Flood Management (level 1)

Description	Learners will explore some of the most frequent natural disasters by beginning to understand their causes and far-reaching effects. They will research the effect of the natural disaster on plants, animals and people, and design an emergency response kit including safety guides and disaster kits
Leading Question	Can you manage a flood in your community?
Total Time Required	4.5 hours over 5 days
Resources Required	- 1 large flat container or tray with sides (a deep tray), soil or modeling clay, sponge, little rocks - Empty plastic container and marker - Plastic bottles, rope, thread and large plastic bag
Subjects	Social science, Art and Design, Literacy, Numeracy
Self-guided/ Supervised activity	High
Learning Outcomes	By the end of this project, learners will be able to: 1. Identify the causes of floods and the impact of excess rains. 2. Identify standard units of measure and design a scale. 3. Describe the impacts of flooding. 4. Explore protective and emergency measures to avoid or mitigate the consequences of flooding.
Previous Learning	None

Day 1- Today you will begin to explore floods.

Time	Activity and Description
15 minutes	● Think of a flood as extra water in a usually dry land. ● Make an illustrated list of the natural sources of water and water bodies that you know. You can include some of the following examples on your list: - Rain, Sea, Rivers, Lakes, Glaciers, etc.

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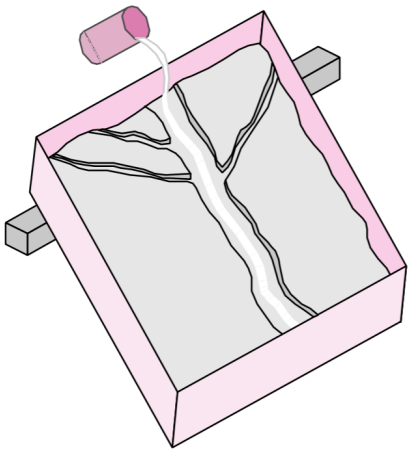
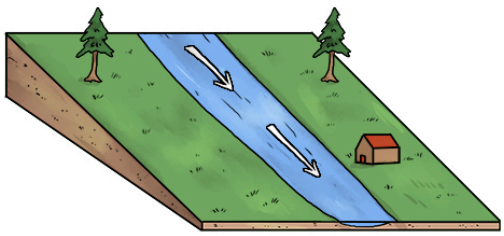
45 minutes	• Make models to explore the impact human activity has on creating floods. Record the outcome of each experiment with drawings or descriptive sentences on the floods. **<u>Flood model set up:</u>** ☐ Take any large flat container or tray with sides. ☐ Place sufficient modeling clay or soil at the bottom of the pan. ☐ Carve a river path for water in the container in the clay/soil. ☐ Place little stones, wood cubes, or toy houses alongside the river to define the path and also make these the “homes” of people.  ☐ Pour water into the model in the river and observe the water staying within the river path. You can add a rainstorm by increasing the volume and the flow of the water. ☐ **Experiment 1:** Observe what will happen to the neighboring areas. Move the little stone homes around their model and notice that those closest to the river get more flooded. ☐ **Experiment 2:** Straightening river channels and paths  - Try keeping a straightened river path as shown above and testing the speed of the water flow and the amount of flooding.

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	 - Then attempt to create a meandering or zig-zag / curved river path and test the speed of water flow and the amount of flooding. - Observe that the curving river path slows down the speed and the intensity of the water flow and reduces the amount of flooding. Also add more bends to the curvature to the test assumption. - Complete your drawings and notes from the different experiments to understand what happens when it rains a lot. ● **Experiment 3:** Improper garbage disposal - Place some rigid objects in the river path to represent garbage. Pour water along the river and observe how the build up of garbage obstructs natural flow of water leading to flooding of the surrounding areas.
15 minutes	**<u>Let's explore the multiple human factors that cause floods:</u>** ● **Experiment 2:** Straightening river channels and paths - Try keeping a straightened river path as shown above and test the speed of the water flow and the amount of flooding. - Then attempt to create a meandering or zig-zag /curved river path and test the speed of water flow and the amount of flooding. - Observe that the curving river path slows down the speed and the intensity of the water flow and reduces the amount of flooding. - Also, add more bends to the curvature to the test assumption. - Complete your drawings and notes from the different experiments to understand what happens when it rains a lot. - For younger learners, orally voice over your understanding based on the experiments and drawings.

DAY 2- Today you will explore and measure the intensity of natural hazards.

