Teaching Primary Science Outdoors

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Powered by
University of Hertfordshire UH

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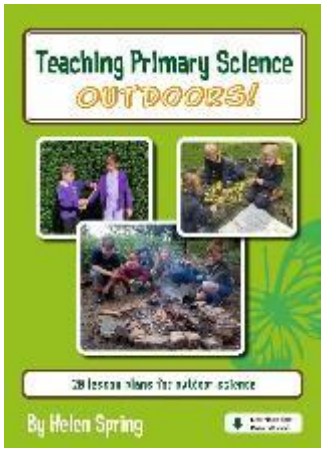
CLEAPSS primary CONSULTANT



Focus4TAPS
Facilitator

Teach Outdoors

Explorify
Champion

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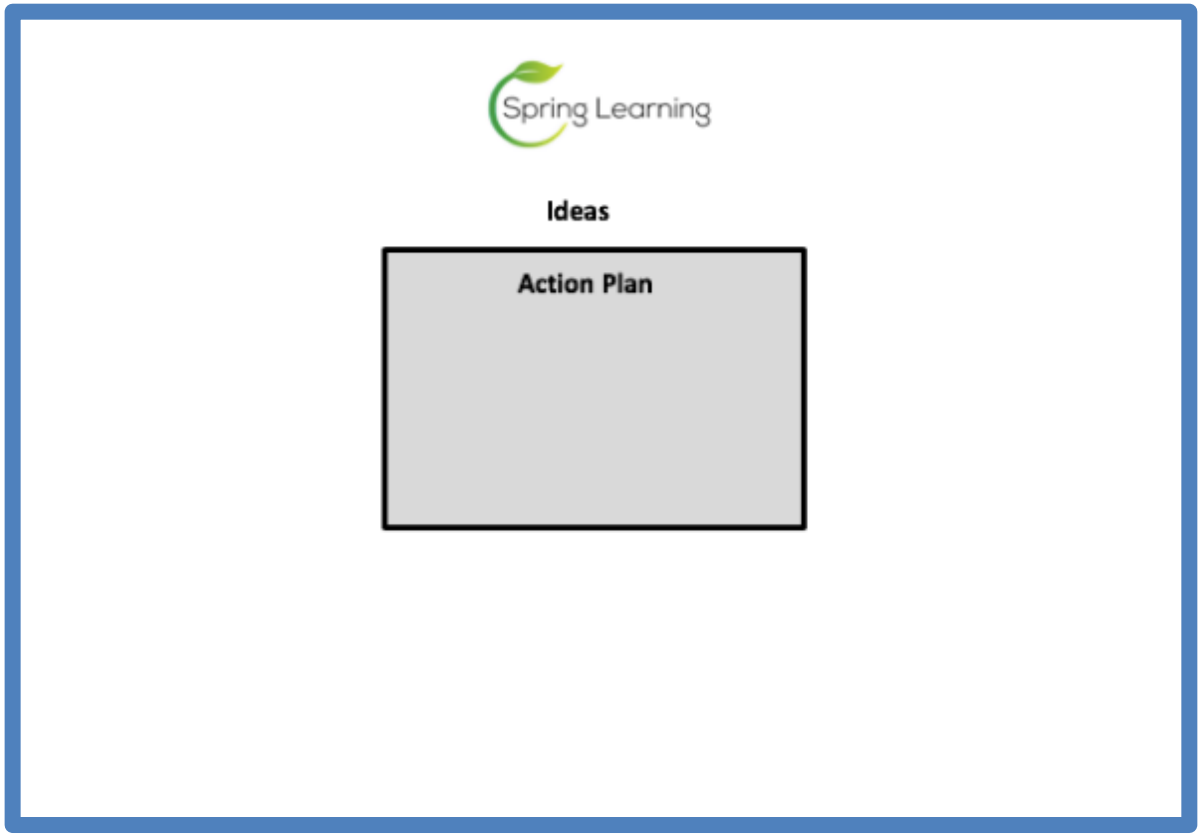
Action Planning



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Teaching science outdoors in your school…

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

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Materials Y2

•identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses

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?

Spring Learning

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).

