

year 5

BIA Sience Term
by Term Scheme
of Work



الأكاديمية الإسلامية البريطانية
BRITISH ISLAMIC
ACADEMY

Term by Term Objectives

year 5

year 5 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	Properties of Materials Music Festival Materials			Properties of Materials Music Festival Materials			Changes of Materials Changing Materials			Changes of Materials Changing Materials		

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

Term by Term Objectives

week	1	Term	Spring 1
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Science Year 5 Properties of Materials

Food prep materials challenge

Objectives

All food prep areas need to meet health and safety standards as well as be made from the best (and hardest) materials around. Your job is to investigate and make recommendations for the right material options.

Science Objectives

- i) Compare and group together everyday materials on the basis of their properties, including their hardness, transparency, and conductivity (electrical and thermal).
- ii) Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Record data and results of increasing complexity using tables and scatter graphs.
- Report and present findings from enquiries, including conclusions and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.



year 5

You Will Need

Provided Resources

- Wrong materials resource
- Food prep area health & safety guidelines
- Sticky-notes investigations guidance & example

Additional Resources

- Range of materials (see suggested list) & nails for scratching
- Video recording devices

week	1	Term	Spring 1
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Science Year 5 Properties of Materials

Food prep materials challenge

Teaching and Activities

Teaching

- Plan and carry out an investigation on a range of materials to test for hardness.
- Present results, identifying the hardest materials that are also fit for purpose as a food prep surface.

Activities

- List properties suited to food prep surfaces.
- Plan and carry out an investigation on a range of materials for their hardness.
- Record findings in table and scatter graph form.
- Select the hardest materials from a range of materials that are also smooth and easy to clean.

Investigation - exploring

- Investigate hard materials suitable for food preparation.

Vocabulary

Opinion/fact, variables, accuracy, precision, scatter graphs, material names, property names, enquiry

Term by Term Objectives

week	2	Term	Spring 1
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Science year 5 Properties of Materials

Keeping it hot... Keeping it cold

Objectives

Ice creams need to stay cold, and hot chocolates and coffees need to stay hot. Can you investigate the insulating properties of a range of materials and make recommendations to food stall holders?

Science Objectives

- i) Compare and group together everyday materials on the basis of their properties, including their hardness, transparency, and conductivity (electrical and thermal).
- ii) Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Record data and results of increasing complexity using scientific diagrams and labels, and line graphs.
- Use test results to make predictions to set up further comparative and fair tests.
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays & presentations.



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year 5

You Will Need

Provided Resources

- Investigation guidance and equipment

Additional Resources

- Metal cup/coffee
- Range of containers (see list)
- Video recording devices

Term by Term Objectives

week	2	Term	Spring 1
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Science year 5 Properties of Materials



year 5

Keeping it hot... Keeping it cold

Teaching and Activities

Teaching

- Plan and carry out an investigation on given materials to explore thermal insulating properties.
- Record and present findings, identifying the best materials for keeping liquids hot or ice cold.
- Suggest uses for thermal conductors in food prep.

Activities

- Be able to define thermal conductor and thermal insulator.
- Plan and set up an investigation to determine which materials make the best thermal insulators.
- Record findings in table and line graph form.
- Recommend materials to store hot drinks and ice cream in based on investigation findings.

Investigation - exploring/fair testing

- Investigate thermal insulating properties of materials to keep refreshments hot or cold.

Vocabulary

Variables, accuracy, precision, line graphs, causal relationship, degree of trust, thermal insulator/conductor

Term by Term Objectives

week	3	Term	Spring 1
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Science year 5 Properties of Materials

Food packaging challenge

Objectives

Paper bags and bottles seem to be the way to go when it comes to take-out refreshments. But which is the best paper to use? And should stall holders go with glass or plastic for their drinks bottles? It is your job to find the answers.

Science Objectives

i) Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- Report and present 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.
- Identify scientific evidence that has been used to support or refute ideas or arguments.



year 5

You Will Need

Provided Resources

- Sample questions for encouraging strength testing
- Guidance for investigation

Additional Resources

- 'Lunch food' (include something greasy)
- Equipment (see list)
- Video recording devices

Term by Term Objectives

week	3	Term	Spring 1
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Science year 5 Properties of Materials



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Teaching and Activities

Food packaging challenge

Teaching

- Plan and carry out an investigation on a range of papers that explores their strength.
- Record and share investigation results in the form of a 'paper presentation'.
- Research the properties of materials used for making drinks bottles.

