FLOODS, DESERTS AND DISPOSABLE NAPPIES

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Here, Verity argues that geography is the ideal vehicle for embedding real-world literacy, numeracy and science knowledge in preparation for year 6 SATs.

As a year 6 teacher, every minute counts as the deadline for May standard assessment tests (SATs) looms ever closer. Due to this, many of the non-tested areas of the curriculum, including geography, can get shoved from the classroom, leaving pupils bereft of the broader range. However, with science soon to return to SATs, teachers will be required to develop ways of embedding this knowledge – and what better way than through geography? Real life, real action, real consequences and links to Education for Sustainable Development and Global Citizenship (ESDGC) and Personal and Social Education to boot.

Flooding: a case study

Flooding provides a great way for pupils to explore how nature, people and place collide with each other. Every autumn and winter we are inundated with scenes of mayhem as the news displays images of swollen rivers, flooded fields and houses ruined by rising water levels. I teach in a coastal school in Pembrokeshire in Wales, so flooding provides an exciting route into a way to develop literacy, numeracy, science and geographical understanding.

We started with a discussion about flooding and what it meant to the young people in the class, and after reflection on news items and personal experiences, the pupils organised their ideas formally to consider whether their knowledge was biased or not. Following this the 'Big Idea' to investigate was revealed. In this case, the notion that all soils can absorb the same amount of water. Or, to frame it as an enquiry question, will all soils become saturated at the same point?

Pupils were asked to create an investigative piece of fieldwork to collect data from the local area and undertake soil analysis. This involved mapping the area and agreeing how and where soil samples should be collected from (for example, is it okay to gather soil from under a hedge, or should it be from an open space? will the location affect the amount of water the soil sample already holds?). This task alone provided opportunities for pupils to develop instructional writing and consider the nuances of fair testing in geography and science, as well as using their knowledge about the local area to predict which soils would become supersaturated more quickly. Those wanting further challenge were tasked with designing a range of tests and methodologies.

Back in the classroom, the samples were recorded on the map and then blind tested – each sample having been labelled with just a number. For the purpose of this enquiry, pupils were asked to bring all samples collected on the same day. We did not go to the extent of drying out samples before analysing them, although it was discussed. Pupils worked in small groups to decipher the colour, texture, smell, pH and absorbency of the samples. They measured water, weighed the soils and took various readings.

It was with some relief that the pupils found that the area that would flood more quickly (i.e. the soil became saturated fastest) was a stretch of coastal road at Newgale Beach (Figure 1). The road runs close to a river mouth – an area renowned locally for flooding, with sandy soil on impermeable bedrock. It is also an area that has, over the years, cost the local council millions of pounds to maintain due to flood damage. As a result, there was a discussion as to the future of the road in the media (BBC, 2015). Given this information, four groups of pupils were asked to provide a cost-benefit analysis based on three coastal management proposals.

- Group A considered updating the sea wall and flood defences – this is known as 'advancing the line'
- Group B looked at the implications of keeping the road and residential dwellings as they were ('holding the line')
- Group C worked on the premise of 'managing a retreat' from the area while developing a different route
- Group D looked at totally 'abandoning' the area immediately and developing a different route through the landscape.

Figure 1: The soil that saturated fastest was found to be near Newgale Beach, Pembrokeshire. Photo © Verity Jones.

Each group considered and discussed the risks, costs and benefits of their solution on a range of spatial and temporal scales. We invited Local Authority representatives in to school to chair a 'consultation process' style of discussion. This proved really motivating with even those who are usually reticent to speak out or join in writing about an issue engaging fully with the work. This was challenging geography in action.

Using the knowledge

The work in the classroom provided an engaging context for learning and one that could be replicated in other areas. Yes, we were fortunate to have the ongoing consultation regarding a local floodplain to situate the soil study on, but even without this aspect, the outcomes were exciting. The question then was: where next? I wanted the pupils to focus on a comparative study, so we looked to areas being affected by desertification. Zimbabwe provided an ideal country with its exports to Europe as well as reports of over-farming of areas combined with uncertain rainfall, increasing population and waste management problems.

With regard to the earlier consideration of soils, pupils were to investigate the effectiveness in absorbency and saturation of babies' disposable nappies. These were linked to changes in Zimbabwean culture: reports in Zimbabwe's *Herald* (Nhutsve, 2014) highlighted that there had been a shift away from the use of traditional cloth 'napkins' for babies towards disposable nappies. This was one result of more women going out to work and the convenience of using disposable nappies (Nhutsve, 2014).

As with the soil analysis, pupils were asked to investigate which nappy was able to absorb the most liquid. After the shrieks of disgust had quietened, they became amazed at the sheer quantities of liquid that a disposable nappy can absorb. Their discussion (both oral and written) was developed regarding the pros and cons of using these products and the impact of disposable nappies socially, culturally, economically and environmentally – encompassing the human and physical geographies of place and product becoming woven into the global context (Figure 2).

While this project could have been left there and considered successful in itself, a further line of enquiry remained. The super-absorbent (polyacrylamide) pellets within the disposable nappies had amassed a great deal of pupil interest in the investigative stage (Figure 3). The pupils raised the question: 'was there another use for the pellets?' The answer is yes. These super-absorbent pellets are now being added to soils in areas of the world where there is low rainfall in order to protect the soil from drying out too quickly and damaging crop growth (Hilding, 2014). (In the UK, garden centres use the pellets in hanging baskets for the same reason.) A full circle – from flood to drought – was mapped through this investigation of absorbency and saturation.

Conclusion

This unit of work provided pupils with the opportunity to embed geographical skills and knowledge into real-life contexts, debate real problems and come up with solutions. It merged the physical with the human and had everyone in the class engaged, enthused and enjoying their learning. These young people willingly went deeper into their thinking, their talking and their writing. Their discussion and discovery had a real-life geography-based purpose. Unwittingly, the pupils were developing their literacy, numeracy and science too. If geography is going to hold its own with regard to time dedicated to it in the classroom, then I believe it is through such rich tasks we will see it becoming embedded.

References

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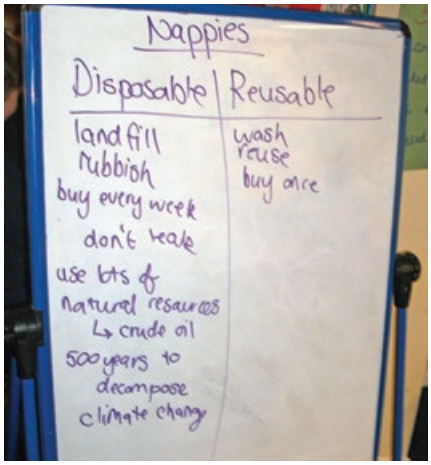

Figure 2: Discussion was developed regarding the pros and cons of disposable nappies. Photo © Verity Jones.

Figure 3: The enquiry led back to soils, as the absorbent pellets used in the nappies are now being added to soils to prevent them from drying out too quickly. Photo © Verity Jones.