FSC

FIELD STUDIES COUNCIL

Building a fieldwork toolkit for new Science teachers

Task 1 Reflection on your fieldwork experience: SWOT analysis

Think about your own personal fieldwork experiences. Reflect on what these experiences have given you and what you have to offer to students. What are your strengths and weaknesses? Then add in any opportunities you have to improve and any threats to your own enjoyment or improvement of your delivery of fieldwork.

Strengths: e.g. I have experience of basic sampling skills such as using quadrats from my own fieldwork.	**Weaknesses:** e.g. I am not confident in plant identification.
Opportunities: e.g. apps like LeafSnap which can help my id skills.	**Threats:** e.g. access to equipment is limited.

S W
O T

- Write a memory from your own personal experience of fieldwork (this could be an idea of the impact it had on you, a memorable moment, or a series of epitome words).

Task 2 Self-assessment of fieldwork toolkit: Learning wall

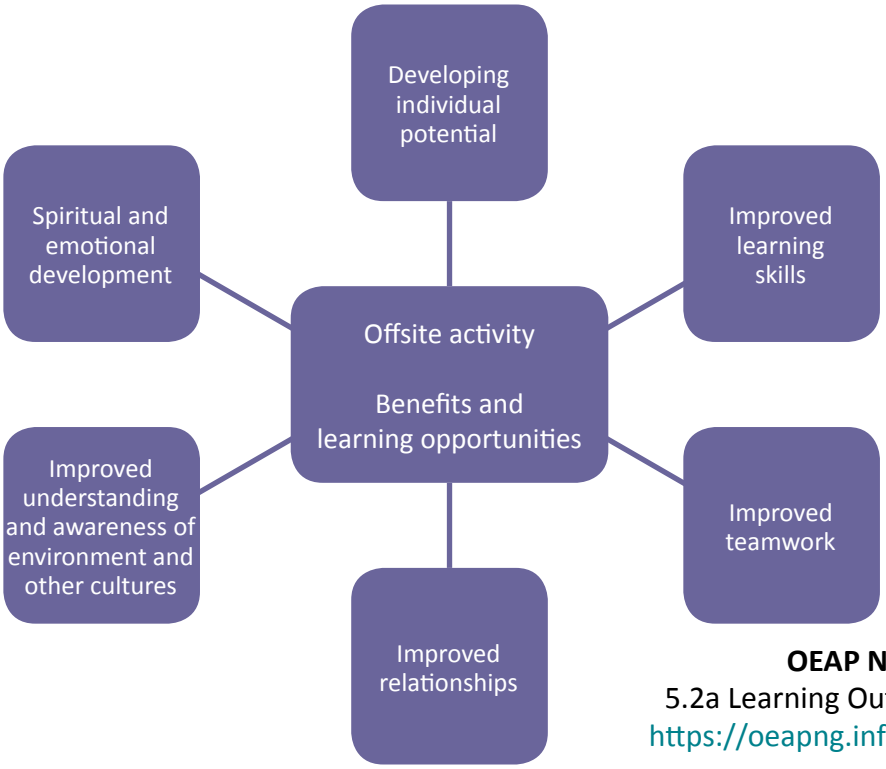
Shade the boxes in three colours, first any skills or areas you feel you already feel confident in, next another colour after the live lesson and thirdly after the follow up webinar. Fill in the blanks with your own objectives or areas of interest.

