Writing for Teaching Geography

Teaching Geography provides a forum for sharing:
• practical strategies for teaching geography
• critical reflection on geography teaching and learning
• curriculum innovation and change in geography.

If you have a teaching strategy, practical idea, resource to share or particular view on educational practice, we would like to hear from you.

Teaching Geography welcomes articles from PGCE students, NQTs and practicing teachers. If you have an idea but have never submitted an article before and would like some advice, please contact Melanie Norman (m.j.norman@brighton.ac.uk), the Editor of Teaching Geography, who will be happy to discuss it with you.

We welcome the submission of the following types of article:

1. Planning and pedagogy articles critically discuss and illustrate approaches to teaching geography. (1500 words)

2. The G-Factor articles (supported by resources online) based around a practical idea for teaching a lesson or sequence of lessons. (1500 words)

3. Change and challenge articles discuss current educational views and how they impact upon geography. (1000–1500 words)

4. How to... articles provide practical advice and strategies for geography departments. (750 words)

There is detailed information on preparing articles for publication at www.geography.org.uk/download/GA_GITGGuide.pdf

The route to publication

You have an idea for an article based on your own practice of:
• what worked well with your students
• what might be useful to others.

Look at past Teaching Geography articles in the online archive to check:
• are your ideas original?
• if the ideas develop an existing idea, is the topic in need of revisiting?
• is the focus on the geography?
• are the ideas clear and focused?

Send the article to the editor who may send it to a member of the Editorial Board:
• Consider and respond to feedback.

Write the article:
• keep to the specified word count
• suggest or provide photos, diagrams and other illustrations (remember copyright laws)
• keep the writing style tight and plain
• ask for help if needed.

Check the writing guidelines for a TG article and decide the type of article you want to write, e.g. G factor, and the length required.

Contact the TG editor:
• send an outline of the idea
• be clear on the submission deadline.

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• it is sent to a copy editor and then to be designed
• you will be sent the proofs to read and check.

Publication:
• you are an author
• you have shared with others
• your professional development has been enhanced.

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Spring 2016 focus on changing landscapes

Cover Image
Sunset over the Scotia Sea in the Southern Ocean from RSS James Clark Ross.
Photo: Anna Totterdell.

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Editorial: New horizons

‘New horizons’ is the focus of this the third issue of Teaching Geography during our 40th year of publication. We explore the topic’s many dimensions and interpretations. The wonderful cover image of sunset on the horizon in Antarctica conjures images from one of my holiday reads, Endurance by Alfred Lansing. This book follows Shackleton’s incredible expedition to the Antarctic from the diaries of the men in his team. 2015 marks the centenary of the loss of their ship Endurance.

The fragility of both the Antarctic and Arctic environments is well documented. Both are under threat from exploitation of resources as well as the impact of human activity, which has been responsible for increasing emissions of CO₂ over the last 100 years. David Hicks’ article suggests that as geography teachers we can encourage learners to ‘see’ factors that influence climate change at all levels and inspire thought and action to create a cleaner, healthier and safer low carbon future or ‘new futures horizon’.

Sylvia Knight and Neil Adger analyse the IPCC report which comments that it is extremely likely that human activities caused more than half of the observed increase in global mean surface temperature from 1951–2010. Sylvia and Neil report that there are a number of ways of addressing the problem but no single option is sufficient in itself. Getting students to ‘see’ climate change as suggested by David, is a good starting point.

The outcome of the May 2015 UK General Election is analysed by Danny Dorling and Ben Henning who offer fascinating insights and perspectives on voting patterns that are hidden from view in our ‘first past the post’ electoral system. Their analysis encapsulates ‘new horizons’ for many people living in the UK and they state that geography matters more than ever when it comes to politics in the UK.

Another ‘new horizon’ for teachers and students is the GCSE exam and teachers will find Bob Digby’s summary extremely helpful when deciding which GCSE specification to choose.

Janet Hutson’s article on ‘Soil sense’ is another aspect of ‘new horizons’. Those of you searching for ideas for teaching soils at key stage 3 will find Janet’s article very helpful. Yet another ‘new horizon’ for some of you is GIS. Raphael Heath’s article encourages readers to embrace the opportunities GIS offers as he assures us it’s not as difficult as it might seem.

Simon Renshaw, Simon Wall and Rob Manger discuss examples drawn from their respective departments with regard to the ‘new horizon’ of assessment without levels and give readers some suggestions that have proved successful in their schools.

I am pleased that the final edition of our celebratory 40th year of publication includes Indra Persaud’s contribution based on her article first published in Geography in 2011 tracing the editorial content of Teaching Geography over the last 35 years. Indra identifies how this journal has always striven to maintain the integrity of school geography. Geography teachers are the ‘expert professionals’, not ‘technicians delivering content’.

Other articles in this edition herald the ‘Year of Fieldwork’, which Teaching Geography is proud to support. John Snelling reminds readers to include fieldwork experience on their CV and Victoria Cook looks back at old issues of Teaching Geography with a fieldwork theme; subsequent issues this academic year will include articles about fieldwork.

Finally, in the last issue we printed a map to accompany Emma Rawlings Smith’s (2015) article which upset some of our readers as the term Arabian Gulf was used on the map rather than their preference for Persian Gulf. There is no intention to offend readers but with our subject we are aware that place names and names of geographical features do vary significantly across cultures.

References
Rawlings Smith, E. (2015) ‘How can we better represent the Middle East?’ 40, 2, pp. 72–75.

Mel Norman at Holywell, Eastbourne. Photo: Tony Norman.
Learning to see climate change

‘It’s not just a geography topic,’ said a colleague of mine recently, ‘it’s a fact of life’. What she was talking about was the role of schools, and geography in particular, in helping young people learn how to live with climate change. It was a timely comment both because 2014 was recognised as the warmest year on record and because the British public is now beginning to wake up to the challenge. A recent research study reported that close to 9 in 10 people in the UK agree that the world’s climate is changing; 76% of respondents said they had personally noticed signs of climate change and 72% agreed that last year’s floods were a sign of things to come (Cardiff University, 2015). The tide of UK public opinion is turning.

Learning to see

In a mere century or so we have burnt half of all the carbon accumulated and buried in the Carboniferous period and pumped it into the air as CO₂. But although many of the things we aspire to equate with high carbon, we are in the habit of putting our comfort and convenience before other people and the environment. In high-carbon societies, one might argue, there is a ‘carbon cover-up’ in which we see the carbon chain, if at all, as a series of unconnected bits, rather than a connected cycle in which we are all inextricably involved. How, therefore, do we help learners to see changing climate as a fact of life rather than just as something one has to learn about in geography? The examples used here are drawn from Stephen Sheppard’s book Visualising Climate Change (2012), in which he encourages learners to ‘see’ carbon more clearly in the local and global community. He identifies key ‘visual indicators’ of a high-carbon lifestyle and illustrates them with dramatic visual imagery, such as 3D and 4D visualizations of future landscapes. Taken together, these provide a carbon recognition scheme for what is largely invisible in our lives.

