

## WHY ALL THE PLASTIC? (LEVEL 1)

<b>Description</b>	The learner will have the opportunity to conduct science experiments to better understand the characteristics of plastic and its impact on the environment and present their learnings as a poster to convince their family to reduce – reuse – recycle
<b>Leading Question</b>	Can you develop an alternative to plastic?
<b>Total Time Required</b>	4.75 hours total over 4 days.
<b>Supplies Required</b>	A tool to dig with, 2 sticks, pens, any fruit core or green leaf, a piece of plastic. Pens, paper, discarded cloth, jute, paper, plastics, etc.
<b>Subjects</b>	Science, Art and Design, Environmental Studies
<b>Supervision</b>	Medium
<b>Learning Outcomes</b>	By the end, the learner will be able to: <ol style="list-style-type: none"> <li>1. Understand what biodegradable and composting means.</li> <li>2. Understand plastics and their uses.</li> <li>3. Understand the danger plastics cause to the environment.</li> <li>4. Understand and appreciate the need for recycling, reusing and replacing plastics.</li> <li>5. Understand and appreciate the availability and need for alternatives to plastics.</li> <li>6. Gain a historical understanding of the evolution of materials.</li> <li>7. Enhance their critical thinking and design skills.</li> <li>8. Improve their research and experimentation skills.</li> <li>9. Improve their presentation and communication skills.</li> </ol>
<b>Previous Learning</b>	None

## DAY 1

Today you will learn about plastic, biodegradable materials, and recycling.

<b>Suggested Duration</b>	<b>Activity and Description</b>
<b>30 minutes</b>	<ul style="list-style-type: none"> <li>- You will have the opportunity today to learn about plastics. What would like to know about plastic?</li> <li>- What do you think happens when something is buried in the soil?</li> </ul>

	<ul style="list-style-type: none"> <li>- Today you will learn about the word biodegradable – something that breaks down naturally and turns into soil</li> </ul> <p>We will do an experiment to explore what happens to plastic and natural food items</p> <ul style="list-style-type: none"> <li>- Dig two small holes in the soil of the garden / lawn / farm (or plant pots if a backyard is unavailable)</li> <li>- Put any plastic trash in one and any fruit core or green leaf in the other hole</li> <li>- Cover both the holes with soil and insert a stick marking the plastic hole with P and the fruit core / green leaf with F or L</li> <li>- Think about what you think you will find after a week. What will happen to the items?</li> </ul>
<b>20 minutes</b>	<ul style="list-style-type: none"> <li>● Illustrate and label the process of garbage disposal in your home. You can also if possible track how the plastic items are trashed. For example: <ul style="list-style-type: none"> <li>- Step 1: Buy relevant plastic item</li> <li>- Step 2: Item is thrown into the dustbin / trash bags in their home</li> <li>- Step 3: Item is then segregated and thrown into a trash chute</li> <li>- Step 4: Item is then collected by the garbage truck</li> <li>- Step 5: Item is then thrown into the sea / landfill</li> </ul> </li> </ul>
<b>20 minutes</b>	Present the illustration of the garbage disposal process to your parents and get feedback and suggestions for improvement (if any). Receive and add the feedback (if any) from your parents/classmates and make changes accordingly to your work.
<b>5 minutes</b>	Discuss with your parents what you discovered and enjoyed the most and least about this process, challenges you faced, etc.

## DAY 2

Today you will learn what plastic is used for around the house.

<b>Suggested Duration</b>	<b>Activity and Description</b>
<b>15 minutes</b>	<ul style="list-style-type: none"> <li>● Identify 5 most common uses of plastic at home and make a list (or illustrate a list)</li> </ul>

	<ul style="list-style-type: none"> <li>- Prompt: grocery bags, plastic containers, toiletry bottles or sachets, bags of chips, plastic toys</li> </ul>
<b>30 minutes</b>	<ul style="list-style-type: none"> <li>• Interview your grandparents and other members of your home and understand whether they used as much plastic for as many different things.</li> <li>• Prompt questions: Did you have as much plastic at home when you were growing up? What did you use instead of plastic for some items? What plastic items did you have?</li> </ul>
<b>15 minutes</b>	<ul style="list-style-type: none"> <li>• Draw comparison images of things from the past without plastic and in the present with plastic. If you cannot draw the images of the things, you and your family used in the past, you could simply write the comparison list including the names of the items and the description of what the items were used for.</li> </ul>
<b>10-15 minutes</b>	Present the list of the 5 common plastics used at home, list of things your grandparents and other members used in the past and the comparison images/lists to your parents.
<b>5 minutes</b>	<p>Parents provide feedback and suggestions on how these can be improved.</p> <ul style="list-style-type: none"> <li>• Add the feedback (if any) to your work.</li> </ul> <p>What did you discover and enjoy the most and least about this process, challenges faced, etc.</p>

## DAY 3

Today you will design alternatives to plastic!

