Teaching Primary Science Outdoors Part 2

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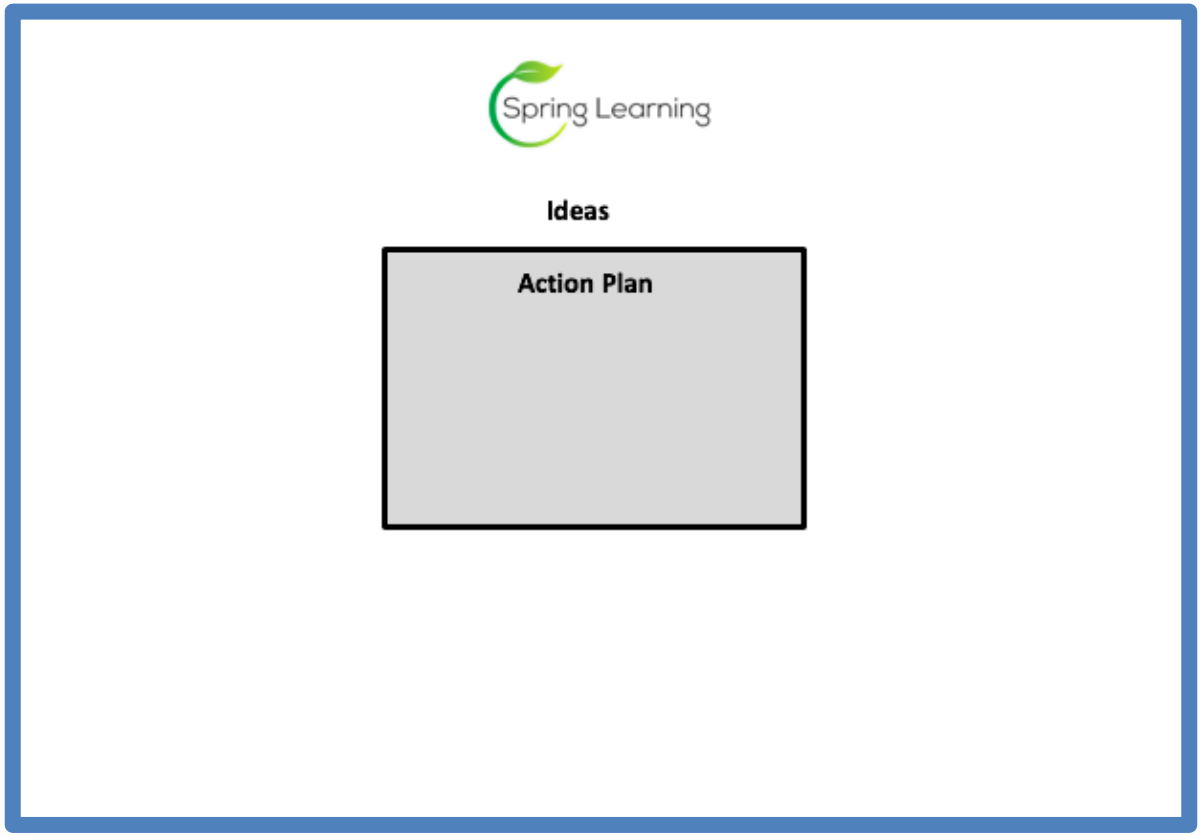
Action planning



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GAP Tasks

1. Look at your planning for the current or next topic you are teaching. Highlight which objectives could and should be taught outdoors.
2. Teach one science lesson (or part of one lesson) outdoors before next week. Be prepared to discuss next week.

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Teach one science lesson (or part of one lesson) outdoors before next week. Be prepared to discuss next week.

- What were the lesson objectives?
- Which type of enquiry did the children use?
- What happened?
- What went well?
- What didn’t work so well?
- What questions do you have?

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What do you think the aims of the Primary Science Curriculum are?

Aims

The national curriculum for science aims to ensure that all pupils:

- 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 knowledge required to understand the **uses and implications** of science, today and for the future.

5 Types of Enquiry

The nature, processes and methods of science

'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. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

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5 Types of Enquiry

ReachOut CPD

enquiring science4all

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5 Types of Enquiry in EYFS

ELG: The Natural World
Children at the expected level of development will:

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

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Progression in Working Scientifically

‘KS1 - pupils should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests and finding things out using secondary sources of information.’

