Inspire Education Trust

Together we achieve, individually we grow

Science Policy

Policy Date: 01/09/2022

Review Date: 01/09/2024

Document History

Version	Status		Date	Author	Summary Changes
1			June 22	J Upton	New policy

Contents

The Science Curriculum at Inspire Education Trust provides children with memorable, ambitious, exciting and relevant learning opportunities designed to develop their knowledge and skills across all areas of Science. Science learning is designed to link to everyday life and makes best use of the locality of our academies.

The Inspire Science Curriculum uses programmes of study from the 2014 Primary National Curriculum as its base, and is organised into half-termly units of work that cover the three key disciplines within Science:

- Biology – learning about living things and their environments

- Chemistry – learning about what materials are made of, what they are used for and how they can change

- Physics – learning about energy and how things move

1. AIMS

The aims of the Science curriculum at Inspire are:

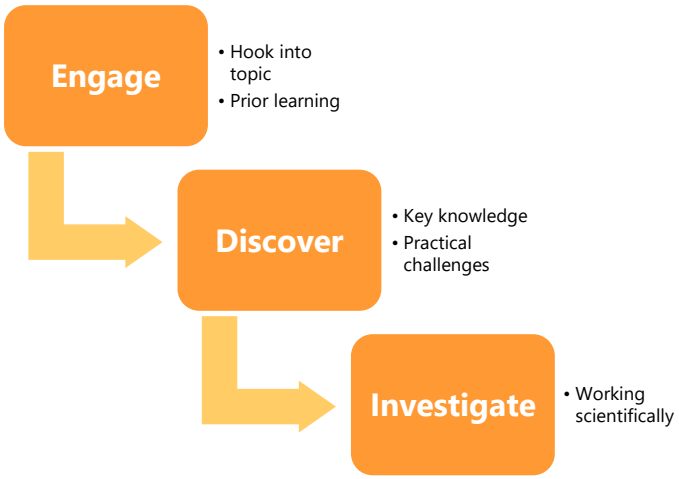
- To inspire a sense of excitement and curiosity about the world around us
- To develop scientific skills including questioning, investigating, observing and drawing conclusions
- To develop scientific knowledge and understanding
- To use scientific concepts to explain everyday occurrences
- To explore and appreciate the work of a range of great British and World scientists

Teaching Sequence for Science

Each half-termly Science unit is taught using the Inspire Teaching Sequence, which incorporates three key elements of Science teaching:

- Engage
- Discover
- Investigate

Engage learning opportunities hook the children into their new unit and provide an opportunity to recap prior learning.
Discover learning opportunities focus on teaching children the core knowledge linked to the unit.
Investigate learning opportunities develop children's skills in working scientifically within meaningful, relevant practical investigations.



2. ENRICHMENT EXPERIENCES / LINKS WITH PARENTS AND THE COMMUNITY

Teaching staff are encouraged to broaden the experiences for the children within Science units through educational visits, visitors into school and shared experiences of the wider school community, for example, involvement with parents and cross-school links etc. Visits and visitors make good use of local people and places, and include a local dentist, a visit to a local allotment and visits from school/family pets.

Children's achievements are celebrated regularly through school newsletters, displays in classrooms and shared areas, and in assemblies where children are encouraged to share their knowledge and skills with the rest of the school.

In addition to this, we involve parents and the wider community in the following ways:

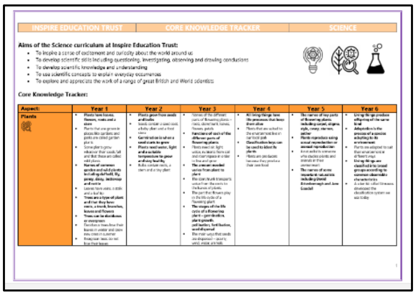
- Curriculum letters to parents are sent at the start of each term, outlining key information about the Science units;
- Children and families are invited to take part in the Inspire Awards Scheme, where, through sets of challenges, children learn about and enjoy the world around them outside school, whilst making lasting memories. Many of these experiences link to learning within the Science Curriculum;
- Regular 'Come and Share' afternoons where children have the opportunity to share their learning that from their Science units as appropriate.

