WHY ALL THE PLASTIC? (LEVEL 3)

Description	Learners will have the opportunity to conduct science experiments to better understand the environment and present their learnings as a poster convince their family to reduce-reuse.
Leading Question	Can you develop an alternative to plastic?
Total Time Required	5.5 hours total over 5 days.
Supplies Required	A tool to dig with, any two sticks to write on, pens, any fruit core or green leaf, a piece of plastic. Pens, paper, discarded cloth, jute, paper, plastics, etc.
Learning Outcomes	1. Understanding what is biodegradable and composting 2. Historical understanding of the evolution of materials 3. Life cycle of plastic in the landfills and oceans.
Previous Learning	None

DAY 1

Today you will learn about plastic and recycling.

Suggested Duration	Activity and Description
5 minutes	• Discuss with the learner that they will have the opportunity to understand more about plastic.
10 minutes	• Learners will explore how common plastic is by making a no plastic list. Learners will make a list of the 10 things in their home that do not have any plastic. • Learners will reflect on how hard it was for them to find items that have no plastic • TIP: Even items like books come wrapped in plastic or have plastic in their synthetic covers or electronic items like TV's the cords are wrapped with plastic.

15 minutes

- Learners will design their home plastic diary for a week to tally their home usage of plastic. Their sheet will include columns for i) the item, ii) number of uses daily, iii) single use, iv) total usage over the week, v) suggested reuse or alternative

30 minutes

- Learners will identify the seven most commonly used plastic items in their home, by exploring their home, discussing with family members etc. Examples can include: Bottles, straws, cups, packaging, bags, food packaging, toiletry sachets etc.

Item	Number of items used in a week	Single use	Total no of uses	Reduce / Reuse / Replace
 Plastic Bag	Monday: Tuesday: Wednesday: Thursday: Friday:	Yes	Student Guess: 5 Family Guess: 5 Actual Total: 3	Reduce: This is how we can reduce the use Reuse: This is how we can repurpose and use it Replace: Based on the alternative developed by the students

- Learners will add a column of whether this plastic is “single use” which means that it is only used once before being discarded. Learners will think about how many of these plastic items were discarded after one use and mark this with a tick or cross in the single use category daily
- Learners will guess which of the plastic items they think is used the most in their home in the week based on an investigation of usage patterns. Learners will also interview their family members to discuss and make the same guess

DAY 2

Today you will learn what biodegradable is and how to recycle.

Suggested Duration	Activity and Description
20 minutes	• Learners will learn the word biodegradable – something that breaks down naturally and turns into soil. • We will do an experiment to explore what happens to plastic and natural food items.

	• Dig two small holes in the soil of the garden/lawn (or plant pots if a backyard is not available.) • Put any plastic trash in one and fruit core or green leaf in the other. • Cover both the holes with soil land insert a stick marking the plastic hole with Plastic and the fruit core/green leaf with Fruit or Leaf • Learners will think about what they think they will find after a week and write it down
10 minutes	• Learners will mark on their weekly plastic diary the uses of plastic for the day across all the items
15 minutes	• Learners will begin to think of the reduce, reuse or replace framework designing the alternatives to plastic
15 minutes	• Learners will think of how we can reduce the usage of common plastic items. Learners will think of a plan on how they can reduce the usage of the item e.g. buy a bigger size of chips bag to last longer etc. • Learners will think of the how we can re-use the commonly used plastic items e.g. refill a plastic bag with grains or ration, reuse a plastic grocery bag for trash etc.

DAY 3

Today you will explore the properties of plastic and how to design alternatives to plastic.

Suggested Duration	Activity and Description
15 minutes	• Learners will begin thinking about alternatives to the most used plastic items in their home and begin making a plan. Some of the core questions include: i) What is the use or purpose of the plastic? ii) How important is the plastic? iii) Are / were there alternatives to plastic? iv) What other materials can you use? v) What is required from the material to be effective?
10 minutes	• Learners will discuss with the family what material options can be used instead of plastic e.g. cloth, paper, jute, glass etc.
20z minutes	• Learners will 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.)

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10 minutes	• Learners will reflect on whether these new solutions would work or not.
15 minutes	• Learners will try and identify the key characteristics that made plastic so special and used so commonly. Learners make a list of what they believe are the special characteristics of plastic • Prompt questions: Do other materials get wet? Are other materials as durable - do they get torn or destroyed as easily? (strong, lightweight, flexible, inexpensive, sanitary, resistant to chemicals, insulator)
10 minutes	• Learners will mark on their weekly plastic diary the uses of plastic for the day across all the items

DAY 4

Today you will write an essay on what you think happens to plastic after it is thrown away.

Suggested Duration	Activity and Description
50 minutes	• As learners discovered, plastic is “indestructible” and they will write an essay with illustrations on what they think happens to plastic when it is thrown away into seas, landfills or is burned? • Learners can write the essay from the perspective of a fish and / or a bird that has to manage the plastic pollution and think and suggest an innovation or idea to clean the oceans and landfills? • *Tip: If they have access to investigate the lifecycle of the plastic based on the attached*. https://www.wwf.org.uk/sites/default/files/2020-02/WWF_Plastics_Explainer.pdf • Prompt questions include: - What if the plastic ends up in the oceans and seas? What do you think happens to marine animals if they eat the plastic? What do you think will happen to us when we eat seafood with plastic? - What happens if you burn plastic? What do you think will be in the impact on air pollution given that plastic is made of chemicals? Most of the most dangerous chemicals are packaged in plastic and it is resistant to these chemicals. - What happens if plastics are left in landfills, what do you think will happen to our land usage – homes / forests, what happens to birds that eat it, what happens to plants?
20 minutes	• Learners will mark on their weekly plastic diary the uses of plastic for the day across all the items.

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DAY 5

Today you will finish their observation and present about recycling.

Suggested Duration	Activity and Description
20 minutes	● Learners will dig around the holes and check the progress of the plastic and food. Based on their observation, they will share what they think will happen and why.
15 minutes	● Learners will now calculate what percentage of plastic is reused in their home across each of the different plastic items e.g. if only 4 of the 10 plastic bags are re-used in their homes that is 4/10*100 = 40% or if 2 of the 12 plastic bottles used in their home in a week are reused that is 2/12*100 = 16.7%
15 minutes	● Learners will now make a bar graph to compare the usage of different plastic items at home. For example: ●
30 minutes	● Learners will compile all of their work from the week to make a poster to convince family members to reduce, reuse or replace plastic. ● Learners will design a poster on what they learned about plastic all week including: How commonly it is used and how much it is used? What makes plastic special? How can we reduce, reuse or replace it? What is the impact of plastic on the environment? How can we save our oceans and landfills? ● Learners need to consider the criteria of a clear message to the family on why plastic is harmful and how much it is used and a convincing argument on reducing, reusing or replacing it.
10 minutes	● Learners will present their argument to the family and notice how many were convinced with it.
5 minutes	● Learners will reflect on why other family members were not convinced and think of what they could do differently

ASSESSMENT CRITERIA

- Analytical thinking and observations made.
- Ability to prepare and ask meaningful questions and follow up questions.
- Critical thinking and problem solving to design alternatives to plastic and how to save the environment.

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- Clarity of messages when drawing, writing or speaking.

ADDITIONAL ENRICHMENT ACTIVITIES

- The activity can be extended with more time to observe the biodegradation that typically takes 4 months.

MODIFICATIONS TO SIMPLIFY

- Design a plastic diary and suggest how plastic can be reduced, reused or replaced.
- Write an essay about the impact wastage and innovation on how to save our oceans and landfills.