

SHELLS AS WAY-UP INDICATORS

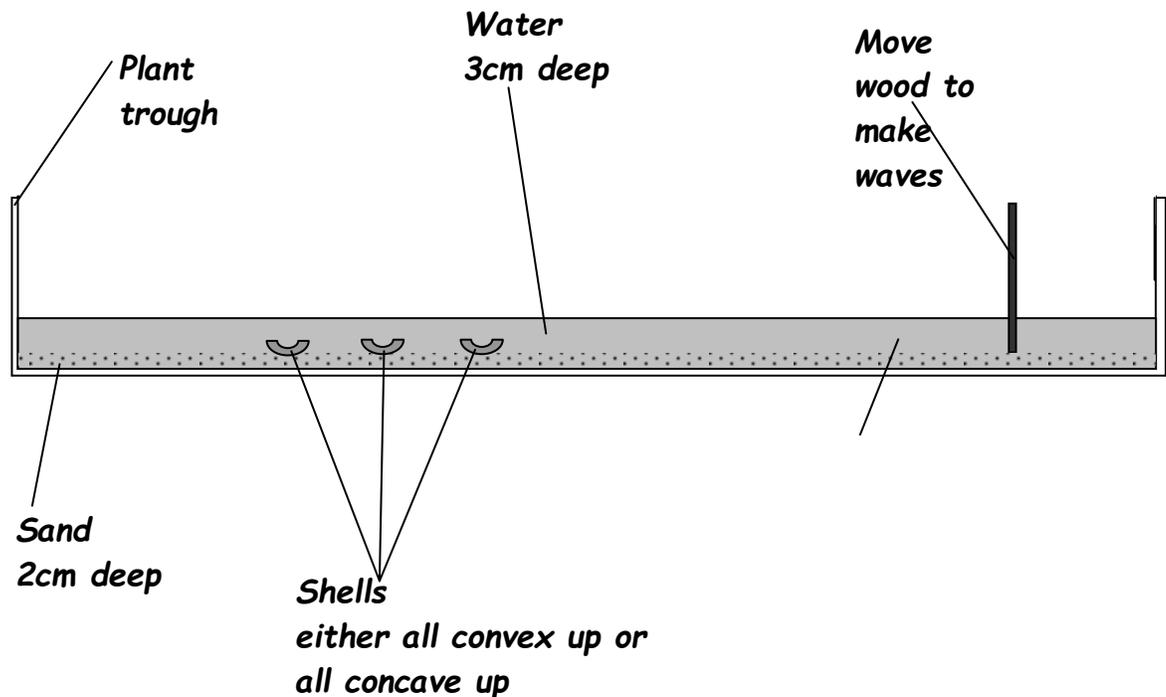
Purpose

To determine if loose valves of Bivalves can be used as way-up indicators in sedimentary rocks.

Instructions

Activity 1 Wave motion

1. Use the piece of wood to spread the sand out evenly over the bottom of the plant trough.



2. Place the small valves on the sand in the tank all concave up. Do not place them close to either end of the tank.
3. Use the piece of wood to make waves but not so vigorously that the water splashes out.
4. Count how many valves are now convex up and how many are concave up.
5. Repeat this three times and work out an average.

6. Now place all the valves on the sand in the tank again, but this time all convex up.

7. Repeat instructions 3 to 5.

Activity 2 Breaking waves

8. Use the piece of wood to push all the sand to one end so that it makes a sloping beach.

9. Place the valves on the sand just above the water on the sand all concave up

10. Use the piece of wood to make some waves but not so vigorously that the water splashes out.

11. Count how many valves are now convex up and how many are concave up.

12. Repeat this three times and work out an average.

13. Repeat instructions 9 to 12 but this time with the valves placed convex up.

14. Draw your conclusions and explain your results.

Activity 3 Shells on a beach

15. Examine the photograph of shells on a beach and work out what percentage is convex up and what percentage is concave up.

Activity 4 Working out the way-up of a rock

16. Examine the rock sample and count the number of valves that are convex up and concave up first on side A and then on side B.

17. Which was the original top of the sedimentary rock?

Teacher's Section

Requirements

Plant trough about 60cm by 14cm by 14cm.

About 1 litre of clean sand preferably white.

Piece of wood 15cm by 8cm to fit easily into the trough.

About 20 small thin valves about 2cm long. Sunset shells and Banded Wedge shells are good. Mussels also work well or if no shells are available pistachio "valves"

The sand should be placed in the trough (about 2cm deep) and the trough filled with 2 litres of water (about 3cm deep).

Photograph of shells on a beach.

Slab of rock full of single valves. My sample came from the Blue Lias at Blue Anchor near Minehead but I am sure that samples can be got from many other places.

Notes.

Make sure students understand concave and convex, they often mix them up.

The effect of marine currents can be simulated in a flume. The valves end up convex up but are often lost buried in the sand, Pouring water along a piece of guttering does not work because the concave up valves float.

If there are several pairs of students it is worth having two troughs, one for each of the first two activities.

Activity 3 can be done on a real beach.

Results

Most of the valves end up convex up because that is the more stable position. They can be used as way-up indicators. Beware - some Bivalves e.g. *Ostrea* and Brachiopods e.g. *Productus* are found in growth position but these have both valves together,

Cost

Trough £6

Time

About 45 minutes