B has 7 sticks. How many sticks do we have left? (Answer: 27)
12. Write that on the board to complete your subtraction sentence. (Answer: 43 – 16 = 27)

13. **Say:** Pupil B borrowed bundles from Pupil A because he did not have enough sticks to subtract. We can also say that we 'renamed' 1 of the Tens to be 10 ones instead.

Guided Practice *(10 minutes)*

1. **Say:** Let's practise. Please write the sum 64 – 25 = in you book. Expand the numbers (Answer: (60 + 4) - (20 + 5))
2. Give pupils 2 minutes to write. **Ask:** Do we have need to rename any of the numbers? Give me the thumbs up if you think 'yes', or the thumbs down if you think 'no'. (Answer: yes)
3. Give pupils a minute to look. **Ask:** Where do we need to rename or borrow? (Answer: We need more ones in 64.)
4. **Say:** Let's borrow 10 from 60. Write (50 + 14)
5. **Say:** Rewrite the sum after you borrow a Ten from 60. (Answer: (50 + 14) – (20 + 5)
6. Give pupils 1 minute to work.
7. **Say:** Now take away the ones and tens. How many are left in the ones? (Answer: 9) How many are left in the tens? (Answer: 30) What is our answer to 64 – 25? (Answer: 39)

Independent Practice *(10 minutes)*

1. Write the following subtraction sums on the board:
   82 – 17 = (Answer: 65)   21 – 9 = (Answer: 12)   55 – 38 = (Answer: 17)
   70 – 42 = (Answer: 28)
2. **Say:** Please answer the sums on the board. You may work with your partner.
3. Give pupils 7 minutes to work. While they are working, ask volunteers to come to the board and write the answers. Make sure they are correct.
4. **Say:** Please check your answers with those on the board. Raise your hand and show me with your fingers how many you got correct.

Closing *(2 minutes)*

1. Write the number 958 on the board.
2. **Ask:** How many Tens are in 958? (Answer: 5) What is the 5 worth? (Answer: 50) How many Hundreds would I have left if I borrowed one Hundred to make 15 Tens? (Answer: 8 Hundreds or 800)
3. **Say:** Well done.

Lesson Title: Using mental strategies for subtraction up to 100	**Theme:** Subtraction of whole numbers up to 100	
Lesson Number: M-03-024	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to solve simple subtraction sums up to 100 mentally.		**Teaching Aids** 100 Chart at the end of the plan.		**Preparation** Draw the 100 Chart, at the end of the plan, on the board.

Opening *(2 minutes)*

1. **Ask:** What is 36 – 10? Everyone please write the answer down on your paper.
2. **Say:** Now raise your paper so I can see your answer. (Answer: 26)
3. **Ask:** What is 36 – 13? Please write the answer down on your paper.
4. **Say:** Now show me your answers. (Answer: 23)
5. Today we are going to learn about ways to do subtraction in your head.

Introduction to the New Material *(15 minutes)*

1. **Say:** Was it easier to subtract 10 or 13 from 36? (Example answer: It was easier to subtract 10 because there were no Ones. I only had to subtract Tens.)
2. **Say:** Today we will try different ways of subtraction.
3. **Say:** Please look at the 100 Chart on the board.
4. Point to 36 on the 100 chart. **Say:** Count back 10. Where do you land? (Answer: 26) What do you notice about where the 26 is compared to the 36? (Answer: It is above it.) Now go 3 back from the 26. Where are you? (Answer: 23) So, if we subtract 36 – 13, we get 23. Raise your hand if you were correct earlier.
5. **Say:** This is a technique you can do in your head. Let's try it again with 83 – 24
6. Write the subtraction sum on the board. Point to 83 on the 100 chart.
7. **Say:** Jump backwards 20 without counting by 1s. **Ask:** Where are you? (Answer: 63 or 2 rows above the 83). **Say:** Count back 4 more. **Ask:** Where did you land? (Answer: 59)
8. **Say:** There are other ways of solving subtraction sums in your head. Let's look at 83 – 24 again. What if you had subtracted 30 from 83? Tell your partner where you would end up? (Answer: 53) But what do you have to do next so that you only subtract 24 instead of 30? Please think about it.
9. Give pupils about 30 seconds to think. Then **Say:** Tell a partner what to do next.
10. **Say:** Please raise your hand to tell us what you did. (Answer: I added 6 back to my answer of 53.)
11. **Ask:** Why did you add 6 back? (Answer: I had taken away too many.)
12. **Say:** Can anyone tell me a different way to think about the subtraction sum? (Example answers: I thought about the bundles of sticks. I had 8 bundles and 3 loose sticks. I took 2 bundles away and then broke apart one of the bundles so I could take 4 loose sticks away.)

Guided Practice *(5 minutes)*

1. Write 47 – 13 = on the board.
2. **Say:** Let's practise. You may use any method of subtraction that you can do in your head. But you must write down what you did to solve it.
3. Give pupils 3 minutes to work. As they work, look for 3 pupils who solved it in 3 different ways. Ask them to come to the board and explain their methods.
4. **Say:** Pupil A (use their name), how did you solve the sum?
5. Pupil A will explain their method as s/he writes it on the board.
6. **Ask:** Show me a thumbs up if you understand Pupil A. Show me a thumbs down if you do not understand.

Independent Practice *(10 minutes)*

1. Write the following subtraction sums on the board:

   47 – 31 = (Answer: 16)   96 – 16 = (Answer: 80)   21 – 8 = (Answer: 13)
   53 – 48 = (Answer: 5)

2. **Say:** Answer the following sums. Please write down how you solved it. After you and your partner finish a sum, tell each other how you solved it.
3. Give pupils about 9 minutes to work.
4. While pupils are working, walk around and help any pupils who are having difficulty. When the 9 minutes is almost up, write the answers on the board.
5. **Say:** Please check your answers with those on the board. Raise your hand and show me with your fingers how many you got correct.

Closing *(3 minutes)*

1. **Say:** Using the 100 Chart on the board, please find pairs of numbers that equal 100. Find as many pairs as you can. Write them on your paper.
2. **Say:** Well done.

[100 CHART]

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Lesson Title: Word problems using subtraction up to 100	**Theme:** Subtraction of Whole Numbers up to 100	
Lesson Number: M-03-025	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes 1. By the end of the lesson pupils will be able to solve word problems using subtraction up to 100.	**Teaching Aids** 1. Word Problems 1-3 at the end of the plan. 2. Part-part-whole model at the end of the plan.	**Preparation** 1. Write Word Problems 1-3, at the end of the plan, on the board. 2. Draw an empty part-part-whole model, at the end of the plan, on the board.

Opening *(3 minutes)*

1. **Say:** Write all the ways you can make 10 with 2 numbers. Use addition or subtraction. You have 1 minute.
2. **Ask:** Will 3 pupils come to the board to write their ways to make 10?
3. **Say:** Show thumbs up if you agree with the answers the pupils are writing. Show thumbs down if you disagree.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to solve word problems. What is another term for word problems? (Answer: Story problems) We call them story problems because they are like very short stories.
2. Point to Word Problem 1 on the board. **Say:** Follow with your eyes as I read the problem.
3. Read the problem out loud.
   Say: Ahmad is reading a book. It has 96 pages. He has already read 54 pages. How many more pages does he need to read?
4. Read it again and make sure the pupils are also reading out loud.
5. **Ask:** What are we trying to find out? (Answer: How many more pages Ahmad needs to read.) Who can underline those words for us?
6. Invite a pupil to the board to underline 'How many more pages does he need to read?'
7. **Say**: Tell your partner what you need to do to solve this problem. Give pupils 1 minute to talk.
8. **Ask:** Who can tell me what your partner said? (Answer: Subtract 54 from 96)
9. **Ask:** How do we know to subtract? (Answer: The problem asked how many *more* pages he needs to read. We only know the number of pages he already read. We need to find the other part of the whole book.)
10. Write the numbers in the part-part-whole diagram on the board to show this problem.
11. **Say:** Solve the problem with your partner.
    When you have the answer, write it and hold it up. (Answer: 42)

96 pages	
54 pages read	? more pages to read
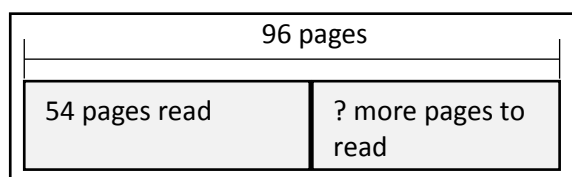
Guided Practice *(10 minutes)*

1. **Say:** We will do a word problem together now.
2. Point to Word Problem 2 on the board. Ask pupils to copy it in their books.

3. **Say:** Underline what you need to find out.
4. **Ask:** What did you underline? (Answer: How many more pupils were at the peace talk than were in class?) Underline that question on the board.
5. **Say:** Tell your partner what to do next. (Answer: Subtract 29 from 47)
6. **Say:** With your partner, solve 47 - 29. Use any method. Think about the bundles, the 100 Chart, or finding the difference.
7. **Say**: Write the answer and hold it up. (Answer: 18 pupils)
8. **Ask**: Will someone explain his or her work? (Example answer: I took 4 bundles of 10 sticks and 7 loose sticks to make 47. I tried to subtract 9 loose sticks, but I couldn't. I broke one of my bundles into loose sticks so I had 3 bundles and 17 loose sticks. Then I took 2 bundles and 9 sticks away. I ended up with 1 bundle and 8 sticks or 18; or I took 30 away from 47 and got 17. But I added 1 back because I had taken 1 too many away since 29 is 1 less than 30.)

Independent Practice *(10 minutes)*

1. Point to Word Problem 3. **Say:** Solve this word problem. Copy it in your book.
2. **Say:** Write how you solved the problem. (Answer: 61 – 38 = 23. I solved 61 – 40 and got 21. Then I added 2 back because I had subtracted 2 too many. I got 23; or I started with 6 bundles of 10 sticks and 1 loose stick. I had to take 8 loose sticks away, so I broke 1 of the bundles into 10 loose sticks. So then I had 5 bundles and 11 loose sticks. Then I subtracted 3 bundles from 5 and was left with 2 bundles. Then I took 8 sticks from the 11 and I had 3. So I had 23 sticks left.)
3. Find 2 pupils who solved the problem correctly, but in different ways. Invite them to come to the board to share their work.
4. **Say:** Now we have Pupil A (use her name) and Pupil B (use his name) who are going to share with us how they each solved the problem. Listen as they explain. If you did it the same way they did, raise your hand.
5. Let Pupil A explain and then let Pupil B explain.

Closing *(2 minutes)*

1. **Say:** Make a list of pairs of numbers that use addition and subtraction to make 100.
2. **Say:** Exchange papers with your partner and check the answers.

[WORD PROBLEM 1]
Ahmad is reading a book. It has 96 pages. He has already read 54 pages. How many more pages does he need to read?
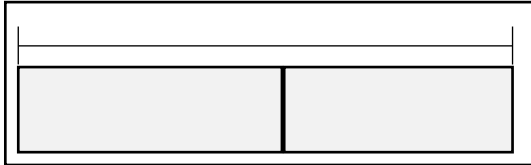
[WORD PROBLEM 2]
On Monday, only 29 pupils were in class. 47 pupils were at a peace talk. How many more pupils were at the peace talk than were in class?

[WORD PROBLEM 3]

Mamie brought 61 marbles to class. But she had a hole in her pocket. When she got to school she only had 38 left. How many marbles fell out of her pocket?

[PART-PART-WHOLE MODEL]

Lesson Title: Revision of Multiplication and Division Table for 2	**Theme:** Everyday Arithmetic: Multiplication and Division of 2, 4, 5, 10	
Lesson Number: M-03-026	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson pupils will be able to: 1. Identify and write the Multiplication and Division table for 2. 2. Know that multiplying by 2 is the same as doubling.	**Teaching Aids** 1. Counters (stones, seeds). 2. Empty Multiplication Table for 2s at the end of the plan. 3. Empty Division Table for 2s at the end of the plan.	**Preparation** 1. Gather counters for each pupil. 2. Draw the empty Multiplication Table for the 2s, at the end of the plan, on the board. 3. Draw the empty Division Table for 2s, at the end of the plan, on the board.

Opening *(1 minutes)*

1. **Say:** I need 3 pupils to come to front of the classroom. **Ask**: How many eyes do they have altogether? (Answer: 6)

Introduction to the New Material *(11 minutes)*

1. **Say:** Today we are going to practise our multiplication and start to learn about division.
2. **Say:** Multiplication is how many you get when you join equal groups.
3. **Ask:** Remember the 3 pupils at the front of the classroom? They each had 2 eyes. So how many *groups* of eyes did we have? (Answer: 3). Was each group equal? (Answer: Yes, each had 2 eyes.)
4. **Ask:** How many eyes did we have when we joined those 3 equal groups of 2? (Answer: 6 eyes)
5. **Say:** Let's use our counters to show this. Make 3 equal groups of 2.
6. **Ask:** How many counters did you need to make 3 equal groups of 2? (Answer: 6)
7. **Say**: We write it like this: 3 times 2 equals 6. Write 3 x 2 = 6 on the board.
8. **Say:** We can use our knowledge about multiplication to learn division too.
9. **Ask:** Will 2 pupils come up front?
10. **Ask:** Will another pupil take 6 counters? If you are seated, take out 6 counters at your desk.
11. **Ask:** How can we make sure each friend gets the same amount? (Example answer: Give 1 to each pupil. If we still have some left, give another counter to each pupil. Keep going until you have no more counters.)
12. Tell the pupil who has the 6 counters to hand 1 counter to each of the 2 'friends'.
13. **Ask:** Do you have any left? (Answer: yes). Give another counter to each friend.
14. **Say:** Keep giving each friend one counter until you have none left. How many does each friend have? (Answer: 3)
15. **Say:** Everyone take your 6 counters and divide them into 2 equal groups.
16. **Say:** We can write this as a division like this: 6 divided by 2 equals 3. Write 6 ÷ 2 = 3 on the board.

17. **Say:** Look at the division backwards. What multiplication can help you with this division? (Answer: 3 x 2 = 6) Why does this help? (Example answer: If you know that 2 groups of 3 equals 6, then you can divide 6 into 2 groups and you get 3.)

Guided Practice *(11 minutes)*

1. **Say:** Copy the Multiplication Table for 2s in your book.
2. **Say:** We are going to fill this together. When we multiply 2 numbers together the answer is called the product. On this table, we write the product in the box where the number at the top meets the number on the left. For example, we said that we had 3 groups of eyes and each group had 2 eyes. So 3 x 2 = 6. Put the product 6 in the box below the 3.
3. Point to the 3 on the top and the 2 on the side. Bring your fingers together at the 6.
4. **Ask:** If you have 0 groups of 2 eyes, how many eyes do you have? (Answer: 0)
5. **Say:** Write a 0 under the 0 in the table because 0 x 2 = 0.
6. **Say:** Think about 1 x 2. Point to where the answer goes.
7. **Say**: I am going to write the answer in the table**.** Write the number 2, under the 1.
8. Invite a pupil to write the 4 under the 2. **Ask:** What do you notice about the answers? (Example answers: They are all even numbers. They count by 2s. We doubled the numbers.)
9. **Say:** So, when you multiply by 2, you can double the number or count by 2s. The answer will always be an even number when you multiply by 2. **Say:** Fill in the rest of the table.
10. Answer:

X	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20

11. **Ask:** Will someone write the answers on the board? Check to make sure it is correct.

Independent Practice *(11 minutes)*

1. **Say:** Now we are going to fill in our Division Table for the 2s up to 20. Copy the table in your book. Give pupils 2 minutes to work.
2. **Say:** Let's look at 6 ÷ 2 again. Who knows what 6 ÷ 2 is? (Answer: 3). How did you know?
3. **Ask:** Where does the 3 go in our Multiplication Table? (Answer: under the 6.) Why? (Answer: 6 divided by 2 is 3.)
4. **Say:** Let's do one more together. What number do I write under the 2? Tell your partner.
5. **Ask:** Who can tell me what to write under the 2? (Answer: 1) How do you know? (Answer: I made 2 equal groups with 2 counters. Each group had 1 counter in it.)
6. **Say:** Complete the rest of the table. Work with your partner if you want to. Use your counters. (Answer:

÷	0	2	4	6	8	10	12	14	16	19	20
2	0	1	2	3	4	5	6	7	8	9	10

7. **Ask:** Will someone fill in the rest of the table on the board? Check to make sure it is correct.

Closing *(1 minute)*

1. **Say:** Today we learned about multiplication and division for 2s.
2. **Say:** Well done class!

[MULTIPLICATION TABLE FOR 2s]

X	0	1	2	3	4	5	6	7	8	9	10
2											

[DIVISION TABLE FOR 2s]

÷	0	2	4	6	8	10	12	14	16	19	20
2											

Lesson Title: Revision of Multiplication and Division Table for 4	Theme: Everyday Arithmetic: Multiplication and Division of 2, 4, 5, 10	
Lesson Number: M-03-027	Class/Level: Class 3	Time: 35 minutes

	Learning Outcomes		Teaching Aids		Preparation
	By the end of the lesson pupils will be able to identify and write the multiplication and division table for 4.		1. Counters (beads, stones) 2. Empty Multiplication Table for 4s at the end of the plan. 3. Empty Division Table for 4s at the end of the plan.		1. Gather enough counters for each pupil to have 20. 2. Draw the empty Multiplication Table for the 4s, at the end of the plan, on the board. 3. Draw the empty Division Table for 4s, at the end of the plan, on the board.

Opening *(1 minute)*

1. **Say:** Yesterday we learned about the Multiplication Table and Division Tables for 2s. Today we will learn the 4s.

Introduction to the New Material *(11 minutes)*

1. Draw 3 groups of 4 on the board as follows : oooo   oooo   oooo
2. **Say:** Look at this picture on the board. Use your counters to make this arrangement.
3. **Ask:** How many equal groups do you see? (Answer: 3) How many circles are in each group? (Answer: 4) How many circles are in all? (Answer: 12)
4. **Say:** Copy the picture on your paper.
5. **Say:** Like yesterday, we will fill our Multiplication Table. Today we will multiply by 4.
6. **Ask:** What is 4 x 3? (Answer: 12). How do you know? (Answer: Add 4 plus 4 plus 4 to make 12. So add 4, 3 times.)
7. **Ask:** Where do we write 12 in our Multiplication Table? (Answer: under the 3) Why? (Answer: 4 times 3 is 12.)
8. **Say:** Let's do one more together. What number do we write under the 7? Tell your partner.
9. **Ask:** Who can tell me what to write under the 7? (Answer: 28) How do you know? (Answer: I added 4, 7 times)
10. **Say:** Fill in the rest of the table. Work with your partner if you want. (Answer: see below)

x	0	1	2	3	4	5	6	7	8	9	10
4	0	4	8	12	16	20	24	28	32	36	40

11. **Ask:** Will someone come to the board to fill in the rest of the table? Check to make sure the table is correct.

Guided Practice *(11 minutes)*

1. **Say:** Now we are going to fill in our Division Table for the 4s up to 40. Copy the table in your book. Give pupils 2 minutes to work.
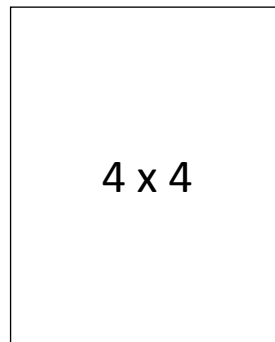
2. **Say:** Let's look at 8 ÷ 4. Who knows what 8 ÷ 4 is? (Answer: 2). How did you know?
3. **Ask:** Where does the 2 go in our Multiplication Table? (Answer: under the 8) Why? (Answer: 8 divided by 4 is 2.)
4. **Say:** Let's do one more together. What number do I write under the 4? Tell your partner.
5. **Ask:** Who can tell me what to write under the 4? (Answer: 1) How do you know? (Answer: I made 4 equal groups with 4 counters. Each group had 1 counter in it.)
6. **Say:** Complete the rest of the table. Work with your partner if you want to. Use your counters. (Answer:

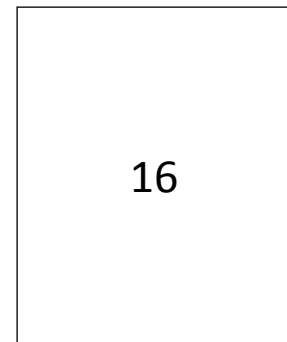| ÷	0	4	8	12	16	20	24	28	32	36	40
4	0	1	2	3	4	5	6	7	8	9	10

7. **Ask:** Will someone fill in the rest of the table on the board? Check to make sure it is correct.

