'Thought is a bird of space,
that, in a cage of words,
may indeed unfold its wings
but cannot fly'

Kalil Gibran; 'The Prophet'

Surely our task as teachers is to not only enable children to operate within the 'cage of words' but also help them 'fly' as thinkers and learners.

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Thinking about thinking

Learning is changing

Assumptions about learning – implicit in all things educational – have been challenged. This has occurred because the world is changing at a phenomenal rate; some reckon that scientific knowledge alone doubles every three and three-quarter years. Increasingly the economies of countries are being information-driven; the revolution in information and communication technology continues unabated and through the contribution of neuroscience we are able to make learning brain-compatible.

At a recent conference in Japan, 25 shifts in the development of learning were clearly identified. They included:

- A shift from the reception of knowledge to the creation of knowledge.
- A shift from the acquisition of knowledge to the management of knowledge.
- A shift from thought systems to the use of thinking tools.

The signs are now clearly evident that a revolution in learning is beginning to take place and at the centre of this revolution is the process of thinking.

As Professor David Perkins (Harvard University) suggested:

> *'Far from thinking coming after knowledge, knowledge comes on the coat-tails of thinking … therefore, instead of knowledge-centred schools we need thinking-centred schools. This is no luxury, no Utopian vision of erudite and elitist education. These are the hard facts about the way that learning works.'*

We have assumed for far too long that it is the school 'subjects' themselves that teach thinking. This fallacy is often supported by the intention that 'subjects' provide opportunities to promote thinking skills.

But when are children actually taught about thinking, how it works and how skills can be applied?
Around the world, initiatives in the direct teaching of thinking skills are flourishing. They range from Singapore's nationwide initiative, where momentum from the 'Thinking Schools – Learning Nation' movement is revolutionising the curriculum, to numerous research and development projects in the United States, Australia, Canada, New Zealand, Hong Kong and so on.

The UK response

Despite large-scale initiatives in educational development in Britain (National Curriculum, Literacy and Numeracy Strategies etc), little has been undertaken in the field of thinking skill development other than a few relatively small-scale projects. In the DfEE document 'Excellence in Schools' (1997) there was encouragement for more examples of the teaching of thinking skills to emerge, as research had previously shown there to be positive learning outcomes.

It has only been with the revision of the National Curriculum in 2000 that real opportunities have arisen for schools and teachers to tap into the potential to enhance learning through an increased focus on the direct development of children's thinking skills.

Alongside the introduction of the six 'Key Skills' (Communication, Application of number, ICT, Improving own learning and performance, Working with others and Problem solving) there is direct reference to five 'Thinking Skills':

- Information processing
- Reasoning
- Enquiry
- Creative thinking
- Evaluation

It is into this framework that this book is contextualised. It combines the requirements of all the National Curriculum Programmes of Study with those five thinking skills.

Making the thinking skills explicit gives us the opportunity to focus directly; to teach thinking. Thus the learners in our schools and classrooms are empowered to see the connections in learning, to understand how thinking and learning works and to apply the skills across and beyond the curriculum.

'Providing opportunities to promote thinking skills' does not ensure that children are taught the skills and can apply them across the curriculum. 'Awareness of' is not the same as 'doing'! I have an awareness that my car engine is repairable but I have no idea how to repair it. In developing ball-control skills in netball it is preferable to teach the skills specifically rather than just hope they will develop during a match.

In Holland children are not introduced to the game of football until they are aged eight; prior to that, ball skills are taught specifically. Only at eight are they given the opportunity to play a game in which the focus is application of the skills taught.

Children as thinkers

For more years than have been good for us in education we have played the 'Academic game' in our schools. Under the categorisation of subject headings, we have been manipulating information as knowledge in the hope that the children themselves will work out how the thoughts, ideas and underlying concepts are connected and 'how the information works'. But we have kept the rules of the 'Academic game' a mystery. The magic that is learning how to learn and think has been kept under wraps as though it was an unspoken prize accessible to the lucky (and clever) few.

How naive of us, then, to believe that our children have not worked all this out for themselves. Children know how learning works. They know how thinking happens.

They are asked to do both many, many times a day. It is just that in the 'Academic game' we have never found time to ask them or discuss with them ways of making learning and thinking more effective.

'Thinking is like a journey from one idea to the next,' said Alison, a nine-year-old in one Cognitive Classroom Project school.

She knows about thinking; she knows of its dynamic quality; she knows that it is about making connections and is about movement between ideas and concepts. It is simply that no-one had ever asked her before!

'Thinking is like doing "join-the-dots"; you start on one thing, then you think, then you go to another thing,' replied Ashley, aged seven.

