

Science - Year 3

Forces and Magnets – Block 3FM

Amazing Magnets

Session 1

Resource Pack

BSS



The British Scientific Society

Pullover House,

113 Pushley Rd,

West Power,

London

Dear Class,

My name is Mr Andrew Newton and I am President of the British Scientific Society. You are probably aware that each year we stage The Big Science Fair. This is a large event that promotes science in a way that is exciting and fun. This year the theme of the fair will be Forces.

Each year we ask schools to help us think up great learning activities that will appeal to children who visit the fair and we have selected your school to help us if you can. We understand from your teacher that you are hard working and dedicated young scientists.

The theme of Forces is quite broad so we were wondering if your school could focus particularly on magnetic forces. Your teacher tells me you might be happy to take on this task as you begin to learn about magnetic forces yourselves. If you agree, we would like you to come up with a series of exciting activities on the theme of magnetic forces that will teach children visiting the fair, all about the science involved whilst exploring and having fun.

Thank you for considering our request. Your teacher has agreed to let me know your decision as soon as possible.

Yours sincerely,

A. Newton

How to play Furious Forces

A team game that will get children exploring how forces can move or change the movement of an object.

You will need

- ✓ A bag of mixed items for each group of about 4-5 children (ideally slightly more items than there are children in the group)
- ✓ The items should comprise a range of everyday objects, e.g. toy vehicles, balls of different sizes and materials (e.g. ping pong, foam, tennis, beach, football), pull along toys, rubber bands, bulldog clips, beanbags, pencil case with zip, spectacle case, rulers, rubbers, scissors, calculators, screw top pots or bottles, coins, any other safe gadgets or tools
- ✓ A sheet of paper and pen per group
- ✓ 30 rectangles of card large enough to write words for display, e.g. 5 X 20cm
- ✓ A flipchart marker pen, sticky tack

How to play

- Divide the class into roughly equal sized groups of about 4-5.
- Give each group a bag of items, a piece of paper and a pen.
- Explain to the children that they will have 3 minutes to write down lots of different ways that a force can move, or change the movement of an object from their bag. Each way will be an action (an imperative verb), e.g. *press, roll, bounce, throw, catch*. Explain that the more they can think of, the better their chance of winning the game!
- Ask the groups to choose one member to write all the verbs/actions down.
- Point out that each item may give you many verbs (e.g. you could squash, roll, throw or kick a ball) so keep thinking!
- Start the game with *–Ready, steady, go!* And time the 3 minutes. Encourage the children to handle the objects and give a *- 30 seconds left* warning.
- After the allocated 3 minutes shout – *Stop!*
- Explain that we will now share our words one at a time going round the groups in turn. Tell them that you will write each word on a card.
- Ask a group to give you one of their words. All the groups should check their list for that word and cross it off if they have it. Write the word on a card and display it on the whiteboard (ask a couple of children to come out and help you stick them onto the white board with sticky tack to help speed things up).
- Ask the next group for a different word and once again other groups should cross it out and you should display it (this will give a complete list of given words for reference and for use later in the session).
- Continue in the same way, rotating round and round the groups in turn. When a group runs out of different words, they are out.
- The last group in wins the game! Add any remaining words on their list to the display.

Push

Pull

Name

I can set up a fair test to compare the force needed to move a toy vehicle on different surfaces

Comparing how vehicles move on different surfaces

Our theory

We think that ...

Our method

To test our theory we will ...

To make it fair we will ...

We will compare these different surfaces:

Our prediction

This is what we think will happen ...

Our Results

Surface	Amount of force (push or pull) needed to move a toy vehicle – e.g. measured by elastic band stretch
	cm
	cm
	cm
	cm

Our Findings

Our group found that ...

We think this is because...

Our prediction was right/ wrong

Amazing Magnets - Session 1 Teachers' Notes

Motivational scenario

The session begins with the teacher showing the children a letter they have received from Mr Andrew Newton of the British Scientific Society. The letter seeks to recruit the children's help to develop some exciting activities to engage visitors at their upcoming science fair on the theme of forces and in particular on magnetic forces. The task will give the children a purpose for their learning which will give an added motivational incentive. The letter from Mr Newton is included in the session resources and can be printed and used just as it is, however it will have more motivational appeal if you personalise it with your school name, class name, teacher's name etc.

Alternatively, if you have a friend who is unknown to the children and prepared to come into school to role play Mr (or Ms) Newton they could recruit the class to the task in person which would be even more motivating.

Resources

In the Investigational PowerPoint Presentation (provided in the session resources) it is suggested that the children measure push and pull using balloons and rubber bands alongside a ruler rather than with a Newton Meter. This makes the concept of comparing force more understandable for young children. In order to produce a varied, measurable effect on each different surface, it is best to use a chain of thin rubber bands for measuring pull and a flabby, flat balloon for push. The balloon works best if it is one that has been blown up large and then allowed to go flat (see image below). If you do not have time to pre-prepare balloons like this, try stretching them by repeatedly blowing them up or leaving them blown up for as long as possible and then letting most of the air out.

For the investigation activity, the children will need to have access to a variety of different surfaces. You could use real surfaces like lino, carpet, tarmac, grass, sand, gravel, etc. if your children are able to have free access to them during the session. If this is not possible you can easily create your own surfaces within the classroom, e.g. cover trays or lids of boxes with a layer of sand, gravel, soil or woodchips. Small samples of matting or carpets are also great and even pieces of fabric like fur, towelling and fleece can make great simulated surfaces for comparison.

