



**BOWLING
GREEN
ACADEMY**

A Great Heights Academy Trust School

How to teach
Science
at Bowling Green Academy

Science Curriculum

Intent



Science: Unit Overview

Science: Unit Focus Overview



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Animals Including Humans - about me Which of the five senses do you think are the most important?	Animals Including Humans - about animals Do all animals have the same senses as humans?	Exploring Everyday Materials: What are materials?	Seasonal Change: What is it like in Winter, Spring, Summer, and Autumn?	Introduction To Plants: How can we grow the tallest sunflower?	Use of Everyday Materials: Which materials are suitable to build a bridge?
Year 2	Animals, including Humans - diet and health Why can't we just eat chocolate?	Animals Including Humans - growth Are life cycles of animals the same?	Living Things and their Habitats: Why do different animals live in different places?	Living Things and their Habitats - habitats around the world How do animals adapt to their environment in order to thrive?	Plants - growth and care What happens to my seed after I have planted it?	Everyday Materials: Can we change materials?
Year 3	Animals Including Humans - what makes us: Are all skeletons the same?	Rocks: What types of rock are there?	Forces and Magnets: Are all materials magnetic?	Light: How can we change the size of a shadow?	Plants - life cycles: What are the roles of plant organs?	Exploring the World of Plants: What are the ideal conditions a plant needs to grow?
Year 4	Animals, including Humans - food and digestion: What happens in our digestive system?	Classifying Things and their Habitats The Big Build Can animals adapt to the habitats they reside in?	Electricity: Does electricity still travel when there is a broken link in a circuit?	States of Matter: Can materials change from being solids, liquids and gases?	Sound: How is sound made?	Living Things and their Habitats - Conservation Can the change in environment pose dangers to living things?
Year 5	Living Things The human life cycle: Do all animals have the same life cycle?	Changes of Materials: Can all materials change state?	Earth and Space: Do all countries around the world have night and day at the same time?	Forces What is the difference between natural and applied forces?	Properties of Materials How energy efficiency can be improved?	Animals, including Humans: Studying Living Things? Why do humans change over time?
Year 6	Animals, including Humans: - blood and transportation Why is it important to maintain a healthy circulatory system?	Living Things and their Habitats: How can we use classification to identify similarities and differences?	Evolution and Inheritance: What has evolution taught us about how animals including humans have changed?	Light How do we see? How do we recognise how shadows are created? How can light change?	Light and Electricity: How are electrical circuits used in everyday life?	Electricity: How are electrical circuits used in everyday life?

At Bowling Green Academy, Science is taught on a weekly basis for at least 60 minutes. Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in this subject. The acquisition of key scientific knowledge is an integral part of our science lessons. Knowledge organisers are created to enable children to learn and retain the important, useful and powerful vocabulary and knowledge contained within each unit. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons.

Our whole school approach to the teaching and learning of science involves the following:

1. Science is taught in planned, and arranged, topic blocks by the class teacher following our half termly topics based on 'Developing Experts' Scheme of work .
2. Our strategy is to enable all children including those with SEND and PP to be catered for through adapted planning suited to their abilities.
3. Our scheme of work ' Developing Experts' encourages teachers to plan for problem solving and real-life opportunities that enable children to find out for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom.
4. Planning involves teachers creating practical, engaging lessons with opportunities for precise questioning in class to test conceptual knowledge and skills and assess children regularly to identify those children with gaps in learning.
5. Our curriculum is progressive. We build upon the learning and skill development of the previous years. This is done through recap and flashback at the start of each lesson.
6. Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career, and new vocabulary and challenging concepts are introduced through direct teaching. The vocabulary is displayed in the classroom and visible to all pupils. This is developed through the years, in keeping with the topics.
7. Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding.
8. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts from outside agencies For example (Science Week).

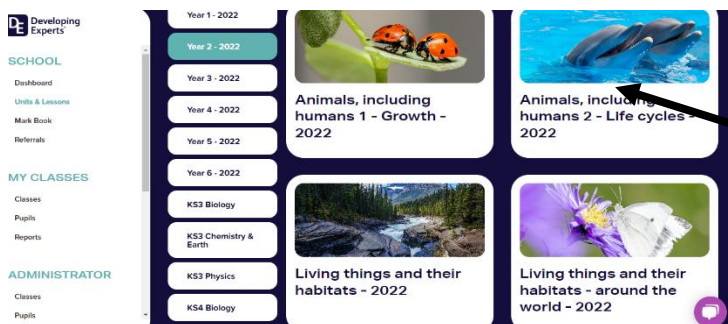
Developing Experts Scheme of work:

Available <https://developingexperts.com/> you will have an individual login for this. Teachers should use Developing Experts to plan and teach Science in school. Adapting lessons and outcomes where necessary. For example, if your topic is space you may wish to link the solar system in with your science lessons. Lessons should also be adapted and differentiated for SEND children and suitable learning challenges should be set that respond to a pupils' diverse learning needs. You may choose objectives for pupils with SEN and/or disabilities that are different from those of the rest of the group, or " modify the curriculum to remove barriers so all pupils can meet their given objectives.

