THE PRESIDENT'S RECOVERY PRIORITIES
Education

Ministry of Education, Science and Technology

Lesson plans for

PRIMARY *Mathematics*

3 CLASS

3 TERM

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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.

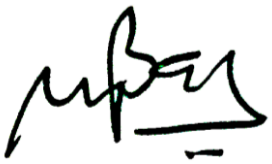
It is now time to build on this success. I am pleased to issue new lesson plans across all primary and JSS school grades in Language Arts and Mathematics. These plans give teachers the support they need to cover each element of the national curriculum. In total, we are producing 2,700 lesson plans – 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

Table of Contents

PRIMARY
Mathematics

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: Estimation and measurement of area using standard units of measurement	**Theme:** Measurement and Estimation - Area and Mass	
Lesson Number: M-03-121	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson, pupils will be able to: 1. Estimate area using standard units and everyday language. 2. Measure area using standard units.	1. Rulers 2. Grid sheet	1. Gather enough rulers for each pupil. 2. Prepare a 1-inch grid sheet, in the Introduction to the New Material, made out of paper or card.

Opening *(5 minutes)*

1. Write**:** 'estimation', 'measurement' and 'area' on the board.
2. **Ask:** Can anyone tell us what each word means? Listen to all the answers provided by pupils before explaining the terms. (Answer: estimation means making a close guess, measurement means giving a number of units to an object, area is the amount of space inside a shape)
3. **Say:** Objects can be measured in different units (millimetres, centimetres, metres, inches) using rulers.
4. **Say:** Because an area is an amount of space, it has to be measured in squares, e.g. If the shape is measured in centimetres (cm), the area of the object will be measured in square centimetres (cm^2).
5. **Ask:** If a shape is measured in metres (m), what will the area of that shape be measured in? (square metres or m^2)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we are going to learn how to estimate or measure the area of objects.
2. **Ask:** Can you give one example of an object for which we can measure the area? (Example answers: board, workbook, classroom, football field)
3. **Say:** Let us look at this card. (Hang up the 1-inch grid sheet on the board.)
4. **Say**: Every little box measures 1-inch on each side. Let us remind ourselves that the area of any shape is the amount of space within that shape. **Ask**: What do you think is the area of the shape pasted on the board? (Listen to answers provided by pupils.)
5. **Say**: Let us work on it together. Since every little box is 1-inch on each side, it means the area of the object will also have to be in inches. **Ask**: How many little boxes are found in the shape? (Answer: 9)
6. **Say:** When we started the lesson, we understood that an area of any object is measured in squares, therefore the area of this object is 9 square inches or $9in^2$.
7. **Say:** Area is also calculated by multiplying the length of an object by the width of the object. (Area = length x width)
8. Draw a rectangle on the board and put measurements on the length and width as shown below.

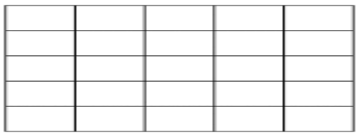
2cm

5cm

9. Point to the width (2cm) **Say:** This is the width of the object. Point to the length (5cm) **Say:** This is the length of the object.
10. **Say**: Let us find the area of the rectangle on the board. We know area = length x width.
11. **Ask:** What is the length of this object (5cm), and what is the width (2cm)?
12. **Say**: Therefore the area = 5 x 2 = 10 square centimetres or $10cm^2$.

Guided Practice *(10 minutes)*

1. Draw this on the board.



2. **Say**: This is a 1cm grid box, estimate the area of the object. (Answer: $25cm^2$)
3. **Ask**: Who has finished? Call out some of the pupils who have raised their hands to share their answers with the class. Count the number of little boxes together with the class and that will be the area of the box.
4. Let pupils sit in pairs, then draw the shape below on the board.

5. **Say**: In pairs calculate the area of the box on the board.(Answer: $16m^2$)
6. Go around the classroom and check if pupils are doing the right thing, correcting those doing it incorrectly. Afterwards, ask pupils to turn their attention to the board and work on it with the whole class. **Say:** The area of the object is the length multiplied by the width; 4m x 4m = 16 and since the area of any object is measured in square the final answer will be $16m^2$.

Independent Practice *(7 minutes)*

1. **Ask:** Who can give me a shape in which we can measure the area. Listen to the answers provided and select one e.g. (desk). Draw a rectangle representing a desk on the board with length of 2m and width of 1m.
2. **Say:** Calculate the area of the desk. (Answer: 2 x 1 = $2m^2$)
3. **Say:** Please compare your answers with the person sitting next to you.

Closing *(3 minutes)*

1. **Say:** We learned how to estimate and measure the area of objects today.
2. **Ask:** What are some of the objects in which we can measure the area? (Answer: desk, football field, classroom, exercise book)
3. **Ask:** What are some of the units that an area can be measured in? (Answer: square centimetres, square metres, square millimetres, square inches)

Lesson Title: Comparing and ordering area using standard units	**Theme:** Measurement and Estimation - Area and Mass	
Lesson Number: M-03-122	**Class/Level:** Class 3	**Time:** 35 minutes

 **Learning Outcomes** By the end of the lesson, pupils will be able to compare and order an area using standard units and everyday language.	 **Teaching Aids** Newspaper	 **Preparation** Gather some newspapers.

Opening *(3 minutes)*

1. Write 'area' and 'order' on the board. **Ask:** Can anyone tell us what each word means?
2. Listen to all answers provided by pupils before explaining the terms. (Answer: Area is the amount of space inside a shape, order means to arrange items, e.g. from biggest to smallest or smallest to biggest.)
3. **Say:** The area of objects are measured in units like square centimetres, square metres, square inches, these units are called 'standard units' because they are always the same size.
4. **Say:** In today's lesson, we are going to look at how we can compare the area of objects and also how we can order area using standard units.

Introduction to the New Material *(12 minutes)*

1. **Ask:** If we have a newspaper and an exercise book, which of them can cover a bigger surface on the classroom floor?
2. **Say:** The newspaper will cover a bigger space on the classroom floor than the exercise book. This means that the newspaper has a bigger area than the exercise book.
3. **Say:** Now let us consider the following objects. Draw the following on the board:

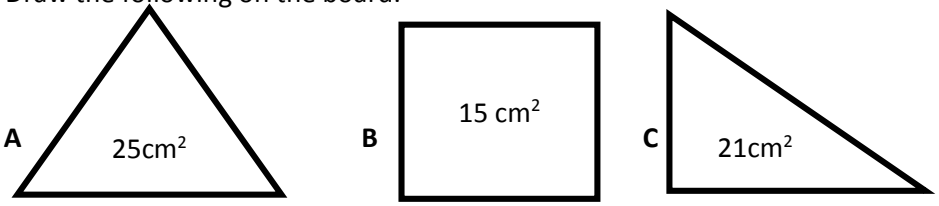
A Area= 50cm^2 **B** Area = 25cm^2

4. **Ask:** Which of the objects will cover a bigger surface? (Answer: Object 'A' will cover a larger surface because it has a bigger area.)
5. **Ask:** Order the objects from smallest to biggest according to area. (Answer: B, A)
6. **Say:** Now let us look at another example. Three objects have the following area: 15cm^2, 20cm^2, 10cm^2. **Ask:** Which is the biggest area? (Answer: 20cm^2). The area that will cover the smallest surface is 10cm^2.
7. **Ask:** From the 'Area' given, who can order them from the smallest to the biggest?
8. Call one of the pupils who has raised their hand to answer (Answer: 10 cm^2, 15 cm^2, 20 cm^2).
9. **Say:** Let us look at another example. Some children made mats, the area of Ishmael's mat is 12 square units. The area of Adama's mat is 16 square units.

10. **Ask:** Who made the mat a larger area? (Answer: Adama)

Guided Practice *(10 minutes)*

1. **Say:** Find a partner to work with to solve the following problem.
2. Write the following on the board:
   The area of a green cloth is 14 square metres ($14m^2$). The area of a red cloth is 10 square metres ($10m^2$), the area of a white cloth is 20 square metres ($20m^2$). Which colour cloth has the smallest area? (Answer: red cloth)
3. Walk around the classroom and support each group as they work work. Explain further and help out groups struggling to agree on an answer.
4. Ask pupils to remain with their partner and arrange the given cloths in order of the one with the biggest area to that with the smallest area. (Answer: white, green, red)
5. Draw the following on the board:



7. **Say:** Please compare the objects and their area above and order them according to the ones with the smallest area to the biggest area. (Answer: B, C, D)
8. Ask one pair to explain their answer to the class.

Independent Practice *(7 minutes)*

1. **Say:** The teacher was sharing pieces of brown sheet to cover the classroom floor. Andrew took a sheet which had an area of 20 square centimetres. Ibrahim took a sheet with an area of 40 square centimetres. Aminata took a sheet with area of 10 square centimetres. **Ask:** Whose sheet can cover a larger area of the classroom? (Answer: Ibrahim)
2. **Ask:** Whose sheet can cover the least space in the classroom? (Answer: Aminata)
3. **Say:** Please compare your answers with the person sitting next to you.

Closing *(3 minutes)*

1. **Say:** We looked at how to compare and order area using standard units.
2. **Ask:** What are some of the standard units we used? (Answer: square centimetres, square metres)
3. **Ask:** In which ways can area of objects be ordered? (Answer: from biggest to smallest and from smallest to biggest)
4. **Ask:** What will cover a larger surface? An object with a bigger area or an object with a smaller area? (Answer: an object with a bigger area)

Lesson Title: Estimation and Measurement of Mass using Standard Units of Measurement	**Theme:** Measurement and Estimation - Area and Mass	
Lesson Number: M-03-123	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson, pupils will be able to: 1. Estimate mass using standard units and everyday language. 2. Measure mass using standard units.	1. Tin of milk, tomato paste, and sardines. 2. Balance scale	1. Find, or make, a balance scale. 2. Gather a tin of milk, tomato paste and sardines.

Opening *(3 minutes)*

1. Write 'estimation', 'measurement' and 'mass' on the board.
2. **Ask:** Can anyone tell us what each word means?
3. Listen to all answers provided by pupils before explaining the terms. (Answer: Estimation means making a close guess, measurement refers to giving a number of units to an object, mass is the measure of how heavy something is.)
4. **Say:** The mass of objects can be measured in different units (kilograms, grams).
5. **Say:** Kilograms are shortened as (Kg) and grams are shortened as (g). Kilograms are bigger than grams. For example, a big bag of sugar weighs 50kg while a small bag of sugar we put in our kitchen weighs 250g.

Introduction to the New Material *(12 minutes)*

1. **Say:** Today we are going to learn how to estimate and measure the mass of objects.
2. Pick up a tin of milk and without looking at the mass, tell the class you think the tin of milk weighs about the same as a 70 gram tin of tomato paste.
3. **Say:** Let us find out if I am right or wrong. Put the tin of milk and the tin of tomato paste on the balance scale.
4. **Say:** The tin of milk has a bigger mass than the tomato paste.
5. Call pupils to come and read the measurement displayed on the tin of milk.
6. **Ask:** Was I correct with my guess?
7. Listen to the response from pupils.
8. **Say:** Please raise your hand if you guessed right.
9. Let the pupils clap for those who had the right guesses.
10. **Say:** Now let us do another example with pictures.
11. Draw the following pictures on the board and label the mass
    Bag of sugar (250g)
    Bag of water (500g)
12. **Ask:** How much does the bag of sugar weigh? (Answer: 250g)
13. Write the answers provided by various pupils on the board.
14. **Ask:** How much does the bag of water weigh? (Answer: 500g)

15. **Ask:** Which bag is heavier? (Answer: the water)

Guided Practice *(12 minutes)*

1. Draw the following on the board:
a) Can of soft drink (Answer: approximately 500g)
b) Bag of rice (Answer: approximately 1,000g)
c) Pepper (Answer: approximately 5g)
2. **Say:** Draw these items in your book. Estimate about how many grams each would weigh. Remember, a bag of water is 500g.
3. Ask 3 volunteers to give their estimate for each item.
4. **Say:** All of our estimates are different, but we can work out together if they are close.
5. **Say:** If a bag of water weighs 500g, we know a can of soft drink weighs about the same, so we can estimate that the soft drink will weigh about 500g.
6. **Say:** If a bag of water weighs 500g, we know a small bag of rice will be heavier than this. We can estimate that a small bag of rice will weigh about the same as 2 bags of water.
7. **Say:** We know a pepper weighs only a very little bit. If we had 100 peppers, it would weigh about the same as a bag of water, so 500 ÷ 100 is 5.
8. **Say:** If your estimates are close to these answers, you did very well!
9. **Ask:** Which of these items would be the heaviest? (Answer: bag of rice)
10. **Ask:** How do you know? (Answer: When you carry a pepper in your hand it feels very light. A can of soft drink feels a bit heavier, but a bag of rice is very heavy.)

Independent Practice *(5 minutes)*

4. **Say:** Write in your exercise books how much you think a tin of sardine weighs. Write your estimate in your book.
5. **Say:** We can look at the tin of sardines and know that it weighs 125g. The weight is written on the label.
6. **Ask:** If a tin of tomato paste weighs 70g, which has a greater mass, a tin of sardines or a tin of tomato paste? (Answer: the tin of sardines)
7. **Say:** Please compare your answers with the person sitting next to you.

Closing *(3 minutes)*

5. **Say:** We learned how to estimate and measure the mass of objects today.
6. **Ask:** What are some of the objects in which we can measure the mass? (Answer: tins of sardine, bags of sand, bags of sugar)
7. **Ask:** What units are mass measured in? (Answer: kilograms, grams)
8. **Ask:** Which is bigger, a kilogram or gram? (Answer: kilogram)

Lesson Title: Comparing and Ordering Mass using Standard Units	**Theme:** Measurement and Estimation - Area and Mass	
Lesson Number: M-03-124	**Class/Level:** Class 3	**Time:** 35 minutes

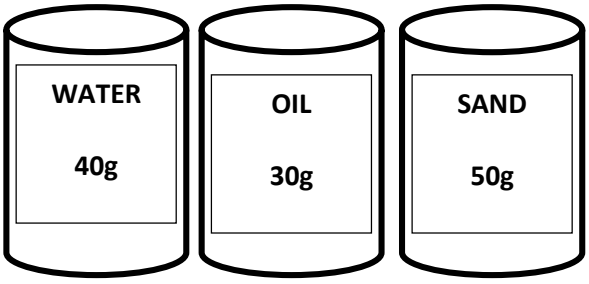
Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson, pupils will be able to compare and order mass using standard units and everyday language.	1. Balance scale 2. Small bag of nails and a small bag of sand.	1. Find, or make a balance scale. 2. Gather together a small bag of nails and a small bag of sand.

Opening *(3 minutes)*

1. Write 'mass' and 'order' on the board.
2. **Ask:** Can anyone tell us what each word means?
3. Listen to all the answers provided by pupils before explaining the terms. (Answer: Mass is the measure of how much an object weighs, order means to arrange items, such as from biggest to smallest or smallest to biggest.)
4. **Say:** In today's lesson, we are going to learn how to compare objects with different masses and how to order those objects.

Introduction to the New Material *(12 minutes)*

1. **Say:** We have 2 bags: 1 filled with sand and 1 filled with nails.
2. **Ask:** Which bag do you think is heavier? **Say:** Discuss this with the person sitting next to you.
3. Allow pupils to discuss this for about 30 seconds.
4. **Say:** There is only way 1 way to find out, and that is by measuring the 2 bags.
5. Ask 1 volunteer to come to the front of the room and hold 1 bag in each hand.
6. **Ask:** Which bag is heavier?
7. **Ask:** So now who can tell me which 1 is heavier, sand or nails?
8. **Say:** To confirm that the nails are heavier than the sand, we will put both bags on the opposite sides of a balance scale. The heavier object will drop down as the lighter object rises up on the balance scale.
9. Place each bag on the balance scale.
10. **Say:** I have 3 cylinders containing water, oil and sand. Can you tell me which 1 is heavier and which 1 is lighter?



11. **Ask:** Which 1 is heavier? (Answer: sand)
12. **Say:** Sand is heavier amongst the three because its mass is 50g.

13. **Ask:** Which 1 is the lightest? (Answer: oil)
14. Let pupils give answers without telling them whether they are right or wrong.
15. **Say:** Oil is the lightest because it has a mass of 30g and if you compare it to the other 2, it is the smallest.
16. **Say:** Now let us order them from the lightest to the heaviest. (Answer: oil, water, sand)

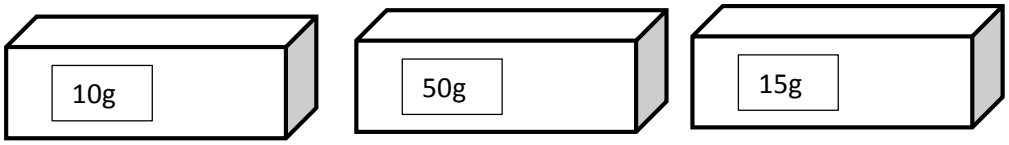
Guided Practice *(10 minutes)*

1. **Say:** Frank's mother has packed all of Frank's things into 3 boxes. 1 box contains his clothes, another box contains his toys and the last box contains his books. Draw the boxes on the board with the mass of each labelled.

2. **Ask:** Which of Frank's items is heaviest and why? (Answer: books, because they weigh 3kg)
3. **Ask:** Which of Frank's items is the lightest and why? (Answer: clothes because they only weigh 1kg)
4. **Ask:** In pairs, arrange Frank's items from the heaviest to the lightest. (Answer: books, toys, clothes)
5. Walk around the classroom and support each group.

Independent Practice *(7 minutes)*

1. Draw the following on the board:



2. **Say:** Draw the boxes in your book.
3. **Ask:** Which 1 is heavier? (Answer: 50g) **Ask:** Which 1 is lighter (Answer: 10g)
4. **Say:** Order the boxes from the heaviest to the lightest. (Answer: 50g, 15g, 10g)
5. **Say:** Order the boxes from the lightest to the heaviest. (Answer: 10g, 15g, 50g)
6. **Say:** Please compare your answers with the person sitting next to you.

Closing *(3 minutes)*

1. **Say:** We looked at how to compare and order mass using standard units.
2. **Ask:** What are some of the standard units we used? (Answer: kilograms, grams)
3. **Ask:** In which ways can mass of objects be ordered? (Answer: from biggest to smallest and from smallest to biggest)
4. **Ask:** What will be heavier? An object with a bigger mass or an object with a smaller mass? (Answer: an object with a bigger mass)

Lesson Title: Word problems involving area and mass using standard units	**Theme:** Measurement and Estimation - Area and Mass	
Lesson Number: M-03-125	**Class/Level:** Class 3	**Time:** 35 minutes

 **Learning Outcomes** By the end of the lesson, pupils will be able to solve word problems involving area and mass using standard units.	 **Teaching Aids** None	 **Preparation** None

Opening *(3 minutes)*

1. Write 'area' and 'mass' on the board. **Ask:** Can anyone tell us what each word means? (Answer: Mass is the measure of the amount of matter in an object, area is the amount of space inside a shape.)
2. **Say:** In today's lesson, we are going to learn how to solve word problems involving area and mass using standard units.