Independent Practice *(11 minutes)*

1. **Say:** Now, carefully tear 2 pieces of paper out of your exercise book. Fold the pages in half and tear along the fold. Keep folding and tearing until you have at least 22 small pieces of paper.
2. **Say:** On each small piece of paper and make a flash card for every multiplication and division problem on your tables. On one side, write the problem, for example 4 x 4. On the other side, write the answer very lightly so it doesn't show through. Keep the flash cards for Lesson 30.

4 x 4

Front

16

Back

Closing *(1 minute)*

1. **Say:** Today we learned about multiplication and division for 4s. Thank you class. Pupils say: Thank you.

[MULTIPLICATION TABLE FOR 4s]

X	0	1	2	3	4	5	6	7	8	9	10
4											

[DIVISION TABLE FOR 4S]

÷	0	4	8	12	16	20	24	28	32	36	40
4											

Lesson Title: Revision of Multiplication and Division Table for 10	**Theme:** Everyday Arithmetic: Multiplication and Division of 2, 4, 5, 10	
Lesson Number: M-03-028	**Class/Level:** Class 3	**Time:** 35 minutes

🎯 Learning Outcomes By the end of the lessons pupils will be able to identify and write the multiplication and division table for 10s.	🖌 Teaching Aids 1. Counters (beads, stones) 2. Empty Multiplication Table for 10s at the end of the plan. 3. Empty Division Table for 10s at the end of the plan.	✍ **Preparation** 1. Gather enough counters for each pupil to have 30. 2. Draw the empty Multiplication Table for the 4s, at the end of the plan, on the board. 3. Draw the empty Division Table for 4s, at the end of the plan, on the board.

Opening *(1 minute)*

1. **Say:** Yesterday we learned about the Multiplication Table and Division Tables for 4s. Today we will learn the 10s.

Introduction to the New Material *(11 minutes)*

1. Draw 3 groups of 10 on the board as follows : ooooooooooo   ooooooooooo   ooooooooooo
2. **Say:** Look at this picture on the board. Use your counters to make this arrangement.
3. **Ask:** How many equal groups do you see? (Answer: 3) How many circles are in each group? (Answer: 10) How many circles are in all? (Answer: 30)
4. **Say:** Copy the picture on your paper.
5. **Say:** Like yesterday, we will fill our Multiplication Table. Today we will multiply by 10.
6. **Ask:** What is 10 x 3? (Answer: 30). How do you know? (Answer: Add 10 plus 10 plus 10 to make 30. So add 10, 3 times.)
7. **Ask:** Where do we write 30 in our Multiplication Table? (Answer: under the 3) Why? (Answer: 10 times 3 is 30.)
8. **Say:** Let's do one more together. What number do we write under the 7? Tell your partner.
9. **Ask:** Who can tell me what to write under the 7? (Answer: 70) How do you know? (Answer: I added 10, 7 times)
10. **Say:** Fill in the rest of the table. Work with your partner if you want. (Answer: see below)

x	0	1	2	3	4	5	6	7	8	9	10
10	0	10	20	30	40	50	60	70	80	90	100

11. **Ask:** Will someone come to the board to fill in the rest of the table? Check to make sure the table is correct.

70

Guided Practice *(11 minutes)*

1. **Say:** Now we are going to fill in our Division Table for the 10s up to 100. Copy the table in your book. Give pupils 2 minutes to work.
2. **Say:** Let's look at 20 ÷ 10. Who knows what 20 ÷ 10 is? (Answer: 2). How did you know?
3. **Ask:** Where does the 2 go in our Multiplication Table? (Answer: under the 20) Why? (Answer: 20 divided by 10 is 2.)
4. **Say:** Let's do one more together. What number do I write under the 10? Tell your partner.
5. **Ask:** Who can tell me what to write under the 10? (Answer: 1) How do you know? (Answer: I made 10 equal groups with 10 counters. Each group had 1 counter in it.)
6. **Say:** Complete the rest of the table. Work with your partner if you want to. Use your counters. (Answer:

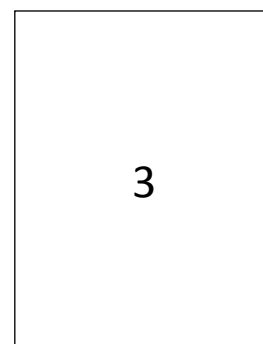| ÷	0	10	20	30	40	50	60	70	80	90	100
10	0	1	2	3	4	5	6	7	8	9	10

7. **Ask:** Will someone fill in the rest of the table on the board? Check to make sure it is correct.

Independent Practice *(11 minutes)*

1. **Say:** Now, carefully tear 2 pieces of paper out of your exercise book. Fold the pages in half and tear along the fold. Keep folding and tearing until you have at least 22 small pieces of paper.
2. **Say:** On each small piece of paper and make a flash card for every multiplication and division problem on your tables. On one side, write the problem, for example 30 ÷ 10. On the other side, write the answer very lightly so it doesn't show through. Keep the flash cards for Lesson 30.

$30 \div 10$	3
Front	Back
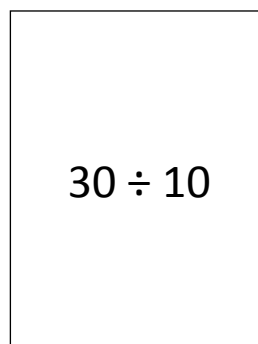
Closing *(1 minute)*

1. **Say:** Today we learned about multiplication and division for 10s. Thank you class. Pupils say: Thank you.

[MULTIPLICATION TABLE FOR 10s]

X	0	1	2	3	4	5	6	7	8	9	10
10											

 [DIVISION TABLE FOR 10s]

÷	0	10	20	30	40	50	60	70	80	90	100
10											

Lesson Title: Revision of Multiplication and Division Table for 5	**Theme:** Everyday Arithmetic: Multiplication and Division of 2, 4, 5, 10	
Lesson Number: M-03-029	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to identify and write the multiplication and division table for 5.	**Teaching Aids** 1. Counters (beads, stones) 2. Empty Multiplication Table for 5s at the end of the plan. 3. Empty Division Table for 5s at the end of the plan.	**Preparation** 1. Gather enough counters for each pupil to have 20. 2. Draw the empty Multiplication Table for the 5s, at the end of the plan, on the board. 3. Draw the empty Division Table for 5s, at the end of the plan, on the board.

Opening *(1 minute)*

1. **Say:** Yesterday we learned about the Multiplication Table and Division Tables for 10s. Today we will learn the 5s.

Introduction to the New Material *(11 minutes)*

1. Draw 3 groups of 5 on the board as follows : ooooo ooooo   ooooo
2. **Say:** Look at this picture on the board. Use your counters to make this arrangement.
3. **Ask:** How many equal groups do you see? (Answer: 3)
4. **Ask:** How many circles are in each group? (Answer: 5)
5. **Ask:** How many circles are in all? (Answer: 15)
6. **Say:** Copy the picture on your paper.
7. **Say:** Like yesterday, we will fill our Multiplication Table. Today we will multiply by 5.
8. **Ask:** What is 5 x 3? (Answer: 15)
9. **Ask:** How do you know? (Answer: Add 5 plus 5 plus 5 to make 15. So add 5, 3 times.)
10. **Ask:** Where do we write 15 in our Multiplication Table? (Answer: under the 3)
11. **Ask:** Why? (Answer: 5 times 3 is 15.)
12. **Say:** Let's do one more together.
13. **Ask:** What number do we write under the 7? Tell your partner.
14. **Ask:** Who can tell me what to write under the 7? (Answer: 35)
15. **Ask:** How do you know? (Answer: I added 5, 7 times)
16. **Say:** Fill in the rest of the table. Work with your partner if you want. (Answer: see below)

x	0	1	2	3	4	5	6	7	8	9	10
5	0	5	10	15	20	25	30	35	40	45	50

17. **Ask:** Will someone come to the board to fill in the rest of the table?
18. **Say:** Check to make sure the table is correct.

Guided Practice *(11 minutes)*

1. **Say:** Now we are going to fill in our Division Table for the 5s up to 50. Copy the table in your book. Give pupils 2 minutes to work.
2. **Say:** Let's look at 10 ÷ 5. **Ask:** Who knows what 10 ÷ 5 is? (Answer: 2)
3. **Ask:** Where does the 2 go in our Multiplication Table? (Answer: under the 10)
4. **Ask:** Why? (Answer: 10 divided by 5 is 2.)
5. **Say:** Let's do one more together.
6. **Ask:** What number do I write under the 5? Tell your partner.
7. **Ask:** Who can tell me what to write under the 5? (Answer: 1)
8. **Ask:** How do you know? (Answer: I made 5 equal groups with 5 counters. Each group had 1 counter in it.)
9. **Say:** Complete the rest of the table. Work with your partner if you want to. Use your counters. (Answer: see below)

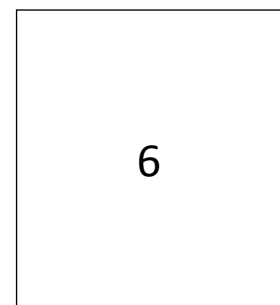| ÷	0	5	10	15	20	25	30	35	40	45	50
5	0	1	2	3	4	5	6	7	8	9	10

10. **Ask:** Will someone fill in the rest of the table on the board?
11. **Say:** Check to make sure it is correct

Independent Practice *(11 minutes)*

1. **Say:** Now, carefully tear 2 pieces of paper out of your exercise book. Fold the pages in half and tear along the fold. Keep folding and tearing until you have at least 22 small pieces of paper.
2. **Say:** On each small piece of paper and make a flash card for every multiplication and division problem on your tables. On one side, write the problem, for example 30 ÷ 5. On the other side, write the answer very lightly so it doesn't show through. Keep the flash cards for Lesson 30.

30 ÷ 5	6
Front	Back
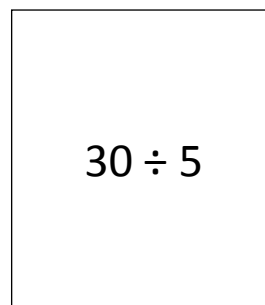
Closing *(1 minute)*

1. **Say:** Today we learned about multiplication and division for 5s.

[MULTIPLICATION TABLE FOR 5S]

X	0	1	2	3	4	5	6	7	8	9	10
5											

[DIVISION TABLE FOR 5S]

÷	0	5	10	15	20	25	30	35	40	45	50
5											

Lesson Title: Practising Multiplication and Division Tables for 2, 4, 5, 10	**Theme:** Everyday Arithmetic: Multiplication and Division of 2, 4, 5, 10	
Lesson Number: M-03-030	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	Teaching Aids	Preparation
By the end of the lesson pupils will be able to identify and write the multiplication and division tables for 2, 4, 5, 10.	1. 2s, 4s, 5s, 10s Multiplication Tables and Flash Cards for each pupil (made in previous lesson). 2. Counters (beads, stones) 3. BINGO card at the end of the plan.	1. Ensure pupils have Multiplication/Division Tables and Flash Cards for 4s, 5s and 10s. 2. Gather enough counters for each pupil to have 20. 3. Draw a BINGO card on the board.

Opening *(2 minutes)*

1. **Say:** Let's count by 4s together. Remember, these are the products, or answers, in the Multiplication Table for 4s. You may use your table to help you. Ready? 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40.
2. **Say:** Now I will say the number to multiply 4 times, and you say the answer. For example, if I say '2', you say '8' because 2 x 4 = 8. Ready? 5 (Answer: 20), 10 (Answer: 40), 1 (Answer: 4), 0 (Answer: 0), 8 (Answer: 32), 4 (Answer: 16), 7 (Answer: 28), 9 (Answer: 36), 3 (Answer: 12), 6 (Answer: 24)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we will practise the multiplication and division facts that we have learned. But first, we will review what multiplication and division are.
2. **Say:** Please take your counters and show 2 x 4. (Answer: oooo   oooo)
3. While pupils are working, draw: oooo   oooo   on the card.
4. **Ask:** How many counters do you need? (Answer: 8)
5. **Say:** Pretend you have 8 groundnuts.
6. **Ask:** If you divide them evenly between 2 people, how many would each person get? (Answer: 4)
7. **Say:** We can write this problem as 8 divided by 2.
8. Write 8 ÷ 2 = 4 on the card. **Say:** We can use multiplication tables to help us divide. Division is when we take the whole group and divide or split it into smaller equal groups.
9. **Say**: Let's try another division problem. Take 10 counters and divide them into 5 equal groups.
10. **Ask**: How many counters will be in each group? Work with you partner to solve.
11. **Ask**: Who can tell me what 10 divided by 5 is? (Answer: 2)
12. **Say**: Please write the problem on your paper: 10 ÷ 5 = 2

Guided Practice *(10 minutes)*

1. **Say**: Now, practise your multiplication and division facts with your partner. Take out your 4s flash cards. Show your partner the side with the problem on it. He or she will tell you the answer. Check it by looking at the back of the card.
2. **Say**: If the answer is correct, put the card in one pile. If the answer is incorrect, tell your partner the answer and put the card in another pile. When you have finished, start again with the cards in the 'incorrect' pile.
3. **Say**: When your partner finishes, trade roles. Go on with the 5s, 10s if you have time.
4. **Say:** If you disagree about the answer, check your Multiplication Tables.

Independent Practice *(10 minutes)*

1. **Say:** Now we are going to practise our multiplication and division facts. Copy the BINGO card. Fill in each square with an answer from your 2's or 4's Multiplication and Division Tables.
2. **Say:** Now I will call out the problems. If you have the answer on your BINGO card, cover that number with a counter. If you cover four squares in a row, column or diagonal, say 'BINGO'!
3. Call out the following problems without saying the answer, but stop if a pupil says 'BINGO': 2 x 0 (Answer: 0), 4 x 1 (Answer: 4), 8 ÷ 2 (Answer: 4), 2 x 4 (Answer: 8), 4 ÷ 4 (Answer: 1) 4 x 7 (Answer: 28), 2 x 8 (Answer: 16), 4 x 9 (Answer: 36), 2 x 3 (Answer: 6) 2 x 1 (Answer: 2), 4 x 6 (Answer: 24), 2 x 5 (Answer: 10), 20 ÷ 4 (Answer: 5), 4 x 8 (Answer: 32), 2 x 9 (Answer: 18), 2 x 7 (Answer: 14)
4. The pupil who calls out 'BINGO' must say the numbers covered. Check if you called out problems with those answers. If so, the pupil wins!
5. If there is more time, play again. Change the order of the problems you call out.

Closing *(3 minutes)*

1. **Say:** Let's practise our Multiplication and Division Tables together.
2. Recite the 2, 4, 5 and 10 multiplication and division tables with the pupils.

[BINGO CARD]

Lesson Title: Multiplication by 8, up to 40, using a Multiplication Table	**Theme:** Everyday Arithmetic: Multiplication and Division: 2, 4, 5, 10 and 8	
Lesson Number: M-03-031	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	Teaching Aids	Preparation
By the end of the lesson pupils will be able to identify and write multiplication and division tables for 8, up to 40.	1. 100 Chart at the end of the plan. 2. Empty Multiplication Table for 8 up to 40 at the end of the plan. 3. Counters (beads, stones)	1. Draw a 100 Chart, at the end of the plan, on the board. 2. Draw an empty Multiplication Table for 8, at the end of the plan, on the board. 3. Gather enough counters for each pupil to have 5.

Opening *(2 minutes)*

1. **Say:** Let's count in 4s. If you need to look at the 100 Chart or your Multiplication Table from last week, you may. Ready? (Answer: 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40)

Introduction to the New Material *(12 minutes)*

1. **Say:** Last week, we learned the multiplication facts for 2, 4, 5 and 10. Today we are going to learn multiplication facts for 8. Who knows what 8 x 1 is? (Answer: 8) We are going to use our 100 Chart to help us learn other 8 multiplication facts.
2. Point to the 100 chart on the board. **Say:** Draw the first 4 rows of the 100 Chart in your book. Stop at 40.
3. **Say:** Look at the 100 Chart. I am going to count one group of 8. Watch where I stop.
4. Point to the numbers as you count.
5. **Say:** 1, 2, 3, 4, 5, 6, 7, 8. Where did I stop? (Answer: 8) Do the same thing on your 100 Chart. Put your counter on the 8.
6. **Ask:** Where would you land if you counted another group of 8? (Answer: 16) Put a counter on the 16. Count another group of 8. Put another counter on the number where you stop.
7. **Ask:** Who can tell me where you put your counter? (Answer: 24)
8. **Say:** Work with your partner to count more groups of 8. Put your counters on the answers. Stop when you find 5 groups of 8.
9. **Ask:** Who can write the numbers you covered on the board? If you are seated, write the numbers on your paper. (Answer: 8, 16, 24, 32, 40)
10. **Ask:** What is 8 times 3? (Answer: 24) If 8 friends each had 3 oranges, how many oranges would they have altogether? (Answer: 24)

Guided Practice *(8 minutes)*

1. **Say:** Now we are going to fill in our Multiplication Table for the 8s, up to 5. Copy the chart on your paper.
2. **Say:** Let's look at 8 x 3 again. Who knows what 8 x 3 is? Use your 100 Chart if you need help. (Answer: 24) How did you know? (Answer: When we counted 3 groups of 8, we stopped on 24.)

3. **Ask:** Where does the 24 go in our Multiplication Table? (Answer: under the 3) Why? (Answer: 3 times 8 is 24.) Write the 24 under the 3 in your Multiplication Table for the 8s.
4. **Say:** Try to complete the table up to 5. Work with your partner if you want to. (Answer: see below)

X	0	1	2	3	4	5	6	7	8	9	10
8	0	8	16	24	32	40					

5. **Ask:** Can someone come to the board and fill in the table up to 5? Check to make sure it is correct.

Independent Practice *(10 minutes)*

1. **Say:** Now, carefully tear 2 pieces of paper out of your exercise book. Fold the pages in half and tear along the fold. Keep folding and tearing until you have at least 6 small pieces of paper.
2. **Say:** On each small piece of paper and make a flash card for every multiplication problem on your table. On one side, write the problem, for example 8 x 1. On the other side, write the answer very lightly so it doesn't show through.

Front   Back

3. **Say**: Practise your multiplication facts with your partner. Show your partner the side with the problem on it. They will tell you the answer. Check it by looking at the back of the card. If the answer is correct, put the card in one pile. If the answer is incorrect, tell your partner the answer and put the card in another pile. When you have finished, start again with the cards in the 'incorrect' pile.
4. **Say**: When your partner finishes, trade roles.
5. **Say:** If you disagree about the answer, check your Multiplication Tables or 100 Chart.
6. **Say:** Keep your flash cards safe, because we will need them again at the end of the week.
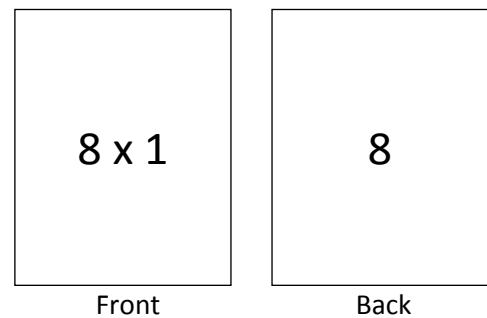
Closing *(3 minutes)*

1. **Say:** We will divide into 2 groups. Right side of the room, raise your hand. You are Group 1. Left side of the room, raise your hand. You are Group 2. We are going to take turns answering multiplication problems. Group 1 will say the first answer. Group 2 will say the second answer. If you think the other group is wrong, raise your hand. Are you ready? Group 1, what is 8 x 1? (Answer: 8), Group 2, what is 8 x 2? (Answer: 16)
2. Begin with all the 8s up to 8 x 5. Then go back and review the 2s, 4s, 5s and 10s.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

X	0	1	2	3	4	5
8						

Lesson Title: Multiplication by 8, up to 80, using a Multiplication Table	**Theme:** Everyday Arithmetic: Multiplication and Division; 2, 4, 5, 10 and 8	
Lesson Number: M-03-032	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson pupils will be able to identify and write a multiplication table for 8, up to 80.		**Teaching Aids** 1. 100 Chart at the end of the plan. 2. Multiplication Table for 8s at the end of the plan. 3. Counters (beads, stones)		**Preparation** 1. Draw the 100 Chart, at the end of the plan, on the board. 2. Draw a Multiplication Table for the 8s, at the end of the plan, on the board (Fill in up to 8 x 5 = 40). 3. Gather enough counters for each pupil to have 10.