Activities

- Plan and set up an investigate into the strength of various papers.
- Select the best paper from a range of papers to make a take-out food bag.
- Research glass and plastic as bottle materials and identify key properties.
- Recommend a material for drinks bottles, based on a range of environmental and property based criteria.

Investigation - exploring/fair testing

- Investigate possible food packaging materials.

Vocabulary

Opinion/fact, variables, accuracy, precision, bar chart

week

4

Term

Spring 1

Science year 5 Properties of Materials

Cleaning team challenge

Objectives

The cleaning team needs the best cloths in the business to keep on top of spills and mess. Can you make recommendations on the most absorbent and tough materials for the job?

Science Objectives

i) Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- Report and present 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.

You Will Need

Provided Resources

- Cleaning rep marketing words,
- Sticky-notes investigation materials
- Images of gloves

Additional Resources

- A range of cleaning cloths (different materials, including kitchen towel)
- Measuring jugs
- Electronic scales
- Marbles
- Water

Term by Term Objectives



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week	4	Term	Spring 1
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Science year 5 Properties of Materials

Cleaning team challenge

Teaching and Activities

Teaching

- Plan and implement investigations to compare absorbency, strength and durability.
- Record and share investigation findings using different graph forms.
- Apply knowledge of fabric properties to suggest fitness for purpose.

Activities

- Plan and set up investigations to test a range of materials for their absorbency, strength and durability.
- Record and present findings in a suitable graph/table.
- Select the materials that are most suited to cleaning.
- Make suggestions for suitable materials based on experience/knowledge.

Investigation - exploring/fair testing

Investigate the absorbency of materials suitable for cleaning with.

Vocabulary

Opinion/fact, variables, accuracy, precision, degree of trust, scatter graphs, line graphs

week	5	Term	Spring 1
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Science year 5 Properties of Materials

Electrical health and safety

Objectives

Electrical health and safety is always key at the Bestival Music Festival - recommendations are required for waterproof electrical insulating materials as well as those that will conduct electricity when breakages happen and emergency repairs are required. Can you investigate the best materials for the electrical H&S team?

Science Objectives

- i) Compare and group together everyday materials on the basis of their properties, including their hardness, transparency, and conductivity (electrical and thermal).
- ii) Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
Report and present 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.

You Will Need

Provided Resources

- Sticky-note investigation resources

Additional Resources

- Items for initial set up (including salty water, pencil, metal spoon, metallic looking plastic, metallic card)
- Materials to test out for conducting electricity (see table)

Term by Term Objectives



year 5

week	5	Term	Spring 1
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Science year 5 Properties of Materials

Electrical health and safety

Teaching and Activities

Teaching

- Plan and implement an investigation into the electrical conductivity/insulation of materials.
- Record and present investigation results in graphic form.
- Make recommendations for materials based on fitness for purpose.
- Compare thermal and electrical conductivity.

Activities

- Plan and set up an investigation looking at the electricity conducting properties of materials.
- Record and interpret data in graph form.
- Select the best materials for insulating wires from water, and for conducting electricity.
- Compare thermal and electrical conduction.

Investigation - problem solving

- Investigate electrical insulators/conductors for health and safety purposes.

Vocabulary

Opinion/fact, variables, accuracy, precision, degree of trust, scatter graphs, line graphs, causal relationships, support/ref

Term by Term Objectives



year 5

week

6

Term

Spring 1

Science year 5 Properties of Materials

Keeping the sound contained

Objectives

The management team want to offer free ear defenders for children coming to the festival. Can you test out a range of materials that combine comfort and style with soundproofing?

Science Objectives

- i) Compare and group together everyday materials on the basis of their properties, including their hardness, transparency, and conductivity (electrical and thermal).
- ii) Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- Report and present 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.

You Will Need

Provided Resources '

- Sticky-note investigation resources
- I can questions

Additional Resources

- Ear defenders
- Sound meter or app
- Materials for testing

Term by Term Objectives



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year 5

week	6	Term	Spring 1
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Science year 5 Properties of Materials

Keeping the sound contained

Teaching and Activities

Teaching

- To plan and implement an investigation into the sound proofing properties of a range of materials.
- To record and present data that identifies the best soundproofing materials.

Activities

- Plan and carry out an investigation into the sound proofing properties of various materials.
- Create and present a report that identifies the best materials for ear defenders based on data and general understanding of materials.

