

## The Nature of Science as a planned activity

Michael Fenton Scientist, Microsoft Innovative Teacher, Ministry of Education e-Learning Fellow

**Do we need to teach a lot of science knowledge to children before we can engage in science activities?**

Some reflections that may help...

- Early pioneers such as Isaac Newton and Galileo did NOT have any 'science' content knowledge....it didn't exist yet!
- What made them 'scientists' was **the way** they went about their wonderings about the world around them.
- **ONE** way to think like a scientist is to simply be willing to put your ideas to the test.

**Teachers that support scientific thinking will:**

### **Raise interest in a subject**

- Are there any **puzzles, riddles, problems or 'weird' stuff** happening related to ANY topic you are working on this term?
  - eg' Different Cultures' - language involves people speaking...how does sound get from one place to another? Can it bounce? Can it reflect? Can people communicate without sound? Has new technology been invented to replace sight, taste or hearing? Have different cultures contributed different science knowledge to the world?
  - eg, 'The Final Frontier' - what were the other frontiers BEFORE the final one? What difficulties did people have to overcome when entering a new frontier? - food, climate hazards, etc. What drove people to enter new frontiers? - food, climate change, minerals, etc? What technologies are required to explore new environments? How to movies and TV shows portray the Final Frontier? What functions does a spacesuit provide?
- What knowledge or interests do the **children** already have about this topic that could incorporate ideas from the Goldsworthy "It's not fair' article?
  - Modelling, classifying and identifying, pattern seeking, making things or developing systems, exploring, and of course, fair testing.
  - It is OK to start from the child's perspective...eg, that the world is flat. We have ideas based on what our senses tell us and this is where science begins. Many adults would have difficulty explaining how we know the world is round. Try standing in the child's shoes and wonder - how could we test our idea OR look at the world a different way?
- Ask fellow **teachers** to add their ideas and interests to the unit; if the teacher is motivated and enthusiastic about their own twist on a unit of work, it is likely their students will pick up on this enthusiasm. Use differences in approaches as a strength of the school.

**Identify specific questions of interest for follow up**

- Have students build up a portfolio of work; digital images, movies, slideshows, games, models, working systems (technology), a play or story, science fair poster, etc. Students could re-create famous disasters such as the Titanic sinking - make a model boat and experiment with different sized rudders (the rudder on the Titanic, if bigger, might have permitted the ship to miss the iceberg)
- If time permits, allow students to do a number of cycles of investigation and get them to either widen or deepen their work in the unit.

**Get their hands dirty!**

- Beginning a unit using ICT, books or video's is OK... but the nature of science means evaluating our judgements against **real-world** consequences.
- It is OK to learn with/from the students...**experiencing things** as the children do is an excellent place to begin learning...for all ages.
- Learning **content often comes as a consequence of an experience** in the real world. You can always ask someone else for help on content...ask a mentor!

**Help students assess their new understanding in relation to consequences for further learning**

- Does the new understanding offer opportunities for more investigation to be done? More data to collect? New categories to be created? New systems to be invented?
- Can this new knowledge be shared so others may benefit? If so, in what form?
- Is there some 'content' knowledge that would now be appropriate for the student to acquire? If so, in what form?

**Help students assess their new understanding in relation to others**

- Does the new understanding have any similarities or differences to current thinking about this topic?
- What impact on society has there been / could there be from using this knowledge?

**The nature of science encourages endless cycles of learning by action!**

Did you just read or watch a video clip about your science host for 6 months...or did you get your hands dirty and DO science?

---

For investigation ideas, science fair methods and lab equipment that could be made for use at school see the Taranaki NZ website:

[www.nexusresearchgroup.com](http://www.nexusresearchgroup.com)