Creativity in practice...

■ Hans Persson

For anyone who has wondered about how creativity looks in practice, this article offers a picture of how creativity can be a powerful force in the classroom.

Let us start with a look at the tradition. From my first days as a science teacher, I saw many examples of times when it was necessary to bring in new approaches to teaching. When my pupils opened their books, this represented a very common method of how science was communicated. This was how I was going to try to *raise their interest in science*. This was also how I was going to *keep their interest alive* and how they would learn something about the *nature of science* and what science was all about. I guess the reader will now understand why I did not feel that my science teaching was an immediate success.

The examples below illustrate some alternatives that I have developed that work with pupils and teachers in many countries all over the world.

The magic bucket

What to do?

Inform your class that you have found a very strange bucket. Show them that when different coloured liquids (clear, red, green) are poured into the funnel at the top, they always come out clear from the hose. Ask them to draw a picture of what they think the bucket looks like inside.

Encourage them to write what *they* think. Tell them that there is not only one right answer. Put all the pictures on display, talk about the different ideas and try to allow some of them to lead to investigations.

What happens?

You will not just get one right answer and I promise that you will be amazed at the range of answers and bright ideas that you hear. Over the years, I have assembled hundreds of examples and they are really interesting, including:

- Magic *('there is a fairy inside', 'our teacher is a magician')*
- A long hose
- Magnet

Other examples include:

- Chemical reaction *('a piece of soap', 'iron sulphur')*
- Density *('the coloured ones are heavier')*
- Filter *('sand, charcoal, popcorn!')*
- Two compartments in the bucket
- A rain cloud inside the bucket
- Animals inside *('chameleon', 'leech')*
- Biology *('a kidney')*
- And a personal favourite: *'We are colour blind'*

As you can see from the children's ideas above, the bucket offers a very good perspective of the pupils pre-knowledge in science. However, this exercise is not about finding out who is right and who is wrong – it is an open problem and if you really take the children's ideas seriously and try to investigate some of them, it will become clear that there is more than one way that works. Usually, I do not open the bucket until we have tried some of the ideas.

One of the most common reactions I get from teachers that have used the magic bucket is that this activity is a really a good way to discover the undiscovered talent in the class.

I also use the bucket as a starting point for science and a model for how scientists work:

- Scientists face ***problems*** (for instance, what is inside the bucket)

The children are very proud of what they have come up with

- Scientists come up with different ***ideas*** (hypothesis, prediction)
- Scientists ***investigate*** if their theory is right
- The investigations lead to ***conclusions***, which can lead to new problems, ideas, investigations…

Scientists often argue and have many different ideas. In this way, the bucket paints a more relevant picture of the nature of science than the traditional investigations, where there is just one way to do it and one 'right answer'.

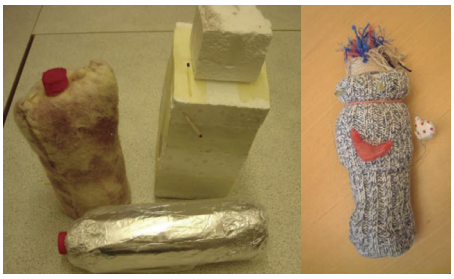
This is an activity that raises the pupils' interest in science. When I do in-service training with teachers, I see too that this is an activity that engages many primary teachers in science and science teaching. They like it, they feel confident with it and it is easy to see that much can be achieved using the bucket.

The bottles

What to do?

Ask the pupils if they can turn a 50cl plastic bottle into something that works as a thermos. I usually allow them a week to solve the problem and let them do it at home. We then discuss how to investigate which solution will work the best. Often we agree that filling the bottles with hot water and measuring the temperature is a good way.

What happens?
Many very different and clever solutions to this problem appear. I think that what grabs the children is the fact that *there*



Some examples of bottle thermoses

actually is something here to investigate. It is a *meaningful investigation*, unlike the traditional method, which is all about 'filling in the blanks' and where there is only one right answer.

One girl made her thermos out of fabric, which works so well that her family still uses it.

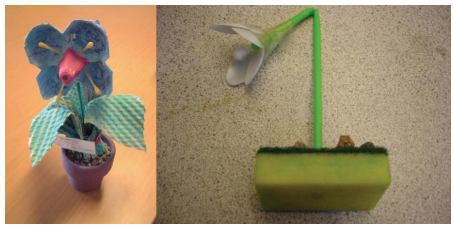
There is no question that this is a more creative investigation than its traditional counterpart. When this bottle activity is carried out, you will not only get interesting discussions, but you will also see that this is a very good example of how you can place the science teaching and learning in an everyday context.

Build a flower

What to do?
Ask the pupils to build a flower. You can let them do it at home and use whatever materials they can find. When the flowers are ready, put them on display and allow space for discussion.

What happens?
The results can be displayed on a table, allowing for discussion about different ideas of how the flowers can be sorted. This usually leads to discussions about how scientists 'sort' flowers. When the flowers are observed closely in detail, you will also get the opportunity to talk about the parts of the flower. Usually the children will have a lot of different ideas about this, which are well worth listening to before showing the class the parts of the flower through a picture with the right answers. This open activity will give more of the children a chance to blossom.

A fantastic variety of smart constructions



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