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Health & Safety in Primary Science…

CLEAPSS 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

Spring Learning

Activity - Exploring materials for a pixie house

Before lesson – check for litter etc especially near bench
Check for loose branches under trees

Resources needed

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.

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

What to do

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.

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

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.

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Definitely outdoors....

Could be outdoors….

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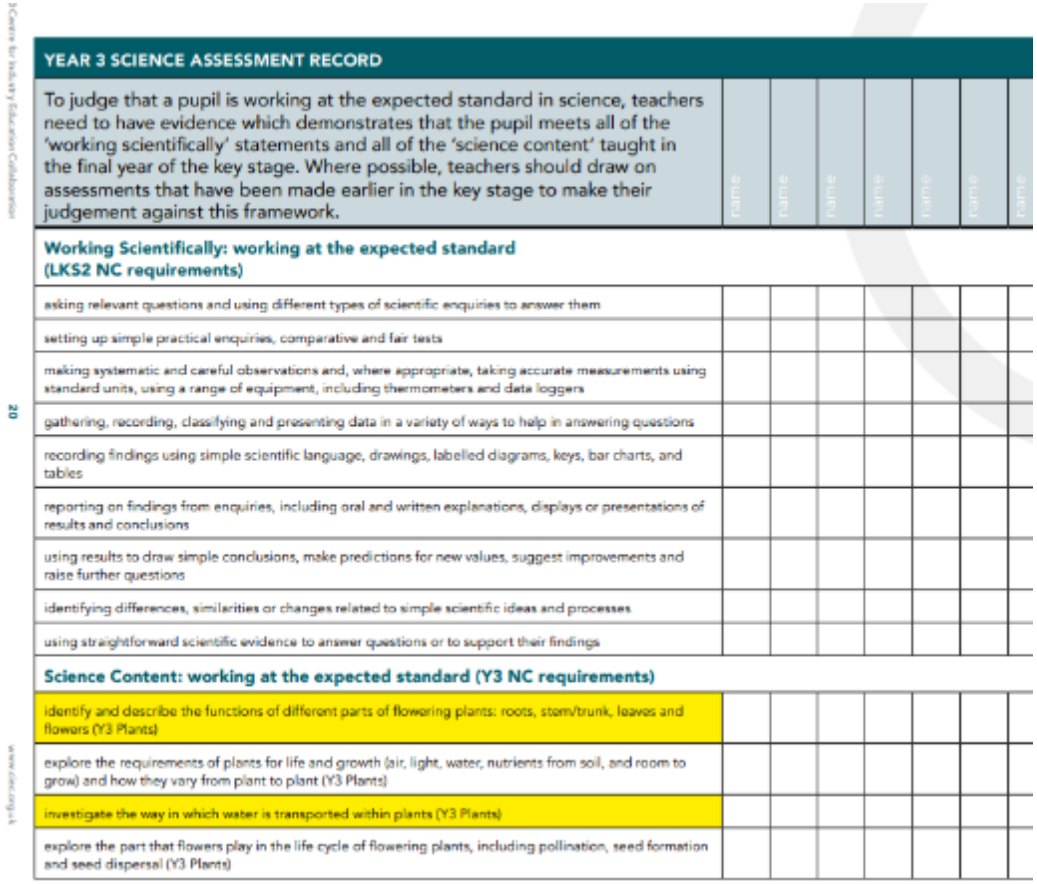
Assessment Outdoors

- A range of approaches for assessing Working Scientifically (PLAN Assessment and PSTT TAPS can support)
- A range of approaches for assessing Conceptual Understanding (PLAN Assessment and PSTT TAPS can support)
- 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)							

PLAN
Planning for assessment

Spring Learning

TAPS

Spring Learning

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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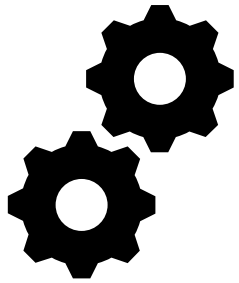
Carousel of outdoor lesson ideas

