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European
Commission


Horizon 2020
European Union funding
for Research & Innovation




STEAM Lesson

3



NAME	Wastey blushes us WASTE, BINS AND GOOD PRACTICES
DESCRIPTION	<p>Waste management in schools is carried out in a wide variety of ways. It depends on the type of waste generated, the containers available for sorting, the cleaning service, etc. But even though the big effort spent if there is no real will and knowledge about how to deal with waste it will not be managed properly. In STEAM 1 and 2, data have been collected about the type of containers (bins) available in the classroom, the amount of waste generated and the classification of waste. Now is time to analyse the data available after the Wastey* research performed from another point of view and decide whether there is any improvement to be so waste management.</p> <p>Are there enough containers? Is it possible to sort all type of waste?</p> <p>Do you know how to classify them?</p> <p>How much waste is generated?</p> <p>Do you know the measures that could be used to reduce the amount of waste generated?</p> <p>Have you seen specific waste that could be reused?</p> <p>*If you don't know Wastey you can do the 2 previous STEAMs or work directly with the data available from your classroom (Identify the bins available, waste generated and analyse the improvement actions).</p>
DURATION	 50 MIN



RESOURCES	<ul style="list-style-type: none"> • Research data (If STEAM 1 and 2 have been performed) • Classroom and floor waste (if STEAM 1 and 2 have not been carried out) • Camera, paper and pen for waste identification (If STEAM 1 and 2 have not been performed) • Link or template about proper waste management • Video camera • If there is no video camera available: Cardstock, markers, glue and paper • Computer or equipment with office automation tools • If there is no computer: sheets, rulers and crayons
WORKING METHODOLOGY	<p>Work by projects. Inductive thinking. Team work.</p> <div style="text-align: center;">  <p>3-5 TEAM MEMBERS</p> </div>
EVALUATION METHODOLOGY	<p>Group evaluation template</p>
OBJECTIVES	<p>Develop the capacity to:</p> <ul style="list-style-type: none"> • think about how waste is managed in the classroom and in the study area (classroom floor), based on data available. • To know the 3Rs and think about the possibility of reducing, reusing or improving recycling in the classroom. • Identify good and bad practices • Identify responsibilities • Identify improvement actions
COMPETENCES	<ul style="list-style-type: none"> • Competence in verbal, non-verbal and digital communication. • Mathematics, Science and Technology. • Digital competence. • Learning to learn



CONTENTS	<ul style="list-style-type: none">• Data analysis• 3 Rs• Recognition of waste types.• Selection of waste.• Best practices in 3R's• Values.
CREATION	<ul style="list-style-type: none">• Data presentation with visual material. Prezi, Google Drive presentations...



ACTIVITY 1

Wastey blushes us

OBJECTIVES: think about, debate and conclude about data collected in the research process

CONTENT:

Based on the data collected in the research, identify the type of waste management carried out in the classroom and plant. URL

COMPETENCES:

- Competence in verbal, non-verbal and digital communication
- Competence in learning to learn and thinking
- Living together skills
- Social and civic competence

DURATION:



10 minutes for activity planning. Introducing the key questions.

30 minutes approach and hypothesis selection. Data analysis and results obtained. Improvement actions suggestion.

10 minutes for results discussion

ACTION:

Presentation of research data obtained.

CONCLUSIONS:

Waste is managed correctly or not.

RESULT:

Oral presentation of the whole group of the results obtained in the investigation.



STEAM PREPARATION

TEACHER'S TEMPLATE

TITLE:

Wastey blushes us
WASTE, BINS AND GOOD PRACTICES

METHODOLOGY:

Work in groups of 3 or 4 people.

The teacher should guide in the data analysis process to obtain relevant information. The students should come up with a conclusion on their own. Once conclusions are obtained, they must be synthesizing and display in a presentation or poster.

If there has been a group in charge of managing Wastey (and this task has not been done by the teacher) they should be distributed among the different working teams.

