Region VIII – Eastern Visayas
Division of Tacloban City
Tacloban City

LESSON 1

LEARNING AREA:	**SCIENCE V: Communicating the Risks of Storm Surge, Mudslides, and Other Extreme Weather Event)**
I. LEARNING OBJECTIVES	
A. Content Standards	The learner understands the risks to communities during a typhoon. In this lesson, storm surge and mudslides will be discussed.
B. Performance Standards	The learner will be able to depict what happens during a storm surge and mudslide using a sandbox model and by explaining it in her/his own words.
C. Learning Competencies	At the end of the session, the learners are expected to: • Understand and describe what happens during a storm surge or mudslide. • Indirectly, to gain some sense of empowerment that they have some control over these situations and can take actions to reduce risks. ***CODE: S5FE-IVe-5***
II. CONTENT / SUBJECT MATTER Risks of Extreme Weather Events (Storm Surge, Mudslides)	
LEARNING RESOURCES	
References	
1.Teacher's Guide	Communicating the Risks of Storm Surge and Other Extreme Events ***Online Toolkit and Tutorial, Lesson 2 Understanding the Event.*** Attached demonstration videos (mp4 files) illustrating how exercise with the sandbox is done.
2.Learner's Materials pages	1.) BEAM 5. Unit 6. 16 Blowing in the Wind. Distance Learning Modules. DLP 50. 2.) MISOSA 5. Module 24. 3.) Science for Daily Use 5. Tan, Conchita T. 2012. p. 234. * 4.) NFE. Paghahanda sa Bagyo. 2011. pp. 5-11.
3.Textbook/s	
B. Other Learning Materials	Online Toolkit and Tutorial; ppt; sandbox, bucket of water, small plastic houses; marker pens.

III. PROCEDURE	
Teacher's Activity	**Students' Activity**
A Preliminary Activity 1. Prayer (Anyone who will volunteer to lead the prayer?) 2. Greetings Good morning class! How are you today? 3. Checking of the Assignment Can anyone share with us something about the assignment you did for today? **B Review**	 Heavenly Father . . . Amen Good morning Teacher Lynie. Good morning classmates! (Have a few pupils share something about the assignment they did.) We will be studying the risks from typhoons.

Last time, I briefly described some of the things we will be learning today. Remind us what topic we will be studying today.	
	Floods, flying objects, etc.
What are some of the risks or dangers associated with typhoons?	
C. Motivation	Yes Teacher.
The way I see it, everyone is feeling good and excited for our lesson today. But before we start, I want you to look attentively on the message on the screen *(in the absence of DLP projector the teacher may use a large print-out).*	
Can you see it clearly?	A warning from PAGASA.
What is it?	
Very good. Okay, look closely on what are written on the message.	Pupil 1: Typhoon is coming. Pupil 2: Danger of storm surge near the sea. Pupil 3: Risk of mudslide in the mountains. Pupil 4: Etc.
PAGASA Bulletin **Typhoon Noring will make landfall Tuesday morning. Coastal areas are threatened by a possible storm surge. Hilly areas face the risk of mudslides.**	
Now, can any of you share with us what you think a storm surge is? How about a mudslide?	(Pupils will give their impressions of what these hazards are. They are encouraged to relate these terms to experiences with past typhoons)
We will try to understand some of the hazards or risks that come with a typhoon. Typhoons are also known as tropical cyclones. In other countries, they are called hurricanes.	(The teacher, and class, should be aware of the possibility that some pupils, who perhaps experienced some of these in the past, may re-experience some of the trauma or grief of the event. Just be understanding and supportive and guide the other students in being supportive, as well. The teacher should judge whether or not to build time into the lesson sharing experiences.)
To get a better image of some of these risks, let us look at a few videos: the first shows a large storm surge, and the second a mudslide, both associated with tropical cyclones. e.g., https://www.youtube.com/watch?v=pvY0KIdmQdM https://www.youtube.com/watch?v=MDcze8yaa64	
Activity	
(The teacher will relate the pre-activity to the lesson proper)	
We will have you work in groups. Some rules for the groupwork are: everyone should participate, try to finish the activity in about 20 minutes, you are encouraged to move around and talk to each other during the groupwork, and there are no right or wrong things to do –in other words, you can be creative.	