Opening *(2 minutes)*

1. **Say:** Yesterday, we learned some of the Multiplication Table for 8s. Let's practise. I will say multiplication questions and you tell me the answers.
2. Call out the following questions; 1 x 8 = (Answer: 8), 4 X 8 = (Answer: 32), 0 X 8 = (Answer: 0), 2 x 8 = (Answer: 16), 5 x 8 = (Answer: 40), 3 x 8 = (Answer: 24)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we will learn the multiplication facts for 8 up to 8 x 10. We will use our 100 Chart we started yesterday. Take it out and finish it with the numbers from 41 to 100.
2. **Say:** Count 1 group of 8 on your chart. Where do you stop? (Answer: 8) Put your counter on the 8.
3. **Say:** Do the next 4 by yourself. Stop at 40.
4. **Ask:** Where did you put your counters? (Answer: 8, 16, 24, 32, 40) Check your partner's 100 Chart to see that the counters are on the correct numbers.
5. Write 8, 16, 24, 32, 40 on the board.
6. **Say:** We will keep going. Where will we stop if we count another group of 8? (Answer: 48)
7. **Ask:** Who can come to the board and count the next group of 8?
8. **Say:** While our volunteer is showing us on the board, count on your 100 Chart. If you think the answer is correct, show me thumbs up. If you think it is incorrect, show me thumbs down. Remember that if we make mistakes, we all will learn from it, so it is ok!
9. **Ask:** Is this correct? If not, who can make the corrections?
10. **Say:** Look at your partner's chart to make sure the correct numbers are covered.
11. **Ask:** How many counters did you use to cover groups of 8 up to 80? (Answer: 10) Who can tell me why? (Answer: 10 groups of 8 is 80, or 10 x 8 = 80)

Guided Practice *(8 minutes)*

1. **Say:** Take out your 8s Multiplication Table that we started yesterday.

2. **Say:** Let's look at 8 times 6. Who knows what 8 times 6 is? Use your 100 Chart if you need help. (Answer: 48). How do you know? (Answer: We counted 6 groups of 8. We landed on 48.)
3. **Ask:** Where does the 48 go in the 8s Table? (Answer: under the 6.) Why? (Answer: 6 times 8 is 48.) Write 48 under the 3 in your 8s Multiplication Table.
4. **Ask:** Who remembers how to write that as a multiplication problem?
5. Invite a pupil to write it on the board.
6. **Say:** If you are seated, write it down. (Answer: 8 x 6 = 48)
7. **Say:** Use your 100 Chart to help you fill in the rest of your 8s Multiplication Table. (Answer: see below)

x	0	1	2	3	4	5	6	7	8	9	10
8	0	8	16	24	32	40	48	56	64	72	80

8. Ask a volunteer to fill in the answers on the board. Check to make sure it is correct.
9. **Say:** Are the numbers on your table the same as the numbers on the board? If not, change yours.

Independent Practice *(5 minutes)*

1. **Say:** Now, carefully tear 2 pieces of paper out of your exercise book. Fold the pages in half and tear along the fold. Keep folding and tearing until you have at least 5 small pieces of paper.
2. **Say:** On each small piece of paper and make a flash card for every multiplication and division problem on your tables. On one side, write the problem, for example 8 x 6. On the other side, write the answer very lightly so it doesn't show through.

8 x 6

Front

48

Back
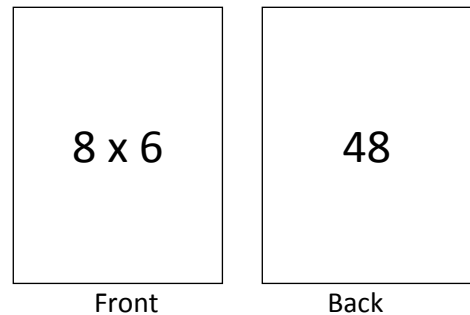
Closing *(10 minutes)*

1. **Say**: Get your flash cards out from yesterday. Practise all of the multiplication facts for 8s with your partner using your flash cards. Show your partner the side with the problem on it. They should tell you the answer. Check it by looking at the back of the card. If the answer is correct, put the card in one pile. If the answer is incorrect, tell your partner the answer and put the card in another pile. When you have finished, start again with the cards in the incorrect pile.
2. **Say**: When your partner finishes, trade roles.
3. **Say:** Keep your flash cards safe because we will need them again tomorrow.

[MULTIPLICATION TABLE FOR 8s]

X	0	1	2	3	4	5	6	7	8	9	10
8	0	8	16	24	32	40					

[100 CHART]

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Lesson Title: Division by 8, up to 40, using a Division Table	**Theme:** Everyday Arithmetic: Multiplication and Division: 2, 4, 5, 10 and 8	
Lesson Number: M-03-033	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson pupils will be able to: 1. Identify and write a Division Table for 8, up to 40. 2. Identify the connection between division by 8 and multiplication by 8.	**Teaching Aids** 1. Counters (beads, stones) 2. Empty Division Table for 8s at the end of the plan.	**Preparation** 1. Gather enough counters for each pupil to have 40. 2. Draw a blank 8s Division Table, at the end of the plan, on the board. 3. Write the word problem, in the Opening, on the board.

Opening *(2 minutes)*

1. **Ask:** If I had 16 oranges and I give them to 8 friends, how many would each friend get?
2. **Say:** If you think you know the answer, raise your hand.
3. Write all the answers on the board. Do not correct them if they are wrong.
4. **Say:** We will see which answer is correct in a few minutes.

Introduction to the New Material *(10 minutes)*

1. **Say:** We have been learning about multiplication by 8. We can use our knowledge about multiplication to learn division too.
2. **Ask:** Who can tell me what division is? (Answer: Accept all answers.)
3. **Ask:** Will 8 pupils come up front?
4. **Say:** You will be the 8 friends in our problem who each get the same amount of oranges.
5. **Ask:** Will another pupil take 16 counters?
6. **Say:** They will be the oranges in the word problem. If you are seated, take out 16 counters at your desk.
7. **Ask:** How can we make sure all 8 friends get the same amount? (Example answer: Give 1 to each pupil. If we still have some left, give another counter to each pupil. Keep going until you are out of counters.)
8. Tell the pupil who has the 16 counters to hand 1 counter to each of the 8 'friends'.
9. **Ask:** Do you have any left? (Answer: yes)
10. **Say:** Give another counter to each friend.
11. **Ask:** Do you have any left? (Answer: no)
12. **Say:** How many does each friend have? (Answer: 2)
13. **Say:** Everyone take your 16 counters and divide them into 8 equal groups, just like we did at the front.
14. **Say:** We can write this as a division problem like this: 16 divided by 8 equals 2.
15. Write 16 ÷ 8 = 2 on the board.
16. **Say:** Look at the division problem backwards. What multiplication problem can help you with this division problem? (Answer: 8 x 2 = 16)

17. **Ask:** Why does this help? (Example answer: If you know that 8 groups of 2 equals 16, then you can divide 16 into 8 groups and you get 2.)

Guided Practice *(10 minutes)*

1. **Say:** Now we are going to fill in our Division Table for the 8s up to 40. Copy the table on your paper.
2. Give pupils 2 minutes to work.
3. **Say:** Let's look at 16 ÷ 8 again.
4. **Ask:** Who knows what 16 ÷ 8 is? (Answer: 2).
5. **Ask:** How did you know? (Example answer: If you know that 8 groups of 2 equals 16, then you can divide 16 into 8 groups and you get 2.)
6. **Ask:** Where does the 2 go in our Multiplication Table? (Answer: under the 16.)
7. **Ask:** Why? (Answer: 16 divided by 8 is 2)
8. **Say:** Let's do one more together.
9. **Ask:** What number do I write under the 8? Tell your partner.
10. **Ask:** Who can tell me what to write under the 8? (Answer: 1)
11. **Ask:** How do you know? (Answer: I made 8 equal groups with 8 counters. Each group had 1 counter in it.)
12. **Say:** Complete the rest of the table. Work with your partner if you want to. Use your counters. (Answer: see below)

÷	0	8	16	24	32	40
8	0	1	2	3	4	5

13. **Ask:** Will someone fill in the rest of the table on the board?
14. **Say:** Check to make sure it is correct. Are the numbers on your table the same as the numbers on the board? If not, change yours.

Independent Practice *(10 minutes)*

1. Write the following division problems on the board:
a. 16 ÷ 8 = (Answer: 2, 8 x 2 = 16)
b. 32 ÷ 8 = (Answer: 4, 8 x 4 = 32)
c. 8 ÷ 8 = (Answer: 1, 8 x 1 = 8)
d. 40 ÷ 8 = (Answer: 5, 8 x 5 = 40)
e. 24 ÷ 8 = (Answer: 3, 8 x 3 = 24)
2. **Say:** Copy and solve these division problems. Use your counters if you need to. Then, write the multiplication problem that can help you to solve the division problem.
3. Give pupils 10 minutes to work.
4. **Say:** Trade papers with your partner. Check the answers.
5. Invite 2 pupils to the front to answer the problems on the board.

Closing *(3 minutes)*

1. **Say:** I will say the division problem. You say the answer. Ready? 16 divided by 8? (Answer: 2) 32 divided by 8? (Answer: 4) 8 divided by 8? (Answer: 1) 40 divided by 8? (Answer: 5) 24 divided by 8? (Answer: 3) Check your multiplication problems with the answers on the board.

[DIVISION TABLE FOR 8s (up to 40)]

÷	0	8	16	24	32	40					
8											

Lesson Title: Division by 8, up to 80, using a Division Table	**Theme:** Everyday Arithmetic: Multiplication and Division; 2, 4, 5, 10 and 8	
Lesson Number: M-03-034	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	Teaching Aids	Preparation
By the end of the lesson pupils will be able to: 1. Identify and write the division table for 8, up to 80. 2. Identify the connection between division by 8 and multiplication by 8.	1. 100 Chart at the end of the plan. 2. Empty Division Table for 8s at the end of the plan. 3. Counters (beads, stones)	1. Draw a 100 Chart, at the end of the plan, on the board. 2. Draw a Division Table for the 8s, at the end of the plan, on the board. 3. Gather enough counters for each pupil to have 40, and 80 for the teaching activity in Introduction to the New Material.

Opening *(2 minutes)*

1. **Say:** I have 80 oranges and I want to give each friend 8 oranges.
2. **Ask:** How many friends can I give 8 oranges to? If you think you know the answer, raise your hand.
3. Write all the answers on the board. Do not correct them if they are wrong.
4. **Say:** We will see which answer is correct in a few minutes.

Introduction to the New Material *(12 minutes)*

1. **Say:** Today we will think about division as finding out how many equal groups we can make.
2. **Say:** I have 80 counters to represent the oranges.
3. **Say**: I will give each pupil 8 counters until I run out. When I give you the counters, please stand so the class can see how many groups of 8 we are making.
4. As you give out the counters, count out loud to 8 each time. Make sure the pupil stands.
5. **Ask:** How many groups of 8 counters did we make? (Answer: 10)
6. **Say:** So we can say that 80 divided by 8 equals 10. We can write it like this.
7. Write $80 \div 8 = 10$ on the board.
8. **Ask:** Look at the division problem backwards. What multiplication problem can you use to help you with this division problem? (Answer: 8 x 10 = 80)
9. **Ask:** Why does this help? (Example answer: If you know that 10 groups of 8 equal 80, then you can divide 80 into groups of 8 and you get 10 groups.)
10. **Say:** So 10 x 8 = 80 helps us know what $80 \div 8$ is.
11. Write 10 x 8 = 80 on the board.
12. **Say:** Remember that multiplication is also repeated addition. So division is also repeated subtraction. So I could write 80 divided by 8 like this:
13. Write: $80 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 = 0$
14. **Say:** Let's look at it on the Hundreds Chart. Start at the 80. Count back 8.
15. **Ask:** Where do we stop? (Answer: 72)

85

16. **Say:** Put your counter on the 72. Keep counting back by 8s and put your counters where you stop each time you subtract 8.
17. Give pupils about 3 minutes to work. **Ask:** How many counters did you use? (Answer: 10)
18. **Say:** That means we can break 80 into 10 groups of 8. Or 80 ÷ 8 = 10.

Guided Practice *(8 minutes)*

1. **Say:** Now we are going to finish filling in our Division Table for the 8's. Use the table you started yesterday.
2. **Say:** Let's look at 80 ÷ 8 again. **Ask:** Who knows what 80 ÷ 8 is? (Answer: 10).
3. **Ask:** How do you know? (Example answer: We gave 8 counters each to 10 people.)
4. **Ask:** Where does the 10 go in our Division Table? (Answer: Under the 80.)
5. **Ask:** Why? (Answer: 80 divided by 8 is 10.)
6. **Say:** Try to complete the rest of the table. Work with your partner if you want to. Use your counters or 100 Chart to help you. (Answer: see below)

÷	0	8	16	24	32	40	48	56	64	72	80
8	0	1	2	3	4	5	6	7	8	9	10

7. **Ask:** Will someone fill in the rest of the table on the board?
8. **Ask:** Are the numbers on your table the same as the numbers on the board?

Independent Practice *(10 minutes)*

1. Write the following division problems on the board:
a. 72 ÷ 8 = (Answer: 9, 8 x 9 = 72)
b. 56 ÷ 8 = (Answer: 7, 8 x 7 = 56)
c. 48 ÷ 8 = (Answer: 6, 8 x 6 = 48)
d. 64 ÷ 8 = (Answer: 8, 8 x 8 = 64)
e. 80 ÷ 8 = (Answer: 10, 8 x 10 = 80)
2. **Say:** Copy and solve the division problems. Use your counters or 100 Chart if you need to. Then, write the multiplication problem that can help you to solve the division problem.
3. Invite 2 pupils to the front to answer the problems on the board.
4. **Say:** Trade papers with your partner. Check the answers.

Closing *(3 minutes)*

1. **Say:** I will say the division problem. You say the answer. Ready? 80 divided by 8? (Answer: 10) 72 divided by 8? (Answer: 9) 56 divided by 8? (Answer: 7) 48 divided by 8? (Answer: 6) 64 divided by 8? (Answer: 8) Check your multiplication problems with the board.

[DIVISION TABLE FOR 8S]

÷	0	8	16	24	32	40	48	56	64	72	80
8	0	1	2	3	4	5					

[100 CHART]

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Lesson Title: Practising Multiplication and Division Tables of 2, 4, 5, 8, 10	**Theme:** Everyday Arithmetic: Multiplication and Division: 2, 4, 5, 10 and 8	
Lesson Number: M-03-035	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson pupils will be able to identify and write the multiplication and division tables for 2, 4, 5, 8, 10.		**Teaching Aids** 1. Empty Multiplication and Division Table for 8s at the end of the plan. 2. Multiplication and Division pictures at the end of the plan. 3. Counters (stones, beads)		**Preparation** 1. Draw an empty Multiplication Table at the end of the plan, on the board. 2. Draw the multiplication and division pictures, at the end of the plan, on the board. 3. Gather enough counters for each pupil to have 12.

Opening *(2 minutes)*

1. **Say:** With your partner, take turns counting in 2s. Next, take turns counting in 4s and 5s.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to review our multiplication and division facts for 2, 4, 5, 8 and 10. First, let's look at multiplication and division in another way. If I have 4 groups of 3, I can put them together to make 12. That is multiplication: 3 x 4 = 12
2. Point to the mutliplication picture on the board. **Say:** If I have 12 and want to divide it into 4 equal groups, I will have 3 in each group. That is division: 12 ÷ 4 =3. Point to the division picture.
3. **Say:** Draw these on your paper.
4. **Say:** Arrange your 12 counters in equal rows on your desk.
5. Give pupils 30 seconds to do this. Some will have 3 rows of 4 and others will have 4 rows of 3.
6. **Ask:** If you have 4 rows of 3, how many do you have altogether? (Answer: 12) That is multiplication.
7. **Ask**: If you have 12 and you want to divide them into 4 equal rows, how many are in each row? (Answer: 3) That is division.

Guided Practice *(10 minutes)*

1. **Say:** Now we are going to take all that we've learned in the last two weeks and put it all together. Look at the blank Multiplication Table on the board. Look at the top row. Just like in the smaller Multiplication Tables, those are the numbers we are multiplying by. They are called factors. The numbers down the side are the other factors. Draw this in your book. Give pupils time to draw the table.
2. **Say:** Put your finger on the 2 on the top. Put your other finger on the 0 on the left side. Move your fingers across and down until they meet in the empty box. The answer to 2 x 0 goes in that box. What goes there? (Answer: 0) Write it in.

3. **Say**: Put your finger on the 2 across the top. Put your finger on the 1 on the left side. Move your fingers until they meet in the empty box. What will we write there? (Answer: 2) Why? (Answer: 2 x 1 is 2)
4. **Say**: Write the numbers that belong in the rest of that column.
5. While they are working, fill in the column under the 2 on the Multiplication Table on the board.
6. **Say:** Check your column with what I wrote on the board. Make changes if you need to.
7. **Say:** Look down the left side and find the 2. Find the 0 at the top. Move your fingers across and down until they meet. What do we write there? (Answer: 0 because 0 x 2 = 0) Fill in the rest of the row.
8. **Say:** Check your partner's work. While pupils work, fill in the column under the 2 and the row to the side of the 2.

Independent Practice *(10 minutes)*

1. **Say:** Fill in the columns under the 4, 5, 8 and 10. Then fill in the rows next to the 4, 5, 8, and 10. Work with your partner. You may use the Multiplication Tables you have or your 100 Chart. (Answer: see below)

	0	1	2	3	4	5	6	7	8	9	10
0			0		0	0			0		0
1			2		4	5			8		10
2	0	2	4	6	8	10	12	14	16	18	20
3			6		12	15			24		30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6			12		24	30			48		60
7			14		28	35			56		70
8	0	8	16	24	32	40	48	56	64	72	80
9			18		36	45			72		90
10	0	10	20	30	40	50	60	70	80	90	100

2. Fill in the table on the board. Walk around and help pupils who are having difficulty. If you find pupils who are doing well, they can also help others.

Closing *(3 minutes)*

1. **Say:** Check your Multiplication Table with the one on the board. If you disagree with an answer, please raise your hand.

Multiplication	Division
?	12
3 | 3 | 3 | 3	? | ? | ? | ?
3 x 4 = ?	12 ÷ 4 = ?

	0	1	2	3	4	5	6	7	8	9	10
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

Lesson Title: Revising Everyday Language for Length	**Theme:** Measurement and Estimation of Length	
Lesson Number: M-03-036	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson pupils will be able to describe the length of different objects using comparative words.	**Teaching Aids** 1. Length Chart at the end of the plan. 2. Length Sentence Frames 1 and 2 at the end of the plan. 3. Sticks 4. Objects in the classroom.	**Preparation** 1. Draw the Length Chart, at the end of the plan, on the board. 2. Write the Length Sentence Frames 1 and 2, at the end of the plan, on the board. 3. Gather 10 sticks of various sizes for each pair of pupils.

Opening *(2 minutes)*

1. **Say:** You have sticks at your desk. In pairs, put them in some kind of order.
2. **Ask:** How did you put them in order? (Example answer: shortest to longest, or longest to shortest.)
3. Try to get different answers.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today, we are going to begin looking at measurement. Tell your partner everything you know about measurement.
2. Give pupils 3 minutes to talk.
3. **Say:** Write as many words as you can think of that are related to measurement.
4. Give pupils 3 minutes to write. Ask pupils a few at a time to write 2 of their words on the board. Try to get 10 words on the board. (Example answers: centimetre, metre, kilometre, length, width, height, weight, big, small, long, short)
5. **Say:** I am going to point to a word and say it out loud. If you have that word on your paper, tap your head.
6. Say and point to each of the words that are on the board.
7. **Ask:** Do you have any words that are not on this list? If yes, please tell us.
8. **Say:** We are going to 'describe' the length of objects using these words: long, longer, longest, short, shorter and shortest today.