Time	Activity and Description
15 minutes	**<u>Make your own ruler/scale!</u>**

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	• A ruler/scale is used to make straight lines or measure distance. Each ruler or scale is marked in equal intervals. • Take any rigid object with a straight border, e.g. a piece of wood, cardboard or even thick paper. • Determine the units of measure as cms or inches. Use the unit of familiarity in their context. • Place your index finger perpendicular to the ruler and add a mark. • Repeat several times until all the surface is covered. Each of the markings will not be exactly a cm or an inch, but it is important to ensure that the distance between them is equal. ***Optional:*** *Older learners can divide each cm or inch into smaller units of measurement including millimeters or centimeters.*
15 minutes	• Rain gauge to measure the amount of rainfall. Use the newly created ruler/scale to measure the amount of rain or water in a cup. • Find a cup, you can use any cup (paper or plastic). You will use this scale to mark the outside of the cup. • Place the cup in an open area (or on some elevated surface), where it is not disturbed when it begins raining. • As the rain fills the gauge, measure the height of the water after each rainfall. • In the case that it is not raining, you can pretend it is raining and fill the cup with water and do the measurement. Do this cup measure experiment 3 times – each time holding the cup under any flowing water for 5-10 seconds. Since it rains with different intensity, do this under a fully open tap or fast flowing water, slightly slower flowing water, until it is just a few drops.
15 minutes	• Complete an illustrated report where you can draw the cup for each of the 3 tries and write the terminology associated with it and the measured amount of rain in each try. • When it rains a lot, the cup gets full very fast and sometimes overflows. If you cannot write, vocalize the terminology.
20 minutes	*Numeracy Extension:* Use your ruler to measure 5 different items in your home. Measure your pencil, eraser, book, finger, vegetable, etc. Then, draw and label the items you measured and their lengths. Then solve these world problems: ☐ What is the longest item you measured? ☐ What is the shortest item you measured? ☐ Were there any two items with the same length? ☐ What is the difference in length between the longest and shortest item? (biggest – smallest) ☐ What is the total length of all the items put together? (add all the numbers) ☐ Can you arrange the numbers from biggest to smallest?

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	☐ What is the difference between the longest two and the shortest two items?

Day 3- Today you will gather research on the impact and result of floods on humans.

Time	Activity and Description
20 minutes	• Ask your parents and family members questions about their experiences with floods. (Optional) You can create a little survey about the impact of a flood with your family members on any 3 or 4 of the below mentioned areas of impact: ☐ Food supplies ☐ Plants and trees ☐ Animals ☐ Homes ☐ Roads ☐ Transportation ☐ Schools
20 minutes	• Draw and write a short note (if possible) on the 3 scenarios of: ☐ Too little rain, also known as droughts (Prompts: What would happen to plants, animals and people with too little water? What color would plants be? What would happen to crops?) ☐ Just enough rain (Prompts: What happens after the rain to plants, animals and people? What are the colors you see after the rain? Etc.) ☐ Too much rain that could lead to a flood (Prompts: What would happen to fields with plants and trees? What would happen to animals that can or cannot swim? What would happen to homes and buildings? What colors do you expect?) ☐ Share and present your draft illustration or note with the family members for feedback. Family feedback will include: - What did they love about the illustration and the presentation? - What could be improved? - Any other suggestions for improvement • Use the feedback to revise the draft illustration or note

Day 4- Today you will prepare yourselves and your communities for floods.

Time	Activity and Description

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<table>
<tr><td>20 minutes</td><td>

Begin by designing an emergency details card for what you will do when a flood happens:

What is the emergency number for the fire / police departments and ambulance? (e.g. 911 or 100)
What is the safe location in your community area? (e.g. school building, hospital etc.)
If you were to get separated from your parents – you need to know the details to share with emergency contact: Parents Full Name, Full Address, Contact Number etc.
What is the name and number of a close relative or friend?

</td></tr>
<tr><td>20 minutes</td><td>

Share the emergency details card with family members for feedback.

Family feedback will include:

What did they love about the emergency details card ?
The correctness of the emergency number of fire/police and ambulance
Any other suggestions for improvements

Use the feedback to revise your emergency details card.

Design a survival kit for when floods happen. Here are some important words to know:

Essential – this is something that is absolutely necessary or extremely important
Important – this is something of great value
Optional – this is something that is nice to have

Make a chart with 3 columns: Essentials, Important and Optional. Write or draw 2 - 4 items in each of the 3 columns. Discuss with your families or parents what are the items that you really need or would be nice to have. Alternatively, Identify which things you cannot manage without for the entire day e.g. food, water – these are essentials, what are the things you really need these things are important e.g. blankets etc. and what are the things that you would like to have, but are ok without e.g. soap etc.
Some examples:

<table>
<tr><th>Essential</th><th>Important</th><th>Optional</th></tr>
<tr><td>Food (that is more durable e.g. biscuits or canned food)</td><td>Blankets</td><td>Torch</td></tr>
<tr><td>Water</td><td>Phones and Chargers</td><td>Soap and Toiletries</td></tr>
<tr><td>Medicine</td><td>ID card or papers</td><td></td></tr>
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<tr><td>10 minutes</td><td>

Make colored flags and a help poster to attract attention from the ground.

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Day 5- Today you will pretend to be weather forecasters.