Seeing carbon

There are several types of visual indicator of a high-carbon lifestyle which can help draw learners’ attention to the links in the carbon chain:

- offshore oil rigs (Figure 1), the Alberta tar sands, fossil fuel-fired power stations: these visual indicators are often sited in remote places
- petrol/diesel-powered vehicles, most TV ads, plastic products and packaging, leaving lights and computers on at night: these visual indicators are much closer to home
- gas explosions, the Gulf of Mexico oil disaster, televised oil clean-ups: these extreme events are all visual indicators of our high-carbon lifestyle.

Using appropriate visual images to make carbon visible makes it easier for both teachers and learners to understand the various ways the carbon chain works in high-carbon societies. In turn, this makes it easier to investigate how the links in that chain came about; their effects (both positive and negative) on our daily lives; and the action that is needed to move on from this socio-cultural, economic and political phase of history. Photographs can be supplied, or students challenged to find their own; then they can be categorised under the main headings below.

Seeing its impacts

There are various environmental visual indicators of the impact created by high-carbon societies. For example, changes in the growing seasons, the pattern of birds nesting and migrating, the frequency and duration of weather outside the usual variation, unpredictable or unprecedented changes in weather, premature deaths. Each school can develop its own local ‘climate change impact profile.’ Environmental visual indicators include:

- melting ice-floes, retreating glaciers, island communities threatened by rising sea levels, dust storms
- torrential rain and flooding, fiercer bush fires, prolonged drought, windstorm damage
- backyard ice rinks, spring coming earlier, new birds at the bird table, water restriction signs, forest die-back
- beach-level tourist development, buildings and infrastructure close to streams and rivers, fire risk for heaths and woodland.

Students can be asked to collect and annotate photos of these and other examples of high-carbon impact.

The affective impact of climate change

Once identified, it is the actual and probable impacts of climate change that cause concern. Common responses include anxiety, anger, resignation and denial, troubled feelings which go against our social and cultural norms. This is why a number of key organisations internationally have drawn attention to the present and future impact of climate change on mental health (Australian Psychological Society, 2014). It is important, therefore, to pay attention to the affective impact of climate change, often not fully acknowledged in the classroom. Learners should be given the opportunity, in pairs or small groups, to discuss their feelings, but this is only possible in a safe and supportive setting in which feelings are acknowledged by both peer group and teacher and not subjected to judgement (Hicks, 2014). As students’ understanding grows their feelings may change.
By acknowledging their feelings and sharing them with like-minded others students can begin to develop a sense of agency – belief in one’s ability to make a difference – and a desire to find others with similar interests. This, plus an appetite to learn more, makes it possible to engage with others in considered action for change, in both the school and the local community (Randall and Brown, 2015). In the context of climate change, such responsible citizenship takes two main forms – adaptation and mitigation.

Adaptation
This means learning how to live with changing weather conditions, in particular higher temperatures, shifting seasons, rising sea-levels, more floods, drought and extreme weather. This will require many changes to the way we live and work, for example how schools and other buildings are designed, where they are located, how we travel, how we farm, the jobs we do. Adapting to climate change is about being prepared in advance for situations that will affect our schools, communities, livelihood and natural environment.

Long ago, geography textbooks used to talk about ‘difficult climates’ and the hazards local people had to face if they had the bad luck to live in the Arctic or the Sahara. While such climates may have seemed difficult to westerners it is unlikely that the locals considered their weather anything other than normal. The weather that we grow up with as children becomes our norm, and weather which adults experience as different or extreme will not necessarily be seen as such by young people. However, teachers should help students to be fully prepared for torrential rain, unexpected flooding and periodic drought, for example. This means having appropriate clothing and agreed safety rules. A sense of normality is important: this is what we do in these circumstances; this is why we do it. Visual indicators of adaptation include:

- strengthening buildings, fire-smart interfaces, urban heat islands, painting roofs white
- sea walls, stream channel reconstruction, beach restoration, storm water swales, retention basins
- water harvesting, intensive food production, backyard vegetable plots, community gardens, farmers’ markets, village shops, volunteer organisations.

Students can be asked to collect and annotate photos illustrating adaptation to climate change. There is some useful material published by the Institution of Civil Engineers, for example, which talks of ‘turning a negative into a positive’ (Institution of Civil Engineers, 2010). Three possible responses to rising sea-level are examined:

- retreat (the sea is allowed to flood some low-level coastal areas)
- defend (building flood defences to keep the sea out)
- attack (moving offshore with buildings floating on stilts).

Mitigation
Mitigation means examining all aspects of life and work in our schools, homes and communities to see how we can reduce the carbon emissions they create. Unless we do this global warming will continue to increase. Mitigation involves rethinking how much energy we use and how it is generated, how energy efficient buildings are (both new and old), how we travel and in what type of vehicle, as well as what our overall carbon footprint is (Carbon Footprint Calculator, 2014). Visual indicators of mitigation include:

- prioritising people and bikes over vehicles, electric and hybrid vehicles, light rail transit, umbrellas and wellington boots.

Figure 1: North Cormorant offshore platform, constructed in 1980, is in the East Shetland Basin of the northern North Sea. This visual indicator of a high-carbon lifestyle is in a remote location, approximately 110 miles north-east of Lerwick in the Shetland in water 161 metres deep.
energy-efficient buildings, rooftop solar panels, outside insulation, wood-burning stoves
• community district heating, higher density housing, co-owned wind farms, grass verges, solar panels on traffic lights.

Students can be asked to collect and annotate photos of these and other examples of carbon mitigation.

The Denby Dale Passivhaus, for example, uses 90% less energy for heating than the average house (Green Building Store, 2015). It was designed as a template for low-energy housing using familiar materials and techniques that any building company could take up (Figure 2). In Aberdare there is a fifteen-year low-carbon project taking place, including solar PV and water heating, heat pumps and low energy street lighting. In terms of transport there needs to be a greater emphasis on bus and rail. There is also increasing availability of electric, hybrid (electricity/petrol), and low CO2 vehicles (recharging electric batteries, of course, from renewable sources).

Acknowledgement
I am particularly indebted to Stephen Sheppard for these ideas on visualising climate change.