Guided Practice *(10 minutes)*

1. Point to Length Sentence Frame 1 on the board.
2. **Say:** Write these sentences. Look around the room to find 3 objects that are different sizes. Fill in the blanks with the objects you chose. For example, 'The desk is long. The table is longer. The board is the longest of all three objects'.
3. **Say:** Draw this chart. Use the words 'long,' 'longer' and 'longest' to label the pictures.
4. As pupils finish, write in the answers. (Answers: see below)

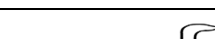| Long	
Longest	
Longer	

Independent Practice *(10 minutes)*

1. Give pupils 3 minutes to write their sentences. Point to Length Sentence Frame 2 on the board.
2. **Say**: Write these sentences. Look around the room to find 3 more objects that are different sizes. Fill in the blanks with the objects you chose. For example, 'The stick is short. The pencil is shorter. The chalk is the shortest of all 3 objects'.
3. Give pupils 3 minutes to write sentences.
4. **Say:** Read your sentences to your partner and ask if they are correct. Then listen to your partner's sentences and say if they are correct.
5. Walk around the room to make sure pupils are correct.

Closing *(3 minutes)*

1. **Say:** Make a list of objects in the room. Put them in order from longest to shortest or shortest to longest. Trade papers with your partner and have them use the words short, shorter, shortest or long, longer, longest to describe your list.
2. **Say:** Well done. Tomorrow we will start to measure lengths using bottle tops. Please bring 5 bottle tops to school tomorrow for us to use.

[LENGTH CHART]

[LENGTH SENTENCE FRAME 1]
The _____ is long.
The _____ is longer.
The _____ is the longest of all three objects.

[LENGTH SENTENCE FRAME 2]
The _____ is short.
The _____ is shorter.
The _____ is the shortest of all three objects.

Lesson Title: Using non-standard units to estimate length of objects	**Theme:** Measurement and Estimation of Length	
Lesson Number: M-03-037	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson pupils will be able to estimate the length of objects by using bottle tops.	**Teaching Aids** 1. Bottle tops, pupils were asked to bring them last lesson. 2. Hair ribbon or shoelace. 3. Lengths Estimates Chart at the end of the plan.	**Preparation** 1. Draw a line on the board approximately 1 meter long. 2. Gather some hair ribbon or laces. Draw the Lengths Estimate Chart, at the end of the plan, on the board.

Opening *(3 minutes)*

1. **Say:** Turn to your partner and describe 3 objects in your house that are long, longer and longest. Then ask your partner to do the same.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we will continue our study of measurement.
2. **Ask:** What do we use to measure? (Example answers: ruler, centimetres, metres, hands, pencils)
3. **Say:** In pairs, list other items that could be used for measuring length. Write your list on your paper. (Example answers: sticks, ropes, pencil, paper) Give pupils about 2 minutes to write.
4. **Say:** We are going to use everyday items to 'estimate' how long objects are. Who remembers what it means to 'estimate'? (Example answer: You get an answer that is close to the actual answer.)
5. Hold up a ribbon or shoelace for all to see.
6. **Say:** Look at this line I have drawn on the board. How many hair ribbons do you think it will take to make the length of the line?
7. Write all the estimates on the board.
8. **Ask:** What do you notice about our estimates? (Example answer: They are all close.)

Guided Practice *(10 minutes)*

1. **Say:** I asked you what you could use to measure. You said sticks, paper and other things. We are going to use bottle tops to estimate lengths.
2. **Say:** Look at your pencil. How many bottle tops do you think it will take to measure the length of the pencil? Tell your partner. (Answer: Accept any answer.)
3. **Say:** Remember, this is just an estimate. You will get better at estimating when we begin to find actual measurements.
4. Point to the Length Estimates Chart.
5. **Say:** Copy this chart in your book. We will fill it in with our estimates.
6. **Ask:** What did you just estimate? (Answer: The length of a pencil.)

7. **Say:** Write in the chart that the object is the pencil. In the next box, write your estimate. For example, if I estimate my pencil is 5 bottle tops long, I write '5' in that box.
8. **Say:** Look at your partner's chart. Raise your hand and show me with your fingers your partner's estimate.
9. **Say:** Look around. Why do we have different numbers for our estimates? (Example answers: Estimates are not exact. Pencils are different lengths. People may use the wide part of the bottle top to measure and others may use the narrow part.) Tell your partner why you think we have different answers.

Independent Practice *(10 minutes)*

1. **Say:** With your partner, choose 5 other objects, in the classroom or outside, to estimate the length of. Write each estimate in your chart. If you have time, estimate more.
2. While pupils are working, walk around to see that they are estimating and not actually measuring. Give pupils about 5 minutes to work. Call pupils back to their seats.
3. **Ask:** Did you and your partner agree on all the estimates? Did you choose short objects or very, very long objects? What was the longest object you estimated? (Example answers: length of building, height of tree, width of classroom)
4. **Say:** Tell your partner if you think estimating lengths of longer objects is easier or more difficult than of shorter objects?
5. **Ask:** Who can explain this to the class? (Example answer: More difficult because they are big and the bottle tops are small)

Closing *(2 minutes)*

1. **Ask:** Estimate how many bottle tops it would take to measure from here to that tree.
2. Point to a tree or other landmark that is about 100 steps away. Write all the estimates on the board.
3. **Ask:** What do you notice about the estimates? (Some are a lot bigger than others. It is very difficult to estimate a distance that far with bottle tops because they are very small.)

[LENGTHS ESTIMATES CHART]

Object	About How Many Bottle Tops?

Lesson Title: Measuring length of large objects and spaces using arm span (non-standard units)	Theme: Measurement and Estimation of Length	
Lesson Number: M-03-038	Class/Level: Class 3	Time: 35 minutes

Learning Outcomes By the end of the lesson pupils will be able to measure length of large objects and spaces using arm span.	Teaching Aids 1. Lengths Estimates and Measurements Chart at the end of the plan. 2. A stick	Preparation 1. Draw the Length Estimates and Measurements Chart, at the end of the plan, on the board. 2. Find a stick that is approximately ½ a meter long.

Opening *(1 minute)*

1. **Say:** Write a list of items you could use to measure objects with.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we will continue looking at measurement. We will find actual measurements. What have we used to measure before? (Answers: ribbons, bottle tops) Today we are going to use our bodies! But first let's remember how to take 'actual' measurements. We are going to use this stick to measure the length of the board. First, let's 'estimate'. Show me with your fingers how many sticks you estimate it will take to make the length of the board. Write all the answers on the board.
2. **Say:** Now I will measure it to get the 'actual' length of the board.
3. Put the end of the stick at one end of board. Mark on the board where the stick ends.
4. **Say:** I am marking the spot on the board where the stick ends. This is where I move the stick.
5. Move the stick to start at the spot you marked, and mark the new spot it ends, and continue to measure like this until you get to the end of the board. Estimate if the last measurement is 1 or ½ the length of the stick.
6. **Ask:** How many sticks long is the board? (Answer: However many sticks it took to get to the end of the board.)
7. Write the measurement on the board. (Example answer: 4 ½ sticks) Circle the estimates that were close to the actual measurement. For example, if the 'actual' measurement was 4 ½ sticks, circle 3 ½, 4, 4 ½, 5, 5 ½.

Guided Practice *(10 minutes)*

1. Point to the Lengths Estimates and Measurements Chart on the board.
2. **Say**: Copy this chart in your book.
3. **Say:** When we spread our arms out as wide as they can go, that is called arm span. We are going to measure objects with our arm span. Without hitting your classmates, spread your arms as wide as you can. Look at your fingertips on your left hand. Look at your fingertips on your right hand. The distance between them is your arm span. How many arm spans do you think your desk is? (Example answers: 1, 1 ½, or 2) Write your estimate in your chart.

4. **Say:** Now, let's measure it. Put one hand on the left of your desk. Spread your arms out as wide as you can. How wide is your desk? Write your answer in your chart. (Example answers: If it is a single desk, it might be ½ an arm span. If it is a table, it might be 1 ½ arm spans.)
5. **Say:** Tell your partner your answers and how close you were with your estimate. Did you have the same answers as your partner? Give them 1 minute to talk.
6. **Ask:** What are your measurements? Record at least 3 different answers.
7. **Ask:** Why do we have different answers? (Example answers: His arms are longer than mine; Her desk is bigger than mine.)

Independent Practice *(10 minutes)*

1. **Say:** With a partner, choose 2 objects in the classroom or outside to measure. First, estimate how many arm spans each will measure. Then, use your arm spans to measure them. Record each answer in your chart. If you have time, measure more than 2 objects.
2. Walk around to check if they are measuring correctly using their arm spans. Ask a few pupils to record their work on the board.

Closing *(4 minutes)*

1. **Say:** Look at the board. Did you measure some of the same objects as others? Are your answers the same or different?
2. **Ask:** If you got a different answer, tell us why. (Example answers: My arms are shorter.)
3. **Say:** Talk with your partner about the following questions:
   a. When is using your arm span a good way to measure? (Example answers: if you are always the one measuring and your arms have finished growing, if you are just trying to compare the lengths of two objects, if you don't have a metre stick)
   b. When is using your arm span a bad way to measure? (if two different people were measuring and they have different arm lengths, if something is very small or very big)
4. **Say:** Tomorrow we will estimate and measure small lengths using our bottle tops, so please make sure you bring them to school again

[LENGTHS ESTIMATES AND MEASUREMENT CHART]

Object	Estimate	Actual
Desk		

Lesson Title: Measuring length of small objects and spaces using non-standard units	**Theme:** Measurement and Estimation of Length	
Lesson Number: M-03-039	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson pupils will be able to measure the length of small objects and spaces using appropriate non-standard units.		**Teaching Aids** 1. Comparing Measurements Chart at the end of the plan. 2. A stick 3. Bottle tops, pupils were asked to bring them last lesson. 4. Groundnut shells		**Preparation** 1. Draw the Comparing Measurements Chart, at the end of the plan, on the board. 2. Draw a line approximately ½ meter long on the board. 3. Find a stick that is approximately 15 - 20 cm long. 4. Gather enough groundnut shells for each pair to have 5.

Opening *(3 minutes)*

1. **Say:** Make a list of 10 objects in the classroom. Put them in order from longest to shortest. When you are finished, trade with your partner and check their list.

Introduction to the New Material *(10 minutes)*

1. **Say:** Yesterday we measured big objects in and out of the classroom. Today we are going to find small objects to measure. Would we use our arm span to measure the length of a pencil? If you think yes, show me thumbs up. If you think no, show me thumbs down. (Answer: no)
2. **Ask:** Why not? (Answer: Our arm span is too big to measure something small like a pencil.)
3. **Say:** We have also used ribbons, and sticks to measure. What could we use to measure small objects? (Example answers: bottle tops, pencils, coins, cans)
4. **Say:** We are going to use pencils, bottle tops and groundnut shells. But if you are at home, you can find other items to measure with. I am going to measure the line on the board with a straw.
5. Point to the line on the board. **Say:** Please make an estimate for how many straws the line will be. Write your answer on your paper.
6. **Say:** Watch me measure the line. If I make a mistake, clap your hands.
7. Place the end of the straw at the beginning of the line. Mark the other end of the straw before you move it. Then put the straw at the mark you made. Continue this process, but the second time, do not make your mark. Move your straw, but do not put it right next to where the previous one ended. In other words, make a mistake in your measuring. Pupils should clap when they see you make a mistake.
8. **Ask:** What did I do wrong? (Answer: You did not make a mark for the end of the straw, and you moved it too far.)
9. **Ask:** Who can show us the correct way to measure? If you are seated, show me thumbs up if they measure correctly. Show me thumbs down if they make mistakes.
10. **Say:** We learn from making mistakes. Thank you for helping me!

Guided Practice *(10 minutes)*

1. **Say:** Use your pencil to measure the width of your desk. That means from one side to the other.
2. **Ask:** What measurement did you get? Write answer on the board.
3. **Ask:** Does anyone have a different answer? (Answer: yes) Write the different answers on the board.
4. **Ask:** Why do we have different answers? (Example answers: My pencil is longer than hers; My desk is bigger than his.)
5. **Say:** Now use your groundnut shells to measure the width of your desk.
6. Give pupils about a minute to measure using the shells.
7. **Ask:** What measurement did you get? Write the answer on the board.
8. **Ask:** Was that more or fewer than when you measured with a pencil?
9. **Say:** Show me with thumbs up if your shell answer was more, or thumbs down if it was fewer than your pencil answer. (Answer: more and thumbs up)
10. **Say**: Tell your partner why your answer was more when you measured with shells than when you measured with your pencil.
11. **Ask:** Who can explain it to the class? (Answer: It takes more shells than pencils to make the width of the desk.)

Independent Practice *(10 minutes)*

1. Point to the Comparing Measurements Chart on the board.
2. **Say:** Copy the chart in your book. With your partner, choose 2 objects in the classroom to measure. First measure them with your pencil, then measure them with your bottle tops. Then measure them with your groundnut shells. Write each answer in your chart. If you have time, measure more than 2 objects.
3. Walk around to check that they are measuring correctly. If there is no space for the pupils to move around in the classroom to measure, allow some to go outside to measure.

Closing *(3 minutes)*

1. **Ask:** Would you use bottle tops or arm spans to measure the distance from our school to Freetown? (Answer: neither) Why? (Answer: It would take too many bottle tops or arm spans to go that far. We should use something bigger.)
2. **Say:** Tomorrow we will continue measuring, so please bring your bottle tops to school again.

[COMPARING MEASUREMENTS CHART]

Object	Pencils	Bottle Tops	Groundnut Shells

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Lesson Title: Solving simple word problems involving non-standard units of measurement	**Theme:** Measurement and Estimation of Length	
Lesson Number: M-03-040	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson pupils will be able to solve simple word problems involving non-standard units of measurement.	**Teaching Aids** 1. Word Problems 1 and 2 at the end of the plan. 2. Sticks 2. Bottle tops, pupils were asked to bring them last lesson.	**Preparation** 1. Write the Word Problems 1 and 2, at the end of the plan, on the board. 2. Gather enough 10cm long sticks for each pair.

Opening *(2 minutes)*

1. **Say:** Think about why we need to measure objects.
2. **Say:** Tell your partner some of the reasons we might measure objects. Give pupils a minute to talk.
3. **Ask:** Who can tell me why we need to measure objects? (Example answers: to know if things will fit in a space, to know how much of an object we might need when we are building)

Introduction to the New Material *(10 minutes)*

1. **Say:** We use measurement to solve the word problems of real life. For example, if you are going to make a shirt, you will need fabric.
2. **Ask:** How much fabric will you need just from your shoulders to your wrists? Measure the length of both of your arms--unless you only want one sleeve!
3. **Ask:** Who will be my shirt model? Who will be my measurer?
4. Invite two pupils to the front of the room.
5. **Ask:** What should Pupil B (use their name) use to measure Pupil A's (use their name) arms? (Example answers: bottle top or 10 cm long stick)
6. **Ask:** Pupil B (use their name), which unit will you use to measure? (Answer: any available)
7. **Say:** Please start at the top of the arm and measure to the wrist. Everyone else, please watch. If our friend is measuring correctly, show me thumbs up. If they are measuring incorrectly, show me thumbs down.
8. If the pupil measuring is making errors, **Ask:** What is going wrong? (Example answer: She is not putting the bottle top right next to where the last one was; She counted wrong.)
9. **Ask:** What should she do next? (Answer: Add the two lengths together.)
10. **Ask:** Did she choose a good unit to measure by? (Possible answer: Using the stick would be faster than using the bottle top.)

Guided Practice *(10 minutes)*

1. Point to Word Problem 1 on the board.

2. **Say:** We need to know what size desks are good for pupils. If you put your notebook, your pencil and a book on the desk, how long does it need to be? Place your materials so they are as long as they can be.
3. **Ask:** What do we need to measure? (Answer: the pencil, the notebook and the book all in a line)
4. **Ask:** What unit should we use? (Answer: bottle tops or something small)
5. **Ask:** After we measure each item, what do we need to do? (Answer: Add them together.)
6. **Say:** Try it with your partner. Give pupils about 5 minutes to work.
7. **Ask:** What is the answer? (Answer: Accept all reasonable answers around 30 bottle tops.)
8. **Say:** Let's try with a different unit. **Ask:** Did it make any difference? (Possible answer: Yes, we need less sticks than bottle tops because the sticks are longer than the bottle tops.)

Independent Practice *(10 minutes)*

1. Point to Word Problem 2 on the board. **Say:** How tall are you? How tall is your partner? Which one of you is taller? How much taller? If you stood on top of your partner, how tall would you be? Choose a good unit to measure with.
2. **Say:** Now that we have practiced word problems, you and your partner try it together.
3. **Say:** You will have about 10 minutes to solve the word problem. Make sure you write everything down that you did to solve it.

Closing *(3 minutes)*

1. **Say:** How tall are you and your partner if you stand on top of each other? What unit did you use to measure?
2. Write all the answers on the board. If you notice any answers that seem incorrect, ask them how they solved the problem.
3. **Say:** Well done, you measured well today.

[WORD PROBLEM 1]
We need to know what size desks are good for pupils. If you put your notebook, your pencil and a book on the desk, how long does it need to be? Place your materials so they are as long as they can be, as shown on the board.

[WORD PROBLEM 2]
How tall are you? How tall is your partner? Which one of you is taller? How much taller? If you stood on top of your partner, how tall would you be? Choose a good unit to measure with.

Lesson Title: Identifying similarities and differences between a rectangle and square	**Theme:** Geometry 2 – D Shapes	
Lesson Number: M-03-041	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to identify the similarities and differences between a rectangle and square.	**Teaching Aids** None	**Preparation** 1. Draw 4 rectangles, 4 squares and 2 triangles of various sizes randomly on the board. 2. Draw a Venn Diagram on the board.

Opening *(1 minute)*

1. **Say:** I'm thinking of a shape. It has 4 sides. What could it be? (Answer: Square or rectangle).
2. **Say:** My shape has 4 corners. What could it be? (Answer: Square or rectangle)
3. **Say:** All 4 sides of my shape are equal. What could it be? (Answer: Square)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to study 2 different shapes.
2. Point to a large rectangle and square on the board.
3. **Ask:** Can you see these shapes on the board? Tell a partner what is the same about them. Give pupils 1 minute to talk.
4. **Ask:** What is different about these shapes? Please tell your partner. Give pupils 2 minute to talk.
5. **Say:** Draw the Venn Diagram in your book.

Guided Practice *(10 minutes)*

1. **Ask:** What is the same about a square and a rectangle? (Answers: They both have 4 sides, 4 angles and 4 right angles. All sides are straight.) Write those in the part of the two circles that overlap because it is true about both the square and the rectangle. Give pupils 2 minutes to write.

Venn Diagram (Answers)
Squares   Rectangles

All four sides are equal

4 sides
4 angles
All sides are straight
4 right angles
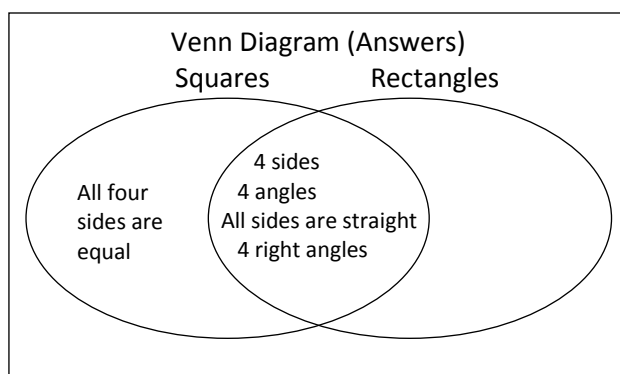
2. **Ask:** What makes a square different? (Answer: All four sides are an equal length.) Write that in the part of the circle that is just about the square. Give pupils 1 minute to write.

3. **Ask:** What makes a rectangle different? (Answer: Nothing) **Say:** Rectangles are any shape that has 4 sides, 4 angles, 4 right angles and all sides are straight. A square is just a special type of rectangle – one with equal sides.)
4. **Say:** I am going to point to shapes. If I point to a square, clap your hands. If I point to a rectangle, stomp your feet. If I point to neither tap your desk.
5. Point to the shapes on the board. Remember that if you point to a square, pupils should clap and stomp. A square is both.

