

# ASE primary science lessons for home (and school) learning: a response to COVID-19

**Lucy Wood and Carla Wallington review the support for primary science teaching and learning provided online by the ASE**

**D**uring the COVID-19 'lockdown', members of the Association for Science Education (ASE) primary science community worked together to develop a series of remote learning resources for the 2020 summer term (see *Weblinks*). This article describes how our aim of making science, with embedded science enquiry activities, accessible to parents and children in their home environment informed our collaborative endeavour. It shows some examples of children's learning outcomes supported by the resources and discusses how these resources may continue to be useful to the primary science community.

As schools across the UK closed in March 2020, we asked ourselves two questions: 'What might science home learning look like?' and 'How might we support primary school teachers and parents?'

Collaboration and discussion lie at the heart of science learning and we felt there was an opportunity to provide a framework that would give parents more confidence in using science language to talk with their children while building a shared understanding. We also believed it was possible to harness the rich resources available in the home environment for children to carry out authentic science enquiry activities.

We wanted to give teachers the flexibility to tailor the lessons for sending out to their pupils and parents, while providing a coherent series of sessions for supporting a complete curriculum topic. Using *PowerPoint* software, we started writing, reviewing and trialling lessons with a small group of science educators, teachers and parents.

The PLAN knowledge matrices (see *Weblinks*) provided the initial structure for selecting learning objectives that aligned with National Curriculum topics for primary schools in England. As the structure of the resources was decided, slightly different approaches emerged for supporting the different age groups. For 5- to 7-year-olds (key stage 1 in England) we focused on providing opportunities for parents and children to share conversations and build understanding of a science topic through a series of 'hands-on' activities that could be sequentially visited over a number of different days or weeks. For 7- to 11-year-olds (key stage 2 in England) the selected topics were broken down into series of lessons



**Figure 1** Opening slide of one of the ASE *PowerPoint* home learning resources

more akin to a scheme of work with defined learning objectives and pupil outcomes.

## **Key stage 1 resources (ages 5–7)**

As 5- to 7-year-olds are generally able to maintain focus on a teaching input for a maximum of 10–12 minutes, we wanted parents to feel comfortable with the notion of engaging their young child's attention for a 'whole lesson', while dispelling the misconception that all children learn in blocks of one hour lessons.

Breaking the science objectives up into 20–30 minute sessions and identifying rich opportunities to learn though enquiry activities were a priority as we designed the resources. The skills children use and develop as they carry out enquiry activities range from making predictions and asking scientific questions, to drawing conclusions and interpreting data or information collected. When these 'working scientifically' skills are embedded into science learning, they help to improve a child's cognitive, social and linguistic development, while encouraging them to become more inquisitive and interested in the world around them.

For example, with the year 1 (ages 5–6) topic on materials, we broke down the objectives into four 20–30 minute activities that would cover:

- identifying the material an object is made of;
- describing the properties of different materials.

Key words: ■ Science enquiry ■ Home learning ■ Curriculum



to understand what their child already knows and therefore focus on the vocabulary or misconceptions they hold.

The resources naturally progress in order to build on prior learning as well as providing extension activities that encourage greater depth and higher-order thinking, such as grouping objects according to the properties of the material from which they are made (Figure 3).

### Key stage 2 resources (ages 7–11)

The resources for 7- to 11-year-olds were designed so that children could work with a degree of independence. However, we acknowledged that parents of this older age group would still need to play an important

websites, such as BBC *Bitesize*, by embedding links within the *PowerPoint* to complement the scientific ideas being explored. As more lessons were written and reviewed, some important features emerged for best supporting parents and their children; these are listed in Box 1.

### Home learning outcomes

The first set of topics were launched as open-access resources on the ASE website just before the start of the summer term. As teachers started to download the lessons and include them as part of the children's home learning we began to receive encouraging feedback:

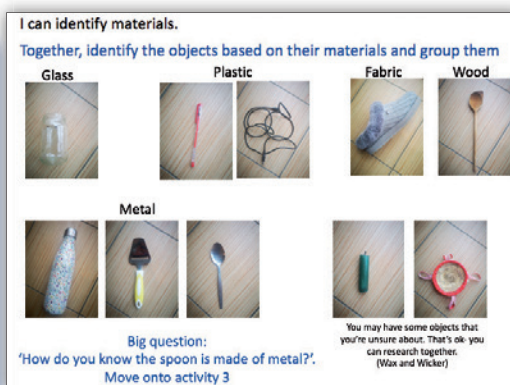
*The resources are so lovely and presented so well. The videos within the resource are really engaging. They are easy for parents to use as home learning – user friendly. The resource lends itself beautifully to the topic. It is a given that it would be highly recommended.* (Anne, year 4 teacher)