Investigation - exploring/fair testing

- Investigate materials that combine soundproofing with comfort.

Vocabulary

Opinion/fact, variables, accuracy, precision, degree of trust, scatter graphs, support/refute

Term by Term Objectives



year 5

week

7

Term

Spring 2

Science year 5 Changing Materials

Soluble solutions

Objectives

Dissolve into your first Science Museum commission by investigating soluble and non-soluble materials. Develop your initial education pack contributions and link them to an exclusive Pinterest board by creating your own QR code.

Science Objectives

- i) Compare and group together everyday materials on the basis of their properties, including their solubility and response to magnets.
- ii) Know that some materials will dissolve in liquid to form a solution.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Record data and results of increasing complexity using scientific diagrams and labels, tables and line graphs.
- Use test results to make predictions to set up further comparative and fair tests.
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in written form.

You Will Need

Provided Resources

- Definitions game cards
- Guidance & resources
- Science Museum guidance
- QR-code and Pinterest guidance
- Sticky-note investigations resource

Additional Resources

- Investigation equipment
- Access to Internet
- Webpage generator (school site or other, e.g. Weebly <https://education.weebly.com/>)

Term by Term Objectives



year 5

week

7

Term

Spring 2

Science year 5 Changing Materials

Soluble solutions

Teaching and Activities

Teaching

- Plan and carry out investigations into soluble materials.
- Record and present methods, findings and further investigations in written form.

Activities

- Plan and carry out investigations into soluble materials.
- Record and present methods and findings in the form of a Science Museum education pack investigation.
- Create an investigation webpage, Pinterest board and a QR-code that links to the board.

Investigation - exploring

Compare properties of solids, liquids and gases.

Vocabulary

Variables, accuracy, precision, enquiry, solid, liquid, gas, dissolve, soluble, solute, solution, line graph

Term by Term Objectives



year 5

week

8

Term

Spring 2

Science year 5 Changing Materials

Separation solutions

Objectives

Explore an array of methods to separate mixed materials back into their constituent parts. Write up your user friendly experiments to include in your education pack and Pinterest page.

Science Objectives

- i) Compare and group together everyday materials on the basis of their properties, including their solubility and response to magnets.
- ii) Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.
- iii) Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- iv) Demonstrate that dissolving, mixing and changes of state are reversible changes.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Use test results to make predictions to set up further comparative and fair tests.
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in written forms.

You Will Need

Provided Resources

- Investigation guidance and separation equipment materials

Additional Resources

- Sieves
- Filters
- Magnets
- Hairdryer/candles
- Water
- Salt
- Flour, rice and pasta
- Filter coffee
- Iron & brass paper clips
- Access to Internet

Term by Term Objectives



year 5

week

8

Term

Spring 2

Science year 5 Changing Materials

Good vibrations

Teaching and Activities

Teaching

- Plan and carry out investigations that attempt to separate mixed materials.
- Record and present methods, findings and further investigations in written form

Activities

- Investigate filtration, evaporation and sieving methods to separate materials.
- Record and present methods and findings in the form of a Science Museum education pack investigation.
- Create an investigation webpage and pin it to a Pinterest board.

Investigation - exploring

- Investigate mixing materials.
- Investigate separating materials.

Vocabulary

Variables, enquiry, soluble, insoluble, filter, sieve, magnet/ism, evaporation

week

9

Term

Spring 2

Science year 5 Changing Materials

The chemistry of cooking

Objectives

Let's hope it doesn't get too hot in the kitchen as you investigate and explore the gourmet side to chemistry. Take an enquiry based approach to the science of baking bread and cakes, and explore the weird and wonderful world of eggs!

Science Objectives

i) Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Record results of increasing complexity using scientific diagrams and labels.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Use test results to make predictions to set up further comparative and fair tests.
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in written forms.

You Will Need

Provided Resources

- Baked goods ingredients list/images

Additional Resources

- Yeast
- Sugar
- Baking powder
- Vinegar
- 1L plastic bottle
- Balloons
- Bread and cake ingredients
- Jelly
- Eggs
- Access to cooking facilities
- Access to the Internet
- Video recording devices



week	9	Term	Spring 2
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Science year 5 Changing Materials

The chemistry of cooking

Teaching and Activities

Teaching

- Plan and carry out irreversible cooking investigations that may create some new materials.
- Record and present methods, findings and further investigations in written form.

