

Towngate Primary Academy



SCIENCE

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Subject Coordinator:

Miss Lane



Links to subject page and resources:

How to Help at Home

Here are some suggestions for ways you can help your child with Science at home:

- <https://www.bbc.com/bitesize/subjects/z6svr82>

KS1 BBC bitesize page provides links, information and activities on the curriculum coverage in KS1.

- <https://www.bbc.com/bitesize/subjects/z2pfb9q>

KS2 BBC bitesize page provides links, information and activities on the curriculum coverage in KS2.

- <https://mommypoppins.com/kids/50-easy-science-experiments-for-kids-fun-educational-activities-using-household-stuff>

The website above provides 50 experiments you can do at home with your children including household items. This encourages children to work scientifically.

Academy Overview

These are the founding principles that inform our curriculum.

We strive to treat each other with respect, show **honesty**, and express **love** for our friends, family and community.

Every day, we show our **appreciation** for the gifts we have been given, and for the world we live in.

We give our children opportunities to show **responsibility**, and they learn through work and play to **co-operate**. Together we thrive.

We expect everyone to show **tolerance** of difference, **patience** in adversity, and face challenge with **courage** and **determination**. We believe in **equality**.

We understand that one of the greatest gifts we can share is **friendship**.

With **optimism**, **hope** and **humility**, our children can achieve anything they set their hearts on.

Through **trust**, **understanding** and **thoughtfulness**, we can build a community of **unity** and **peace**. Every moment is an opportunity to do our best, to achieve **quality** in all our outcomes.

Every day, in every way, we seek to live by these values, and to help others to do so too.

3 Intentions

Intention

At Towngate Primary Academy, we strive to promote the love of learning science and for children to understand and be curious about the science within their everyday lives. We promote the importance of an investigative approach through regular 'hands on' experiences wherever possible. It is our intention that by the end of each Key Stage, each child will have an understanding of a variety of scientific concepts and be able to confidently discuss them. We aim for all children to work scientifically during lessons and work collaboratively investigating different concepts and ideas.

Implementation

In order to allow children to reach their full potential, we cover the objectives set out in the Programmes of Study in the National Curriculum. We mix the content knowledge and investigation skills needed to solve science problems and make decisions and predictions based on what they have learned. Our lessons also allow the children to practise their maths and English whilst developing their reasoning and problem solving skills. Also, our values based learning and SMSC is represented through teaching and lessons. In Year 5 and 6 content is delivered in each year group in accordance with the National Curriculum. In both Key Stage 1 and Lower Key Stage 2 the content for each year group in accordance with the National Curriculum is taught across a two year rolling programme that covers all content and skills for working scientifically for the two year groups. Teachers are able to plan units drawing upon a number of resources such as Snap Science, our progressive skills documents and Discovery Dog in KSI, which are all used and amended to meet the needs of the children. To ensure children make the necessary progress and are challenged appropriately, teachers plan enjoyable, engaging and inspiring practical activities that mean the children are working hands-on; these lessons link science concepts to everyday life so the children can understand the world around them in a scientific way. Our lessons aim to develop a child's social skills by working in teams and encourage resilience, determination, perseverance, communication, collaboration, questioning and problem-solving.

Magic Moments and Events

KSI INSPIRE Mornings

Parent comments:

"What a lovely morning, it's so special being with the children and seeing their work."

"A really creative morning, the children loved it and learnt how to make things out of stuff that would normally be thrown away. We will be doing this at home."



Y5 Eureka Sleepover



Protected Characteristics

Class/Year Groups	Age	Disability	Gender Reassignment	Marriage or Civil Partnership	Pregnancy/Maternity	Race	Religion/Beliefs	Sexual Orientation	Gender
KSI	Learning about the life cycle.	Learning about Stephen Hawking and the impact he had on science today.			Learning about the life cycle.		Being respectful towards the different beliefs scientists hold.		Helen Sharman – female astronauts and challenging the stereotypes around scientific job roles.
Class 3									Through our study on human impact we will identify important female media figures and learn how they actively help and promote saving the planet (Angelina Jolie).
Class 3/4									Through our study on human impact we will identify important female media figures and learn how they actively help and promote saving the planet (Angelina Jolie).
Class 4									Exposure to female and male scientists.
Class 5								Space Topic: Sally Ride - the only openly gay astronaut	
Class 6					Links with Science and RE objectives of celebrating new life. Visit from the school nurse				

Impact

Through the consistent use of the progressive skills document and 'Snap Science' tool, staff are able to assess children during lessons and at the end of a unit. Each unit of work has a science assessment sheet looking at children of all abilities and enables teachers to see how they can challenge children and how to fill in potential gaps and plan accordingly.