References

Historically it is the world’s richer countries which have been responsible for most CO2 emissions so they should also bear the greatest burden for mitigation. As a result of recent campaigning some investors have begun to move away from fossil fuels, for example the Rockefeller Foundation, the World Council of Churches and Glasgow University, the first university to do so in Europe (The Guardian, 2015).

Telling new stories
Stories, it has been said, whether fiction, myths or true accounts, help us hold the beginnings, middles and ends of our lives together. Without inspiring stories we will not have hope: to share and cherish such stories is to maintain hope.

Stories (economic, political, social and cultural) do indeed hold our lives together. They influence much that we do and take for granted because they are so deeply embedded in our subconscious that we often don’t know that they’re there. Fictional stories, real life stories and success stories can also help us find our way in troubled times. They provide something to hold on to so that we don’t give up hope or get lost. They give direction. In the face of climate change the high carbon story now has to be seen as dangerous and therefore redundant. It is not a story that leads to human or planetary wellbeing. What we now need to give us direction are new and exciting narratives of low-carbon change in our schools, homes and communities (Porritt, 2014; Ashden Awards, 2015).

If learners can bring our high-carbon chain into focus then the nature of the old story becomes more visible. It is a story which brought us to this place in history but which no longer serves us well. The new story is one of working towards a cleaner, healthier and safer low-carbon future. If geography is committed to developing a critical futures perspective then there could be interesting times ahead. | TG

Figure 2: This three-bed detached house in Denby Dale, West Yorkshire is the first UK Passivhaus to be built with cavity wall construction. Its design relies on a simple tea cosy effect: with maximum use of super insulation and stringent levels of air-tightness. By combining this with optimum levels of ‘passive solar gain’ (heat from the sun) and Mechanical Ventilation with Heat Recovery systems, Passivhaus design can create buildings that require minimal heating. Photo: www.denbydalepassivhaus.co.uk
Climate change – emerging scientific issues

Greenhouse gas emissions resulting from human activity have been increasing since the Industrial Revolution, but in the past five decades the rate of increase has quickened, driven largely by economic and population growth. Globally, emissions continue to rise and are now higher than ever. This has led to atmospheric concentrations of the major greenhouse gases—carbon dioxide, methane and nitrous oxide—that are unprecedented in at least the last 800,000 years.

The IPCC report (2013) is definitive: the world’s climate has already changed and the observed changes have caused discernible impacts on natural systems such as plants, animals, river flows and glaciers on all continents and across the oceans (Figure 1). These climate changes have also been shown to affect the human population through exposure to drought, flood, heatwaves and storms. Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems.

There are a number of ways of addressing the problem of climate change, including reducing emissions and adapting to changes in sea level and climate, but no single option is sufficient by itself.

The Intergovernmental Panel on Climate Change (IPCC), the leading international body for the assessment of climate change, was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear view on the current state of scientific knowledge about climate change and its potential environmental and socio-economic impacts. The IPCC reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. The latest report was released, in late 2013 and spring 2014 (IPCC, 2014), together with supporting material such as summary videos and posters (IPCC, 2013). The report is available at www.ipcc.ch/report/ar5. IPCC reports are regarded as the most authoritative statement on climate change science because:

- the reports are written by hundreds of leading scientists from all parts of the world
- they are reviewed by the whole research community, therefore they represent the state of knowledge at the time they are finalised
- they are reviewed and approved by the world’s governments through the UN.

Causes of climate change so far

It is extremely likely that human activities caused more than half of the observed increase in global mean surface temperature from 1951 to 2010 (Figure 2).

Between 1951 and 2010, global surface temperatures rose between 0.08 to 0.14°C per decade. During this time:

Figure 2: Global surface temperatures from 1870 to 2010. (a) the black line shows global surface temperatures (1870–2010) relative to the 1961-1990 average. The red line shows climate model simulations of global surface temperature change produced using the sum of the impacts on temperature from natural (b, c, d) and anthropogenic factors (e). Note the different vertical scales. Source: IPCC (2013).
greenhouse gases contributed a global mean surface warming of between 0.5°C and 1.3°C.

- Other anthropogenic forcings¹ (such as land use changes and atmospheric pollution) contributed between –0.6°C and 0.1°C.

- Natural forcings¹ (such as changes in solar activity and in volcanic eruptions) contributed between –0.1°C and 0.1°C.

- Internal variability, the naturally variable processes within the climate system such as the El Niño-Southern Oscillation, contributed between –0.1°C and 0.1°C.

A major contribution to ‘other’ anthropogenic forcing is aerosols, which in this context refer to small particles of liquids or solids, such as fine dust, dispersed in the air. These come from both natural and human sources, and their interactions with radiation and clouds can affect the climate in multiple and complex ways. Some aerosols scatter and reflect solar radiation and therefore tend to cool the climate, while others absorb radiation, causing warming. The balance between cooling and warming depends on the properties of the aerosol (such as its colour) and local environmental conditions. Anthropogenic aerosols have cooled the Earth since pre-industrial times, masking some of the warming from greenhouse gases. In particular, between about 1950–1980, the quantity of aerosols in the atmosphere caused global ‘dimming’.

The observed global mean surface temperature has shown a much lower rate of increase over the past 15 years than over the past 30–60 years, with the trend over the period 1998–2012 estimated to be between one third and one half of the trend over the period 1951–2012. Even with this so-called ‘hiatus’ or pause, the 2000–2010 decade has been the warmest in the instrumental record. The IPCC concluded that the hiatus is probably the result of both a cooling contribution from natural internal variability and a reduced trend in natural forcing (volcanic eruptions and a downward phase of the 11-year solar cycle). During the hiatus, the climate system has continued to accumulate energy, for example warming the oceans and causing the global mean sea level to continue rising.

Food security

Since 1960, negative impacts of climate change on crop yields have exceeded positive impacts (although positive trends are evident in some high-latitude regions) (Figure 3). In the same time, climate change has negatively affected wheat and maize yields globally, as well as in many individual regions. The effects on rice and soybean yields have been smaller in major production regions and globally, with particularly few studies available of soy. The majority of the impact has been on food production; however food access, utilization, and price stability may also have been affected. In recent years, several periods of rapid food and cereal price increases following extreme weather events in key producing regions indicate a sensitivity of current markets to climate. There is a large negative sensitivity of crop yields to extreme daytime temperatures of around 30°C. Temperature trends are therefore important for determining both past and future impacts of climate change on crop yields at subcontinental to global scales. Local temperature increases in excess of about 1°C above pre-industrial levels are projected to have negative effects on yields for the major crops (wheat, rice and maize) in both tropical and temperate regions, although individual locations may benefit.