PREPARATION

This Steam takes place after the action of catching Wastey. Data from the research should be collected. The analysis will focus on waste management data that has been indirectly collected in the Wastey search process.

** If STEAM 1 and 2 have not been done, a prior analysis of the type of waste and bins available in the classroom should be made, Activity1 will add an extra question for this option*



Activity 1 Wastey blushes us

Objective: think about, debate and conclude about data collected in the research process

Materials:

- Wastey data capture template
- Bin map
- Research Template
- 3 R's Template
 - URLs: <https://www.youtube.com/watch?v=JCq8I7hhSF0>
 - Zona de reciclado de residuos en el centro: <https://labiznagaecoescuela.wordpress.com/2015/04/08/la-clase-de-4o-prepara-las-cajas-para-separar-los-residuos/>
 - ¿Cómo reciclamos en el aula? <https://labiznagaecoescuela.wordpress.com/separamos/>
 - <http://www.txorierribhi.com/2016-2017-berriak/delegatuberdeekinlaneanhasigara>

Methodology and timing:

50 minutes. Open-questions asked to drive the activity and complete the objectives fixed, have a vision about how waste is managed, decide whether it is correct or not and establish improvement actions.

10 minutes. Activity approach. Video Viewing and Presentation of Guiding Questions.

Now that the exercise is finished - Wastey has been caught or not (positive or negative result), let's have a look at the information provided by our little friend. For this purpose, we have to take the data must be pulled from the research and see if we can get some more relevant information.

30 minutes. Development of the activity. Open the Wastey data capture template and answer the following questions (Wastey blushes us -template:

- Where and when is waste generated?
- What kind of waste is in the classroom? (Row 7 bins - indicate what type of waste each bin is for)
- Most probably: Paper, cardboard, plastic and food waste.
- They may also appear markers, batteries...
- How many bins are there per classroom? Indicate the total number per classroom. From 1 to 5
- Which are the different types of bins in each classroom? Usually, bins for paper re-use, paper, plastic and the other types of recycling, . Boxes for pens and felt-tip pens, batteries or other kind of waste could appear.
- analyse: Does the type of waste bin match the type of waste that is thrown into it? What is the residue that is most often out of place? Yes or no. It could be anyone.
- Which type of waste bin generates the most waste? Check weights.
- Based on observed waste, is there any type that you think is reusable or that could be stopped from being generated? (paper used only on one side, bottle caps, empty plastic bottles, aluminium...).
- Do you think it is possible to improve the way of separating waste?
- Do you think it is possible to reduce the amount of waste?
- Who are the main responsible for this situation?
- Wastey blushes us
- Yes (if there are improvements in waste management) / no (if everything is managed correctly).
- Why? How could waste management be improved?



	<p>10 minutes presentation of results. And conclusions. Each group should answer these questions:</p> <p>Wastey blushes us Data indicate that this statement is true or false (why?) Why is so important to properly separate at source? Highlight the importance of waste as a resource. https://www.youtube.com/watch?v=_EA6VL1Zj0s</p> <p>How could the management be improved? Who should be invited to participate in this improvement process?</p> <p>Possible solutions:</p> <p>Waste is properly managed. There are enough bins for each type of waste, Separation at origin is properly done. Improvement; reduce the amount (reuse and reduce). Identify improvements or good practices (use of reusable packaging for snacks, aluminium or glass bottles, unpackaged fruit. Using paper on both sides...)</p> <p>Waste is wrong managed. There are not enough bins for each type of waste, there are, but separation is not properly done. Corrective measures (creating spaces and containers to manage waste, creating posters make people understand where each type of waste should be thrown to....).</p> <p>Action: Presentation of the results provided by the data. Identification of improvement actions. Identification of responsible parties</p> <p>Conclusions: Waste is managed correctly or not.</p> <p>Result: Oral presentation of the results obtained in the investigation.</p>
<p>Activity 2 Make an advertise</p>	<p>Objective: write down the news and make an advertise</p> <p>Description:</p> <p>PREPARE AND ADVERTISE THE NEWS.</p> <ul style="list-style-type: none"> • Indicates what has happened • Indicate how you know that mouse is the guilty one • Indicates the number of people participating in the investigation • Indicates the methods used to collect data • Indicate the results. How much and which type of waste has been identified? • Provide some solutions to avoid happen again. • Indicate some consequences of right waste classification <p>Place the headline and subtitle identified in the activity1 of STEAM2 and the above information in a post (use the school blog, write down a text document (Google drive, Microsoft Word ...).</p> <p>Use Voki or another similar tool (mobile recorder, for example) to spread your news. Include the link in your post</p> <p>Enrich your news including links to mobile applications, games or internet sites that show how to make a correct waste selection.</p>



