

SATIPS

Support and training in Prep, Primary and Senior Schools

Geography

Editorial

The Spring Term is always a short sharp affair that is seemingly over before it has begun. Those having examinations at the end of the term might feel as if there has, with half term, been scant time at all to have done much teaching, especially if there have been plays, or swimming heats or other such distractions. It is of course, never the best term for expeditions either, despite the mild weather we have largely been experiencing (though the point is taken that there is never inappropriate weather, just inappropriately rugged up pupils). Whilst there may be opportunities to do some field work on weather, sometimes this might be best done staring out of the classroom window and accessing the wireless weather station!

It is a good term, however, to take a little stock, and perhaps to consider the IT needs of the department, and to think about expeditions in other terms. It might also be a good time to consider not only the weather, but the changing climate.

Hopefully this term's edition gives some food for thought. I wish you warm weather and a splendid Spring Break.

Andrew Lee

iPad Pro and Apple Pencil in the Geography Classroom

Andrew Lee

The iPad pro and apple pencil were released in November 2015. Unlike many of the Apple devices that have been reviewed in the SATIPS Geography Broadsheet, the iPad Pro and Apple Pencil are ideal classroom companions for the teacher rather than for pupils. At first there may seem little reason to rejoice, instead seeing the Device as just another iPad. The beauty of this device, however, lies in its connection with other technology in the classroom. Where connectable to a digital screen via an Apple TV (either Version 3 or Version 4) the set up has the capacity to act as a wireless whiteboard slate. With the technology configured in this way it is possible to face classes when writing notes or drawing diagrams on the iPad, thus maximising eye contact in the classroom and creating an environment where the teacher is able to keep the class in view. This makes lessons more compelling and increases pupil engagement.

In order to use the iPad in this way, it is necessary to download applications that support handwriting. The use of the iPad in this way does not appear to have been, as yet, fully exploited by application developers. Whilst there is a number of applications that will provide this functionality, there is not one clear leader in the pack. Hopefully, application developers will see the potential for the use of the technology and produce applications that replicate the touch screen whiteboard. Using the Apple pencil, however, provides much increased control over writing. Not only can the pencil be tilted to provide a shading stylus, it is also pressure sensitive meaning that a hard press on the stylus leads to a darker line simulating the use of real pencil.

Being freed from the very front of the classroom is also a great bonus so as to provide visual variety in the classroom. Given that the iPad will operate throughout the room and beyond, it is possible to move around the room and teach which is useful when demonstrating equipment, showing maps, or pointing out the examples. Because the iPad Pro, like other iPads, is equipped with the camera it is also possible to project things on the desk onto the screen while looking at small objects or rock samples etc. This turns the iPad into a virtual episcopo and allows pupils to see things more clearly and allows the teacher to point things out effectively. The iPad Pro and Apple Pencil are also excellent tools for the drawing diagrams. Given that these diagrams are immediately digital, it is very easy to upload them to teaching websites or two other useful locations. Moreover it is also possible to make small recordings of demonstrations in classroom which may then be emailed or uploaded to teaching websites.

One of the other advantages is that many types of teaching media maybe uploaded onto the iPad. This means, for example, a teacher could easily Flip between YouTube, Keynote, Safari, and handwriting on the board applications such as those listed. Using the technology in this way reduces the amount of 'flip' time which normally occurs in the classroom as a teacher shifts from one data source to another. Moreover, once the iPad is connected and going the teacher can concentrate on one device, rather than trying to get a DVD machine to work, plugging in equipment, finding remote controls etc. 🍏

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Applications that teachers might find useful on the iPad pro include: Notability, Paper 53, and Evernote.

Teaching about environment in CE Andrew Lee

The Hydrological Cycle

The hydrological cycle is a topic that pupils sometimes complain about, saying that they have been taught the topic time and time again. The topic, however, becomes much more interesting, when taught to pupils with a solid level of geographical and meteorological understanding. Indeed, there is much of great interest in the water cycle. Whilst it might seem that increasing levels of complexity might make pupils baulk, quite the contrary can be the case. Because their experience of weather, and even of the countryside is a very personal one, pupils often respond well to understanding the processes which they have seen and wondered about. The key to capturing imagination is ensuring that the processes are explained in sufficient details so pupils can clearly grasp what is going on. Sometimes this is best done by analogy or demonstration using teaching aids.

