

Field Studies Activity A: Erosion

Purpose:

To show students how natural coastal processes driven by the weather and sea conditions shape our coastline and teach them about geological features such as stacks and arches

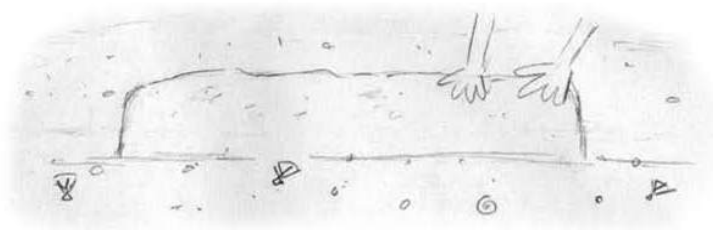


Equipment needed:

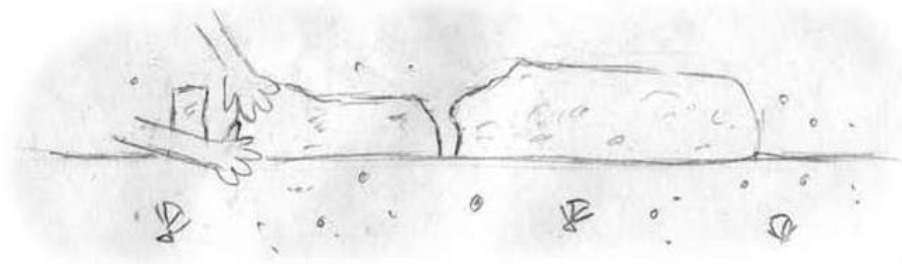
- Sand (beach)
- Water (sea)

Activity:

- 1) Build a long log-like shape in the sand using sand from the beach



- 2) Make your hands act as the wind and sea scraping away on either side of your sand model. When your hands meet in the middle, form a shape like you see in this picture of Old Harry Rocks, Studland, England.



- 3) What you've just done is a speeded up re-enactment of how the wind, rain and sea shaped the real Old Harry Rocks at Studland.



Field Studies Activity B: Longshore Drift

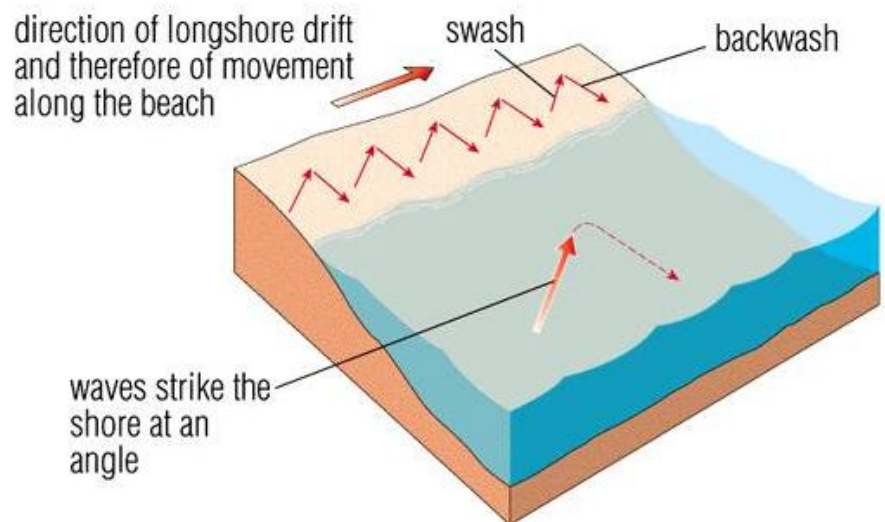
Purpose:

To show students how the action of longshore drift affects beaches.

- When waves approach the coastline at an angle the sediment (sand, pebbles, stones) will be carried up the beach (**swash**) at the same angle; it then moves back down (**backwash**) at right angles.
- The result is a zig zag motion along the beach which moves sediment along a coastline.

Equipment needed:

- Clip boards
- Pencils
- Measuring stick/tape
- 2 cones
- 1 ball/orange



Activity:

1. Mark out a 10m strip along the sea shore with measuring stick/tape and put a cone at either end.
2. One student to throw the ball or orange into the sea.
 - a. *What do you predict will happen to the orange?*
3. Students to observe and draw sketch of what they see.
 - a. *What direction is it moving?*
 - b. *Where else on the beach can we see evidence of longshore drift?*
 - c. *What would happen to the beach if no new sediment was washed up?*

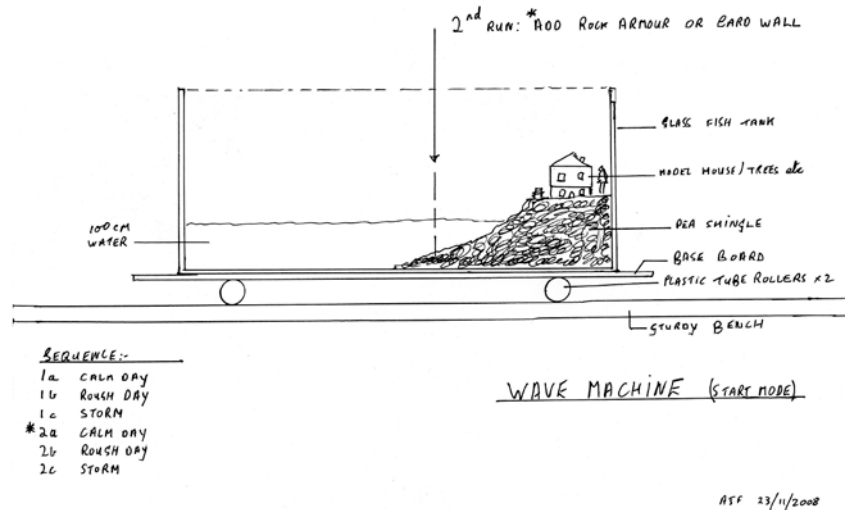
Remember to make sure that the ball or orange is thrown in to the side of the marked area towards the prevailing wind (as you look out to sea) or it will move away from the students.

