

# Teaching Primary Science Outdoors

*Helen Spring*

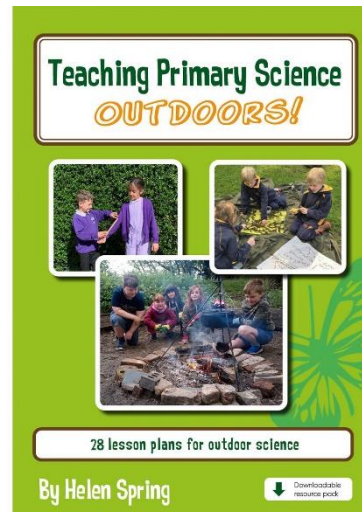
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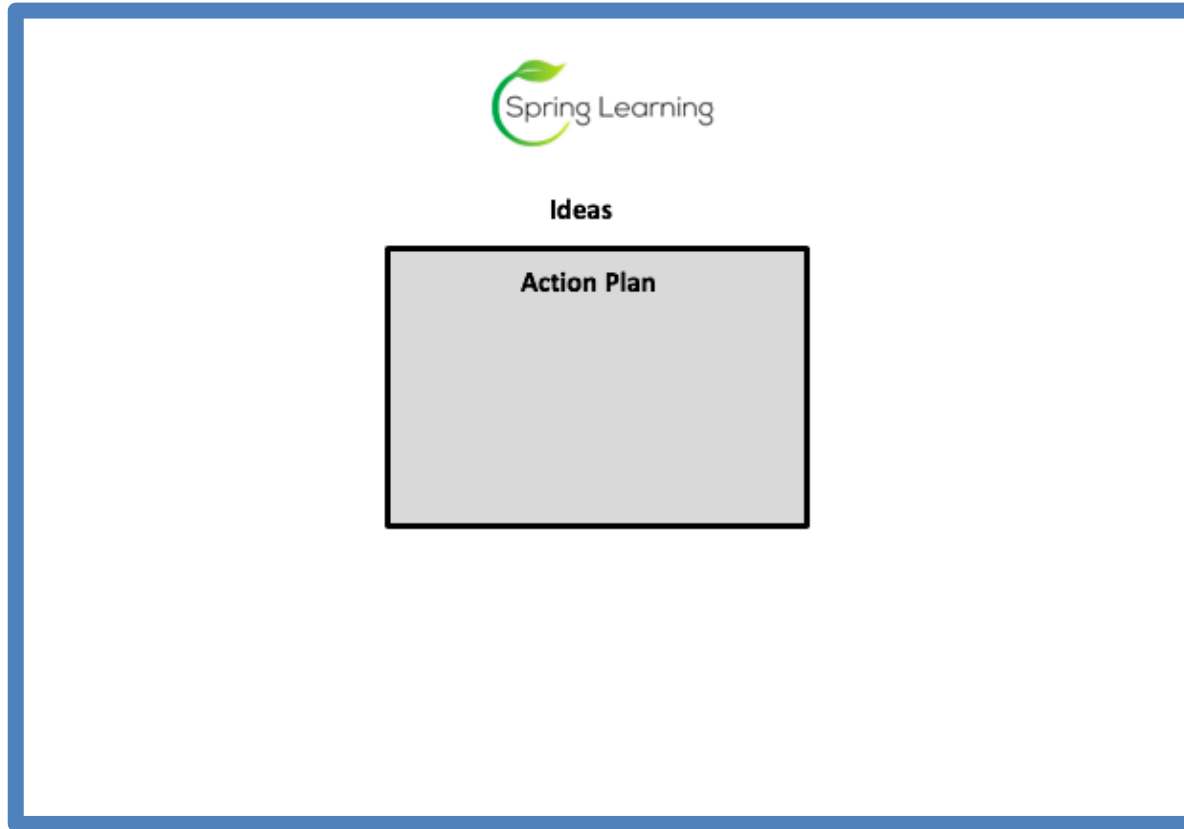
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# Spring Learning



# Action Planning



# Learning Outcomes

The session will include:

- Characteristics of effective outdoor learning.
- Managing children in an outdoor setting.
- A discussion about health and safety in the outdoor setting.
- Making links between Working Scientifically curriculum objectives and Outdoor Learning.
- Exploring how Subject Knowledge curriculum objectives can be taught in the outdoor setting.
- Exploring assessment in the outdoor setting.

# 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)



# Outdoor Learning at your school

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



# Why go outside anyway?



# 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).



# Forest School

Forest School is an inspirational process, that offers ALL learners regular opportunities to achieve and develop confidence and self-esteem through hands-on learning experiences in a woodland or natural environment with trees.

