**Wave Height Activity**- Teacher’s Instructions

In this hands-on exercise, students will take a closer look at wave height, how it is measured, and how it is impacted by different wind speeds. This exercise can be done as a class or in groups and is designed to supplement the Science on a Sphere animation of Global Wave Height.

**Materials:**

Large glass pan or tank

Ruler

Water

Stopwatch

Fan or blow dryer with multiple speeds

Dry erase markers

Rubber ducky or another floating toy

Student worksheet

1. Review the definitions of wave crest, wave period, wave trough, and wave height and have the students record the definitions on their worksheet.
   1. Wave height: The vertical distance between the highest point of a wave (wave crest) and the lowest point of a wave (wave trough)
   2. Wave period: The time it takes for one wave to pass a fixed point
   3. Wave crest: the highest part of the wave
   4. Wave trough: The lowest part of a wave
2. Introduce the materials for the activity and tell students that they will be creating waves by designing and performing 4 different trials with the materials. Encourage them to consider factors like the depth of the water and the speed of the wind created by the fan.
3. Students will perform each of their 4 trials and record their results on the student worksheet. They will measure the wave height with the ruler, and can make marks on the tank with the dry erase marker to help.
4. Students will write a conclusion on the experiment, which should acknowledge that higher winds lead to greater wave height.

**Extension**: Students can experiment with the National Geographic Wave Height Simulator:<http://education.nationalgeographic.com/education/multimedia/interactive/wave-simulator/?ar_a=1>

**Wave Height Activity Student Worksheet**

1. Define the following terms:
   1. Wave crest:
   2. Wave height:
   3. Wave period:
   4. Wave trough:
2. Design four trials to perform an experiment on wave height with the following materials:

Glass pan or tank

Ruler

Water

Stopwatch

Fan or blow-dryer with multiple speeds

Dry erase markers

Rubber ducky or another floating toy

1. Perform your four trials and record your findings below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Trial** | **Height of wave trough** | **Height of wave crest** | **Wave Height** | **Wave Period** | **Estimated wind speed** | **Water depth** |
| Trial 1 |  |  |  |  |  |  |
| Trial 2 |  |  |  |  |  |  |
| Trial 3 |  |  |  |  |  |  |
| Trial 4 |  |  |  |  |  |  |

4.) Draw a diagram of one of your trials. Label the wave crest, wave trough, and wave height.

5.) How does wind impact waves?

6.) Why is predicting wave height important?

7.) What could you add to this experiment that could change your results? Think about the ocean and the different variables that might impact waves.