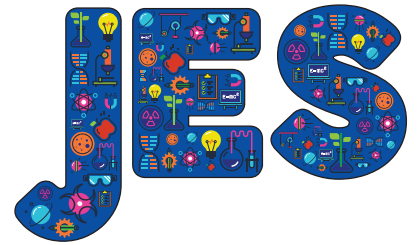


Outdoor learning, science trails and inquiry: an introduction



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Increasing evidence points to how learning outside the classroom has the potential to enrich all who take part: *'The benefits of the outdoor classroom are clearly not confined to students alone. Teachers noted improved relationships with students, personal development in their teaching and ... job satisfaction'* (Dillon *et al*, 2005; Natural England, 2012; Natural Connections Demonstrations Project, 2016) and can help to combat under-achievement: *'Outdoor learning may be particularly beneficial for children who struggle to maintain concentration in more formal classroom settings and actively seek out ways to introduce direct experience into their learning'* (Waite, 2010).

The ASE (2016) is committed *'to promoting fieldwork as an effective and inspirational way'* for children to learn science. There are now many projects that provide opportunities for children to learn outdoors, and Continuing Professional Development (CPD) opportunities for teachers to learn how to facilitate effective learning outside the classroom. A good example of this is the 'Teach Outdoors – Learning Through Discovery' project (2016), which aims to raise standards through outdoor learning. Leaders of the project argue that the benefits of learning through discovery are wide-reaching, which include:

- increased pupil engagement as children are involved in experiences first hand;
- improvement of behaviour for those with behavioural issues through giving children opportunities to be responsible and earn the trust of their peers and adults;
- children being active rather than passive learners whilst learning lifelong skills;
- improved emotional wellbeing and confidence;
- risk assessment opportunities; children are given opportunities to assess risk whilst being taught strategies to identify dangers and stay safe; and
- improvement in physical fitness. (Teach Outdoors – Learning Through Discovery, 2016)

In this issue, articles (Bartoszeck & Tunnicliffe, 2017; Morgan, Franklin & Shallcross, 2017; Mujtaba, Tunnicliffe & Sheldrake, 2017) and the book review (Bilto, Bento & Dias, 2017) all focus on the importance of providing children with opportunities for outdoor learning and inquiry. Authors discuss how teachers and facilitators can engage children in meaningful learning experiences that contextualise science via the environment. One interesting way of achieving this is to plan opportunities for children to undertake science trails, which can take place almost anywhere and, therefore, capitalise on any environment. Maths and science trails have been used in schools for a number of years to engage children in learning maths and science outside the classroom, but what specifically is a 'Maths or Science Trail'?

A 'Maths or Science Trail' can be developed by children and teachers to stimulate maths or science conceptual understanding, whilst practising inquiry skills such as problem-solving, observation, questioning and pattern-seeking, in a setting local to a school. Children and teachers actively take a pre-planned walk around a chosen outdoor environment to explore and investigate a particular concept or topic within maths or science.

An example of a simple maths trail would be to ask children to look for numbers or shapes in their local environment. Science trails can provide students with opportunities to explore a topic and uncover the science behind that topic. For example, when learning about trees (Year 1, Key Stage 1, (age 6) Science National Curriculum – to learn about coniferous and deciduous trees) children can explore the local environment to compare the locations and types of plants found there, then use their observations and scientific knowledge to explain why certain plants are suited to certain locations.



Maths and science trails not only can take place in the local environment, but, in fact, anywhere outside the classroom. For example, the Science Museum in London provides a number of well-thought-through science trails where children can explore the galleries and objects that the museum has to offer. One science trail that is particularly engaging is called 'Spectacular Space', in which children are encouraged to engage with a number of objects to uncover the science and stories behind them. For example, one object on the trail is the Apollo 10 Mission command module – children are asked to examine the module and find evidence to demonstrate that the module actually went into space! On close inspection, using their observation skills, children discover that the underside is burned and charred where it re-entered the Earth's atmosphere. Next, the children are asked to take a pen and a piece of paper and drop them from the same height to investigate which will hit the ground first. They are then asked to explain why this happens (using their understanding of air resistance and surface area) before being informed that the investigation they just did was done on the Moon, but with a different outcome – both objects hitting the floor at the same time; children are asked to explain why, promoting abstract thinking skills. Therefore, we can see that the activities to which the children are exposed throughout the

science trail are designed to encourage the children to use and improve their scientific knowledge and understanding whilst practising their inquiry skills.

The following interesting article by Morgan, Franklin and Shallcross (2017) discusses the use of science trails to investigate physics with children in the Early Years Foundation Stage and Key Stage 1 (age 5-7), giving readers ideas of how they themselves can use science trails with the children whom they teach.

For Key Reports and References, please see:

<https://www.ase.org.uk/resources/outdoor-science/>
<http://publications.naturalengland.org.uk/publication/6636651036540928>

<https://pstt.org.uk/resources/curriculum-materials/lets-go-science-trails>

<http://www.sciencemuseum.org.uk/educators/things-to-do/activitysheets-trails-apps/spectacular-space-trail-ks2>

<http://teachoutdoors.co.uk/wp-content/uploads/2016/11/Benefits-of-Teaching-Outdoors.pdf>

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