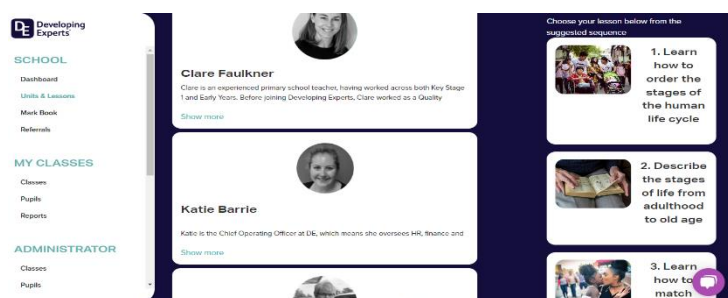
How to access Developing Experts:

The image illustrates the process of accessing the Developing Experts platform through three sequential screenshots:

- Step 1 – Select Units and lessons:** The first screenshot shows the 'SCHOOL' dashboard with a sidebar menu. An arrow points from the 'Units & Lessons' option in the menu to the 'Unit & Lessons Library' page.
- Step 2 – Select National Curriculum Science:** The second screenshot shows the 'Unit & Lessons Library' page. An arrow points from the '2022 *NEW* English National Curriculum Science' tile to the 'MY CLASSES' section.
- Step 3 – Select your year group:** The third screenshot shows the 'MY CLASSES' page with four tiles representing year groups: 'Year 1 - 2022', 'Year 2 - 2022', 'Year 3 - 2022', and 'Year 4 - 2022'. An arrow points from the 'Year 2 - 2022' tile to the text 'Step 3 – Select your year group'.

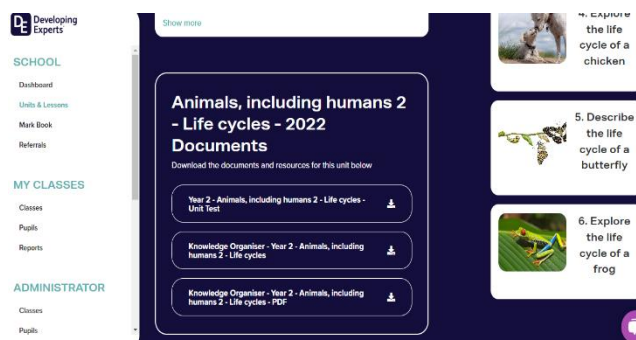


Step 4 – Select your topic



Step 5 – This will give you an overview of the topic and the lessons in it. Select the lesson you will teaching. This then will take you to the lesson resources and video.

In the unit overview you will find a Test about the topic and the knowledge organiser. This includes the vocabulary that will be used in that unit of work. There may be some additional vocabulary on the year group's overviews, however you can use the edit the mat if you wish. These can also be found on the server: Curriculum Folders 2022-2023 – Science Curriculum. Here you can then just pick the year group and topic you require.



Unit Knowledge Organisers:

Unit Knowledge Organisers should be in books at the start of each new unit . These are found on the Developing Experts Website and on the server -Curriculum 2022-23. Please make sure you print out the correct unit knowledge organiser and stick it in the children's books before they start the next unit of work. Some of the Unit Knowledge Organisers also have pre and post assessments that you may find useful to inform you of what the children already know or don't know so that you can teach accordingly. They are also useful to inform your assessments after a unit has been taught.

Science Overview:

To support planning and be able to see a clear curriculum coverage of what is being taught please refer to unit overview above.

Lesson sequence:

Science lessons at Bowling Green should follow the sequence set out as per 'Developing Experts 'Scheme of work. Lessons should start with a flashback and recall of previous learning. Children to record their work in books. Teachers **Must encourage the children to have high standards of presentation of work in their books.**

Example

Flashback / Prior learning	Lesson Starter	New learning and activities	Plenary / Assessment
Recall and flashback 5 minutes	Share mission objectives and rocket words / Key questions answer the recall questions on the PPT (video) 5 minutes	40- 45 minutes	Assessment Quiz 5 – 10 minutes

Science Resources:

Science resources are stored in the storage cupboard in the photocopier room and in the cellar inside the blue metal storage unit. All resources are labelled in boxes. You can also access topic books related to your unit of work. The books will be found in year group boxes above the science cupboard in the photocopier room.

Please ensure resources are returned after each use/lesson.

