

Big books or little books

Alison Trew and Caroline Skerry outline using floorbooks in science to develop children's ideas, thinking and reasoning skills, to model the collaborative nature of science and to support effective teacher assessment

Keywords Floorbooks, Collaboration, Assessment

The Ofsted report, *Maintaining Curiosity in Science* (Ofsted, 2013, p.11) states that improvements in achievement in science could be traced to six features. One was 'increasingly accurate assessment' and another was 'very good, regular monitoring of achievement in science for individuals and groups of children'.

We believe that a floorbook provides teachers with a manageable and meaningful way to do this in science. In this article, we will outline what floorbooks are and explain why and how they are useful for children and teachers, making links with the recently revised 'Floorbooks' resources on the PSTT website (pstt.org.uk/resources/curriculum-materials/floor-books).

Using floorbooks is not a new idea...the PSTT published a CPD unit back in 2002. We have used floorbooks in our science lessons for several years to support the children's learning and teacher assessment, and we shared some of our floorbooks at a workshop at PSEC 2019.

Science in little books

There may be times when it is appropriate for children to record their science in written form and an exercise book is the best place for this. In this situation, it is important that teachers and children are clear about the focus of the science learning. In the example opposite (see Figures 1a and 1b), children (aged 6 years) looked at leaves and were asked to observe and record what they saw. The example in Figure 1a is very neat, correctly labelled and there is a grammatically correct sentence that describes the leaf below the diagram. The work in this image includes fewer descriptive words. Which is best? This rather depends on the learning objective: if the objective was to write a sentence to describe a dandelion, we might consider Figure 1a to be better than 1b; if the objective is to observe and record what you see (it was), then we should regard Figure 1a as having successfully met the criteria (more so than Figure 1b) – a dandelion usually has a curved tip. This illustrates how important it is that teachers assess children's attainment in science against a scientific objective.



Figures 1a and 1b Children (aged 6 years) were asked to observe and draw a dandelion leaf

Having talked to many teachers across the South West, we often hear that teachers feel under pressure to have evidence of children's science learning in exercise books and, in many schools, there is an understanding that children should be writing about their science investigations in a formal format: method, diagram, results (maybe a table or graph) and a conclusion. This would be an example of a scientific report, but it is not the only way that children can demonstrate their knowledge and understanding of science concepts, or their practical skills.

Teachers could teach and assess children's understanding of science through drama (Braund, 2015; McGregor *et al*, 2017), Bright Ideas (PSTT, 2019), Concept Cartoons® (Naylor & Keogh, 2014), card sorts, concept maps, drawings and annotated diagrams, etc. (Naylor *et al*, 2004). Some children will be able to explain their science investigations and conceptual understanding orally, but may struggle to present this work in a written form in their exercise books. Using drawings, discussions and oral presentations enables children who do not have literacy skills that correspond with their science skills to demonstrate what they know in science.

What is a floorbook?

A floorbook has traditionally been a large book for recording children's learning, both individually and collaboratively, with any age group. Floorbooks can include photographs, children's comments, drawings, tables, graphs, annotated diagrams, classification keys and writing.

Having a class record means that it is easier to track changes in children's ideas and to understand how children are developing their understanding of science. A floorbook provides an opportunity for the reluctant writer, the dyslexic child, the child with English as an additional language (EAL), and those with numerous other special educational needs and disabilities (SEND) to express their scientific knowledge and skills in a safe environment, because it removes barriers to learning.

Recording and assessing practical science skills in floorbooks

Whatever you teach in science, you will be developing children's enquiry skills: presenting new experiences and encouraging children to ask questions that can be investigated, making predictions, planning investigations, observing and measuring, collecting data, interpreting

data and drawing conclusions and evaluating the practical work (Harlen, 2019). These skills can be recorded in a floorbook (see Figure 2). Writing is essential for very few of these skills, perhaps only for recording data.