High quality planning	Health & safety	Outdoor delivery	Fieldwork techniques	Benefits of outdoor learning	Following up fieldwork
Plan purposeful fieldwork	Explain risk-benefit	Group management in the field	Knowledge of sampling strategies	Demonstrate impact on Inter and intrapersonal skills for students	Use locational context to explain findings
Embedding study within scheme of work	Identify hazards	Making nature connections	Knowledge of sampling strategies	Links to exam content	Data presentation and interpretation
Suitable location chosen	Assess risk	Student led fieldwork	How to determine suitable sample size	Recognising global connections and synoptic links	Statistical analysis
Support from National outdoor providers	Mitigate risk	Adapting good pedagogy for the outdoors	Justifying the use of different quadrats	Benefits recognised and valued by SLT / other departments	Drawing conclusions
	Sharing risk-benefit with participants		Use of abiotic equipment and data loggers		

Task 3 Benefits of outdoor learning: Different stakeholders

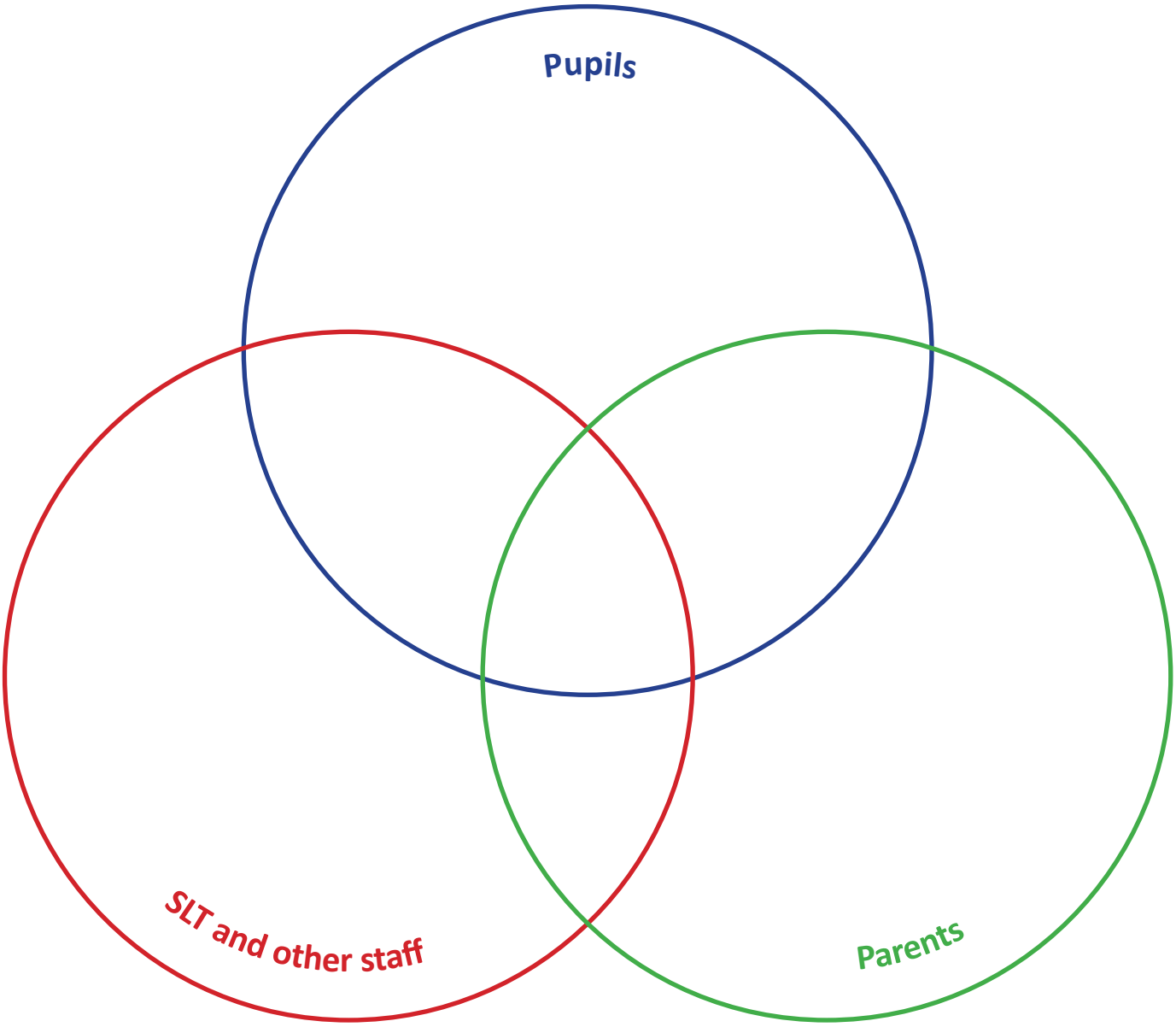
The following infographics have been produced by the Institute for Outdoor Learning and the Outdoor Education Advisers' Panel. Use your research skills to summarise the main benefits of fieldwork, then categorise them into the Venn diagram on page 4.