Science programme of study 2014

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Progression in Working Scientifically

‘LKS2 - Pupils should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.’

Science programme of study 2014

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Progression in Working Scientifically

‘UKS2 – Pupils should select the most appropriate ways to answer science questions using different types of scientific enquiry to answer their own questions, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information.’

Science programme of study 2014

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Planning for Working Scientifically

Substantive knowledge (the stuff about science)

Working Scientifically

Enquiry type

Question to investigate

https://www.facebook.com/Primary-Science-Geeks-332136757195457

@priscigeeks

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Substantive knowledge (the stuff about science)

Identify that most living things live in habitats to which they are suited…

Working Scientifically

observing closely, using simple equipment

Enquiry type

Which minibeasts will I find in this habitat?

Question to investigate

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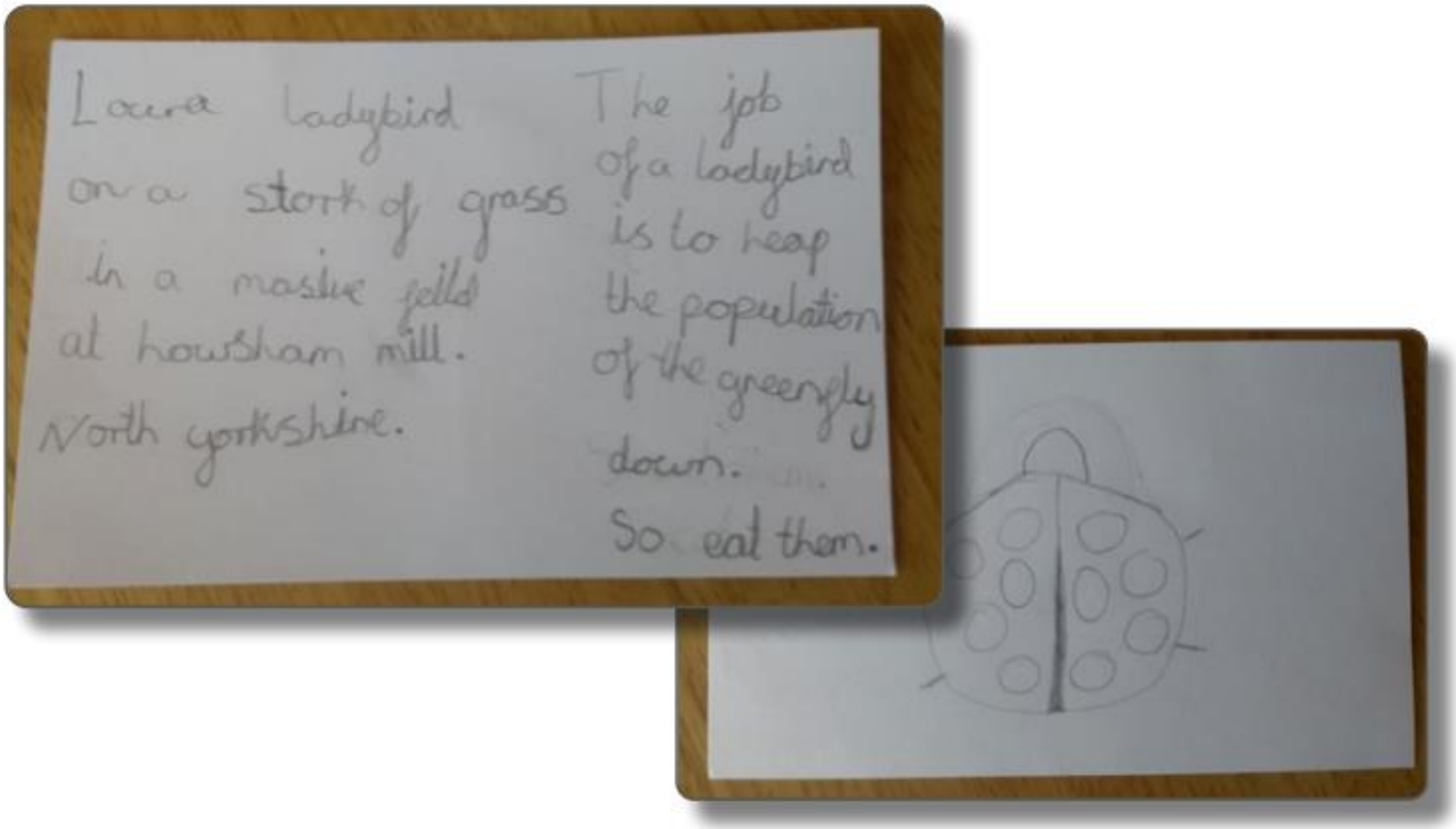
Pattern seeking



