

## **Erosion and Coastal Deposition**

### **Standards Covered in this Module**

#### **NGSS:**

4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.

MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

#### **Common Core:**

MP.2 Reason abstractly and quantitatively.

4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.

## **Guiding Questions**

How can erosion and deposition change the appearance of a coastline? What can be built to slow the process of erosion along a coast line?

## **Word wall**

- Sedimentary Rock – Rock formed in layers. Often found near water sources and a result of deposition and erosion.
- Erosion – The carrying away of sediments from rocks and minerals through wind or water moving past it.
- Deposition – When sediments are eroded from rocks and minerals, they will travel and be deposited in a new location

## **Procedure**

1. Video – Ben Explains Coastal Deposition
2. Junior Archaeologist Assignment
3. Record data in log book
4. Look at the pictures of the beach in Ashkelon where columns were used to slow erosion.
5. Interactive homework

## **Junior Archaeologist Assignment**

*Warning, this lab may get messy!*

For this assignment, you will need a supply of sand, water, a ruler, a craft stick (large popsicle stick) and a rectangular bucket/tub (I like the clear plastic ones from the dollar store that you can hold shoes in!).

On one side of your bucket, you will make a layer of sand about 3cm high and about 1/3 the length of your tub. Add a little water so that the sand is able to hold its shape, but do not over saturate the sand. Make a barrier between your sand and the rest of the bucket by putting a ruler tight against the sand. Draw what your “coastline” looks like in your logbook.

Next, add two cups of water to the other side of your bucket and take your ruler out. Using your ruler, you will create waves in the water by gently moving the ruler back and forth ten times between the sand and the opposite side of the bucket. When you are done, draw and record what your coastline looks like in your logbook and mark any changes that have occurred.

Next, reset your coastline the way you did at the beginning of the experiment. This time, place your craft stick parallel with your coastline about 5 cm from the edge of the sand. The craft stick represents a breakwater. Create 10 more waves with your ruler, and record what your coastline looks like with the breakwater added in.

One more time, reset your coastline. Place your popsicle stick edge in the sand and have it stick out perpendicular from your coastline. This represents the jetty you saw on the coast in Ashkelon. When creating your waves this time, move your ruler back and forth from the left side of the coast to the right side of the coast. Record your observations in your science notebook.

## **Interactive Homework**

Erosion can happen when you have any water source that moves. With a parent, find a water source near your house. This could include a lake, river, or the ocean. In your logbook, make notes of how the water is moving. Next, write down if there are many man made objects that have been built in your water source such as jetties, breakwaters, or cement barriers along the shore to slow the process of erosion (look at the pictures of how scientists in Ashkelon have slowed the process of erosion by reusing Roman columns!). If there is not man made objects, look for natural methods of erosion, like plants or vegetation around the shoreline. Next, discuss with your parent what the pros and cons are of using this type of method. Do you think there could be any harm to the wild life in the area because of the man made additions? Could you think of any way other than what is already there to slow the process of erosion?