

year 4

BIA Science Term
by Term Scheme
of Work



الأكاديمية الإسلامية البريطانية
BRITISH ISLAMIC
ACADEMY

Term by Term Objectives

year 4

year 4 Overview December to March ⁽¹⁾

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Spring	Electricity It's Electric			Electricity It's Electric			Sound Listen Up!			Sound Listen Up!		

(1) Subject to change. Please visit the website or call-in for regular updates.

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Term by Term Objectives

week	1	Term	Spring 1
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Science Year 4 Electricity : It's Electric

Electrical fun!

Objectives

Challenge your knowledge and misconceptions about electricity by exploring a number of electrical games and devices.

Science Objectives

- i) i) Identify common appliances that run on electricity.
- ii) Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.

Working Scientifically

- 1. Ask relevant questions and use different types of scientific enquiries to answer them.



year 4

You Will Need

Provided Resources

- Question pages (laminare if possible)

Additional Resources

- Sticky notes
- Resources for building electrical circuits
- Remote-controlled toys
- Games that use electricity
- Plugs with a short bit of wire
- Screwdrivers
- Flipchart

go to this website :

<http://sciencewithkids.com/science-games/electronic-buzzer-game.html>

Term by Term Objectives



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year 4

week	1	Term	Spring 1
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Science Year 4 Electricity : It's Electric

Electrical fun!

Teaching and Activities

Teaching

- Explore electrical games and resources, identifying what they know and what they need to know about electricity.

Activities

- Spend time exploring a range of games that use electricity, and materials needed to make a simple electrical circuit.
- Consider what they already know about electricity.
- Understand that electrical items in our homes are powered from mains electricity or batteries and identify some of these appliances and devices.

Investigation - exploring

- Explore electricity and understand what you already know.

Vocabulary

Electricity, circuit, switch, battery, plug, mains, appliance, device, wire, crocodile clip, bulb, buzzer, connection, power, cell

Term by Term Objectives

week	2	Term	Spring 1
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Science year 4 Squash, Bend, Twist, Stretch

Which fabric is the stretchiest?

Objectives

Consider different fabrics and what they could be used for. Devise an investigation to test the elasticity of the fabric and record the results.

Science Objectives

- i) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- ii) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Working Scientifically

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests.
- Identify and classify.
- Use their observations and ideas to suggest answers to questions.
- Gather and record data to help answer questions.



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You Will Need

Additional Resources

- Testing stretchy materials resource
- A variety of materials (cloth) of different stretchiness (e.g. cotton, wool, nylon)
- Tape measure or ruler
- Small plastic bags
- Marbles
- Thin elastic bands



week	2	Term	Spring 1
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Science year 4 Squash, Bend, Twist, Stretch

Which fabric is the stretchiest?

Teaching and Activities

Teaching

- Examine fabrics and discuss the requirements of some clothes.
- Talk about how to test fabric's elasticity properties and make predictions.
- Consider these questions: What length is the fabric at the start? To what length does it need to stretch? What length does it return to?

Activities

- Look at a selection of fabric and understand why stretchy fabric is sometimes used in clothing.
- Investigate and explore the elasticity of fabric and make predictions.
- Begin to understand how to make a test fair and to record results in a bar chart.

Investigation - exploring, pattern seeking, problem solving

- Talk about how to test fabric's elasticity properties, make predictions and devise an investigation based on attaching weights to the ends of strips of fabric.

Vocabulary

Shape, changed, twist/twisting, squash/squashing, bend/bending, stretch/stretching, material, properties

Term by Term Objectives

week	3	Term	Spring 1
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Science year 4 Squash, Bend, Twist, Stretch

Testing rigidity

Objectives

Examine a selection of different materials and explore their rigidity by devising an investigation to test them. Why is it important that some materials bend and flex?

Science Objectives

- i) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- ii) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Working Scientifically

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests.
- Identify and classify.
- Use their observations and ideas to suggest answers to questions.
- Gather and record data to help answer questions.



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You Will Need

Provided Resources

- Images of bridges and vocabulary cards from resource

Additional Resources

- A selection of materials for each group, including lengths of wood, metal, plastic, card (Make them similar lengths: you could use plastic, metal and wooden rulers)
- Small weights (100g)
- Tape
- String

Term by Term Objectives

week	3	Term	Spring 1
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Science year 4 Squash, Bend, Twist, Stretch



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Teaching and Activities

Testing rigidity

Teaching

- Understand that some materials need to be able to 'give' a little and not break (for bridges carrying heavy traffic, for example).
- Look at a selection of materials and discuss how they might be tested for their rigidity.
- Devise an investigation to test the flexibility of materials (by hanging weights from string onto the end of each strip of material).
- Make predictions and carry out the investigation, recording the results.

