Tadpole Farm
CE Primary Academy

Approach to Science

(Additional Information)

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Our Vision:

At Tadpole Farm CE Primary Academy, our vision is to provide children with a Science curriculum that enables them to explore and discover the world around them. Science is essential for understanding the basic principles of life on our planet and the scientific discoveries that have provided sustainability for the way we live today.

We want all pupils to experience this legacy of scientific knowledge and develop a sense of respect and curiosity when learning. We do this through a range of scientific enquiry throughout our Science learning journeys.

At Tadpole Farm CE Primary Academy, we believe it is vital to promote and develop transferable skills such as observation, communication and teamwork to evolve the whole child as a lifelong learner. Our objective is to provide lessons which consolidate prior knowledge, encourage perseverance through challenging a deeper understanding and that are rooted in scientific vocabulary.

We encourage children to show tolerance of others observations and conclusions, including consideration of how changes in science can affect our local community.

Intent: What do we want children to learn?

At Tadpole Farm we recognise the importance of science in every aspect of daily life. As one of the core subjects taught in primary schools, we give the teaching and learning of science the prominence it requires.

Our aim is to equip our children with the working scientific skills, knowledge and vocabulary motivated by our core skills of active learning, enquiry and creative thinking.

Our Science curriculum is shaped by the National Curriculum for Science, our school curriculum, our school values and the ethos at Tadpole Farm. Our science curriculum aims to ensure that all children:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific skills required to understand the uses and implications of science, today and for the future.

Schemes of Work

All of teaching and progression comes directly from the national curriculum and ensures we have full coverage of each year groups expected knowledge and skills.

We have curriculum plans, progression of skills documents and Knowledge Organisers that cover each unit's learning to support teachers and pupils knowledge of coverage. These documents can be found on the school server.

At Tadpole Farm we use the website Collins Connect Snap Science to support our teaching and learning, providing plans, resources and working scientifically skills you can apply to your lessons. Each new teacher will be given a log in for the site before the beginning of the school year.

https://connect.collins.co.uk/School/Portal.aspx?ReturnUrl=%2fschool%2fPrimary%2fUnits.aspx

What should I teach and when?

There is an agreed long-term plan for the teaching of Science from EYFS to year 6 at Tadpole Farm. This long-term plan shows the units that are to be studied in each year group, and in which order they should be taught, these are adaptable by each teacher if they feel a unit would work better based on links with other subjects across the curriculum, though should be discussed with the subject leader.

Working Scientifically and Enquiry skills are a focus to improve children's knowledge at Tadpole Farm and these should be shown and discussed in each science lesson, developing experts website can support with recognising the skills being covered in each unit of work.

Science is taught in 1-hour lessons every week or a combined week of science. To be taught by the class teacher.

Planning

Science planning is recorded within the medium-term planning document. On the MTP for Science you must show the learning objective this should be linked with the key questions on the pupils Knowledge organiser. It should also show the Working Scientifically and Enquiry Skill being covered in each lesson.

Every lesson should have a Learning objective, key question and working scientifically and enquiry skills should all be shown.

Knowledge Organisers for Science should be present in Science books at the beginning of each new unit, these should be reviewed at the start of every lesson, children will be asked to complete the speech bubbles with their understanding. Teacher to review to check for and address any misconceptions.

How we teach Science

At Tadpole Farm we approach our teaching and learning of Science in a variety of ways depending on the unit being covered. Each session begins with key vocabulary, the question being asked along with links being made to prior learning and other subjects (e.g. different areas of plants are taught from EYFS to Year 3) . In each lesson input should be given from teachers to provide the theory the children need to know and apply this knowledge in a range of ways through written, practical and investigation based work.

Working scientifically and Enquiry skills should be discussed each lesson to develop a consistent understanding of the skills the children use. Children should also be introduced to the form of science (biology, chemistry, physics) they are learning and the careers involved within that scientific area. Children work in orange science exercise books.