Figure 2 Examples of children's enquiry skills recorded in a floorbook

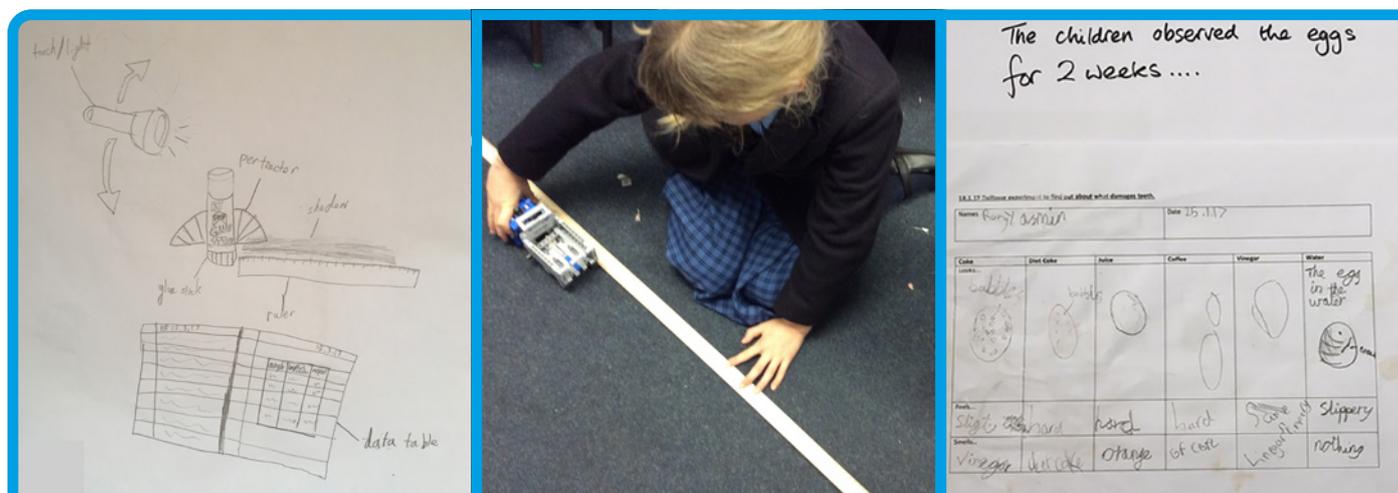


Figure 2a Planning: children plan their investigation directly in the floorbook

Figure 2b Measuring: the teacher took photographs of some children during the lesson as evidence that they could measure length accurately

Figure 2c Recording data: in pairs, children took turns to record daily the effect of different liquids on eggs over a two-week period. The data were collated and kept in the floorbook. From this the children wrote their own conclusions

Recording and assessing children's conceptual understanding in floorbooks

A floorbook provides a place to keep evidence of children's attainment demonstrated through drama, presentations, PowerPoints, Concept Cartoons®, etc.

Often a photograph provides evidence of what a child can do but, to create a record of children's conceptual understanding, teachers could ask the children to record their ideas on sticky notes or photograph diagrams or thoughts noted on whiteboards. Examples of how floorbooks have supported teachers' assessment can be found on the PSTT website (pstt.org.uk/resources/curriculum-materials/assessment-1). We suggest that teachers could scribe for a poor writer and might prompt children who are struggling (recording 'S' on the sticky note when a lot of help is given).

It is worth stressing here that, when misconceptions arise (and they will), they should always be addressed. This might be a conversation with a small group of children during the same lesson, or in the subsequent lesson once you have reviewed all the child's contributions. We offer the children the opportunity to write a new sticky note, which they can place over or next to their initial idea. Scientists can change their minds and we tell the children this.

We are often asked whether it is possible to see an individual child's progress during a sequence of work if this work is not in an individual's book. We believe that it is, if you include a wide range of responses (not just the 'correct' ones). Our floorbooks value everyone's ideas and showcase development of understanding, rather than only correct understanding (see Figure 3).

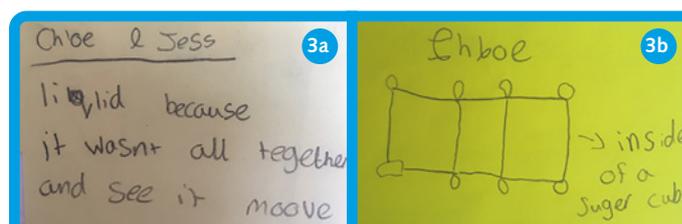


Figure 3 Children were asked to sort materials (including sugar) into solids and liquids. Initial ideas were recorded in the floorbook. Some children incorrectly identified sugar as a liquid (a). Two weeks later, the same children drew a diagram to explain why sugar is a solid (b)

Advantages and disadvantages of floorbooks

For children:

Floorbooks can be used with any age group, but are especially useful with younger children and for others who have limited writing skills. We have found that children are motivated because they enjoy seeing their photos and their work in the floorbook. Key vocabulary is reinforced when children browse through the floorbook.

