



Meteorites

Journey to other celestial objects

time

50 minutes

learning outcomes

To:

- know what a meteorite is
- know that a meteorite leaves craters
- know that the depth and size of the craters depends on the size, weight and speed at which the object hits the ground.

end product

- craters in a sand container

materials needed

- photographs of a meteorite and crater (Appendix)
- 6 large containers, at least 5 cm deep (or the sandpit in the playground)
- 6 small stones (maybe picked up in the playground)
- 6 table tennis balls
- 6 large marbles
- 6 large trays (if the activity takes place outside, these will not be needed)
- sand
- unusually shaped black stone

Preparation

For the activity **Story** you will need a stone, preferably an unusually shaped one. You may be able to get this in a garden centre.

For the activity **Make meteorite craters** prepare the containers of sand.

Make sure the small stones, the heavy objects and the lightweight objects are close at hand. If you are carrying out this experiment indoors, you are advised to place the containers on large trays or plastic sheets to catch any sand spilling out of the containers.

For the activity **Real meteorites and craters** you will need the photographs of the meteorite and the crater from the Appendix.



Story 15 min.

Show the children the large, unusually shaped stone. Tell the following story:

Yesterday I went for a walk in the woods. All of a sudden I heard a strange sound. I looked around, but didn't see anything strange. But it seemed like something had fallen. I took a closer look at the ground around me. There I saw a small hole with a funny looking stone in it (show the stone and pass it round the class). **It doesn't look like an ordinary stone. There was no-one nearby who could have thrown the stone. Maybe the stone came from outer space! It's completely black. I wanted to pick it up, but it was too hot to touch! I waited a while until it was cool enough to pick up. It was very heavy.**

(Adapt the story where necessary to match your stone.)



Encourage the children to share what they think about this stone? Where do they think it comes from?

Get the children involved in the story by asking them what they think the stone looks like. What could it be? End the discussion by saying that it might be a stone from outer space: a meteorite.

Ask the children if they know what a meteorite is. Explain that a meteorite is a piece of rock or iron that comes from outer space. Ask if they think you can find a meteorite very often. Say that there are very few officially registered meteorites in the world. Some are so small that you could fit them in your pocket, just like this stone here.

But in some countries, much bigger meteorites have been found. What do you think happens if a meteorite hits the ground very fast?



The children discover how craters are made by meteorites.

Good to know. The largest known meteorite is in Africa and weighs 60 tons. That is equivalent to the weight of 15 elephants!



Make meteorite craters 25 min.



When a meteorite falls from outer space and lands on the Earth it makes a crater. Organise the children into groups of four. Put the containers of sand on the ground. Give each group a container with sand. Give each child in the group a different object: a table tennis ball, a large marble or a small stone. Get the children to drop the objects into the container one-by-one. They should drop the object from two heights. Once from low height and once from standing height. Each time they should carefully remove the object from the container and complete the task on the worksheet. Encourage them to pay attention to how large and how deep the hole is each time. Make sure the sand is smoothed out in between each throw, so that the imprint left by the object can be seen clearly.

What is the difference between the various objects? Does it make any difference if the object was dropped from low or greater height?



Discuss the results. Which object left the biggest crater? Which object left the deepest crater? Are meteorites dangerous to people, generally speaking? Explain that the stone you showed them at the beginning of the lesson is not a real meteorite. The chance of someone finding a meteorite while they're out for a walk is very small indeed.



Real meteorites and craters 10 min.

Show the photograph of the meteorite. Explain that is the biggest known meteorite. It measures around three by three metres. Show the photograph of the crater formed by a meteorite. This is the biggest known crater. This one is around 1200 metres across. Talk about the size of this meteorite and the crater while you show the photographs. Compare the size of the children's craters caused by the different objects. Why is the crater in the photograph so big? Encourage the children to look at their answers on the worksheet to help explain that the when dropped from a given height, the larger the object, the larger the crater; the heavier (greater the mass of) the object, the larger the crater. The greater the height of drop, the larger the crater.



Meteorites

1 Make meteorite craters

1 Make a drawing showing what the hole in the sand looks like.

a Is it a deep hole?

b Is it a wide hole?



stone

make a drawing
HERE
of the crater
made
by the stone
dropped
from standing height

make a drawing
HERE
of the crater
made by the stone
dropped from
a low height

make a drawing
HERE
of the crater
made by the table
tennis ball dropped
from low height



table tennis ball

make a drawing
HERE
of the crater
made by the table
tennis ball dropped
from standing height