Something we are focussing on this year is areas of teaching and learning in Science where we can address the protected characteristic. Above is what we have in place so far at this point.

phone
notes

Overview of Subject

Aims and objectives

At Towngate Primary Academy our aim is for all children to develop a wide range of scientific knowledge and skills that will together provide a strong foundation for them to become independent, lifelong learners who are able to use and apply scientific understanding to solve problems in the real world. Pupils will be given opportunities to interrelate the requirements of science within a broad and balanced approach across the curriculum, with opportunities to consolidate and reinforce basic literacy and numeracy skills within the subject. The creative curriculum delivered by our Academy provides opportunities to enhance learning by providing children with a real context for developing and applying their scientific skills through a wide range of experiences and challenges.

By the time children leave the Academy our aim is:

- To increase the child's knowledge and understanding of the world alongside an enthusiasm and enjoyment of scientific learning and discovery.
- To develop values of curiosity, originality, co-operation, perseverance, open mindedness, self-criticism, responsibility and independence in thinking.
- To enable children to effectively and confidently communicate their scientific knowledge, understanding and enquiry skills by providing opportunities to observe, question, describe, illustrate, hypothesise, evaluate and interpret.
- To use appropriate scientific vocabulary.
- To develop children's understanding of the effects of their actions on the environment and implications of Science today and for the future.

To develop children's respect for the materials and equipment they handle with regard to their own, and other children's safety.

SMSC

Spiritual –

Students show their spiritual development in Science through their ability to reflect on their own beliefs and those of others, to inform their perspective on different scientific discoveries and investigations. They are taught to respect different beliefs, faiths and feelings that compete with scientific understanding. All students are encouraged and empowered to use their imagination and creativity to further develop their learning and understanding.

Moral –

Through our scientific investigations and scientific enquiry, students are able to recognise the differences between right and wrong, following rules and respecting and understanding the rules put in place. This allows them to apply this to their own lives and understand how the rules we have in science when investigating, are to keep us safe. The students understand the consequences of their behaviours and actions if they do not follow these safety rules.

Social –

During the teaching of science, children are able to use a range of social skills, during investigations they are demonstrating teamwork and collaboration with other students, socialising with children from different religious, ethnic and socio-economic backgrounds. By encouraging children to be reflective, critical, curious and resilient in this subject, the children demonstrate skills and attitudes that will allow them to participate fully in all areas of school life and demonstrate this out of school.

Cultural –

Through discussion in science, the students are able to understand and develop an appreciation of the wide range of cultural influence that have shaped scientific discoveries and investigations. Science provides children with the opportunities to explore interest and improve understanding of the world around them.

British Values

British Values in Science:

Individual liberty –

We learn to confidently share our own opinions and ideas and respect the opinions of others. Within all our lessons students are encouraged to make their own choices when planning an investigation and recognise that others may have different points of view for where they would start.

Democracy –

We learn through our lessons to take into consideration the views and opinions of others. We take turns and instructions from others.

Mutual Respect –

When learning and investigating during lessons we work as a team, supporting each other and sharing ideas and opinions. We discuss our findings and respect each other's work, through this we offer support and advice to others.

Tolerance –

Through lessons and discussion we look at scientific discoveries which have come from other cultures and how religious beliefs often compete with scientific understanding. We learn to be respectful of these beliefs and appreciate and understand them.

The Rule of Law –

We learn and understand the importance when working scientifically to follow our safety rules and we allow students to understand the consequences of their actions, which in turn helps students apply this understanding to their own lives.

Whole School Overview

Science Whole School Curriculum Map 2018/19

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Early Years	Ourselves – similarities to other Autumn and changes	Light and dark Changes – Cook It	Space Materials and their properties Magnets	Spring – Growing Plants Life cycles		Different environments Under the sea Investigations
KSI	Working Scientifically		Ourselves Life cycles Growing up Our body Taking Care Senses		Plants	
LKS2	Switched On	Human Impact	In a state	Good vibrations	What happens to the food we eat?	
Year 5	Circle of life Living things	Reproduction in plants and animals	Changing materials	Earth and Space Visit from planetarium Eureka trip?		Forces
Year 6	Body Health	Everything changes: Evolution and Inheritance	Body Pump	The Nature Library	Danger! Low Voltage	Light up your world

Both KSI and LKS2 work on a rolling programme where the content of the two year groups are covered across two years.

Retention, Memory and Recall

Children have different types of memory which effects how they recall and retain facts and skilled movements.

Retention, Memory and Recall in Science

Memory plays an important role in enabling children to recall scientific facts accurately, relatively instantaneously and when faced with a scientific problem they can refer back to these embedded facts and skills.

