CHAPTER 6 Magnets and springs

Lesson	Objectives	Main activity	Group activities	Plenary	Outcomes
Lesson 1 Forces and motion	• To ascertain the children's current knowledge of forces and motion from their work in Key Stage 1/Primary 1–3.	Concept mapping.	Drawing concept cartoons. Looking at magnetic and non-magnetic materials.	Sharing ideas and asking questions.	• Teacher can assess the level of the children in the class. • Teacher can arrange children in appropriate class groups.
Lesson 2 Magnets	• To know that there are forces between magnets which push and pull. • To make observations.	Looking at the poles of magnets.	Completing a worksheet on magnets. Looking at magnets and their properties. Investigating repulsion and attraction in magnets.	Agreeing a general rule for the attraction and repulsion properties of magnets.	• Can demonstrate how a magnet is attracted and repelled by another magnet. • Can make observations.
Lesson 3 Magnetic materials	• To know that some materials are magnetic and others are not. • To be able to make observations and comparisons.	Testing materials for attraction by a magnet.	Testing different types of metal for magnetic attraction. Researching magnetic attraction in metals.	Comparing results and research.	• Can recognise magnetic and non-magnetic materials.
Lesson 4 Uses of magnets	• To know that magnets have uses.	Looking at the uses of magnets.	Using secondary sources to explore uses of magnets. Writing a 'Guide to...' the uses of magnets.	Drawing conclusions about the range of uses of magnets.	• Can describe a range of uses for magnets.
Lesson 5 Magnet strength test	• To know that magnets can be tested for strength. • To be able to plan and carry out a fair test.	Planning an investigation to test the strength of magnets.	Investigating the strength of magnets. Making magnets.	Discussing findings and feedback on ensuring a fair test was carried out.	• Can consider what makes a fair test. • Can use simple equipment safely. • Can describe their observations using scientific vocabulary.
Lesson 6 Do magnets work through materials?	• To investigate whether magnets will work through a range of materials.	Planning an investigation to test which materials magnets will work through.	Testing a range of materials to see if magnets will work through them. Writing a poem or rap to report findings.	Discussing the investigation and sharing poems.	• Can investigate whether magnets will work through a range of materials.
Lesson 7 Springs	• To know that springs and elastic bands exert forces.	Brainstorming knowledge of springs.	Experiencing and describing a selection of springs and elastic bands. Looking at the direction of the forces exerted by springs and elastic bands.	Demonstration of push and pull forces in springs.	• Can recognise the pushes and pulls made by springs. • Can recognise the forces exerted by a stretched elastic band.
Lesson 8 Jack-in-the-box	• To know that when a spring is compressed downwards and released a force is exerted upwards.	Handling and exploring jack-in-the-boxes and relating them to work on springs. Role-playing being a jack-in-the-box.	Making a simple jack-in-the-box.	Explaining how their Jack-in-the-boxes works.	• Knows that when a spring is compressed downwards and released a force is exerted upwards.
Lesson 9 Uses of springs	• To know that springs are used in a variety of ways.	Completing a survey of springs.		Sharing of survey findings.	• Can describe how springs are used in a variety of ways.
Lesson 10 Springs in action	• To investigate the forces exerted by springs and elastic bands.	Designing and making a simple ballista.		Demonstration by the children.	• Know that an elastic band can exert a force. • Can recognise that a force acts in a particular direction.
Lesson 11 Testing a rubber band	• To know that the force exerted by an elastic band depends on how much it is stretched. • To make observations, measure in standard units and to draw conclusions from results.	Using simple catapults to project a missile.	Investigation using a flat board catapult into the relationship between stretch and the force exerted by an elastic band. Making a simple paddle boat.	Children's explanation of their findings and the relationships.	• Can describe the relationship between the amount an elastic band stretches and the force that it exerts. • Can make observations, measure in standard units and draw conclusions from results.

Lesson	Objectives	Main activity	Group activities	Plenary	Outcomes
Lesson 12 Driving force	• To know that elastic bands exert forces that can be used to drive things along.	Making cotton reel vehicles.		Holding a 'Cotton reel Grand Prix'.	• Can recognise that elastic bands exert forces that can be used to drive things along.
Enrichment Lesson 13 Energy	• To know that energy can change forms.	Looking at stored and movement energy.	Completing a worksheet on energy transfer. Designing and building a model which shows energy change.	Demonstrating models.	• Can recognise that energy can change forms. • Can recognise that stored and electrical energy can be changed into movement energy.
Enrichment Lesson 14 Where do we get our heat from?	• To know that heat is a form of energy and it may be supplied by several sources. • To know that energy can change forms.	Looking at uses of heat energy.	Identifying sources of heat energy and its uses.	Sharing ideas about how heat energy is used.	• Can recognise that heat is a form of energy. • Can recognise different sources of heat. • Can recognise different applications of heat in everyday life.

Assessment	Objectives	Activity 1	Activity 2
Lesson 15	• To assess the children's knowledge of the properties of magnets, types of forces and the uses of springs.	Describing bar magnets and attraction and repulsion.	Identifying pushes and pulls and the uses of springs.