Activities

- Understand that some materials need to be able to 'give' a little and not break (for bridges carrying heavy traffic, for example).
- Explore a selection of materials and discuss how they might be tested for their rigidity (identical lengths of wood, plastic, metal, card).
- Devise and carry out an investigation to test how much they will bend and discuss the results.

Investigation - exploring over time, pattern seeking, problem solving

- Devise an investigation to test how much they will bend by hanging weights from string onto the end of each strip of material.

Vocabulary

Squash/squashing, bend/bending, stretch/stretching, material, properties, strong, weak, rigid, flexible

Term by Term Objectives



year 4

week

4

Term

Spring 1

Science year 4 Squash, Bend, Twist, Stretch

Tough and flexible

Objectives

Consider and sort different materials according to their material properties. Wonder what the world would be like without rigidity and test materials for their durability and toughness.

Science Objectives

- i) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- ii) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Working Scientifically

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests.
- Identify and classify.
- Use their observations and ideas to suggest answers to questions.
- Gather and record data to help answer questions.

You Will Need

Provided Resources

- Flexible objects resource

Additional Resources

- A variety of objects with different material properties
- A range of objects with the same material properties
- Hoops
- Labels on card
- A selection of old clothes (sock, jeans, thin vest, overalls, sweatshirt)
- Coarse grain sand paper
- Wood block

Term by Term Objectives



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week	4	Term	Spring 1
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Science year 4 Squash, Bend, Twist, Stretch

Magnets and metal

Teaching and Activities

Teaching

- identify and discuss the materials/properties of objects and sort them according to criteria.
- Test materials for their durability and toughness and consider the usefulness of materials for our everyday lives.
- Consider the question: if everything I touched became flexible, how would my life be different? Tell stories to each other about an average day in a world where nothing was rigid.

Activities

- Identify and sort objects with different material properties.
- Test fabrics for their durability and toughness and consider the everyday usefulness of materials.
- Consider the importance of material properties by wondering what life would be like without it.

Investigation - sorting, classifying and identifying

Sort objects in the classroom according to these criteria: flexible, rigid, hard, soft, stretchy, stiff.

Vocabulary

Flexible, rigid, hard, soft, stretchy, stiff, strong, weak, rigid, flexible, material, properties

Term by Term Objectives

week	5	Term	Spring 1
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Science year 4 Squash, Bend, Twist, Stretch

Which is the strongest paper?

Objectives

Explore a selection of paper and predict the strongest one. Test the papers using weights and record the results.

Science Objectives

- i) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- ii) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Working Scientifically

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests.
- Identify and classify.
- Use their observations and ideas to suggest answers to questions.
- Gather and record data to help answer questions.

You Will Need

Provided Resources

- What's my Material? cards
- 'The paper I have chosen' sheet

Additional Resources

- A selection of different sorts of paper (sugar paper, backing paper, wrapping paper, printer paper, tracing paper, tissue paper)
- Scissors
- Hole punch
- Paper clip
- 100g weights
- Freezer bags

Term by Term Objectives



year 4

week	5	Term	Spring 1
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Science year 4 Squash, Bend, Twist, Stretch

Which is the strongest paper?

Teaching and Activities

- Be challenged to find the strongest paper to wrap a present.
- Understand that paper varies in strength and think of a way to test the strength of different papers.
- Plan, make predictions, and carry out an investigation.

Activities

- Investigate paper strength, working in groups and recording their findings.
- Predict the outcome of the investigation and produce a simple bar chart or annotated drawings of the results.

Investigation - sorting, classifying and identifying

- Be challenged to find the strongest paper to wrap a present. Collect sheets of different types of paper and make them the same size.
- Make a hole in each sheet and hang a weight from it, adding weights until the paper tears. Record the results.

Vocabulary

Strong, tear, rip, weight, grams, bar chart, results, material, properties

Term by Term Objectives



year 4

week

6

Term

Spring 1

Science year 4 Squash, Bend, Twist, Stretch

Paper bridges

Objectives

Using your knowledge of paper strength and rigidity, build a paper bridge strong enough to hold a toy car.

Science Objectives

- i) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- ii) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Working Scientifically

- Ask simple questions and recognise that they can be answered in different ways.
- Observe closely, using simple equipment.
- Perform simple tests.
- Identify and classify.
- Use their observations and ideas to suggest answers to questions.
- Gather and record data to help answer questions.

