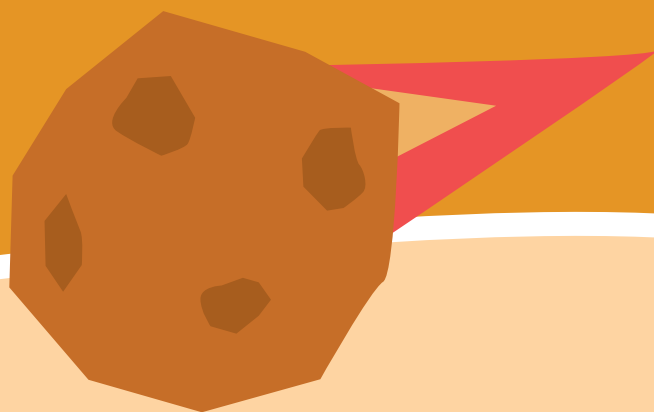




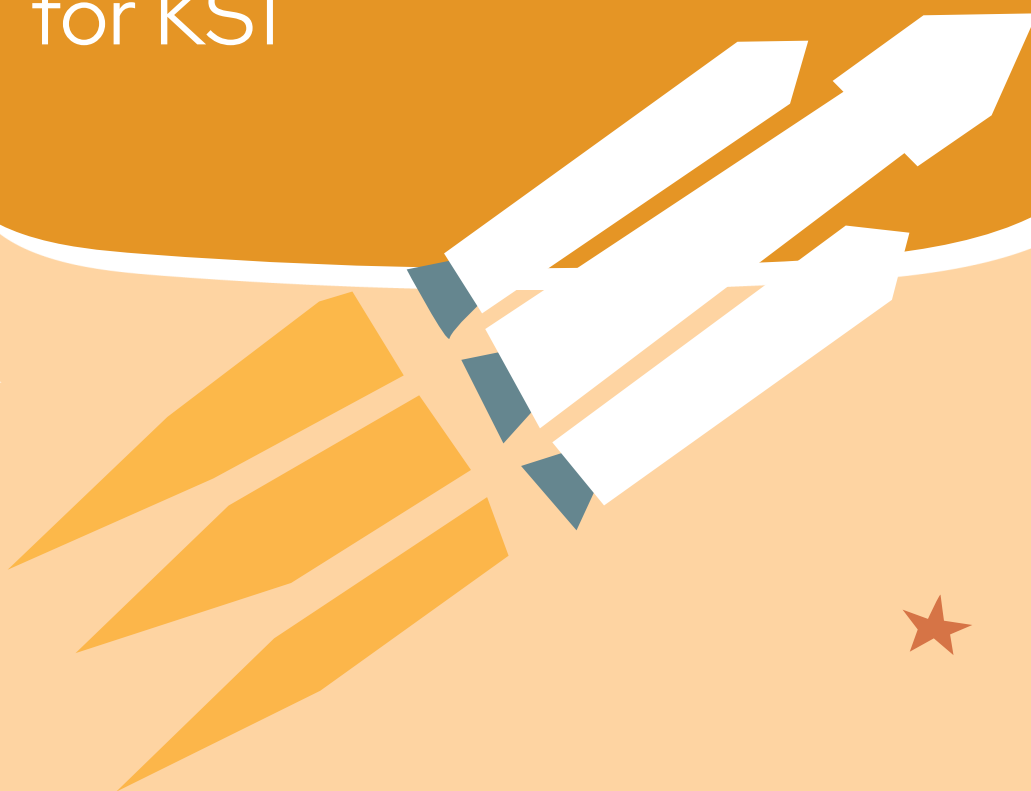
Winchester
Science Centre

By Wonderseekers



Blast Off!

Pre-visit resources
for KS1



KS1 - Blast Off!

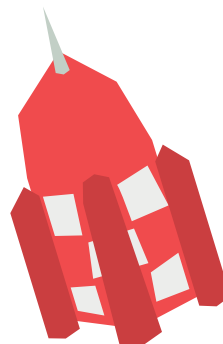
These activities are designed to be completed before you visit for your Blast Off! workshop. We recommend working through the activities from 1 to 4 but you are welcome to pick and choose depending on your group's prior knowledge and any ideas they may spark along the way.