A detailed look at the Hydrological Cycle

It is a good thing, that in the Common entrance syllabus, the water cycle is considered part of the unit of work weather and climate, rather than being part of the rivers topic. Whilst the hydrological cycle is naturally connected to fluvial morphology, there is much more opportunity within the weather and climate topic to connect hydrological processes with the processes of weather. Pupils, typically find learning about the process of rainfall creation to be quite interesting. This topic allows them to learn about the differences between snow, sleet, hail and rain.

Pupils always find hailstones interesting with many having stories of massive hailstones to relate to the class. YouTube videos of large hailstones can also be compelling viewing in the classroom and are easily found. Revealing to pupils that hail is commonly experienced in warmer weather is also an interesting opportunity to explain to children the differences in temperature at ground and cloud levels. The notion of frozen rain blowing about high in the atmosphere and growing through the layering of water onto already frozen droplets is one that pupils can easily picture. Snow too, both as plaything and as a concept is something that much interests pupils. Deeply exhaling onto a window pane and showing condensation is an excellent exercise to demonstrate the way that water vapour appears in a cloud as a parcel of air cools. Subsequently explaining to pupils that snowflakes are formed when that water vapour freezes without coalescing into water droplets once again gives pupils a means of picturing the process in their mind's eyes.

There is an interesting 8 minute film about Chuck Bentley who as a US snow enthusiast who became very interested in photographing snow crystal formation. See: tinyurl.com/satips002

The very formation of raindrops is something that also captures the imagination of pupils. The point at which water condenses from cooling air leads onto tiny particles of water coalescing around condensation nuclei. Tiny aerosols comprised of materials such as ice, salt crystals, fragments of pollution, or volcanic particles might be suitable micro-objects around which particles might coalesce. Subsequent droplets of coalesced water might then collide with one another leading to the formation of larger and larger raindrops. Pupils find it interesting to consider that each raindrop contains many of these such aerosols around which they began to coalesce. These micro-particles are known as condensation nuclei. It is these condensation nuclei that are sometimes used to seed clouds in an attempt to instigate rainfall creation processes leading to downpours.

Cloud seeding, however, has only ever had limited success. See this 4 minute BBC video on cloud seeding in the UAE: tinyurl.com/satips003 Following water around the water cycle leads to mountain tops where ice is potentially trapped in ice caps for thousands or even millions of years. This is another opportunity to capture the imagination of pupils being taught. Consider Arctic and Antarctic ice for example and consider the millions of years that it has been trapped in situ. The water cycle, therefore, has storage moments, where water is stuck in the cycle, perhaps on ice caps, perhaps it is 'stuck' in a lake for a long period of time. It might even be frozen into the ground in permafrost.

Exploring processes of interception, infiltration, and surface run-off also provide pupils opportunities to visualise paths and trajectories of raindrops. Rain, for example on the leaves and trees takes much time to reach the ground. Having been slowed down water then infiltrates into the ground but only after there has been the delay in getting that water into the aquifer. Having pupils imagine the path of a raindrop is a useful projective technique. Consider, for example, the raindrop that lands in a forest by a river compared with a raindrop that lands on the roof of guttered house similarly by a river. The raindrop landing on the roof will move into the gutter and through into the drainage system and then quickly into the river much faster than a raindrop landing on foliage might. Getting pupils to 'trace' water flow through various paths is a useful tool for getting them to think through the hydrology of a set of locations.

Also consider raindrops at the point they reach the ground. Some rain will infiltrate into the ground and again make its way downhill as throughflow

in the water table. Where conditions have been very dry, and the ground maybe crusty, sometimes water will run off even if there has been little rain. Once, however, the surface softens, water may then begin to infiltrate. In other instances where there is heavy rainfall water might not be able to infiltrate at a sufficient rate to sustain infiltration, if for example the water can't soak into the ground fast enough. In this instance water might infiltrate at a maximum sustainable speed and excess water will run off the slope. In other instances rock type may have an impact upon speed of infiltration.