Introduction to the New Material *(12 minutes)*

1. **Say:** A playing field is 10 metres long and 5 metres wide. **Ask:** What is the area of the field? (Answer: $50m^2$)
2. **Say:** We know the area of an object is the length multiplied by the width of the object; that is (length x width). Therefore the area of this playing field will be 10m x 5m = $50m^2$.
3. **Say:** Daniel has a cloth with an area of $20cm^2$ and Michael has a cloth which has an area of $25cm^2$.
4. **Ask:** Whose cloth do you think can cover a bigger surface? (Answer: Michael's)
5. **Say:** Now let us find out together. Daniel's cloth has an area of $20cm^2$ and Michael's cloth's area is $25cm^{2.}$
6. **Ask:** Between 20 and 25, which is bigger? (Answer: 25). **Say:** So Michael's cloth can cover a bigger surface than Anthony's.
7. **Say:** Now let us look at another example; the area of David's foot is $6cm^2$. Estella's foot has an area of $4cm^2$ and Bintu's foot has an area of $10cm^2$.
8. **Ask:** Whose foot can cover a bigger surface on the ground? (Answer: Bintu's)
9. **Say:** Since we know an area of any object is how much that object covers a particular surface, it means that the one with the foot with the biggest area will cover the biggest surface.
10. **Say:** Since Bintu's foot has the biggest area ($10cm^2$), she will cover a bigger surface on the ground compared to David and Estella.
11. **Say:** Now let us look at some examples involving the mass of objects. A box contains 4 bags of sugar. Each bag of sugar has a mass of 10kg.
12. **Ask:** What will be the total mass of the box? (Answer: 40kg)
13. **Say:** Since each bag of sugar weighs 10kg, the total mass of the box will be 4 x 10kg = 40kg.
14. **Say:** Linda has 5 sticks in her bag. Each stick has a mass of 6g.
15. **Ask:** What is the mass of the 5 sticks altogether? (Answer: 30g)

16. **Say:** The total mass of the sticks will be: 5 x 6g = 30g
17. **Ask:** So if Linda had 10 sticks, what would be the total mass of all 10 sticks? (Answer: 60g)

Guided Practice *(10 minutes)*

1. **Say:** Andrew and Ramatu are sharing oranges. All the oranges have the same mass of 10g each. After sharing the oranges, Andrew had 5 oranges while Ramatu ended up with 7 oranges.
2. **Ask:** What is the total mass of Andrew's oranges (Answer: 50g)
3. **Ask:** What is the total mass of Ramatu's oranges? (Answer: 70g)
4. Go around to each group and monitor their work as they try to work out the answers. Explain further to groups that are struggling and help them out.
5. Ask 4 pairs to tell the class the answer they arrived at. Write the answers on the board.
6. **Ask:** What will be the total mass of all of Andrew's and Ramatu's oranges together? (Answer: 120g)
7. Check again on each group and inspect their work. Explain and direct groups which happen to be on the wrong path.
8. **Write:** Mohamed has a number of slates with an area of $4m^2$ each and needs to cover a space made on the floor. The area of the space on the floor to be covered is $16m^2$. **Ask:** How many slates will Ike need to cover the space on the floor (Answer: 4 slates)
9. Walk around the class and check on each group's work, help out those who are struggling.

Independent Practice *(7 minutes)*

1. Write the following problem on the board and read it out loud to the pupils:
   Irene finds the mass of her basketball is 350g and her football is 500g.
2. **Ask:** How much heavier is the mass of her football than the basketball? (Answer: 150g)
3. **Ask:** What is the total mass of both the basketball and football combined? (Answer: 850g)
4. Write the following problem on the board and read it out loud to the pupils:
   The length of Elizabeth's book is 30cm and the width is 5cm. **Ask:** What will be the area of Elizabeth's book: (Answer: $150cm^2$)
5. **Say:** Compare your answers with the person sitting next to you.
6. Go around the classroom and check the answers of pupils and do any necessary corrections.

Closing *(3 minutes)*

1. **Say:** We looked at how to solve word problems involving mass and area using standard units like kilograms (kg), grams (g), centimetres (cm), and metres (m).
2. **Say:** Mathew is holding a comb and a pair of scissors. The comb has a mass of 10g and the scissors has a mass of 20g. **Ask:** What is the total mass of the items Mathew is holding? (Answer: 30g)
3. **Say:** Raymond has two cloths. One has an area of $10m^2$ and the other $5m^2$. **Ask:** What is the total surface area that Raymond can cover with his joined cloths? (Answer: $15m^2$)
4. **Say:** Well done.

Lesson Title: Locating unit fractions on the number line	**Theme:** Number and numeration - Fractions	
Lesson Number: M-03-126	**Class/Level:** Class 3	**Time:** 35 minutes

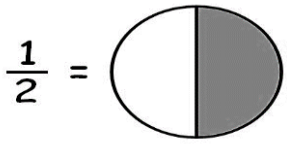
Learning Outcomes By the end of the lesson, pupils will be able to locate halves and quarters on a number line.	**Teaching Aids** None	**Preparation** None

Opening *(3 minutes)*

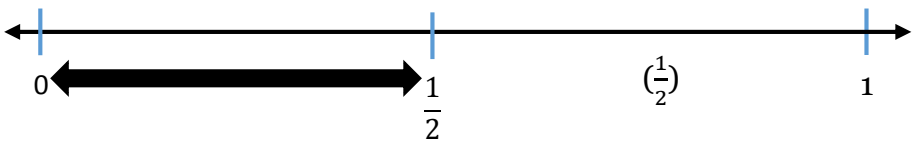
1. **Ask:** If I have one whole orange, how can I share it between four boys? Listen to suggestions from pupils. **Say:** I can share the orange between the boys by cutting it into four equal parts.
2. **Say:** Each boy will receive a small portion called a quarter: $\frac{1}{4}$
3. **Say:** We write one quarter as $\frac{1}{4}$ because it is one part out of four parts.
4. **Say:** If we only had to share the whole orange between 2 boys, we would cut the orange into two equal parts. Each boy would receive one half: $\frac{1}{2}$
5. **Say:** We write one half as $\frac{1}{2}$ because it is one part out of 2 parts.
6. **Say:** In today's lesson, we will learn how to locate unit fractions on a number line. Unit fractions are fractions which have a numerator or top number of 1, e.g. $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{6}$. **Say:** They are called unit fractions because they mean one small part or unit.

Introduction to the New Material *(12 minutes)*

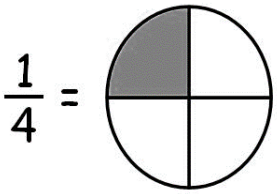
1. Draw a circle on the board and shade one half. **Ask:** Who can tell me the shaded fraction?



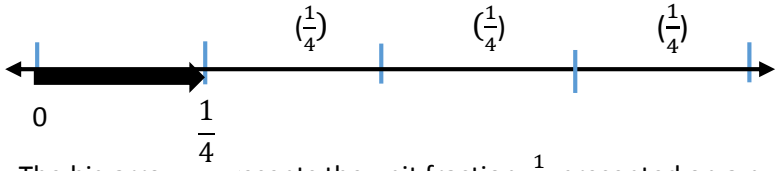
2. Listen to answers provided by pupils and **Ask:** How many equal parts is the circle divided into? (Answer: 2) **Say:** Meaning it is in halves. **Ask:** How many equal parts have been shaded? (Answer: 1). **Say:** So the fraction shaded is one half $\frac{1}{2}$.
3. **Say:** Fractions can be represented on a number line by marking off the correct number of equal parts between 0 and 1, and then finding the endpoint of the first part.
4. **Say:** Let us learn how to put one half on a number line. **Say:** Since the circle is divided into two equal parts, our number line should also be divided into two equal parts. Demonstrate this on the board.



5. **Say:** We label this line as $\frac{1}{2}$ because it shows 1 part out of the 2 equal parts. The shaded half in the circle is represented on the number line by the thick black arrow.
6. Draw a circle on the board and shade one quarter. **Say:** Now let us look at this.



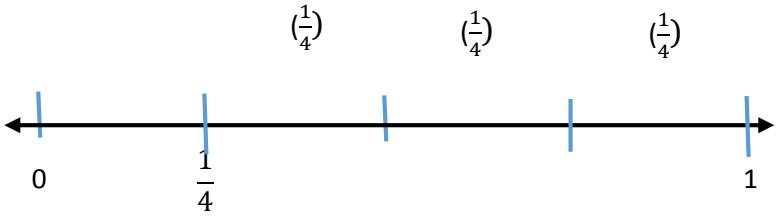
7. **Ask:** How many equal parts is this circle divided into? (Answer: 4)
8. **Ask:** How many parts have been shaded? (Answer: 1)
9. **Say:** Since it has been divided into four parts, it means our number line also needs to be divided into four equal parts, like this: (Use the number line in front of the class to demonstrate.)



10. **Say:** The big arrow represents the unit fraction: $\frac{1}{4}$, presented on a number line.

Guided Practice *(12 minutes)*

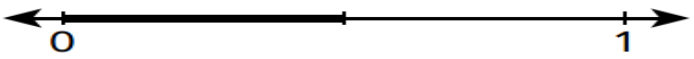
1. **Say:** Draw two blank number lines in your book, locate and label the unit fractions: $\frac{1}{2}$ and $\frac{1}{4}$



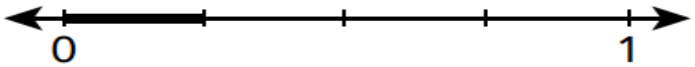
2. Walk around the classroom and support pupils that are having difficulty.

Independent Practice *(5 minutes)*

7. **Write:** Please identify the unit fraction on each number line.

(a) 

(Answer: $\frac{1}{2}$)

(b) 

(Answer: $\frac{1}{4}$)

Closing *(3 minutes)*

1. **Say:** A unit fraction is a fraction with 1 as the numerator.
2. **Ask:** How do you locate a unit fraction on a number line? (Answer: Mark off the correct number of equal parts between 0 and 1, then find the endpoint of the first part.)
3. **Ask:** Why are fractions like $\frac{1}{2}$ called unit fractions? (Answer: Because they mean one small part of a unit.)

Lesson Title: Identifying unit fractions with denominators 1 -5 using pictorial representation	**Theme:** Number and numeration - Fractions	
Lesson Number: M-03-127	**Class/Level:** Class 3	**Time:** 35 minutes

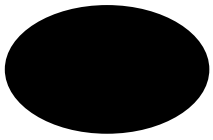
Learning Outcomes By the end of the lesson pupils will be able to: 1. Identify unit fractions with denominators 1-5 using pictorial representation. 2. Write and read fractions using mathematical notation.	**Teaching Aids** None	**Preparation** None

Opening *(3 minutes)*

1. **Say:** In our last lesson, we learned how to place one half and one quarter on the number line.
2. **Say:** Today we are going to look at identifying unit fractions with different denominators using pictorial representations.
3. **Say:** Fractions consist of a numerator, the top number and denominator, the bottom number.
4. **Say:** Consider the fraction $\frac{1}{2}$, 1 is the numerator (the number of parts or units) and 2 is the denominator (the total number of parts or units).
5. **Say:** If I have one whole orange, how can I share it between four boys? Listen to suggestions from pupils. **Say:** I can share the orange between the boys by cutting it into four equal parts.
6. **Say:** Each boy will receive a small portion called a quarter: $\frac{1}{4}$.

Introduction to the New Material *(12 minutes)*

1. Draw a circle on the board and shade the whole shape.
2. **Ask:** What fraction of the circle is shaded? (Answer: $\frac{1}{1}$)

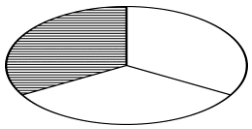


Let pupils provide answers. (expect mixed responses)
Say: The circle represents one whole (1), and we have shaded the whole circle so we can say that the shaded part is 1 unit out of the 1 whole, $\frac{1}{1}$.

3. Draw a rectangle cut into 5 equal parts. Shade one part. **Ask:** What can you tell me about the next picture?

4. Ask one volunteer to tell the class what the picture represents. (Example answer: The rectangle is divided into 5 parts, and 1 part is shaded so it represents $\frac{1}{5}$)
5. **Ask:** Is there anyone who thinks differently? Call a couple of pupils with different answers to tell the class what they think the picture represents.
6. **Say:** There are five equal parts and one is shaded. The fraction shaded is written as $\frac{1}{5}$.

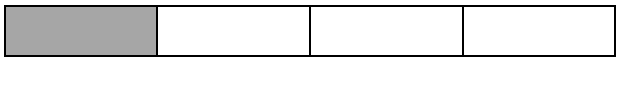
7. Draw a circle on the board and cut it into 3 equal parts. Shade one part. **Say:** Let us work out one more example. **Ask:** What fraction is the shaded area in the picture below? (Answer: $\frac{1}{3}$)

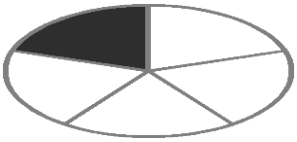


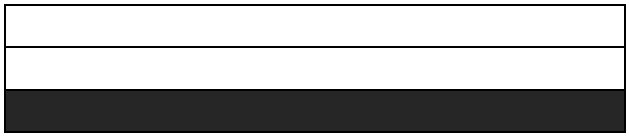
8. **Say:** Please raise your hand if you know the answer.
9. Call one volunteer to come and write his or her answer on the board.
10. **Say:** The circle is divided into three equal parts and one part is shaded, so the shaded area represents one-third of the circle and is written as $\frac{1}{3}$, 1 represents the shaded portion and 3 represents the total number of parts that the circle is divided into.

Guided Practice *(10 minutes)*

1. Draw the following on the board.



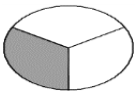
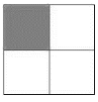
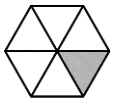


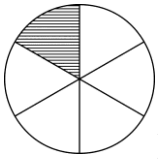


2. **Ask:** What fractions have been shaded in these pictures? **Say:** Work in pairs to draw the pictures and write the fractions in your exercise books. (Answer: $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{3}$,)
3. Ask a volunteer that had all the correct answers and let them write their answers on the board.

Independent Practice *(8 minutes)*

1. **Say:** Draw the pictures in your book.
2. **Ask:** Circle and label the figure that has $\frac{1}{4}$ of its area shaded? (Answer: 'b')

(a)  (b)  (c) 

3. **Say:** Draw a circle and shade $\frac{1}{5}$ of it. Label your picture. (Answer: )

4. **Say:** Please write your answers in your exercise books. **Say:** Exchange your exercise books with the person next with you and compare answers.

Closing *(2 minutes)*

1. **Say:** To get fractions, objects need to be divided into equal parts. The numerator represents the chosen part (shaded) and the denominator represents the total number of parts the object is divided into.
2. **Say:** In this lesson, we looked at identifying unit fractions with denominators 1 – 5. We will continue with fractions in our next lesson where we'll look at identifying unit fractions with denominators 6 – 10.

Lesson Title: Identifying unit fractions with denominators 6-10 using pictorial representation	**Theme:** Number and numeration - Fractions	
Lesson Number: M-03-128	**Class/Level:** Class 3	**Time:** 35 minutes

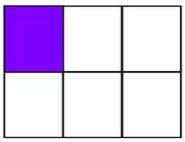
Learning Outcomes By the end of the lesson pupils will be able to: 1. Identify unit fractions with denominators 6-10 using pictorial representation. 2. Write and read fractions using mathematical notation.	**Teaching Aids** None	**Preparation** None

Opening *(3 minutes)*

1. **Say:** In our last lesson, we identified unit fractions with denominators 1-5, today we will go further and look at identifying unit fractions with denominators 6 – 10 using pictorial representations.
2. **Say:** Fractions consist of a numerator and denominator.
3. **Ask:** What is a numerator? (Answer: The number on the top, it tells us the number of units or pieces in the part.)
4. **Ask:** What is a denominator? (Answer: The number on the bottom, it tells us the number of units in the whole.)
5. **Say:** Consider the fraction $\frac{1}{2}$, 1 is the numerator (the chosen unit/part) and 2 is the denominator (the total number of parts/units).
6. **Say:** If I have one full watermelon, how can I share it between 10 boys? (Answer: By cutting the watermelon into 10 equal parts and sharing among the boys.) Listen to suggestions from pupils.
7. **Say:** Each boy will receive one tenth of the watermelon and it is written in a fraction form as: $\frac{1}{10}$.

Introduction to the New Material *(12 minutes)*

1. Draw a rectangle divided into 6 parts on the board. Shade one part. **Ask:** What fraction of the whole is the shaded portion? (Answer: $\frac{1}{6}$)

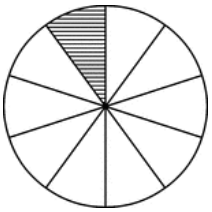


Let pupils provide answers (expect mixed responses)
Say: The box has been divided into 6 equal parts and the shaded part represents one part out of the total six. So the fraction of the shaded area will be $\frac{1}{6}$.

2. Draw a rectangle divided into seven parts. Shade one part. **Ask:** What can you tell me about the next picture?

Call on one pupil who has raised his/her hand to tell the class what the picture represents.
(Answer: $\frac{1}{7}$)

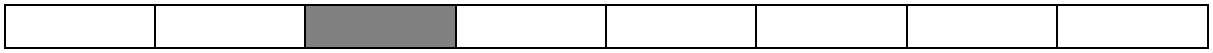
3. **Ask:** Is there anyone who thinks differently? Call on a couple of pupils with different answers to tell the class what they think the picture represents.
4. **Say:** The shaded area represents one part of the total seven parts. The fraction of the shaded area is written as: $\frac{1}{7}$

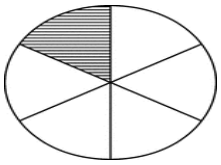


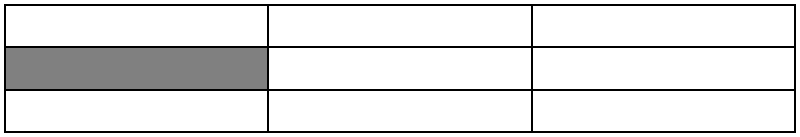
5. Draw a circle divided into 10 parts on the board. Shade one part. **Say:** Let us work out one more example together.
6. **Ask:** What fraction is the shaded area of the circle? (Answer: $\frac{1}{10}$)
7. **Say:** Please raise your hand if you know the answer. Call one volunteer to write their answer on the board.
8. **Say:** The circle is divided into ten equal parts and one part is shaded so the shaded area represents one tenth of the circle and it is written as $\frac{1}{10}$. 1 represents the shaded portion and 10 represents the total number of parts that the circle is divided into.