Core Science Knowledge

The Inspire Science Curriculum builds children's knowledge in key areas of scientific study:

- Plants
- Animals and their Habitats
- Microorganisms
- The Human Body
- Evolution and Inheritance
- Everyday Materials and their Properties
- Changing Materials
- Rocks
- Forces
- Light
- Electricity
- Sound
- Earth and Space & the Seasons
- Sustainability / Looking after our Planet

A Knowledge Tracker identifies core knowledge statements that children learn in each year group from Year 1 to Year 6, building their knowledge in these key areas.


INSPIRE EDUCATION TRUST | CORE KNOWLEDGE TRACKER | SCIENCE

Aims of the Science curriculum at Inspire Education Trust:

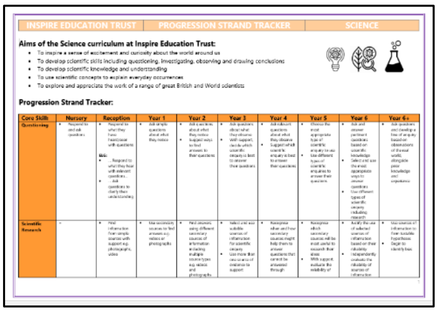
Core Knowledge Tracker:

Core Science Skills

Skills in Working Scientifically are taught within every Science unit, with all units containing at least one learning focus designed to develop investigation skills.

Working Scientifically covers eight key skills and progression in skills is supported through a Science Progression Strand Tracker which identifies age-related expectations for each skill area:

- Questioning
- Scientific Research
- Observing
- Identifying, Grouping & Classifying
- Measuring & Recording Data
- Investigating
- Recording & Analysing Data
- Communicating Findings

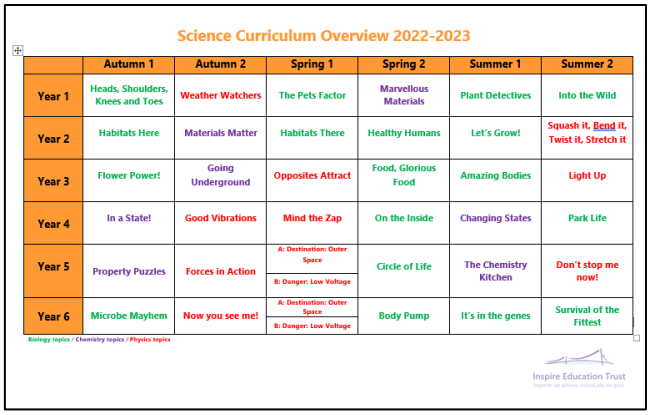

INSPIRE EDUCATION TRUST | PROGRESSION STRAND TRACKER | SCIENCE

Aims of the Science curriculum at Inspire Education Trust:

Progression Strand Tracker:

3. SCIENCE CURRICULUM PLANNING

Long Term Plans: These take the form of a Curriculum Overview which gives the overview of what Science units will be taught and when across the two-year cycle. This also shows coverage of the three Science disciplines – biology, chemistry and physics.



Science Curriculum Overview 2022-2023

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Heads, Shoulders, Knees and Toes	Weather Watchers	The Pets Factor	Marvellous Materials	Plant Detectives	Into the Wild
Year 2	Habitats Here	Materials Matter	Habitats There	Healthy Humans	Let's Grow!	Squash it, Bend it, Twist it, Stretch it
Year 3	Flower Power!	Going Underground	Opposites Attract	Food, Glorious Food	Amazing Bodies	Light Up
Year 4	In a State!	Good Vibrations	Mind the Zap	On the Inside	Changing States	Park Life
Year 5	Property Puzzles	Forces in Action	A: Destination: Outer Space B: Danger: Low Voltage	Circle of Life	The Chemistry Kitchen	Don't stop me now!
Year 6	Microbe Mayhem	Now you see me!	A: Destination: Outer Space B: Danger: Low Voltage	Body Pump	It's in the genes	Survival of the Fittest