Through these activities, you will be exploring a few different materials and how their properties make them suitable for flying.. You'll also be exploring some of the pushes and pulls that affect a flying object.. With the final activity we will start exploring the force of friction.

Teacher Guide

Learning Objective

- To explore the different pushes and pulls on objects that fly
- To explore how the friction occurs between two different objects



Key Science

Everything in our world is constantly experiencing different forces. These forces are pushes and pulls that act on an object due to its interaction with something else in our world. We are going to focus on gravity and friction.

Gravity is a force that pulls small objects towards larger objects. We feel the gravity of the Earth all the time as it pulls us towards itself. For something to fly, like a rocket, they need to generate force to overcome gravity and not be pulled to the ground. Birds do this by flapping their wings, planes do this by burning fuel. As they push up into the air, gravity is trying to pull them back down toward the ground, which is why they need to keep pushing upwards.

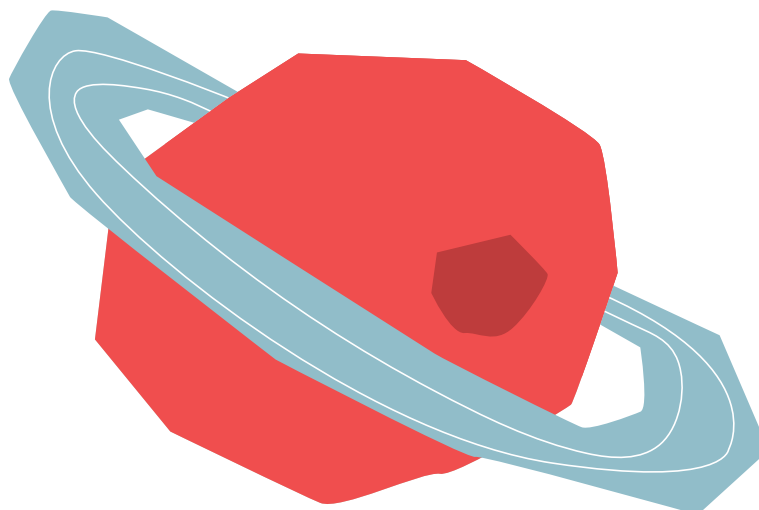
The other force we are going to focus on is friction. Friction is a resistance force which means it opposes the forces moving an object. Friction is a force between two surfaces when they are trying to slide against each other. Here the friction slows down the surface, with rougher surfaces generating more friction and slowing down faster. This is why we wear trainers when running around, as they have rougher soles and stop us skidding over.

Curriculum Links

- Observing closely, using simple equipment
- Performing simple tests
- Identifying and classifying
- Describe the simple physical properties of a variety of everyday materials
- Compare and group together a variety of everyday materials on the basis of their simple physical properties

Key terms

- **Push & Pull** – These are opposite forces (demonstrate pushing and pulling)
- **Fuel** – A resource that is burned/used to produce energy
- **Direction** – The way something is moving
- **Distance** – A measure of how far something moves
- **Mass** – Mass is the amount of matter or substance that makes up an object usually measured in kilograms (Kg)
- **Weight** – The force acting on an object due to gravity
- **Friction** – This is the force between two surfaces sliding together.
- **Force** – A force is a push or a pull acting on an object. We can use forces to change the direction of an object.
- **Aerodynamic** – Having a shape which reduces the drag from air moving past.
- **Air resistance** – The force that opposes the movement of an object through air



Activity 1 – What are some things that fly? How? (5–10 minutes)

Overview

This activity introduces the concept of flight and encourages a creative discussion about how things fly. Have a discussion with your class around what kinds of things can fly and what we need to be able to fly.