IOL, About Outdoor Learning
https://www.outdoor-learning.org/Good-Practice/Research-Resources/About-Outdoor-Learning



OEAP National Guidance:
5.2a Learning Outcomes Mind Map
https://oeapng.info/download/1176

- Categorise the main benefits of fieldwork in the Venn diagram below.



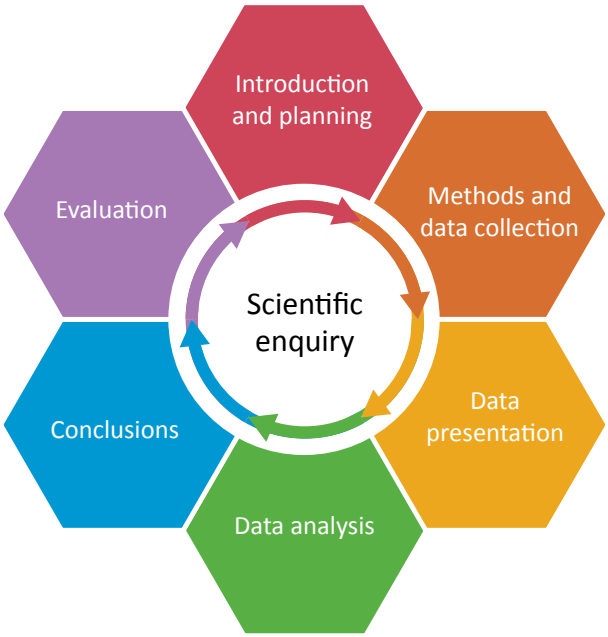
- Highlight, within your summary, the benefits that are most relevant to your individual settings.

Task 4 Scientific enquiry and the value of purposeful fieldwork

The scientific enquiry process is just that: a process. It should be shared with students as such, with full engagement in each stage.

- Reflect upon each of the different stages of scientific enquiry.

  What are the opportunities to engage students with each stage?



To make this as valuable and meaningful as possible, consider the steps that make up a scientific approach to fieldwork.

We recommend as background to this schematic you read the ASE paper 'Scientific Enquiry'

https://bit.ly/3cbO6Ng

- Now think about any fieldwork that you have led or observed.

  Underline those parts of the diagram (right) which, in your opinion, were less well-covered.

Scientific attitudes

- ☐ Show concern for accuracy, precision, repeatability and reproducibility
- ☐ Understand that scientic data develops over time with new evidence
- ☐ Evaluate risks

Experimental skills

- ☐ Make predictions
- ☐ Plan investigations to answer questions
- ☐ Take reliable readings using a range of equipment
- ☐ Consider reliability of method and suggest possible improvements
- ☐ Record data gathered using more than one technique

Measurement

- ☐ Understand and use SI units and IUPAC chemical nomenclature
- ☐ Use and derive simple equations
- ☐ Data analysis