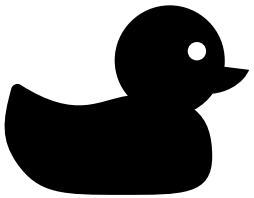
- EYFS – forces (PLAN Assessment)
- Y1 – parts of a plant (Spring Learning)
- Y2 – habitat postcards (Spring Learning)
- Y3 – soil (CLEAPSS)
- Y4 – drying (TAPS)
- Y5 – air resistance (PLAN Assessment)
- Y6 – Heart / circulation (Spring Learning)

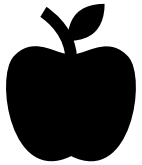
Spring Learning

Forces EYFS

- Explore how things work (Nursery).
- Explore and talk about different forces they can feel (Nursery).
- Talk about the differences between materials and changes they notice (Nursery).
- Explore the natural world around them (Reception).
- Describe what they see, hear and feel whilst outside (Reception).







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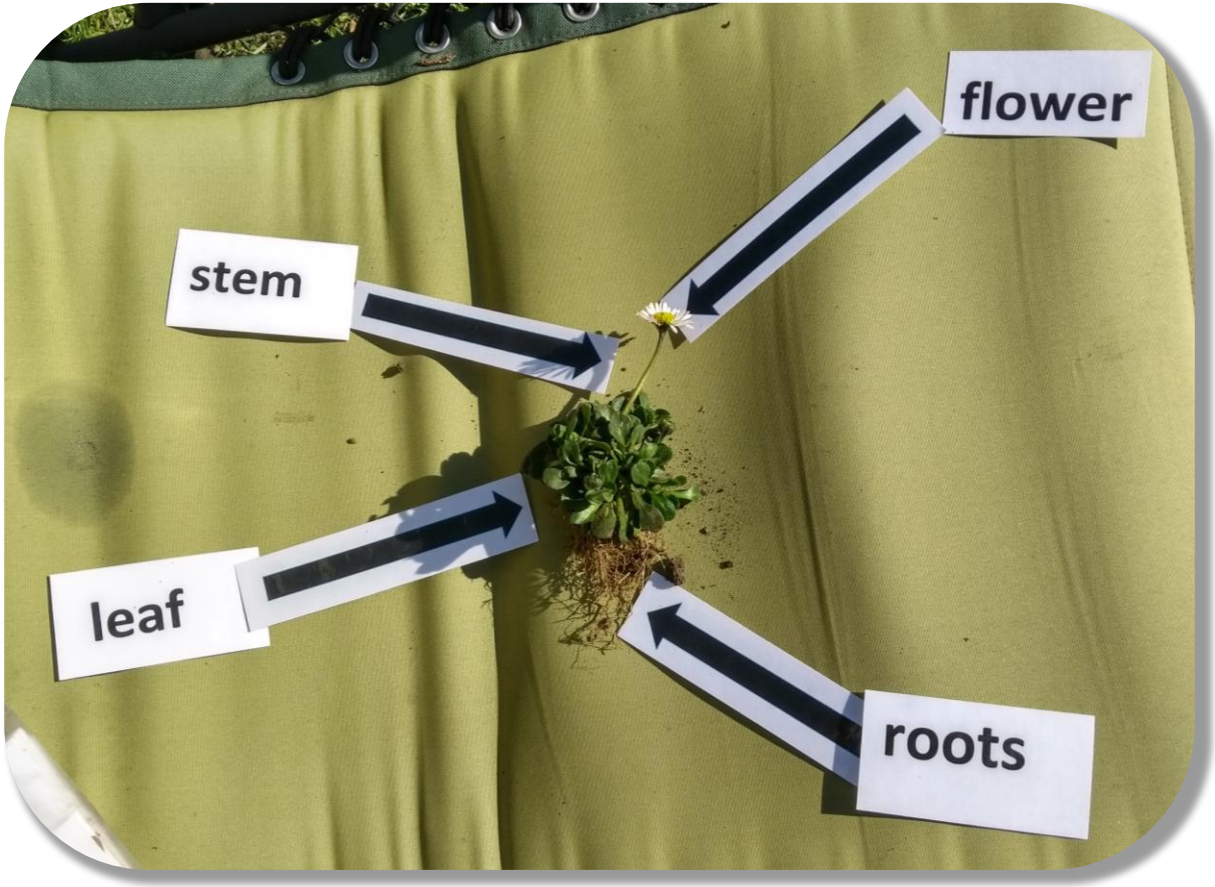
Plants Y1



- identify and describe the basic structure of a variety of common flowering plants, including trees.