Human security

The notion of human security encapsulates the vital core of human lives: people’s ability to be free and live with dignity. Human security has direct material aspects, such as life and livelihood, but also less tangible aspects, such as cultural expression and identity (Adger, 2014). There is rarely a single threat to human security, but climate change – because it increases migration, undermines livelihoods, challenges the ability of governments to safeguard populations and compromises the cultural values that are important for community and individual wellbeing – puts it progressively at risk (Figure 4).

In all regions of the world, people adapt to climate variability by migration and mobility. In the past, major extreme weather events have led to significant population displacement, and changes in the incidence of extreme events will amplify the challenges and risks of such displacement. However, many vulnerable groups, particularly in low and middle-income countries, do not have the resources to migrate to avoid the impacts of floods, storms and droughts. Migration may in any case be undesirable: it can lead to changes in important cultural expressions and practices and, in the absence of institutions to manage the settlement and integration of migrants in destination areas, can increase the risk of poverty, discrimination, violent conflict and inadequate provision of public services, public health and education.
Future challenges of climate change

- **Physical impacts**: Sea level rise, extreme events and hydrolog disruption pose major challenges to vital transport, water, and energy infrastructures and can weaken states socially and economically.

- **Territorial impacts**: For example in areas highly vulnerable to sea level rise.

- **Trans-boundary impacts**: Changes in sea ice, shared water resources, and the migration of fish stocks have the potential to increase rivalry between states.

- **Violent conflict**: This can undermine livelihoods, impel migration and weaken valued cultural expressions and practices.

- **Adaptation and mitigation strategies**: Strategies which aim to reduce exposure to climate change, for instance large infrastructure developments or the resettlement of communities against their will, carry risks of disrupted livelihoods, displaced populations, deterioration of valued cultural expressions and practices, and in some cases violent conflict.

On the basis of current evidence about the observed impacts of climate change on environmental conditions, in future climate change will be an increasingly important cause of global human insecurity, and the greater the impact of climate change, the harder it will be to adapt. | TG

Note

¹ Forcing represents any external factor that influences global climate by heating or cooling the planet. Examples of forcings are volcanic eruptions, solar variations and anthropogenic (human) changes to the composition of the atmosphere.

References


Useful weblinks


The Climate Change, Agriculture and Food Security Program’s ‘Big Facts’ website (https://ccafs.cgiar.org/bigfacts) is a great source of accessible facts and images for independent student research.

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The UK General Election of 2015 was held on 7 May and the results were remarkable. The nations of the once-United Kingdom divided in a way that has not been seen for at least a century. A new major third party, the Scottish National Party (SNP), emerged as a significant force, taking 56 of the 650 parliamentary constituencies. Previously the best the SNP had managed was just 12 of Scotland’s 71 seats, in 1974. The last time a third party rose so quickly and so strongly was in 1918, when Sinn Féin (Irish for ‘we ourselves’) won 73 seats across Ireland in the last General Election before the formation of the Irish Free State in 1922. The SNP secured fewer seats in 2015 because there were hardly any more they could win: SNP candidates only stood for election in Scotland, and the total of Scottish seats is 59. The Conservative, Labour and Liberal parties each held one of the remaining three Scottish seats: elsewhere in Scotland their share of the vote was minimal.

Conventional maps of the UK usually show each part of the country in rough proportion to its land area (Figure 1). But Scotland contains proportionately more land than people, and as it is people who get to vote, its rural constituencies are much larger than in most of the UK. Because of this the SNP’s victory is over-emphasised on the traditional map – Scotland did not receive the share of the overall vote that it might imply. Furthermore, the three constituencies that the SNP failed to win in Scotland are shown very differently on the conventional map. The Liberals only held one seat, Orkney and Shetland, but this thinly populated area figures very large on the conventional map: they appear to have done far better. Similarly, the Conservatives held on to the single rural constituency of Dumfriesshire, Clydesdale and Tweeddale, which looks very large on the conventional map. In contrast, a tiny speck of red on the conventional map represents Labour’s hold of Edinburgh South. The election result has radically changed politics in Scotland: but Scotland is only a small part of the UK.
The Conservative majority
The conventional map also over-emphasises the Conservative victory – contrast the near-solid blue block in Figure 1 with the attenuated ribbons of blue in Figure 2. In fact, looking at Figure 2 it is quite hard to see how the Conservatives were able to form a government. This is partly because area in the cartogram is drawn in proportion to total population, not just those who are on the electoral roll and chose to vote; but also because the Conservatives only just won a majority of seats – 330 out of a total for the UK of 650 – so the blue areas are only just a majority of the area in the map.

Hardly any trace remains of the Liberal Democrats, who managed to hold on to only eight seats. One reason for the Conservative victory was that they took 26 seats from the Liberal Democrats. The Conservatives polled the most votes, some 11.3 million, mainly increasing in the areas where they were already most popular. The Conservative change cartogram (available to download) shows that the Conservative vote actually fell in 240 constituencies and rose by less than 2% of the available electorate in a further 137 seats. Almost always this was because they picked up support (net) from former Lib-Dem voters. The Conservative share cartogram (available to download) shows clearly that Conservative support is strongest in rural areas and weakest in Scotland, Northern Ireland and most large cities.

So how did the Conservatives win the 2015 election? Their victory is down to a number of factors. The rise of the SNP and the United Kingdom Independence Party (UKIP) split the opposition. Pre-election polling by Ipsos MORI, adjusted for the actual results, shows that Labour had a clear lead only amongst younger women, voters in social class DE, private and social renters, and black and minority ethnic voters (Skinner, 2015). The cartogram in Figure 3 demonstrates that turnout was higher in areas where people were more likely to vote Conservative and where population turnover, poverty and economic precarity were lower.

Other political parties
There was also a relatively new political party in Britain. UKIP, formed in 1993, made little impression on general elections until 2015, when it won 12.6% of the 30.7 million votes cast. This made it the third largest party by popular vote, but even so, because of the ‘first past the post’ electoral system, it only secured one seat at Westminster. There was a swing to UKIP in more northern, less affluent areas (see the cartogram available to download) but not in London. The rise of UKIP reflects the trend in continental Europe, where most countries have a far-right, nationalist party that draws much support from economically depressed areas where people fear change and population mobility. The Green Party also performed well in the election, securing 1.2 million votes (3.8%); but again secured just one seat. A cartogram (available as a download) reveals that their share of the vote increased most in areas of high population density. Under a system of proportional representation, more people might have voted Green, as they do in much of the rest of Europe where such voting systems exist.