Forest School is a specialised learning approach that sits within and compliments the wider context of outdoor and woodland education.

The ethos is shared by thousands of trained practitioners across the UK and beyond. Its roots reach back to early years pioneers in outdoor learning and across the sea to Scandinavia.

*'Forest School is a feeling you can't put into words.'* Tonicha, aged 9

*'I don't have ADHD when I'm out in the woods.'* David, aged 14

[www.forestschoollassociation.org](http://www.forestschoollassociation.org)

[www.forestschools.com](http://www.forestschools.com)

[A Marvellous Opportunity for Children to Learn](#)

# Health & Safety in Primary Science...

**CLEAPPS** [www.cleapss.org.uk](http://www.cleapss.org.uk)

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



**Be Safe book** [www.ase.org.uk](http://www.ase.org.uk)



Any advice given by your LA must be considered

# Risk Assessment

<b>What are the hazards? What could happen? Please list</b>	<b>Who is at risk?</b>	<b>Current Control Measures in Place</b>	<b>Further action required to reduce risk to an acceptable level</b>	<b>Action by whom</b>	<b>Action by when</b>
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

# 5 Types of Enquiry



ReachOut  
CPD

enquiring  
science<sup>4</sup>all

# The 5 types of enquiry outdoors....

- Comparative and fair testing – How does the length of time we exercise for affect our heart rate? (taken from [Ogden Trust](#), 'Developing Children's skills in Fair Testing')
- Research using secondary sources – iPad apps – Pl@ntnet
- Observing over time – observe the changes across the four seasons. Can you create a representation of Winter using materials around you? Twig game!
- Pattern seeking – What colour flowers do pollinating insects prefer? (taken from [Ogden Trust](#), 'Develop Children's skills in Pattern Seeking')
- Identifying, classifying and grouping – leaves, trees, fungi, flowers, minibeasts, rocks, materials....