Even Ben, a philosophical and spiritual five-year-old, could describe the function and purpose of the mind.

'It's a place in your brain where you keep all your dreams. It's for memories and information as well.'

Ben has the basis upon which to build the structures that are metacognition; the ability to think about thinking.

The Cognitive Classroom

Outcomes from the Cognitive Classroom Project (1998 to present; a schools-based project to develop pupils' thinking skills) show, time after time, that not only do children have their own working knowledge of what thinking is, but also by involving themselves in the explicit articulation of its workings, they can often dramatically improve their thinking and learning potential.

Vanessa was one such child. Within a 30-minute introduction to a simple colour-referenced vocabulary for different thinking styles, she was not only able to display her working knowledge of the styles, but also could plan a sequence of foci for thinking that would help her explore a simple issue. For Vanessa, that thinking was power and it made a remarkable transformation in her self-esteem as a thinker and learner.

Consistently, outcomes from programmes and approaches to the teaching of thinking have shown a similar influence on self-esteem and confidence-building in thinking for learning and it should come as no surprise to us as teachers.

About this book

This book evolved as one of the many positive outcomes of The Cognitive Classroom Project (1998 to present). The Project is a practical response to the need for schools to consider ways of enhancing learning through the direct teaching of thinking skills. Discrete thinking skill programmes do exist and there are initiatives to introduce such skills into school subjects as discrete entities. However, no tools exist to empower teachers and learners to release the cross-curricular potential of the five National Curriculum thinking skills and to see their relevance within and beyond the school curriculum. This is the raison d'etre of this book.

Thinking skills is a practical, easy-to-use toolkit to support teachers. Practical thinking activities for Key Stage 1 and 2 children are provided and these can be used to introduce and develop specific thinking skills when appropriate to the needs of groups/classes of children or individual children.

Thinking skills enables you to plan explicit teaching of essential skills in support of learning activities across the curriculum. Children will also have the opportunity to make connections between the skills and real life situations, thus seeing the purpose and reason for learning.

For example, a teacher might be planning work in English that involves deduction from classifying skills. The chosen text may include actions taken by the main character and actions of others. A question may be asked as to who is to blame for a particular situation. If children have not been introduced to the skill of classifying information and do not have experience in applying that skill, then they will be unable to deduce from the text who is to blame.

This is explored in more detail in Chapter 3, 'Planning for thinking skills.

We have called the activities in this book 'THUNKS'. Each 'thunk' introduces and helps to teach a specific thinking skill.

'THUNKS' is an acronym for:

THinking for
UNderstanding and
Knowledge in
Subjects

Each 'thunk' is laid out on two pages and gives details and guidance for the teacher on the organisation and management of the activity plus a description of the activity and suggestions for extension activities. Some 'thunks' have a 'thinking frame' attached. This is a graphical organiser that children can use to organise their thinking.

Organising and managing the activity

Key skills – this refers to key skills that will be used during the 'thunk'.
Subject links – this refers to some of the subjects in which this skill could be further developed.
Aims – the particular aims of the 'thunk' relating specifically and solely to thinking skills.
Organisation – explains whether the 'thunk' is for individuals, pairs, groups or the whole class.
Time – this is an indication of the time each 'thunk' will take. This is for guidance only and teachers will need to use their professional judgement on the length of time needed to complete each section of the 'thunk'.
Resources – although we have endeavoured to keep the need for additional resources, other than paper for recording thinking and outcomes, to a minimum, there are occasions when the teacher will need to provide some. These are all readily available and most schools will already have them.
Outcomes – exactly what is expected to be achieved by the learners is detailed in this section.
The task – a description of the 'thunk' activity.
Assessment – what to assess and how to assess the children's thinking is described.
Teaching tip – this is where the teacher will find specific guidance on how to teach the 'thunk'. It is not a lesson plan but advice on the pace, structure and delivery of the activity. This is intended to be supportive without being too prescriptive and flexible enough to be relevant to all school situations.
Extension activities – a variety of ideas for developing the 'thunk' into other and often more challenging areas.

The jigsaw

Information-processing skills: Locating and collecting information

Key skills

- Communication
- Working with others
- Problem solving
- Application of number

Subject links

- Geography
- Numeracy

Aim

- To locate and collect information from the immediate environment, such as the school.

Organisation

Pairs

Time

45 minutes

Resources

- 'The planning frame' on page 130

Outcomes

- The children will have created a visual representation of the information collected, and will have developed an understanding of the working parts of a school.

Task

Ask the children to tell you what they already know about the different parts of the school, such as the headteacher's office. Can they name the parts? Do the names give a clue to the purpose of that part of the school?