Activities

- Cook and bake noting the irreversible changes that occur.
- Plan and carry out investigations into the impact of certain ingredients on an end product.
- Create an investigation webpage with an embedded video and pin it to a Pinterest board.

Vocabulary

Variables, accuracy, precision, enquiry, new material, not usually reversible, gas given off, degree of trust

week

10

Term

Spring 2

Science year 5 Changing Materials

Oxidation sensation

Objectives

Some changes in materials can't be reversed and they can produce new materials in the process. Immerse yourself in the world of oxidisation and observe how rust is formed and how apples spoil when cut open – can you prolong your apple's shelf life or is it all looking brown?

Science Objectives

i) Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Record data and results of increasing complexity using scientific diagrams and labels, and tables.
- Report and present 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.

You Will Need

Provided Resources

- Investigation guidance/enquiry questions
- Observation/recording tables (for less able)

Additional Resources

- An old, rusty roasting tray (or image provided)
- Range of liquids and nail types (see tables)
- Apples
- Lemon juice
- Salt
- Sugar
- Vitamin C tablets
- Access to the Internet/photographic equipment.

Term by Term Objectives



year 5

week

10

Term

Spring 2

Science year 5 Changing Materials

Oxidation sensation

Teaching and Activities

Teaching

- Plan and carry out oxidation investigations.
- Observe and record oxidation reactions over time.

Activities

- Plan and carry out investigations into the impact of certain ingredients on an end product.
- Record observations through photographs.
- Create a whole class investigation webpage with photo observations and pin it to a Pinterest board.

Vocabulary

Opinion/fact, variables, accuracy, precision, scatter graphs, material names, property names, enquiry

Term by Term Objectives



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year 5

week

11

Term

Spring 2

Science year 5 Changing Materials

The chemistry kitchen

Objectives

Learn about some chemists who have invented very useful new materials and have fun creating new materials. Find out about brand new materials that are still in the development phase of their life.

Science Objectives

i) Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Report and present 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.
- Identify scientific evidence that has been used to support or refute ideas or arguments.

You Will Need

Provided Resources

- Instructions for making goo
- Research guidance

Additional Resources

- Tablets/laptops and Internet access
- Liquid laundry starch
- PVA glue
- Mixing bowl
- Spoon
- Airtight containers

Term by Term Objectives



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year 5

week	11	Term	Spring 2
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Science year 5 Changing Materials

The chemistry kitchen

Teaching and Activities

Teaching

- Complete research on new materials and their uses.
- Apply knowledge of materials as they create a new substance.

Activities

- Create their own 'new' gooey material.
- Know about some famous materials inventors.
- Research and record information about new materials and their possible uses.

Investigation - exploring

- Make new materials.
- Investigate irreversible changes.

Vocabulary

Opinion/fact, variables, accuracy, precision, enquiry, new materials

Term by Term Objectives



year 5

week

12

Term

Spring 2

Science year 5 Changing Materials

Science fair - Audience testing

Objectives

Get your colourful lab coats on and invite some potential 'clients' to try out your education pack - share your Pinterest page and show them your investigating eggs video. Is your Education pack ready for the Science Museum or does it still need a few 'changes'?!

Science Objectives

- i) Compare and group together everyday materials on the basis of their properties, including their solubility and response to magnets.
- ii) Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
- iii) Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- iv) Demonstrate that dissolving, mixing and changes of state are reversible changes.
- v) Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Working Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Report and present 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.
- Identify scientific evidence that has been used to support or refute ideas or arguments.

You Will Need

Additional Resources

- Range of investigation equipment (based on children's needs)
- Laptops/tablets and Internet access
- 'Lab coats'

Term by Term Objectives



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year 5

week

12

Term

Spring 2

Science year 5 Changing Materials

The rock star challenge

Teaching and Activities

Teaching

- Set up and run a range of materials investigations.
- Share knowledge and understanding of materials and the scientific process.

Activities

- Set up a series of materials investigations.
- Support visitors as they take part in a range of materials investigations.
- Showcase their education packs to an audience.

Investigation - pattern seeking

- Present findings in the form of an education pack for the Science Museum.

Vocabulary

Opinion/fact, variables, accuracy, precision, enquiry, solution, soluble, insoluble, new material, gives off gas, mixture, reversible, irreversible, evaporation, sieving, filtering, magnets, heating, burning, cooking, reaction