This rarely happens with children's individual exercise books. We believe that the main advantage for both children and teachers is that, with less time given to writing, there is more time available for developing and justifying ideas and scientific concepts. Children should still be taught to record data and write scientific methods and conclusions, but this could be done in literacy lessons.

We asked children what they thought about using floorbooks. Without exception, the children were enthusiastic about using them (see Figure 4). Some were pleased not to have to write, but it is apparent that children value each other's opinions, and enjoy asking and answering one another's questions, particularly when the teacher is involved. Leaving 'challenge questions' in the floorbook, which is available to the class during the week, and encouraging children to add their ideas, continues the science conversation beyond the science lesson. We believe that using floorbooks in this way demonstrates that science is a subject that is collaborative, promotes debate and justification of ideas and is emulating the life of the scientific research community.

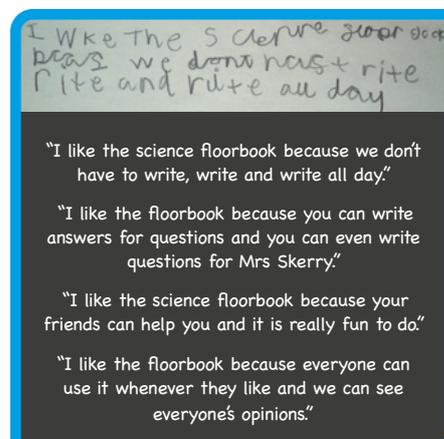


Figure 4 Children's thoughts on using floorbooks in science lessons

For teachers:

Teachers can gather and record evidence of scientific practical skills, knowledge and conceptual understanding that are not dependent on a child's ability to write. With experience, the floorbook can be completed during or just after the lesson, saving time photocopying work later and marking (see Figure 5). A weekly review of the floorbook quickly shows which children have slipped under the radar. These children can be focused upon the following week. Some children cannot, or do not, like having their photograph taken, but they can still contribute through sharing their ideas on sticky notes.

Figure 5 Collecting evidence of quality teaching and learning during the lesson

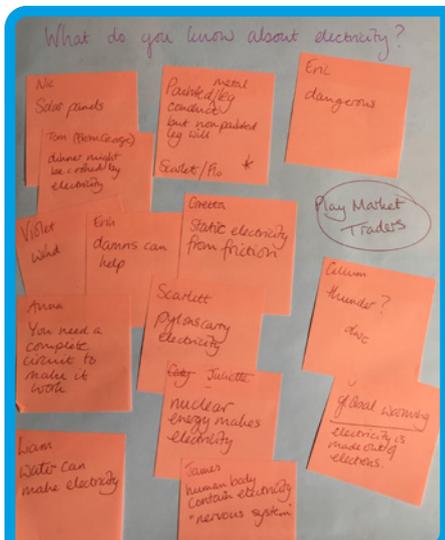


Figure 5a An elicitation task – children placed sticky notes into the floorbook during the lesson and the teacher reviewed them later to support further planning

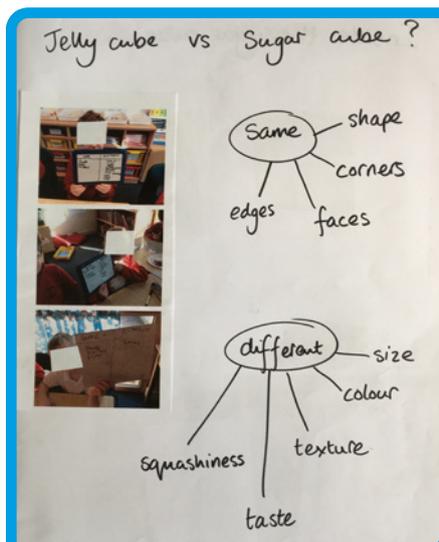


Figure 5b Feedback from a class discussion – children identified similarities and differences between a jelly cube and a sugar cube individually on their white boards before a whole class discussion. The teacher has photographed responses from 3 children (these are children who don't like to contribute during whole class feedback). During the class discussion, the teacher has written the responses from the class in the floorbook so that this can be referred to later in the lesson or a subsequent lesson