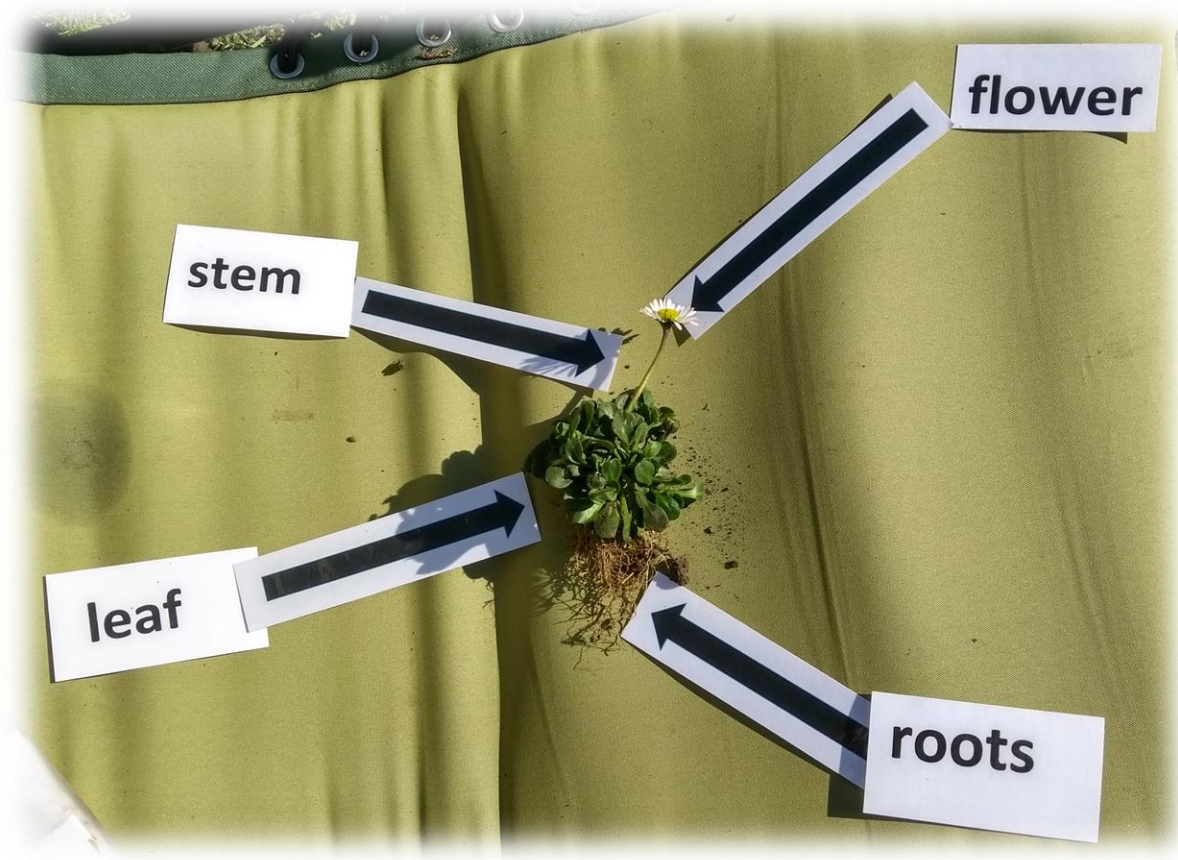
# Science Lessons

All good science lessons, both indoors and outdoors, should have both a subject knowledge and a working scientifically objective.

- There should be opportunities for pupils to make progress and opportunities for assessment.
- TAPS and PLAN resources provide many examples of assessment opportunities that either are taking place outdoors or could take place outdoors.



# Definitely outdoors....





# Could be outdoors....





# 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?

# Year 2 programme of study

## Living things and their habitats

### Statutory requirements

Pupils should be taught to:

- explore and compare the differences between things that are living, dead, and things that have never been alive
- 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
- identify and name a variety of plants and animals in their habitats, including micro-habitats
- 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.

# Properties and Changes of Materials





# Animals including Humans





# Uses of Everyday Materials

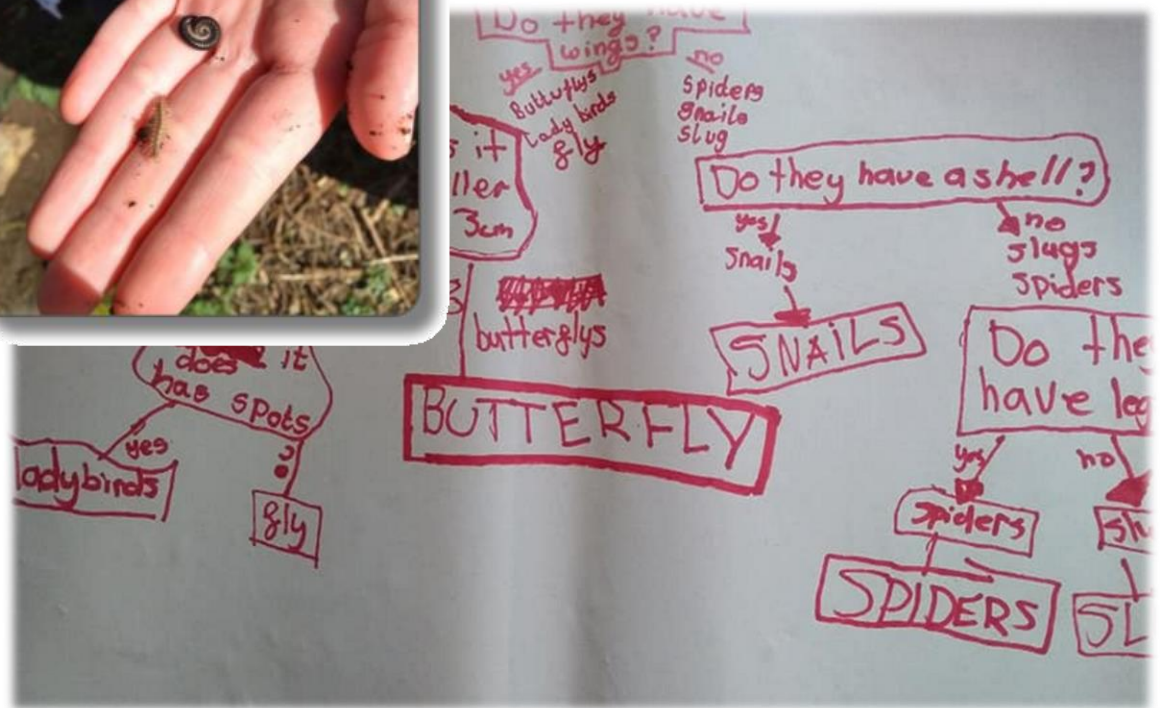


The plastic tunnel is water proof so the pixie will be dry

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

# Living Things and their Habitats





# Animals including humans



# Animals including Humans – Y3

Discuss how the following objectives **could** be taught, or partially taught, outdoors. One person from each group to post in 'chat' when you return...

Pupils should be taught to:

- identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- identify that humans and some other animals have skeletons and muscles for support, protection and movement.



# Assessment

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

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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
<b>Working Scientifically: working at the expected standard (LKS2 NC requirements)</b>								
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								
<b>Science Content: working at the expected standard (Y3 NC requirements)</b>								
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.