The class will be divided into 2 groups. All group number 1 you stay near the sandbox on the right side of and form a circle and all number 2 also form a circle and stay near the sandbox near the left.) Note: if the students want, and if anyone has a smartphone, they can video their work.	Student will start counting 1…2..1….2….1…2 After counting students will form a circle based on their number.
ACTIVITY 1 Group 1: Read the title, materials and procedure below Title of the Activity : "Let's Create a Mountain" Materials : sandbox, plastic houses 1. Create a mountain area with one tall mountain and one valley. 2. Put some plastic houses on the mountain slope and some in the valley. *NOTE FOR TEACHER: Ideally, you would provide some guidance while the students are working with the sand/mud. For Group 1, it is best if their mountains are not simply bowls but ones with folds and channels (a picture of a typical mountain can be shown in class) –this is so a little water on the peak can create a big flood in channels and valleys.*	(*Students will read…..*)
Group 2: Title of the Activity – "Let's Create a Coastal Area" Materials: sandbox, plastic houses 1. Using the sandbox, create a coastal area where the ocean floor becomes more shallow as it gets closer to the land. 2. Put some houses on the coast, some near, some far from the ocean. *(Note: it is important that the ocean floor becomes less and less shallow approaching the shore (and, also, the "cove" can get more narrow like a funnel) –this is so a little wave in the open ocean can be amplified into a big storm surge)* We have 20 minutes to do this. Finished? Now, briefly explain to the rest of the class what you constructed.	(*Members of Group 1 discuss their work, then Group 2 does the same.)*
ACTIVITY 2	

Group 1 Now, we will recreate what happens when a strong typhoon, with plenty of rain, comes.

Title: "When the Heavy Rain Comes During Strong Typhoons"

Materials: sandbox with soil or sand, bucket of water, watering can, optional: plastic houses, trees.

Procedure:

1. The entire group will work together in shaping the sand or soil in the sandbox to simulate a mountain range
2. Using your sandbox where mountains were created, one or two group members will pour water onto the top of the highest peak
3. The rest of the group will carefully observe what will happen to the soil/sand, and the differences between what happens in steep versus shallow slopes.

(*Members of Group 1 discuss their work, then Group 2 does the same.)*

Members of Group 1 tell, in their own words, what is happening as they pour the water, and what would be happening if this were a real mountain area.

Group 2:

Title: "When the Wind Blows the Water"

Materials: squeegee, coastal sandbox

Procedure:

1. Each member of the group will be participating in shaping the sand/soil into a simulated coastline (try to have the coast get narrower and shallower as one gets closer to the shore as described below).
2. Pour water into the "ocean" section while the rest of the class is watching
3. Use squeegee (as a wind) to push water to the shore
4. First trial - push the water gently to the shore
5. Second trial – push the water more suddenly to the shore
6. Third trial- push the water more forcefully
7. Observe what will happen to the water and the houses near the seashore, especially how a small ripple in the "open ocean" translates into a big wave once it reaches the "shore".

Members of Group 2 tell, in their own words, what is happening as they push the water, and what would be happening if this were a real coastal area.

Both groups can fill out the table below

Trials	Observations
Trial 1	
Trial 2	
Trial 3	

NOTE: As a guide to how the class activity takes place, the teacher can first watch some videos that can be found at https://www.environmental-communication.space/learningmodule (under "Sandbox Demonstrations"):

B. ANALYSIS

1. Can you describe what happened to the mountains when the water was poured on it?

2. Based on your activity, can you describe what a mudslide is; what a slope failure is?

3. What causes a mudslide / slope failure / storm surge? What factors makes it more serious and the danger higher?

4. Where are the areas that are more dangerous to live in when a strong wind pushes the water?

5. Why is this situation dangerous?

C. ABSTRACTION / GENERALIZATION

What does this mean for people who live on a mountainous area?

What does this mean for people who live in coastal areas?

D. APPLICATION

Let us do this…

1. Group 1 will take the coastal sandbox
2. Group 2 will take the mountain sandbox
3. Each group will reshape the mountain and the coast so that it will be safe and the water and waves will cause less damage
4. Now, using the water, demonstrate how there would be less damage on the homes.
5. Describe what you did and why is there less damage on the homes.

Notes:

If there is enough time, the students can just play with the different sand/soil configurations, moving houses around, etc. to see what will help. They have different options, such as just moving houses away from steep slopes or farther from the coast.

They ca build channels along the slopes to convey water away from the homes. They can put sand dunes along the coast or vegetation. Etc. Lastly, when all actions have been taken, and the risk is still there, families can evacuate their homes and return after the risk has passed.

IV. EVALUATION	In a 1 whole sheet of paper. Answer the following questions as if you are explaining to your parents. 1, How is the storm surge formed? 2. Why does a small wave far away become a big flood by the time it gets to the houses? 3. How does a mudslide form? 4. After days of rain, why does a small amount of rain trigger a mudslide or landslide?
V. ASSIGNMENT	Write a paragraph to describe clearly what a storm surge or mudslide is and what is it like?

