

TRANSPORT BY WIND

Purpose

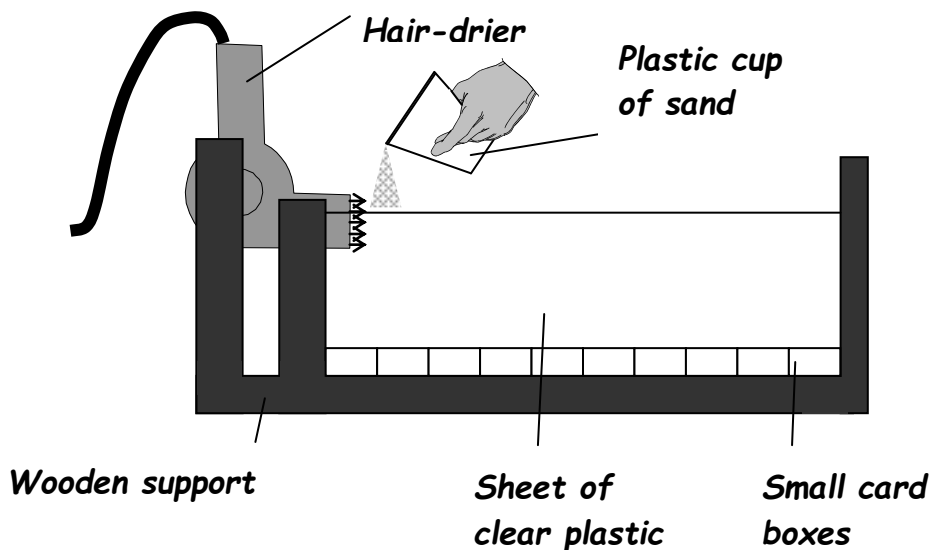
To explain how size, shape and density affect the ease with which grains can be moved by wind:

Instructions

In each activity the grains should be poured carefully and slowly from the appropriate container just in front of and above the nozzle of the hairdryer as in the diagram.

Activity I

Take the container of poorly sorted grains (200ml 0.125 to 4mm) and pour them out very slowly by shaking the container in front of the hairdryer.



Note the distribution of grains in the trays.

Use the grain size card to measure the maximum and average grain size in each tray.

Plot average grain size against distance from hairdryer.

Activity II

Take the 0.1 g grains of quartz and mica and pour them in front of the hair drier.

Note how far from the hair drier each grain lands.

Plot a graph of number and type of grain against distance.

Repeat using the 0.2g grains.

Activity III

Take the galena and pour it in front of the hair drier. Measure the volume in each box. Tip it all back into the original container.

Repeat with the sand.

Plot a bar graph of volume against distance for each.

Question

At Kalgoolie, in Australia, small grains of gold are found mixed in with larger grains of quartz sand in the wind blown sediment close to the outcrop of the gold vein. Explain why.



Apparatus for transport by wind

Teacher's Section

Requirements

200ml poorly sorted sand, 0.125 to 4mm.

10 grains of quartz and 10 grains of mica each weighing 0.1g.

As above but each weighing 0.2g.

100ml of galena and 100ml of quartz sand all with a grain size of 0.5mm.

Grain size scale.

Hairdryer.

100ml measuring cylinder and funnel.

8 cardboard boxes 7.5 by 10cm labelled A to H.

Apparatus as shown in diagram.

Making the apparatus (80 minutes)

You will need a base board 10.5cm wide and 85cm long and 12mm thick.

The front is perspex and is 17cm by 67cm and the back is hardboard of the same size. The ends are 16cm by 10.5cm by 1.2mm. One end has a U shaped notch to take the hair drier nozzle. There will also need to be support for the body of the hair drier. Assemble as in diagram.

Notes and results

The maximum grain size decreases with distance but all trays contain the finer grain sizes. Students usually do not note this. The mica, because of its shape is carried much further than the quartz, sometimes beyond the boxes.

The galena all ends up close to the hairdryer.

The wind was unable to carry the dense but fine gold grains or the large quartz grains far. The fine quartz grains will have been blown further away.

Time

15 minutes

Cost

Hairdryer £6