

# Multiple Lines of Defense Model Directions

## Materials & Resources

- MLOD Kits (see supply list)

## Procedure

### Engage

Participants identify specific hurricane-related coastal hazards...

Ask participants if they have even been in a hurricane. What do they remember about it? Did they witness any flooding? Where did the water come from? What is the most dangerous aspect of a hurricane for coastal communities? Write the answers on the board. Reveal that storm surge is the most deadly aspect of hurricanes for coast communities.

### Explore

Participants collaborate to create designs to protect their model coastal town...

Assign small teams to a MLODS model. Explain that teams will have to design protections for their coastal communities. Reveal that a hurricane will be impacting their town shortly to test their defenses. Have each team look at the materials included in the kit and discuss how they can be used to protect their model town from the incoming hurricane. Remind teams that they must develop a plan before they can begin building their protections.

Possible design restrictions:

- A specific budget with costs associated with different materials
- Limits on the amount of certain materials used (eg. clay)
- Limits on the length/size of certain protections
- Any others you wish to implement

Once team members have agreed on a design, have them place their protections on the model.

## Explain

Participants share their chosen protections and why they chose them...

Have each team share their design and protections. What protections did they employ? Levees? Marshes? Elevated houses? As they are explaining, give participants the correct vocabulary for the protections (eg. pump station or flood gate if they included them, etc). Make note of any protections that they did not include, but do not share this with participants at this point. Have participants make predictions about what will happen when the hurricane comes. Will their town be protected? Where might water get through their protections? Etc.

## Elaborate

Participants will reflect on the results of the hurricane event and resulting damage...

Roll the hurricane die to determine the category of hurricane. Based on the category, adjust the strength and amount of the marbles tossed onto the MLODS board. Remember to have the hurricane (marbles) come from the elevated water end of the board. Ask teams to reflect on how their designs held up against the storm surge. What was the most effective line of defense? It was most likely marshes if they included those. Explain that in real life, marshes reduce storm surge, create habitat for economically important animals, and reduce coastal erosion, etc. Contrast that with levees, which likely stopped additional storm surge but do not provide any other benefits. Where was the most significant damage? Why might that be? Use this moment to highlight income inequality, the costs associated with these protections, and the impact on access to certain lines of defense (eg. elevated homes). Ask teams what they might do differently if they were to design new protections.

Show the included MLODS graphic and photographs of each protection. Which lines of defense did they not include (eg. ridges, elevated highways)? Why? Discuss why these lines of defense are also critical for the protection of coastal towns.