



Significant Episode: Radioactivity

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Finding 3.8: Pathways

Include multiple pathways and approaches to learning that allow students to investigate a range of mathematical concepts and methods and strategies.

Background

Early on in the project we had a cluster get-together where a colleague from another school presented a mathematical investigation activity called 'Chocolate Cake' (maths300) that she had used with her Year 8 class. Although as a cluster we were focussing on investigations, she was the first teacher to try an activity and share her experiences with us. We all sat in awe listening to her story about how the students enthusiastically participated and how they become 'quite competitive' in their engagement. I was inspired to try a similar investigation with my own classes.

What happened?

This inspired me then to try a lesson called 'Radioactivity' (maths300). The lesson looked at the half-life of radioactive substances and used the Chernobyl disaster as a context to investigate fractions and exponential functions. In particular, it centred on the long-term impact of the nuclear disaster on the Chernobyl people. The context was useful for addressing a common misconception – they thought that after the 'second half-life' the whole substance would disappear rather than it being 'half of half'. This proved to be a light bulb moment for the students! There was a sense of excitement as they grasped the concept, and so we then used the concept to estimate how long it would take a radioactive substance to break down completely, and this led to some interesting answers and insights. I then decided to show the students a '60 Minutes' video where Richard Carlton explored Chernobyl 20 years on. This proved to be a powerful and moving context because it really put into perspective how half-life relates to real life issues and how Chernobyl will be a wasteland for thousands of years. The '60-Minutes' report contained a range of disturbing images, including some of children suffering permanent physical damage as a result of the nuclear fallout. I remember the room being 'dead quiet' and even some students were crying.

Results

There seemed to be two important outcomes for the class from the activity. First, the students all grasped and understood the concept of 'half-life' and exponential decay functions. Second, the context was powerful in showing the students the relevance of the mathematical concept in a real-life example. Also, because the context was rich with emotion and meaning, it gave the students a paradigm example to anchor their conceptual understanding.

Some questions to prompt discussion:

1. *How could this lesson be built on and how could it be connected with other Learning Areas?*
2. *What might be the lessons for Terry (the teacher) in this experience?*
3. *What other interesting or important aspects are in this Significant Episode?*

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