ACTIVITY 1 - CARD

Answer these 6 questions.

1. **What has happened?**
 2. **Who has participated or who is involved? The guilty one/s who performed the action**
 3. **When it happened? The moment when it has happened**
 4. **Where it happened? The place where it happened**
 5. **Why or What was it done for? The purpose of why it was made**
 6. **How it was done? The way it was performed**
- **Choose a headline and a subtitle for the news** ("Waste is delightful for mice", "Waste vs Rodents" - "Mice come to the classroom"
Please, notice that each headline puts the focus on a situation/fact
To select your own headline, first think about the fact you want to highlight;
In Research Process? in data collection? in mice or in waste?).
 - **Select from all the images and resources generated which are the one better shows the research process you have followed and show relevant information.** Select at least 3 images, 3 elements showing data (table, graph, image ...) and 4 keywords



ACTIVITY 1 – TEACHERS GUIDE

Introduction to the activity.

Information is the key basis for education, values or changes in life habits. You cannot want what you do not know, you cannot change a habit without a reason why. That is why we will use all the information collected to advertise the data collected about waste and the importance of waste generation at the school.

For this purpose, we will generate a news item the data collected throughout the investigation. The tips is to use the episode of the mouse to share two main concepts:

If a correct waste management is carried out in selected classrooms (or not)

News must be based on proven facts not on assumptions, rumours or opinions.

A series of questions will be made. A round of 2 minutes for each of them will be done to collect answer and afterwards, select the one that best fits to our case. That's why in this case is very important to provide a short answer.

Solutions:

- **What has happened?** The presence of food in the bins of the classrooms has bring the mouse to the classrooms. A research process has been carried out to catch the mouse feeding on waste from bins of the 3th floor. A research process has been followed to better understand why the waste initially collected in 3th floor bin, has appeared scattered throughout the classrooms. Using as excuse to justify the activity that on the third-floor classrooms a correct / incorrect waste management has been detected-
- **Who has participated or is involved?** The mouse as the main guilty of the dirtiness of the classrooms. People in charge of the research.
- **When has it happened?** The time when it has happened. A research process has been carried out over the last 2 weeks.
- **Where has it happened?** Include the centre and the affected classrooms
- **Why or What was it done for?** To ensure cleanliness in the classrooms. To identify who caused the dirtiness.
- **How has it been done?** Describe the methodology followed by the research process.
- **Choose a headline and a subtitle for the news** ("Waste is delightful for mice", "Waste vs Rodents" - "Mice come to the classroom"
Please, notice that each headline puts the focus on a situation/fact
To select your own headline, first think about the fact you want to highlight;
In Research Process? in data collection? in mice or in waste?).

HEADLINES

Waste wins the battle.

A mouse discovers the wrong waste management process.

A rodent and the chaos of waste.

1 school, 4 classrooms and the right / wrong waste management process.

An opportunity for the planet. (The objective is to highlight the waste concept and use the mouse as an element to bring attention to the subject).

A research, a mouse and the chaos of waste.