We also received samples of children's work and it was interesting to see how our vision for encouraging enquiry activities had been



**Figure 2** Considering the properties of everyday household objects

A house is full of a variety of materials that are often overlooked, but, if children can collect ten items and mindfully consider their properties, instantly science is brought into the home (Figure 2). Children may have their own unique way of describing each object. At the initial stages of learning a topic this provides a valuable insight, allowing the 'teacher'



**Figure 3** Grouping objects by the properties of their materials

supporting role. As such, we saw it as an opportunity to help 'demystify' science, which is often perceived as a subject needing to remain firmly within school.

Each topic aimed to provide a balance of different learning and enquiry activities. They drew directly on freely available video clips and

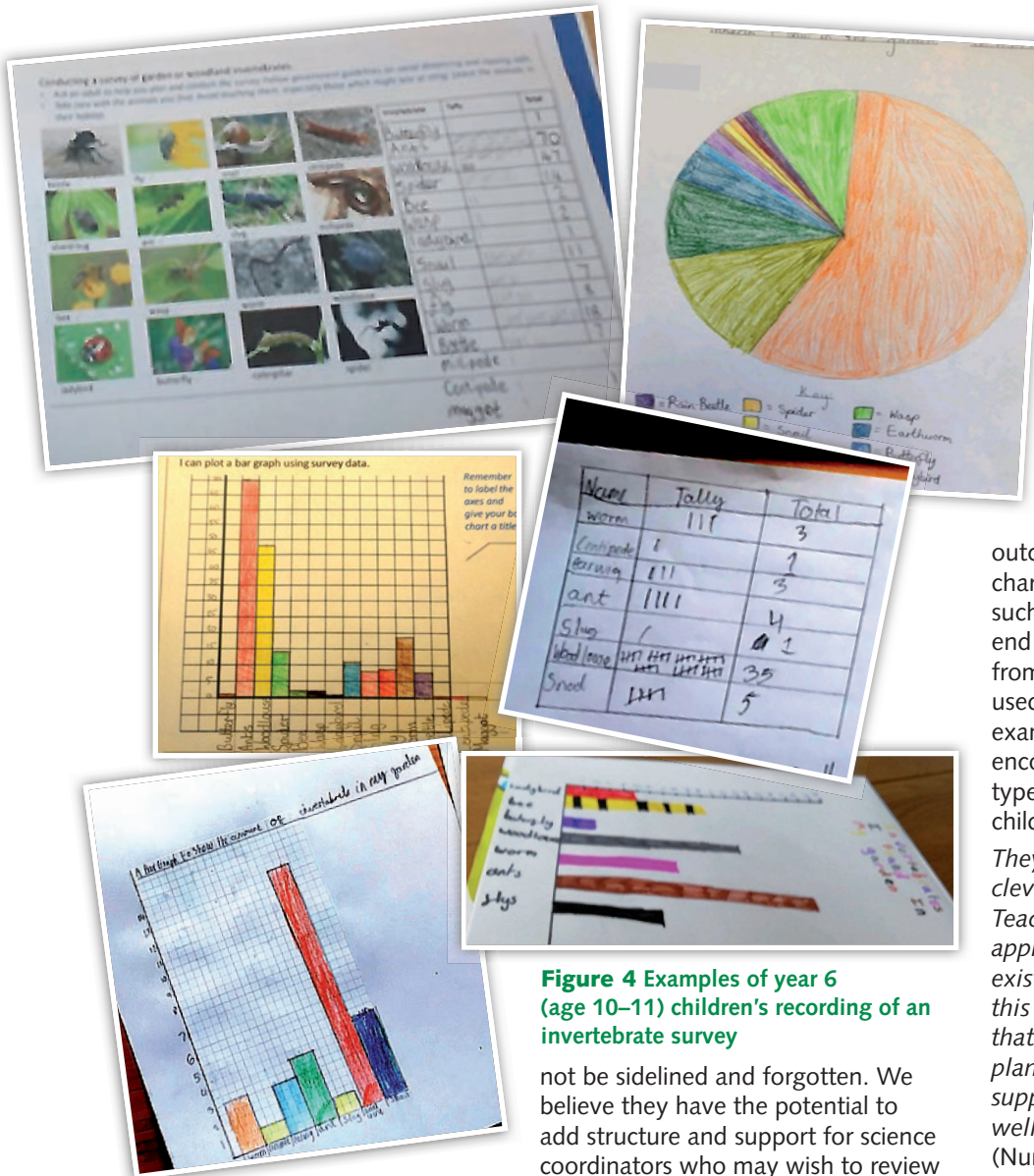
taken up and, in many cases, adapted or extended beyond the initial suggestions. For example, Figure 4 shows some of the tally charts, bar graphs and pie charts produced by year 6 children (ages 10–11) at Burlington Junior School in response to a lesson about invertebrates. While some children had chosen to print the worksheets, others had produced their own tally charts and

