



ICE ICE BABY

MAKE YOUR OWN GLIDING GLACIERS!

LEARNING OBJECTIVES

- Find out what a glacier is and how it shapes the landscape
- Discover what materials make up a glacier
- Investigate how and why glaciers move.

1-2 HOURS

INDEPENDENT LEARNING

DIFFICULTY: ★★★★★

YOUR MISSION

Glaciers are great rivers of ice and compacted snow. As they move (rarely more than two metres a day), they carve out troughs in the rock around them. Although made of ice, they are often dirty because they carry large amounts of debris with them.

Your challenge is to simulate how a glacier advances and retreats, and discover what damage it causes to the landscape.

GET STARTED

PHASE 1:

Make a large block of ice in the freezer. Water will expand as it freezes so use a plastic beaker, cup or container. Then set up the tray. Cover the base of it with some sand (a couple of centimetres deep) and scatter the gravel or stones on top.

PHASE 2:

Remove the ice block from its container and place on the sand at one end of the tray. Press down, and then push it slowly in a straight line towards the other end of the tray. Notice how the block of ice pushes the sand and gravel before making a curved channel and creating a mound of debris in front of it. This is called **moraine**. Stop halfway and then pull the ice block back towards the start. This happens with real glaciers. They advance and retreat depending on the surrounding temperatures. The ice may start to melt now at the base under the weight of the rest of the block, and pieces of gravel may be left. These are called **erratics**. In a real glacier they can weigh thousands of tonnes.

PHASE 3:

Push the block of ice back along the tray again, creating more moraine. By now the bottom of the tray should be exposed. This also happens to an actual glacier. The surface that is uncovered is the **bedrock** (the hard, solid rock beneath surface materials) of the area.

YOU WILL NEED

- Large block of ice
- Ice cubes
- Sand
- Gravel or small stones
- Plastic container
- Plastic tray
- Old piece of softwood board

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PHASE 4:

Now you're going to investigate the damage that moving glaciers can do. Take an ice cube, wait until it has just started to melt and then dip it in sand. Moving your hand in a circle, rub the sandy side of the ice cube on the old piece of softwood board. Keep dipping the ice cube in the sand so it stays sandy as you rub.

PHASE 5:

Do this for several minutes, then look at the surface of the board. The ice will have scraped the sand against the wood causing grooves and gouges. These scrapes are called **striations**. This is the kind of damage that a glacier can do to the bedrock of an area as it moves backwards and forwards.

THINGS TO THINK ABOUT

* Find out more about the world's best-known glaciers. The largest in the world is reckoned to be the **Lambert-Fisher Glacier** in Antarctica, which has been measured at 400 km long and 100 km wide. As well as in the polar regions, there are glaciers in many of the mountain ranges of Europe, Asia, Africa and the Americas including the Alps, the Caucasus, the Himalayas, the Rockies and the Andes.

* Research the life and work of the scientist/naturalist **Louis Agassiz** (1807–1873). He looked at how glaciers worked and also identified the effects of ice erosion in places where glaciers no longer existed. It led him to suggest that, at times in the past, much of North America and Europe must have been covered with large sheets of ice. It was his work that started people thinking about the possibility that 'ice ages' had happened in the past.

FUN FACT

The only continent where glaciers aren't currently found is Australia.