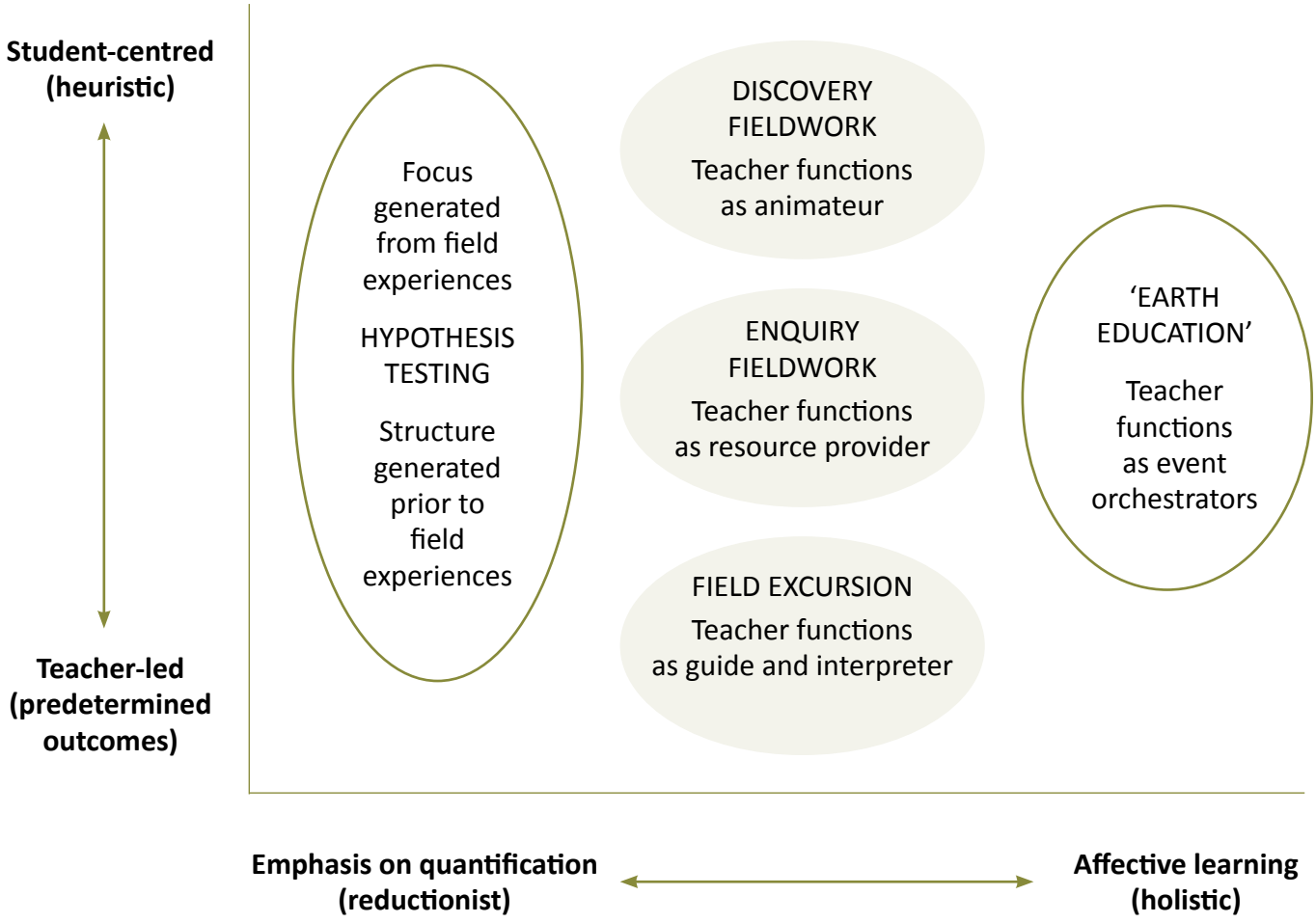
Analysis and evaluation

- ☐ Present data appropriately
- ☐ Draw conclusions in relation to evidence
- ☐ Identify further questions from results
- ☐ Evaluate data and sources of error
- ☐ Apply mathematical concepts and calculate results

Reflection on the value of having different approaches to fieldwork

We should use the idea of 'creation of a need to know' to inspire and engage students in the enquiry process to get maximum value out of the fieldwork experience by combining different forms of fieldwork approach.

