

How To...

Day 29: Slow the drop!

Create a parachute to slow the fall of a Lego figure. Use newspaper (or other materials) and string. Which design makes the 'best' parachute?

Use this Challenge Chaser activity from PSTT to find out the science behind it.



Slow the drop!

LINKED CHALLENGE

To make a parachute to save a Lego™ figure



ACTIVITY OVERVIEW

Explore with the children the basics of air resistance using a piece of newspaper: let the paper fall from a set height; fold the paper in half and half again, and repeat; finally, scrunch the paper up and repeat once more. How does the paper fall each time? What path does it take through the air? How long does it take? Draw out the key forces acting on the paper (see key facts below for more detail) and apply this to parachutes. Check out the linked supporting video to see this in action.

Set the children a challenge: Lego™ figures are trapped in a tall building and need to escape to stop a Duplo™ invasion. Can you design a parachute so that they can leave the building safely?

Provide time for each pair to make and test a parachute. Can they make improvements? Explore each of the parachutes as a group. Which parachute works well and why? What makes a good parachute? Would the same parachute work for a heavier figure?

Extension Activity: Explore the misconception that heavier objects fall more quickly:

1. Using the funnel, fill one plastic bottle with sand and leave the other empty.
2. Drop the bottles from the same height. Do they land at different times?
3. Repeat the drop. Use a tablet or other device to record this in slow motion. This makes it easier to see results.

KEY FACTS/SCIENCE

Unsupported objects fall towards the Earth because of the force of *gravity* acting between the Earth and the falling object. Gravity pulls objects towards the centre of the Earth. A common misconception is that heavier objects fall more quickly than lighter ones, however all objects of the same shape accelerate towards Earth at the same rate, but the rate of fall may be slowed due to *air resistance*. The material and shape of the object can affect both air flow and air resistance, and it is this can lead to misconceptions.

Air resistance (sometimes called *drag*) is a force created as objects travel through air and acts in opposition to the direction of travel. The surface area of the canopy of a parachute is important here as it is this that creates air resistance; the larger the area, the more air resistance is created and the slower the parachute will fall.

RESOURCES

Main Activity

Sheets of newspaper
String
Lego™ figures
Scissors
Metre ruler
Sticky tape

Extension Activity

2 identical plastic bottles
Sand
Funnel
Tablet for recording
Tennis ball

QUESTIONS/FURTHER LEARNING

- Which forces are acting on a parachute as it falls?
- Is there a most efficient shape for a parachute?
- How do parachutes work?
- What materials can parachutes be made from - why is this important?
- TOP TIP: explore the scientist Galileo to find out more about his discovery about falling objects.

Online supporting video:
<https://www.bbc.co.uk/bitesize/clips/zhyrvcw>



Instructions

1. Explore air resistance using newspaper.
2. Make a parachute out of newspaper, string and use a Lego figure to test it.
3. How long does it take for your Lego figure to reach the floor?
4. Can you make any improvements?

<https://pstt.org.uk/resources/curriculum-materials/childrens-university-stem-clubs>