

Hammer and Feather

Materials

- Toy hammer (made of plastic or wood)
- Feather

Instructions

1. Hold up the toy hammer and feather and ask children to predict which objects will hit the ground first.
2. Drop the hammer and the feather and notice that the toy hammer falls quickly, while the feather floats slowly to the ground.
3. Invite the children to fan their cheeks with their hands, and discuss how air cannot be seen, but it can be felt. It was air that slowed down the feather and made it glide gently to the ground.
4. What would happen if the hammer and feather were dropped on the Moon where there is no air? Watch the video of Apollo 15 astronaut David Scott dropping a hammer and a feather on the Moon in 1971: <http://apod.nasa.gov/apod/ap111101.html>
5. What if there was a place on Earth that did not have any air? Watch the video of a bowling ball and feather falling in a vacuum chamber (skip to 1:26 for the drop with air and 2:52 for the drop with no air): <https://youtu.be/E43-CfukEgs>



What happens?

The force of gravity pulls objects towards the Earth and air resistance slows down falling objects. The shape of an object affects how much air it has to push through. Heavier objects push against air with more force than lighter objects, so heavier objects tend to fall faster than lighter objects of the same size and shape. On the Moon, or in a vacuum chamber, where there is no air, objects fall to the ground at the same rate, regardless of their size, shape or weight.



Image credit: NASA