Field Studies Activity C: Sea Defences

Purpose:

This activity shows the students how forceful the sea can be and the impact it has on shingle/sand and buildings on the coast. It also demonstrates how sea defences can be used to reduce the impact of wave energy in the short term.

These activities can be done using the LiCCo wave machine or it can be done on the beach with the students. The equipment required and the steps for both activities are described below.



Equipment:

A. Wave machine

- Fish tank
- Plastic tube rollers
- Base board
- Shingle/Large rocks
- Thin strip of wood/Half section of plastic pipe
- Model house, lego people, plastic trees, etc.

B. Houses on the beach

- Bits of wood, pebbles – materials that should be available on the beach

Activity:

A. Wave machine

1. Fill wave machine with shingle, water and position model house and lego people, etc. (as shown in the diagram above) and gently roll the tank back and forth on its rollers
2. Ask the students what is happening to the shingle
3. Increase the force of the movement as the students continue to observe
4. Place the large rocks in a line/wood in front of shingle/ then the half pipe and repeat motions
5. Students to watch what happens to defences as waves come in and see what effect the water has on the defences and also the beach and house/lego/people

B. Houses on the beach

1. Students build houses using wooden blocks close to the shoreline as the tide is coming in
2. Collect materials from the beach to build protective barriers in front of their wooden houses
3. Retreat up the beach as the tide comes in further. What do the students think will happen as the sea comes in? Which design lasted the longest and why?

Field Studies Activity E: Sea Level Rise

Purpose:

To explore what happens to the sea levels when ice melts on land and in the sea.

Materials:

- Measuring jug
- Permanent marker
- Two plastic containers
- Modelling clay
- Knife
- Tap water
- Ice cubes



Activity:

1. Put a block of modelling clay into the plastic containers.
2. Make the top of the clay flat and level.
3. Fill the plastic containers half full of tap water. The water represents the ocean.
4. Add 5-10 ice cubes into the water in one container and immediately mark the water level on the side of the container with a permanent marker. The ice cubes represent floating ice bergs.

What do you think will happen as the ice cubes melt?

5. Then place 5-10 ice cubes on top of the clay in the other container, lightly pressing them down into the clay. Immediately mark the water level on the side of the container with the permanent marker. The ice cubes represent an ice sheet on land.

What do you think will happen as the ice cubes melt?

6. Allow the ice in your models to melt in a place where they won't be disturbed. Watch the ice cubes on top of the clay to make sure they stay balanced, and that all the water from these ice cubes is able to drain off of the clay.
7. Once the ice has completely melted, check the water level in each container again.

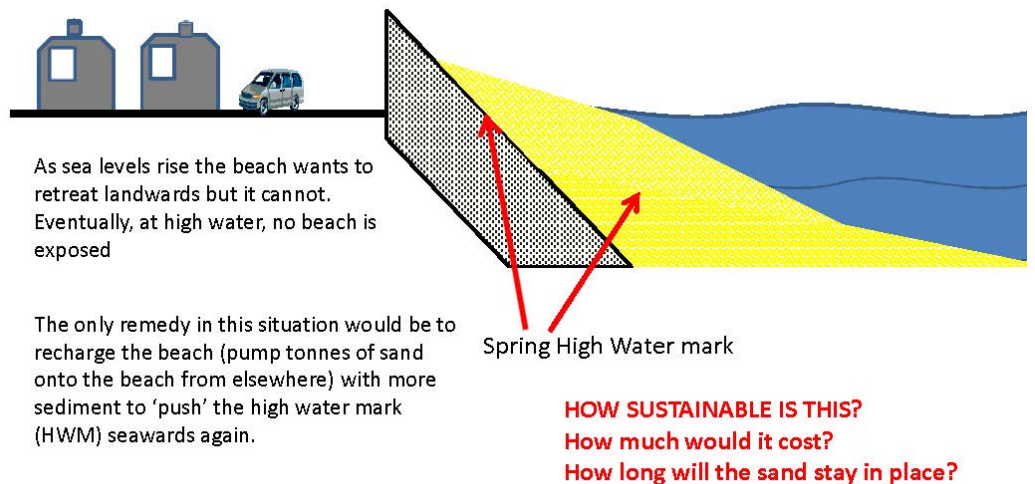
Has the water level risen in any of the containers? If it has, why do you think this is, and what do you think the implications are for changes in sea level in the real world?

Field Studies Activity F: Beach Recharge

Purpose:

To explore how beach recharge works and what its limitations may be under different conditions.

'Shallow beaches and hard defences do not mix'!



Materials:

- A tray
- Modelling clay
- Piece of plywood (width of tray)
- Sand
- Jug of water
- Marker pen

Activity:

1. Use a tray and place some clay at one end
2. Rest a piece of plywood at an angle against the clay to represent a seawall
3. Pile some sand up against the wall but at shallow angle
4. Pour a jug of water CAREFULLY in at the opposite end of the tray
5. Mark the water level in the sand with a matchstick
6. Now add two more jugs of water GENTLY into the tray
7. Mark the new level with another matchstick

What has happened to the area of beach available for recreation?

8. Now, without removing any water, pour a new amount of sand onto the existing submerged sand and mark the new water level with a third matchstick

Now, what has happened to the area of beach available for recreation?