Please check 'Developing Experts' prior the half term to see if there are any further resources that you may need and let the **science co-ordinator know so that they can be purchased.**

If you feel that you know of a better experiment/ activity that you can do that is not on 'Developing Experts' as long as it is related to the lesson that you are teaching from the scheme, then it is fine to do change activities. However, if you still need resources then please let the Science Co-ordinator know.

Assessment:

Pre/Post Assessments

At the beginning of a topic the children should be guided to remember what they have previously learned about the topic by looking what they have already learnt on the subject. There are assessment tests on Developing Experts which you may wish to use to inform your planning and assessments at the start and end of a unit.

Science Assessment

Throughout the year, teachers at Bowling Green Academy summaratively assess whether children are working at/above or below the expected level for their age based on their understanding and application of the content of the National Curriculum and the acquisition of key scientific knowledge in science. Further formative assessment takes place in every lesson. Teachers ensure the progression of skills for working scientifically are developed and scientific enquiry skills are embedded.

How do we assess – examples:

- 1- As part of the introduction to each new science topic, teachers review what the children know already using pre assessments. Lessons are then planned to ensure that key knowledge is developed over time, over the course of each science block and in a progressive sequence. Key knowledge is reviewed by the children and rigorously checked and consolidated by the teacher at the end of each unit of work. Example: describe how a puppet's shadow changes if it is moved closer to a light source. Year 6 – Light unit.
- 2- Retrieval quizzing/ flash backs are used at the start of every lesson to ensure retention of knowledge and understanding. Example: name a variety of plants and animals in their habitats, including microhabitats. Year 2- Living things and their habitats.
- 3- Considering work/materials/ investigations produced by children together with discussion about this with them. Example: Charlotte wants to carry out a fair test to investigate which surface to place on a floor to prevent people from slipping. Name 2 variables she must keep the same to make it a fair test. Year 5 - Forces unit.
- 4- Testing – at times, children may answer test-questions linked to their units of work. These are provided by Primary Experts and can be adapted by teachers.

Inclusion:

What knowledge must learners acquire?

While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting, and analysing data.

Strategies to support learners (examples*)

- Key word/vocab map prompt
- Vocabulary displayed in class
- Checklist of learning steps
- Practical demonstration
- Visual aid
- Recall of vocabulary learned previously
- Prior knowledge
- Scaffolding
- Modelling

Where is vocabulary and language explicitly taught? Scientific vocabulary develops and evolves from EYFS to KS1 and through to KS2. The promotion of a language rich science curriculum is essential to the successful acquisition of knowledge and understanding in science. Vocabulary includes words that are needed for the unit knowledge but also specifically identified Tier 2 vocabulary that we want the children to learn throughout their time at Bowling Green Academy. Vocabulary is displayed in the classroom and referred to throughout science teaching. This is also visible to all pupils throughout the term. 'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group.

Strategies to support learners include

- Praise and encouragement
- Pre teaching
- Repetition of key learning points
- Clear language
- Subtitles on videos.
- Recall of previous learned Vocabulary

What does progression look like?

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Our pupils should be taught essential aspects of the knowledge, methods, processes and uses of science.

Our curriculum is divided into units /topics of work. These are built to ensure progression within scientific skills and knowledge.

Strategies to support learners include

- Memory activities
- Waiting/processing time
- Uncluttered tasks
- Use of high quality wagolls
- Modelling
- Scaffolding
- Recall activities
- Unit plans

CPD

Staff are advised to ensure that they have a good understanding of the science topic that they are teaching.

Developing Experts

Developing Experts has CPD on their lesson plans and website.

Outreach CPD

This is an excellent free online resource and takes you through topics in different key stages.

- <https://www.reachoutcpd.com/>
- Takes you through each unit has 4 sections per unit including science needed and suggests misconceptions that the children may have.
- Gives you a certificate at the end
- Provides links and resources that can be used in lessons

Stem Learning

This is a free resource that offers CPD, lesson resources and ideas for all STEM subjects. It will also keep you up to date with the latest technologies and news.

<https://www.stem.org.uk>

<https://www.futurelearn.com/courses/planning-forlearning>

Seesaw:

Photographs

Opportunities for outdoor learning should be provided. When lesson activities are practical, please add photographs to Seesaw to evidence the journey and outcome of that lesson. When photographs are used, children should write their own comments.

Marking

This should be done as per the school marking policy. Please remember when providing written feedback the next steps should relate to the achievement of the objective, and where appropriate move the learning forward with the use of appropriate targets.

Useful resources and activity ideas:

Useful websites for science teachers

Science Associations in the UK

- [Association for science education](#) (ASE)

Practical science resources

Science

- [CREST Awards – a great programme providing science enrichment activities to inspire and engage 5-to-19-year old](#)
- <https://www.bbc.co.uk/bitesize/subjects/z2pfb9q> Resources for teaching science KS1 and KS2
- Twinkl – you will find lots of resources here which can support the teaching and learning in your class.