Guided Practice *(10 minutes)*

1. **Say:** Work in pairs to label the next pictures of fractions.
2. Draw the following on the board:



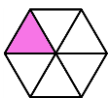


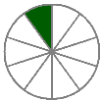


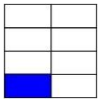
3. **Ask:** What fractions have been shaded in these pictures? **Say:** Draw the pictures and write the fractions in your exercise books. (Answers: $\frac{1}{8}, \frac{1}{6}, \frac{1}{9}$,)
4. Ask a volunteer with all the answers correct to write their answers on the board.

Independent Practice *(8 minutes)*

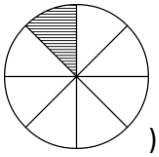
1. Draw the following pictures on the board. **Say:** Draw the pictures in your book. Label the figure that has $\frac{1}{10}$ of its area shaded? (Answer: 'b')

(a) 

(b) 

(c) 

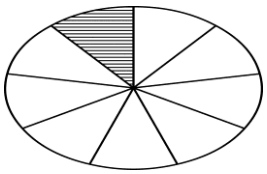
2. **Say:** Draw a circle in your book. Shade $\frac{1}{8}$ of the circle and label it.

(Answer: )

3. **Say:** Please exchange your exercise books with the person next to you and compare answers. Make the necessary corrections.

Closing *(2 minutes)*

1. **Say:** To get fractions, objects need to be divided into equal parts. The numerator represents the chosen part (shaded) and the denominator represents the total number of parts the object is divided into.
2. Draw the figure on the board and **Ask:** What is the fraction of the shaded area?



(Answer: $\frac{1}{9}$)

Lesson Title: Identifying non-unit fractions with denominators 2-10 using pictorial representation	**Theme:** Number and numeration - Fractions	
Lesson Number: M-03-129	**Class/Level:** Class 3	**Time:** 35 minutes

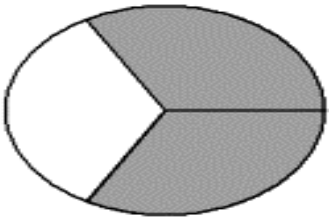
Learning Outcomes By the end of the lesson, pupils will be able to identify non-unit fractions with denominators 2-10 using pictorial representation.	**Teaching Aids** None	**Preparation** None

Opening *(3 minutes)*

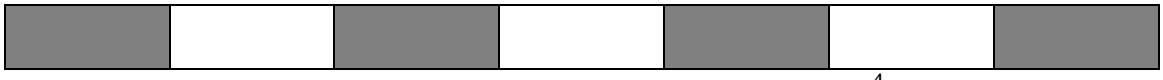
1. **Say:** Our previous lessons have focussed identifying unit fractions. Today's lesson is about identifying non-unit fractions with denominators 2-10 using pictures.
2. **Say:** Non-unit fractions are many parts of a whole which is divided into equal parts. **Say:** A non-unit fraction has a numerator which is more than 1, e.g. $\frac{2}{3}, \frac{4}{5}$.
3. **Say:** Throughout the lesson, we will use pictures to identify and explain non-unit fractions.

Introduction to the New Material *(12 minutes)*

1. **Say:** Abdulai, Moses and Umu are sharing an apple. The apple is cut into three equal parts and shared amongst the children. If Abdulai and Moses combine their apples, it makes 2 pieces out of the 3 pieces cut.
2. Draw a circle on the board, divide it into three equal parts and shade two of the three parts.



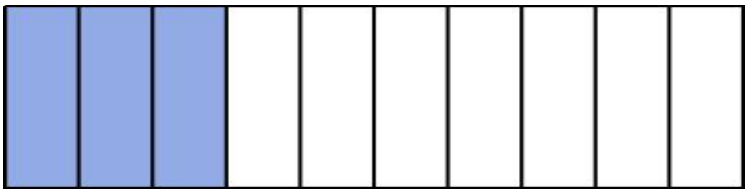
3. **Say:** The shaded part represents two-thirds which is Abdulai and Moses' share of the apple. The fraction is written as $\frac{2}{3}$ with 2 being the shaded parts and 3 being the total number of parts.
4. Draw the following picture on the board. **Ask:** What can you tell me about the next picture?



Ask one volunteer to tell the class what the picture represents. (Answer: $\frac{4}{7}$)

5. **Ask:** Is there anyone who thinks differently? Call a couple of pupils with different answers to tell the class what they think the picture represents.
6. **Say:** The shaded area represents four out of the seven parts. The fraction of the shaded area is written as: $\frac{4}{7}$.
7. Draw a rectangle divided into 10 equal parts. Shade 3 parts. **Say:** Let us work out one more example together.

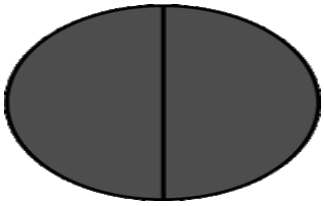
8. **Ask:** What fraction is the shaded area in the picture below? (Answer: $\frac{3}{10}$)



9. **Say:** Please raise your hand if you know the answer. Ask one volunteer to write the answer on the board.
10. **Say:** This shape is split into ten equal parts, the bottom number of the fraction. Three parts are shaded, this is the top number of the fraction.
11. **Say:** The shaded fraction is three out of the ten parts. This is three tenths, or: $\frac{3}{10}$

Guided Practice *(10 minutes)*

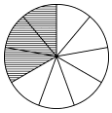
1. Draw the following on the board:

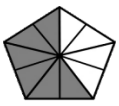


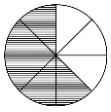
2. **Say:** Draw these pictures in your book, then work with a partner to write what fraction has been shaded in each picture.
3. **Say:** Please write the fractions in your exercise books. (Answer: $\frac{4}{8}$, $\frac{2}{2}$, $\frac{4}{9}$)
4. Ask a volunteer with the correct answers to write the answers on the board.

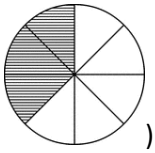
Independent Practice *(8 minutes)*

1. Draw the figures below on the board.
2. **Say:** Draw these pictures in your book. Circle the figure that has $\frac{6}{10}$ of its area shaded? (Answer: 'b')

(a) 

(b) 

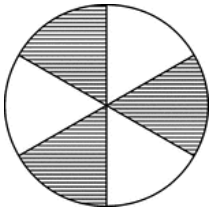
(c) 

3. **Say:** Please draw a circle in your book and shade $\frac{3}{8}$ of the figure. (Answer: )

4. **Say:** Exchange your exercise books with the person next with you and compare answers. Please make the necessary corrections.

Closing *(2 minutes)*

1. **Say:** We looked at how to identify non-unit fractions using pictorial representation.
2. **Say:** Non-unit fractions are many parts of a whole which is divided into equal parts.
3. Draw the figure on the board and **Ask:** What is the fraction of the shaded area?

 (Answer: $\frac{3}{6}$)

Lesson Title: Identifying unit and non-unit fractions with denominators 2-10 on the number line	**Theme:** Number and numeration - Fractions	
Lesson Number: M-03-130	**Class/Level:** Class 3	**Time:** 35 minutes

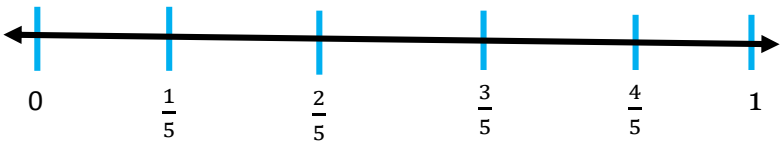
Learning Outcomes By the end of the lesson, pupils will be able to identify non-unit fractions with denominators 2-10 on the number line.	**Teaching Aids** Long number line	**Preparation** Draw a long number line on the board.

Opening *(2 minutes)*

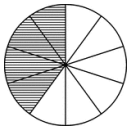
1. **Say:** For the last few lessons, we have been learning about unit and non-unit fractions. We drew pictures and used number lines to represent the fractions.
2. **Say:** Today we are going to identify unit and non-unit fractions with denominators 2-10 on the number line.
3. **Say:** Just like unit fractions, non-unit fractions can be represented on a Number Line.

Introduction to the New Material *(11 minutes)*

1. **Say:** I have an apple divided into 5 equal parts. We are going to represent these equal parts on a number line.
2. **Ask**: Before we draw the number line, how many equal parts are we going to divide our number line into and why? (Answer: We will have 5 equal parts, each representing one unit of the whole.) Let pupils come up with suggestions and make them aware of the answer.
3. **Say:** Now let us draw our number line and label it. Draw:

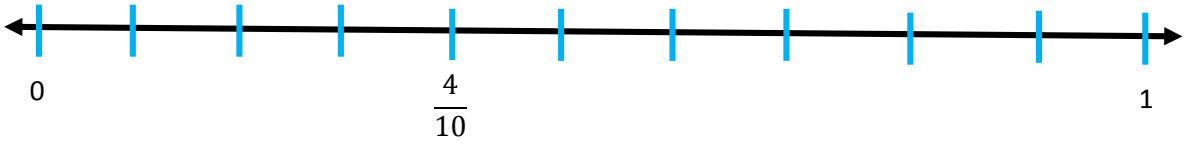


4. **Say:** The number line represents one whole which has been divided into five equal parts. Each marking represents a unit of the whole.
5. Draw a circle divided into 10 equal parts. Shade 4 parts. **Say:** Now let us look at this picture.

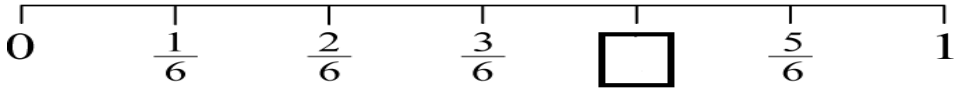


6. **Ask:** Who can describe this picture?
7. **Say:** Please raise your hand if you know. Call on a couple of the pupils to provide answers. (expect mixed responses)
8. **Say:** The figure is divided into ten equal parts and 4 units have been shaded. **Say:** The picture can be written in a fraction form as: $\frac{4}{10}$
9. Draw a large number line on the board. **Say:** Let us use our number line to label the shaded part of the circle.

10. **Say:** The circle is divided into ten equal parts so we'll have to mark ten units on the number line. (mark ten units)
11. **Say:** The shaded part is four units out of ten. So please count four units on the number line and label it $\frac{4}{10}$. The number line should look like this:



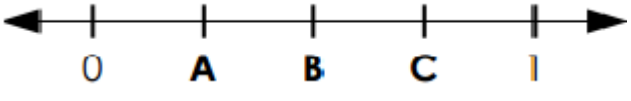
12. Draw the following number line on the board. **Say:** Now let us study this Number Line.



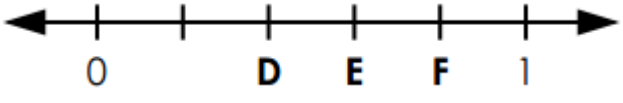
13. **Ask:** How many unit fractions are formed on the number line? (Answer: 6)
14. **Say:** Please label the missing fraction. (Answer: $\frac{4}{6}$). Call on volunteers of pupils to tell the class their answers and explain why. (Example answer: There are 6 equal parts on the number line so the denominator is 6. I counted along the number line 4 equal parts so the numerator is 4. The fraction is $\frac{4}{6}$.

Guided Practice *(10 minutes)*

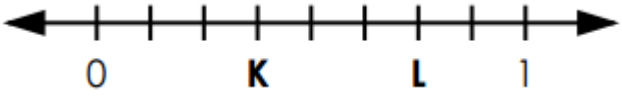
1. Draw the following number lines on the board. **Say:** In pairs, write the fractions represented by the letters on the number lines.

(a) 

(Answer: (A=$\frac{1}{4}$, B=$\frac{2}{4}$, C=$\frac{3}{4}$)

(b) 

(Answer: D=$\frac{2}{5}$, E=$\frac{3}{5}$, F=$\frac{4}{5}$)

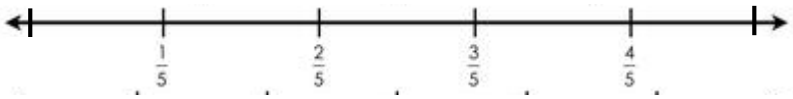
(c) 

(Answer: K=$\frac{3}{8}$, L=$\frac{6}{8}$)

2. Walk around the classroom and support pupils that are struggling.
3. Ask 8 volunteers (4 boys and 4 girls) to write one answer each on the board. **Say:** Give yourself a clap for each question you answered correctly. Gently pat your partner on the back for trying their best.

Independent Practice *(10 minutes)*

1. **Write:** Joshua took out the lace from his shoes and made five equally spaced knots.
   (a) Draw his lace.



(b) Starting from the first knot to the last knot, how man unit fractions are formed by the five knots (Answer: 5 unit fractions)

(c) What fraction of the lace is labeled at the third knot? (Answer: $\frac{3}{5}$)

2. **Say:** Please exchange your exercise books with the person next to you and compare answers. Let them do the necessary corrections.

Closing *(2 minutes)*

1. **Say:** We just learned how to identify unit and non-unit fractions with denominators 2-10 on the number line. **Say:** Fractions are units which show us the chosen number of units divided by the total number of units of the object.
2. **Say:** In our next class, we will be learning equivalent fractions with denominators up to 5.

Lesson Title: Equivalent fractions with denominators up to 5	**Theme:** Number and numeration. Everyday arithmetic - Fractions	
Lesson Number: M-03-131	**Class/Level:** Class 3	**Time:** 35 minutes

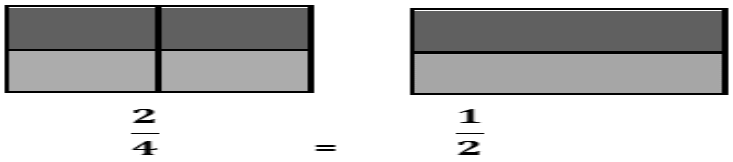
Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson, pupils will be able to identify equivalent fractions with denominators up to 5 using pictorial representation.	1. 2 Apples (or oranges or other fruit that can be easily cut into equal parts). 2. Knife.	1. Gather 2 apples, or other fruit that can be cut into equal parts. 2. Find a knife.

Opening *(2 minutes)*

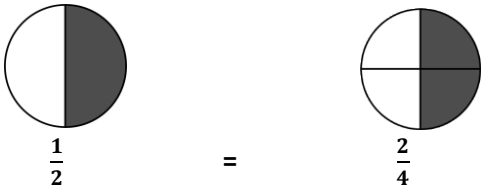
1. **Say:** Welcome to today's class. During our previous lessons, we looked at both unit and non-unit fractions and how to draw them and put them on the number line.
2. **Say:** Today we're going to learn about fractions have the same value but use different numbers in the numerator and denominator.

Introduction to the New Material *(13 minutes)*

1. **Say:** When two or more fractions have the same values but use different numbers in the numerator and denominator. Such fractions are called 'equivalent fractions'.
2. **Say:** Consider these pairs of bricks. (draw on the board)



3. **Say:** The fractions are equivalent because they take the same portion of a whole.
4. **Say:** From the above example, it can be seen that both the numerator and denominator in the first brick were divided by two (2) to get the numerator and denominator of the second brick. It can therefore be said that when both the numerator and denominator of a fraction are divided by the same number, the fraction will be an equivalent fraction.
5. **Say:** Also to get an equivalent fraction, the numerator and denominator of a fraction can be multiplied by the same number. The fraction that results will be an equivalent fraction as shown in the following example:
6. Draw the following on the board:

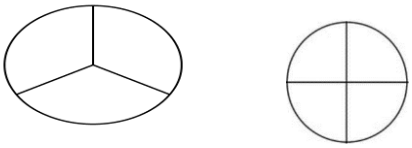


Say: Both the numerator and denominator of the fraction in the first picture were multiplied by two (2) to get the fraction of the second picture.

7. Ask 2 volunteers (1 boy and 1 girl) to the front of the class and **Say:** I have some apples I want to share with these pupils.

8. Take one apple and cut it into three equal parts and give them to the girl.
9. Take another apple and cut it into four equal parts and give them to the boy. Now **Ask:** How many pieces of the apple does the girl have? (3). **Ask:** How many pieces of the apple does the boy have? (4)
10. **Say:** No matter how many slices the apples were cut, both pupils had the same amount of apple.

Girl **Boy**



$\frac{3}{3}$ = $\frac{4}{4}$

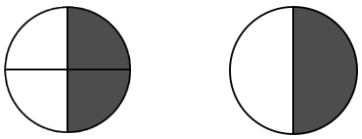
11. **Say:** From this example we can also see that two fractions which are each equal to 1 are also referred to as equivalent fractions. ($\frac{3}{3}$ = 1, $\frac{4}{4}$ = 1)

Guided Practice *(10 minutes)*

1. Draw the following on the board:
2. **Say:** Draw these in your exercise book. Work in pairs to write the missing fractions.

(a) 

$\frac{2}{2}$ = ☐ (Answer: $\frac{3}{3}$)

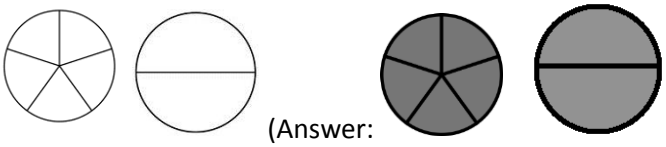
(b) 

☐ = $\frac{1}{2}$ (Answer: $\frac{2}{4}$)

3. Ask a volunteer to write the correct answers on the board.

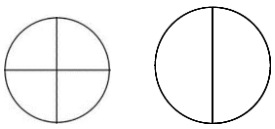
Independent Practice *(6 minutes)*

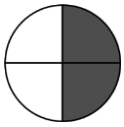
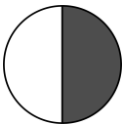
1. Write on the board: The equivalent fractions are given in these pictures. Please colour the fraction written under each picture.



(Answer:

$\frac{5}{5}$ = $\frac{2}{2}$ $\frac{5}{5}$ = $\frac{2}{2}$)



$\frac{2}{4}$ = $\frac{1}{2}$ (Answer: $\frac{2}{4}$ = $\frac{1}{2}$)

2. **Say:** Now exchange your exercise books with the person next to you and compare answers. Let them do the necessary corrections.