Each unit the children should complete at least one investigation or big write to show the knowledge they have acquired. This could be a whole class investigation beginning with predictions and finished with answering questions such as about fair tests and conclusions. This could also be a non- chronological report, leaflets, presentations, biographies as long as the expectation is to show what the children have learnt throughout the unit or knowledge of a key area of learning within the unit.

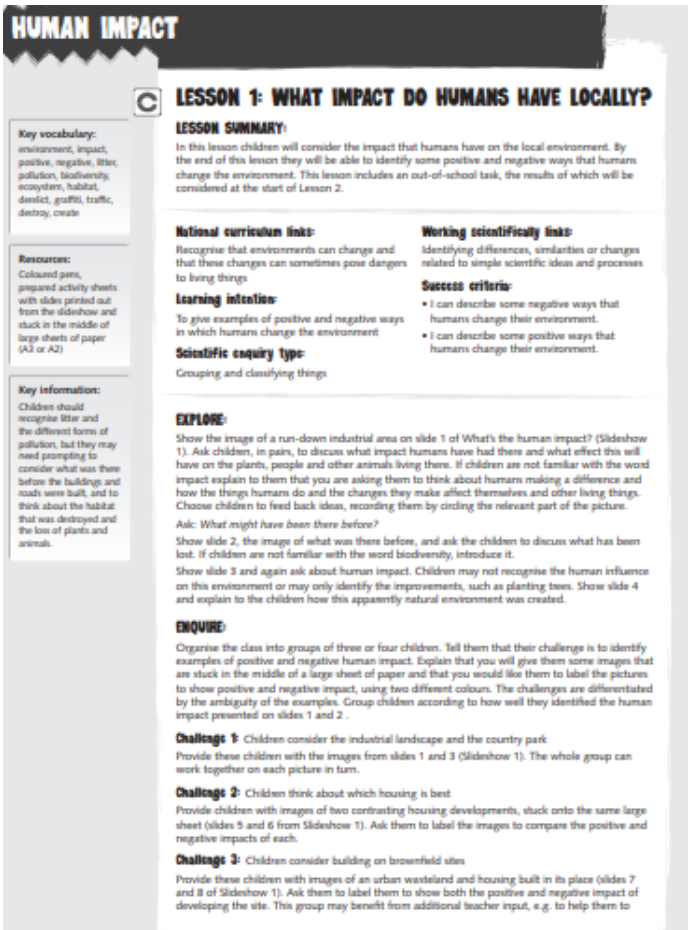
They are taught to present their work beautifully and are encouraged to enhance their work, by adding diagrams and use of skills to give predictions, conclusions and consider what makes a fair test to support written work differentiated based on each year group, shown in progression of skills working scientifically section.

Work is marked in line with the Marking Policy.

Resources

Resources to support the teaching of Science can be found in the Science cupboard including additional resources available in the forest school cupboard (please see subject lead for access). This equipment is shared throughout the school and must be returned; they are to be used to support input, skills, practical and investigation based work in class. Additional resources can possibly be provided if you contact the subject lead. Any resources you feel are essential should be mentioned to the subject lead to support you, however this needs to be in advance to provide time to acquire resources if possible.

Collins Connect Snap Science is Tadpole Farm subscribed online resource for Science. Each lesson plan provides teachers with key information, enquiry and working scientific links, success criteria, nc links, learning intention and key vocabulary.



HUMAN IMPACT

LESSON 1: WHAT IMPACT DO HUMANS HAVE LOCALLY?

Key vocabulary:
environment, impact, positive, negative, litter, pollution, biodiversity, ecosystem, habitat, derelict, graffiti, traffic, destroy, create

Resources:
Coloured pens, prepared activity sheets with slides printed out from the slideshow and stuck in the middle of large sheets of paper (A3 or A2)

Key information:
Children should recognise litter and the different forms of pollution, but they may need prompting to consider what was there before the buildings and roads were built, and to think about the habitat that was destroyed and the loss of plants and animals.

LESSON SUMMARY
In this lesson children will consider the impact that humans have on the local environment. By the end of this lesson they will be able to identify some positive and negative ways that humans change the environment. This lesson includes an out-of-school task, the results of which will be considered at the start of Lesson 2.