The Labour party vote
Finally there is the main opposition party. Apart from in Scotland, Labour saw their support rise most where they were already strongest, and the map of Labour support (available as a download) shows that their appeal to voters across the UK was far more widespread than that of the Conservatives: but the distribution of their support was less favourable to them than the distribution of Conservative support. Losing all but one of their seats in Scotland did not change the electoral arithmetic because the Liberal Democrats and Conservatives did not win any of those Scottish seats from Labour.

Voting and the electoral system
Despite nearly all the polls suggesting that the election was going to be too close to call, almost 16 million people, 33.9% of the electorate, eligible and registered to vote, did not vote. Some of this may be down to voter apathy; however, many of those non-voters may have been unable to vote because they had moved away from their registered address within the past year or two and failed to register at their new address. We do know that population mobility is increasing: fewer people
stay in the same home for long, and many have to move for work reasons. Another cause may be changes to the voter registration system: since 2014 it is no longer possible for one member of a household to register all the voters there, or for universities to register all their students.

The results of UK elections are not just affected by how many votes a party wins, but their distribution. If the number of parliamentary seats were proportional to the votes cast, and as many people had voted for each party as did under the current ‘first-past-the-post’ system, the number of Conservative seats would have fallen from 331 to 239, Labour from 232 to 197 and the SNP from 56 to 31. Northern Irish parties would still have some 18 seats, if the voters there were not given the option to vote for any other parties. On the other hand, Plaid Cymru seats would have risen from three to four, Liberal Democrat from eight to 51, Green from one to 24 and UKIP from one to 82. In these circumstances it is easy to see that many voters might become disillusioned with the electoral system: their votes appear not to matter. It is possible that under a proportional voting system more people would vote and the electoral landscape would change. This is speculation: but in mainland Europe, which does have more proportional voting systems, many more parties are represented in government.

### Voter concentration

The 2015 General Election was a potential watershed. The graph (Figure 4) shows how the votes for the Conservative Party became more geographically concentrated across the UK than they had been even in 1918. 1918 saw the election of some 73 Members of Parliament for a third nationalist party in Ireland and the breakaway of the Republic, eventually by popular support although the full story is far more tortuous and complex than that (some people in Ireland call it a revolution). The statistic being plotted in the graph is the minimum proportion of Conservative voters who would have to move between parliamentary constituencies if there were to be an even spread of such voters across the UK. This measure of segregation rose dramatically between 2010 and 2015 only because of rising political polarisation within England. The political geography of the UK has never been as divided as it became in May 2015.

### Little change?

The map showing which party won or held each seat and which party had held it before 2015 (see Figure 5) gives an impression of little change. When it comes to the 650 parliamentary seats, in percentage terms that is true. Although 56 of the 59 Scottish seats, and 37 of the 46 held in England and Wales by the Liberal Democrats, changed hands, and two changed in Northern Ireland, of the two main political parties Labour won 10 seats from the Tories and lost eight to them. In total 113 seats (17 %) changed hands: 83 % did not.

In terms of votes cast, however, the picture is very different. After the election newspaper headlines were dominated by the collapse of the Liberal vote and the surprise Conservative overall majority, but the other story was of fundamental change. The rise of UKIP and the Green Party, in terms of votes cast, if not parliamentary seats, split the opposition to the dominant Conservative force in British politics. Conservative seats were becoming more Conservative, Labour seats more Labour, and with the near-annihilation of the Liberal Democrats, the party of ‘the middle’, the country polarised politically.

### So what will happen next?

Figure 6 shows which parties are now the major challengers in each seat across the UK. Blues and reds dominate. Labour has become again the major opposition in almost all of the South of England (but it is a long way behind in many areas). There is a smattering of seats in which the Greens came second, more where UKIP and the Librals are the (often distant) challengers. Thus in a ‘first-past-the-post’ election it is again a two-horse-race: Labour verses Tory. However, if the
Labour Party is to be as popular as the Tories are today they will need to increase their share of the vote by 12.5% – as much as UKIP’s total vote.

Registering to vote
Registering to vote matters. Before the next election – 2020 if not before – there will be a boundary review. The boundaries of parliamentary constituencies will be redrawn according to the number of people who are registered to vote in each area by autumn 2015. Register to vote now and you change the very boundaries of the constituencies that candidates will contest at the next election, and possibly several elections to come. If people in urban areas do not register now (see Figure 7), then even if there is a majority vote against the current government in 2020 that majority may not win enough seats to form a government. Geography matters when it comes to politics in the UK – it matters more than it ever has before.

Polling by Ipsos MORI on election day showed that turnout fell by 8% among men aged 18-24 (only 42% of whom voted). It also fell by 4% among private renters (only 51% of whom voted). It fell by 1% among the poorest social classes in the UK (‘semi-skilled’ and ‘unskilled’ workers, only 57% of whom voted). A huge number of young, poor and precariously housed people could have voted, but didn’t. One day they could matter electorally far more than they matter now. Your students could easily be among them.

Note
The authors would like to thank Ron Johnston and Aniko Horvath for their comments on earlier drafts of this article.

References and further reading
Choosing a new GCSE specification

There are new GCSE specifications from 2016. Bob examines the changes, gives an overview of the content of each draft specification and gives advice on the selection of which specification may be right for your school.

It’s time for specification change! Geographers should not fear this; indeed, we should welcome it, to reflect a changing world. When current GCSEs were developed during 2007–8, China was the fifth largest economy in the world; now it is the second. While the economies of the world’s wealthiest countries barely grew between 2007–11, the output of the ‘emerging economies’ increased by almost 20%, according to The Economist (2011). During the same period, the population of megacities in high-income countries (e.g. London) reversed the trend of five decades of population decline, such that London now ranks among the world’s fastest growing urban areas. Time for change indeed!

However, the new GCSEs from 2016, officially known as GCSE (9-1), are driven by change of a different nature, for they are prompted by a political desire to define subjects through content. Current GCSEs were developed on the basis of subject criteria set by the Qualifications and Curriculum Authority (QCA) (2007). The criteria consisted of general statements about, for example, the proportion of physical geography that should be included in a GCSE geography qualification, or a requirement that sustainability should form a core focus. The new requirements, published by the Department for Education (2014), specify actual subject content to be taught which the Awarding Bodies (ABs) will have to include.

Key changes in content

Three changes are worth noting:

- The new GCSEs discussed in this article apply to England. From 2016, Wales will have its own GCSE qualifications with different arrangements; for example, Welsh GCSE geography specifications are likely to retain controlled assessment. The brand name ‘WJEC’ now applies to Welsh schools only. English qualifications are being developed under a new brand, ‘Eduqas’.