<b>Suggested Duration</b>	<b>Activity and Description</b>
<b>5 minutes</b>	<ul style="list-style-type: none"> <li>• For each of the 5 common plastics identified on the previous day, discuss with your family what material options can be used instead of plastic. E.g. cloth, paper, glass, jute, etc.</li> </ul>
<b>15 minutes</b>	<ul style="list-style-type: none"> <li>• Identify the key characteristics that made plastic so special by testing it out to understand why it is used so commonly</li> <li>• Potential other materials include: cloth, paper, glass metal etc.</li> </ul>
<b>20 minutes</b>	<p>Discuss the following:</p> <ul style="list-style-type: none"> <li>- Do other materials get wet? Do the items inside get wet? (e.g. cloth and paper)</li> </ul>

	<ul style="list-style-type: none"> <li>- Are other materials as durable - are they torn or destroyed as easily? (e.g. paper and glass)</li> <li>- Are other materials heavy and not easy to carry or travel with? (e.g. metal and glass)</li> <li>- Can all materials be made into any shape? (e.g. paper and glass)</li> </ul>
<b>20 minutes</b>	<p>Pick 3 of the commonly used plastic items as identified the previous day</p> <ul style="list-style-type: none"> <li>● Experiment with trying to replace plastic with the chosen other material options (e.g. what else can you store shampoo in? How else can you package chips? Etc.)</li> <li>● Reflect on whether these new solutions would work or not given the previous experiment and whether this will meet all the special characteristics of plastic</li> </ul>
<b>10-15 minutes</b>	<p>Present the list of alternatives to plastics, characteristics that make plastics special and results of the experiment above to your parents/family.</p>
<b>5 minutes</b>	<p>Parents provide feedback and suggestions on how these can be improved.</p> <p>Add the feedback (if any) to your work.</p> <p>What did you discover and enjoy the most and least about this process, challenges faced, etc.</p>

## DAY 4

Today you will practice drawing and presenting about recycling.

<b>Suggested Duration</b>	<b>Activity and Description</b>
<b>20 minutes</b>	<ul style="list-style-type: none"> <li>● Dig up from the holes the items that you have buried on day 1 back up from the hole and note the changes you observe in the plastic and food items.</li> <li>● Based on the observation, share what you think will happen in a few weeks and give your reasons as to why. (It is advised to wait for 2 weeks to see significant changes)</li> </ul>
<b>30 minutes</b>	<ul style="list-style-type: none"> <li>● Compile all of your work from the week to do a presentation to share the images, lists, drawings and calendar and share your main learnings with the family</li> </ul>

<p><b>10 minutes</b></p>	<ul style="list-style-type: none"> <li>● Design a chart of the top three plastic items that you would like to:             <ul style="list-style-type: none"> <li>- Reduce the use of</li> <li>- Replace with something different (draw or list the alternatives)</li> <li>- Reuse (drawing different items in each of the columns)</li> </ul> </li> </ul> <p>Make sure that you are drawing different items in each of the columns.</p>
<p><b>10 minutes</b></p>	<p>Pin up the chart in your home in a place where all family members can see it What did you discover and enjoy the most and least about this process, challenges you faced, etc.</p>

<p><b>Additional Enrichment Activities</b></p>	<p>The activity can be extended with more time to observe the biodegradation which typically takes 4 months.</p>
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## ASSESSMENT CRITERIA

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By the end of the learning, the student would be able to:

- Analytically think about observations made
- Gain an ability to prepare and ask meaningful questions and follow-up questions.
- Gain critical thinking and problem-solving skills in designing alternatives to plastic.
- Sow a clarity of messages when drawing, writing or speaking.