



STEM
LEARNING

Teaching Primary Science Outdoors

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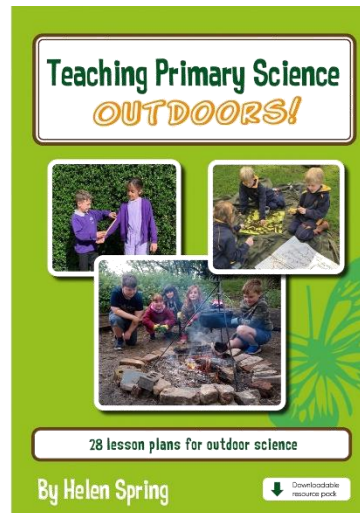
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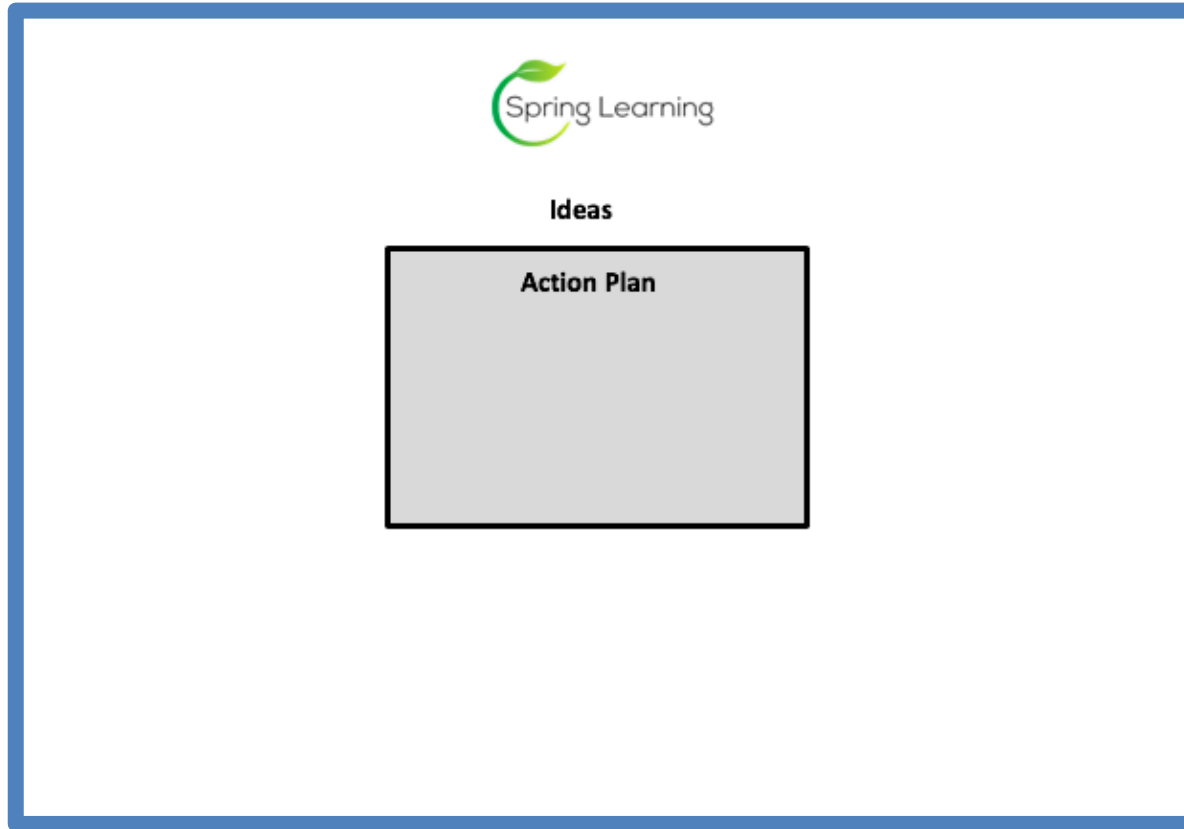


Intended Learning Outcomes

By the end of the session you will be able to:

- Explore the theory behind outdoor learning
- Discover curriculum-linked science lesson ideas that can be taught outdoors
- Explore assessment in the outdoor setting
- Plan meaningful outdoor learning for your pupils

Action Planning



What is Outdoor Learning?