Closing *(4 minutes)*

1. **Say:** We just learned about equivalent fractions with denominators up to 5 using pictures.
2. **Say:** When the numerator and denominator of one fraction are multiplied by the same number, the resulting fraction is an equivalent fraction.
3. **Say:** When each of two fractions represents 1 whole, the two fractions are also equivalent.

Lesson Title: Equivalent fractions with denominators from 6 to 10	**Theme:** Number and numeration - everyday arithmetic - Fractions	
Lesson Number: M-03-132	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to identify equivalent fractions with denominators from 6 to 10 using pictorial representation.	**Teaching Aids** Paper	**Preparation** Gather 2 pieces of paper.

Opening *(2 minutes)*

1. **Say:** In our last lesson, we looked at equivalent fractions with denominators 2-5. Today we will continue by looking at equivalent fractions with denominators from 6 to 10.
2. **Ask:** Who can tell us what an equivalent fraction is? (Answer: fractions have the same value but use different numbers in the numerator and denominator.)

Introduction to the New Material *(13 minutes)*

1. Draw the following on the board. **Say:** Consider these two walls.

$\frac{1}{5}$ = $\frac{2}{10}$

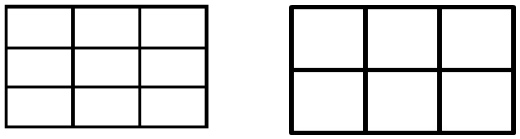
2. **Say:** The fractions are equivalent because they take the same portion of a whole. In the first picture, if we want the whole of the shaded part, we have to take one brick but in the second picture, if we want the whole of the shaded part, we'll have to take two bricks.
3. **Say:** So from this example, it can be seen that both the numerator and denominator in the first wall were multiplied by two (2) to get the numerator and denominator of the second wall. When both the numerator and denominator of a fraction are multiplied by the same number, the resulting fraction will be an equivalent fraction.
4. **Say:** Also to get an equivalent fraction, the numerator and denominator of a fraction can be divided by the same number. The fraction that results will be an equivalent fraction as shown in the following example:
5. Draw the following on the board:

$\frac{2}{10}$ = $\frac{1}{5}$

Say: Both the numerator and denominator of the fraction in the first picture were divided by two (2) to get the fraction of the second picture.

6. Ask 2 volunteers (1 boy and 1 girl) to the front of the class and **Say:** I have two sheets paper I want to share with these pupils.
7. Take one sheet of paper and cut or tear it into six equal parts and give them to the girl.
8. Take another sheet of paper and cut or tear it into nine equal parts and give them to the boy. Now **Ask:** how many pieces of paper does the girl have? (Answer: 6). **Ask:** How many pieces of paper does the boy? (Answer: 9)
9. **Say:** No matter how many pieces in which the papers were cut, both pupils have the same amount of paper because each person's pieces joined together gives us one (1) whole sheet of A4 paper.

Boy **Girl**

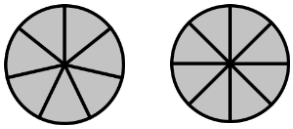


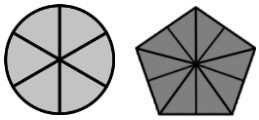
$\frac{9}{9}$ = $\frac{6}{6}$

10. **Say:** From this example we can see that, two fractions which are each equal to 1 are also referred to as equivalent fractions. Write on the board: ($\frac{9}{9}$ = 1, $\frac{6}{6}$ = 1)

Guided Practice *(12 minutes)*

1. Draw the following pictures on the board **Say:** In pairs, draw the pictures and write the missing fractions.

(a)  $\frac{7}{7}$ = ☐ (Answer: $\frac{8}{8}$)

(b)  ☐ = ☐ (Answer: $\frac{6}{6}$, $\frac{10}{10}$)

2. Ask a volunteer to write the correct answers on the board.

Independent Practice *(6 minutes)*

1. Write the following on the board:

$\frac{3}{6} = \frac{1}{2}$ $\frac{1}{4} = \frac{2}{8}$ $\frac{7}{7} = \frac{9}{9}$

2. Say: The equivalent fractions are written on the board. Please draw pictures to show each set of equivalent fractions and write the fraction under each picture. (Answer:
3. **Say:** Now exchange your exercise books with the person next to you and compare answers. Let them do the necessary corrections.

Closing *(2 minutes)*

1. **Say:** When the numerator and denominator of one fraction are multiplied by the same number, the resulting fraction is an equivalent fraction.
2. **Say:** When the numerator and denominator of one fraction are divided by the same number, the resulting fraction is an equivalent fraction.
3. **Say:** When each of two fractions represents 1 whole, the two fractions are also equivalent. e.g. ($\frac{6}{6} = \frac{10}{10}$)

Lesson Title: Adding like fractions	**Theme:** Number and numeration - everyday arithmetic - Fractions	
Lesson Number: M-03-133	**Class/Level:** Class 3	**Time:** 35 minutes

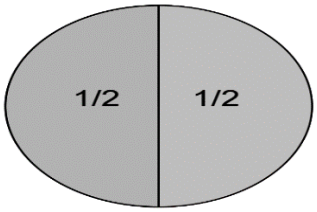
Learning Outcomes By the end of the lesson, pupils will be able to add like fractions.	**Teaching Aids** None	**Preparation** None

Opening *(2 minutes)*

1. **Say:** Today we are continuing with our number and numeration theme.
2. **Say:** Over the last couple of lessons, we have been looking at fractions. Who can tell me some of the things we have learned about fractions? (Example answers: how to draw pictures to represent unit and non-unit fractions, how to put fractions on a number line, equivalent fractions)
3. **Say:** Today we are going to look at how to add like fractions.

Introduction to the New Material *(13 minutes)*

1. **Ask:** Can anyone tell us what a like fraction is? (Answer: Fractions with the exact same denominator) Allow about three pupils to give answers (expect mixed responses). If any pupil gets the answer right, draw the rest of the class' attention to the answer provided and if no pupil manages to get the answer then you can tell them.
2. Draw the picture below on the board. **Say:** Like fractions are the results of the same unit or parts from the same whole. Please take a look at the picture below:



3. **Say:** The circle has been divided into two equal parts, so each part is half of the circle. The fraction for half as you are aware is written as, $\frac{1}{2}$
4. **Say:** The two fractions have the same denominator (2) and that makes the two fractions 'like fractions'.
5. **Say:** Like fractions can be added together, this is done by adding the numerators of the fractions and keeping the denominator unchanged.
6. **Say:** The denominators don't change because it represents the whole, and since 'like fractions' belong to the same whole, the denominators remain the same.
7. **Say:** Now let us try and add the two 'like fractions' in our picture on the board; this means: $\frac{1}{2}+\frac{1}{2}$ Write $\frac{1}{2}+\frac{1}{2}$ on the board.
8. **Say:** We know that when adding 'like fractions', the denominators remain unchanged and we add the numerators.
9. **Ask:** So what is 1 + 1? (Answer: 2)
10. **Say:** We are already aware that the denominators don't change when adding 'like fractions' so our answer will be $\frac{2}{2}$ = 1

11. **Say:** Now that we understand how it works, let us try and solve this question. Write: $\frac{4}{6}+\frac{1}{6}$ on the board.
12. **Ask:** What is 4 + 1? (Answer: 5) **Say:** So the answer is: $\frac{5}{6}$, please don't forget that the denominator doesn't change.
13. Write: $\frac{5}{10}+\frac{3}{10}$ on the board. Ask pupils to copy the question in their exercise books.
14. **Ask:** What do we do first in solving this question? (Answer: Add the numerators).
15. **Ask:** So if we add the numerators what do we get? (Answer: 8) Ask 1 volunteer to come to the board and add the numerators.
16. **Say:** Now that we have added the numerators we need to put our new numerator over the denominator which is 10.
17. Write on the board: $\frac{5}{10}+\frac{3}{10}=\frac{8}{10}$

Guided Practice *(10 minutes)*

1. Write the following equations on the board. **Say:** Work in pairs to solve the following questions and write your answers in your exercise books.
   (a) $\frac{3}{7}+\frac{3}{7}=$ (Answer: $\frac{6}{7}$) (b) $\frac{2}{9}+\frac{3}{9}=$ (Answer: $\frac{5}{9}$)
   (c) $\frac{2}{8}+\frac{1}{8}=$ (Answer: $\frac{3}{8}$) (d) $\frac{4}{5}+\frac{1}{5}=$ (Answer: $\frac{5}{5}$)
   (e) $\frac{1}{7}+\frac{3}{7}=$ (Answer: $\frac{4}{7}$)
2. Work around the classroom to support pupils. Correct those with wrong answers and explain further to those needing extra assistance.
3. Give pupils 8 minutes to work, then talk through each answer with the class.

Independent Practice *(8 minutes)*

1. On the board, write:
   (a) $\frac{5}{7}+\frac{1}{7}=$ (Answer: $\frac{6}{7}$) (b) $\frac{3}{8}+\frac{3}{8}=$ (Answer: $\frac{6}{8}$)
   (c) $\frac{3}{4}+\frac{1}{4}=$ (Answer: $\frac{4}{4}$) (d) $\frac{3}{10}+\frac{5}{10}=$ (Answer: $\frac{8}{10}$)
   (e) $\frac{1}{3}+\frac{1}{3}=$ (Answer: $\frac{2}{3}$)
2. **Say:** Please solve the following questions and write the answers in your exercise books.
3. **Say:** Exchange your exercise books with the person next to you and compare answers. Let them do the necessary corrections.

Closing *(2 minutes)*

1. **Say:** 'Like fractions' are fractions which have the exact same denominator.
2. **Say:** 'Like fractions' can be added by adding the numerators of the fractions to be added. The denominator remains the same because all 'like fractions' are part of one whole.

Lesson Title: Subtracting like fractions	**Theme:** Number and numeration - everyday arithmetic - Fractions	
Lesson Number: M-03-134	**Class/Level:** Class 3	**Time:** 35 minutes

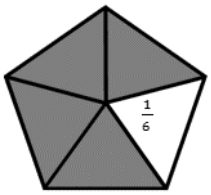
Learning Outcomes By the end of the lesson, pupils will be able to subtract like fractions.	**Teaching Aids** None	**Preparation** None

Opening *(2 minutes)*

1. **Say:** In our last lesson, we learned how to add 'like fractions' within one whole with denominators up to 10.
2. **Say:** Today we will continue by looking at subtracting 'like fractions'.

Introduction to the New Material *(13 minutes)*

1. **Say:** Let us refresh our memory about what 'like fractions' are, like fractions are fractions with the exact same denominator. e.g. $\frac{2}{7}$ and $\frac{1}{7}$
2. Draw the picture below on the board. **Say:** Like fractions are a result of the same unit or parts from the same whole. Please take a look at the picture below:



3. **Say:** The picture has been divided into six equal parts, so each part is one sixth, the fraction is written as: $\frac{1}{6}$
4. **Say:** We know that the whole is $\frac{6}{6}$, and we also know that the fraction of the non-shaded area is $\frac{1}{6}$.
5. **Ask:** How can we find the fraction for the shaded part? (Answer: Subtract the white portion from the whole.)
6. **Say:** Just like with the addition of like fractions, when subtracting like fractions, we only subtract the numerators of the fraction and leave the denominator unchanged.
7. **Say:** Since 'like fractions' belong to the same whole, the denominators remain the same.
8. Write: $\frac{6}{6} - \frac{1}{6}$ on the board.
9. **Say:** Now let us try and subtract the two 'like fractions' in our picture on the board; this means: $\frac{6}{6} - \frac{1}{6}$.
10. **Say:** We know that when subtracting 'like fractions', the denominators remain unchanged and we subtract the numerators.
11. **Ask:** So what is 6 - 1? (Answer: 5) **Say:** We are already aware that the denominators don't change when subtracting 'like fractions' so our answer will be: $\frac{5}{6}$
12. Write the answer on the board and ask pupils to copy the equation in their exercise books.
13. **Say:** Now let's try and solve this question. Write $\frac{8}{10} + \frac{1}{10}$ on the board.

14. **Ask:** What is 8 - 1? (Answer: 7) **Say:** So the answer is $\frac{7}{10}$, don't forget the denominator doesn't change.
15. Write $\frac{5}{7} - \frac{3}{7}$ on the board. Ask pupils to copy the question in their exercise books.
16. **Ask:** What do we do first in solving this question? (Answer: subtract the 3 from 5) Let pupils come up with a number of suggestions and if someone gets the answer right, draw the class' attention to it.
17. **Ask:** So if we subtract 3 from 5 what do we get? (Answer: 2) Ask a volunteer to come to the board and subtract 3 from 5.
18. **Say:** Now that we have dealt with the numerators, we need put the new numerator on the denominator which is 7.
19. On the board, write $\frac{5}{7} - \frac{3}{7} = \frac{2}{7}$

Guided Practice *(10 minutes)*

1. Group pupils into pairs and **Say:** Please solve the following questions. Write your answers in your exercise books.

   (a) $\frac{7}{7} - \frac{3}{7} =$ (Answer: $\frac{4}{7}$) (b) $\frac{8}{9} - \frac{3}{9} =$ (Answer: $\frac{5}{9}$)
   (c) $\frac{5}{8} - \frac{2}{8} =$ (Answer: $\frac{3}{8}$) (d) $\frac{4}{5} - \frac{1}{5} =$ (Answer: $\frac{3}{5}$)
   (e) $\frac{3}{7} - \frac{1}{7} =$ (Answer: $\frac{2}{7}$)
2. Walk around the classroom and support pupils with wrong answers and explain.
3. Write the answers on the board and talk through how each problem was solved.

Independent Practice *(8 minutes)*

1. **Say:** Please solve the following questions. Write the answers in your exercise books.
2. On the board, write:

   (a) $\frac{5}{7} - \frac{1}{7} =$ (Answer: $\frac{4}{7}$) (b) $\frac{8}{8} - \frac{3}{8} =$ (Answer: $\frac{5}{8}$)
   (c) $\frac{3}{4} - \frac{1}{4} =$ (Answer: $\frac{2}{4}$) (d) $\frac{5}{10} - \frac{2}{10} =$ (Answer: $\frac{3}{10}$)
   (e) $\frac{3}{3} - \frac{1}{3} =$ (Answer: $\frac{2}{3}$)
3. **Say:** Please exchange your exercise books with the person next to you and compare answers. Let them do the necessary corrections.

Closing *(2 minutes)*

1. **Say:** 'Like fractions' are fractions which have the exact same denominator.
2. **Say:** 'Like fractions' can be subtracted by subtracting the numerator of the second fraction from that of the first fraction. The denominator remains the same because all 'like fractions' are part of one whole.

Lesson Title: Word problems involving addition and subtraction of like fractions	**Theme:** Number and numeration. Everyday arithmetic Fractions	
Lesson Number: M-03-135	**Class/Level:** Class 3	**Time:** 35 minutes

 **Learning Outcomes** By the end of the lesson, pupils will be able to solve word problems involving addition and subtraction of like fractions.	 **Teaching Aids** None	 **Preparation** None

Opening *(2 minutes)*

1. **Say:** In our previous two lessons, we learned how to add and subtract 'like fractions'.
2. **Say:** We will go further in this lesson and look at word problems involving addition and subtraction of like fractions.

Introduction to the New Material *(13 minutes)*

1. **Say:** Sometimes questions involving the addition and subtraction of like fractions can be in a sentence form. Let us look at an example.
2. On the board, write: Jessica picked $\frac{3}{10}$ of a bucket of apples and Mary picked $\frac{1}{10}$ of a bucket of apples. How many buckets total did they pick? (Answer: $\frac{4}{10}$)
3. **Ask:** What is this question asking us to do? (Answer: Add the total amount of apples picked by Jessica and Mary.)
4. **Say:** To find the total number of buckets they both picked, we have to add the fractions of what they both picked. So let us solve this together.
5. Write: $\frac{3}{10} + \frac{1}{10}$ on the board.
6. **Say:** If we remember our previous lessons, to add like fractions we need to add the numerators while leaving the denominator unchanged. **Ask:** So what is 3 + 1? (Answer: 4).
7. **Say:** So our final answer will be $\frac{4}{10}$. This is the total buckets of apples both Jessica and Mary picked. Write the equation in your book.
8. **Say:** Let us look at another example.
9. **Say:** Please solve this question and write your answer in your exercise books.
10. On the board, write: Daniel ate $\frac{3}{8}$ of a cake on Wednesday and $\frac{2}{8}$ of a cake on Thursday. In total, what fraction of the whole cake did Daniel eat? (Answer: $\frac{5}{8}$)
11. **Ask:** How do we find the total fraction of cake Daniel ate? (Answer: We add $\frac{3}{8}$ to $\frac{2}{8}$.)
12. **Say:** Now that we know what to do, let us try and work it out.
13. **Say:** To add $\frac{3}{8}$ to $\frac{2}{8}$, we first need to add the numerators.
14. **Ask:** what is 3 =2 (Answer: 5). Remember when doing addition or subtraction involving like fractions, we always have to maintain the numerator.

15. **Say:** So this means the total amount of cake Daniel ate is, on the board, write out: $\frac{3}{8}$ to $\frac{2}{8} = \frac{5}{8}$
16. **Say:** Let us look at more examples.
17. On the board, write: Fred and Felicia ate a total $\frac{5}{7}$ of the apple. If Fred ate $\frac{2}{7}$ of the apple, how much apple did Felicia eat? (Answer: $\frac{3}{7}$)
18. **Ask:** Who can tell the class what can be done to find out the fraction of the apple eaten by Felicia? (Answer: Subtract what Fred ate from the total fraction of what both Fred and Felicia ate.)
19. **Say**: We all remember that when subtracting like fractions, we only subtract the numerators and leave the denominators unchanged.
20. On the board, write: $\frac{5}{7} - \frac{2}{7} = \frac{3}{7}$. **Say:** 5 – 2 equals 3
21. **Ask**: Abu Bakarr and Isata finished $\frac{2}{3}$ of the work together. If Abu Bakarr finished $\frac{1}{3}$ of the work on his own, how much of the work did Isata finish on her own?
22. **Say:** The total work done by both Abu Bakarr and Isata minus the work done by Abu Bakarr will give us the work done by Irene.
23. On the board, write: $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$. **Say:** the total work done by Isata is $\frac{1}{3}$

Guided Practice *(10 minutes)*

1. Write the following problems on the board and read them out loud to the pupils. **Say:** Please solve the following questions, write your answers in your exercise books.
   (a) Foli and Isaac shared $\frac{6}{10}$ of a box of mangoes. If Foli's share was $\frac{2}{10}$, how much did Isaac get? (Answer: $\frac{6}{10} - \frac{2}{10} = \frac{4}{10}$)
   (b) Paul washed $\frac{2}{5}$ of the dirty clothes on Friday and $\frac{2}{5}$ of the dirty clothes on Saturday. What fraction of the dirty clothes did Paul wash in total? (Answer: $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$)
   (c) A mother and child together drank $\frac{5}{9}$ of a cup of porridge. If the child drank $\frac{1}{9}$ of a cup of porridge, how much porridge did the mother drink? (Answer: $\frac{5}{9} - \frac{1}{9} = \frac{4}{9}$)
2. Walk around to each pair and inspect their work, help pairs who are struggling to read independently.