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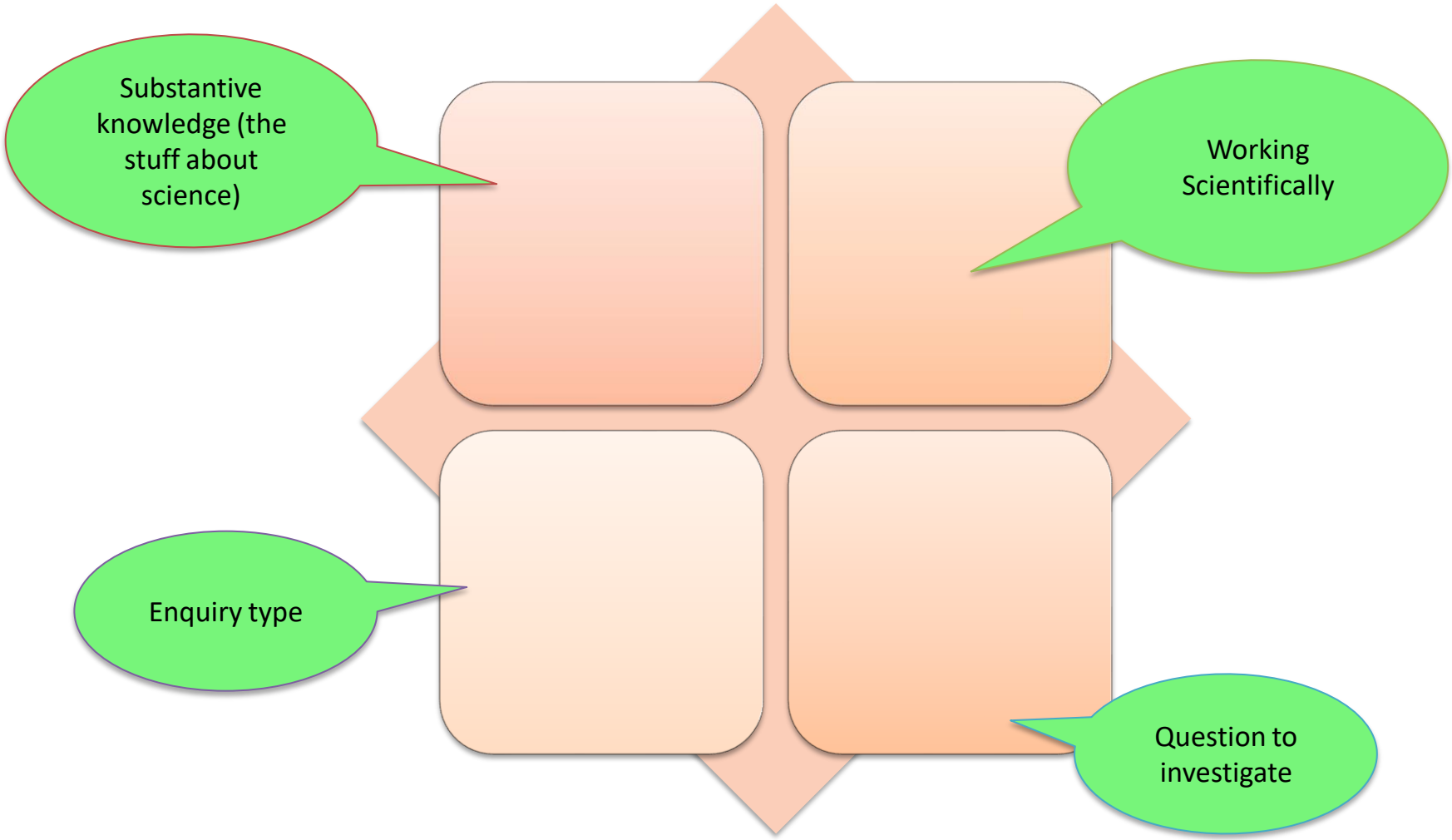
Planning for Working Scientifically