Learning Outside the Classroom (LOtC) is the use of places other than the classroom for teaching and learning. It is about getting children and young people out and about, providing them with challenging, exciting and different experiences to help them learn.



Council for Learning Outside the Classroom

Outdoor learning is that which takes place beyond the four walls of the traditional classroom environment.

Association for Science Education (ASE)



Why go outside anyway?



Outdoor Learning at your school

- What is going well?
- What challenges do you face?
- What questions do you have?

5 Characteristics of Effective Outdoor Learning

1. one that supports children in making the transitions from within the classroom to beyond it
2. one where there is both regular and frequent use of the outdoor setting.
3. fully prepares children for working in the outdoors by addressing the basic psychological and physiological needs of the children before leaving the classroom
4. the teachers manage the transition back to the classroom as consciously as they manage the move to the outdoor setting
5. a shift to weaker framing

HOATH, L. (2015).

Materials



The plastic tunnel is water proof so the pixie will be dry

The rocks are heavy so the pixie house doesn't blow away

This is a slope to make it easier for the pixies to go into the house

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Definitely outdoors....



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Could be outdoors....



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Planning to teach science outdoors

Plants – Year 3

Pupils should be taught to:

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- 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
- investigate the way in which water is transported within plants
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Planning to teach science outdoors



Children in reception will be learning to:

Examples of how to support this:

Describe what they see, hear and feel whilst outside.

Encourage focused observation of the natural world.

Listen to children describing and commenting on things they have seen whilst outside, including plants and animals.

Encourage positive interaction with the outside world, offering children a chance to take supported risks, appropriate to themselves and the environment within which they are in.

Name and describe some plants and animals children are likely to see, encouraging children to recognise familiar plants and animals whilst outside.

Recognise some environments that are different from the one in which they live.

Teach children about a range of contrasting environments within both their local and national region.

Model the vocabulary needed to name specific features of the world, both natural and made by people.

Share non-fiction texts that offer an insight into contrasting environments.

Listen to how children communicate their understanding of their own environment and contrasting environments through conversation and in play.

Planning to teach science outdoors

Animals, including humans – Year 1

Pupils should be taught to:

- identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- identify and name a variety of common animals that are carnivores, herbivores and omnivores
- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense

Evolution and inheritance



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Health & Safety in Primary Science...

CLEAPPS www.cleapss.org.uk

There is an annual password which can be found on the latest newsletter. Email membership@cleapss.org.uk to check if you are a member.



Be Safe book www.ase.org.uk

Any advice given by your LA must be considered



Risk Assessment

What are the hazards? What could happen? Please list	Who is at risk?	Current Control Measures in Place	Further action required to reduce risk to an acceptable level	Action by whom	Action by when
Natural and manmade obstacles (trees, ropes etc) – leading to injury	all		Children to be supervised Education Officer to dynamically risk assess the site and any new obstacles created before children are allowed to use them.	Group leaders Helen	At event
Tree climbing – fall leading to injury	all		Children to be supervised Tell children to climb no higher than 2 metres (Helen's insurance)	Group leaders Helen	At event
Rope swings - fall	all	Helen to take down any rope swings which appear unsafe Children not allowed to use the fixed rope swing over the river	Group leaders to supervise Helen to dynamically risk assess the putting up of any new rope swings	Group leaders Helen	At event

Forces



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5 Types of Enquiry



ReachOut
CPD

enquiring
science⁴all

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Assessment

- [PSTT TAPS](#) for assessing Working Scientifically
- PLAN Assessment resources for exemplification of ARE for subject knowledge
- A good tracking system