Independent Practice *(8 minutes)*

1. **Say:** Please solve the following questions, write the answers in your exercise books.
2. On the board, write:
   (a) Sam has $\frac{5}{9}$ of last week's money and $\frac{1}{9}$ of this week's money. How much money does Sam have left in total? (Answer: $\frac{5}{9} + \frac{1}{9} = \frac{6}{9}$)
   (b) Mary and Abdul both swept $\frac{3}{4}$ of the classroom together. If Mary swept $\frac{1}{4}$ by herself, how much of the classroom did Abdul sweep? (Answer: $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$)

(c) Together, Lansana and Jessica ate $\frac{5}{6}$ of a loaf of bread. Lansana ate $\frac{4}{6}$ of the loaf of bread. What fraction of the bread did Jessica eat? (Answer: $\frac{5}{6} - \frac{4}{6} = \frac{4}{6}$)

3. **Say:** Please exchange your exercise books with the person next to you and compare answers. Let them do the necessary corrections.

Closing *(2 minutes)*

1. **Say:** Today we looked at word problems involving like fractions with denominators 2-10.
2. **Say:** Like fractions can be added and subtracted by adding or subtracting the numerators of the two fractions, the denominator remains unchanged because all 'like fractions' are part of one whole.

Lesson Title: Telling the time in hours and half hours	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-136	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson pupils will be able to: 1. Tell the time in hours and half hours using a 12 hour clock face. 2. Use appropriate language to tell the time.	Clock	1. Find a 12-hour clock. 2. Draw the clocks in the Guided Practice and Independent Practice on the board.

Opening *(2 minutes)*

1. **Say:** Please turn to your partner and tell them what you know about time.
2. Let pupils talk for a minute.
3. **Ask:** What time did you get to school today? (Example answers: 7 o'clock, 8 o'clock)

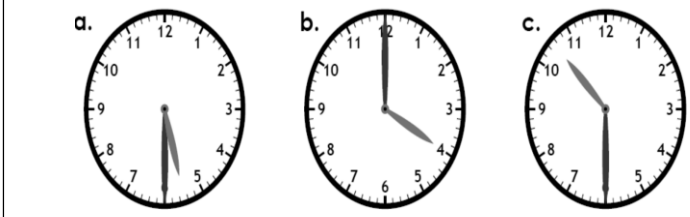
Introduction to the New Material *(10 minutes)*

1. **Say:** We are going to learn how to tell the time from a clock or watch in hours and half hours today.
2. **Ask:** How do we tell the time? (Possible answers: Reading the time from wall clocks, wrist watches, phones)
3. **Say:** Please look at the clock on the board.
4. **Say:** Tell me anything you see from the clock. Take pupils answers and write some on the board.
5. **Say:** The clock is divided into 12 parts/hours starting from 12, to 1, 2, 3, and so on up to 12 again.
6. **Say:** The clock also has 3 moving pointers or hands at in middle. The shorter or little hand indicates hours. The longer or big hand indicates minutes and the skinny one that moves very fast indicates seconds.
7. **Say:** The moving hands move from 12 to 1, 2, 3 and so on, in a 'clockwise' direction. Illustrate the above information with the clock for pupils to differentiate between the hands.
8. **Say:** When the little hand falls on a number that is hours, and when the big hand falls on a number that one is for minutes.
9. **Say:** The minutes are in intervals of 5 and that there are 60 minutes in an hour.
10. Adjust the clock so that the hour hand points to the 9 and the minute hand points to the 12.
11. **Say:** If the minute hand is pointing straight up to the 12, we know it is o'clock.
12. **Say:** Looking at the position of the pointers, the time is 9 o'clock.
13. Adjust the clock so that the minute hand points to 6 and the hour hand is half way between the 9 and the 10.
14. **Ask**: Who can tell me the time from the clock? (Answer: Half past 9.)

15. **Say:** If the minute hand is pointing to the 6, it has gone half way around the clock so we know it is half past.

Guided Practice *(10 minutes)*

Guided Practice Clocks



1. **Say:** Please look at these clocks.
2. **Say:** When the minute pointer (big hand) is on the number 6, it is '30 minutes' of half past.
3. **Say:** The time in clock a. is 5:30 or half past 5.
4. **Ask:** What is the time for clock b.? (Answer: 4 o'clock)
5. **Ask:** What is the time for clock c.? (Answer: half past 10 or 10:30)
6. Ask a volunteer to write the solutions on the board.
7. **Say:** Now, please use your pencils to draw a clock to indicate the time '1:30' or half past 1.
8. Give pupils about 2 minutes to work.
9. Go around the classroom to make sure that pupils are doing the work properly.

Independent Practice *(10 minutes)*

Independent Practice Clocks

1. **Say:** Working with your partner, draw these clocks and work out the time for each of them.
2. **Say:** You will have 10 minutes to find the time. (Answer: d) 12:30 or half past 12, e) 6 o'clock, f) 8:30 or half past 8).

Closing *(3 minutes)*

1. **Ask:** What is the time now?
2. Pupils read the time from the wall clock.
3. Write their answers on the board.
4. **Say:** Well done.

Lesson Title: Telling the time in quarters of an hour	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-137	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson pupils will be able to: 1. Tell the time in quarters of an hour using a 12 hour clock face. 2. Use appropriate language to tell the time.	Clock	1. Draw the clocks for the G1. Find a 12-hour clock. 2. Draw the clocks in the Guided Practice and Independent Practice on the board.

Opening *(2 minutes)*

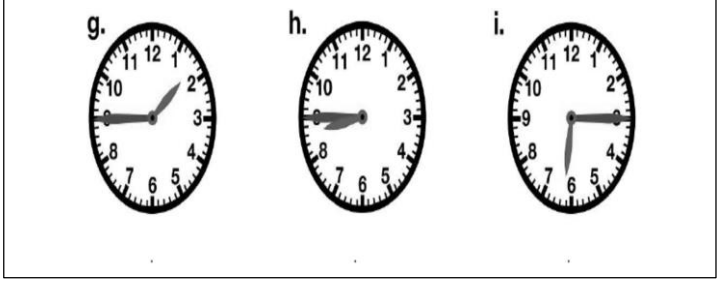
1. **Say:** Please turn to your partner and tell them what you know about hours and minutes.
2. Allow pupils a minute to talk.
3. **Ask:** What time did school finish yesterday? (Example answers: 1 o'clock, 2 o'clock)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today, we are going to learn how to tell the time from a clock or watch in quarters of an hour.
2. **Ask:** What is the time on the clock when the hour hand is between the 2 and the 3 and the minute hand is on the 6? (Answer: 2:30 or half past 2)
3. **Say:** Please look at the clock on the board. Adjust the clock to read 9:30.
4. **Ask:** Who can read the time from the clock on the board?
5. Adjust the clock to read 9:15
6. **Say:** Look on the clock and tell me anything you see from the clock. Take pupils answers and write some on the board (Possible answers: The hour hand is just past the 9, the minute hand on 3)
7. **Say:** The time on the clock is 9:15 or quarter past 9.
8. **Say:** When the minute hand is on the 3, we say it is a 'quarter past the hour'. So 9:15 is read as 'quarter past 9'.
9. Adjust the clock to read 2:45. **Ask**: What is the time on the clock?
10. **Say**: Similarly, when the minute hand is on the 9, we say it is 'quarter to the next hour'.
11. **Say:** The time on the clock is 2:45 or 'quarter to 3'.

Guided Practice *(10 minutes)*

Guided Practice Clocks

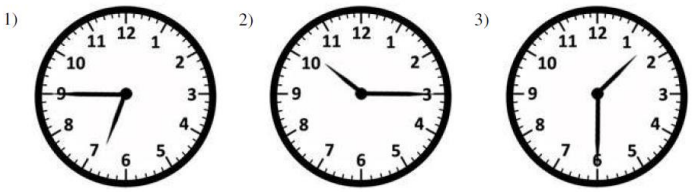


1. **Say:** Please look at these clocks.
2. **Ask:** What is the time on clock (g)? (Answer: 1:45 or quarter to 2)
3. **Ask:** Who can tell the time from clock (h)? (Answer: 8:45 or quarter to 9)
4. **Ask:** What is the time on clock (i)? (Answer: quarter past 6 or 6:15)
5. **Say:** Draw these clocks and write the time under each one.
6. **Say:** Draw a clock to indicate the time as quarter to 5.
7. Give pupils about 2 minutes to work.
8. Go round to make sure that the pupils are doing the right thing.

Independent Practice *(10 minutes)*

Independent Practice Clocks

Read the clock and write the time.



1. **Say:** Copy these clocks in your book. Working with a partner read the clocks and write down the times.
2. **Say:** You will have 10 minutes to find the times.
3. Go around the classroom to support pupils.

Closing *(3 minutes)*

1. **Ask:** What are your answers? (Answers: 1) quarter to 7 (6:45); quarter past 10 (10:15); one thirty or half past 1 (1:30))
2. Allow pupils about 2 minutes to talk.
3. Write their answers on the board.

Lesson Title: Telling the time to 5 minutes	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-138	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson pupils will be able to: 1. Tell the time to 5 minutes using a 12 hour clock face. 2. Know the number of minutes in an hour. 3. Use appropriate language to tell the time.	Clock	1. Find a 12-hour clock. 2. Draw the clocks in the Guided Practice and Independent Practice on the board.

Opening *(2 minutes)*

1. **Say:** Please turn to your partner and tell him what you know about hours and minutes.
2. Allow pupils a minute to talk.
3. **Ask:** What is the time from the clock now? (Example answers: 8:00, 9:00)

Introduction to the New Material *(10 minutes)*

1. **Say:** Today we will learn how to tell the time from a clock to 5 minutes.
2. **Ask:** What is the time on the clock when the hour hand is just past the 2 and the minute hand is on the 3? (Answer: 2:15 or quarter past 2)
3. **Say:** When the big hand is pointing to a number, each number on the clock represents 5 minutes. Count with me as I point to the numbers. 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60.
4. Adjust the clock to read 8:05 or draw the hands on the clock on the board.
5. **Say:** Please look at the clock and tell me the time. Pay attention to the position of the minute hand.
6. **Ask:** What is the time from the clock now? (Answer: 8:05 or 5 past 8). Note if there are wrong answers and correct them.
7. **Ask:** What is the position of the minute hand? (Answer: The minute hand is on the 1)
8. Adjust the clock to read 8:10 or draw the hands on the clock on the board.
9. **Ask**: Who can read the time from the clock for us? (Answer: 8:10 or 10 past 8)
10. **Ask**: What is the position of the minute hand at this time? (Answer: on 2)
11. Adjust the clock to read 8:20 or draw the hands on the clock on the board.
12. **Ask**: What is the position of the minute hand? (Answer: on 4)
13. **Ask:** What time does the clock say? (Answer: 8:20 or 20 past 8)
14. Adjust the clock to read 8:55 or draw the hands on the clock on the board.
15. **Ask**: Who can tell me the position of the minute hand? (Answer: on 11)
16. **Ask**: Who can read the time for us? (Answer: 8:55 or 55 past 8 or 5 to 9)

17. **Ask:** Who can tell me something you noticed about the movement of the minute hand as we moved from 8:00 to 8:05 to 8:10? (Possible answer: The minute hand was moving at an interval of 5.)
18. **Say**: The minute hand moves at an interval of 5 and there are 60 minutes in an hour.

Guided Practice *(10 minutes)*

Guided Practice Clocks

1. **Say:** Look at these clocks.
2. **Say:** The little hand is for the hours and the big hand is for the minutes.
3. **Say:** The time on clock (a) is 3:10 because the hour hand is just past the 3 and the minute hand is on the 2.
4. **Ask:** What is the position of the minute hand from clock (b)? (Answer: On the 11)
5. **Ask:** Who can tell the time from clock (b)? (Answer: 5:55)
6. **Say:** Work with your partner to find the time in clock (c). (Answer: 2:40)
7. **Say:** Draw the clocks in your exercise book and write the time.
8. Go around to make sure that the pupils are doing the right thing and support them.

Independent Practice *(10 minutes)*

Independent Practice Clocks

1. **Say:** Copy these clocks in your book. Working with a partner read the clocks and write down the times.
2. **Say:** You will have 10 minutes to find the times.
3. Go around the classroom to support pupils.

Closing *(3 minutes)*

1. **Ask:** What are your answers? (Answer: g) 4:45, h) 6:25, i) 8:50)
2. Allow pupils about 2 minutes to talk.
3. Write their answers on the board.

Lesson Title: Telling the time to the nearest minute	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-139	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson pupils will be able to: 1. Tell the time to the nearest minute using a 12 hour clock face. 2. Use appropriate language to tell the time.	**Teaching Aids** Clock	**Preparation** 1. Find a 12-hour clock. 2. Draw the clocks in the Guided Practice and Independent Practice on the board.

Opening *(2 minutes)*

1. **Say:** Please turn to your partner and tell him what you know about hours and minutes.
2. Allow pupils a minute to talk.
3. **Ask:** What is the time from the clock now? (Example answers: 8:00, 9:00)

Introduction to the New Material *(10 minutes)*

1. **Say:** We are going to continue to learn about time. Today we will learn how to tell the time to the nearest minute.
2. **Say:** I am going to adjust the clock to read 9:04.
3. Adjust the clock to read 9:04
4. **Say:** Look on the clock and tell me the time. Please pay attention to the position of the minute pointer.
5. **Ask:** What is the time from the clock now? (Possible Answers: 9:05, 9:04)
6. **Say:** The correct time is 9:04.
7. **Say:** Each of the small short lines in between the numbers on the clock represents one minute.
8. Adjust the clock to read 9**:**13
9. **Ask:** What is the number in minutes if the minute pointer is on 2? (Answer: 10)
10. **Say:** We are going to count the number of small lines after 2 on the clock.
11. **Ask:** How many small lines are there after 2 on the clock? (Answer: 3)
12. **Say:** That is 3 minutes. Add that to the 10 minutes.
13. **Ask:** How many minutes did you get in total? (Answer: 13)
14. **Say:** The time from the clock is therefore 9:13
15. Adjust the clock to read 9:42
16. **Ask**: Who can read the time from the clock for us? (Answer: 9:42)
17. **Ask**: How did you arrive at your answer? Please explain it to us. (Answer: I knew that the 8 was 40 minutes and then I counted on the next 2 lines, so I got 42. The time is 9:42)

18. **Say:** To read the time, first identify the hour with the little or hour hand. Then look at the position of the minute hand**.** The numbers on the clock represent 5 minute intervals and each little line is one minute. There are 60 minutes in an hour.
19. **Say**: To read the time to the nearest minute, count each of the number of smaller lines as minutes and add them up to the minute hand position.
20. Demonstrate this with the clock.

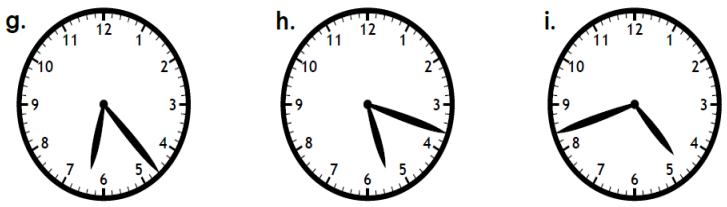
Guided Practice *(10 minutes)*

1. **Say:** Look at these clocks. Draw the clocks in your book.
2. **Say:** The shorter hand is for hours and the longer hand is for minutes.
3. **Say:** The time on clock a) is 9:29 because the hour pointer is slightly after 9 and the minute pointer is on the 4th small line after 25 minutes.
4. **Ask:** What is the position of the minute hand from clock (b)? (Answer: on the 2nd small line after 20 minutes)
5. **Ask:** What is the position of the hour hand from clock (b)? (Answer: just after 8)
6. **Ask:** Who can read the time from clock (b) for us? (Answer: 8:22)
7. **Say:** Please work with your partner to find the time for clock (c). (Answer: 10:57)
8. Go around the classroom to make sure that the pupils are doing their work correctly and support them.

Independent Practice *(10 minutes)*

1. **Say:** Copy these clocks in your book. Working with a partner read the clocks and write down the times.
2. **Say:** You will have 10 minutes to find the times.
3. Go around the classroom to support pupils.

Independent Practice Clocks



Closing *(3 minutes)*

1. **Ask:** What are your answers? (Answer: g) 6:23 h) 5:18 i) 4:42)
2. Allow pupils about 2 minutes to talk.
3. Write their answers on the board.
4. **Say:** Well done, you are getting very good at telling the time.

Lesson Title: Units of time: second, minute, hour	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-140	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson pupils will be able to: 1. Know the units of time: second, minute, hour. 2. State the relationship between them.	Clock	1. Find a 12-hour clock, with hour, minute and second hands. 2. Draw the clocks in the Guided Practice and Independent Practice on the board.

Opening *(2 minutes)*

1. **Say:** Please turn to your partner and tell them what you know about hours and minutes.
2. Allow pupils a minute to talk.

Introduction to the New Material *(10 minutes)*

1. **Say:** We are going to continue learning about time. Today we will learn about the units of time and their relationship.
2. **Say:** Please look at this clock and turn to your partner. Tell your partner anything you notice on the clock.
3. **Ask**: Who can tell me anything they noticed about the clock? (Possible answers: there is an hour hand, a minute hand, there are numbers starting from 12 going round 1, 2,3,… to 11, there are lines to represent minutes)
4. Adjust the clock to read 9:00. **Ask:** What is the time on the clock?
5. **Say:** Please look on the clock again.
6. **Ask:** How many hours are there on the clock? (Answers: 12).
7. **Say:** We are going to count the hours on the clock from 1. Let the pupils count as you point to the hours from 1 to 12.
8. **Say:** There are 12 hours on the clock.
9. Adjust the clock to read 9**:**15. **Ask:** What is the time on the clock now? (Answer: 9:15)
10. **Ask:** How many minutes are there in an hour? (Answer: 60)
11. **Say:** We are going to count the minutes on the clock from the number 1. Recall that the numbers represent 5 minutes, so let's count by 5s.
12. Let the pupil count in fives as you point to the numbers from 1 to 12.
13. **Say:** We discovered that there are 60 minutes in an hour.
14. **Say:** If you want to read the time from a clock, you must first look at the hour hand followed by the minute hand.
15. **Say:** This means that the units for measuring time are hours and minutes.