## Box 1 Key features of the key stage 2 resources

The following emerged as important features:

- Brief guidance for parents about how they were being asked to support their child.
- Learning objectives with key science words in bold letters to focus on important vocabulary.
- Learning outcomes framed as an 'I can ...' statements.
- A list of any required resources and an estimate of time needed for the activities.
- An opportunity to explore and discuss children's prior knowledge or what they might have learnt in earlier sessions.
- Illustrated explanations of the key learning points with supporting links to external resources and video clips.
- Clear guidance for carrying out the suggested enquiry or other learning activity.
- The option of 'pencil and paper' recording or printable worksheets for supporting learning outcomes.
- An optional 'find out more ...' activity for taking the learning further with links to other organisations and websites.
- A glossary of the key scientific vocabulary introduced during the session for reference.
- An example of possible learning outcomes with guiding comments to support pupils' own assessment of their work with their parents.





**Figure 4** Examples of year 6 (age 10–11) children's recording of an invertebrate survey

not be sidelined and forgotten. We believe they have the potential to add structure and support for science coordinators who may wish to review their school's approach to the science curriculum and are seeking to build confidence in their colleagues. The topics within the resource serve as a model, illustrating how teachers can open up enquiry opportunities and foster 'working scientifically' skills, while also explaining key scientific concepts. As such, we hope they will help inspire teachers to creatively plan and accomplish innovative science lessons that engage their learners.

Moreover, newly qualified teachers or teachers entering a new year group could be encouraged to adopt the framework as they plan a year of science lessons for the first time. The resources provide two topics for each year group, which are closely linked

to curriculum objectives. The range of suggested home learning activities can be easily adapted for using in a school environment, while also being ready for supporting 'blended learning' should the need arise in the future.

One of our goals as we developed the series of sessions within a curriculum topic was to promote the value of children producing a varied range of learning evidence. It can include children's oral comments and photographs of practical activities, alongside written

outcomes such as annotated pictures, charts and diagrams. Examples of such evidence are provided at the end of each 'lesson' and feedback from teachers who have already used the resources suggests these examples instil a sense of calm and encouragement by illustrating the types of outcomes and evidence children may produce:

*They are so well written and so cleverly done, if I can say this! Teachers and parents have really appreciated them. I am using the existing topics as basis of planning for this academic year. I really do hope that ASE considers writing similar plans for the other topics. It also supports teacher subject knowledge so well. Thank you for all the hard work.* (Nur, year 6 teacher)

By providing a clear but flexible framework, we hope the resources will serve to equip teachers with the confidence to explore, adapt and create lessons for themselves, both within and beyond the topics written to support home learning during the summer of 2020. Visit the ASE website (see *Weblinks*) to find out more!

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bar graphs or pie charts to represent their survey findings. Their teacher commented:

*My class have really engaged with the work and have enjoyed it. No questions from parents so that means they have all accessed it without any issues. I do get lots of messages if things don't work or they don't understand it! I have included some more work from my class to show you the lovely work they have completed and how good a quality it is for home learning. I really think the resources are brilliant.* (Julia, year 6 teacher)

**Looking ahead**

Even though children have returned to school, these resources need

**Weblinks**

ASE primary remote learning resources:  
[www.ase.org.uk/ase-coronavirus-hub-primary-remote-learning-resources](http://www.ase.org.uk/ase-coronavirus-hub-primary-remote-learning-resources)

PLAN knowledge matrices:  
[www.planassessment.com/plan-knowledge-matrices-teacher](http://www.planassessment.com/plan-knowledge-matrices-teacher)