Spring Learning

Living Things and their Habitats Y2

- 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 microhabitats

Rocks and Soils Y3

- recognise that soils are made from rocks and organic matter.

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States of Matter Y4

- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

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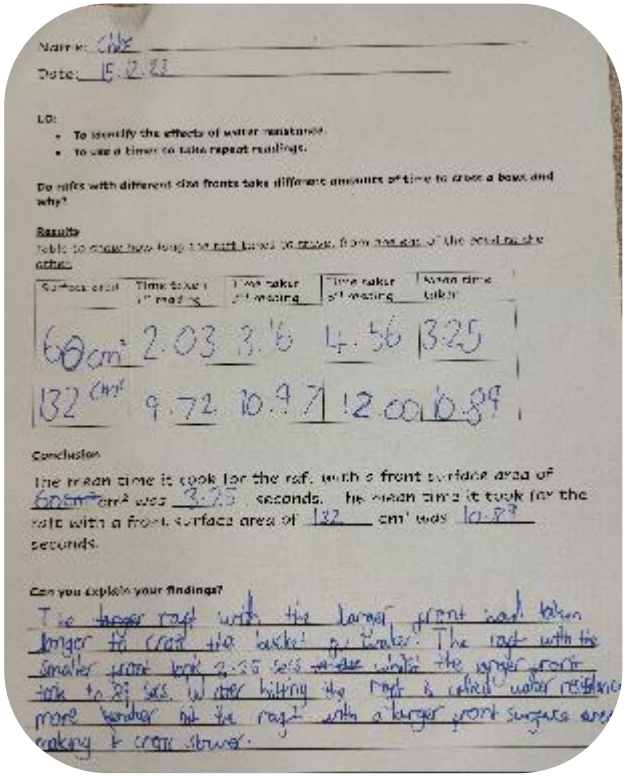
Forces Y5



- identify the effects of air resistance, water resistance and friction, that act between moving surfaces

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Forces Y5

•recognise that some mechanisms including levers and pulleys… allow a smaller force to have a greater effect

Animals including Humans Y6

- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood

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Definitely outdoors....

Could be outdoors….

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A good science lesson

- Conceptual knowledge objective
- Working scientifically objective
- Type of enquiry
- Assessment focus / foci
- Success criteria / what the learning might look like
- Anything else?

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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?

PLAN
Planning for assessment

Spring Learning

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

Spring Learning

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

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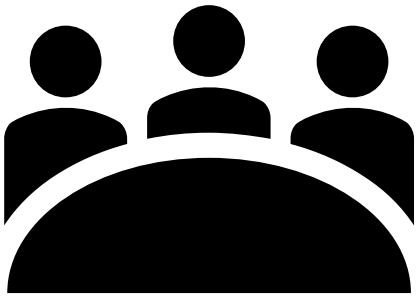
Planning to teach science outdoors

- In year group / KS pairs choose a lesson objective
- Plan how to teach it (or part of it) outdoors
- Lesson plan to be shared with everyone here in a gallery walk



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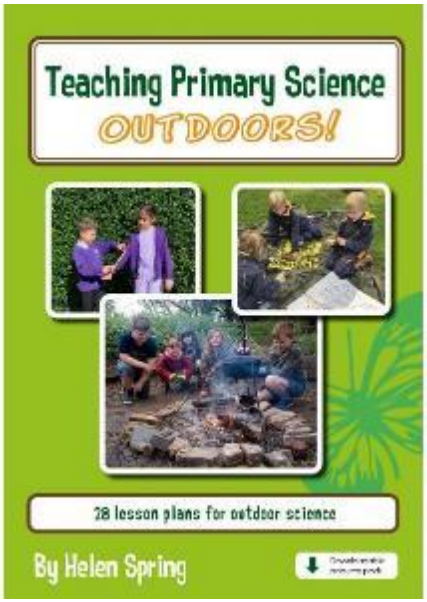
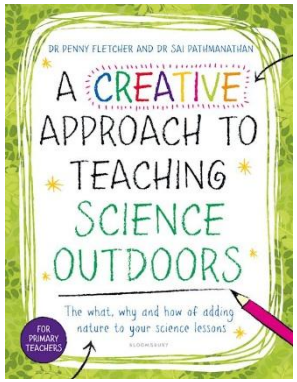
Resources to support outdoor learning and science