16. **Say:** There is also another unit for time called seconds. It is indicated by a thin long hand that moves faster. The seconds are very fast like your heartbeat.
17. **Say**: There are 60 minutes in an hour. Write 60 minutes = 1 hour on the board.
18. **Say**: There are 60 seconds in one minute. Write 60 seconds = 1 minute on the board

Guided Practice *(10 minutes)*

1. **Say:** Look at the problems.
2. **Say:** Let's convert 120 minutes into hours together.
3. **Say:** We know that 60 minutes = 1 hour, so 120 minutes is how many hours? (Answer: 120 minutes/60minutes = 2; 120 minutes = 2 hours)
4. **Say:** We will solve question 2 now:
   1 hour = 60 minutes
   2 hours = 2 x 60 minutes = 120 minutes
   2 hours 10 minutes = 120 minutes + 10 minutes = 130 minutes
5. **Ask:** Who can give me the answer for question 3? (Answer: 1 minute= 60 seconds, 60 x 2 = 120 seconds)

Guided Practice Problems

1. Convert 120 minutes into hours
2. Convert 2 hours 10 minutes into minutes
3. Convert 2 minutes into seconds

Independent Practice *(10 minutes)*

1. **Say:** Write the problems in your book and work with a partner to answer them.
2. **Say:** You will have 10 minutes to find the times.
3. Go around the classroom to support pupils.

Independent Practice Problems

1. Convert 2 hours 11 minutes into minutes
2. Convert 180 minutes into hours
3. Convert 3 minutes into seconds

Closing *(3 minutes)*

1. **Ask:** What are your answers?
   (Answers: 1) 131 minutes; 2) 3 hours; 3) 180 seconds)
2. **Ask:** How did you solve these problems? Allow pupils about 2 minutes to talk. (Answer: 1) 1 hour = 60 minutes, 60 x 2 =120 minutes, 120 + 11 = 131 minutes; 2) 180 ÷ 60 = 3 hours; 3) 3 x 60 = 180 seconds)
3. Address some of the challenges pupils had with the Independent Practice problems.
4. **Say:** Well done. Thank you class. Pupils say: Thank you.

Lesson Title: Estimating and measuring time in seconds, minutes, hours	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-141	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to estimate and measure time in seconds, minutes and hours.	**Teaching Aids** Clock	**Preparation** 1. Find a 12-hour clock with hour, minute and second hands. 2. Draw the clocks in the Guided Practice and Independent Practice on the board.

Opening *(5 minutes)*

1. Point to the clock.
2. **Ask:** What do you notice and know about the clock? Allow pupils to come up with various responses. (Possible answers: the hour, minute and second hands, there are numbers on the clock starting at 12 and going all the way back to 12, there are five minutes between each number on the clock, there are 60 minutes in an hour)
3. **Say:** Today we will be looking at estimating and measuring time in seconds, minutes and hours.

Introduction to the New Material *(10 minutes)*

1. **Say:** The clock tells us the time at a particular moment. As can be seen from our clock, there are three hands.
2. **Say:** The short hand is the hour hand, the long one is the minute hand and thin one is the second hand.
3. **Ask:** How many seconds make one minute? (Answer: 60 seconds)
4. **Ask:** How many minutes make an hour. (Answer: 60 minutes)
5. **Say:** The clock starts from 12 and ends at 12. There are 5 minutes between every number so for instance, between 1 and 2 there is a five minutes difference.
6. **Say:** If the minute hand is on '2' it means it reads as 10 minutes, in the same way if the minute hand is on 1, it reads as 5 minutes. Let us try to measure the time on our clock.
7. Move the hour hand to '2' and the minute hand to '4'. **Ask:** What is the time on the clock? (Answer: 2:20 or 20 past 2)

8. **Say:** The hour hand is on 2 so it means the hour is 2 hours, the minute is on 4 and that is 20 minutes because counting from 12, there are 5 minutes each between 12 and 1, 1 and 2, 2 and 3, 3 and 4; making 20 minutes.

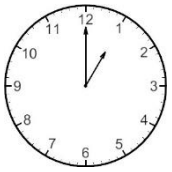
9. On the board, write the important activities that happen during the day and ask students at what times they occur. Draw the clock faces next to the times and call on volunteers to draw in the hour and minute hands to show the times for each activity.

school starts 8:00  lunch break  closing time 

10. Direct pupils attention to the second hand on the wall clock. While you time one minute, have pupils close their eyes and raise their hands when they think one minute has passed.
11. **Say:** Estimate how many letters of the alphabet I can write on the board in one minute. Have pupils time you as you write the letters of the alphabet. Together with the class, count the letters to find the total number.

Guided Practice *(8 minutes)*

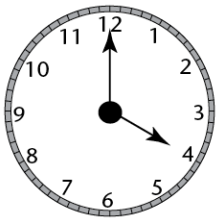
1. Write the following questions on the board and read them out loud to the pupils.
   (a) What is the reasonable unit to measure the time it takes to peel a banana? Please choose one (seconds, minutes or hours). (Answer: seconds)
   (b) What is the reasonable unit to measure the time it takes to sweep the classroom? Please choose one (seconds, minutes or hours) (Answer: minutes)
   (c) What is the time displayed on the clock:

 (Answer: 1:00, one o'clock)

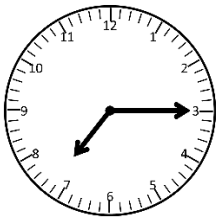
2. **Say:** In pairs, please solve the questions on the board and write your answers in your exercise books.
3. Walk around to each group and inspect their work, help out any groups that are struggling.

Independent Practice *(8 minutes)*

1. Draw the following on the board and read the questions out loud to the pupils.
   (a) What is the time displayed on these clocks:



(Answer: 4:00)



(Answer: 7:15)

(b) Draw a clock showing the time 2:15.

(Answer: 

)

2. **Say:** Solve the questions on the board and write the answers in your exercise books.
3. **Say:** Exchange your exercise books with the person next to you and compare answers. Let them do the necessary corrections.

Closing *(4 minutes)*

1. **Say:** We have looked at how to estimate and measure time in seconds, minutes and hours.
2. **Say:** We have learned that 60 seconds make up 1 minute and 60 minutes make one hour.
3. **Ask:** What is the reasonable unit to measure the time it takes to play a football match? (Answer: hours and minutes)
4. **Say:** Well done!

Lesson Title: Units of time - weeks, months, years	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-142	**Class/Level:** Class 3	**Time:** 35 minutes

 **Learning Outcomes** By the end of the lesson pupils will be able to: 1. Know the units of time: weeks, months, years. 2. State the relationship between them.	 **Teaching Aids** None	 **Preparation** Write the questions in the Guided Practice and Independent Practice on the board.

Opening *(5 minutes)*

1. **Say:** In our last lesson, we learned about estimating and measuring time in seconds, minutes and hours.
2. **Say:** Today we are continuing our lesson on measurement and estimation of time by looking at units of measurement in weeks, months and years.
3. **Ask:** Can you tell me the names of some of the months? (Answer: January, February, March, April, May, June, July, August, September, October, November, December) Allow pupils to say some of the months and write them on the board.

Introduction to the New Material *(10 minutes)*

1. **Say:** A previous lesson taught us how time can be measured in seconds, minutes and hours. Similarly, time can be measured in weeks.
2. **Say:** Seven days together make one week. **Ask:** Who can mention some of the days within a week? (Answer: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday) Allow pupils to try and mention all the days of the week and write their responses on the board.
3. **Say:** A week can be any period of seven days. It can be from Friday to Thursday, Saturday to Friday, Sunday to Saturday.
4. **Ask:** Tom said he was going to visit his uncle in Freetown for seven days, how many weeks do you think Tom will spend with his uncle (Answer: 1 week).
5. **Say:** Since we know that seven days make 1 week, therefore Tom will be spending 1 week with his uncle.
6. **Say:** In addition to weeks, time can also be measured in months and years. There are twelve months in a year, the first month is January and the last month is December. Point to the list of months written on the board.
7. **Say:** Different numbers of days make up a month. Some months are made up of 30 days (April, June, September and November), while others are made up of 31 days. (January, March, May, July, August, October, December)
8. **Say:** February is special and has 28 days or 29 days in a leap year.

9. **Ask:** If Sophia has been attending this school for 24 months, how many years has she been a pupil of this school (Answer: 2 years). **Say:** Please raise your hand if you know the answer. Allow pupils to come share their thoughts and write their answers on the board.
10. **Say:** There are 12 months in a year so if Sophia has been a pupil in this school for 24 months then it means she has been in this school for 2 years.
11. **Ask:** Who can guess the number of weeks we have in one year? (Answer: 52) **Say:** Please raise your hand if you know the answer. Call on a number of pupils to provide answers and write them on the board.
12. **Say:** There are 52 weeks in a year.
13. **Ask:** If Mr. Johnson has been the head teacher of this school for 1 year, how many weeks has Mr. Johnson been the head teacher? (Answer: 52 weeks)
14. **Say:** We have already learned that there are 52 weeks in a year so if Mr. Johnson has been a head teacher for a year, then it means he has been the head teacher for 52 weeks.
15. **Say:** A year also consists of 365 or 366 days in a lead year.

Guided Practice *(8 minutes)*

1. Read the following questions on the board to the pupils:
   (a) How many months have 31 days? Write the months that have 31 days. (Answer: 7 months; January, March, May, July, August, October, December)
   (b) How many months make up 1 year? Write the months of the year in order. (Answer: 12 months; January, February, March, April, May, June, July, August, September, October, November, December)
   (c) Write down two sets of days representing a week. (Answer: Sunday to Saturday; Monday to Sunday; Tuesday to Monday; Wednesday to Tuesday; Thursday to Wednesday; Friday to Thursday; Saturday to Friday)
2. **Say:** In pairs, solve the questions on the board and write your answers in your exercise books.
3. Walk around to each group and support pupils as they work.
4. Ask volunteers to write their answers on the board and explain to the class how they answered the questions.

Independent Practice *(10 minutes)*

1. Read the following questions on the board to the pupils:
   (a) How many months have 30 days? Mention them (Answer: 4 months; April, June, September, November)
   (b) How many days are there in 1 year? (Answer: 365 or 366 days in a leap year)
   (c) How many weeks are there in a year? (Answer: 52 weeks)
   (d) How many days make up a week? (Answer: 7 days)
2. **Say:** Please write these questions in your exercise book and write the answers.
3. **Say:** Exchange your exercise books with the person next to you and compare answers and let them do the necessary corrections.
4. Have 4 volunteers (2 boys and 2 girls) write their answers on the board.

Closing *(2 minutes)*

1. **Say:** We have looked at units of measurement using weeks, months and years.
2. **Say:** We have learned that there are 12 months in a year, 365 days in a year and 52 weeks in a year.
3. **Say:** In our next lesson, we will continue to study estimation and measurement of time by looking at how to estimate and measure time using weeks, months and years.

Lesson Title: Estimating and measuring time in weeks, months, years	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-143	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes By the end of the lesson, pupils will be able to estimate and measure time in weeks, months and years.	**Teaching Aids** None	**Preparation** Write the questions in the Guided Practice and Independent Practice on the board.

Opening *(2 minutes)*

1. **Say:** We have been learning about time in our previous lessons. We have estimated and measured time in seconds, minutes and hours.
2. **Say:** We have also learned about another group of units in measuring time: weeks, months and years.
3. **Say:** Today we are continuing our lesson on measurement and estimation of time by looking at estimating and measuring time in week, month and year.

Introduction to the New Material *(13 minutes)*

1. **Ask:** If Angela left for a 2-week vacation on December 4th, when did she return from her holidays? (Answer: December 28th). **Say:** Please raise your hand if you know the answer to this question.
2. **Say:** Angela went on holidays for two weeks. **Ask:** How many days are in a week? (Answer: 7 days).
3. **Say:** If there are seven days in a week, then there are 14 days in two weeks. (2 x 7 = 14)
4. Write on the board: 4th December + 14 days (14 + 4 = 28) **Say:** So Angela returned on the 28th of December.
5. **Ask:** Can anyone guess the unit of measurement of a school term? (Answer: weeks). Allow pupils to come up with ideas and be ready for mixed responses.
6. **Say:** A school term consists of about 15 weeks therefore, the unit of measuring the school term period is weeks.
7. **Ask:** If Sillah was born on 1st January and Assiatu was born on June 30th of the same year, how much older is Sillah? (Answer: 6 months)
8. **Say:** Please raise your hand if you know the answer. Choose about 3 volunteers to provide answers and write them on the board.
9. **Say:** Since Sillah and Assiatu were all born in the same year, it means we will be working with months.
10. **Say:** So between January 1st and June 30th, let us write the months in-between those dates, there is (write on the board): January, February, March, April, May and June.
11. Count the total number of months together with the class.
12. **Say:** So Sillah is 6 months older than Assiatu.

13. **Ask:** Can anyone guess how many years every FIFA World Cup is organised? (Answer: 4 years) Allow pupils to guess a couple of times before telling them the answer.
14. **Say:** So now we know that every World Cup is organised after every 4 years.
15. **Ask:** If the last World Cup was organised in 2014, when will the next one be organised? (Answer: 2018)
16. Allow pupils to come up with their own suggestions and write them on the board.
17. **Say:** Now let us find out if you are right.
18. **Say:** If the last World Cup was organised in 2014 and we know that the next World Cup will be organised after four years, then the next World Cup will be (write on the board):
    2014 + 4 years = 2018
19. **Ask:** If Osman was born on 1st April 2001 and Joseph was also born on 1st April 2003, what is the difference between Osman and Joseph's age? (Answer: 2 years)
20. **Say:** The difference between their ages is 2 years because from 2001 to 2002 is 1 year and from 2002 to 2003 is also another 1 year, you add it together and you get 2 years.

Guided Practice *(8 minutes)*

1. Read the following questions on the board out loud to the pupils:
   (a) If I travelled to visit my brother on March 2nd and returned on March 16th, how many weeks did I spend with my brother? Write your answer in weeks. (Answer: 2 weeks)
   (b) If today is 12th November and the Sierra Leone election was on 12th June, how long ago was the Sierra Leone election? Write your answer in months. (Answer: 5 months)
   (c) If the World Cup is organised every four years and the last one was organised in 2014, when was the last one before that organised? (Answer: 2010)
   (d) The annual examination started on March 20, 2003 and ended on April 3, 2003. How long did the examination continue? (Answer: 2 weeks)
2. **Say:** In pairs, please solve the questions and write your answers in your exercise books.
3. Walk around and help any pairs that are struggling.
4. Ask 4 volunteers to explain how they answered each question. **Say:** If you agree with the answer put your hands on your head.

Independent Practice *(10 minutes)*

1. Read the following questions on the board out loud to the pupils:
   (a) Yvonne's vacation is from June 15th to July 6th. How long is Yvonne's vacation? Write your answer in weeks. (Answer: 3 weeks)
   (b) Hawa's appointment with the doctor was on February 10th. The doctor wants to see Hawa again in six months. In which month should Hawa make an appointment? (Answer: August)
   (c) I left for Freetown on May 9, 2016 and returned on June 8th 2016. How long did I remain away from home? (Answer: 1 month)
   (d) Emmanuel rented a house on 1st January, 2016. If he rented the house for two years, which year is he expected to move out of the house? (Answer: 2018)
2. **Say:** Please solve the following questions and write the answers in your exercise books.

3. **Say:** Please exchange your exercise books with the person next to you and compare your answers. Let them do the necessary corrections.

Closing *(2 minutes)*

1. **Say:** We have looked at how to estimate and measure time in weeks, months and years.
2. **Say:** Let us review one last example. If Karim is enrolled in a class in 2016 and he is supposed to be in the class for three years, what year is he is expected to complete the class?
   (Answer: He is expected to complete the class in 2019 because 2016 + 3 = 2019)
3. **Say:** Good work, class! In our next lesson, we will continue to look at estimating and measuring of time by looking at how to compare and order time by seconds, minutes, hours, days, weeks, months, and years.

Lesson Title: Comparing and ordering time	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-144	**Class/Level:** Class 3	**Time:** 35 minutes

 **Learning Outcomes** By the end of the lesson, pupils will be able to compare and order time: in seconds, minutes, hours, weeks, months, years.	 **Teaching Aids** None	 **Preparation** Write the questions in the Guided Practice and Independent Practice on the board.

Opening *(2 minutes)*

1. **Say:** We have been learning about time in our previous lessons. We have so far learned how to estimate and measure time in seconds, minutes, hours, weeks, months and years.
2. **Say:** Today we are continuing our lesson on measurement and estimation of time by comparing and ordering time in seconds, minutes, hours, weeks, months and years.
3. **Ask:** Both Ali and Mohammed are running towards the school's main gate. If Ali can get there in 1 minute 50 seconds and Mohammed can get there in 2 minutes. Who will be at the main gate first? (Answer: Ali)

Introduction to the New Material *(13 minutes)*

1. **Say:** Three boys, Abdul, Ahmed and Emmanuel, are running the 100m race. Abdul finished in a time of 20 seconds, Ahmed finished in a time of 14 seconds and Emmanuel finished in a time of 18 seconds.
2. **Ask:** Compare and order the times to show who finished first in the race and who finished last. (Answer: Ahmed, Emmanuel, Abdul)
3. Allow pupils to deliberate amongst themselves for about 30 seconds and then **Say:** Let me have a show of hands from those who were able to solve the question.
4. Call about four volunteers to give their answers and write them on the board.
5. **Say:** Let's solve it together to check our answers.
6. Write each runner and the time they ran on the board. **Say:** As we are looking for the person who finished the race first, it means we are looking for the one who used the least amount of time to run.
7. **Say:** As Ahmed used 14s to run, it means he ran the fastest and completed the race first, followed by Emmanuel who ran 18s. Abdul was the last person in the race because he used the most amount of time in running at 20s.
8. **Say:** Let us look at another example.
9. **Say:** Three pupils are trying to find out who can sweep the classroom floor the quickest. Patricia used 1hr 35m to sweep, Samuel used 1hr 12m to sweep and Elizabeth used 1hr 15m to sweep. **Say:** Compare the times the pupil used to sweep and order them from slowest to quickest. (Answer: Patricia, Elisabeth, Samuel)

10. Allow pupils to talk amongst themselves for about 30 seconds and then **Say:** Let me have a show of hands from those who were able to solve the question. Call about 2 volunteers to give their answers and write them on the board. **Say:** Let's check our answers.
11. **Say:** To arrange times in order from slowest to quickest means arranging from the last to the first, so in this case, we are arranging according to the one who took more time sweeping to the one who took the least amount of time sweeping.
12. Write each pupil's name and the time they used on the board. Compare the times together with the class. **Say:** From the times used, it can be seen that Patricia used the most time in sweeping, followed by Elisabeth and then Samuel.
13. **Say:** There are four children in a taxi: Mary, Momoh, Paul, and Isha.
14. **Say:** Mary is 10 years 2 months old, Momoh is 10 years 6 months old, Paul is 12 years old and Isha is 10 years 4 months old. **Say:** Compare and order the ages according to the youngest to the oldest. (Answer: 10 years and 2 months, 10 years 4 months, 10 years 6 months, 12 years)
15. Write the pupil's responses on the board before you show them the correct answer.