Independent Practice *(10 minutes)*

1. Draw the following shapes on the board:
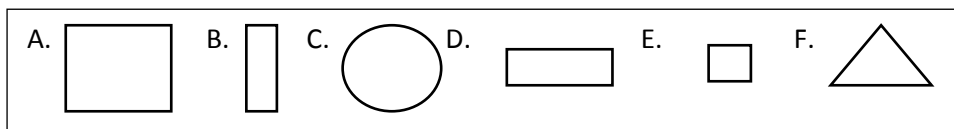
2. **Say:** Look at the shapes I have drawn on the board. Please draw them on your paper and label them as a rectangle, square, neither or both.
3. Give pupils 4 minutes to draw the shapes and label them. Then **Say:** Trade papers with your partner. Please check her answers as we call out the answers.
4. **Ask:** What is Shape A? (Answer: both square and rectangle) What is Shape B? (Answer: rectangle) What is Shape C? (Answer: neither or circle) What is Shape D? (Answer: rectangle) What is Shape E? (Answer: both square and rectangle) What is Shape F? (Answer: neither or triangle)
5. **Say:** Please draw and label 2 rectangles and 2 squares on your paper.
6. Give pupils 2 minutes to draw. Then **Say:** Trade papers with your partner and check their answers. Raise your hand if you disagree. Give pupils 1 minute to check papers.

Closing *(4 minutes)*

1. Draw the following shape on the board:
2. **Say:** Copy this shape in your book. Count how many squares you can find. There are more than 9. Give pupils 3 minutes to work.
3. **Say:** If you want the answer, come see me on your way out of the classroom. If you want to work on this at home, you can ask me for the answer later. (Answer: 14. All of the 9 small squares, 1 big square that contains all 9 small squares, and 4 squares that contain 4 small squares)
4. **Say:** Well done!
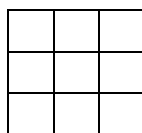
(Answers:)
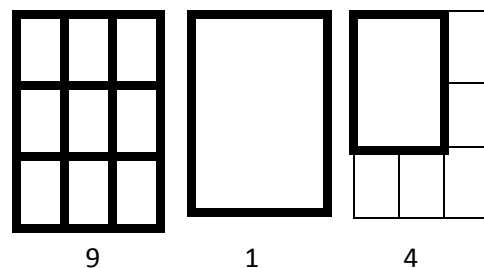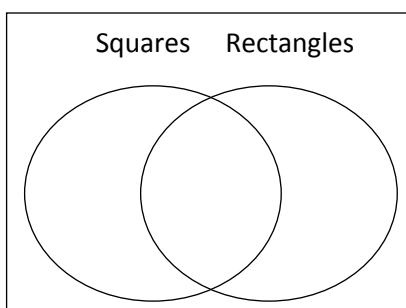
9   1   4

[VENN DIAGRAM]

Squares   Rectangles

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Lesson Title: Identifying similarities and differences between a rectangle, square and triangle	**Theme:** Geometry 2 – D Shapes	
Lesson Number: M-03-042	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to identify similarities and differences between a rectangle, square and triangle.		**Teaching Aids** Classroom Examples List at the end of the plan.		**Preparation** 1. Draw a Classroom Examples List on the board. 2. Draw 4 squares, 4 rectangles and two different triangles (one with a right angle and one without) on the board.

Opening *(1 minute)*

1. **Say:** I am going to point to some shapes. If I point to a square, please clap your hands. If I point to a rectangle, stomp your feet. If I point to neither, tap your desk.
2. Point to the shapes Remember that if you hold up a square, pupils should clap and stomp. A square is a special type of rectangle so it is both. Go through 5-6 shapes.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to add triangles to our learning about shapes. Please turn to your partner and tell him everything you know about triangles. Give pupils 30 seconds to talk.
2. **Say:** Who can point to a triangle on the board? How is it the same as a square? (Answer: straight lines, angles/corners)
3. **Ask:** How is it the same as a rectangle? (Answer: straight lines, angles/corners)
4. **Ask:** What makes it different from a square? (Answer: 3 lines, 3 angles, smaller angles/corners)
5. **Ask:** How is it different from a rectangle? (Answer: 3 lines, 3 angles, smaller angles/corners)
6. **Ask:** Who knows what a right angle is? (Answer: It is an angle that makes a square angle.) Please look at your table. Each of the angles is a right angle. Now, look at the board. Each of the angles is a right angle. Can you find another example of a right angle in the room? (Example answers: notebook angles; book angles; seat angles; doorway angles)
7. **Say:** Who can point to a square? How many right angles does a square have? (Answer: 4)
8. **Ask:** Who can show us where the right angles are on a square?
9. Ask a pupil to come and show the class where the right angles are on the board.
10. While the pupil is coming to the board, **Say:** If you are seated, draw a square on your paper. Mark the right angles.
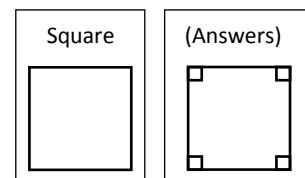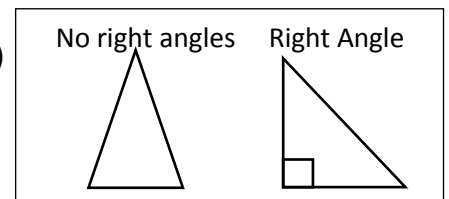
Guided Practice *(10 minutes)*

1. **Say:** Who can point to a rectangle? How many right angles does a rectangle have? (Answer: 4)
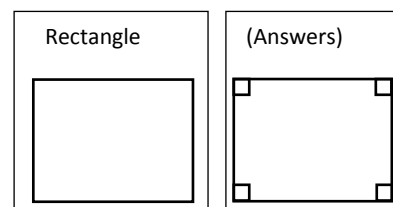
2. **Ask:** Who can show us where the right angles on a rectangle are?
3. Ask a pupil to come to the board and show the class where the right angles are on the rectangle on the board.
4. While the pupil is coming to the board, **Say:** If you are seated, draw a rectangle on your paper. Mark the right angles.
5. **Say:** Show me thumbs up if you agree with Pupil A (Use his name). Show me thumbs down if you disagree.
6. If pupils disagree, ask them to come change the answer on the board. They must explain their answers. After 1-3 pupils make changes, show the correct answer. Remind them that mistakes are a good way to learn.
7. Point to a large triangle that <u>does</u> have a right angle.
8. **Ask:** Look at this triangle. Does it have a right angle? (Answer: yes)
9. **Ask:** Who can show us where the right angle is?
10. **Say:** If you are in your seat, mark the right angle.
11. Point to a large triangle that <u>does not</u> have a right angle.
12. **Ask:** Does this have a right angle? (Answer: no)
13. Point to the triangle that <u>does</u> have a right angle.
14. **Say**: Triangles do not have to have a right angle. Some triangles do and some triangles do not.

No right angles   Right Angle

Independent Practice *(10 minutes)*

1. **Say:** Please look around the room. Find items that are squares, rectangles and triangles. Make a list of each shape and the items you see. Draw the Classroom Examples list on your paper and then list the items under each shape.
2. After about 7 minutes, **Say:** Who can write 1 or 2 of your items in our chart? Have pupils write as many items as they can in the time you have remaining.
3. While pupils are writing on the board, **Say:** Switch Classroom Examples Lists with your partner. Please check for correctness. Ask your partner if you disagree with their examples.
4. **Say:** You may add examples from your partner's list or the list on the board to your list.

Closing *(4 minutes)*

1. **Say:** Look at your shapes. How are they the same? (Answer: straight lines, angles)
2. **Ask:** How are they different? (Answer: different numbers of sides and angles, different size angles)
3. **Say:** Well done, you know your shapes very well.

[CLASSROOM EXAMPLES LIST]

Squares	Rectangles	Triangles

Lesson Title: Drawing squares and rectangles using its properties		**Theme:** Geometry 2 – D Shapes	
Lesson Number: M-03-043		**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to draw squares and rectangles using their properties.	**Teaching Aids** 1. Properties of Shapes Chart at the end of the plan. 2. Properties of Shapes Sentence Frames at the end of the plan.	**Preparation** 1. Draw Properties of Shapes Chart, at the end of the plan, on the board. 2. Write the Properties of Shapes Sentence Frames, at the end of the plan, on the board. 3. Draw 2 triangles, 4 squares and 4 rectangles of different sizes on the board.

Opening *(2 minutes)*

1. **Say:** Point to a square on the board. **Ask:** What makes it a square? (Answer: It has 4 equal sides and 4 angles/corners that are all right angles.)
2. **Say:** Point to a rectangle on the board. (Remember that a square is a special type of rectangle.)
3. **Ask:** What makes it a rectangle? (Answer: It has 4 sides and 4 right angles.)
4. **Say:** Point to a triangle. **Ask:** What makes it a triangle? (Answer: It has 3 sides and 3 angles)
5. **Ask:** Who can come to the board and point to a right angle?
6. **Say:** Clap for our friend if she/he is correct.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to use the properties we learned about shapes to help us draw them. Draw the Properties of Shapes Chart in you book. Write in the 3 shapes that we are studying under the word Shape.
2. **Ask:** Who can write it on the board? (Answers: rectangle, square, triangle)
3. **Say:** Each column is a property of shapes. We can use properties to describe shapes.
4. **Say:** Please turn to a partner and tell him what properties of shapes we will be discussing today.
5. Give pupils 1 minute to talk.
6. **Ask:** Who can raise their hand and tell me what properties we will be discussing? (Answer: sides, angles, straight edges, right angles)
7. **Say:** Look at your partner's chart. Did they write all the properties across the top of the chart? If not, please correct them.

Guided Practice *(10 minutes)*

1. Point to a rectangle on the board.
2. **Say:** How many sides does it have? (Answer: 4) **Ask:** Where do we write that in our chart? (Answer: next to 'rectangle' and below 'Sides')
3. **Ask:** How many angles does a rectangle have? (Answer: 4) **Say:** Write that in your chart.
4. **Ask**: How many straight lines does a rectangle have? (Answer: 4) **Say**: Write that in your chart.

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5. **Say:** The next space is more difficult. Think about our discussion of right angles. How many 'right angles' does a rectangle have? Remember that a right angle is a square angle like the angle of your desk. Talk with your partner and decide how many right angles a rectangle has.
6. Give pupils a minute to discuss.
7. **Ask**: Who can tell me how many 'right angles' a rectangle has? Show me with your fingers how many right angles a rectangle has. (Answer: Pupils hold 4 fingers in the air.)
8. **Ask:** Who can explain why they have 4 fingers in the air? (Answer: Each angle is square.)
9. **Say**: Write 4 in the chart to show how many right angles a rectangle has.
10. **Say**: Now fill in the columns for the square.
11. **Say:** Trade charts with your partner. Check his/her work. If it is correct, give it back to him/her. If not, explain to him/her what the correct answers are.
12. Make sure you have filled in the correct answers on the board:

Properties of Shapes Chart (Answers)				
Shape	Sides	Angles	Straight edges	Right angles
rectangle	4	4	4	4
square	4	4	4	4
triangle				

Independent Practice *(8 minutes)*

1. **Say:** Now you will use these properties to draw squares and rectangles on your own.
2. **Say:** You are going to draw as many squares and rectangles as you can to fill the page in your exercise book or to fill your paper.
3. **Say:** Remember that squares have 4 straight equal sides and 4 right angles.
4. **Say:** Label each shape as a square or a rectangle.
5. **Say:** Once you have filled the page, find a classmate who has finished as well.
6. **Say:** Take turns drawing 4 points on a piece of paper that can be connected to make a square or a rectangle.
7. **Say:** Once you have drawn 4 points, hand the paper to your partner to connect the dots and create a square or a rectangle and label it.

Closing *(5 minutes)*

1. Point to the sentence frames on the board.
2. **Say:** Copy the sentences in your book and fill in the missing words or numbers.
3. **Say:** Well done, you all drew good squares and rectangles today! Tomorrow we will finish our properties of shapes chart and draw triangles.

[PROPERTIES OF SHAPES CHART]

Shape	Sides	Angles	Straight edges	Right angles

[PROPERTIES OF SHAPES SENTENCE FRAMES]

A rectangle has __(4)__ sides.

A rectangle has __(4)__ right angles.

A square has __(4)__ sides and __(4)__ right angles.

A __(square)__ is a special type of rectangle.

Both squares and rectangles have __(straight)__ edges.

Lesson Title: Drawing Triangles using its Properties	**Theme:** Geometry 2 – D Shapes	
Lesson Number: M-03-044	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of this lesson, pupils will be able to draw triangles using its properties.	**Teaching Aids** 1. Properties of Shapes Chart at the end of the plan. 2. Properties of Shapes Sentence Frame at the end of the plan.	**Preparation** 1. Draw the Properties of Shapes Chart, at the end of the plan, on the board. 2. Write the Properties of Shapes Sentence Frame, at the end of the plan, on the board. 3. Draw 4 triangles (at least 1 with a right angle), 2 squares and 2 rectangles on the board.

Opening *(1 minute)*

1. **Say:** Please take out your Properties of Shapes Chart from yesterday. Show me on your fingers how many right angles a rectangle has. (Answer: 4)
2. **Ask**: What makes a square different from a rectangle? (Answer: All sides are the same length.)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we will finish our Properties of Shape Chart. Then we will use our knowledge of shapes to draw triangles**.**
2. **Ask:** Who can point to a triangle on the board? How many sides does it have? (Answer: 3)
3. **Say:** Write that in your chart next to 'Triangle' and below 'Sides'.
4. **Ask:** How many angles does a triangle have? Please tell your partner.
5. **Say:** Write your answer in your chart.
6. **Ask:** Who can tell me what to write on the board? (Answer: 3)
7. **Ask**: How many straight edges does a triangle have? Raise your hand and show me with your fingers. (Answer: 3)
8. **Say**: Write that in your chart.
9. **Say:** The next space is more difficult.
10. **Ask:** How many 'right angles' does a triangle have?

Properties of Shapes Chart (Answers)				
Shape	Sides	Angles	Straight edges	Right angles
rectangle	4	4	4	4
square	4	4	4	4
triangle	3	3	3	0-1

11. **Say:** Remember, a right angle is a square angle like the angle of your desk. Talk with your partner and decide how many right angles a triangle has.
12. Give pupils a minute to discuss.
13. **Ask**: Who can tell me how many 'right angles' a triangle has? (Answer: 0 or 1)
14. **Ask**: Can you explain why? (Answer: A triangle does not have to have any right angles. But it can have 1 right angle.)
15. **Say**: Try to draw a triangle with 2 right angles.
16. Give pupils about 30 seconds. They will discover that it can't be done.

17. **Ask**: Why can't a triangle have 2 or 3 right angles? (Answer: It can't have 2 right angles, because then the third line wouldn't connect to make a triangle. The answer is 0 or 1.)
18. If pupils are unable to explain the answer, explain it to them by drawing it on the board.
19. **Say**: Write 0 or 1 in the chart to show how many right angles a triangle has.

Guided Practice *(10 minutes)*

1. **Say:** Now you will use these properties to draw triangles, squares and rectangles on your own.
2. **Say:** You are going to draw as many triangles, squares and rectangles as you can to fill the page in your exercise book or to fill your paper.
3. **Say:** Remember that squares have 4 straight equal sides and 4 right angles and triangles can have 0 or 1 right angles.
4. **Say:** Label each shape as a triangle, a square or a rectangle.
5. **Say:** Once you have filled the page, find a classmate who has finished as well.
6. **Say:** Take turns drawing 3 or 4 points on a piece of paper that can be connected to make a triangle, a square or a rectangle.
7. **Say:** Once you have drawn 4 points, hand the paper to your partner to connect the dots and create a triangle, a square or a rectangle and label it.

Independent Practice *(14 minutes)*

1. Point to the sentence frames on the board.
2. **Say:** Copy the sentences in your book and fill in the missing words or numbers.
3. Give pupils 4 minutes to write.
4. **Say:** Draw a picture in your book using only squares, rectangles and triangles. Label each shape.
5. Give pupils 10 minutes to draw.

Closing *(1 minute)*

1. **Say:** Well done, you all drew good squares and rectangles today! Tomorrow we will finish our properties of shapes chart and draw triangles.

[PROPERTIES OF SHAPES CHART]

Shape	Sides	Angles	Straight edges	Right angles
rectangle	4	4	4	4
square	4	4	4	4
triangle				

[PROPERTIES OF SHAPES SENTENCE FRAMES]

A triangle has __(3)__ sides.
A _____ can have __(0 or 1)__ right angles.
The edges of a triangle are (straight).

Lesson Title: Drawing more complex patterns using squares, rectangles and triangles	**Theme:** Geometry 2 – D Shapes	
Lesson Number: M-03-045	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to draw more complex patterns using squares, rectangles and triangles.	**Teaching Aids** 1. 2 large squares, 2 large triangles, 4 large rectangles. 2. How Many Triangles Figure at the end of the plan. 3. Shape Patterns at the end of the plan.	**Preparation** 1. Prepare 2 large squares, 2 large triangles, 4 large rectangles made from paper or cardboard. 2. Draw the How Many Triangles figure, at the end of the plan, on the board. 3. Draw the Shape Patterns, at the end of the plan, on the board.

Opening *(2 minutes)*

1. **Say:** If I hold up to a square, please clap your hands. If I hold up a rectangle, stomp your feet. If I hold up a triangle, tap your desk.
2. Hold up the shapes on the board. If you hold up a square, pupils should clap and stomp. A square is a special type of rectangle so it is both. Go through about 5-6 shapes.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to use our shapes to make patterns. I need 4 pupils to come to the front of the room.
2. Give 1 pupil a square, another pupil a triangle and rectangles to 2 pupils.
3. **Say:** Please hold your shape up so the class can see it.
4. **Ask:** Who can draw the shapes that they are holding on the board? If you are seated, please draw the shapes on your paper in the same order in which they are standing.
5. **Say:** I need 4 more pupils to come to the front of the room.
6. Give 1 pupil a square, another pupil a triangle and 2 pupils rectangles.
7. **Say:** Please arrange yourselves so that you are in the same order as the first 4 pupils.
8. If the first 4 pupils are standing in the following order: square, rectangle, rectangle, triangle, then the second group of 4 pupils should stand next to them in the same order: square, rectangle, rectangle, triangle. In this example, you would have square, rectangle, rectangle, triangle, square, rectangle, rectangle, triangle.
9. **Ask:** Is the second group of 4 pupils in the correct order? Are they in the same pattern as the first 4 pupils? If you think so, show me a thumbs up. If not, show me a thumbs down.
10. **Ask:** Who can draw the next 4 shapes in the order in which they are standing on the board? If you are seated, please copy this pattern on your paper.
11. After most are finished drawing the pattern, have the pupils sit down.

Guided Practice (*8 minutes*)

1. Draw the following pattern on the board:
2. **Say:** Draw the pattern on your paper. Please fill in the correct shape on the last lines.
3. Give pupils 2 minutes to work.
4. **Ask:** What shape did you chose to fill in the blank. (Answer: triangle)
5. If pupils say square or rectangle, **Say:** If you chose a square, tell us why.
6. **Say:** If you chose a rectangle, tell us why.
7. **Say:** If you chose a triangle, tell us why.
8. **Say:** Please think about your answer again. What shape should go in the blank? (Answer: triangle)
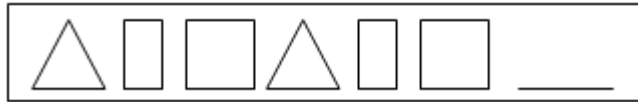
Independent Practice (*10 minutes*)

1. **Say:** Copy the 3 patterns in your book. Then fill in the blank with the shapes that will complete the pattern.
2. Give pupils about 8 minutes to work**.**
3. **Say:** Trade with your partner. Check their work. (Answers: A. Square; B. Triangle, Square; C. Low Rectangle, Tall rectangle)
4. **Ask:** Who can fill in the patterns on the board? If you are seated, check your answers with those on the board.

