

# Section 2:

## Visual and Creative Thinking

### Overview

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ICT is a powerful tool that can help a user or learner to visualise relationships that are difficult to explore in other ways. Interpreting data in a table by representing it as a graph or chart can help to make the information more meaningful. Using *PowerPoint* to 'build' a diagram on a slide in a presentation helps to get children to focus on the relevant features of the diagram as they are introduced. ICT can also help with visualisation of processes or supporting the development of mental pictures or models of situations. In science, a diagram of the life cycle of a butterfly can help to reinforce the cyclical nature of the process. An animation of the circulation of blood around the body, or cutaway sections of a human showing the skin, then the muscles, the internal organs and then the skeleton can powerfully support or scaffold an understanding of the structure of the body. One of the features on some of Multimaps'

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aerial photos is a dynamic overlay of a street map, making it possible to see the links between the features on the photograph and the more abstract representation of the street plan. ICT can enable virtual experiments to be undertaken or modelled where either it will take too long or is too complex or dangerous to do practically. In addition it is possible to experiment with variables in an ICT based model to develop understanding both of the particular experiment, but also the concept of a variable, without having to re-run a practical experiment several times.

The provisional nature of information on computers is also a powerful feature. Being able to make changes to a picture or piece of writing easily is a real incentive to improve, adapt and develop ideas (provided you learn the difference between the 'Save' and 'Save As...' commands!). This can support children's creativity as they try out, save and compare different versions. One area where

the power of these visual relationships and the provisionality of ICT can be combined is in concept mapping and mind-mapping. These are related thinking skills strategies. They are both visual ways of organising ideas and can be supported very effectively using ICT. The CD contains some demos of commercially available software designed to create mind-maps and concept maps.

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#### Mind-mapping

In mind mapping the idea is to create a picture or diagram of an idea or theme by writing down the words and recording the links between the ideas as branches. It is clearly related to brainstorming, though it can also be used as a technique to take notes, summarise or revise ideas or topics. The main difference from brainstorming is that the ideas are not written in a list, or as a series of unrelated ideas anywhere on the page. A typical mind-map may well look like a tree or river with lots of branches and sub-branches. To create a mind-map, the idea is to start with a key theme or idea and write down the sub-ideas or themes, then work down each of these sub ideas to note down further related ideas, creating new branches as you go. Where a mind-map is used to take notes, the diagram structure or 'map' keeps track of the developing themes in a talk or the reading matter that is being summarised.

#### Concept mapping

With concept mapping the idea is that the relationships between ideas are explored more precisely. The links between ideas are labelled. A typical concept map will look more like a web with the

relationship between ideas made explicit. Concept mapping purists would argue that such labels should be grammatically correct so that such maps can be 'read' along the connecting lines.

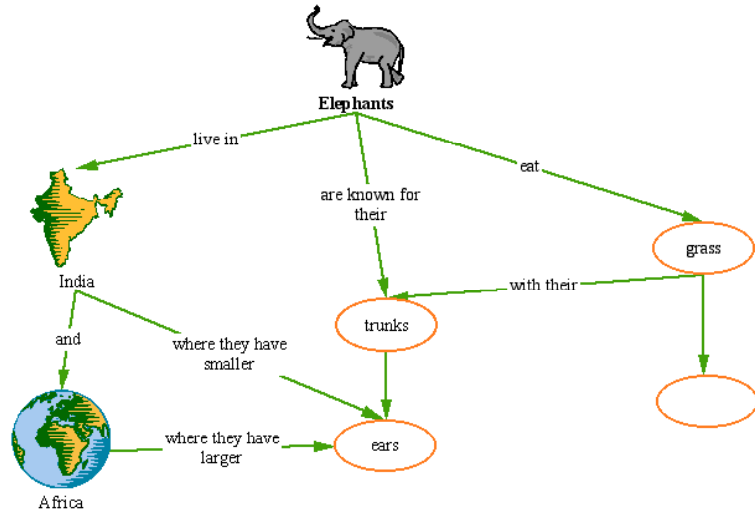
Concept mapping has been used in many areas of the curriculum, but particularly in science where it is often used as an assessment tool, or pre and post teaching to try to identify the development of understanding. The depth of links and the connections between ideas on the map can all be used to assess understanding.

Concept or mind mapping software, such as *Inspiration*, really comes into its own when you need to revise or update a map (there is a demo version on the CD).

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You can also usually generate lots of ideas to create a branching structure of ideas easily (such as in *Inspiration's* 'Rapid Fire' mode). Another major advantage of using computer software specially designed for concept mapping is that when you move ideas around you keep the links, unlike in a desk-top publishing environment. In addition some of the software lets you see your mind-map or concept map in different ways, such as a writing or outline view. These can even be exported to other programs, such as *Word* or *PowerPoint*, to develop writing or a presentation on a subject.



## Using Mind Maps and Concept maps in the classroom

These techniques can be used in many ways. Although we have made a distinction between the two approaches, in practical terms they are closely related. Mind-mapping a theme is often a good way to get started on a concept map. With younger children they will need some introduction and practice in using the techniques. To get them started it is often better to use partially completed concept maps and ask them to add ideas or to label links. Once they are familiar with what is expected, the maps can be used to discuss their understanding of the ideas on the map. The examples which follow show how these techniques can be adapted for use in primary classrooms.