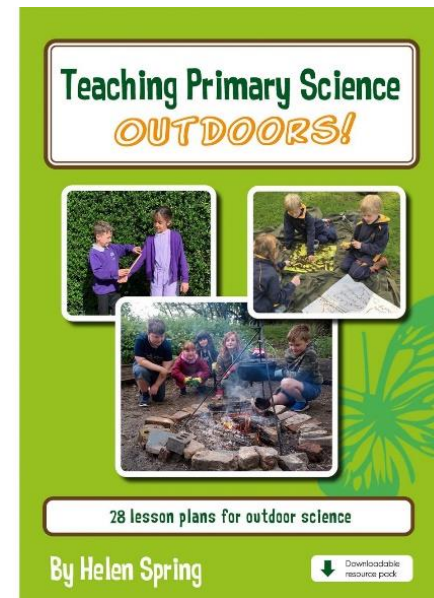
	Possible skills focus	Examples of science learning which can be done outdoors	Examples of science learning about the outdoors
<b>Age 4-7</b>	<ul style="list-style-type: none"> <li>- Ask questions</li> <li>- Perform simple tests</li> <li>- Observe closely</li> <li>- Gather and record data to answer Qs</li> <li>- Identify and classify</li> </ul>	<p>How could we make the best shelter? <a href="#">Incy spider shelter</a> R</p> <p>What happens to the ice? <a href="#">Frozen balloons</a> R</p> <p>Which materials can we see light through? <a href="#">Transparency</a> Y1</p> <p>Which objects do we think will float/sink? <a href="#">Float &amp; sink</a> Y1</p> <p>Which material made the best boat? <a href="#">Boat materials</a> Y2</p> <p>How do we get the character out of the ice? <a href="#">Ice escape</a> Y2</p> <p>What materials can we find? <a href="#">Materials hunt</a> Y2</p> <p>How do we test which material is the most waterproof? <a href="#">Waterproof</a> Y2</p>	<p>How can we sort the things we have found? <a href="#">Scavenger sort</a> R</p> <p>Do all leaves look the same? <a href="#">Leaf look</a> Y1</p> <p>What parts does this plant have? <a href="#">Plant structure</a> Y1</p> <p>What colours/shades can we find? <a href="#">Shades of colour</a> Y1</p> <p>What season is it now? <a href="#">Seasonal change</a> Y1</p> <p>What does a plant need to keep healthy? <a href="#">Plant growth</a> Y2</p> <p>What living things can we find nearby? <a href="#">Nature spotters</a> Y2</p> <p>Is this alive? Has this ever been alive? <a href="#">Living &amp; non-living</a> Y2</p> <p>How many daisies are in each area? <a href="#">Daisy footprints</a> Y2</p> <p>Where do woodlice live? <a href="#">Woodlice habitats</a> Y2</p>
<b>Age 7-11</b>	<ul style="list-style-type: none"> <li>- Plan different types of enquiry to answer Qs</li> <li>- Take measurements</li> <li>- Gather, record and classify data</li> <li>- Report findings</li> <li>- Use results to draw simple conclusions</li> <li>- Evaluate degree of trust in results</li> </ul>	<p>Which kind of materials make shadows? <a href="#">Making shadows</a> Y3</p> <p>Which rock is the most hard-wearing? <a href="#">Rocks report</a> Y3</p> <p>How can we package the egg? <a href="#">Egg drop</a> Y3</p> <p>Which area is hottest/coldest? Adapt <a href="#">Measuring temp</a> Y4</p> <p>How do we find out the best conditions for drying? <a href="#">Drying</a> Y4</p> <p>Which is the best material for the job? Adapt <a href="#">Champion tapes</a> Y5</p> <p>How can we compare our planes? <a href="#">Paper planes</a> Y5</p> <p>How far can we make a spinner travel? <a href="#">Spinners</a> Y5 (link to seed dispersal)</p>	<p>How much water do plants need? <a href="#">Measuring plants</a> Y3</p> <p>How can we help our local environment? <a href="#">Eco action</a> Y3</p> <p>What living things can we find? <a href="#">Local survey</a> Y4</p> <p>Making a classification key for our area, e.g. <a href="#">Outdoor keys</a> Y6</p> <p>Plus:</p> <p>Woodland Trust <a href="#">spotter sheets and activities</a></p> <p>Growing plants <a href="#">website guide</a> for each month of the year</p> <p>Dr Katherine Forsey's detailed plans for pond/bush/minibeast/rock pool <a href="#">hunts</a></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.

# Resources to support outdoor learning and science



# Action planning



**Ideas**

**Action Plan**

Please post your  
top action in the  
chat!



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