



Throughout the whole of primary education, children are engaged in developing their knowledge and understanding of the world. At the same time, they are also developing their ability to use language as a tool to investigate, analyse and describe that world. Language is the medium for learning about the other subjects of the curriculum and they, in turn, are the vehicle for developing language.

envisage how English may be used as the medium to learn about other things when children's competence in the language is so limited.

However, by adopting an approach in which we regularly include content from other subject areas in our language lessons, even at the most elementary levels, we can help to integrate learning English into the simultaneous development of knowledge and language taking place in the rest of primary education.

As well as making our lessons intrinsically more interesting, the inclusion of real content enables us to address aspects of children's social, cognitive, psychological and emotional development in ways that are often left to chance in a more narrowly-focused, language-driven approach.

Why science?

In my own teaching at primary level, I find that one of the most rewarding and successful subject areas for devising activities for language lessons is science. There are three main reasons for this, related to skills, attitudes and language.

1 Science and skills

The skills needed by a scientist and a language learner have much in common. For example, both need to be able to make hypotheses, predictions and observations. They also need to be able to experiment, explain, analyse, take notes, organise data, discover rules, deduce conclusions, communicate their ideas and so on. These parallels between scientific skills and language learning skills mean that science can provide a useful context for developing cognitive skills that are highly relevant for children, both in their role as foreign language learners and in their overall educational development.

2 Science and positive attitudes

Children's involvement in purposeful scientific activity, even at the simplest level, can help to promote positive attitudes towards ways of thinking and working that will be invaluable to them both as language learners and as people. ►►►

Simple science

Carol Read develops language through easy experiments.

When children start learning a foreign language, however, it is somehow different and isolated from the mutually reinforcing process which enriches and links all other subject areas at school. This is not perhaps surprising as, initially at least, it seems difficult to





Simple science

►►► These include such things as curiosity and interest in the world around them, open-mindedness, inventiveness, creativity and perseverance. They also include a willingness to listen and value the suggestions of others, try out ideas, tolerate uncertainty, reflect critically, respect evidence and work collaboratively in pairs or groups.

3 Science and language

Science offers wide scope for devising classroom activities which will encourage children to use language from the English syllabus, eg simple present, simple past, imperatives, *can* for ability and possibility, etc. The 'hands-on' nature of science helps to make meaning and concepts demonstrably clear and the naturally-repeated structural patterns which occur in many science activities provide plenty of opportunities for integrated language practice in a relevant and purposeful way. At the upper end of primary, the logical structure of simple science-based texts can also facilitate the teaching of writing skills and discourse markers such as *first*, *next*, *then*, *finally*, *so*, *because*, etc within a naturally contextualised framework.

Criteria for choice

There are many books on primary science, as well as educational websites, which offer a wealth of ideas for activities with children. These commonly relate to topics such as water, energy, food, light and sound, electricity, magnetism, weather, animals and plants. However, as none of the ideas suggested in primary education sources is specifically intended for language teaching, there are a number of key questions to bear in mind before deciding whether or not it is a good idea to adapt or use a particular science activity in your class.

Is the vocabulary suitable?

As language teachers rather than science teachers, we need to ensure that the vocabulary we introduce is accessible and potentially useful. Many science activities involve vocabulary that may be infrequently used and is difficult for children learning English in terms of meaning and/or pronunciation. It may also prove hard to find opportunities to recycle vocabulary related to a particular science activity in later lessons.

Is the concept appropriate?

When using science activities in language lessons, it is important to build on or extend scientific concepts that are already familiar to the children, rather than to introduce completely new concepts which are likely to be confusing.

What are the cognitive and linguistic demands?

Before going ahead with an activity, we need to be sure that the level of both the cognitive and the linguistic challenge is appropriate for the children and that there is not a mismatch between the two.

Is it feasible to do in class?

Many science activities involve materials and equipment that may be difficult to obtain or take into class. Some involve leaving things to be observed over a period of time, some require the children to go outside the classroom and some can produce a lot of mess! The best activities for the language class are the ones which are the easiest for you to manage in the context in which you work.

Is it safe?

This is a vital consideration and if you think there is any risk at all, eg as in activities which involve electricity or heating water, it is better to discard the idea and think of something else.

Are you prepared?

This is also vital! As a language teacher rather than a science specialist, it is

likely that you will need to do some preparation beforehand in order to be sure you know how the activity works and to be ready to respond to the children's ideas and questions during the lesson.

When to use science activities

The primary science activities on pages 25 and 26 have been adapted for use with children in English lessons at a very elementary level. Activities such as these can be incorporated into our teaching programme whenever the topic and/or the language fits in with our syllabus. If we are using a story-based approach, science activities can also be derived from the content of the stories themselves. For example, a traditional story like *Jack and the beanstalk* can be the starting point for an investigation into plants (children grow broad beans from seed and measure the growth), while *Goldilocks and the three bears* can prompt an investigation into insulation. (What kind of bowls would be best to keep the bears' porridge hot?)