SUBTITLE.

A research game discovers an opportunity to improve waste management on the 3rd floor of the school....

A mouse puts the school "in red" ...

Wrong waste management becomes an opportunity to improve the planet.

- **Select from all the images and resources generated which are the one better shows the research process you have followed and show relevant information.** Select at least 3 images, 3 elements showing data (table, graph, image ...) and 4 keywords.

The selected elements must provide key information.

Example: images bringing attention about chaos in waste selection, an image showing the moment the mouse is found by the research team. Graphs showing data about waste generated.



ACTIVITY 1 – EVALUATION

WHAT HAVE YOU LEARNT?

CONTENTS & COMPETENCES	Totally agree	I agree	I disagree
We know the difference between waste and waste as a resource			
We can correctly classify the paper, plastic and other remaining			
We can differentiate what a food waste is			
We can identify a data			
We know how to extract information from the available data			
We know how to record the data along the time			
We know how to record the data with the correct measurement units			
We can identify an erroneous data			
We can make a hypothesis and validate or discard it			
We can plan actions in different time slots			
We are able to represent data at least 3 different ways			
We are able to identify what prevention, reduction, reuse and recycling are			
GROUP WORK	Totally agree	I agree	I disagree
We have created a team			
We have put a name to the team			
We have shared the work equally			
We have participated all the people fairly			
We were able to reach an agreement when different opinions raised.			
We have helped our group partners when it has been necessary			
If we had a problem, we tried to solve it			
If we have not been able to solve it, we have asked the tutor for help			
We have improved any action included in the previous evaluation (only answer if you wrote any)			
USE OF ORAL AND WRITTEN LANGUAGE	Totally agree	I agree	I disagree
We have spoken clearly respecting available time and in the requested language			
The texts created have no spelling mistakes			
We have used commas and punctuation marks correctly			
We have used capital letters at the beginning			
We have look for words that we did not understand			
We have used at least one new word throughout the activity			
USE OF TECHNOLOGY	Totally agree	I agree	I disagree
We have used internet images correctly (free images or quitting authorship)			
We have surf in internet searching for information from reliable sources			
We have verified the sources of information and validate the contents shown.			
We have used digital tools to create a video or podcast			



What would you improve in your next group activity? Free space for suggestions



ACTIVITY 2 - CARD

MAKE AN ADVERTISE

It's time to write down the news and make an advertise.

PREPARE AND ADVERTISE THE NEWS.

- Indicates what has happened.
- Indicate how you know that mouse is the guilty one
- Indicates the number of people participating in the investigation
- Indicates the methods used to collect data
- Indicate the results. How much and which type of waste has been identified?
- Provide some solutions to avoid happen again
- Indicates some consequences of right waste classification

Place the headline and subtitle identified in the activity 1 of STEAM Lesson 2 and the above information in a post (use the school blog, write down n a text document (Google drive, Microsoft Word ...).

Use [Voki](#) or another similar tool (mobile recorder, for example) to spread your news. Include the link in your post

Enrich your news including links to mobile applications, games or internet sites that show how to make a correct waste selection.



ACTIVITY 2 – EVALUATION

WHAT HAVE YOU LEARNT?

CONTENTS & COMPETENCES	Totally agree	I agree	I disagree
We can explain properly what has happened			
We can explain properly the method we used to collect data			
We are able to represent the results			
We are able to identify solutions to avoid happening again			
GROUP WORK	Totally agree	I agree	I disagree
We have created a team			
We have put a name to the team			
We have shared the work equally			
We have participated all the people fairly			
We were able to reach an agreement when different opinions raised.			
We have helped our group partners when it has been necessary			
If we had a problem, we tried to solve it			
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We have used recording and editing tools correctly			
We have surf in internet searching for information from reliable sources			
We have verified the sources of information and validate the contents shown			
We have used digital tools to create a video or podcast			



What would you improve in your next group activity? Free space for suggestions