Guided Practice *(8 minutes)*

1. Read the following questions on the board out loud to the pupils:
   (a) It takes 2hrs 35m 15s to wash the dishes, 1hr 45m 10s to wash the children, and 3 hrs to wash the clothes. Compare the times needed to wash each thing and order them from the shortest time required to wash to the longest time required. (Answer: children, dishes, clothes)
   (b) Three children were born this morning at the hospital. Juma was born at 1:23am, Andrew was born at 12:50am and Sallay was born at 4:00am. By comparing the times they were born, arrange the children in the order of the oldest to the youngest. (Answer: Andrew, Juma, Sallay)
   (c) Mr. Omar is planning on sending three letters to three cities in the England. The letter to Manchester will take 2 weeks 5 days, the letter to Norwich will take 2 weeks, and the letter to Ipswich will take 2 weeks 4 days. Compare the times needed for each letter to reach the destination and arrange the cities which will receive the letters from first to last. (Answer: Norwich, Ipswich, Manchester)
2. **Say:** In pairs, please solve the questions on the board and write your answers in your books.
3. Invite 3 volunteers to explain how they solved each problem. **Say:** If you agree give your friends a thumbs up.

Independent Practice *(10 minutes)*

1. Read the following questions on the board out loud to the pupils:
   (a) Order these times from the shortest to the longest.
   10hrs 35m 12s 10hrs 30m 15s 20hr 12m 10s
   20hrs 12m 00s 12hrs 40m 20s 18hrs 15m 12s
   (Answer: 10hrs 30m 15s, 10hrs 35m 12s, 12hrs 40m 20s, 18hrs 15m 12s, 20hrs 12m 00s, 12hrs 40m 20s)
   (b) Order the following times from the longest to the shortest.

12 ears 8 months 3 weeks 10 years 2 months 1 week 10 years 2 months 2 weeks
(Answer: 12 years 8 months 3 weeks, 10 years 2 months 2 weeks, 10 years 2 months 1 week)

2. **Say:** Please solve the following questions and write the answers in your exercise books.
3. **Say:** Please exchange your exercise books with the person next to you and compare answers. Let them do the necessary corrections.

Closing *(2 minutes)*

1. **Say:** In today's lesson, we looked at how to compare and order time.
2. **Say:** Order these times from the earliest to the latest. 8:35:12, 8:35:02, 9:12:00. (Answer: 8:35:02, 8:35:12, 9:12:00)
3. **Say:** In our next lesson, we will continue to study estimation and measurement of time by looking at word problems about time.

Lesson Title: Word problems about time	**Theme:** Measurement and Estimation - Time	
Lesson Number: M-03-145	**Class/Level:** Class 3	**Time:** 35 minutes

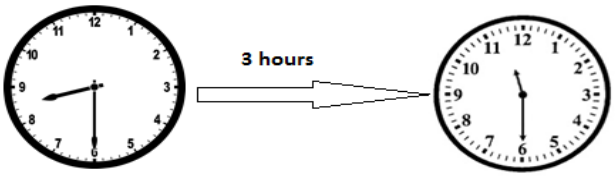
 **Learning Outcomes** By the end of the lesson, pupils will be able to solve word problems about time involving seconds, minutes, hours, weeks, months, and years (not conversion).	 **Teaching Aids** None	 **Preparation** Write the questions in the Guided Practice and Independent Practice on the board.

Opening *(2 minutes)*

1. **Say:** We have been learning about time in our previous lessons. We have looked at how to estimate, measure and order time in seconds, minutes, hours, weeks, months and years.
2. **Say:** Today we are continuing our lesson on measurement and estimation of time by looking at word problems about seconds, minutes, hours, weeks, months and years.

Introduction to the New Material *(13 minutes)*

1. **Ask:** Jonathon was 9 years old on July 2nd. Rugiatu was nine years old on July 23rd. How many days older is Jonathon? How many weeks older is Jonathon? (Answer: 21 days, 3 weeks)
2. **Say:** Please raise your hand if you know the answer. Allow about 3 pupils to try and solve the question. **Say:** Now turn your attention to the board and let us all try and work on it together.
3. **Say:** Since Jonathon and Rugiatu are both nine years old, it means they were both born in the same year. **Say:** We have been told that they were both born in July, so to find the difference in their ages, we have to subtract 2 from 23 which is 21, so Jonathon is older than Rugiatu by 21 days. **Say:** From our previous lessons, we know there are 7 days in a week so 21 days is equal to 3 weeks; Jonathon is older than Rugiatu by 3 weeks.
4. **Say:** Let us see how many of you can correctly work out the following question.
5. **Say:** A dress took only 13 days to make. The dress was finished and ready to be worn for the first time on May 27, what day did they begin making the dress? (Answer: May 14)
6. Ask 1 volunteer to come to the front of the class and write their answer on the board.
7. **Ask:** Did anyone get a different answer than what is on the board?
8. If some pupils got different answers, call two more volunteers to write their answers on the board.
9. **Say:** Let us work out the question together. Since the dress was started 13 days ago, it means we must subtract 13 from 27 which will give us 14. So it means the movie was started on 14th May.
10. **Ask:** Victor left home at 8:30 am for school. He returned home at 11:30 am. How long was he away from home? (Answer: 3 hours)

11. Draw 

on the board.
12. **Say:** From the clock, we can see that 3 hours passed between 8:30 am and 11:30 am.
13. **Ask:** David was admitted to hospital on 1st June 2003 and was discharged from hospital on 29th June, 2003. How many weeks was he in hospital? (Answer: 4 weeks)
14. **Say:** Let us find out how many weeks David spent in the hospital. Since he stayed at the hospital from 1st June until 29th June, it means he spent 28 days in the hospital and from our previous lessons we learned that there are 7 days in one week so 28 days is equal to 4 weeks.
15. **Write:** When Samuel finishes his examination in March 2017, he will start his secondary school education 6 months later. **Ask:** In which month is Samuel expected to start his secondary school education? (Answer: September, 2017)
16. **Ask:** If Mr. Morrison arrived at the meeting at 9:20am and he was 10 minutes late, when did the meeting start? (Answer: 9:10 am)
17. **Say:** Please raise your hand if you know the answer to this last question.
18. Ask a volunteer to write the answer on the board. **Say:** Let us solve the question together as a class.
19. **Say:** Since Mr. Morrison was 10 minutes late, we need to subtract 10 minutes from 9:20 am and that'll give us 9:10am. **Say:** So this means the meeting started at 9:10 am.

Guided Practice *(8 minutes)*

1. Read the following questions on the board out loud to the pupils:
   (a) Many airlines make you purchase a ticket 2 weeks before your flight. If Raymond is leaving on March 22nd, on what day should he purchase his ticket? (Answer: March 8th)
   (b) Mr. Williams left on a 3 week holiday on 3rd January, when did he return from his holidays? (Answer: 24th January)
   (c) If Mary arrived at the guest house on June 10th and left on September 10th. How long did Mary stay at the guest house? (Answer: 3 months)
   (d) Joshua is 3 months older than Mohammed. Joshua is 1 year old, how old is Mohammed? (Answer: 9 months old)
2. **Say:** In pairs, please solve the following questions and write your answers in your exercise books.
3. Walk around and support pupils.
4. Ask 4 volunteers to explain how they solved the problems. **Say:** If you got the same answer put your hands on your head.

Independent Practice *(10 minutes)*

1. Read the following questions on the board out loud to the pupils:
   (a) Sankoh and Joshua are running to school. Sankoh took 2mins 50s to reach school and Joshua took 2 minutes 45 seconds to reach school. Who got to school first? (Answer: Joshua)

(b) Christopher walks for 10 minutes 10 seconds to the junction, he takes an poda poda which takes another 10 minutes 15 seconds before it gets to his school. What is Christopher's total travel time from his house to his school? (Answer: 10:10 + 10:15 = 20 minutes 25 seconds)

(c) The school prefect came to school at 8:20 am. The teacher on duty wasn't happy because the school prefect was late by 30 minutes. What time was the school prefect supposed to come to school? (Answer: 7:50 am)

2. **Say:** Solve the following questions and write the answers in your exercise books.
3. **Say:** Please exchange your exercise books with the person next to you and compare answers.

Closing *(2 minutes)*

1. **Say:** Today we have learned how to solve word problems about time.
2. **Ask:** Francis was born on 31st May. His cousin Prince was born on 31st December of the same year. How much older is Francis than Prince? (Answer: 7 months)
3. **Say:** In our next lesson, we will be learning how to measure and estimate volume using standard units of measurement. Please try and find household boxes like tea bag boxes, cereal boxes, and also bring a ruler.

Lesson Title: Estimation and Measurement of Volume using Standard Units of Measurement	**Theme:** Measurement and Estimation - Volume and Capacity	
Lesson Number: M-03-146	**Class/Level:** Class 3	**Time:** 35 minutes

 **Learning Outcomes**	 **Teaching Aids**	 **Preparation**
By the end of the lesson, pupils will be able to estimate volume using standard units and everyday language.	1. Rulers, in the previous lesson pupils were asked to bring them. 2. 1-inch cubes 3. Different-sized cubes and cuboids.	1. Find, or make, 1-inch cubes made of wood or plastic. 2. Gather examples of cubes and cuboids, e.g. cereal boxes, tea bag boxes.

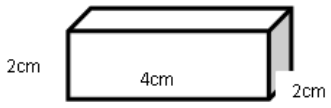
Opening *(5 minutes)*

1. On the board, write: estimation, measurement, volume. **Ask:** What do these words mean?
2. Listen to all answers provided by pupils before explaining the terms. (Answer: estimation means to make a close guess; measurement means giving a number of units to an object, volume means the amount of space occupied by an object or substance)
3. **Say:** Volume can be measured in different units (millimetres, centimetres, metres, inches)
4. **Say:** Because volume is the amount of space occupied by an object, it has to be measured in three dimensions; the width, length and height and expressed in cubic units. For example, if the shape is measured in centimetres (cm), the volume of the object will be measured in cubic centimetres (cm^3).
5. **Ask:** If an object is measured in metres (m), what will be the volume of that shape be measured in? (Answer: cubic metres or m^3)

Introduction to the New Material *(10 minutes)*

1. **Ask:** Can you give one example of an object for which we can measure the volume? (Answer: household boxes, cylinder, jerry cans)
2. **Say:** Let us try to investigate how volume works. **Say:** I'm going to take one household box and fill it up with 1-inch cubes.
3. **Ask:** How many of these cubes do you think will fill up the whole box I am holding? (Answer: Accept all answers.)
4. **Ask:** How many 1-inch cubes does it take to fill up/make up the length of the box?
5. Measure with the class. **Say:** Please write the answer in your book.
6. **Ask:** How many 1-inch cubes does it take to fill up/make up the width of the box?
7. Measure with the class. **Say:** Please write the answer in your book.
8. **Ask:** How many 1-inch cubes does it take to fill up/make up the height of the box?
9. Measure with the class. **Say:** Please write the answer in your book.
10. **Say:** Let's count the number of 1-inch cubes it takes to fill the box, write down the total number of cubes in your exercise books.

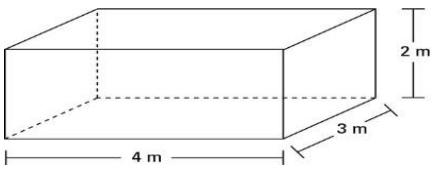
11. **Say:** The volume of an object can also be calculated by multiplying the length, the width and the height.
12. Write this formula for finding volume on the board as:
    Volume = L x W x H (Volume = length x width x height)
13. **Say:** Let's use a ruler to measure (in inches) the length, width and height of the box.
14. **Say:** Multiply the length by the width by the height.
15. **Ask:** What is the answer for the volume of the box?
16. **Ask:** Is your answer the same as the total number of cubes we used to fill the box? (Answer: yes)
17. **Say:** Now let us look at other examples on how to calculate and write volume.
18. **Ask:** A box is 4 inches wide, 6 inches long and 2 inches high. What is the volume?
19. **Say:** Look at the board. We know the volume of an object is the length multiplied by the width and by the height.
20. On the board, write: Volume = L x W x H = 4 x 6 x 2 = 24 x 2 = 48 cubic inches or $48in^3$
21. Draw a rectangle on the board and put measurements on the length and width as shown below.



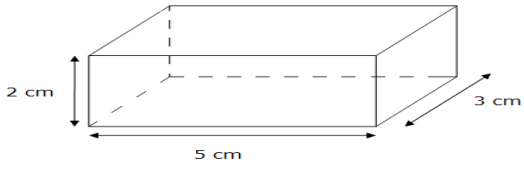
22. **Say**: Let us find the volume of the box on the board. We know volume = length x width x height.
23. **Say**: Therefore the volume = 4 x 2 x 2 = 16 cubic centimetres or $16cm^2$.

Guided Practice *(12 minutes)*

1. Draw the following boxes on the board.
2. **Say:** In pairs, please calculate the volume for these boxes.

(a) 

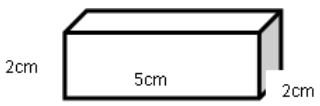
(Answer: 4 x 3 x 2 = $24m^3$)

(b) 

(Answer: 5 x 2 3 = $30cm^3$)

3. Go around the class and check each group's work. Support those who are struggling.
4. Ask 2 volunteers to explain their answer and write it on the board.

Independent Practice *(5 minutes)*



1. **Say:** Please calculate the volume for this box. (Answer: $20cm^3$)
2. **Say:** Please compare your answers with the person sitting next to you.

3. Let pupils do their corrections.

Closing *(3 minutes)*

1. **Say:** We learned how to estimate and measure the volume of objects today.
2. **Ask:** What are some of the units that volume can be measured in? (centimetres, metres, millimetres, inches)
3. **Say:** Since volume is the amount of space occupied by an object, it has to be measured in 3 dimensions. Thus volume is expressed as cubic units, e.g. cubic metres (m^3).
4. **Ask:** If an object has its length, width and height in inches, in what unit will its volume be? (Answer: cubic inches, in^3)

Lesson Title: Comparing and ordering volume using standard units	**Theme:** Estimation - Volume and Capacity	
Lesson Number: M-03-147	**Class/Level:** Class 3	**Time:** 35 minutes

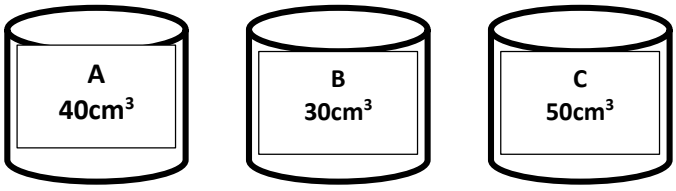
Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson, pupils will be able to compare and order volume using standard units and everyday language.	1. 2 bowls 2. Rice	Find 2 bowls of different sizes, and some rice.

Opening *(2 minutes)*

1. Write 'compare' and 'order' on the board. **Ask:** Can anyone tell us what each word means?
2. Listen to all the answers provided by pupils before explaining the terms. (Answer: compare means to note any similarities or difference between two items, order means to arrange items, e.g. from biggest to smallest or smallest to biggest)
3. **Say:** In today's lesson, we are going to learn how to compare objects with different volumes and also how to order those objects.

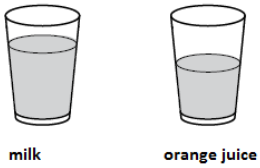
Introduction to the New Material *(14 minutes)*

1. Put the two bowls in front of the class. **Ask:** Which one do you think has the biggest volume? Allow pupils to discuss among themselves for about 30 seconds and then ask two volunteers (1 boy and 1 girl) to tell the class which one they think has the biggest volume.
2. Ask 1 volunteer to come to the front of the class and fill one bowl with rice. Ask the pupil to now pour the rice into the other bowl. If the second bowl can't contain all the rice then say to the class that the first bowl has a bigger volume than the second bowl.
3. Draw these 3 cylinders on the board:



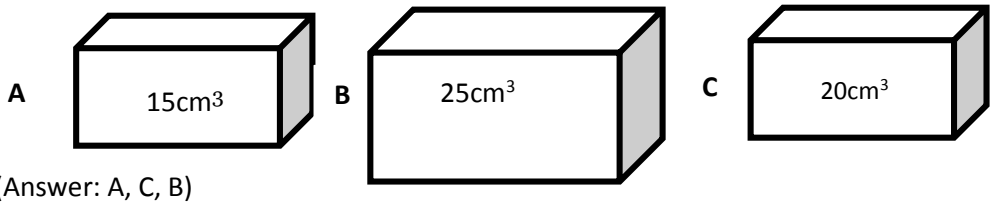
4. **Say:** I have three cylinders of different volumes. Arrange them from the one with the greatest volume to the one with the least volume.
5. Ask 3 volunteers to write their answers on the board.
6. **Say:** From the three cylinders, it can be seen that cylinder 'C' has the greatest volume, followed by cylinder 'A'.
7. **Say:** Cylinder 'B' has the least volume.
8. **Say:** If we are to order the cylinders from the one with the least volume to the greatest volume, the order will be; cylinder 'B', cylinder 'A', cylinder 'C'.

9. **Say:** Now let us look at another example.
10. Draw these glasses on the board.



11. **Say:** Compare the two glasses below. Which one has the least volume?

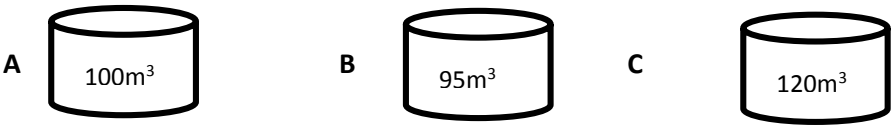
12. **Say:** Please raise your hand if you know which glass has the least volume.
13. **Say:** It can be seen from the picture that the volume of milk is greater than the volume of orange juice.
14. **Say:** Compare and order the following objects from the one with the least volume to the one with the greatest volume.



