



LEARNING TO TALK

Kirstin Greygoose
shares how she has developed talk in the early years in her school

Figure 1
Can a 'nest of frozen dinosaur eggs' promote talk as children consider how to 'free the dinosaurs from their eggs'?

As science subject leader I wanted to explore pupil questioning in the early years and find a lesson format that could be replicated throughout the school to engage all the children in regular short discussions focusing on science enquiry.

In a report to the Wellcome Trust in 2005, key points were given for improving children's scientific literacy (Murphy and Beggs, 2005: 10):

The four workgroups at the conference ... unanimously agreed that encouraging children to question/investigate was the best way to improve scientific literacy.

The second choice for these workgroups was again unanimous – making science more relevant to everyday life.

Using allocated science leadership time,

I planned a weekly programme of 30-minute 'Science Talk' sessions with one of our reception classes (ages 3 and 4) with three key aims:

- to develop the children's questioning skills;
- to improve their scientific literacy;
- to develop their confidence in using scientific enquiry skills.

Using curiosity boxes

Primarily, I planned to use a series of 'curiosity boxes', previously set up, to engage the children in scientific literacy through simple sorting and grouping activities. Using a set of drawers on wheels, the three boxes were organised into phase groups: early years (ages 3–5); key stage 1 (ages 5–7) and key

stage 2 (ages 7–11). They contained odds and ends from charity shops, party bags and conference freebies, such as spinners, whistles, balloon pumps and jumping frogs.

Initially, the children's responses to the objects within the curiosity boxes were as expected. They described the objects in simplistic terms using their senses: 'It makes a sound'; 'I can pull it'. They were happy to play with the items but waited for the teacher's direction to engage with the materials further.

It was clear after this session that I needed a simple but relevant focus for each activity to make the most of questioning opportunities and deepen the children's understanding. I found myself researching lessons from a range of sources, including the inspiring world of 'home-schooling' on Pinterest, which was full of easy-to-use and 'kitchen-sink' science ideas.

The following week, I donned a tiger onesie to complement the class theme based on the popular story of *The tiger who came to tea* by Judith Kerr. This instantly promoted a wide range

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Figure 2 Exploring how to free the dinosaurs from their frozen 'eggs'

of questions from the children about tigers, their diet and their features. I asked 'What do you know about tigers?' and the children were itching to reveal their insider knowledge. When they told me that tigers eat meat, I asked if they used a knife and fork, which was met with raucous outbursts from most of the children.

This led to a discussion about how I might catch my food and tear it with my 'sharp claws'. Although this was a much more focused session, once again most interactions were directed through the teacher and teaching assistant rather than the children responding to each other's comments.

Developing questioning through enquiry

For the third week I adapted my planning to promote peer talk. Using model dinosaurs frozen in balloons to create 'dinosaur eggs', the children were asked to solve the problem of how to free the dinosaurs (Figure 1). (I let the creative side get the better of me and elaborated with a story of how I found large footprints and a nest of frozen eggs while walking in the woods!)

During the introductory discussion, the children made simple predictions based on their knowledge of ice cubes and ice on mummy's car, before

Figure 3 (above) A model for developing questioning skills in science

Figure 4 Trying to pick up jelly in oil with chopsticks provoked links to real life in the kitchen at home



gathering in groups to tackle the challenge. There was a noticeable change in the way the children interacted with the equipment and each other, because it was relevant to their experience and there was a definite 'prize' at the end. A competitive element arose as they watched each other's attempts to defrost the 'dinosaurs' and the children borrowed and adapted strategies from one another. Once one idea had been eliminated, they quickly moved onto copy other more successful endeavours (Figure 2).

The follow-up discussion involved significantly less teacher-led questioning and probing, with children talking to each other about their findings.

Dialogic and authoritative talk

Over the course of 15 weeks, our Wednesday Science Talk sessions became an eagerly anticipated event,

with two parents commenting that their children counted down the days until the next time the 'science lady' was coming in. I encouraged children to become a 'real' scientist each Wednesday afternoon, emphasising that good scientists use 'good looking' and 'good talking' to find things out.

As I adapted and improved the activities to suit short bursts of questioning, enquiry and evaluation, the children's responses displayed greater scientific understanding, questioning and reflection. These changes were also noted by their class teacher in other lessons across the week.