Clays for example might initially allow substantial infiltration, but although the clay might initially rapidly absorb water, water does not flow through it very quickly meaning that once saturated the clay will be incapable of further absorption and where it might lay on the surface of a slope there might be a rapid change from water being absorbed to it being repelled, leading to a sudden change from water infiltrating to water running off. Such a change might lead to the rapid accumulation of floodwater once a 'tipping point' is reached.

Careful use of terminology is important when teaching about the water cycle. Run-off for example might be either a noun or verb in that that run-off might be the water moving across the surface of a slope but it might also be the process by which water runs off a slope. On the other hand, throughflow refers to water moving through the aquifer with the means by which it moves being referred to as infiltration. Percolation on the other hand is the process by which water moves downwards through cavities and porous subsurface rock.

There is a useful video without commentary which might be useful in the classroom to help show or trace processes. As a prep it might be useful to set pupils to write a commentary that might go with the animation. It may be found here: https://www.youtube.com/watch?v=0_c0ZzZfC8c Or here: <http://tinyurl.com/SG060216>

Al Gore's Update: The Climate Reality Project Released Friday 23 February 2016 (Recorded in Vancouver)

<http://tinyurl.com/satips001>

Since Al Gore's Inconvenient Truth was released in 2006 Mr Gore has been campaigning relentlessly for the environment. Whilst his initial offering was a sobering picture of just how much had to be done, his revisit just released celebrates the extent of what has been done. There is an awareness in environmental circles about public exhaustion regarding persistent gloomy pictures of the future and whilst there is no doubt continuing concern about the future of the planet, this last episode is an opportunity to say well done, we've done

amazingly well in many areas, but there's still much more to be done.

Here are some of the key information revealed in Mr Gore's update.

We deposit 110 million tonnes of carbon every 24 hours into the atmosphere.

We still rely on dirty carbon based fuels for 85% of the energy we use, globally.

The energy trapped by man made global warming pollution is now equivalent to 400 000 Hiroshima atomic bombs per day 365 days a year.

This energy heats up the atmosphere. We have an increasing number of extremely hot days.

Higher temperatures are having a very significant impact on people and plants.

The heat is being trapped in the oceans.

The warmer oceans are evaporating more water vapour into the skies. This funnels water vapour over the land where there are record breaking downpours.

This is causing historic floods and mudslides e.g. in Chile, Spain.

There is more energy in the atmosphere and storms are different now. There are also increased droughts in some areas and more water vapour in the atmosphere in other areas. There are more fires, more lightning, more rainfall and more flooding. These climate related disasters also create political instability. The Syria drought for example turned 60% of Syria's fertile land into desert and drove 1.5 million people into Syria's already crowded cities.

Tropical diseases are spreading to the higher latitudes with transport playing a role in the movement of viruses.

Land based animal and plant species are now moving towards the poles at a rate of 3 metres per day. The earth is at risk of losing 50% of the living species on the planet by the end of the century.

Last year even in the middle of winter the Arctic was not frozen over. The temperature was 10°C higher than usual.

The ten cities most at risk from sea level rise are Kolkata, Mumbai, Dhaka, Guangzhou, Ho Chi Minh, Shanghai, Bangkok, Rangoon, Miami and Hai Phong.

Whilst we still need to effect massive change in the way we use energy there is some good news. 🍀

Humans have moved to wind power much more quickly than was anticipated. It was expected that by 2010 there would be 30GW of wind based energy generation in the world. In fact we've now around 435GW of energy, with the cost of this energy going down and down.

On 26 December 2015, Germany managed to get 81% of all its energy from renewable sources (mainly solar and wind). Many countries managing more than 50%.

With solar power the expectation in 2002 was that by 2010 there would be 1GW growth per annum, but by 2010 it was 17 times this amount. By 2015 it was beaten by 58 times.

The cost of renewable energy is becoming cheaper and cheaper. At some point 'Grid Parity' will be reached, when renewable energy will be less than the cost of energy from non renewable sources.

It might be useful to show the video to pupils.

It can be found here:

tinyurl.com/satips004