

Spirit of Innovation

STEAM Resources



Science

Year Five

Forces – Air Resistance

Parachutes

Links

Working scientifically

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- Using test results to make predictions to set up further comparative and fair tests
- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

Forces

- Explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Resources

- Yoghurt pots
- Cake cases
- Paper cones
- Plastic bags
- Cotton
- String
- Single hole punch
- Scissors
- Sticky tape
- Blue tac/plasticine
- Weighing scales
- Stop watch
- Air Resistance PowerPoint ([Download](#))
- Parachute write up sheet ([Download](#))
- Parachute result sheet ([Download](#))

Skills

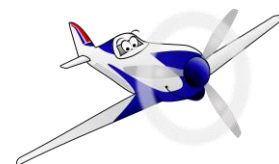
- Working as a pair
- Working in a team
- Discussing ideas
- Collaboration and compromise
- Designing and carrying out a fair test
- Make predictions and give reasons
- Planning and designing
- Measuring accurately

Questions

- Why do objects fall to the ground?
- What is air resistance?
- What shapes travel through air effectively?
- What shapes increase air resistance?
- How can you change the air resistance of a shape?
- What do you believe makes a good parachute?
- Can you use your findings to improve upon your original designs?



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- Recording data
- Report back findings
- Improve designs based on findings

Activity

Activity One

Whole Class
(30 – 40 mins)

Air Resistance PowerPoint ([Download](#))

Health and safety considerations are key to design engineers. The Spirit of Innovation design engineers need to consider the safety of the pilot. When flying The Spirit of Innovation plane the pilot will wear a parachute on his back. The PowerPoint will explain how and why parachutes work, recapping gravity and provide an introduction to the force 'air resistance.'

Activity Two

In pairs/Whole Class
(30 - 40 mins)

Pupils to investigate how the size of the canopy affects a parachute's rate of descent.

In pairs, design and make a parachute. The aim is to make a parachute that slows the pilot down, so they can glide to Earth safely.

Each pair will have a selection of materials in which to make the canopy from, as well as various thicknesses of chords.

The 'dummy' pilot will be created from a ball of plasticine/blue tac, weighing the same for each pairing.

As a class, discuss and design a fair test that will determine which parachute slows the pilot down successfully. Each parachute will be dropped three times, take each measurement 3 times and calculate the mean.

After the results have been collected and analysed; each pair could be given the opportunity to design and make a second parachute.

After testing, decide if their improvements have been effective; i.e. did it slow the pilot down in less time than the original parachute?

Explain the reasonings behind the difference in times.

FAIL: First Attempt In Learning



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