

Teaching Primary Science Outdoors

Helen Spring

www.SpringLearning.co.uk

helen@springlearning.co.uk

@SpringLearns

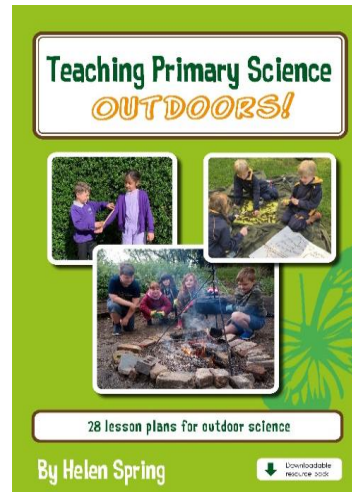
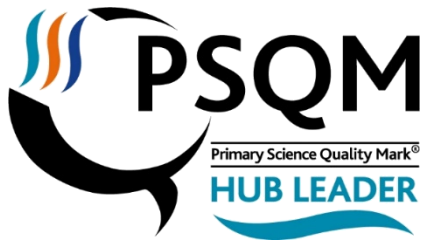


@SpringLearns

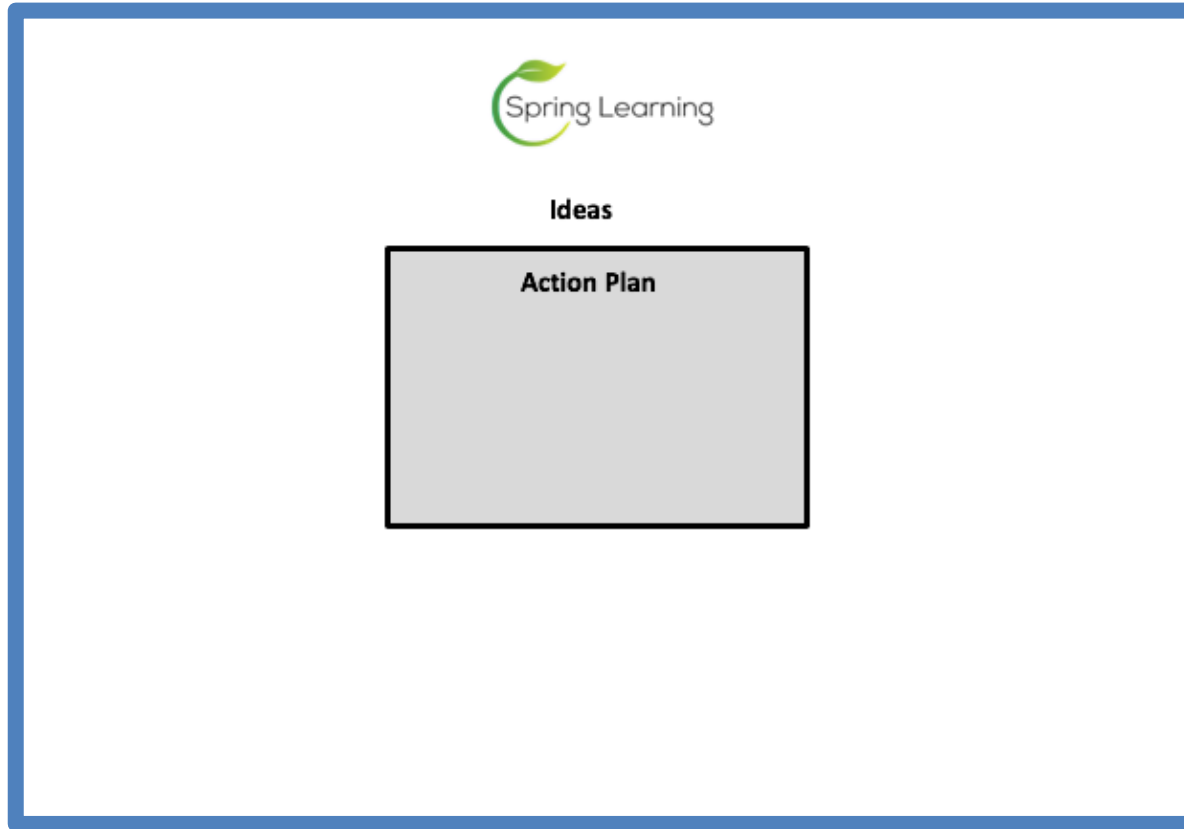
@PSQM_HQ

#PSQM

Spring Learning



Action Planning



Learning Outcomes

The session will include:

- Characteristics of effective outdoor learning.
- Managing children in an 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 and PSQM

PSQM Science Subject Leadership Criteria

Science is valued and improved through the development of effective processes for subject leadership:

- A. There is a clear vision for science, created and implemented by teachers and children, through principles for teaching and learning.
- B. Strategic support for subject leadership is provided and includes:
 - Focussed CPD for subject leader
 - Regular release time
 - Resources to facilitate development in science.
- C. There is a monitoring cycle, including pupil voice, that informs actions taken and the development of science.