- From June 2016, no further account will be taken of Level 1/2 certificates in progress measures, and will no longer count in performance tables when new GCSEs become available. For geography, 2017 GCSE results will be the last ones to count and Level 1/2 certificates in geography are being withdrawn.

- Similarly, international GCSEs (IGCEs) will continue to be offered for independent schools, but will not count in performance tables or attract funding.

Figure 1: The schedule for current and new GCSE specifications.

Table: Schedule for current and new GCSE specifications.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Autumn 2015</th>
<th>Autumn 2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Last two-year GCSE intake</td>
<td>Last one-year GCSE intake</td>
<td>Final summer examinations</td>
<td></td>
</tr>
<tr>
<td>2016 specification GCSE (9-1)</td>
<td>First teaching of three-year GCSE</td>
<td>First teaching of two-year GCSE</td>
<td>First teaching of one-year GCSE</td>
<td>First new GCSE examinations</td>
</tr>
</tbody>
</table>

Figure 2: Do the new GCSEs apply to me?

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Figure 2: Do the new GCSEs apply to me?

Key changes in content

All ABs have to comply with the new subject content in order to gain approval from Ofqual. The content areas are:

1. geography of the UK
2. geomorphic processes and landscape
3. changing weather and climate
4. global ecosystems and biodiversity
5. resources and their management
6. cities and urban society
7. global economic development issues.

In addition, fieldwork must be carried out in two separate environments, and a range of geographical skills must be taught, including mathematical and data processing skills.

The content does not imply a specific geographical approach or sequence of study; ABs have been free to develop content in any way they consider appropriate (Figure 3). However, teachers comparing the seven specifications will see very similar topic headings (Figure 4). Broadly, two models have emerged in developing the new specifications, which very much reflect current GCSEs:

- A thematic approach, defining content by physical/human themes. Specifications adopting this approach are AQA (which has developed a single specification, unlike the other three which have developed two), Edexcel A, WJEC Eduqas A, and OCR B.

Three changes are worth noting:

- The new GCSEs discussed in this article apply to England. From 2016, Wales will have its own GCSE qualifications with different arrangements; for example, Welsh GCSE geography specifications are likely to retain controlled assessment. The brand name ‘WJEC’ now applies to Welsh schools only. English qualifications are being developed under a new brand, ‘Eduqas’.

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Figure 2: Do the new GCSEs apply to me?
AQA

The AQA specification covers familiar themes and topics from current GCSE courses, providing sound progression from key stage 3 to Post-16. There is a balanced coverage of physical, human and environmental geography, and a thematic approach, with an emphasis on contemporary issues and future changes. It encompasses a wide range of locations, places, environments and processes, and provides the basis for a broad understanding of geography. There is a choice of content in selected themes, including landscapes, ecosystems and resources, allowing teachers to select specific content and learning experiences. The specification requires the use of a range of investigative skills and approaches, including maths, statistics and modern information technologies. An issue evaluation and decision-making exercise based on pre-released resource contributes a problem-solving element to assessment. There are a variety of assessment techniques, including multiple choice questions, short structured and stimulus/data response questions, and extended writing opportunities.

Edexcel

Pearson have developed two specifications based on their current courses. Specification A takes a thematic approach organised by physical and human environments, including a third paper investigating fieldwork and people-environment challenges faced by the UK. Specification B offers an issues-based approach organized by UK and global geography, including a third decision-making paper investigating people-environment issues at a global scale. Both specifications build on concepts taught at key stage 3 and prepare students for AS and A level study. Prescribed fieldwork environments link to the specification content and remain the same every year. Content requirements are fully exemplified with geographical overview and geographical depth signposted so it is clear what to teach. Geographical skills, fieldwork and synoptic links are also integrated within the course content. Command word definitions are published within the specifications and are used consistently in combination with mark tariffs and mark schemes in extended writing questions.

WJEC Eduqas

Each WJEC Eduqas GCSE geography specification takes an enquiry approach to geographical information, issues and concepts, based on the principle that geographical education should enable learners to become critical and reflective thinkers by engaging them actively in the enquiry process. Content is organised around enquiry questions and learners should be encouraged to pose geographical questions of their own. Fieldwork is emphasised in each of the specifications. The shift from controlled assessment is viewed as an opportunity to move beyond simple tasks of measurement, recording and presentation to a concept-driven task designed to raise awareness of the true nature of geographical fieldwork. Methods and concepts that must be studied within each cycle will be released to examination centres at least two years before the year 11 examination. This structure has been designed to allow teachers complete flexibility in choosing contexts and appropriate locations for their fieldwork. The assessment will challenge learners to apply what they have learned through specific fieldwork in local contexts to the wider context of UK geography. WJEC Eduqas Geography A is derived from the current WJEC Geography A specification and retains an element of choice so that examination centres can provide additional breadth and depth to the core geography provided in the subject content. WJEC Eduqas Geography B is derived from the current WJEC Geography B specification and retains its focus on issues, values and attitudes, and problem solving.