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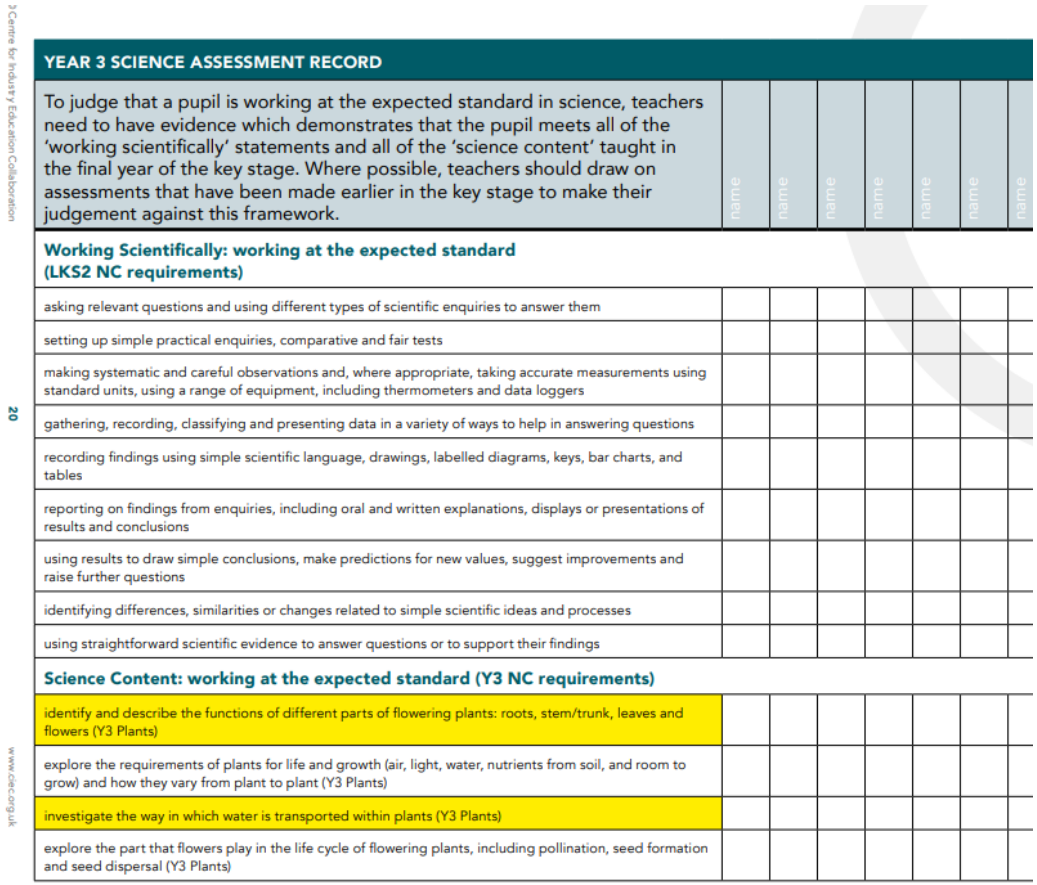
Explorify

Assessment

- Assessment of Working Scientifically (e.g. PSTT TAPS)
- Assessment of Conceptual Understanding (e.g. PLAN Assessment)
- A good tracking system



YEAR 3 SCIENCE ASSESSMENT RECORD							
To judge that a pupil is working at the expected standard in science, teachers need to have evidence which demonstrates that the pupil meets all of the 'working scientifically' statements and all of the 'science content' taught in the final year of the key stage. Where possible, teachers should draw on assessments that have been made earlier in the key stage to make their judgement against this framework.	name	name	name	name	name	name	name
Working Scientifically: working at the expected standard (LKS2 NC requirements)							
asking relevant questions and using different types of scientific enquiries to answer them							
setting up simple practical enquiries, comparative and fair tests							
making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers							
gathering, recording, classifying and presenting data in a variety of ways to help in answering questions							
recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables							
reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions							
using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions							
identifying differences, similarities or changes related to simple scientific ideas and processes							
using straightforward scientific evidence to answer questions or to support their findings							
Science Content: working at the expected standard (Y3 NC requirements)							
identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers (Y3 Plants)							
explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant (Y3 Plants)							
investigate the way in which water is transported within plants (Y3 Plants)							
explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal (Y3 Plants)							