Outdoor Learning and PSQM

PSQM Science Teaching Criteria

Subject leadership responds to development needs in science teaching:

- A. There is provision and signposting of relevant internal or external professional development and support with which staff engage.
- B. Teachers are supported to use a range of effective strategies for teaching science which challenge and support the learning needs of all children.
- C. Resources are audited annually, well-organised and accessible, so that children can regularly and safely use appropriate practical and digital resources, information texts and the outdoor environment.

Outdoor Learning and PSQM

PSQM Science Learning Criteria

Subject leadership develops teachers' practice:

- A. Children are taught to use different enquiry types to answer scientific questions about the world around them, through the use of scientific enquiry skills.
- B. A range of strategies and processes for formative, summative and statutory assessment are used, which reflect a shared understanding of the purposes of assessment in science and current best practice.
- C. Initiatives that encourage all children to think that science is relevant and important to their lives, now and in the future, are supported and promoted.

Outdoor Learning and PSQM

PSQM Wider Opportunities Criteria

Children's experiences of science are enriched:

- A. Curriculum planning links science to other areas of learning.
- B. There is participation in some external initiatives, topical science events and family learning.

Padlet and Break Out Rooms

How is your school managing learning taking place outside?

- 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).

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

Activity - Exploring materials for a pixie house



Resources needed

Before lesson - check for litter especially near bench

In an ideal world, this lesson would take place in a forest area, where there are lots of sticks, leaves and other natural materials around. Additional materials should include different types of cloth (cotton, felt, etc.), plastic carrier bags or cling film, cardboard and paper towel.

What to do

*John to work with TA
Take Abby's epi pen (wasps)*

Prepare the materials you want the children to work with.

Discuss what children already know about the materials available to them.

Explain your health and safety rules. These might include the area that the children are allowed to work in and the things they can and cannot pick up.

If possible, put the lesson into a context, such as a story or topic.

Set the task – Can you make a house for a pixie? Discuss what the requirements are for your pixie... Does the pixie need to be warm, dry, protected from predators? You can adapt this depending on the context and the materials available.

Give the children time to explore with the materials available to them and to build a shelter for their pixie.

Children should then carry out simple tests to find out whether the requirements set were met. This is likely to include whether the pixie house is waterproof, warm or windproof.

Ensure that children wash their hands thoroughly after working outdoors.

Go from the fence to the wall. Do not pick the orange berries.

5 Types of Enquiry



ReachOut
CPD

enquiring
science⁴all

Materials

Images © Millgate House Publishing
'Teaching Primary Science
Outdoors'
by Helen Spring



Materials

Images © Millgate House Publishing
'Teaching Primary Science
Outdoors'
by Helen Spring



Definitely outdoors....

Images © Millgate House Publishing
'Teaching Primary Science
Outdoors'
by Helen Spring



Could be outdoors....

Images © Millgate House Publishing
'Teaching Primary Science
Outdoors'
by Helen Spring



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?



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

Light – Y6

Pupils should be taught to:

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

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

Assessment



- A system for assessing Working Scientifically (eg PSTT TAPS)
- A system for assessing conceptual understanding (PLAN Assessment can support with this)
- A good tracking system

© Centre for Primary Education Collaboration

20

www.cpe.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
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 Conceptual Understanding



Assessing Working Scientifically

LB



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.

The 5 types of enquiry outdoors...

LA

- 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.
- 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....

Evolution and inheritance



Images © Millgate House Publishing
'Teaching Primary Science
Outdoors'
by Helen Spring

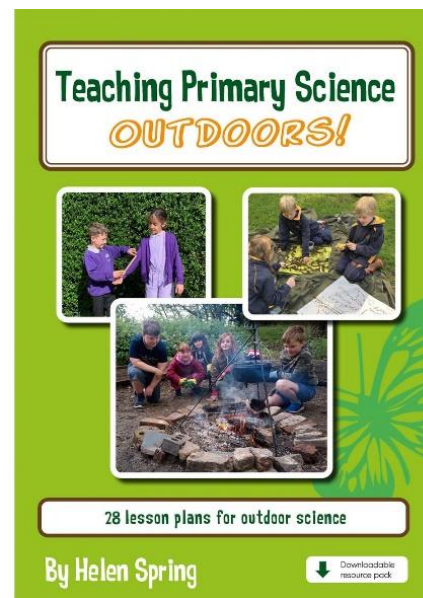
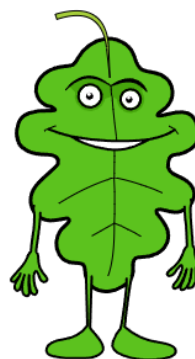