You Will Need

Provided Resources '

- Paper Bridge Designs resource

Additional Resources

- A selection of different sorts of paper
- Scissors
- Tape
- Toy car

Term by Term Objectives



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year 4

week

6

Term

Spring 1

Science year 4 Squash, Bend, Twist, Stretch

Paper bridges

Teaching and Activities

Teaching

- Revise learning about materials and their properties.
- Work in small groups to design and make a paper bridge to hold a toy car.
- Explain selections and predictions for the success of their bridge.
- Consider the question: what happens if the paper is folded into a concertina shape?

Activities

- Articulate their learning about materials and their properties.
- Work in small groups to design and make a paper bridge to hold a toy car, selecting the paper they think will work best.
- Explain their selections and predictions for the success of their bridge.

Investigation - problem solving

- Work in small groups to design and make a paper bridge to hold a toy car, selecting the paper they think will work best.

Vocabulary

Strong, tear, rip, weight, rigidity, flexibility, concertina, material, properties

Term by Term Objectives



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year 4

week

7

Term

Spring 2

Science year 4 Listen Up!

Sound walk

Objectives

Go on a 'sound walk' through the school and begin to think about how sound is made.

Science Objectives

i) Identify how sounds are made, associating some of them with something vibrating.

Working Scientifically

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Use straightforward scientific evidence to answer questions or to support their findings.

You Will Need

Provided Resources

- 'Silent PowerPoint
- Sound sheets (5 per child)

Additional Resources

- Clipboards (1 per child)
- A gong (or similar instrument)
- Box of instruments (large and small – enough for every child to have one)

Term by Term Objectives



year 4

week	7	Term	Spring 2
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Science year 4 Listen Up!

Mopping up

Teaching and Activities

Teaching

- Ask and answer questions about the sounds that can be heard and begin to consider how sounds are made.

Activities

- Consider which areas of the school will be quiet, which will be loud and which will have no sound at all.
- Walk around the school listening for different sounds.
- Begin to consider sound and how sounds are made.
- Understand the term 'noise pollution'.

Investigation

Go on a 'sound walk' through the school and begin to think about how sound is made.

Vocabulary

Sound, listen, hear, ears, noise, loud, quiet, silent, vibrations

Term by Term Objectives



year 4

week

8

Term

Spring 2

Science year 4 Listen Up!

Good vibrations

Objectives

Explore sound further and investigate vibrations and how sound travels.

Science Objectives

- i) Identify how sounds are made, associating some of them with something vibrating.
- ii) Recognise that vibrations from sounds travel through a medium to the ear.
- iii) Recognise that sounds get fainter as the distance from the sound source increases.

Working Scientifically

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Set up simple practical enquiries and comparative and fair tests.
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

You Will Need

Provided Resources

- Instructions for making a string telephone

Additional Resources

- Drum and beater
- Bowl of water and tuning fork (1 set per table)
- Paper or plastic cups (with a small hole punched in the bottom)
- Long lengths of string
- Dry rice

Term by Term Objectives



year 4

week

8

Term

Spring 2

Science year 4 Listen Up!

Good vibrations

Teaching and Activities

Teaching

- Explain that sounds are made when an object vibrates and begin to understand that we hear sounds when the vibrations travel from a source through a medium to our ears.
- Use this knowledge to recognise why sounds get fainter when you are further from the source of the sound.

Activities

- Learn that there are many kinds of sound and that there are many ways of making sound.
- Understand that sound is made through vibrations from a source.
- Research how sound travels.
- Know that sound travels through different mediums, including air, water and solids.
- Recognise that sounds get fainter as the distance from the sound source increases.

Investigation - observing over time, problem solving

- Explore sound further and investigate vibrations and how sound travels.

Vocabulary

Sound, transmit, medium, air, water, solid, vibrations, source, sound waves, particles, travel

week	9	Term	Spring 2
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Science year 4 Listen Up!

Pitch and volume

Objectives

Investigate pitch and volume by exploring instruments and the different sounds they make.

Science Objectives

- i) Find patterns between the pitch of a sound and features of the object that produced it.
- ii) Find patterns between the volume of a sound and the strength of the vibrations that produced it.

Working Scientifically

- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Identify differences, similarities or changes related to simple scientific ideas and processes.
- Use straightforward scientific evidence to answer questions or to support their findings.

You Will Need

Provided Resources

- Activity sheets (1 per child)

Additional Resources

- A range of instruments of any type available (stringed, drums, recorders and percussion)



week	9	Term	Spring 2
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Science year 4 Listen Up!

Pitch and volume

Teaching and Activities

Teaching

- Notice patterns between the pitch and volume of a sound and the features of the object that produced it. Use understanding of pitch and volume to answer questions about soundwaves.

Activities

- Understand that sound is a form of energy and will know that the more energy that is put into creating a sound, the louder the sound that is made.
- Look for patterns between the pitch of a sound and features of the object that produced it.
- Begin to see a pattern between the pitch and volume of a sound and the shape of the wave it produces.