Closing (*5 minutes*)

1. **Say:** Copy this figure of triangles in your book. Please count how many triangles you can find.
2. **Say:** If you want the answer, come see me on your way out of the classroom. If you want to work on this at home, you can ask me for the answer later. (Answer: 13. All of the 9 small triangles, 1 big triangle that contains all 9 small triangles, and 3 medium triangles that each contains 4 small triangles.)

Answers:
9 small triangles, 1 large triangle, 3 medium triangles (shown)
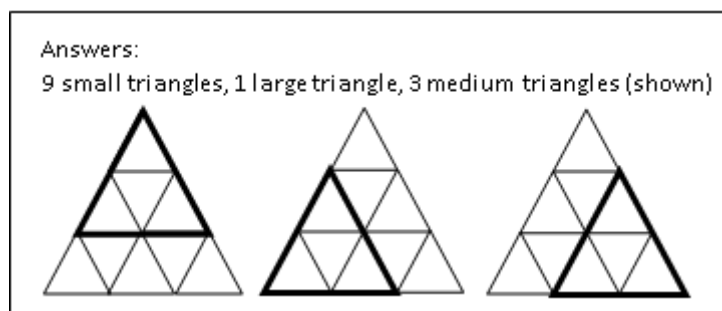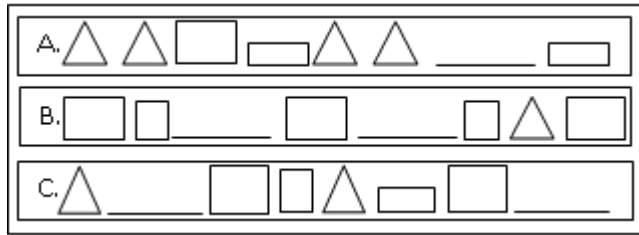
How Many Triangles?
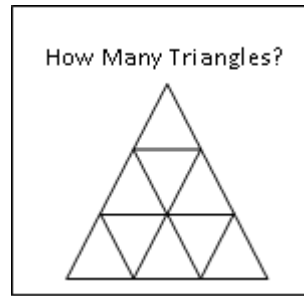
Lesson Title: Identifying and drawing a cube using its properties		**Theme:** Geometry 3 – D Shapes	
Lesson Number: M-03-046		**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to identify and draw a cube using its properties.		**Teaching Aids** 1. Cube. 2. Properties of 3-D Shapes Chart at the end of the plan.		**Preparation** 1. Find a cube. 2. Draw Properties of 3-D Shapes Chart, at the end of the plan, on the board.

Opening *(2 minutes)*

1. **Say:** I am going to show you a shape. Raise your hand if you know what the shape is called.
2. Hold up the cube and ask volunteers to suggest the name of the shape. If they say the wrong shape, it is okay, explain why it is not that shape.

Introduction to the New Material *(11 minutes)*

1. **Say:** Last week, we looked shapes that were flat. This week, we will study shapes that are not flat. They are called 3-Dimensional shapes or 3-D shapes. The first one is called a 'cube'.
2. Hold up a cube.
3. **Say:** This is a cube.
4. **Ask:** How would you describe a cube? (Example answers: All faces are squares; there are 6 faces.)
5. **Say:** A cube has 6 faces. Faces are the flat sides of the shape.
6. **Ask:** What flat shape is each of the faces on a cube? (Answer: a square)
7. **Say:** The edges are where the faces meet.
8. Show pupils where the edges are**.**
9. **Ask:** How many edges does a cube have?
10. Count the edges with the pupils. (Answer: 12)
11. **Say:** Vertices are where the edges meet.
12. Show pupils where the vertices are**.**
13. **Ask:** How many vertices does a cube have?
14. Count the vertices with the pupils. (Answer: 8)

Guided Practice (*10 minutes)*

1. **Say:** Look at the cube I have.
2. **Say:** Let's learn how to draw a cube.
3. Draw each step on the board as you say them.
4. **Say:** First you draw a square (A).
5. Give pupils about 30 seconds to draw a square.
6. **Say:** Next, please draw a diagonal line coming off each of the 4 angles of that square (B).
7. Give pupils about 30 seconds to draw those lines.
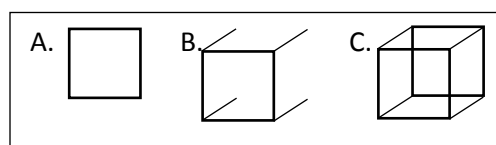
8. **Say:** Then, draw a square to connect the ends of each of the 4 lines you just drew.
9. **Say:** Look at your partner's cube. Please make corrections if you need to.
10. **Say:** Draw 4 more cubes in your book.

Independent Practice *(11 minutes)*

1. **Say:** We are going to draw a chart to show the Properties of our 3-D shapes. Please make sure to keep this for the rest of the week because we will add to it.
2. **Say:** Work with your partner to fill in the Properties of the 3-D Shapes.
3. Give pupils about 8 minutes to work.

Properties of 3-D Shapes (Answers)				
Shape	Number of Faces	Shape(s) of faces	Number of Edges	Number of Vertices
Cube	6	Squares	12	8

4. **Say:** We are going to check our answers. Look at your paper as we call out the correct answers.
5. Write the answers in the chart on the board as the class tells you the answers.
6. **Ask:** How many faces does a cube have? (Answer: 6)
7. **Ask:** What are the shapes of the faces? (Answer: squares)
8. **Ask:** How many edges do cubes have? (Answer: 12)
9. **As:** How many vertices do cubes have? (Answer: 8)
10. **Say:** Please keep this chart safe. We will be adding more shapes in the next few lessons.

Closing *(1 minute)*

1. **Say:** Well done, you drew wonderful cubes today. Thank you class.

[PROPERTIES OF 3-D SHAPES CHART]

Shape	Number of Faces	Shape(s) of faces	Number of Edges	Number of Vertices

Lesson Title: Identifying and drawing a cuboid using its properties		**Theme:** Geometry 3 – D Shapes	
Lesson Number: M-03-047		**Class/Level:** Class 3	**Time:** 35 minutes

| **Learning Outcomes** By the end of the lesson, pupils will be able to identify and draw a cuboid using its properties.	**Teaching Aids** 1. Properties of 3D Shapes Chart at the end of the plan. 2. 3-D shapes.	**Preparation** 1. Draw Properties of the 3-D Shapes Chart, at the end of the plan, on the board. 2. Gather 3-D objects cubes, cuboids, cylinders, and prisms, e.g. boxes, tins, cans.

Opening *(2 minutes)*

1. **Say:** I am going to show you some different shapes. If I hold up a cuboid, please clap your hands quietly.
2. Hold up the 3-D shapes that you have one at a time. If they clap when you hold up another shape, it is okay. They will learn more about cuboids in this lesson.

Introduction to the New Material *(10 minutes)*

1. **Ask:** Who remembers what kind of shapes we have been looking at this week? (Answer: 3-D)
   Ask: What makes them different from the shapes we studied last week? (Answer: 3-D shapes are not flat.)
2. Hold up a cuboid. **Say:** Today's shape is a 'cuboid'. This is a cuboid. How would you describe it? (Example answers: Two faces are squares, the others are rectangles, or all are rectangles, there are 6 faces and 12 edges and 8 vertices, it looks similar to a cube.)
3. **Ask:** What did we say faces were? (Answer: flat sides of the shape) How many faces does a cuboid have? (Answer: 6) What flat shape is each of the faces on a cuboid? (Answer: 6 rectangles, but 2 can be squares)
4. **Say:** A cuboid has 6 faces. Faces are the flat sides of the shape.
5. **Say:** The edges are where the faces meet. Show pupils where the edges are.
6. **Ask:** How many edges does a cuboid have? (Answer: 12)
7. **Say:** Vertices are where the edges meet. Show pupils where the vertices are.
8. **Ask:** How many vertices does a cuboid have? (Answer: 8)

Guided Practice (*10 minutes*)

1. **Say:** Please look at my cuboid.
2. **Say:** Let's learn how to draw a cuboid.
3. Draw each step on the board as you say them.
4. **Say:** First you need to draw a rectangle. (A.)
5. Give pupils about 30 seconds to draw a rectangle.
6. **Say:** Next you draw a diagonal line coming off each of the 4 angles of that rectangle. (B.)
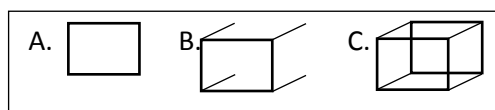
7. Give pupils about 30 seconds to draw those lines.
8. **Say:** Now, draw a rectangle to connect the ends of each of the 4 lines you just drew.
9. **Say:** Please look at your partner's cuboid. Make corrections if you need to.
10. **Say:** Draw 4 more cuboids in your book.

Independent Practice *(10 minutes)*

1. **Say:** Take out your Properties of 3-D shapes that we started yesterday. Make sure to keep this for the rest of the week because we will add to it.
2. **Say:** Please make another row and write in our new shape. Work with your partner to fill in the Properties of 3-D Shapes.
3. Give pupils about 8 minutes to work.

Properties of 3-D Shapes (Answers)				
Shape	Number of Faces	Shape(s) of faces	Number of Edges	Number of Vertices
Cube	6	Squares	12	8
Cuboid	6	Squares or Rectangles	12	8

4. **Say:** We are now going to check our answers. Please look at your paper as we call out the correct answers.
5. Write the answers in the chart on the board as the class tell you the answers.
6. **Ask:** How many faces does a cuboid have? (Answers: 6) What are the shapes of the faces? (all rectangles, or 2 squares and 4 rectangles) How many edges do cuboids have? (Answer: 12) How many vertices do cuboids have? (Answer: 8)
7. **Say:** Please keep this chart. We will be adding more shapes to it in the next lessons.

Closing *(5 minutes)*

1. **Say:** Look around the room. Please list as many examples of cuboids as you can.
2. While they are working, call volunteers to the board to list their items**.**
3. **Ask:** Are there any items on the board that you disagree with?
4. If there are disagreements, let each pupil explain their thinking. Make corrections on the board.
5. **Say:** You may add more to your list from what your classmates list on the board.
6. **Say:** Well done, you now know all about the properties of cuboids.

[PROPERTIES OF 3-D SHAPES CHART]

Shape	Number of Faces	Shape(s) of faces	Number of Edges	Number of Vertices
Cube	6	Squares	12	8

Lesson Title: Identifying and Drawing a Prism using its Properties	**Theme:** Geometry 3 – D Shapes	
Lesson Number: M-03-048	**Class/Level:** Class 3	**Time:** 35 minutes

| **Learning Outcomes** By the end of the lesson, pupils will be able to identify and draw a prism using its properties.	**Teaching Aids** 1. Properties of 3D Shapes Chart at the end of the plan. 2. 3-D objects	**Preparation** 1. Draw Properties of the 3-D Shapes Chart, at the end of the plan, on the board. 2. Gather 3-D objects cubes, cuboids, cylinders, and prisms, e.g. boxes, tins, cans.

Opening *(2 minutes)*

1. **Say:** I am going to show you some different shapes. If I hold up a prism, please clap your hands quietly.
2. Hold up the 3-D shapes that you have one at a time. If they clap when you hold up another shape, it is okay. They will learn more about prisms in this lesson.

Introduction to the New Material *(5 minutes)*

1. **Say:** We are continuing to learn about 3-D shapes. Today we will look at 'prisms'.
2. Hold up a triangular prism.
3. **Say:** This is a triangular prism.
4. **Ask:** How would you describe a triangular prism? (Example answers: 2 faces are triangles, 3 are rectangles)
5. **Say:** A triangular prism has 5 faces. Faces are the flat sides of the shape.
6. **Ask:** What flat shape is each of the faces on a prism? (Example answers: 2 triangles and 3 rectangles or 2 triangles and 3 squares)
7. **Ask:** How many edges do you see? (Answer: 9)
8. Show pupils where the edges are**.**
9. **Ask:** How many vertices do you see? (Answer: 6)
10. Show pupils where the vertices are**.**

Guided Practice (*10 minutes*)

1. **Say:** Please look at my triangular prism.
2. **Say:** Let's learn how to draw a triangular prism.
3. Draw each step on the board as you say them.
4. **Say:** First you need to draw a triangle (A).
5. Give pupils about 30 seconds to draw a triangle.
6. **Say:** Next you draw a diagonal line coming off each of the 3 angles of that triangle (B).
7. Give pupils about 30 seconds to draw those lines.
8. **Say:** Now, draw a triangle to connect the ends of each of the 3 lines you just drew.

A. B. C.
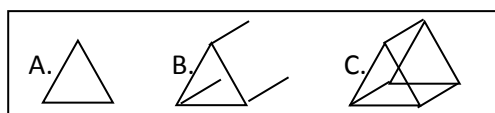
9. **Say:** Please look at your partner's prism. Make corrections if you need to.
10. **Say:** Draw 4 more triangular prisms in your book.

Independent Practice *(10 minutes)*

1. **Say:** Take out your Properties of our 3-D Shapes chart. Make sure to keep this for the rest of the week because we will add to it.
2. **Say:** Fill in the Properties of a triangular prism on the next row down.
3. Give pupils about 6 minutes to work.
4. **Say:** We are going to check our answers. Please look at your paper as we call out the correct answers.
5. Write the answers in the chart on the board as the class tell you the answers.
6. **Ask:** How many faces does a prism have? (Answer: 5)
7. **Ask:** What are the shapes of the faces? (Answer: Triangles, squares and rectangles)
8. **Ask:** How many edges do prisms have? (Answer: 9)
9. **Ask:** How many vertices do prisms have? (Answer: 6)

Properties of 3-D Shapes (Answers)

Shape	Number of Faces	Shape(s) of faces	Number of Edges	Number of Vertices
Cube	6	Squares	12	8
Cuboid	6	Squares or Rectangles	12	8
Prism	5	Triangles and Squares or rectangles	9	6

10. **Say:** Please keep this chart. We will be adding more shapes to it tomorrow.

Closing *(8 minutes)*

1. **Say:** Look around the room. Please list as many examples of prisms as you can.
2. While they are working, call pupils to the board to list their items**.**
3. **Ask:** Are there any items on the board that you disagree with?
4. If there are disagreements, let each pupil explain their thinking. Make corrections on the board.
5. **Say:** You may add more to your list from what your classmates list on the board.

[PROPERTIES OF 3-D SHAPES CHART]

Shape	Number of Faces	Shape(s) of faces	Number of Edges	Number of Vertices
Cube	6	Squares	12	8
Cuboid	6	Squares or Rectangles	12	8

Lesson Title: Identifying and drawing a cylinder using its properties	**Theme:** Geometry 3 – D Shapes	
Lesson Number: M-03-049	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to identify and draw a cylinder using its properties.	**Teaching Aids** 1. Properties of 3D Shapes Chart at the end of the plan. 2. 3-D objects 1. 2. Empty tin cans that are cylinders.	**Preparation** 1. Draw Properties of the 3-D Shapes Chart, at the end of the plan, on the board. 2. Gather 3-D objects cubes, cuboids, cylinders, and prisms, e.g. boxes, tins, cans.

Opening *(1 minute)*

1. **Say:** Draw a square, rectangle and triangle on your paper. Label them with the correct name.

Introduction to the New Material *(10 minutes)*

1. **Say:** We are continuing to learn about 3-D shapes.
2. Hold up a cylinder. **Ask:** Does anyone know what this is called? (Answer: cylinder)
3. **Say:** This is a cylinder. How would you describe a cylinder? (Example answers: 2 faces are circles)
4. **Say:** A cylinder has 3 faces. The faces are the flat sides of the shape. What flat shape is each of the faces on a cylinder? (Answer: 2 circles, and a rectangle wrapped around it)
5. Some pupils will have difficulty visualising the rectangle wrapped around the cylinder. To further explain, take a piece of paper and roll it into a tube. Show the pupils that each end is a circle, then unroll the paper to show them the rectangle.
6. **Ask:** How many edges do you see? (Answer: 2) **Say:** There are 2 edges because the circular faces meet the curved face at each end.
7. **Ask:** How many vertices do you see? (Answer: 0) Why? (Answer: A circle has no angles and the edges never meet.)

Guided Practice (*10 minutes)*

1. **Say:** Let's draw a cylinder together.
2. **Ask:** What do I draw first? (Answer: 1 circle)
3. Draw the circle on the board.
4. **Ask:** What do I draw next? (Answer: A line going diagonally from the top of the circle and another line going diagonally from the bottom of the circle.)
5. Draw the lines on the board.
6. **Ask:** What is the final step? (Answer: Draw a circle at the other end of the lines.)
7. Draw the circle on the board.
8. **Say:** Check your partner's work.
9. **Say:** Draw 4 more cylinders in your book.
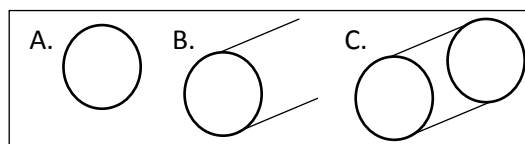
Independent Practice *(10 minutes)*

1. **Say:** Please take out your Properties of our 3-D Shapes chart. Make sure to keep this for the rest of the week because we will add to it.
2. **Say:** Fill in the Properties of a cylinder on the next row down.
3. Give pupils about 3 minutes to work.

Properties of 3-D Shapes (Answers)				
Shape	Number of Faces	Shape(s) of faces	Number of Edges	Number of Vertices
Cube	6	Squares	12	8
Cuboid	6	Squares or Rectangles	12	8
Prism	5	Triangles and Squares or rectangles	9	6
Cylinder	3	Circles	2	0

4. **Say:** We are going to check our answers. Please look at your paper as we call out the correct answers.
5. Write the answers in the chart on the board as the class tells you the answers.
6. **Ask:** How many faces does a cylinder have? (Answer: 3) What are the shapes of the faces? (Answer: 2 circles and a rectangle wrapped around) How many edges do cylinders have? (0) How many vertices do cylinders have? (0)
7. **Say:** Please keep this chart. You may need to for Lesson 50.
8. If pupils cannot keep their papers, collect them each day and return them at the beginning of the next lesson.
9. **Say:** Look around the room. Please list as many examples of cylinders as you can.
10. While they are working, call pupils to the board to list their items**.**
11. **Ask:** Are there any items on the board that you disagree with?
12. If there are disagreements, let each pupil explain their thinking. Make corrections on the board.
13. **Say:** You may add more to your list from what your classmates list on the board.

Closing *(4 minutes)*

1. **Say:** I need 1 pupil to come to the front of the room.
2. **Say:** (To Pupil A) Choose one of the 3-D shapes we have been learning about this week. Do not tell us which one you chose. Please describe it to us using its properties. If you are seated, try to guess what shape our friend is describing. When you think you know, put your finger on your nose.
3. When most pupils have their fingers on their noses, call on one of them to guess what shape is being described.
4. Call another pupil to the front to describe another shape. Keep going until your time is finished.
5. **Say:** Well done, you did a good job of describing shapes today.

Lesson Title: Practising of drawing more cubes, cuboids, prisms, cylinders	Theme: Geometry 3 – D Shapes	
Lesson Number: M-03-50	Class/Level: Class 3	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to practise drawing more cubes, cuboids, prisms, and cylinders.		Teaching Aids 3-D shapes - cubes, prisms, cuboids and cylinders.		Preparation Gather approximately 10 3-D shapes, e.g. small boxes, cans, tins.

Opening *(5 minutes)*

1. **Say:** I am going to hold up shapes. When you see a cube, please clap your hands. If I hold up a cuboid, stomp your feet. If I hold up a prism, tap your desk. If I hold up a cylinder, cover your ears.
2. Hold up the 3-D shapes you have. Go through about 8 shapes. Make sure to hold up at least 1 of each. Try to have different sizes of the same shape.

Introduction to the New Material *(8 minutes)*

1. **Say:** We are going to play a game with our 3-D shapes. It is called 20 Questions. Has anyone ever played 20 Questions? I am going to choose one of the shapes that I have. You will take turns asking me questions about the shape I chose. You can only ask 1 question at a time. The questions have to be able to be answered with either a 'yes' or 'no'. For example, I could ask, 'Does it have more than 3 faces?' because that can be answered either 'yes' or 'no'. I cannot ask, 'How many faces does it have?' because the answer would be a number, not 'yes' or 'no'.
2. Choose a shape but do not let the pupils see it.
3. **Ask:** Who wants to ask the first question?
4. The pupil asks a question. Answer it with 'yes' or 'no'. If the pupil asks a question that does not have a yes or no answer, tell them to try to ask it again so you can answer it with yes or no. After the first question is asked and answered, let another pupil ask a question.
5. After 5-6 questions, **Ask:** Does anyone have a guess about which shape I chose?
6. If the pupil is incorrect, keep playing. If they ask 20 questions and still do not know the answer, tell them.
7. Choose another shape and let the pupils ask questions about that one.