You will need (per group)

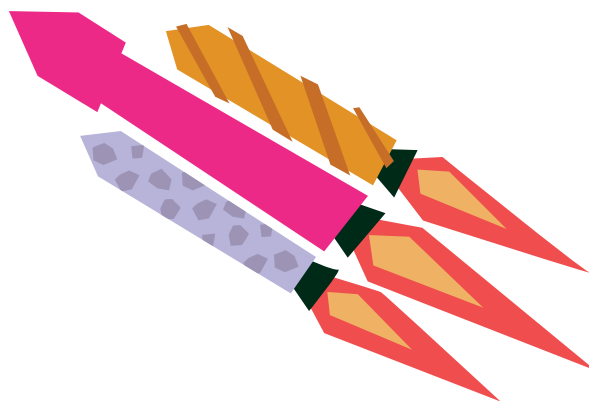
- You could have some pictures of different flying things, e.g. animals, machines, superheroes
- Pens and paper

Instructions

1. What is flying? Have a discussion with the class and come up with a definition you agree with for flying.
2. Come up with a list of different things that fly! See how many you can come up with and group them based on how they fly. Think about what they need to fly. (E.g. birds flap their wings, aeroplanes have an engine and have a runway for a 'run-up', helicopters have spinning rotor blades). Have a discussion about the different groups that emerge and identify if there are any similarities between them.

Take it further

Why can't humans fly? Ask the class and explore what we would need to have as humans to fly.



Activity 2: How do things fly? (15–20 minutes)

Overview

In this activity we will be seeing how paper airplanes fly. The students will be making paper airplanes and seeing how far they fly, and what they can do to make them fly further.

You will need

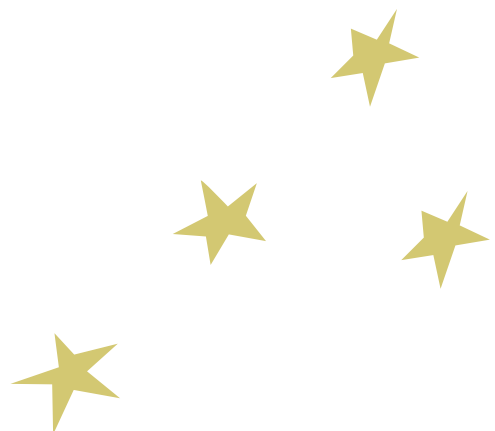
- Thin card or paper
- Tape
- Coloured cones

Instructions:

1. Lay out the cones in a straight line. These will act as markers to see how far the planes fly.
2. Break the students up into groups. Each group will make their own paper airplane.
3. Get the students to line up and then throw their paper airplanes. See which plane goes the furthest and explore why with the children. Was it thrown the hardest? Does it have the biggest wings?
4. Discuss why all the planes came down. It's due to gravity, and they all took time due to the wings allowing them to glide.

Take it further

Explore if different plane designs allow them to go further, what if we use different materials? Or make them lighter or more pointy? Give opportunities for the students to try different things to see if that improves the distance they are able to achieve.



Activity 3: How does friction affect moving objects? (15–30 minutes)

Overview

A class experiment sliding different materials over different surfaces to see if they generate more or less friction – are some materials more 'slidey'? Can you use materials to make something slide less far if you want to? Materials that create the least amount of friction will slide across the flooring the most.

You will need

- Pieces of different materials – paper, fabrics, etc.
- Something to attach materials to or wrap them around – wooden blocks, whiteboard rubbers, rectangles of Multilink cube.
- Different surfaces – table, carpet, floor.
- Different coloured cones.

Instructions:

1. Set cones out in a line along the floor. Use one to show where to start, and allocate the others numbers of points (e.g. white cone for start line, red cone is 3 points, green is 10 points, yellow cone is 5 points).
2. Teams spread out and experiment using different materials on their block, and pushing them along the same surface to see how far they go.
3. Teams choose the material they think will work best, then take turns pushing their block from the starting cone and seeing how many points they get.
4. Discuss which material worked best at sliding.
5. Repeat on other surfaces (lino instead of carpet flooring, along a table, on tarmac outside, etc.).

Take it further

- How do the different materials affect the way that the object slides?
- Do the materials behave differently on different surfaces?
- What kinds of materials make the block slide too far?
- What kinds of materials make the block stop too early?