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Assessing Working Scientifically

Primary science enquiry outdoors

Learning outdoors is a key part of primary science. The Teacher Assessment in Primary Science (TAPS) project has created a wide range of activities to support Working Scientifically. Many of these can take place outside and examples are listed below, with hyperlinks directly to the TAPS plan.

	Possible skills focus	Examples of science learning which can be done outdoors	Examples of science learning about the outdoors
Age 4-7	- Ask questions - Perform simple tests - Observe closely - Gather and record data to answer Qs - Identify and classify	How could we make the best shelter? Incy spider shelter R What happens to the ice? Frozen balloons R Which materials can we see light through? Transparency Y1 Which objects do we think will float/sink? Float & sink Y1 Which material made the best boat? Boat materials Y2 How do we get the character out of the ice? Ice escape Y2 What materials can we find? Materials hunt Y2 How do we test which material is the most waterproof? Waterproof Y2	How can we sort the things we have found? Scavenger sort R Do all leaves look the same? Leaf look Y1 What parts does this plant have? Plant structure Y1 What colours/shades can we find? Shades of colour Y1 What season is it now? Seasonal change Y1 What does a plant need to keep healthy? Plant growth Y2 What living things can we find nearby? Nature spotters Y2 Is this alive? Has this ever been alive? Living & non-living Y2 How many daisies are in each area? Daisy footprints Y2 Where do woodlice live? Woodlice habitats Y2
Age 7-11	- Plan different types of enquiry to answer Qs - Take measurements - Gather, record and classify data - Report findings - Use results to draw simple conclusions - Evaluate degree of trust in results	Which kind of materials make shadows? Making shadows Y3 Which rock is the most hard-wearing? Rocks report Y3 How can we package the egg? Egg drop Y3 Which area is hottest/coldest? Adapt Measuring temp Y4 How do we find out the best conditions for drying? Drying Y4 Which is the best material for the job? Adapt Champion tapes Y5 How can we compare our planes? Paper planes Y5 How far can we make a spinner travel? Spinners Y5 (link to seed dispersal)	How much water do plants need? Measuring plants Y3 How can we help our local environment? Eco action Y3 What living things can we find? Local survey Y4 Making a classification key for our area, e.g. Outdoor keys Y6 Plus: Woodland Trust spotter sheets and activities Growing plants website guide for each month of the year Dr Katherine Forsey's detailed plans for pond/bush/minibeast/rock pool hunts

The full set of enquiry lesson plans can be found under the 'Focused Assessment plans' tab, including many others which could take place outdoors:
https://pstt.org.uk/resources/curriculum-materials/assessment
The majority of plans can be adapted for any age group or situation, so the above are only suggestions.

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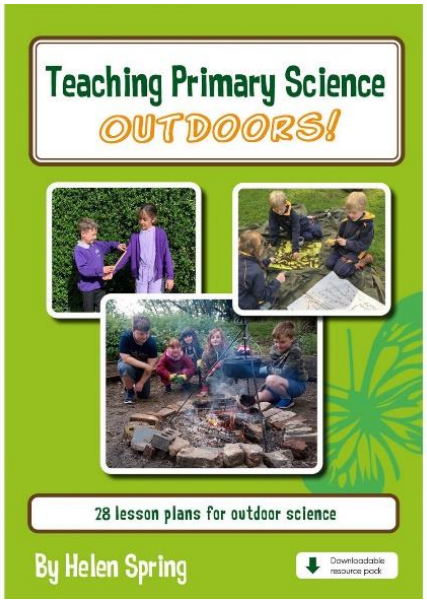
Resources to support outdoor learning and science

Learning through Landscapes



why & how?
PRIMARY SCIENCE TEACHING TRUST

ERNEST COOK TRUST
ECT
learning from the land

PLAN
Planning for assessment

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