OCR

The two new OCR GCSE specifications have contemporary topics to engage students and take a holistic approach to fieldwork and geographical skills by embedding them within study and assessments. OCR Geography A (Geographical Themes) takes a thematic approach, giving opportunities to study the geography of the UK and compare and contrast this with content on a global scale. OCR Geography B (Geography for Enquiring Minds) follows an enquiry approach to learning, with a decision making element to the assessment to hone students’ problem solving skills. Both specifications are clearly worded with no hidden content to support all learners. Both qualifications have more minutes than marks to help support the loss of tiering. Assessments are clear and concise, with a range of question styles from multiple choice, to short structured and extended response. Fieldwork requirements are outlined to give teachers flexibility over the location and context most suitable for their school and students.
<table>
<thead>
<tr>
<th>AQA</th>
<th>Edexcel A</th>
<th>Edexcel B</th>
<th>WJEC Eduqas A</th>
<th>WJEC Eduqas B</th>
<th>OCR A</th>
<th>OCR B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper 1: Living with the Physical Environment (1 hr 30 mins) 35%</td>
<td>Paper 1: The Physical Environment (1 hr 30 mins) 37.5%</td>
<td>Paper 1: Global Geographical Issues (1 hr 30 mins) 37.5%</td>
<td>Paper 1: Changing Physical &amp; Human Landscapes (1 hr 30 mins) 35%</td>
<td>Paper 1: Investigating Geographical Issues (1 hr 45 mins) 40%</td>
<td>Paper 1: Living in the UK Today (1 hr) 30%</td>
<td>Paper 1: Our Natural World (1 hr 15 mins) 35%</td>
</tr>
<tr>
<td>• Challenge of Natural Hazards</td>
<td>• The Changing Landscapes of the UK</td>
<td>• Hazardous Earth</td>
<td>• Landscapes and Physical Processes</td>
<td>• Changing Places – Changing Economies</td>
<td>• Global Hazards</td>
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<tr>
<td>• Physical Landscapes in the UK</td>
<td>• Weather Hazards and Climate Change</td>
<td>• Development Dynamics</td>
<td>• Changing Environments</td>
<td>• Changing Economies</td>
<td>• Changing Climate</td>
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</tr>
<tr>
<td>• Living World</td>
<td>• Ecosystems, Biodiversity and Management.</td>
<td>• Challenges of an Urbanising World.</td>
<td>• Environmental Challenges</td>
<td>• Urbanising World.</td>
<td>• Distinctive Landscapes</td>
<td></td>
</tr>
<tr>
<td>Paper 2: Challenges in the Human Environment (1 hr 30 mins) 35%</td>
<td>Paper 2: The Human Environment (1 hr 30 mins) 37.5%</td>
<td>Paper 2: UK Geographical Issues (1 hr 30 mins) 37.5%</td>
<td>Paper 2: Environment &amp; Development Issues (1 hr 30 mins) 35%</td>
<td>Paper 2: Problem Solving Geography (1 hr 30 mins) 30%</td>
<td>Paper 2: The World Around Us (1 hr) 30%</td>
<td></td>
</tr>
<tr>
<td>• Urban Issues and Challenges</td>
<td>• Changing Cities</td>
<td>• The UK’s evolving Physical Landscape of the UK</td>
<td>• Weather, Climate and Ecosystems</td>
<td>A problem-solving paper in three parts assessing the content from across the three themes described in Paper 1.</td>
<td>• Ecosystems of the Planet</td>
<td></td>
</tr>
<tr>
<td>• Changing Economic World</td>
<td>• Global Development</td>
<td>• The UK’s Evolving Human Landscape</td>
<td>• Economic Development Issues</td>
<td>Paper 2: Geographical Skills (1 hr 30 mins) 40%</td>
<td>• People of the Planet</td>
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<tr>
<td>• Resource Management</td>
<td>• Resource Management</td>
<td>• Fieldwork in a physical and human environment</td>
<td>• Social Development Issues or Environmental Changes</td>
<td>Paper 3: Applied Fieldwork Enquiry (1 hr 15 mins) 30%</td>
<td>• Environmental threats to the planet</td>
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<tr>
<td>Paper 3: Geographical Applications (1 hr) 30%</td>
<td>Paper 3: Geographical Investigations: Fieldwork and UK Challenges (1 hr 30 mins) 25%</td>
<td>Paper 3: People and Environment Issues – Making Decisions (1 hr 30 mins) 25%</td>
<td>Paper 3: Applied Fieldwork Enquiry (1 hr 15 mins) 30%</td>
<td>Paper 3: Geographical Skills (1 hr 30 mins) 40%</td>
<td>Paper 3: Geographical Skills (1 hr 30 mins) 40%</td>
<td></td>
</tr>
<tr>
<td>• Issue Evaluation (from pre-release)</td>
<td>• Physical Fieldwork</td>
<td>• People and the Biosphere</td>
<td>• Approaches to Fieldwork Methods</td>
<td>• Geographical Skills</td>
<td>• Global Hazards</td>
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<tr>
<td>• Fieldwork (human and physical including interaction)</td>
<td>• Human Fieldwork</td>
<td>• Forests Under Threat</td>
<td>• Fieldwork Enquiry</td>
<td>• Fieldwork Assessment</td>
<td>• Changing Climate</td>
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<tr>
<td></td>
<td>• UK Challenges</td>
<td>• Consuming Energy Resources</td>
<td>• In a physical and human environment</td>
<td>• Application to UK contexts</td>
<td>• Distinctive Landscapes</td>
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<tr>
<td></td>
<td></td>
<td>• Making Geographical Decisions</td>
<td></td>
<td></td>
<td>• Sustaining Ecosystems</td>
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</tbody>
</table>

WJEC Eduqas will select one fieldwork method and one concept for two contrasting investigations.
• An issues-based approach, which defines content largely by its topicality and which is embedded in a people-environment approach. Specifications adopting this approach are Edexcel B, WJEC Eduqas B and OCR A. These specifications have a place-basis for their examinations, for example Edexcel B has a global focus for Component One and a UK focus for Component Two.

Both models include a clear requirement for fieldwork skills, including map and statistical skills, plus fieldwork skills that go beyond those developed for Controlled Assessment.

That said, there are variations:
• OCR B – a specification which has traditionally adopted an issues-based approach – has developed an issues-based approach but within a thematic framework.
• In addition, tectonic hazards, which is omitted from the compulsory content (as well as at key stage 3), has been included in new specifications from AQA, Edexcel B, WJEC Eduqas A and OCR B.

Key changes in assessment
From 2016, all GCSE specifications will be assessed:
• by linear terminal examination. No further modular or unitised examinations will exist
• by un-tiered papers, for the first time since 1994
• using the new grading system from 1 to 9 (Figure 4). The bottom of grade 4 will equate to the bottom of the current grade C (essential in maintaining consistency in data dashboards in schools), and the bottom of grade 7 will equate to the current grade A boundary. Grade 9 will be determined statistically, representing the top 20% of those awarded grade 7 or above.

Changes to examinations
The new un-tiered examinations are very different from the GCSE geography examinations teachers and students are used to.

1. ABs will now have to set papers which will reliably assess all ten grades (1 to 9, plus ungraded). That means most specifications have longer papers and more marks. Where there are options within a topic (for example, in Edexcel A where there is a choice of two from rivers, coasts, or glacial landscapes), exam papers will be longer and candidates will have to navigate their way through.

2. With four new Assessment Objectives (AOs) and their weightings (Figure 5), examinations will be tougher. 35% of examination marks will be for AO3 Application – arguably the toughest of the four AOs. It has been clear that command words should be used from AO3 which will stretch the most able. All assessments will require candidates to be able to respond to tougher command words, such as ‘analyse’, ‘evaluate’, ‘assess’, or ‘discuss’. Students already confront ‘comment’ and ‘examine’, and they already evaluate in Controlled Assessment (albeit with some guidance), but the new exams will undoubtedly be more demanding.

