Learning Activity

Name :
Class :
Date :

Activity 1 | Experiment on Microplastic Solutions in the Sea

Objectives
Students are able to create experimental prototypes to solve the problem of microplastics in the marine environment effectively and efficiently

Instructions
Each group can use a shopping voucher worth Rp25,000 to design a tool that can clean water from microplastics. Explanations of the materials provided and their ingredients are in the table below. Fill in the table according to the design that your group will make!

Group Assignment
• Work well in groups
• The tools provided for free are gloves, scissors, plastic cups, and rulers
• The problem that will be solved is a miniature of the problem in the Fukushima Sea, Japan. So it is forbidden to clean microplastics by pouring water from a glass.

Success Criteria
When your group has finished, the remaining microplastics and water will be observed using the following criteria:

- **Microplastics removed**

• 25% removed 100 points
• 50% removed 200 points
• 75% removed 300 points
• 100% removed 400 points

- **Water removed**

• 0% 100 points
• 25% 75 points
• 50% 50 points
• 75% 25 points
• 100% 0 points

Once your group has decided on a solution plan to create, fill out the following table to purchase the materials you and your team will need. If your group spends a maximum of Rp16.000 in total, you and your team will receive an extra 20 points. For example, if your and your team's design is able to clean 75% of microplastics and carry 50% of water, then the points received are 300 + 50 + 20 = 370 points.

No	Tools and Materials	Size	Price
1	Iron powder	20 gr	Rp 7.500
2	Cooking oil	20 ml	Rp 4.000
3	Filter cloth	10 cm x 10 cm	Rp 3.000
4	Ethanol	20 ml	Rp 6.000
5	Small round magnet	1 pcs	Rp 2.000
6	Paper	1 lembar	Rp 5.00
7	Ice cream stick	1 pack	Rp 2.000
8	Plastic	1 pcs	Rp 200
9	Detergent	20 gr	Rp 2000
10	Pipette	1 pcs	Rp 1.500
11	Tape	10 cm	Rp 5.00
12	Aloe vera gel	20 ml	Rp 7000
13	String	1 m	Rp 2.000

Based on the tools and materials above, discuss with the group what tools and materials are needed!

No	Tools and Materials	Function	Size	Price
1				
2				
3				
4				
5				
dst				
Total				

Questions

1. What are the success criteria and limitations of this project?

2. Describe the initial state of microplastics and water in a glass, then make a comparison!

3. If you use oil in this project, why does the oil separate from the water when mixed?

4. Among the materials provided, which material will be effective in reducing microplastics? Why is that?

5. Describe the design that you and your team worked on! Explain its advantages and disadvantages?

6. In your opinion, how does this problem impact the marine ecosystem?

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