Benefits

There are a number of significant benefits which derive from incorporating activities with real content in our language lessons at even the earliest levels.


- ★ Lessons are made more interesting and enjoyable, and children generally find it extremely motivating to discover things about the real world.
- ★ Language is used purposefully and the focus on real meaning helps to make it memorable.
- ★ Children use different combinations of their multiple intelligences (Gardner): visual-spatial, kinaesthetic, logical-mathematical, verbal-linguistic, musical, naturalist, interpersonal and intrapersonal. This widens the appeal of classroom activities and enables



children to build on their strengths and helps them improve areas which are weaker.

- ★ Working with real content provides a framework which enables us to take account of the children's whole development, including thinking skills, social skills, emotions and attitudes, as well as language skills, in an integrated way.
- ★ Last, but by no means least, it also helps us to maintain effective class management. In my experience, there is nothing like a class of children intent on discovering the way rainbow patterns appear on a piece of white paper, waiting to see what happens when a pencil is dropped into water, or munching reflectively on a piece of unidentified fruit, to prevent distraction, keep them interested, motivated and, above all, learning.



By using activities borrowed from other subject areas such as science in our language lessons, learning English is brought into the cycle of simultaneously developing knowledge and language that underpins and enriches all other areas at primary school. As language teachers, this allows us to do our job more effectively; as educators, it enables us to address the whole development needs of the children we teach. 

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Gardner, H *Frames of Mind: The Theory of Multiple Intelligences* Fontana 1983



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Does it float or sink?

Content aim: to apply understanding of the concept of floating and sinking to classroom objects

Learning and thinking skills: making predictions based on previous knowledge; observing what happens and recording results

Attitudes and social skills: interest in materials and properties that make things float or sink; co-operation and turn-taking in groups

Language focus: present simple (third person), classroom objects

Materials: plastic mineral water bottle cut in half and filled with water, small classroom objects (eg rubber, pencil sharpener, paper clip, drawing pin, pencil, elastic band, piece of string)

Organisation: groups, whole class

What to do

- 1 Pre-teach the verbs *float* and *sink* and the names of any objects you are going to use that children don't already know.
- 2 Divide the class into groups of three or four. Say: *Look at the objects. Talk in your groups and decide whether they sink or float.* Demonstrate the activity with one group, eg *I think a rubber sinks. Me too. No, I think it floats. I don't know.* Groups talk about each object in turn and decide whether it sinks or floats.
- 3 Put the cut-off bottle filled with water where everyone can see it. Hold up each object in turn and ask: *Does it sink or float? Ask: Why?* and encourage children to justify their views, eg *It's metal.* Be ready to re-model or expand their contributions in English where necessary.
- 4 Invite individual children to come and drop each object into the water. The rest of the class watch to see whether or not they predicted correctly.

Follow-up ideas

Children draw the objects in the correct place (depending on whether they sink or float) on a picture of the bottle and write sentences about each one, eg *A rubber sinks in water.* They can also experiment with different objects at home and then ask each other or you about them in the next class.

Flower fun

Content aim: to investigate how quickly a flower drinks water

Learning and thinking skills: making predictions, observing what happens over several days, drawing a picture and writing about the result

Attitudes and social skills: interest in flowers and plants; respect for the opinions of others

Language focus: *going to*, simple past

Materials: a white carnation, a plastic cup of water with red food colouring

Organisation: individual, whole class

What to do

- 1 Show children the carnation and the cup of red water. Say: *I'm going to put the flower in the cup of red water. What do you think is going to happen?* Listen to their ideas. When they say: *The flower's going to go red*, ask: *How long is it going to take?* and encourage them to make further predictions, eg *It's going to take six hours/one day*, etc.
- 2 Children individually write or complete sentences with their predictions, eg *I think the flower is/isn't going to go red. It's going to take three hours.* They then talk about and compare their predictions. Explain that they must now wait until the next lesson to find out what happens. (The flower usually takes about two days to go red.)
- 3 In the next lesson, children draw a picture to show the experiment and write the result, eg *We put a white flower in red water. The flower went red in two days.*

Follow-up ideas

Children grow a plant from seed and investigate what it needs to live in addition to water.