Biology topics / Chemistry topics / Physics topics

Inspire Education Trust

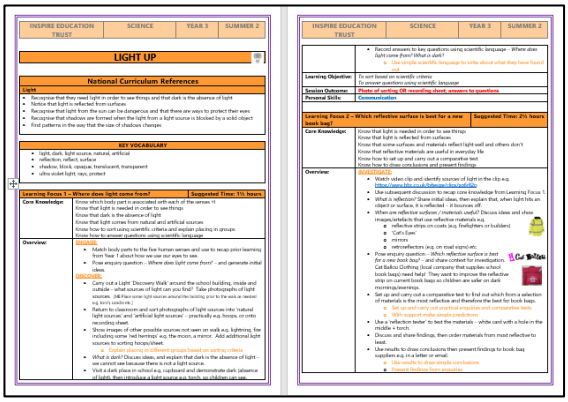
Medium Term Plans: These take the form of Curriculum Planners. These provide information about:

- National Curriculum coverage
- Key vocabulary
- The five Learning Focuses in the unit

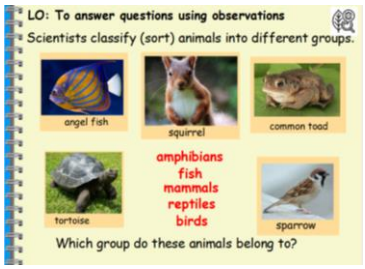
Learning focuses are based around enquiry questions. Curriculum planners detail core knowledge taught in each learning focus along with skills-based learning objectives. An overview of the content of sessions is also included.

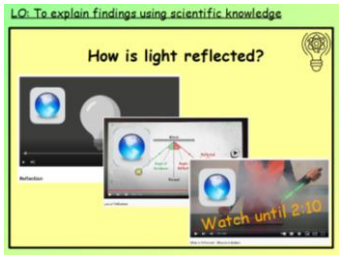
Personalisation of curriculum planners takes place as appropriate at individual academy level, in order to maximise local links and current school development focuses.

Explicit links to the Inspire PSHE Curriculum are made where relevant and appropriate.



Short Term Plans – These take the form of individual Flip-chart plans. These support the learning journey through each learning focus, with enquiry questions and learning objectives included to support the development of both knowledge and skills.





As with curriculum planners, personalisation of flipchart planning takes place as appropriate at individual academy level, in order to best match the learning needs of individual cohorts of children.

Significant Scientists

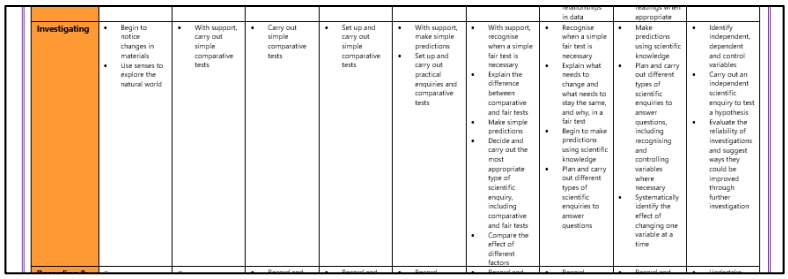
Within the Inspire Science curriculum, children learn about a range of scientists, both British and World, that have contributed / contribute to the development of Science over time.

Some of the identified scientists come from the past, and are remembered for their achievements, for example Sir Isaac Newton and Carl Linnaeus. Some of the scientists are working in Britain and the world today and are nationally/internationally regarded, for example Prof. Sarah Gilbert and Dr Maggie Aderin Pocock. Other scientists are those who work more locally, using science in their everyday work, for example a local dentist and personal trainer.




4. DIFFERENTIATION

Differentiation is completed by class teachers based on their knowledge of the children within their classes, and those children's needs. A range of strategies are used when fit-for-purpose to support children's access to learning and provide additional challenge, including task, grouping and use of resources. The knowledge and skills Strand Trackers are used by teachers and leaders to ensure appropriate differentiation of the core knowledge and skills within learning focuses. Teachers are able to track back to lower year groups to support children who are not yet working at age-related expectations, as well as to track forwards to challenge more able learners in a particular skill.