What characteristics or features help them to recognise each part, for example a classroom? List the parts and their characteristics on the board.

Next ask the children to work in pairs and explore the school to look for the information needed, for example the number of classrooms and what other rooms or areas there are and what they are used for. The children should keep a tally chart of the information.

The class should then report their findings to the teacher.

Each pair then records their findings on the planning frame (page 130). They can either write or draw pictures to represent each part of the school.

Teaching tip

Encourage the children to use the word 'information' as much as possible. Instead of asking 'What have you found out?' ask 'What information have you found?' Give each pair a simple sheet with boxes marked for different parts of the school; they use these for a tally chart of each part.

Reinforce the concept of the jigsaw as being separate pieces of information which make up a whole picture. In other words when we collect different pieces of information and these are put together we have an overall understanding of something, or a concept.

Extension activities

- ❑ Give the children a simplified map of the school. Each pair has to identify the different parts of the school on the map. They must then devise a colour key for each part.

- ❑ Each pair could then use their numeracy skills to record the number of people using each part of the school.

- ❑ If there is a local shopping area near to the school, the children could collect information about some of the shops. Groups of children could visit a shop (with adult supervision) and collect information about it, such as opening times, what it sells, how old the shop is and how many people work in it. Each group should then draw a picture of their shop and report back to the whole class what information they have collected. All the pictures could then be displayed as a frieze to give an overall impression of the shopping area. Information about each shop could be displayed under each picture.

Assessment

- Assess if the children have been able to identify all the main areas of the school.
- Assess if they understand what the main purpose is of each sort of area.
- Assess if they are able to identify some of the main characteristics of each sort of area, for example classrooms have many tables with chairs around them or offices are much smaller than classrooms.

The assessment can be through scrutiny of the outcomes on the thinking frame, and through careful questioning.

Information-processing skills: Locating and collecting information

Key skills

- Communication
- ICT
- Problem solving

Subject links

- Science
- Music

Aim

- To locate and collect relevant information on the different instruments found in an orchestra.

Organisation

Groups of three

Time

1 hour (access to ICT may need to be spread over a longer period)

Resources

- Information books
- CD-Roms on music/orchestras
- Internet access

Outcomes

- The children will be able to give the names of each instrument in the orchestra and a description of how each one is played.

The orchestra

Task

Provide the children with various resources, such as books, CD-Roms, audio tapes, posters and access to the Internet, that will give them information on the orchestra.

Before using these resources, ask the children to tell you what instruments they already know. Ask them if they know how they are played.

Then ask them to use the central supply of resources to compile a list of the different instruments and a simple description of how each of them is played.

As a plenary ask the groups to feed back to the class on the following:

- ❑ How did they collect the information?
- ❑ Which source was most useful?
- ❑ Which was the quickest way of locating the information?
- ❑ What literacy skills did they use?

Teaching tip

Ensure that there are sufficient resources available.

Ensure that there are equal opportunities for everyone to use the ICT resources. You may need to organise a rota for each group if you do not have an ICT suite in your school.

To avoid a rush towards the resources and the random grabbing of them, encourage the groups to start by thinking about what sort of resources might be useful to them and how they can quickly determine if a source is going to be useful (title, contents page and index). Also, encourage them to think about what they might do with the information once they have located it. Will they take quick notes, or share the information with the whole group and agree if it is useful and relevant, or will they copy information down verbatim? Will they need access to ICT either to locate the information or to help store it? For instance by scanning a page of a book and printing it out, or saving it to disk?

Extension activities

- ❑ Once the information is located and collected ask the children to make an audio tape of some of the different instruments and a commentary on how each is played.

- ❑ Divide the class into groups and allocate one section of the orchestra – the brass section, woodwind, percussion, strings – to each group. The task is for each group to locate and collect information for their section and devise their own way of presenting that information to the whole class (or to another class of younger children). Encourage them to use a multimedia approach to the presentation. After their presentations ask each group why they chose to present it in that way. What was their thinking behind it?

- ❑ Instead of locating information about the orchestra, the children could find out about different instruments from around the world.

- ❑ This skill of locating and collecting information can be related to enquiry skills, particularly asking relevant questions. This can be reinforced by asking the children to locate and collect information about their own chosen topic. But before they do they have to pose five questions about that topic that they would like to find the answers to. For example, the topic chosen is the Olympics. They might pose questions such as, 'When did the Olympics begin?' and 'How many sports are there in the Olympics?'

Assessment

- Observation of how children are locating and collecting the information. Is it random 'dipping into' sources of information or are literacy skills such as study skills and using index being used? How are the children organising/managing their search for information?