3 Centre for Industry Education Collaboration

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www.cic.org.uk

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	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)								

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	<ul style="list-style-type: none"> - Ask questions - Perform simple tests - Observe closely - Gather and record data to answer Qs - Identify and classify 	<p>How could we make the best shelter? Incy spider shelter R</p> <p>What happens to the ice? Frozen balloons R</p> <p>Which materials can we see light through? Transparency Y1</p> <p>Which objects do we think will float/sink? Float & sink Y1</p> <p>Which material made the best boat? Boat materials Y2</p> <p>How do we get the character out of the ice? Ice escape Y2</p> <p>What materials can we find? Materials hunt Y2</p> <p>How do we test which material is the most waterproof? Waterproof Y2</p>	<p>How can we sort the things we have found? Scavenger sort R</p> <p>Do all leaves look the same? Leaf look Y1</p> <p>What parts does this plant have? Plant structure Y1</p> <p>What colours/shades can we find? Shades of colour Y1</p> <p>What season is it now? Seasonal change Y1</p> <p>What does a plant need to keep healthy? Plant growth Y2</p> <p>What living things can we find nearby? Nature spotters Y2</p> <p>Is this alive? Has this ever been alive? Living & non-living Y2</p> <p>How many daisies are in each area? Daisy footprints Y2</p> <p>Where do woodlice live? Woodlice habitats Y2</p>
Age 7-11	<ul style="list-style-type: none"> - 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 	<p>Which kind of materials make shadows? Making shadows Y3</p> <p>Which rock is the most hard-wearing? Rocks report Y3</p> <p>How can we package the egg? Egg drop Y3</p> <p>Which area is hottest/coldest? Adapt Measuring temp Y4</p> <p>How do we find out the best conditions for drying? Drying Y4</p> <p>Which is the best material for the job? Adapt Champion tapes Y5</p> <p>How can we compare our planes? Paper planes Y5</p> <p>How far can we make a spinner travel? Spinners Y5 (link to seed dispersal)</p>	<p>How much water do plants need? Measuring plants Y3</p> <p>How can we help our local environment? Eco action Y3</p> <p>What living things can we find? Local survey Y4</p> <p>Making a classification key for our area, e.g. Outdoor keys Y6</p> <p>Plus:</p> <p>Woodland Trust spotter sheets and activities</p> <p>Growing plants website guide for each month of the year</p> <p>Dr Katherine Forsey's detailed plans for pond/bush/minibeast/rock pool hunts</p>

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.

Planning for Outdoor Learning

- Take a copy of the curriculum
- Highlight the obvious opportunities for outdoor learning in your year group (eg – identifying trees)
- In a different colour, highlight the less obvious opportunities for outdoor learning
- Choose one objective and plan how you will teach it outdoors. What barriers need to be overcome in your context?



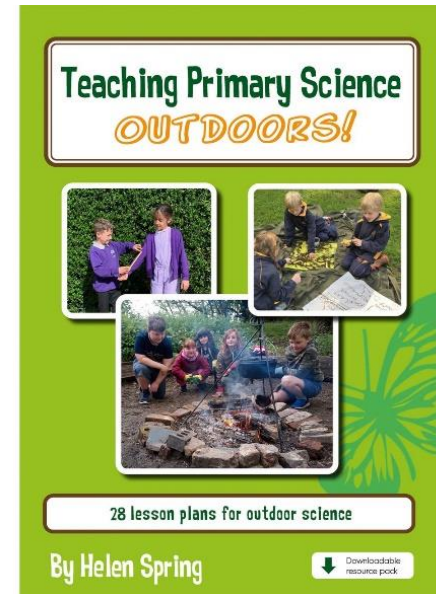
Resources to support outdoor learning and science



Learning through Landscapes



PLAN
Planning for assessment



Action planning and evaluations



Ideas

Action Plan

<https://forms.office.com/r/W84T0FrT4m>

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