Rainbows

Content aim: to investigate the order of the colours in a rainbow

Learning and thinking skills: carrying out a simple science experiment by hypothesising, observing, comparing and reporting

Attitudes and social skills: interest in the properties of light and colour; willingness to listen to the ideas of others

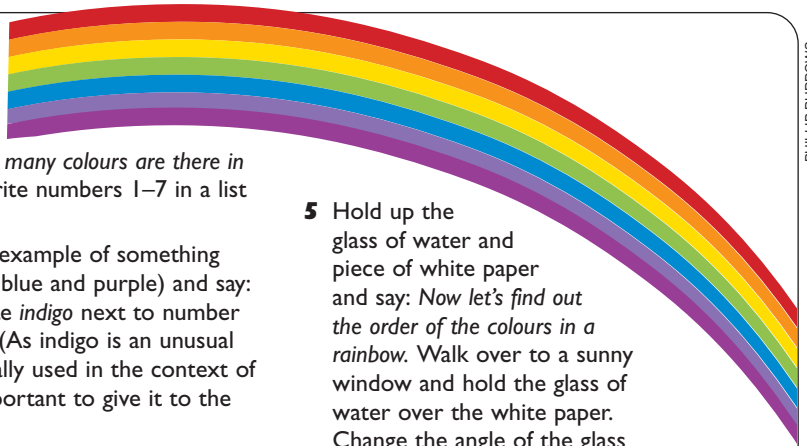
Language focus: numbers, colours, verb *to be*, questions with *What?*

Materials: glass of water, piece of plain white paper, sunny window

Organisation: pairs, whole class

What to do

- 1 Draw a large arc with your hand and pre-teach rainbow. Ask: *How many colours are there in a rainbow?* (7). Write numbers 1–7 in a list on the board.
- 2 Show children an example of something indigo (a blend of blue and purple) and say: *This is indigo*. Write *indigo* next to number six on the board. (As indigo is an unusual word and only really used in the context of rainbows, it is important to give it to the children.)
- 3 Divide the class into pairs. Say: *Now talk about the other colours in the rainbow*. Demonstrate the activity with one child, eg *What's colour number 1?* (*I think*) *it's orange*. *No, it isn't. It's red*. In pairs, children talk about and guess the order of all the colours in a rainbow in the same way. If you like, they can also write a list.
- 4 Children report back their ideas and record all their guesses on the board, eg *What's number 1?* (*We think*) *it's red*.



- 5 Hold up the glass of water and piece of white paper and say: *Now let's find out the order of the colours in a rainbow*. Walk over to a sunny window and hold the glass of water over the white paper. Change the angle of the glass until the sun shines through, leaving a 'rainbow' on the paper. Invite groups of children to come and look and compare the order of colours with their guesses. (The correct order is red, orange, yellow, green, blue, indigo, violet.)

Follow-up ideas

Children draw, colour and write about the colours of a rainbow based on their observations. They can also do further activities on the colour spectrum, the difference between primary and secondary colours and the ways colours combine.

Mystery fruit

Content aim: to investigate our sense of taste

Learning and thinking skills: making guesses based on sight, smell and texture; using evidence from a simple experiment to draw conclusions

Attitudes and social skills: interest in finding out about our senses; willingness to collaborate in a group

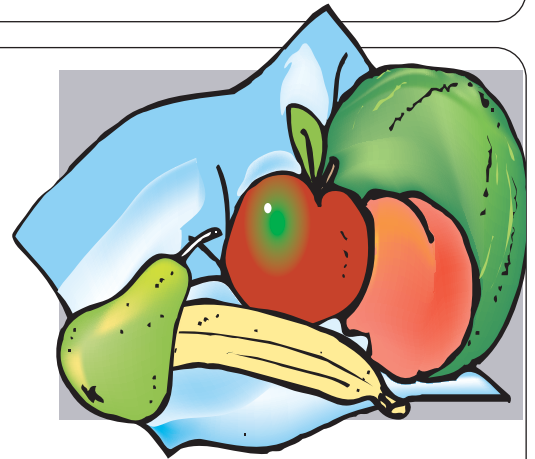
Language focus: *What's this? It's a ...*, names of fruit

Materials: blindfolds, whole and cut-up fruit (eg banana, apple, pear, peach, melon), containers in which to put the fruit (eg empty yoghurt pots)

Organisation: whole class, groups

What to do

- 1 Show children the whole fruit and pre-teach the names if necessary.
- 2 Give individual children in turn a piece of cut-up fruit to taste and identify, eg (*I think*) *it's a melon*. Ask: *Is it easy to identify the fruit?* (yes). Then show them the blindfolds and ask: *Is it easy if you can't see?* Listen to their responses.
- 3 Demonstrate the activity by blindfolding a child in front of the class and giving him or her three pieces of different fruit to eat and try to identify, eg *What's this?* (*I think*) *it's a ...*. The rest of the class watch and see how many the child gets right.
- 4 Divide the class into groups and give a blindfold and cut-up pieces of fruit to each. Children take turns to blindfold each other and taste three pieces of fruit. They keep a record of their scores and then report back to the class.
- 5 Children repeat the experiment, this time holding their noses as well as wearing the blindfold. They keep a record of their scores (which in theory should be worse!) and report back in the same way.



- 6 Ask what they can conclude from their scores in the experiment. Listen to their ideas, re-modelling or expanding them in English where necessary, eg *It's difficult to identify food if we can't see it or smell it. Our tongue helps us to identify basic taste, but we also use our eyes and nose to know what we're eating*.

Follow-up ideas

Children identify food which is sweet, sour, salty and bitter and draw a picture to show the taste areas of their tongue.