Some fieldwork strategies



Job, D. (1999) *New Directions in Geographical Fieldwork*. Cambridge: Cambridge University Press

Task 5 Approaches to fieldwork

For each of the 5 opportunities for fieldwork detailed in David Job's diagram on page 6, match up an example that would fit the context.

Hypothesis testing	Students asked to explore and discover where a nature garden would be best suited to be built in the school grounds. They have access of a wide range of equipment and follow their own interests as they justify and design their investigation, to collect data to allow them to come to a solution to the question
Field excursion	Students given a quadrat to test diversity in a mown and non-mown grassland using random sampling
Enquiry fieldwork	Students plan a visit to a chosen relevant, local site e.g. Zoo or RSPB reserves and are free to explore the habitats, species, conservation programmes, genetics, and adaptations, as well as having time to play and explore the area. Having followed their interest and seen the wider context in which scientific data has an impact and value, students create a project to share their topic of expertise
Discovery fieldwork	Teacher takes students to a woodland that is managed through rotational coppicing for a tour by the RSPB warden about the practice and management of the area
Earth education	Students investigate a local salt marsh environment and set up their own investigation into the factors affecting it; they are free to choose their own sampling design , organism(s) and equipment, to follow their own particular thread of interest

- For a fieldwork day you have experienced reflect upon how this would be classified using David Job's classification. Consider the opportunities present within a basic design of a fieldwork day to incorporate multiple approaches.

Task 6 Evaluating of the benefits of fieldwork

Finally evaluate the benefit of outcomes for students of having exposure to that range of fieldwork approaches instead of a basic hypothesis testing exercise. Use the flow diagram template if you wish.

Fieldwork approach	Exemplification	Benefits	Impacts on learner

Health and safety in the outdoors

Health and Safety is a fundamental part of fieldwork. A wealth of guidance and good practice can be found on the Outdoor Education Advisor Panel (OEAP) website, and this national guidance should be the first place to build your knowledge, skills, and confidence. As a new Science teacher, it is important to understand the roles and responsibilities of others. OEAP's Status Remit and Rationale is a good place to see the support network available to you https://oeapng.info/essential-reading

Do some research into risk-benefit. Start by looking at section 4.3c of the OEAP National Guidance
4.3c Risk management - an overview
https://oeapng.info/download/1144

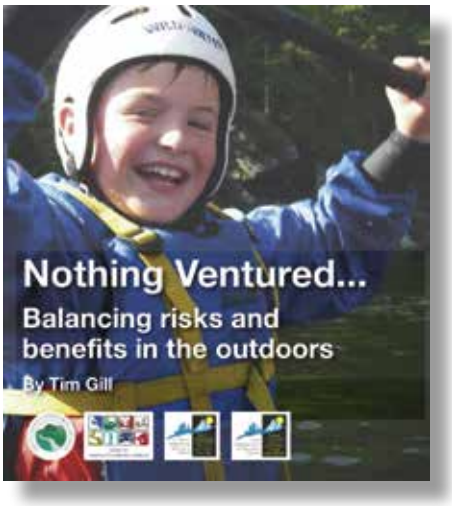
Then look at section 5.2b for a planning basics for outdoor learning, offsite visits and LotC 5.2b Planning Basics for Outdoor Learning, Off Site Visits and Learning Outside the Classroom
https://oeapng.info/download/1178

Task 7 Nothing Ventured...

Read *Nothing Ventured...* by Tim Gill. This short report can be downloaded from

https://www.outdoor-learning.org/Good-Practice/Good-Practice/Risk-and-Benefit-in-Outdoor-Learning

Nothing Ventured... Balancing risks and benefits in the outdoors aims to encourage readers to take a reasonable and proportionate approach to safety in outdoor and adventurous settings, and to reassure them that managing risks should not be a disincentive to organising activities.



➢ Summarise your findings from the *Nothing Ventured...* report in the table below.