National curriculum links:
Recognise that environments can change and that these changes can sometimes pose dangers to living things

Working scientifically links:
Identifying differences, similarities or changes related to simple scientific ideas and processes

Learning intention:
To give examples of positive and negative ways in which humans change the environment

Success criteria:
- I can describe some negative ways that humans change their environment.
- I can describe some positive ways that humans change their environment.

Scientific enquiry type:
Grouping and classifying things

EXPLORE
Show the image of a run-down industrial area on slide 1 of What's the human impact? (Slideshow 1). Ask children, in pairs, to discuss what impact humans have had there and what effect this will have on the plants, people and other animals living there. If children are not familiar with the word impact explain to them that you are asking them to think about humans making a difference and how the things humans do and the changes they make affect themselves and other living things. Choose children to feed back ideas, recording them by circling the relevant part of the picture.

Ask: What might have been there before?

Show slide 2, the image of what was there before, and ask the children to discuss what has been lost. If children are not familiar with the word biodiversity, introduce it.

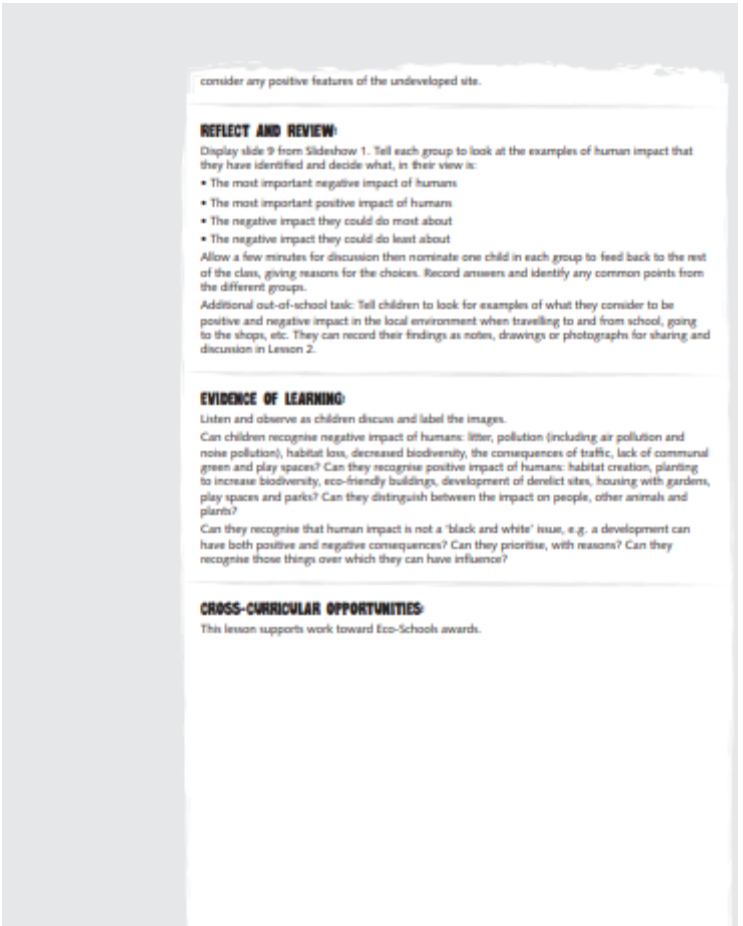
Show slide 3 and again ask about human impact. Children may not recognise the human influence on this environment or may only identify the improvements, such as planting trees. Show slide 4 and explain to the children how this apparently natural environment was created.

ENQUIRE
Organise the class into groups of three or four children. Tell them that their challenge is to identify examples of positive and negative human impact. Explain that you will give them some images that are stuck in the middle of a large sheet of paper and that you would like them to label the pictures to show positive and negative impact, using two different colours. The challenges are differentiated by the ambiguity of the examples. Group children according to how well they identified the human impact presented on slides 1 and 2 .

Challenge 1: Children consider the industrial landscape and the country park
Provide these children with the images from slides 1 and 3 (Slideshow 1). The whole group can work together on each picture in turn.

