

### Lesson 3: Flood Prevention

#### Performance Expectation:

- MS-ESS3-2- Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
- MS-ESS3-3- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Timing: 60- 120 minutes

#### Materials:

- Budget Planning Science Notebook Page (1 per student)
- Design Your Plan Science Notebook Page (1 per student)
- Plan Evaluation Science Notebook Page (1 per student)
- Materials of the students' choosing to build model city with (i.e. chart paper, modeling clay, computer, etc.)

#### Lesson Directions:

- Introduction – Budget Planning (10-15 minutes)
  1. Tell students they are going to be creating an emergency plan for the upcoming flood season. Their job is going to be to convince the city leaders how important data can be in preparing for incoming floods.
  2. Pass out the Budget Planning Science Notebook Page.
    - a. If doing virtually, ask students to open the document.
  3. Have students look at the city information, the average weather data, and their planning budget.
    - a. This activity can be done individually or in groups of 2-4.
  4. Have students complete the budget planning chart for how much of and what kind of material they want to use to help plan for the flood season.
    - a. As a class discuss reasons for choosing the materials they chose.
- Main Lesson – Design Your Plan (30 minutes +)
  1. Tell students that they are going to design and build a model city with the reservoir they chose and the type of levee they chose to demonstrate their emergency flood plan.
  2. Tell students they can use whatever artistic medium they want to build their model. Some possible options include:
    - a. Draw your city on a piece of poster paper
    - b. Build a 3D model out of paper or other materials
    - c. Build a computer-generated 3D model using a computer
  3. Pass out the Design Your Plan Science Notebook Page.
    - a. If doing virtually, ask students to open the document.
  4. Tell students to sketch out or plan where they want everything to go in their model city. Remind them to include the mountainous terrain (where the water flows from) and the river running through their model city.

5. Have students build their city.
    - a. This could be a quick build or a couple weeks long project.
  6. Have students answer the reflection questions after they are done with their project. Remind them that these answers can be used as part of their presentation and to give them some more topics to talk about while presenting.
    - a. What did you find was the hardest part about planning your city?
    - b. How did you use the data you were given about the area to plan for future flood prevention?
    - c. Why do you think it is important for a city to be prepared for natural hazards?
- Closing – Plan Evaluation (20+ minutes, depending on number of groups)
    1. Tell students they are going to be listening to each other present their emergency plans and model cities. While listening to other groups present, they will be acting as the emergency planning committee working to finalize the flood season plan. They need to listen closely to each presentation and answer the questions in order to figure out which plan should be proposed to the city leaders.
    2. Pass out copies of the Plan Evaluation Science Notebook Page. Each student will need one copy per group presenting.
      - a. If doing virtually, ask students to open the document and save multiple copies.
    3. Tell students to listen carefully as every plan is shared, and answer each of the questions about each presentation.
    4. After every plan has been shared, ask the students to share which plan they think will work the best and why. If multiple plans are brought up, have a vote for which plan should be brought before the city leaders.