Investigation - exploring/pattern seeking

- Investigate pitch and volume by exploring instruments and the different sounds they make.

Vocabulary

Sound, volume, loudness, amplitude, pitch, soundwave, frequency

Term by Term Objectives



year 4

week

10

Term

Spring 2

Science year 4 Listen Up!

Pardon?

Objectives

Understand how we hear sounds and begin to consider ways to reduce what we can hear.

Science Objectives

- i) Identify how sounds are made, associating some of them with something vibrating.
- ii) Recognise that vibrations from sounds travel through a medium to the ear.

Working Scientifically

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Use straightforward scientific evidence to answer questions or to support their findings.

You Will Need

Provided Resources

- Independent Task sheets (1 each)
- Hearing PowerPoint
- Discussion drawing.

Additional Resources

- Pieces of card
- Sticky tape

week	10	Term	Spring 2
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Science year 4 Listen Up!

Pardon?

Teaching and Activities

Teaching

-Use what they know about the world to ask and answer questions about the hearing of humans and other animals. Understand that sound travels slower than light.

Activities

- Begin to understand some of the workings of the human ear.
- Consider some of the ways we try to reduce the sounds that we hear.
- Understand that we hear because sound waves (vibrations) enter our ears.
- Explain why we see lightning before we hear thunder.

Investigation - exploring

-Understand how we hear sounds and begin to consider ways to reduce what we can hear.

Vocabulary

Vibrations, sound waves, sign language

Term by Term Objectives



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year 4

week

11

Term

Spring 2

Science year 4 Listen Up!

Sssshhhhhh!

Objectives

Plan and conduct an investigation into which material best reduces the sounds we hear.

Science Objectives

- i) Recognise that vibrations from sounds travel through a medium to the ear.
- ii) Recognise that sounds get fainter as the distance from the sound source increases.

Working Scientifically

- Ask relevant questions and using different types of scientific enquiries to answer them.
- Set up simple practical enquiries and comparative and fair tests.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Use straightforward scientific evidence to answer questions or to support findings.

You Will Need

Provided Resources

- Sound-proofing PowerPoint
- Group ideas sheet enlarged to A3 – 1 per group
- Investigation sheet – 1 each

Additional Resources

- A range of materials for sound-proofing
- Elastic bands
- Hair (Alice) bands so that material can be fixed to heads)

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Term by Term Objectives



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year 4

week

11

Term

Spring 2

Science year 4 Listen Up!

Sssshhhhhh!

Teaching and Activities

Teaching

- Investigate sound-proofing materials by planning and conducting a fair test, considering all the variables and how to record the results.

Activities

- Consider reasons needed to reduce sounds and reasons for not reducing sounds.
- Work in a group to plan an investigation that will find out which material will best reduce sound.
- With help, consider the different variables of their test and plan how to ensure their investigation is fair.
- Record the results of the investigation and use the results to draw a conclusion.

Investigation - pattern seeking, fair testing, exploring over time, problem solving

- Plan and conduct an investigation into which material best reduces the sounds we hear.

Vocabulary

Investigation, fair-test, factor (variable), prediction, results, resources, planning, muffle

Term by Term Objectives



year 4

week

12

Term

Spring 2

Science year 4 Listen Up!

The rock star challenge

Objectives

Present your ear defenders design, and explain your findings.

Science Objectives

- i) Identify how sounds are made, associating some of them with something vibrating.
- ii) Recognise that vibrations from sounds travel through a medium to the ear.
- iii) Find patterns between the pitch of a sound and features of the object that produced it.
- iv) Find patterns between the volume of a sound and the strength of the vibrations that produced it.
- v) Recognise that sounds get fainter as the distance from the sound source increases.

Working Scientifically

- Use straightforward scientific evidence to answer questions or to support findings.
- Gather, record, classify and present data in a variety of ways to help answer questions.

You Will Need

Provided Resources

- iAssessment sheet

Additional Resources

- Musician masks (1 for each adult)

Term by Term Objectives



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year 4

week

12

Term

Spring 2

Science year 4 Listen Up!

The rock star challenge

Teaching and Activities

Teaching

- Answer questions about the results of the investigation into sound reduction and demonstrate an understanding of sound, including how it is made and how it travels.

Activities

- Describe product to others.

Demonstrate understanding of sound by explaining why their product is the best.

Provide evidence to show that the results of their product testing came from a fair test.

Present findings to a panel of judges.

Evaluate product against the original criteria.

Investigation - problem solving

- Present ear defenders design and explain findings.

Vocabulary

Fair-test, evidence, results, conclusion, evaluate