

Changes Due to Drought– Teacher Notes

We live in the world's driest habitable continent

Defining drought is difficult when many areas naturally have little rain. The [Bureau of Meteorology](#) defines drought as when rainfall is below the lowest 10% measured for that area for a period of three months or more. One example is the drought of 2017 – 2019 that preceded the extensive East Coast bushfires of 2019-2020.

Drought can lead to severe erosion because of loss of vegetation, which holds the soil in place. When vegetation is no longer present, soil is vulnerable to erosion by wind and (at the end of the drought) water. Droughts also cause dams and waterways to dry up. This often means that the little water this is left become saline.

Wind



Wind can be a powerful force in shaping landscapes. The World Heritage listed Willandra Lakes Region of New South Wales has impressive examples of this in Lake Mungo.

Winds blowing from the West for millions of years have blown in sediments and sculpted them to form dunes and the famous lunettes (shown in the photo at left).

Wind erosion has also uncovered many artefacts from more than 40 000 years of Aboriginal settlement in the area.

The following activity asks students to predict what will happen with wind erosion.

Observing How Damp Soil is More Resistant to Wind than Dry Soil

This activity can be messy with excitable classes. Although it can be carried out on desks covered with newspaper, it is easier to clean up if carried out in the sandpit or on the ledge surrounding it.

Materials

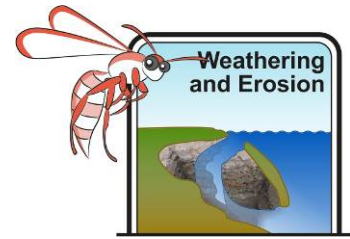
- Moist and dry sand
- Drinking straws
- Sandpit



Before blowing



After blowing



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Method

1. Make two “sandcastles” - both the same size, one with dry sand and the other with moist (not wet) sand. An alternative is to fill half a takeaway container with moist sand and half with dry, as shown in the photos on the previous page.
2. Students should predict what will happen if the wind blows across dry sand and wet sand.
3. They then blow through the straw for 10 seconds on each type of sand.
4. Students should compare what happened to the each sandcastle/type of sand.

Prediction

It doesn't matter if the student gets the correct prediction or not, as long as the prediction is reasonable.

Observations

Same: The type of sand, the size of the castle/pile, how long we blew on each.

Different: The dry sand blew away faster than the wet sand. More sand blew away from the dry sand than the wet sand.

Discussion

What changes to the landscape do you predict will happen if wind blows across a drought stricken landscape? Soil will blow away exposing bare rock. Precious topsoil will be blown away and farmers cannot plant their crops.

Observing How Drying Soil Brings Salt to the Surface

Salt from the sea is blown in on the wind onto our landscape. Some salt also comes from rivers drying up. These processes have been going on for millions of years. Salt is usually dissolved when it rains and is carried down through the soil. It usually rises to the surface when drought occurs. Scrubs and trees use groundwater and release it into the air. When drought occurs vegetation dies and groundwater is allowed to rise to the surface of the land bringing up salt. When the water evaporates, a crust of salt is left on the land. Most plants cannot tolerate salt, so they die.

Materials

- A plastic cup or small beaker
- Sand
- Salty water. Just mix salt into warm water until no more will dissolve.

Method

1. Almost fill the cup with sand
2. Pour in the salty water until the sand is all damp
3. Place the cup on a warm windowsill and observe over several weeks

The salt will rise to the surface with the water. When the water evaporates it leaves behind a thick salty crust. The speed at which it does this depends on the local climate. In a hot dry area, salt should start appearing in one week.