Claire Seeley shares how the TASC wheel can help develop children’s thinking skills in science

Since Rendlesham Community Primary School in Suffolk opened five years ago the question at the front of our minds has been ‘How can we help our children to develop their thinking skills?’ Then we discovered TASC. The concept of TASC (Thinking Actively in a Social Context) was created by Belle Wallace (Wallace et al., 1993) as a model that can be used to nurture and develop thinking skills (Figure 2). As children work through the TASC wheel, the teacher has a very good opportunity to facilitate explicit conversations about thinking. This allows the children to grow in their capacity to articulate their thoughts and they begin to see thinking as an identifiable skill that can grow and develop. The TASC wheel is a truly cross-curricular tool; however, in science we have found that the wheel is a great framework for helping children to structure their scientific enquiries.

How TASC links to science
Science enquiry is ‘what children do in order to answer scientific questions about the world around them’ (Turner et al., 2011). It can take a range of shapes and styles, including observing over time, identifying and classifying, pattern seeking, researching and fair testing. When you look closely, it is easy to see that the TASC wheel has many parallels with the scientific process. Essentially the TASC wheel is underpinned by Bloom’s taxonomy (Bloom, 1956) and asks the thinker to work through a complete process using both lower and higher order thinking skills. It begins with the simple idea of identifying what they already know and working out what the challenge is asking them to achieve. Once the children have mastered those basic ideas they then have a much stronger

Figure 1 Bee-coming excited at Bee Fest with a frame full of honey

Figure 2 The TASC wheel developed by Belle Wallace
platform onto which they can scaffold new ideas and imagine a variety of creative solutions. In our school the children use it both as a planning aid and as a methodology for working through problem-solving challenges.

Bee Fest – our TASC challenge day

There has been much in the news about decline of the honey bee. Albert Einstein declared that if the honey bee were to become extinct, the human species would die out in four years! Therefore, what better species for children to study and to engage with for some practical conservation work?

Our day began with an assembly to set the scene. Through games and songs we explored the anatomy of a honey bee and the social structure of bee society. The head teacher took the role of the queen bee, teachers the nurse bees, girls the worker bees and boys the drones. The games created a real ‘buzz’ of excitement.

Each class was then given a TASC challenge to explore through the day. On this occasion the questions were provided (Table 1); however, we hold similar days where the children frame their own science-enquiry questions. The challenges were varied and were chosen to complement the science curriculum being taught at that time for each class. The aim behind them was to create a climate of low risk but high challenge – just enough stretch to facilitate a good science enquiry but not so much risk that a fulfilling outcome is miles out of reach. To use a phrase from Vygotsky (1978), the challenge needs to lie within the ‘zone of proximal development’, that is, just outside the comfort zone of achievement.

Each class then used the TASC wheel in their own way to work through their challenge. For example, with the younger children, the wheel was used at the front of the class to scaffold the children’s thinking as the whole class tackled the challenge together (Figure 3). For the older children, the TASC wheel was photocopied and they worked through their challenge in groups (Figure 4). My preference is to set up groups of similar ability so that the super confident dominant children are usually in one group, allowing other children to have the opportunity to take the lead. However the groupings are varied depending on the challenge.

The TASC wheel in action

The procedure for each section of the wheel is outlined below.

Gather/organise

The TASC wheel begins by asking the children to consider what they already know about the topic in question – in our case ‘What do we know about the honey bee?’ At this point the children mind-mapped their ideas. This is a crucial part of the process and is very useful as an initial assessment for learning tool. We were fortunate in receiving some brilliant material to aid the children’s work. This included a drawstring bag containing a workbook, lavender seeds, a sample of honey and a wooden spoon for each child provided by the Beekeepers Association of Great Britain in conjunction with Soroptimist International. Each class also had a very useful session with a local beekeeper, of whom they could ask tricky questions and explore issues related to their challenge. There is also a fascinating wealth of information on the internet that children can utilise.

Identify

Next the children had to define what the challenge meant to them. What were they being asked to do? At this point some children needed help to clarify the question. Class discussion is ideal for this as the children can assist each other to clarify.

Table 1 Progression in questions provided for the initial TASC wheel activity at Bee Fest

<table>
<thead>
<tr>
<th>Nursery &amp; Reception (ages 3–5)</th>
<th>What do bees make? How can I use it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea: honey and bees wax</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Years 1 and 2 (ages 5–7)</th>
<th>How can I make some more places for bees and insects to live?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea: insect hotel from old pallets/lacewing houses too</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Years 3 and 4 (ages 7–9)</th>
<th>What would happen if there were no bees? What do bees need to stay alive? How can we help them?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea: Think about how to provide more pollen for the bees at our school</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 5 (ages 9–10)</th>
<th>How can you promote honey? How do bees make it? What are the health benefits?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Year 6 (ages 10–11)</th>
<th>How do bees communicate? Find a way to tell the rest of the school about it at the end of the day.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pheromones/waggle dances</td>
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</table>

Figure 3 (above) Reception class use of the TASC wheel

Figure 4 (below) The older children work in groups using the TASC wheel to guide them.
meaning, challenge each other and refine their understanding of the challenge.

Generate

Using the TASC wheel enables the children to take complete ownership of the challenge. They develop their ability to think around a problem and to see that there might be more than one way to answer the challenge. The children weigh up the relative merits of each possible approach and as a group they select one of the options. It can be difficult for those children whose ideas are not followed through to the end, but the children are good at reaching their own compromises.

Decide

After the children reached a consensus on the direction of their enquiry, they then worked together to produce their outcome. The outcomes were numerous and very varied, ranging from a dramatic advert portraying the health benefits of honey, a waggle dance, some delicious honey cakes, information posters and models (Figure 5).

Implement/evaluate

At regular intervals the groups reported back to the rest of the class on their progress. Teachers worked as facilitators, supporting the children through questioning or helping them to find resources. Evaluation and reflection was an important part of the process as the children challenged each other to clarify their explanations or to identify patterns as they emerged throughout the enquiry, allowing the children to refine their thinking. As the children communicated their ideas they created lots of evidence for assessment, which we then used to complete their APP (Assessing Pupils’ Progress) science assessment grids.

Communicate/learn from experience

At the end of the day the school gathered together for another assembly so that the children could share their learning from the day – another facet of the TASC wheel. It was a giant plenary session in which the children not only related their learning to each other but also continued to learn as they found out more about the honey bee. The children really enjoyed sharing what they had done and learnt and there was a fantastic atmosphere. This was also a good opportunity for some informal assessment for learning as teachers listened to the children’s presentations. The children also enthusiastically continued to generate more research questions, such as ‘Which colour do honey bees like best?’ and ‘Why do they build hexagonal combs – why is it not another shape?’ And so the TASC wheel rolled into action once more!

References


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Getting started with TASC

- Before any group work, make sure that the children generate a code of conduct so that every child’s ideas are respected and valued by the group.
- Ask the children to set their own TASC challenge questions.
- At each stage of the wheel, discuss with the children what sort of thinking they will be doing.
- Maximise higher order thinking by encouraging the children to ask each other questions.
- Allow children time to think – some TASC challenges can run over a day or a week.
- Give the children the opportunity to select their own resources, choose their own working style and choose how they will communicate their answer to the challenge question.
- Have regular reporting back sessions where the children are encouraged to talk about their thinking.
- Your role as a teacher is to be a facilitator.
- Give each group a TASC wheel to use as a thinking or planning tool.

Websites

British Beekeepers Association: www.bbka.org.uk
TASC: www.tascwheel.com