Forces

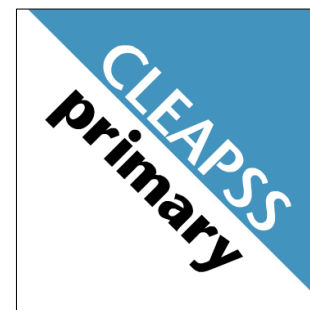


Images © Millgate House Publishing
'Teaching Primary Science
Outdoors'
by Helen Spring

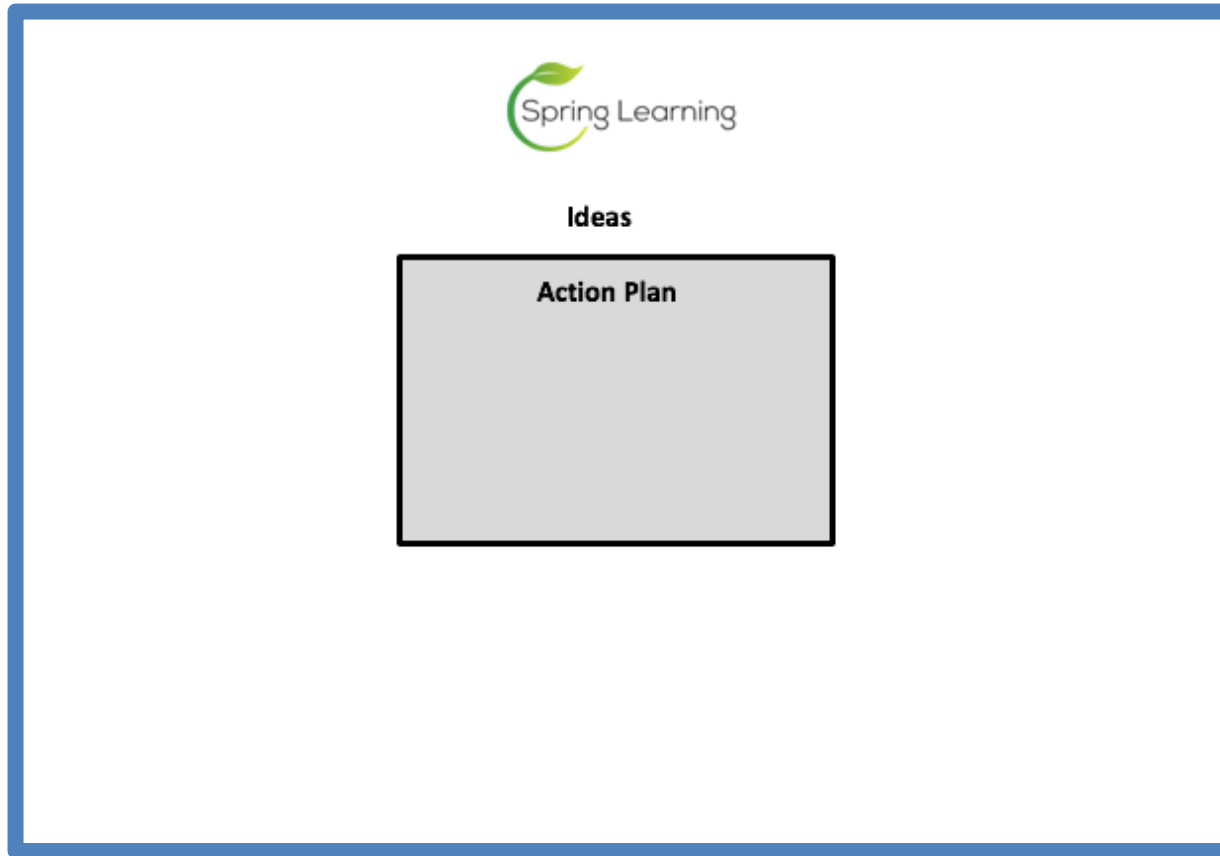
Resources to support outdoor learning and science



Playground
SCIENCE



Action planning



Teaching Primary Science Outdoors

Helen Spring

www.SpringLearning.co.uk

helen@springlearning.co.uk

@SpringLearns



@SpringLearns

@PSQM_HQ

#PSQM