Guided Practice (8 *minutes*)

1. **Say:** Now you are going to play 20 Questions with your partner. The pupil whose name comes last in the alphabet chooses a shape first. So if Kumba and Sao were partners, Sao would choose the shape and Kumba would ask the questions. Remember when you choose a shape, draw it on your paper, but do not tell your partner. When you ask questions, they must be yes or no questions. After the pupil asks questions and guesses the correct shape, switch roles and play again.

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2. While pupils are playing, walk around and make sure pupils are asking yes or no questions.
3. Let the pupils play for about 8 minutes. This should give each of them an opportunity to be the chooser and the questioner.

Independent Practice *(10 minutes)*

1. **Say:** Many of these 3-D shapes are used to build machines and buildings. Today you get to design your own structure with these shapes. Draw a picture in your book using at least 3 different 3-D shapes.
2. Give pupils 10 minutes to work. **Say:** Hold up your work for me to see.

Closing *(4 minutes)*

1. **Say:** Please look at your partner's picture. List the shapes they have drawn in their picture.
2. **Say:** Well done, you drew beautiful pictures using 3-D shapes.
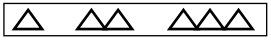
| **Lesson Title:** Drawing patterns for number sequences that involve addition	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-051	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to draw patterns for number sequences that involve addition.	**Teaching Aids** None	**Preparation** None

Opening *(2 minutes)*

1. **Say:** I am going to clap a pattern. You will repeat it.
2. Clap: x   xx   xxx   xxxx
3. Pupils repeat the pattern.
4. **Ask:** What was the pattern? (Answer: You added one more clap each time.)

Introduction to the New Material *(10 minutes)*

1. Draw the following on the board: △ △△ △△△
2. **Say:** Today we will look at patterns made from shapes. We will work out what will come next in the patterns. Please look at this pattern. Draw the pattern in your book. What is the pattern? (Answer: You add 1 triangle each time.) What will be next in this pattern? (Answer: 4 triangles)
3. **Say:** If we continued the pattern, what would we draw next? (Answer: 4 triangles) Please draw that in your book.
4. Draw 4 triangles on the board.
5. **Ask:** And then what? (Answer: 5 triangles) What would be next? (Answer: 6 triangles)
6. **Say:** Finish drawing the pattern.
7. **Ask:** Who can explain to us how you knew what to do? (Answer: Each time, we added 1 more triangle, so I got 4 triangles, then 5 triangles and finally 6 triangles.)

Guided Practice *(10 minutes)*

1. **Say:** We can also look at patterns that are a little more complicated.
2. Draw the following on the board:
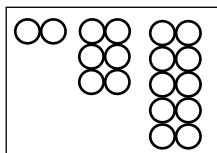
3. Look at this pattern and tell your partner what the pattern is.
4. Give pupils 1 minute to talk. **Ask:** Who can tell me what the pattern is? (Answer: Add 4 each time)
5. **Say:** Draw this pattern in your exercise book. Please draw the next shape in the pattern.
6. Give pupils 3 minutes to work. While pupils are working, ask one pupil to come draw the next shape on the board.

7. **Say:** Look at your partner's pattern. Did they draw the same pattern as the one on the board? How many circles did the next shape have? (Answer: 14) If you continued the pattern, how many circles would you have? (Answer: 18) Please draw that pattern.
8. **Ask:** If you drew 3 more shapes, how many circles would there be? Think about it. Please tell your partner.
9. Give pupils a minute to think and then tell their partner. **Ask:** Who can share with us how many circles you would have to draw if you drew three more shapes? (Answer: 22, 26, 30) How did you know? (Answer: 18 + 4 = 22, 22 + 4 = 26 and 26 + 4 = 30)

Independent Practice *(10 minutes)*

1. **Say:** Think of your own pattern to draw using shapes. Make sure there is a clear addition pattern. Please draw the first 3 shapes in your pattern. When you finish, you will change with a partner. They will draw the next 2 shapes in your pattern.
2. While pupils are working, walk around the room to see that the patterns are addition patterns. Give pupils about 10 minutes to work.

Closing *(3 minutes)*

1. **Ask:** Who can share their pattern with the class?
2. Call one volunteer to the front to draw their pattern.
3. **Ask:** Who can come draw the next shape on the board?
4. **Say:** Well done! You've made lots of patterns using addition today.

Lesson Title: Drawing patterns for number sequences that involve subtraction	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-052	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to draw patterns for number sequences that involve subtraction.	**Teaching Aids** None	**Preparation** None

Opening *(3 minutes)*

1. **Say:** Please draw an addition pattern in your exercise book.
2. **Ask:** Who can share their pattern with us? Call a volunteer to the board to draw their pattern.
3. **Ask:** Is their pattern correct? Is it an addition pattern? If you think so, show me thumbs up. If you do not think it is, show me thumbs down.

Introduction to the New Material *(10 minutes)*

1. Draw the following subtraction pattern on the board:
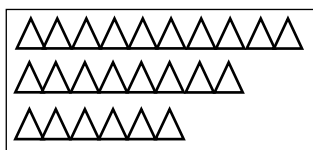
2. **Say:** Today we will continue to look at patterns made from shapes. We will work out what will come next in the patterns. Look at this pattern. Please draw this pattern in your exercise book. What is the pattern? (Answer: You subtract 2 triangles each time.) What will be next in this pattern? (Answer: 4 triangles)
3. **Say:** If we continued the pattern, what would we draw next? (Answer: 4 triangles) Please draw it in your exercise book.
4. Draw 4 triangles on the board.
5. **Ask:** And then what? (Answer: 2 triangles) What would be next? (Answer: 0 triangles)
6. **Say:** Finish drawing the pattern in your exercise book.
7. **Ask:** Who can explain to us how you knew what to do? (Answer: Each time we subtracted 2 more triangles, so we got 4 triangles, then 2 triangles and finally 0 triangles.)

Guided Practice *(10 minutes)*

1. Draw the following on the board:

2. **Say:** We can also look at patterns that are a little more complicated. In this pattern, each circle is worth 10. Please look at this pattern and tell your partner what the pattern is.

3. Give pupils 1 minute to talk. **Ask:** Who can tell me what the pattern is? (Answer: Subtract 1 circle of 10 each time)
4. **Say:** Please draw this pattern in your exercise book. Then draw the next circle in the pattern.
5. Give pupils 3 minutes to work. While pupils are working, ask one pupil to draw the next circle on the board.
6. **Say:** Please look at your partner's pattern. Did they draw the same pattern as the one on the board? How many circles did the next figure have? (Answer: 4 circles of 10 or 40) If you continue the pattern, how many circles would you have? (Answer: 3 circles of 10 or 30) Please draw that figure.
7. **Ask:** If you drew 2 more figures, how many circles would there be? Think about it. Now tell your partner.
8. Give pupils a minute to think and then tell their partner. **Ask:** Who can share with us how many circles you would have to draw if you drew two more figures? (Answer: 2 circles of 10 or 20, 1 circle of 10 or 10) How did you know? (Answer: Each time we took 1 more circle of 10 away. 3 − 1 = 2, 2 -1 = 1)

Independent Practice *(10 minutes)*

1. **Say:** You will think of your own subtraction pattern to draw using shapes. Make sure there is a clear subtraction pattern. Draw the first 3 figures in your pattern. When you finish, you will trade with your partner. They will draw the next 2 figures in your pattern.
2. While pupils are working, walk around the room to see that the patterns are subtraction patterns. Give pupils about 10 minutes to work.

Closing *(2 minutes)*

1. **Ask:** Who can share their pattern with the class?
2. Call one volunteer to the front to draw their pattern.
3. **Ask:** Who can come draw the next figure on the board?
4. **Say:** Well done. Next lesson we will be making patterns with bottle tops, so please bring 10 bottle tops to school tomorrow.

Lesson Title: Finding and describing number patterns out of the classroom that involve addition	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-053	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to find and describe number patterns out of the classroom that involve addition.		**Teaching Aids** 1. Bottle tops, pupils were asked to bring 10 in the previous lesson. 2. Word Problem at the end of the plan.		**Preparation** Write the Word Problem, at the end of the plan, on the board.

Opening *(2 minutes)*

1. **Say:** Start at 4. Count up by 3s. What is the next number? (Answer: 7). What is the next number? (Answer: 10) Write the next 3 numbers in your exercise book. (Answers: 13, 16, 19)
2. Give pupils 1 minute to write their answers.
3. **Say:** Change exercise books with your partner and check their answers.

Introduction to the New Material *(10 minutes)*

1. **Say:** Yesterday, we were looking for patterns using shapes. Today we are going to think about patterns out in the world.
2. **Say:** Farmer Gabriel had 2 chickens. They laid 1 egg on Sunday, 2 eggs on Monday, 3 eggs on Tuesday, 1 egg on Wednesday and 2 eggs on Thursday. If this pattern continues, how many eggs would you expect Farmer Gabriel's chickens to lay on Friday and Saturday? How many eggs would Farmer Gabriel's chickens lay for the whole week?
3. **Say:** We need to find the pattern.
4. As you say the next sentences, draw it on the board as you say it.
5. **Say:** Use your bottle tops to show the pattern. Pull out 1 for Sunday. How many for Monday? (Answer: 2). Put those in a group. How many do you need to Tuesday? (Answer: 3)
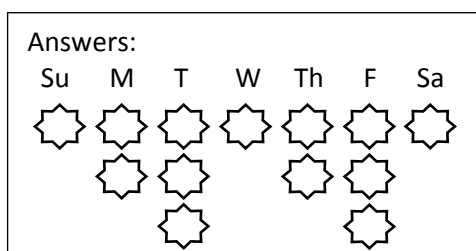
6. **Say:** Check your partner and make sure they have a group of 1, a group of 2 and then a group of 3 on their desk.
7. Give pupils 30 seconds to check.
8. **Ask:** What should you have for the next group – or Wednesday? Let's listen to the problem again. **Say:** Farmer Gabriel had 2 chickens. They laid 1 egg on Sunday, 2 eggs on Monday, 3 eggs on Tuesday, 1 egg on Wednesday and 2 eggs on Thursday.

9. **Say:** Show me with your fingers how many we need for Wednesday. (Answer: 1) How many do we need for Thursday? (Answer: 2)
10. Draw Wednesday and Thursday on the board.
11. **Ask:** Try to find the pattern in how the chickens were laying eggs. What is the pattern? (Answer: They lay 1, then 2, then 3 eggs.) How many do you think Farmer Gabriel will get on Friday if the pattern continues? (Answer: 3) What about Saturday? (Answer:1)
12. **Say:** Lay your bottle tops out and see if your pattern is correct.
13. Draw Friday and Saturday on the board so pupils can check their work.
14. **Say:** You should have laid your bottle tops out in this pattern on your desk. (Point to your drawing.)
15. **Ask:** How many eggs do Farmer Gabriel's chickens lay each week? (Answer: 13)

Guided Practice *(10 minutes)*

1. **Say:** Farmer Gabriel sold his eggs to his neighbours. The first week, his neighbour Marima bought 4 eggs. The next week she bought 8 eggs. The third week, she bought 12 eggs. If this pattern continues, how many eggs will she buy on the 4th week? Will he have enough eggs to sell her on the 4th week?
2. **Say:** Work with your partner to try to answer the questions. Try to find the pattern to help you.
3. Give pupils about 5 minutes to work.
4. **Ask:** Based on her pattern of buying eggs, how many eggs will she probably buy on the 4th week? (Answer: 16)
5. **Ask:** How do you know? (Answer: Each week she bought 4 more eggs. Since she bought 12 in the 3rd week, I added 12 + 4 and got 16.)
6. **Ask:** If this pattern continues, will he have enough eggs to sell her on the 4th week? (Answer: No. He will need 16 eggs because she adds 4 each week. His chickens only produce 13 each week.)

Independent Practice *(10 minutes)*

1. Point to the Word Problem on the board.
2. **Say:** Farmer Gabriel decided to buy 2 more chickens. They produced 2 eggs on Sunday, 3 eggs on Monday, 4 eggs on Tuesday and 3 eggs on Wednesday. Write the pattern for how many eggs these chickens laid for the entire week.
3. **Say:** Please copy the word problem in your exercise book. Write the pattern for this group of chickens. Then write how many eggs he gets from these chickens each week. Make sure you show how you did your work.
4. Walk around while pupils are working to make sure they understand the problem.

Closing *(3 minutes)*

1. **Ask:** Who can come to the board and show us how you solved the problem? If you are seated, show me

Answers:

Su	M	T	W	Th	F	Sa

2 + 3 + 4 + 2 + 3 + 4 + 2 = 20 eggs from these chickens

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thumbs up if you think she is correct or thumbs down if you think she is incorrect.

[WORD PROBLEM]
Farmer Gabriel decided to buy 2 more chickens. They produced 2 eggs on Sunday, 3 eggs on Monday, 4 eggs on Tuesday and 3 eggs on Wednesday. Write the pattern for how many eggs these chickens laid for the entire week.

Lesson Title: Finding number patterns out of the classroom that involve subtraction	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-054	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to find and describe number patterns out of the classroom that involve subtraction.	**Teaching Aids** By the end of the lesson, pupils will be able to find and describe number patterns out of the classroom that involve subtraction.	**Preparation** Write the Word Problem, at the end of the plan, on the board.

Opening *(3 minutes)*

1. **Say:** Let's start at 50 and count backward by 10s. Please count with me. 50, 40, 30, 20, 10, 0.
2. **Ask:** Who can give me a 2-digit number? Who can give me a 1-digit number?
3. Write the 2-digit number and the 1-digit number on the board.
4. **Say:** With a partner, please start at the 2-digit number and count backward by the 1-digit number. For example, if the numbers were 54 and 3, I would start at 54 and count backwards by 3s, I would say, 54, 51, 48, 45, 42, 39, 36, 33, 30… Keep going until you get to zero.

Introduction to the New Material *(10 minutes)*

1. **Say:** Four weeks ago, Musu harvested 24 bunches of cassava leaves from her garden. 3 weeks ago, she harvested 20 bunches. Two weeks ago, she only harvested 16 bunches and last week she was only able to harvest 12 bunches. If this pattern continues, how many bunches of cassava leaves will she harvest this week?
2. **Ask:** What do we know? (Example answer: 4 weeks ago she got 24, 3 weeks ago she got 20, 2 weeks ago she got 16, last week she got 12.)
3. Write the list on the board as the pupil tells what we know.
4. **Say:** We can make a list of what we know to help us. In your exercise book, please write the list.
5. Give pupils 1 minute to write the list.
6. **Say:** Please raise your hand if you see the pattern. Tell your partner what the pattern is.
7. Give pupils about a minute to find the pattern and talk to their partners.
8. **Ask:** What is the pattern? (Answer: She subtracted 4 bunches each week or she harvested 4 fewer bunches each week.)
9. **Ask:** How many will she most likely harvest this week? (Answer: 8) How do you know? (Answer: I subtracted 12 – 4 and got 8.)
10. **Ask:** How many will she most likely harvest next week? (Answer: 4) How do you know? (Answer: I subtracted 8 – 4 and got 4.)
11. **Ask:** How is it different from the patterns we worked with yesterday? (Answer: This is a subtraction pattern.)

Guided Practice *(10 minutes)*

1. **Say:** In April last year, the weather began to cool off quickly. On April 1, the temperature was 30°. A week later it was 28°. The next week it was 26°. If this pattern continued, what would the temperature have been the next week? What about 2 weeks later?
2. **Ask:** What list could we make with the information we know? (Answer: Week 1 = 30°, Week 2 = 28 °, Week 3 = 26 °)
3. Write the information on the board as the pupil tells you what we know.
4. **Say:** Please copy this in your exercise book. Work with your partner to work out what the temperatures will be in the next 2 weeks.
5. Give pupils 4 minutes to work.
6. **Ask:** What was the pattern you found? (Answer: Subtract by 2° each week)
7. **Ask:** Who can come to the board and finish the list?
8. **Ask:** If the pattern continued, what would the temperature be in Week 4? (Answer: The temperature dropped 2° each week, so it would be 24° in Week 4).
9. **Ask:** If the pattern continued for 2 more weeks, what would the temperature be each week? (Answer: If it continued this way for two more weeks, the temperature would be 22° in Week 5 and 20° in Week 6.)
10. **Say:** Please complete your list in your exercise book.

Independent Practice *(10 minutes)*

1. Point to the word problem on the board.
2. **Say:** Jeneba went to the market and bought groundnuts for her children to eat. There were 80 groundnuts in the bag. Each day, she gave her children some to eat. After the first day, she had 68 left. After the second day, she had 56 left. After the third day, she had 44 left. How many did she give her children each day? How many would she have left after 6 days? (Answer: The pattern is that Jeneba gave 12 groundnuts to her children each day. The pattern is 80, 68, 56, 44, 32, 20, 8. She would have 8 left after 6 days.)
3. **Say:** Please solve the problem. Write what you would do to solve it. You may want to make a list. Include the pattern you found.
4. Give pupils about 6 minutes to work. **Ask:** Who can share with us what they did?
5. After that pupil is finished explaining, **Ask:** Did anyone solve it in a different way?
6. Make sure that all pupils have the correct answer.

Closing *(3 minutes)*

1. **Say**: Now let's count by 4s up to 40. Are you ready? 4, 8, 12, 16, 20, 24, 28, 32, 36, 40.
2. **Say:** Ok, now count backward by 4s. Start at 40. Are you ready? 40, 36, 32, 28, 24, 20, 16, 12, 8, 4, 0.
3. **Say:** Well done.

[WORD PROBLEM]
Jeneba went to the market and bought groundnuts for her children to eat. There were 80 groundnuts in the bag. Each day, she gave her children some to eat. After the first day, she had 68 left. After the second day, she had 56 left. After the third day, she had 44 left. How many did she give her children each day? How many would she have left after 6 days?

Lesson Title: Finding number patterns in the classroom	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-055	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to find and describe number patterns in the classroom.	**Teaching Aids** 1. A clock. 2. Word Problems 1-3 at the end of the plan.	**Preparation** 1. Find a clock. 2. Write the Word Problems 1-3, at the end of the plan, on the board.

Opening *(2 minutes)*

1. **Say:** Please look around the room. Do you see any patterns? (Example answers: numbers on the clock, desk rows, window panes)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to find more patterns to help us solve problems. They may be addition or subtraction patterns.
2. Point to Word Problem 1.
3. **Say:** Read the problem with me as I read it out loud.
4. **Ask:** What information do we know? (Answer: how many pupils are in classes 6, 5 and 4) We can make a list again and find the pattern. What do I write in my list? (Answer: the numbers of class 6, 5 and 4 pupils)
5. As the pupils tell you, write it on the board as a list.
6. **Ask:** What is the pattern? (Answer: The number goes up 5 pupils each time we drop a grade level.) If that pattern continues, how many pupils would you expect in class 3? (Answer: 65) How many in class 2? (Answer: 70) How many in class 1? (Answer: 75)
7. Write those on your list.

Guided Practice *(10 minutes)*

1. Point to Word Problem 2.
2. **Say:** Please read the problem out loud with me.
3. **Say:** In pairs, make a list with the information that you know. Write your list in your exercise book.
4. Give pupils about 5 minutes to work. While they are working, have a pupil come up and write the list on the board.
5. **Ask:** What is the pattern? (Answer: Each week, she uses 6 pages.)
6. **Say:** With your partner, decide how many clean pages she will have after Week 4.
7. Give pupils about 30 seconds to work.
8. **Ask:** How many pages will she have left after the 4th week? (Answer: 29) Please add this to your list.

Independent Practice *(10 minutes)*

1. Point to Word Problem 3.
2. **Say:** Read the problem silently as I read it out loud.
3. **Say:** Solve the problem. Please make a list. Show the pattern you found.
4. Give pupils about 6 minutes to work.
5. Walk around while they are working and help those get started who are having difficulty.
6. **Ask:** Who can share with us what they did? Please write your list on the board.
7. **Ask:** How many minutes passed when the minute hand went from the 12 around to the 11? (Answer: 55 minutes)
8. **Ask:** Did anyone solve it a different way? If so, let the pupil explain their way to the class.
9. Make sure that all pupils have the correct answer.