Time	Activity and Description
20 minutes	• First prepare a script and narrate it – this can be recorded by family members. You can draw or write a few key words to help prepare for the news report. • First you have to think of a warning issued by your National Weather Service. The warning has to alert people when bad weather might happen. • In the warning issue, you need to cover: - How do floods happen? - How can you measure the different amounts of rain? - What will happen if there is a flood? - How can we be prepared for it with our emergency ID cards and survival kit
20 minutes	• Present this weather warning report orally to all their family members.

Additional Enrichment Activities	• Learners can interview people around their community on how to best prepare for a flood
Modifications for Simplification	• Learners can reduce the number of models and instruments being used for measurements

Assessment criteria

By the end of the project, a majority of my learners were able to:

- ☐ Identify how human actions can cause flooding.
- ☐ Design a scale/ ruler and measuring items.
- ☐ Design the emergency protocol card.
- ☐ Differentiate between items as essential, important or optional in the event of flooding.
- ☐ Produce a final weather watch report.

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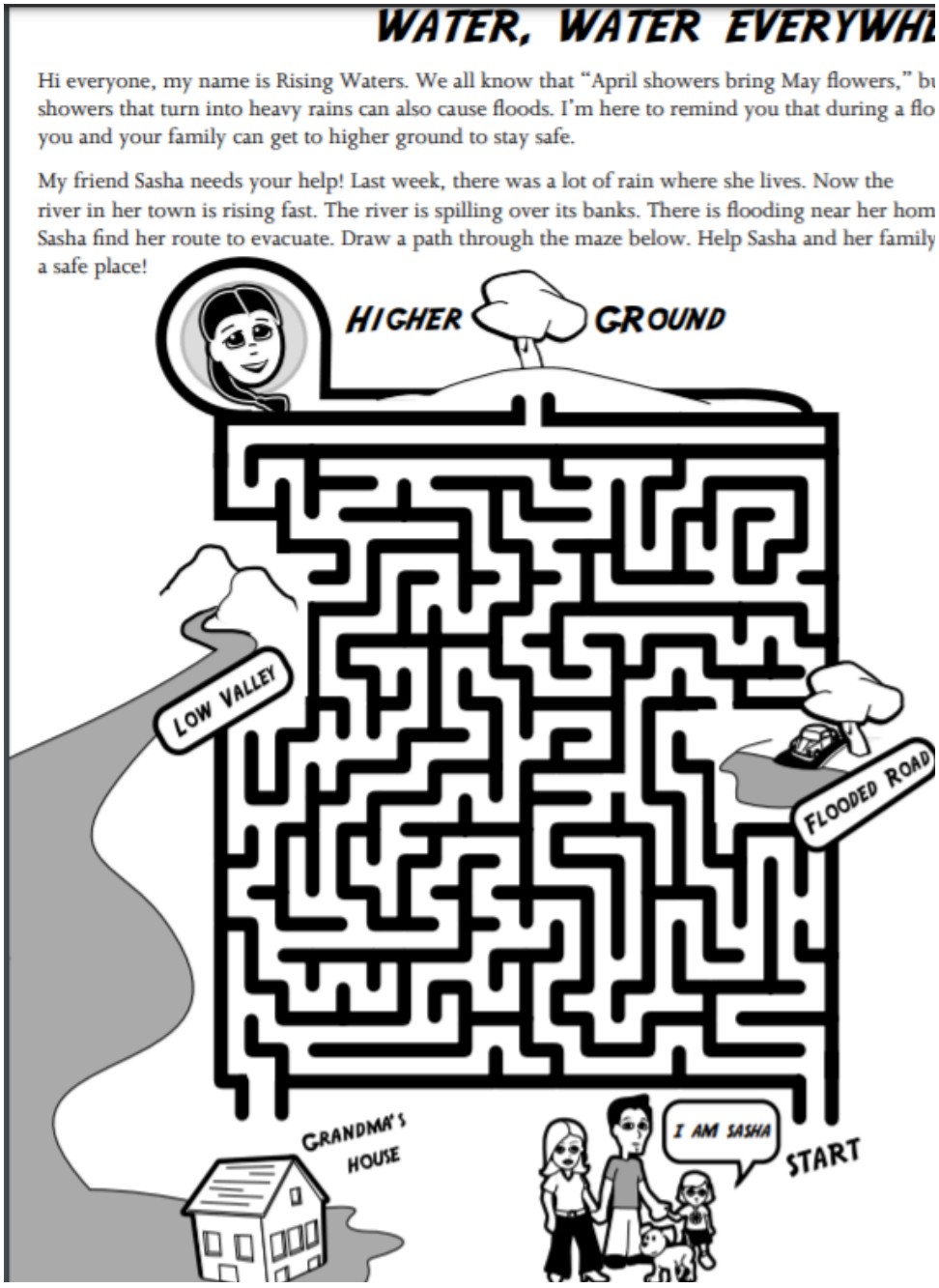
APPENDIX



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