Learning through Landscapes

PLAN
Planning for assessment





Playground SCIENCE

Primary Science Teaching Trust

LEAFEd
LEAF Education

National Education Nature Park and Climate Action Awards

THE ERNEST COOK TRUST

CLEAPSS primary

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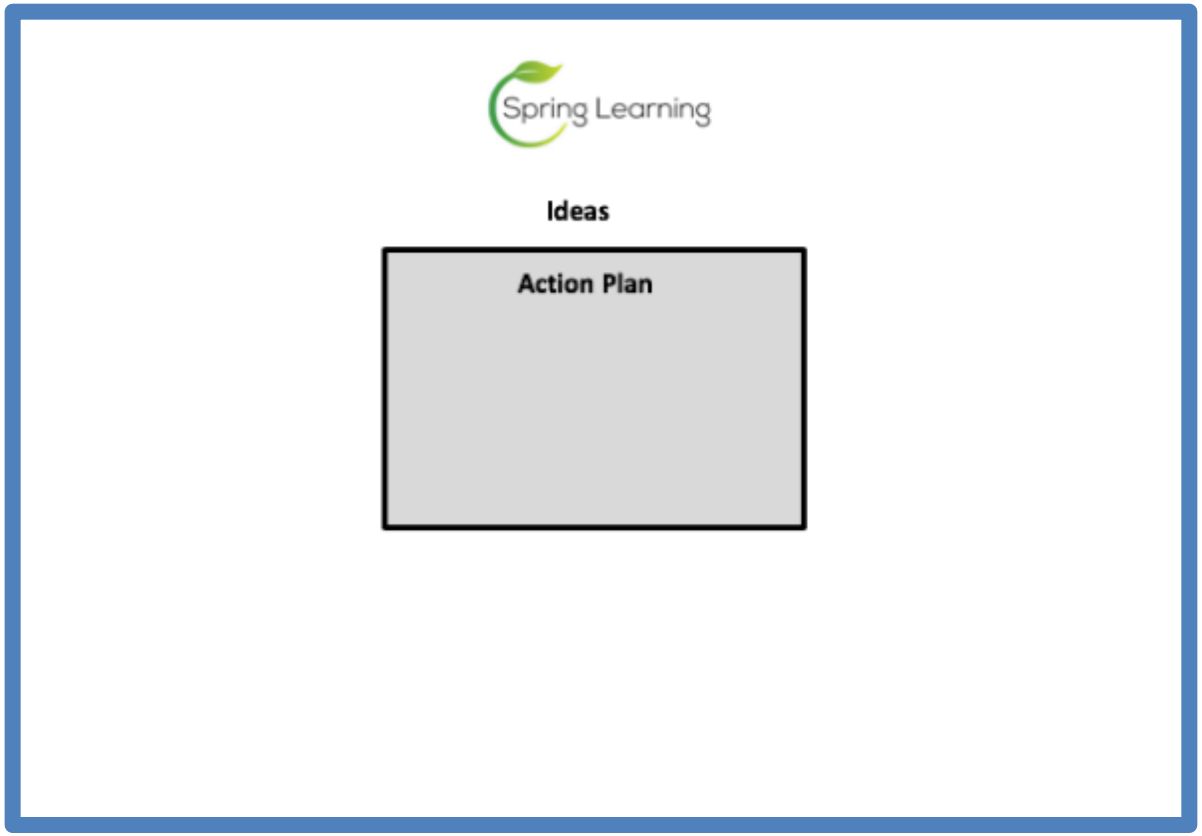
Action Planning and evaluations



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