Challenge 2: Children think about which housing is best
Provide children with images of two contrasting housing developments, stuck onto the same large sheet (slides 5 and 6 from Slideshow 1). Ask them to label the images to compare the positive and negative impacts of each.

Challenge 3: Children consider building on brownfield sites
Provide these children with images of an urban wasteland and housing built in its place (slides 7 and 8 of Slideshow 1). Ask them to label them to show both the positive and negative impact of developing the site. This group may benefit from additional teacher input, e.g. to help them to



consider any positive features of the undeveloped site.

REFLECT AND REVIEW
Display slide 9 from Slideshow 1. Tell each group to look at the examples of human impact that they have identified and decide what, in their view is:
- The most important negative impact of humans
- The most important positive impact of humans
- The negative impact they could do most about
- The negative impact they could do least about

Allow a few minutes for discussion then nominate one child in each group to feed back to the rest of the class, giving reasons for the choices. Record answers and identify any common points from the different groups.

Additional out-of-school task: Tell children to look for examples of what they consider to be positive and negative impact in the local environment when travelling to and from school, going to the shops, etc. They can record their findings as notes, drawings or photographs for sharing and discussion in Lesson 2.

EVIDENCE OF LEARNING
Listen and observe as children discuss and label the images.

Can children recognise negative impact of humans: litter, pollution (including air pollution and noise pollution), habitat loss, decreased biodiversity, the consequences of traffic, lack of communal green and play spaces? Can they recognise positive impact of humans: habitat creation, planting to increase biodiversity, eco-friendly buildings, development of derelict sites, housing with gardens, play spaces and parks? Can they distinguish between the impact on people, other animals and plants?

Can they recognise that human impact is not a 'black and white' issue, e.g. a development can have both positive and negative consequences? Can they prioritise, with reasons? Can they recognise those things over which they can have influence?

CROSS-CURRICULAR OPPORTUNITIES
This lesson supports work toward Eco-Schools awards.

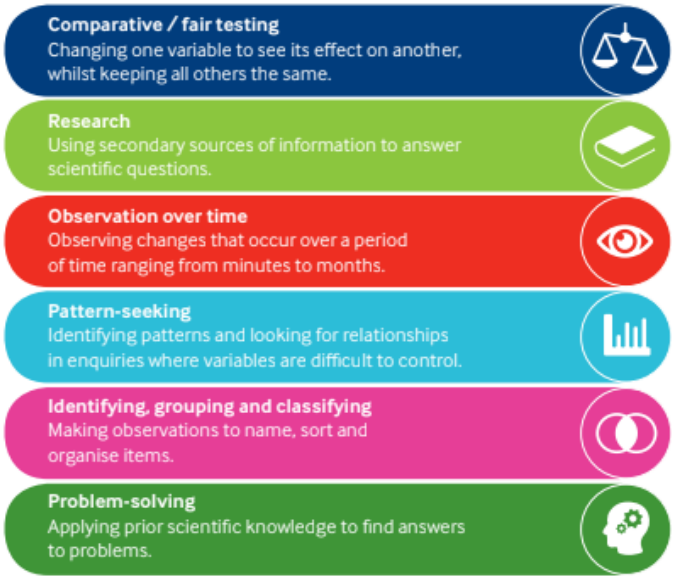
Assessment

Science is assessed six times a year, at the end of each unit of work. To make your assessment judgements, you will need to access the assessment documents for expectations.

These documents contain all of the information about the knowledge and skills that each child should have to be assessed as depth (D) (although greater depth in science is only when a child shows exceeding outside knowledge of a subject) , at (A), target (T) and emerging (E). Once you have assessed each child (TBC)

How do we investigate science?

Types of Enquiry



What are the skills we will learn when we investigate?

Working Scientifically Skills

	Ask scientific questions		Present results
	Plan and set up an enquiry		Interpret results • answer the question
	Observe closely		Draw conclusions (KS2) • explain the results using knowledge
	Take measurements		Make a prediction (KS2)
	Gather and record results		Evaluate an enquiry (KS2)

Example of a knowledge organiser