Something I already knew	Something new I have learnt	Still to find out

Task 8 Health and safety in the outdoors: risk benefit

Annotate the photo with the possible hazards you notice, as well as the benefits of the outdoor learning.

Five step process of Risk Assessment: research the five-step process:	
1	
2	
3	
4	
5	

➢ Now go back to your annotations above and add control measures to each hazard that you identified.

Activity 1 Risk-benefit analysis

Which of the following three scenarios seems to you to pose most risk? Justify your choice.

To complete a risk-benefit analysis, follow the 5-step process of risk assessment, as well as balancing the benefits of outdoor learning. Use the glossary on page 12 to help you.

➢ Complete the risk-benefit form for the photo on the screen, shown in the live lesson.

Benefits	
Risks	
Local factor	
Precedents and/or comparison	
Decision	
Actions taken	
Ongoing monitoring and management	

http://www.playengland.org.uk/resource/risk-benefit-assessment-form

Glossary
Benefits: the specific, positive things that students gain through the opportunities that are under assessment (social, physical, emotional, educational, psychological, etc.). **Local factors:** any relevant issues that are specific to the setting being assessed (for example, access to the site, proximity to busy roads or other hazards, etc.). Any relevant supporting policies and strategies should also be mentioned here. **Decision:** this is the assessor's conclusion following a risk-benefit assessment. The choices could include:
• Proceed/continue with no adjustments to working practices and continue to monitor • Proceed/continue with some specific adjustments to working practices while continuing to monitor • Cease activity until further assessments can be made
Actions taken: This should state the actions taken as a result of the decision reached. The choices could include:
• None • Introduce or increase monitoring of benefits and/or risks • Introduce or increase supervision • Introduce other measures to reduce risks • Introduce additional features or activities that increase the level of risk and challenge or other benefits • Meet with parents/students to raise awareness of approach to risk and benefit • Suspend activity
Ongoing monitoring and management: State here any future actions that may need to be taken

Dynamic risk assessment scenario

On accessing the woodland for your fieldwork, you realise that since the assessment there has been some felling done, there are large piles of timber stacked up and some machinery around the site you had planned to use.

➢ Complete a virtual dynamic risk assessment and decide what action you would take.

Activity 2 Bucket challenge

A bucket challenge is a great way to introduce creativity, curiosity, and challenge as well as teaching valuable scientific rigour and enquiry skills.

- Write your three questions in the boxes below

  Hint: It often helps students to consider the bigger picture, inter-relationships and/ or synoptic links within an ecosystem and then scale down to an area of interest.

- Choose one question you would like to progress, and tick the box next to your chosen question. Use this question to progress through the following series of questions.

Develop an investigation aim that could be investigated at your site	
Why is this interesting to you?	
Note any underlying scientific concepts, theory on synoptic links	
Sampling strategy	
Methods and equipment	
How excited are you about finding out the answer?!	

- Why have we asked about your interest and excitement? What is the value of this, as it is not technically part of the investigation sequence?

Sharing your ideas using Padlet

To share your ideas on Padlet, go to https://bit.ly/3fFitOf and double click on the background or the icon (right) and you can upload your file or photo of the worksheet there.

You might even add comments on how you might differentiate or adapt your approach, for example for other locations.

Reflection

- Why is this a useful approach for supporting fieldwork and bringing about these additional benefits?

- Any barriers and solutions?

Activity 3 Context is key

Choose one of the suggested 'giving context' activities from the Live Lesson, or one of your own ideas, and create a mind map to explore the value-added elements this activity brings.

Hint: Remember this is not just about introducing fun activities (although natural play is important!). There are academic and wider inter/intrapersonal benefits to them as well, and often these all link together. Add your thoughts to the mind map and try to draw out some of these links once completed to create a concept map.

Chosen activity:

- Look back at your Learning Wall from the Pre-lesson Preparation and reflect on how you have developed your fieldwork toolkit. If any gaps or questions remain, you can take advantage of the interactive elements of the Webinars to further your knowledge.