Activity

Episode 26
9th September 2014

STEM Changes

Key Learning

Students will learn how to plan and conduct science investigations to find answers to questions.

The Australian Curriculum

Science/Science as a Human Endeavour/Use and influence of science

Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives Year 5 & 6

Scientific knowledge is used to inform personal and community decisions Year 5 & 6

Science/Science as a Human Endeavour/Nature and development of science

Important contributions to the advancement of science have been made by people from a range of cultures Year 5 & 6

Science/Science Inquiry Skills/Questioning and predicting

With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be Year 5 & 6

Discussion Questions

1. What does S.T.E.M. stand for?
2. If you want to be a fighter jet pilot or a Hollywood animator what skills of a high level do you need?
3. Who is Australia's Chief Scientist?
4. What is the Chief Scientist worried about?
5. The year 8 kids are doing a science experiment and having fun. What are they learning about?
6. One of the boys says "I reckon it's important to study science because it opens up a lot of _____ _____."
7. What are some of the changes the Chief Scientist would like to see in teaching Maths and Science in schools?
8. One of the girls in the advanced maths course wants to go into medicine, what does the other girl want to be?
9. Make a list of at least 10 jobs that require maths and science skills.
10. Is learning science and maths important? Explain your answer.

Activities

Discuss

Discuss the BtN story with students using the following questions to help guide discussion:

- What words do you associate with science and maths?
- What is science? Come up with a class definition.
- What is maths? Come up with a class definition.
- How would your life be different without scientific discoveries?
- How does maths play a part in your everyday life?
- Is learning science and maths important? Explain your answer.

Experimenting in the classroom

Students can have a go at one of the following CSIRO's *Science by Email* experiments or choose another one from the website http://www.csiro.au/Portals/Education/Programs/Do-it-yourself-science.aspx

- How to make sherbet – http://www.csiro.au/helix/sciencemail/activities/Sherbet.html
- Bendy water – http://www.csiro.au/helix/sciencemail/activities/WaterBend.html
- Glow worm – http://www.csiro.au/helix/sciencemail/activities/glowworm.html
- Charge your light bulbs – http://www.csiro.au/helix/sciencemail/activities/ChargeYourLightbulbs.html

There are also experiments with a maths focus that students can have a go at http://www.csiro.au/Portals/Education/SbE-Activity-Archive/Maths-activities.aspx

The ABC's *Experimental* website has some science experiments students can try http://www.abc.net.au/science/experimentals/experiments/

Alternatively, students could design their own science experiment to answer a question or solve a problem. Here are some examples of possible questions as a starting point for a scientific inquiry.

- Are you already focusing on a science topic in class? Use this as a basis for your experiment.
- Visit your school or local community garden to discover possible scientific experiments. Working with a partner, students must identify a researchable problem and conduct an investigation based on their observations. For example, which vegetables grow best in shade?

Investigation Framework

Here is an investigation framework to guide students when planning and conducting their experiments.

- What am I going to investigate?
- What do I think will happen (prediction)?
- Why do I think this will happen?
- What steps do I need to follow to investigate my prediction?
- What materials and equipment will I need? Make list or draw and label each item.
- How will I make it a fair test? What variables am I going to keep the same?
- Write a sentence that summarises what happened?
- A labelled diagram or a table of my results or observations to demonstrate what happened.
- Was this what I expected?

Big science questions

Pose a big science question as the starting point for a scientific inquiry. Here are some examples of possible questions:

- *Why did dinosaurs die out?*
- *Why is the sky blue?*
- *How big is the universe?*
- *Is time travel physically or logically possible?*
- *How and why did the universe begin?*

Think of creative ways to explain/answer your science question (using multimedia, models, video or a Prezi presentation http://prezi.com/index/). Take a look at this Prezi presentation called *Science Investigation Project 2012* for inspiration.

Go to the ABC Science Ask an Expert website to ask a curly question!
http://www.abc.net.au/science/askanexpert/

Create your own science lesson

Create your own mini science lesson to teach to students in another class. The ABC's Surfing Scientist has lots of lessons to inspire you http://www.abc.net.au/science/surfingscientist/lessonplans/default.htm . Carefully plan your lesson so that you are clear about what you want students to learn. Share your lesson with a group of students in your class or another class.

Further Investigations

Tell your own real scientific story that explains a concept, invention or discovery. Make a short video or presentation that tells your science story.

Draw a picture of what you think a scientist looks like. What scientific work does your scientist do?

Reflection

Has your view of learning science changed since completing this investigation? Explain your answer.

Related Research Links

Behind the News – Science Kids
http://www.abc.net.au/btn/story/s3687421.htm

ABC News – Chief scientist Ian Chubb unveils ambitious strategy to secure Australia's future prosperityhttp://www.abc.net.au/news/2014-09-02/chief-scientist-ambitious-strategy-boost-competitiveness/5711398

ABC News – Top scientist calls for change to get students interested in science and mathshttp://www.abc.net.au/news/2013-07-27/call-for-changes-to-science-teaching-to-boost-graduate-numbers/4847334

ABC Science – The Surfing Scientist
http://www.abc.net.au/science/surfingscientist/lessonplans/default.htm

CSIRO – Do-it-yourself science
http://www.csiro.au/Portals/Education/Programs/Do-it-yourself-science.aspx

NSW Education and Communities – Why is science important in young kids' lives?
http://www.schoolatoz.nsw.edu.au/homework-and-study/other-subjects-and-projects/science/why-science-is-important-in-young-kids-lives

Australian Science Teachers Association – Science Web
http://scienceweb.asta.edu.au/