Effective teaching in Science minimises the overload of the working memory where they are temporarily stored and maximises retention in long term memory. This achieved through our progression based curriculum where Scientific elements are revisited and children are encouraged to work scientifically through hands on investigations and applying these in different contexts.

Assessment

The Learning Challenge Curriculum and Snap Science tool, used to plan and teach Science, ensure that children are accessing work at age related expectations, with regular opportunities to be challenged through higher-level objectives. Teaching and learning is regularly monitored through lesson observations and book scrutiny to ensure a high standard of teaching and learning is maintained across the Academy.

Children are assessed according to age related expectations in line with curriculum requirements. This is done in line with the school assessment calendar. This information is recorded and monitored by the co-ordinator. Children are given the opportunity to self-asses themselves against objectives during each topic. Children who have not made sufficient progress are identified and supported through provision in class.

Here are some examples of our assessment grids where the children are able to be reflective on what they've enjoyed and learnt that topic:

KSI				
Animals and their habitats				
Working Scientifically	Pupil	Beginning	Achieved	Exceeded
17/1 I can identify and classify				
I can observe closely, using simple equipment.				
I can gather and record data to help answer questions				
I can use observations to suggest answers to questions				
I can ask simple questions recognising they are are are are are in different ways				
17/2 I can perform simple tests and record data				
Curriculum Objectives				
17/1 I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals				
17/1 I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)				
17/1 I can identify and name a variety of common animals that are carnivores, herbivores and omnivores.				
17/2 I can identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.				
17/2 I can explore and compare the differences between things that are living, things that are dead and things that have never been alive.				
17/2 I can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.				

Year 5				
Earth and Space				
Working Scientifically	Pupil	Beginning	Achieved	Exceeded
I can 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				
I can take measurements, using a wide range of scientific equipment, with increasing accuracy and precision, and taking repeat readings when appropriate.				
I can identify scientific evidence that has been used to support or refute ideas or arguments				
I can use test results to make predictions to set up further comparative and fair tests				
Recording data and results of increasing complexity using scientific diagrams and labels, classification key, tables, scatter graphs and bar and line graphs.				
Curriculum Objectives				
I can describe the movement of the Earth, and other planets, relative to the Sun in the Solar System.				
I can use the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.				
I can describe the movement of the Moon relative to the Earth.				
What I have enjoyed during this topic:				

Progression

Progression in Working Scientifically

'Working scientifically' specifies the understanding of the nature, processes and methods of Science for each year group. It should not be taught as a separate strand...Regular INSET and monitoring provides opportunity for teachers to ensure the focus and progression of the teaching of 'Working Scientifically' skills. Teachers plan according to age related expectations, ensuring that challenge and support is based on next steps for learning. Scientific learning forms a central part of Science teaching across the Academy and is the preferred method by which children acquire knowledge in their science topics.

Progression in knowledge

The subject knowledge content of the National Curriculum is delivered through the use of science schemes of work. These are based on the year group expectations from the new curriculum document. A whole school mapping process ensures that all the subject areas are covered and taught at an appropriate level across the Academy.

Key Skills Taught

Here at Townagte we follow Snap Science which ensures progressive knowledge and skills are taught through the different year groups.

Below are some examples of the contents covered across school:

Year 2

- ▶ Our Changing World (9 lessons)
- ▶ What is in your habitat? (4 lessons)
- ▶ The apprentice gardener (15 lessons)
- ▶ Materials: Good choices (11 lessons)
- ▶ Materials: Shaping up (8 lessons)
- ▶ Take care (6 lessons)
- ▶ Growing up (7 lessons)
- ▶ Additional teacher material

Year 4:

- ▶ Our Changing World (4 lessons)
- ▶ In a state (17 lessons)
- ▶ Good vibrations (12 lessons)
- ▶ Switched on (11 lessons)
- ▶ Where does all that food go? (12 lessons)
- ▶ Human impact (9 lessons)
- ▶ Who am I? (5 lessons)
- ▶ Additional teacher material

Year 5:

- ▶ Our Changing World (5 lessons)
- ▶ Circle of life (9 lessons)
- ▶ Reproduction in plants and animals (9 lessons)
- ▶ Get sorted (7 lessons)
- ▶ Everyday materials (9 lessons)
- ▶ Marvellous mixtures (8 lessons)
- ▶ All change! (8 lessons)
- ▶ Feel the force (11 lessons)
- ▶ The Earth and beyond (9 lessons)

Year 6:

- ▶ Our Changing World (6 lessons)
- ▶ The nature library (13 lessons)
- ▶ Body pump (8 lessons)
- ▶ Body health (12 lessons)
- ▶ Everything changes (12 lessons)
- ▶ Danger! Low voltage (11 lessons)
- ▶ Light up your world (12 lessons)