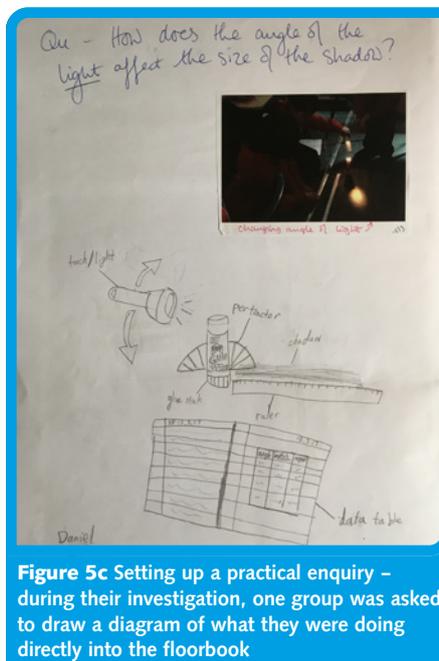


Figure 5c Setting up a practical enquiry – during their investigation, one group was asked to draw a diagram of what they were doing directly into the floorbook

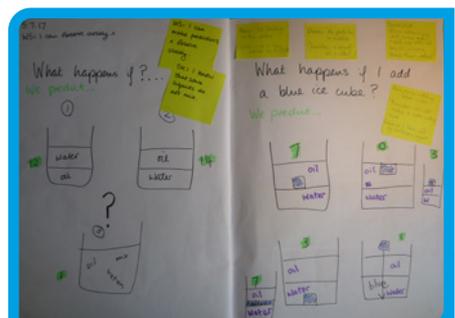


Figure 5d Making predictions – during a class discussion, the teacher drew the children's different ideas in the floorbook and, after a vote, recorded the children's predictions

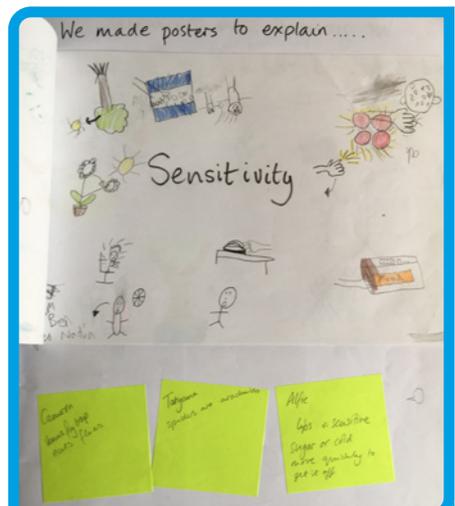


Figure 5e Group work – children worked in groups to create posters, which they presented to the class. These were stapled together and stuck into the floorbook during the lesson

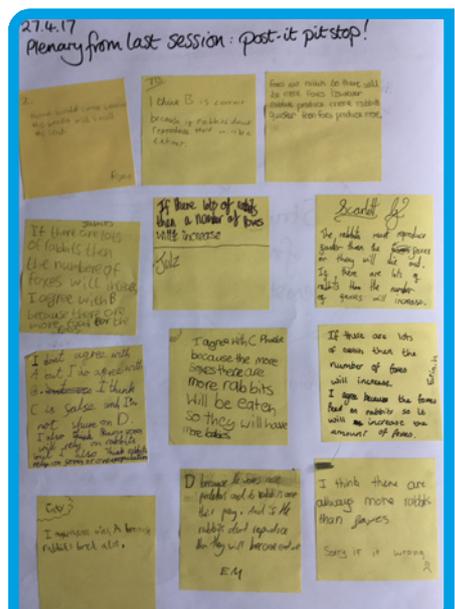


Figure 5f Plenary – a Concept Cartoon® was used to prompt discussion and children had time to reflect, before they wrote their thoughts on a sticky note and stuck them in the floorbook during the lesson