A study of research for effective classroom talk in science (GTC, 2011: 1), highlighted the key differences in teacher-directed questioning:

They found that science teachers needed to use different kinds of talk to enable pupils to move from their existing everyday understanding of natural phenomena towards a scientific view. These included 'dialogic' episodes when teachers probed pupils' everyday ideas and 'authoritative' episodes when the teacher introduced scientific ideas. Sometimes the talk was interactive and sometimes it was not. The skill lay in making the right choices at the right time.

As the sessions evolved, I found I was most often using 'dialogic' episodes as the activities were directly linked to the children's own experiences. For some of the more abstract concepts, I employed 'authoritative' talk to teach simple ideas to enable the children to engage with the task, such as the 'Egg Walking'.

Organising an effective Science Talk session

Simplicity is essential to a productive exploration session. Most activities sustain children's interest over 30 minutes (which for this age range is quite an achievement), with verbal feedback and recording by the teacher and/or teaching assistant for reflection and evaluation after the session. Photographs have also been useful in

recording the children's findings and as a prompt for discussion at a later date.

I found that questioning worked best when I used open-ended prompts, establishing the children's existing knowledge first and then posing questions to move their thinking along as in the example in Box 1.

The focus is less about science content than about children gaining confidence to make statements, test an idea and change their views when new evidence is presented to them. This also allows you greater scope for creativity, knowing you are not pinned down to a particular concept or theme and that you can learn together.

The use of simple, cheap and familiar resources that require little or no preparation helps the lesson to flow and a quick tidy-up afterwards. This also enables children to replicate the lesson at home in discussion with parents and siblings.

The model (Figure 3) can be adapted to suit all ages, as it focuses on the quality of scientific questioning and enquiry rather than varying levels of scientific knowledge and understanding.

Findings

Over the series of lessons, the children's vocabulary developed beyond simple observations of colour, shape and size to sort and group objects and they began to generate their own questions for investigation. They rapidly gained confidence in making suggestions about their observations to explain why something had happened, linking the lesson to real-life experiences. After a session on 'Jelly Chopsticks' one child commented that the oil stopped the jelly sticking to the plate just like when Dad cooked in

Figure 5 Can you really walk on eggs without breaking them?



a pan at home (Figure 4).

Often, the initial question was so open that it led to genuine enquiry, purposeful investigation and an interesting insight as to the children's experiences and related progress.

There are many things I would adapt if repeating the sessions. For example, for the 'Bubble-Snake' activity, I would have a few props to hand, such as inflated and deflated balloons, to support the children's ideas and facilitate further discussion with those less able to visualise an abstract concept. However, the lessons have frequently taken a turn I didn't expect and were very much child-led, as I had initially hoped.

The process has also helped the class teachers to identify one or two children working above expectations, for which the Science Talk sessions provide effective challenge.

At the end of the project, my main aim is to disseminate my findings to staff within the school, using sample sessions for training, and team-teaching to demonstrate how simple and effective high-quality questioning and talk can be from the early years upward. Several teachers have already started dropping in on

a Wednesday afternoon to find out how the sessions run and observe the process for themselves. During a recent staff meeting, I introduced the 'Egg Walking' activity – with only one egg sacrificed (Figure 5) – where we used concept cartoons to promote talk and explanations and then to feed back to each other after trying out the activity for ourselves.

I was pleasantly surprised by the increase in scientific literacy and application as each week progressed and the positive impact the activities had on other areas of children's learning. Science Talk has not only met the main aims of the initial project but raised the bar for future science teaching of these children in our school.

References

- GTC (2011) *Research for teachers: Effective classroom talk in science*. General Teaching Council for England.
- Murphy, C. and Beggs, J. (2005) *Primary science in the UK: a scoping study*. Final report to the Wellcome Trust. Belfast: Queen's University.

Box 1 The simple introduction for the week 15 'Bubble-Snake' investigation

Q: What do you know about bubbles?

They are always round and you could pop them easily.

They are full of air.

They float, like a balloon.

They have rainbows in them.

Q: How do we make a bubble?

I can make one with my mouth.

You have to blow air into it.

Q: If I have different-shaped bottles, will I get different shaped bubbles?

No, they are always round.

Yes, because some bubbles are big and some are small.

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