(Answer: A, C, B)

Guided Practice *(10 minutes)*

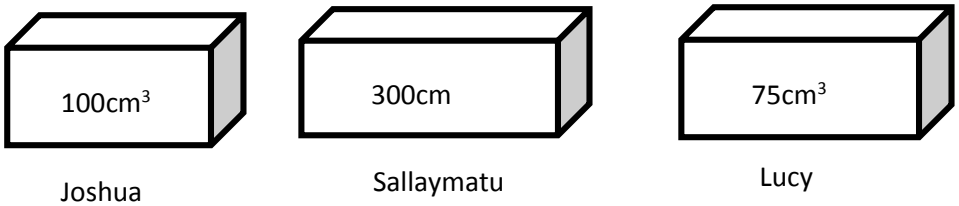
1. Draw the following barrels on the board.
2. **Say:** Mr. Frank has three barrels in his house and each barrel has a specific volume. The pictures on the board represent each barrel and their volumes.



3. **Ask:** Which barrel has the highest volume? (Answer: C)
4. **Ask:** Which barrel has the lowest volume? (Answer: B)
5. **Say:** In pairs, order the barrels from the lowest volume to the highest volume. (Answer: B, A, C)
6. **Say:** Order the barrels from the highest volume to the lowest volume. (Answer: C, A, B)
7. Walk around the classroom and support each pair as they work. Help out any groups that are struggling.

Independent Practice *(7 minutes)*

1. Draw the following on the board and **Say:** Three pupils are each given a box of different dimensions.:



2. **Ask:** Who has the box with the highest volume? (Answer: Sallaymatu)
3. **Ask:** Who has the box with the least volume? (Answer: Lucy)
4. **Say:** Order the pupils' boxes according to the highest to the least volumes. (Answer: Sallaymatu, Joshua, Lucy)
5. **Say:** Order the pupils' boxes from the least to the highest volumes. (Answer: Lucy, Joshua, Sallaymatu)
6. **Say:** Exchange your exercise book with the person sitting next to you and compare answers.
7. **Say:** Those who had some of the questions wrong should now do their corrections.

Closing *(2 minutes)*

1. **Say:** We looked at how to compare and order volume using standard units.
2. **Ask:** In which ways can volume of objects be ordered? (Answer: From biggest to smallest and from smallest to biggest.)
3. **Say:** In our next lesson we will continue by learning about how to estimate and measure the capacity of objects.
4. **Say:** Everyone should bring a jug or cup to tomorrow's lesson.

Lesson Title: Estimation and measurement of capacity using standard units of measurement	**Theme:** Measurement and Estimation - Volume and Capacity	
Lesson Number: M-03-148	**Class/Level:** Class 3	**Time:** 35 minutes

 **Learning Outcomes** By the end of the lesson, pupils will be able to estimate capacity using standard units and everyday language.	 **Teaching Aids** 1. Household jugs or cups, in the previous lesson pupils were asked to bring them. 2. 1 litre bottle and some 500ml bottles. 3. Sand 4. 2 measuring jugs	 **Preparation** 1. Gather some jugs and cups. 2. Find a 1litre bottle, and some 500ml bottles. 3. Collect some sand. 4. Find 2 graduated measuring jugs.

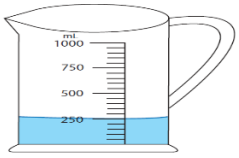
Opening *(4 minutes)*

1. Write 'estimation', 'measurement' and 'capacity' on the board. **Ask:** Can anyone tell us what each word means?
2. Listen to all the answers provided by pupils before explaining the terms. (Answer: estimation means to guess, measurement means giving a number to an object capacity means the maximum amount a container can hold)
3. **Say:** Capacity can be measured in different units (litres, millilitres, gallons, pints)
4. **Say:** Capacity is only used in relation to containers and generally refers to liquid measurements.

Introduction to the New Material *(15 minutes)*

1. **Ask:** Can you give one example of an object for which we can measure the capacity? (Example answer: jerry can)
2. **Say:** Let us see how capacity works.
3. Let pupils fill the household jugs or cups they brought with sand. Pick up one of the 500ml bottles and **Ask:** Do you think this bottle can hold the total amount of sand in your cups and jugs? (anticipate both 'yes' and 'no' answers)
4. **Say:** Let us find out from a couple of you. Ask two girls to come to the front of the class and fill one bottle each with the sand they have in their cups and jugs to know whether their estimation was right or wrong. Repeat the process by letting two boys also fill the bottles with sand from their cups and jugs.
5. Now pick up the 1L bottle and **Say:** This bottle has a capacity of 1L, let us find out how many bottles of sand from the 500ml bottle can fill a 1L bottle. Call on a pupil to come to the front of the classroom, fill up one 500ml bottle and ask him/her to pour it into the 1L bottle. Repeat until the 1L bottle is full.
6. **Ask:** How many 500ml bottles make a 1L bottle? (Answer: 2)
7. **Say:** So it means that 1L = 2 x 500ml which is also equal to 1000ml.

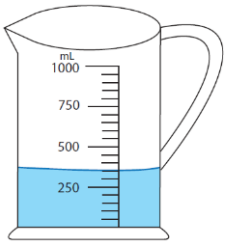
8. **Say:** We can also measure capacity by using measuring jugs. These measuring jugs have been marked with the exact capacities so it is easier to know how much water or liquid is in the jug.
9. Pick up a measuring jug and **Say:** This measuring jug has a full capacity of 1000ml.
1. Fill a small cup with sand and **Say:** I want to know the capacity of my cup, so I am going to use the measuring jug to measure. Pour the sand into the jug. Read the measure from the jug out loud.



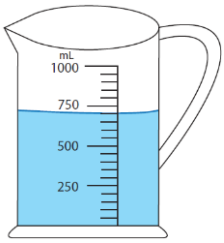
2. Call 4 volunteers to come and measure the capacity of sand they have in their household cups and jugs.

Guided Practice *(10 minutes)*

1. Draw the following pictures on the board. **Say:** I wanted to measure the capacity of 2 different bowls. I filled the bowls up with water, then poured it into these measuring jugs.

(a) 

(Answer: 350ml)

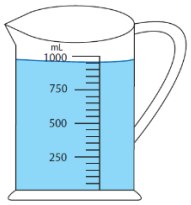
(b) 

(Answer: 700ml)

2. **Say:** In pairs, please find the capacity of water in these measuring jugs.
3. Go around the classroom and check each group's work and help out any groups that are struggling to get the reading right.

Independent Practice *(4 minutes)*

1. On the board, draw:



2. Say: I filled a bottle up with water and wanted to measure the capacity, so I used a measuring jug.
3. **Ask:** What is the capacity of my bottle? Use the measuring jug drawn on the board to help you. (Answer: 950ml)
4. **Say:** Please compare your answers with the person sitting next to you and do your corrections.

Closing *(2 minutes)*

1. **Say:** We learned how to estimate and measure the capacity of objects today.
2. **Ask:** What are some of the units that capacity can be measured in? (Answer: litres, millilitres, gallons)
3. **Say:** In our next lesson, we will be looking at comparing and ordering capacity using standard units.
4. **Say:** Please bring two cups or jugs each with you for our next lesson.

Lesson Title: Comparing and ordering capacity using standard units	**Theme:** Estimation - Volume and Capacity	
Lesson Number: M-03-149	**Class/Level:** Class 3	**Time:** 35 minutes

Learning Outcomes	**Teaching Aids**	**Preparation**
By the end of the lesson, pupils will be able to compare and order capacity using standard units and everyday language.	1. Household jugs or cups, in the previous lesson pupils were asked to bring them. 2. 1.5 litre bottle and 1 litre bottle. 3. Sand 4. 2 measuring jugs	Find 1.5 litre and 1 litre bottles. 3. Collect some sand. 4. Find 2 graduated measuring jugs.

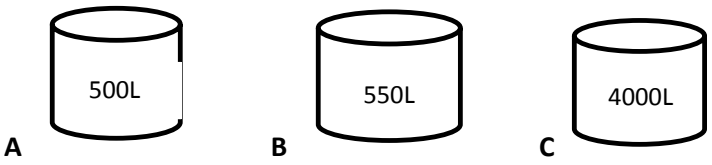
Opening *(2 minutes)*

1. **Say:** In our last lesson, we learned how to estimate and measure capacity using standard units of measurement.
2. **Say:** Today, we are going further and will look at how to compare and order objects with different capacities.
3. Write 'compare, order' on the board. **Ask:** Can anyone tell us what each word means?
4. Listen to all answers provided by pupils before explaining the terms. (Answer: compare means to note any similarities or difference between two items; order means to arrange items, e.g. from biggest to smallest or smallest to biggest)

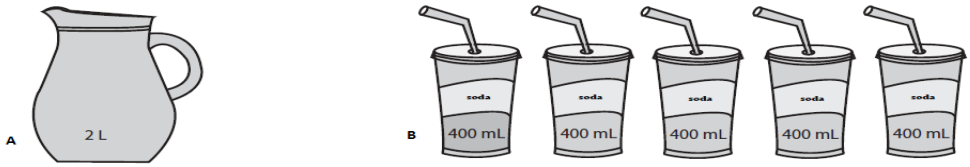
Introduction to the New Material *(15 minutes)*

1. Put both the 1.5L bottle and 1L bottle on a table in front of the class and **Say:** We are going to compare these two bottles and find out which one has the largest capacity.
2. **Ask:** Which of the bottles do you think has the largest capacity? Call on a couple of pupils for responses. (be ready for mixed responses)
3. Now fill the 1.5L bottle with sand and **Say:** We are now going to try and fill the second bottle with sand from the first bottle. Pour the sand into the 1L bottle until it is full, there will be some sand still left in the 1.5L bottle.
4. **Say:** You can see that the second bottle couldn't take all the sand from the first bottle, so it means the first bottle (1.5L) has a larger capacity than the second bottle (1L).
5. **Say:** If any container can carry more substance than another container, then it means the first container has a higher capacity.
6. **Say:** Now fill up one of your cups with sand. **Say:** Try pouring the sand into the other cup.
7. **Say:** Raise your hand if there is more sand left after filling the second cup.
8. **Say:** This means that your first cup has a higher capacity than your second cup.
9. **Say:** Raise your hand if there is still space left in your second cup after filling it with sand from the first cup. **Say:** This means that your first cup has a lower capacity than your second cup.

10. **Say:** Now that we understand how to compare capacity, let us look at how to order capacity as well.
11. **Say:** The school has three containers with different capacities. On the board, draw:



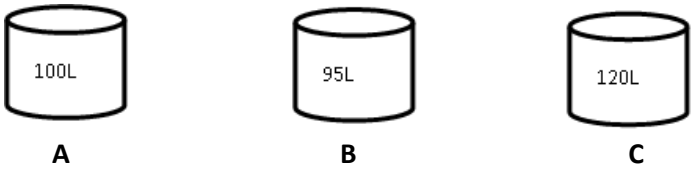
12. **Ask:** Who can order these containers from the one with the largest capacity to the smallest capacity? (Answer: B, A, C)
13. **Say:** Since we have been asked to order from the highest to the lowest, we need to start with the container with the highest capacity which is container 'B'.
14. **Say:** The second highest is container 'A' and the one with the least capacity is container 'C'.
15. **Ask:** Who can order the same containers from the least capacity to the highest capacity? (Answer: C, A, B)
16. **Say:** Now let us compare the following objects to determine where they are equal, greater or lesser. Draw:



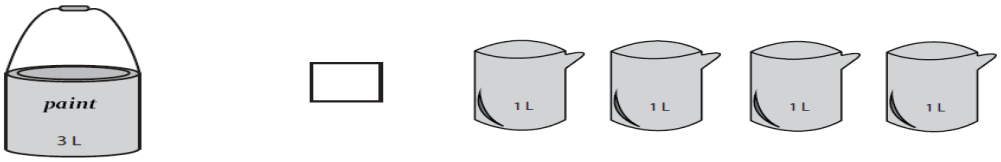
17. **Say:** If we add the containers in 'B' we get a total of 2000ml. From our previous lessons, we know that 1L=1000ml, so 2000ml = 2L. So we can conclude that the capacity of container in 'A' is equal to the total capacity of containers in group 'B'.

Guided Practice *(10 minutes)*

1. Draw the following on the board:



2. **Say:** Mr. Owusu has three barrels in his house and each barrel has specific capacity.
3. **Say:** Order the barrels from the lowest capacity to the highest capacity. (Answer: B, A, C)
4. **Say:** Order the barrels from the highest capacity to the lowest capacity. (Answer: C, A, B)
5. On the board, draw:



6. **Say:** In pairs, compare the capacity of the paint bucket and the total capacity of the small cups by putting '<, >, or =' in the box provided. (Answer: <)
7. Walk around the classroom and help any groups that are struggling.

Independent Practice *(6 minutes)*

1. **Say:** Three pupils are each given a bottle of different capacity. On the board, draw:

2. **Ask:** Who has the bottle with the largest capacity? (Answer: Curtis)
3. **Ask:** Who has the bottle with the smallest capacity? (Answer: Lucy)
4. **Say:** Order the pupils' bottles from highest to lowest capacity. (Answer: Curtis, Joshua, Lucy)
5. **Say:** Order the pupils' bottles from lowest to highest capacity. (Answer: Lucy, Joshua, Curtis)
6. **Say:** Exchange your exercise book with the person sitting next to you and compare answers.

Closing *(2 minutes)*

1. **Say:** We have looked at how to compare and order capacity using standard units. **Ask:** In which ways can the capacity of objects be ordered? (Answer: From biggest to smallest and from smallest to biggest.)

Lesson Title: Word problems involving volume and capacity using standard units	**Theme:** Estimation: volume and capacity	
Lesson Number: M-03-150	**Class/Level:** Class 3	**Time:** 35 minutes

 **Learning Outcomes** By the end of the lesson, pupils will be able to solve word problems involving volume and capacity.	 **Teaching Aids** None	 **Preparation** Write the word problems in the Guided Practice and Independent practice on the board.

Opening *(2 minutes)*

1. **Say:** In our previous lessons, we have been learning about volume and capacity.
2. **Say:** We are going to continue this today by looking at word problems involving volume and capacity.

Introduction to the New Material *(14 minutes)*

1. **Say:** Anthony is building a box, the box is 6cm long, 2cm wide and 3cm high. **Ask:** What will be the volume of the box when completed? (Answer: 6 x 2 x 3 = 36cm^3)
2. Give pupils about 30 seconds to work this out. **Say:** Please raise your hand if you have finished calculating the volume. Take answers from three different pupils and write their answers on the board.
3. **Say:** Now let us work it out together. Remember from our previous lessons that to get the volume of an object, we need to multiply the length, the width and the height.
4. On the board, write**:** volume = L x W x H = 6 x 2 x 3 = 36cm^3
5. **Say:** I bought a box of chalk from the shop. The box was 7cm long, 3cm wide and 10cm high. **Ask:** What was the volume of the box? (Answer: 7 x 3 x 10 = 210cm^3)
6. **Say:** Please raise your hand if you can find the volume. Call one of the pupils who raised their hand to calculate the volume of the box on the board.
7. **Say:** Let us all find out if our answers are correct or not. We already know that volume is length multiplied by width and by height. On the board, write: Volume = 7 x 3 x 10 = 210cm^3
8. **Say:** Mustapha's pet butterfly lives in a cardboard box which is 10cm long, 4cm wide and 2m high. **Ask:** What is the volume of the cardboard box? (Answer: 10 x 4 x 2 = 80cm^3)
9. Give pupils about 30 seconds to calculate the volume. Ask two volunteers (1 boy and 1 girl) who have finished to tell the class their answers. Afterwards, **Say:** Let us work it together.
10. On the board, write: Volume = 10 x 4 x 2 = 80cm^3
11. **Ask:** If one bucket holds 2L of water, how many litres of water will 9 buckets hold? (Answer: 18L)
12. **Ask:** How can we find the capacity of 9 buckets? Call on two pupils to share their opinions with the class on how to calculate the capacity of 9 buckets.
13. **Say:** To find the capacity of 9 buckets, we need to multiply the total number of buckets with the capacity of one bucket. So the capacity of nine buckets will be (write on the board): 2L x 9 = 18L
14. **Say:** So 9 buckets will hold a total of 18 litres of water.
15. **Say:** Please try and solve the following word problem. On the board, write: At a party, Samuel drank 40ml of apple juice, and 28ml of orange juice.

16. **Ask:** How much did Samuel drink altogether? (Answer: 68ml)
17. Call on one volunteer to work out the total amount that Samuel drank on the board. **Say:** Let us work this out together.
18. **Say:** The total that Samuel had to drink is the apple juice he had added to the orange juice he had.
19. On the board, write: Total Samual drank = 40ml + 28ml = 68ml

Guided Practice *(10 minutes)*

1. Read the following problems out loud to the pupils and **Say:** Please solve these in pairs:
   (a) The hotel's swimming pool is 10m long, 10m wide and 3m high. What volume of water can be filled in the swimming pool? (Answer: $300m^3$)
   (b) Daniel's cupboard is 10in long, 5in wide and 4in high. What is the volume of cupboard? (Answer $200in^3$)
   (c) If a can of Coca-Cola holds 50ml, how much will 4 cans hold? (Answer: 200ml)
   (d) If Mrs. Jackson made a 500ml pot of tea, how much tea is left if she pours 150ml into a mug? (Answer: 350ml)
   (e) Mrs. Andrews' tank has a capacity of 200L and Mrs. Stephens' tank has a capacity of 250L. Whose tank can carry more water? (Answer: Mrs. Stephens' tank)
2. Go around and support the pupils.
3. Ask 5 pupils to explain their answers to the class and write them on the board.

Independent Practice *(7 minutes)*

1. Read the following problems out loud to the pupils:
   (a) Edward started with 56ml of orange juice and his friend drank 24ml. How much did Edward have left? (Answer: 32ml)
   (b) I bought a box with a length of 8cm, width of 1cm and height of 3cm. Calculate the volume of the box. (Answer: $24cm^3$)
   (c) Esther's jewellery box is 2cm long, 2cm wide and 2cm high. What is the volume of the jewellery box? (Answer: $8cm^3$)
2. **Say:** Please solve the questions on the board and write your answers in your exercise books.
3. **Say:** Please exchange your exercise book with the person sitting next to you and compare answers.

Closing *(2 minutes)*

1. **Say:** Today we studied how to solve word problems involving volume and capacity using standard units.
2. **Say:** Solving word problems is similar to solving pictorial questions; it follows the same procedure and it is straight forward if you know the formula.
3. **Say:** Please keep practicing how to solve volume and capacity questions by revising what you have written in your exercise books.

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