Closing *(3 minutes)*

1. **Say:** Let's count in 3s. Are you ready? 3, 6, 9, 12, 15, 18, 21, 24, 27, 30. Good job!
2. **Say:** Well done.

[WORD PROBLEM 1]
At Mullah Aktar Islamic School there are 50 pupils in class 6, 55 pupils in class 5, and 60 pupils in class 4. If the pattern continues, how many pupils should there be in the class 3, class 2 and class 1?

[WORD PROBLEM 1]
After the first week of term 1, Mariam had 47 clean pages in her exercise book. After the second week, she had 41 clean pages left. After the third week, she had 35 clean pages. If the pattern continues, how many pages will she have left after the fourth week?

[WORD PROBLEM 1]
Look at the clock. If the minute hand starts on the 12 and ends at the 1, 5 minutes have passed. When it goes to the 2, 10 minutes have passed. When the minute hand goes from the 12 to the 3, 15 minutes have passed. Make a list to show how many minutes have passed when the minute hand gets to each number on the clock. How many minutes have passed when the minute hand goes from the 12 around to the 11?

Lesson Title: Writing number sequences from pattern rules that involve addition	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-056	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to write number sequences from pattern rules that involve addition.		**Teaching Aids** Word Problem at the end of the plan.		**Preparation** Write the Word Problem, at the end of the plan, on the board.

Opening *(3 minutes)*

1. **Say:** Please repeat after me.
2. Clap, stomp, clap stomp, clap, stomp, clap, stomp.
3. Pupils do the same.
4. **Say:** Watch and listen to this pattern.
5. Clap, stomp, tap the desk, stomp. Repeat this pattern 3 times.
6. **Say:** Now you try.
7. Pupils clap, stomp, tap the desk, stomp, clap, stomp, tap the desk, stomp, clap, stomp, tap the desk, stomp.
8. **Say:** Now let's try a difficult one.
9. Clap, Clap, tap, stomp, tap. Repeat the pattern 3 times.
10. **Say:** Now you try.
11. Pupils clap, clap, tap, stomp, tap, clap, clap, tap, stomp, tap, clap, clap, tap, stomp, tap.

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we will continue to talk about patterns. These patterns will be numbers that are in sequences. All number sequences follow rules. The rule tells us what to do each time so we know what number comes next. Who can count in 5s for us? (Answer: 5, 10, 15, 20, 25, 30…)
2. Write the numbers on the board as the pupil counts.
3. **Ask:** How did our friend know which number came next each time s/he counted? (Answer: S/he added 5 each time.)
4. **Say:** The rule for this sequence is that we add 5 each time.
5. Write 25, 29, 33, 37,_____, _____, _____, _____ on the board
6. **Say:** Please look at the sequence I have on the board. Look for the rule. Tell your partner what you think the rule is.
7. Give pupils 1 minute to talk.
8. **Ask:** Who can tell me the rule? (Answer: Add 4 each time) What is the next number in the sequence? (Answer: 41) What is the next number in the sequence? (Answer: 45) What is the next number in the sequence? (Answer: 49) What is the next number in the sequence? (Answer: 53)

Guided Practice *(12 minutes)*

1. Write the following on the board:

    2, 4, 6, 8, ___,___,___,___.   (Answer: Add 2 each time. 10, 12, 14, 16)

    8, 14, 20, 26, ___,___,___,___. (Answer: Add 6 each time. 32, 38, 44, 50)

    3, 13, 23, 43, 53,___,___,___,___. (Answer: Add 10 each time. 63, 73, 83, 93)

    1, 2, 4, 8,___,___,___,___. (Answer: Double the number each time. 16, 32, 64, 128)

2. **Say:** Please copy the number sequences in your book. Write the rule. Then write the next 4 numbers in the sequence.
3. Give pupils about 6 minutes to work.
4. **Ask:** Who can come finish sequence A and tell us the rule?
5. **Say:** If you are in your seat, please check your answers with the board. If you disagree with the answer on the board, raise your hand.
6. Call on a volunteer to write in the answers on the board for each number sequence.

Independent Practice *(8 minutes)*

1. Point to the Word Problem on the board.
2. **Say:** We are going to use our knowledge of sequences to solve a word problem.
3. Read the problem out loud.
4. **Say:** Please solve the problem. Write what you did to solve it. Include the sequence you came up with and the rule you used. (Answer: 27 pebbles. He started with 7. The sequence is 7, 11, 15, 19, 23, 27. The rule is that he added 4 each day.)
5. Give pupils about 6 minutes to work.
6. **Ask:** Who can share with us what they did?
7. After that pupil is finished explaining, **Ask:** Did anyone solve it in a different way?
8. Make sure that all pupils have the correct answer.

Closing *(2 minutes)*

1. **Say:** Let's skip count in 3s to 30. (Answer: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30)
2. **Say:** Let's skip count in 4s to 40. (Answer: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40)
3. **Say:** Well done.

[WORD PROBLEM]

Abdul likes to collect pebbles. He started with 7 pebbles. Each day, he gathers 4 new pebbles to add to his collection. How many pebbles will Abdul have after 5 days of collecting pebbles?

Lesson Title: Writing number sequences from pattern rules that involve subtraction	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-057	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to write number sequences from pattern rules that involve subtraction.		**Teaching Aids** None		**Preparation** None

Opening *(2 minutes)*

1. Write 9, 14, 19, 24, 29, ___,___,___,___. on the board.
2. **Ask:** Who can tell me the rule in the sequence on the board? What are the next four numbers in that sequence? (Answer: Add 5 each time. 34, 39, 44, 49)

Introduction to the New Material *(8 minutes)*

1. **Say:** The rules that help us determine sequences do not always involve addition. They can involve any operation: Addition, subtraction, multiplication and division. Today we will focus on rules that use subtraction.
2. **Ask:** Who can start at 35 and count backwards by 5s for us? (Answer: 35, 30, 25, 20, 15, 10, 5, 0)
3. Write the numbers on the board as the pupil counts.
4. **Ask:** How did our friend know which number came next each time s/he counted? (Answer: S/he subtracted 5 each time.)
5. **Ask:** What is the rule for this sequence? (Answer: subtract 5 each time)
6. Write 45, 39, 33, 27, ___,___,___,___. on the board.
7. **Say:** Please look at the sequence I have on the board. Look for the rule. Tell your partner what you think the rule is.
8. Give pupils 1 minute to talk.
9. **Ask:** Who can tell me the rule? (Answer: subtract 6 each time) What is the next number in the sequence? (Answer: 21) What is the next number in the sequence? (Answer: 15) What is the next number in the sequence? (Answer: 9) What is the next number in the sequence? (Answer: 3)

Guided Practice *(10 minutes)*

1. Write the following number sequences on the board:
   21, 19, 17, 15, ___,___,___,___. (Answer: Subtract 2 each time. 13, 11, 9, 7)
   54, 47, 40, 33, ___,___,___,___. (Answer: Subtract 7 each time. 26, 19, 12, 5)
   88, 78, 68, 58,___,___,___,___. (Answer: Subtract 10 each time. 48, 38, 28, 18)
   160, 80, 40, ___,___,___. (Answer: Half the number each time. 20, 10, 5)

2. **Say:** Please copy the sequences in your exercise books. Write the rule. Then write the next 3 or 4 numbers in the sequences.
3. Give pupils about 6 minutes to work.
4. **Ask:** Who can come finish the patterns on the board and tell us the rules?
5. **Say:** If you are in your seat, please check your answers with the board. Show me thumbs up if you agree or thumbs down if you disagree with the answers on the board.
6. Call on volunteers to come to the board and write in the answers for the patterns. Make sure they are correct. If not, or if others show thumbs down in disagreement, ask another pupil to share their answer. Help pupils to see the correct answer.

Independent Practice *(10 minutes)*

1. Write the following on the board:

    3, 6, 9, 12, 16, 19, 22, ___,___,___,___. (Answer: Add 3 each time. 25, 28, 31, 34)

    58, 52, 46, 40, 34, 28, ___,___,___,___. (Answer: Subtract 6 each time. 24, 18, 12, 6)

    105, 95, 85, 75, 65, 55, ___,___,___,___. (Answer: Subtract 10 each time. 45, 35, 25, 15)
2. **Say:** I've written some number sequences on the board.
3. For each number sequence, write the rule and the next 4 numbers.
4. Walk around the room support pupils who are struggling.

Closing *(5 minutes)*

1. **Say:** Please make a number sequence that follows a subtraction rule. Change with your partner and work out what their rule was. Then write the next 4 numbers in your partner's sequence.
2. **Say:** Well done.

Lesson Title: Finding the missing numbers in sequences that involve addition	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-058	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to find the missing numbers in sequences that involve addition.	**Teaching Aids** None	**Preparation** None

Opening *(2 minutes)*

1. Write 42, 37, 32, 27, ___,___,___,___. on the board.
2. **Ask:** Who can tell me the rule in the sequence on the board? What are the next four numbers in this sequence? (Answer: Subtract 5 each time. 22, 17, 12, 7)

Introduction to the New Material *(5 minutes)*

1. Write 2, 5, ___, 11, 14, 17 on the board.
2. **Say:** We talked about rules that sequences use to make a pattern. Today, we are going to find those rules with numbers missing in the sequences. All of the rules will involve addition today. Let's look at the sequence on the board. We have to work out the rule where we have 3 numbers together. Sometimes we have to guess and then check to see that we are correct.
3. **Ask:** What three numbers are together? (Answer: 11, 14 and 17) Based on these three numbers, what do you think the rule is? (Answer: Add 3) How do we check to see if we are correct? (Answer: Look at the 11, 14 and 17) **Ask:** Does our 'Add 3' rule work there? (Answer: yes)
4. **Ask:** If that is our rule, what number goes in the blank space? (Answer: 8) You should always check the entire sequence to make sure you use the correct rule. Let's check: 2 + 3 = 5, 5 + 3 = 8, 8 + 3 = 11, 11 + 3 = 14, 14 + 3 = 17. Are we correct? (Answer: yes)
5. **Say:** Always look at what you know to get started. In this example, you know that you add 3 to the 2 to get 5 and you know that you add 3 to 11 to get 14.

Guided Practice *(15 minutes)*

1. Write the following number sequences on the board:
    > 3, ___, 9, 12, 15, ___. (Answer: Add 3 each time. 6, 18)
    > 9, 19, ___, 39, ___, 59 (Answer: Add 10 each time. 29, 49)
    > 13, ___, 21, ___, 29, 33, ___. (Answer: Add 4 each time. 17, 25, 37)
2. **Say:** Please copy the problems in your exercise book. Write the rule. Then write the missing numbers in the sequence. Remember, look at what you know to get started.
3. Give pupils about 6 minutes to work.
4. **Ask:** Who can come and finish the first sequence on the board and tell us the rule?
5. **Say:** If you are in your seat, please check your answers with those on the board. Show me thumbs up if you agree or thumbs down if you disagree with the answers on the board.

6. Ask volunteers to write in the answers for on the board. **Ask:** What was the rule and how did you know? (Example answer: I knew that I had to add 3 to 9 to get 12, and 3 to 12 to get 15. I added 3 to 3 and got 6. When I checked it, I added 3 to 6 and got 9, so it fit in the sequence. Then I could add 3 to 15 to get 18 for the last number.)

7. Write 11, 16, ___, 29, 37, 46, 56.

8. **Say:** Look at this number sequence I have on the board. Look for the rule. Please tell your partner what you think the rule is. Tell her what number goes in the blank space.

9. Give pupils 1 minute to talk.

10. **Ask:** Who can tell me the rule? (Answer: Add 1 more each time. We added 5 to the 11, and then I added 6 to the 16, then 7 to the 22, then 8 to the 29, then 9 to the 37 and finally 10 to the 46.) What is the missing number in the sequence? (Answer: 22)

11. **Ask:** Who can explain how you worked out the rule? (Example answer: (I knew that if I added 5 to 11, I would get 16. If I added 8 to 29, I got 37. If I added 9 to 37, I got 36. If I added 10 to 46 I got 56. I saw the pattern that each time I added 1 more. So if I added 6 to 16, I got 22. I checked it by adding 7 to 22 and I got 29 which was the next number in the sequence.) Pat yourself on the back if you got the correct answer. Pat yourself on the back if you tried.

Independent Practice *(8 minutes)*

1. Write the following on the board:

    2, ___, 6, 8, 10, ___,___.   (Answer: Add 2 each time. 4, 12, 14)

    8, ___, 16, 20, 24, ___,___. (Answer: Add 4 each time. 12, 24, 32)

    26, 37, 48 ,___, 70,___, 92 (Answer: Add 11 each time. 59, 81)

2. **Say:** Please copy the sequences I have on the board. Fill in the missing numbers.

3. Give pupils about 6 minutes to work.

4. **Ask:** Who can explain the first sequence? What did you get and how did you work out the rule?

5. **Ask:** Did anyone think about it differently?

6. **Say:** Please turn to your partner and explain how you worked out the second and third sequences. If you disagree on the answers, raise your hands and I will come to you.

Closing *(5 minutes)*

1. **Say:** Make a number sequence that follows an addition rule. Please write your sequence, but leave at least one or two numbers out. Now change with your partner and fill in his missing numbers.

2. **Say:** Well done.

Lesson Title: Finding the missing numbers in sequences that involve subtraction	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-059	**Class/Level:** Class 3	**Time:** 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to find the missing numbers in sequences that involve subtraction.		**Teaching Aids** None		**Preparation** None

Opening *(2 minutes)*

1. Write 69, 74, 79,___ , 89, 94,_____. on the board
2. **Say:** Write the missing numbers on your paper. Who can tell me the rule in the sequence on the board? What are the missing numbers in the sequence? (Answer: Add 5 each time. 84, 99)

Introduction to the New Material *(5 minutes)*

1. Write 50, __, 30, 20, 10 on the board.
2. **Say:** Today, we are going to find the missing numbers in sequences that use rules of subtraction. Let's look at the sequence on the board. Just like in the addition sequences we did yesterday, we need to look at what we know to get started. We have to work out the rule where we have 2 numbers together. Sometimes we have to guess and then check to see that we are correct.
3. **Ask:** What two numbers are together? (Answer: 30 and 20) Based on these two numbers, what do you think the rule is? (Answer: subtract 10) How do we check to see if we are correct? (Answer: look at the 20 and 10) **Ask:** Does our 'Subtract 10' rule work there? (Answer: yes)
4. **Ask:** If that is our rule, what number goes in the blank space? (Answer: 40) You should always check the entire sequence to make sure you used the correct rule. Let's check: 50 – 10 = 40, 40 – 10 = 30, 30 – 10 = 20, 20 – 10 = 10. Are we correct? (Answer: yes)

Guided Practice *(10 minutes)*

1. Write the following on the board:
   23, 21, 19, ___, 15, 13 (Answer: Subtract 2 each time. 17)
   28, 24, 20, ___, 12 (Answer: Subtract 4 each time. 16)
   84, 72, ___, 48, 36, ___, (Answer: Subtract 12 each time. 60, 24)

2. **Say:** Please copy the problems in your exercise books. Write the rule. Then write the missing numbers in the sequence. Remember, look at what you know to get started.
3. Give pupils about 6 minutes to work.
4. **Ask:** Who can come finish the sequences and tell us the rules?
5. **Say:** If you are in your seat, please check your answers with those on the board. Show me thumbs up if you agree or thumbs down if you disagree with the answers on the board.

6. Ask volunteers to write in the answers on the board. **Ask:** What was the rule and how did you know? (Example answer: I knew that I had to subtract 2 from 21 to get 19 and I also had to subtract 2 from 15 to get 13. I subtracted 2 from 19 and got 17. When I checked it, I subtracted 2 from 17 and got 15, so it fit in the sequence.) Make sure they are correct. If not, or if others show thumbs down in disagreement, ask another pupil to share her answer. Help pupils to see the correct answer.

Independent Practice *(15 minutes)*

1. Write the following on the board:
    9, 17, 25,___, 41 (Answer: Add 8. 33)
    50,___, 150, 200, 250 (Answer: Add 50. 100)
    110, 100, 90,___, 70 (Answer: Subtract 10. 80)
    21, 23,___, 27, 29,___,   (Answer: Add 2. 25, 31)
    ___,75,___, 69, 66, 63 (Answer: Subtract 3. 78, 72)

2. **Say:** Copy the sequences I have on the board. Fill in the missing numbers. The sequences may have addition <u>or</u> subtraction rules. You may work with your partner if you wish.
3. Give pupils about 6 minutes to work.
4. **Ask:** Who can explain the first sequence? What did you get and how did you work out the rule?
5. **Ask:** Did anyone think about it differently?
6. **Say:** Please turn to your partner and explain the second and third sequences to them. If you disagree on the answers, raise your hands and I will come to you.
7. **Ask:** Who can explain the fourth and fifth sequences to the class?
8. Call on three different volunteers to explain them.

Closing *(3 minutes)*

1. **Say:** Please make a number sequence that follows an addition or subtraction rule. Write your sequence, but leave at least one or two numbers out. Now change with your partner and fill in his missing numbers.
2. **Say:** Well done.

Lesson Title: Making drawings with repeating patterns	**Theme:** Algebra Number Patterns Addition and Subtraction	
Lesson Number: M-03-060	**Class/Level:** Class 3	**Time:** 35 minutes

|	**Learning Outcomes** By the end of the lesson, pupils will be able to make drawings with repeating patterns.		**Teaching Aids** None		**Preparation** None

Opening *(3 minutes)*

1. **Say:** Many songs have rhythms that have a repeating pattern. Let's clap a pattern that you may hear in a song. I will clap it. You repeat it.
2. Clap the following pattern: xx x xx x xx x
3. Pupils should repeat it.
4. Try a more complicated one: x xx xxxx x xx xxxx

Introduction to the New Material *(10 minutes)*

1. **Say:** We also see patterns all around us. Sometimes when shopkeepers sell their items at the market, they make colourful patterns with flags to attract our eyes. If Hawanatu has 3 colours of flags, she might arrange them in a pattern.
2. Draw the following flag pattern on the board using coloured chalk if possible.
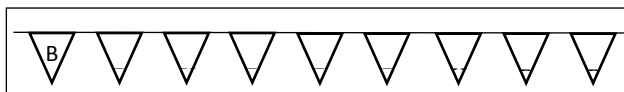
3. **Say**: Suppose she arranged them like what I drew on the board – the B means the flag is blue. The R means the flag is red. The Y means the flag is yellow. What colour do you think her next flag would be? (Answer: blue) Who can tell us the pattern they see? (Answer: blue, blue, yellow, red) What would the colour of the 15th flag be? (Answer: yellow). Draw the flag pattern in your book.

Guided Practice *(10 minutes)*

1. **Say:** Musu wants to make a wrap skirt that has a repeating pattern on it. She starts out with pieces of fabric that made a pattern like this:
2. Draw the following on the board: ▬ ▬ ▬ ▬ ▬
3. **Say:** Musu needs more fabric. She wants to keep the pattern intact so she need to work out what design should come next. Draw the fabric on your paper. Draw the next 4 pieces of fabric that she should sew to keep the pattern going. (Answer: ▬ ▬ ▬ ▬)
4. Give pupils about 5 minutes to work.
5. **Ask:** Who can tell me what the repeating pattern is on this fabric? (Answer: from left to right, it is thick line, thin line, dots, dots)
6. **Ask:** What did you draw on the new pieces of fabric? (Answer: thin line, dots, dots, thick line)

Independent Practice *(10 minutes)*

1. **Say:** Now you have the opportunity to design your own fabric for a wrap skirt or shirt. You must use a repeating pattern on your design.
2. Give pupils about 8 minutes to work.
3. **Say:** Please trade your drawings with your partner. Try to continue their pattern next to their drawing. If you do not see a repeating pattern, ask them to explain it to you.

Closing *(2 minutes)*

1. **Say:** Hold your patterns up for the whole class to see.
2. Ask 4 volunteers (2 boys and 2 girls) to describe their pattern to the class.
3. **Say:** You have made a lot of beautiful patterns today.

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