Investigating	• Begin to notice changes in materials • Use senses to explore the natural world	• With support, carry out simple comparative tests	• Carry out simple comparative tests	• Set up and carry out simple comparative tests	• With support, make simple predictions • Set up and carry out practical enquiries and comparative tests	• With support, recognise when a simple fair test is necessary • Explain the difference between comparative and fair tests • Make simple predictions • Decide and carry out the most appropriate type of scientific enquiry, including comparative and fair tests • Compare the effect of different factors	• Recognise when a simple fair test is necessary • Explain what needs to change and what needs to stay the same, and why, in a fair test • Begin to make predictions using scientific knowledge • Plan and carry out different types of scientific enquiries to answer questions	• Make predictions using scientific knowledge • Plan and carry out different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Systematically identify the effect of changing one variable at a time	• Identify independent, dependent and control variables • Carry out an independent scientific enquiry to test a hypothesis • Evaluate the reliability of investigations and suggest ways they could be improved through further investigation

Within all Science lessons, teachers plan for appropriate access for children identified as SEND, ensuring children benefit from the broad and balanced curriculum at a suitable challenge level for all.

5. ASSESSMENT IN SCIENCE

Throughout all Science units, retrieval practice strategies are used by teachers to activate prior learning, and revise and consolidate core knowledge. Strategies used include low-stakes quizzes, true or false activities and group discussions.

At the end of each Science unit, children are assessed by teachers in relation to both the core knowledge for the unit and the focus working scientifically skills developed. Teachers complete a Science Learning Review record for each unit, identifiying children who are 'working at', 'working above' or 'working below' age-related expectations. Gaps in learning and next steps are also identified, so to inform personalisation of future Science short-term planning. This might be for particular individuals or groups of children.

Additional ongoing assessment includes:

- Science books – including children's reflections and comments;
- Questioning and discussion;
- Children's work – exercise books, paper, posters, oral presentations, performances, photographs, videos etc.;
- Peer- and Self-assessment.

6. MONITORING

Planning: Long- and medium-term planning is provided for staff by the Trust Curriculum Team. Short-term planning, in particular differentiation and academy-based personalisation, is monitored on an on-going cycle throughout the year Senior Leadership Teams, alongside the Trust Curriculum team as appropriate.

Science Books: These are monitored on a regular basis by members of the Academy and Trust Leadership Teams, working alongside the Trust Curriculum Team as appropriate. Expectations for Standards in science books are outlined to staff. Science Books are also be monitored by subject leaders, again alongside the Trust Curriculum Team where necessary.

Pupil Voice: As part of regular pupil voice activities, children are invited to share their work and their views on the Science curriculum with the Head Teacher or members of the School Leadership team.

Learning Walks and Lesson Observations: These take place as part of the cycle of school self-evaluation and monitoring.

7. SCIENCE IN EARLY YEARS

The Early Years Foundation Stage delivers science content through the 'Understanding of the World' strand of their bespoke curriculum. This involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology, and the environment. Children learn to explore and talk about the natural world, including the effect of changing seasons. Children are assessed against Early Learning Goals at the end of their Reception year.

8. EQUAL OPPORTUNITIES

We aim to give all children, irrespective of age, gender or ethnic origin equal opportunity to make maximum progress. It is expected that all children will be given the opportunity to learn the Science Curriculum in a creative and encouraging learning environment which encompasses a range of learning and teaching styles. All lessons are differentiated appropriately to meet the needs of all learners. It is hoped that this approach will motivate and support children's learning at all levels including the Able and Talented, EAL and children identified with a Special Educational Need (SEND).

9. ROLES AND RESPONSIBILITIES

The Trust's Curriculum Team, the Head of Education, Primary, and Trust Standards Committee have overall responsibility for the Science Curriculum. They are responsible for overseeing the delivery of the Science Curriculum and are supported by members of each academy's Senior Leadership Team through:

- Regular formal and informal discussions with staff;
- Monitoring planning to ensure curriculum coverage and accurate pitch;
- Carrying out evidence scrutinies alongside planning;
- Observing learning and teaching to ensure quality teaching of knowledge and skills;
- Regular reviews of the curriculum through staff and pupil questionnaires and open dialogue;
- Making changes where necessary;
- Speaking with the children about their learning.

All teaching staff are responsible for the personalising of planning and delivery of the Science curriculum on a weekly basis and for making cross-curricular links where appropriate. Staff make amendments to planning in order to optimise learning opportunities when they arise.

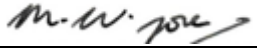
10. REVIEW

This policy will be reviewed in line with the Trust Improvement Plan.

Reviewed:	J Upton	September 2022
Next Review Date:		September 2024
Approved by Directors:		4 October 2022

Signed:

Lois Whitehouse
Headteacher



David Bermingham
Chair of Directors