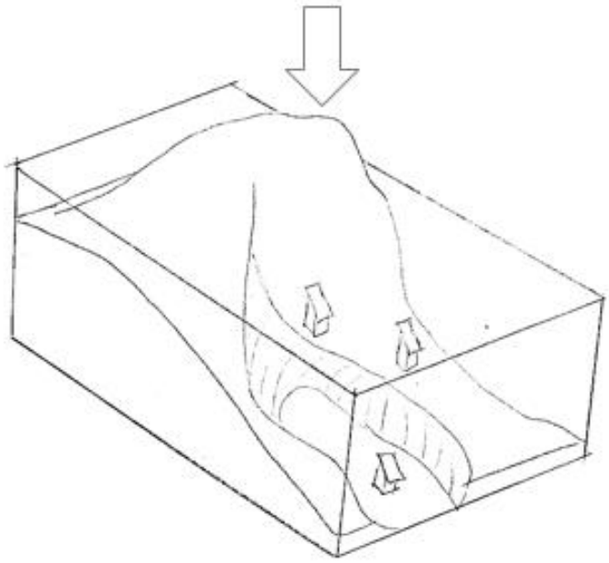
Projected for a 90-minute session (but it may exceed this time).

If sandboxes are not available, the teacher can just show the videos referenced above and find a few other videos showing actual storm surges and mudslides.
Examples:

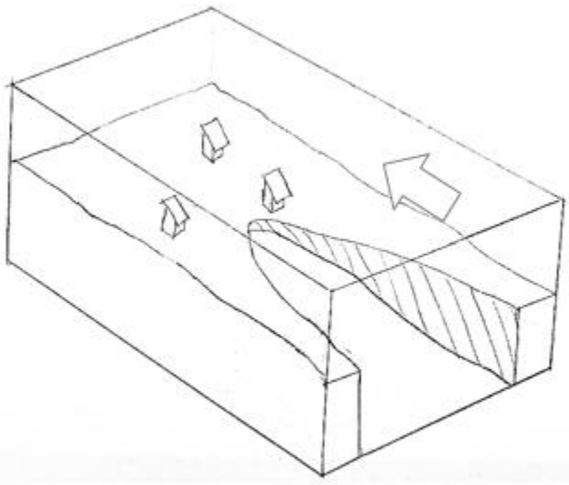
https://www.environmental-communication.space/learningmodule (mudslide, storm surge)
https://www.youtube.com/watch?v=pvY0KIdmQdM (storm surge)
https://www.youtube.com/watch?v=9r80c0UA6Ps (mudslide)

Note:
The teacher needs to determine what videos are appropriate for the class. Some can be quite distressing to watch. If better or more appropriate videos than those listed above can be found, please substitute.

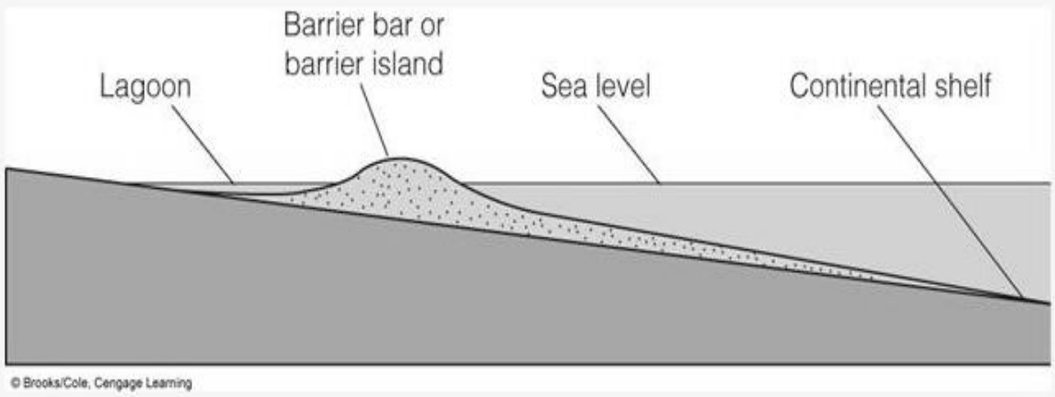
Lastly, if there is enough time, the teacher can have the sandboxes as well as the videos for the lesson.



Mudslide Sandbox



Storm Surge Sandbox



This Lesson Plan can be cited and referenced as:

> **Lejano, R., E. Casas, Jr., Yanger, M. J. and M. Pormon (2019).** Hazards, Risk, and Resilience: Lesson Plans for Teaching Risk Communication in Primary Schools. New York University and the University of the Philippines Visayas Tacloban College, New York City and Tacloban City.

Authors:

Dr. Eulito Casas Jr. – UPV Tacloban College
Dr. Jean Yanger – Eastern Visayas State University
Mr. Chester Tamayo – DepEd. Tacloban City Division
Prof. Miah Maye Pormon – UPV Tacloban College
Ms Lynie Pajota – DepEd Tacloban City
Mr. Angelo Peñaranda – DepEd Tacloban City
Dr. Raul Lejano – New York University