3. The examination experience for many average- or below average-ability candidates is likely to be different. Currently, Foundation Tier candidates who achieve a grade C have a positive exam experience. They sit an examination paper in which approximately two-thirds of marks will deliver a grade C. This means that they face papers where they are probably able to access all questions. In the new examinations, this is less likely:
• the new grade 4 boundary will have three grades below it and six above. This means that it is likely to be awarded at about one third of the marks – say 30 on a 90-mark paper. Current C grade candidates are therefore likely to find examinations tougher.
• Similarly, the new grade 7 is likely to be awarded at about two-thirds of the marks.
Key changes in fieldwork

With the removal of Controlled Assessment, fieldwork is now only assessed within terminal examinations. However, the requirement for fieldwork has been strengthened, with two days’ fieldwork specified within the subject content, and all AEs have to ensure that these are carried out as part of an investigative process in two contrasting environments. These might be physical or human, urban or rural. Headteachers will be required to sign a statement affirming that fieldwork investigations have been carried out in accordance with these requirements.

Six stages in the enquiry process are stated within the subject content. These are to form the basis of assessment. The stages are:

i. understanding of the kinds of question capable of being investigated through fieldwork and an understanding of the geographical enquiry processes appropriate to investigate these

ii. understanding of the range of techniques and methods used in fieldwork, including observation and different kinds of measurement

iii. processing and presenting fieldwork data in various ways including maps, graphs and diagrams

iv. analysing and explaining data collected in the field using knowledge of relevant geographical case studies and theories

v. drawing evidenced conclusions and summaries from fieldwork transcripts and data

vi. reflecting critically on fieldwork data, methods used, conclusions drawn and knowledge gained (DFE, 2014).

Done properly, these stages may offer a broader fieldwork experience than the rather limiting requirements for Controlled Assessment, where Examiners’ Reports have commented upon routine tasks performed by candidates, rather than developing any sense of enquiry.

Specifications vary in their approach:

- Edexcel have identified environments in which to carry out fieldwork. These are linked to the specification content.
- WJEC Eduqas have framed their requirements based on one fieldwork methodology and one geographical concept.
- AQA and OCR leave teachers free to choose topics and locations from within the specification content.

How should I choose a specification?

- Do you prefer a thematic approach (split by physical/human) or an issues-based approach (split by scale or place, e.g. global vs UK)?
- Do you have particular favourite physical or human topics? With so little variation between the specifications, there may seem to be little to differentiate them. However, tectonic hazards have been omitted from required subject content. In spite of this, AQA, Edexcel B, Eduqas A and OCR B have included it.
- For fieldwork, do you prefer a specified content approach (Edexcel), a skills and concepts approach (WJEC Eduqas) or do you prefer to be free to choose whichever fieldwork topics you like from within the specification content (AQA and OCR)?
- Do you want a specification with a decision-making exercise? If so, Edexcel B, Eduqas B and OCR B have included one, and AQA has an ‘Issue Evaluation’.

Notes

This article, written in July 2015, refers to the draft specifications which may change during the review by the regulations.

References

Creating and deploying ‘hinge’ questions

In order to generate a ‘need to know’ (Roberts, 2006) in students’ imaginations when planning a learning sequence with an enquiry-based approach, teachers of geography typically head up their enquiry with a ‘rich’ or ‘big’ geographical question, such as ‘Why are some places more suited to particular forms of renewable energy production than others?’ (Weeden and Lambert, 2006). As the learning sequence progresses and smaller geographical questions are explored, students come to understand how their newly acquired knowledge interacts to address the thrust of the enquiry question. It is usually obvious to teachers that a huge learning payload is delivered as this knowledge is synthesised in the students’ minds.

During a geographical enquiry, teachers continually question students in an effort to assess the level of their understanding. However, obtaining useful whole-class data as students navigate an enquiry is challenging. Although it may please some school leadership teams, assessing progress by marking every student’s work at the end of each lesson is unlikely to be sustainable: eliciting evidence of student achievement and progress without generating vast piles of marking requires more agile methods of assessment. This article describes how the formative assessment technique of hinge questions assists in obtaining evidence of student progress and achievement.

Formative assessment is a powerful tool for raising achievement in schools. Inside the Black Box (Black and Wiliam, 1998) challenged teachers to seek new ways of evidencing student achievement which could be reviewed to make better-informed modifications to their classroom practice:

*The quality of the evidence – and, therefore, the quality of the instructional adjustments – depends on the quality of the questions asked* (Wiliam, 2011, p.93).

Hinge questions are multiple-choice assessment questions which require all students to respond. On his blog history teacher Harry Fletcher-Wood (2013) describes a hinge question as a technique which allows the teacher to check for understanding at a ‘hinge-point’ in a learning sequence, because of two interlinked meanings:

- it is the point where you move on from one key idea/activity/point to another
- understanding the content before the hinge is a prerequisite for the next phase of learning.

The deployment of a hinge question allows teachers to identify any student misconceptions as the enquiry unfolds, so they can make adjustments based on the evidence. Despite their pre-emptive efforts and carefully constructed lesson plans, teachers are frequently surprised by students’ misconceptions when exploring new geographical content. Hinge questions have the capacity to quickly reveal student misconceptions at a whole-class level, so interventions can be made promptly. At the most fundamental level, designing an effective hinge question requires teachers to have a clear understanding of both their learning intention(s) and students’ potential misconceptions. Although devising hinge questions can be time consuming and challenging, they are a powerful tool that can be reused with different classes annually.

Sharing high-quality questions may be the most significant thing we can do to improve the quality of student learning (Wiliam, 2011, p.104).

Creating hinge questions

The following summary, influenced by Dylan Wiliam (2011), provides a range of subject-specific examples and guidance for designing an effective hinge question. Wiliam suggests that when designing hinge questions teachers should:

- focus on the critical aspects of the learning intentions, as opposed to ideas that are not essential for further progression
- receive student responses promptly. Ideally, students should respond within one minute and teachers should interpret responses within thirty seconds (figure 1). Hinge questions are a quick check on understanding, not a new piece of work
- aim to ensure it is impossible for students to reach correct answers using an incorrect thought process.

Creating and deploying ‘hinge’ questions

Simon describes how the formative assessment technique of ‘hinge’ questions can support geographical enquiry and provide useful evidence of student progress.

Accompanying online materials
Two examples of geographical hinge questions

What are scree slopes?

In a year 10 lesson which was part of a mountain landscapes unit, students explored the question ‘How do physical processes create mountain landscape features?’. Students had prior knowledge of the role of physical processes in the formation of desert landscapes, but the hinge point in this lesson was students’ ability to understand the significance of freeze-thaw weathering as the driving process in the formation of scree slopes.

Display an image of a scree slope (Figure 2) and ask students to describe what they can see, but also to pay particular attention to the appearance, angle and surface of the slopes in the image. Then show a video of a runner on a scree slope (www.youtube.com/watch?v=B5FMkCY5nCw) and ask students to consider how the material on the surface of the mountain slope was formed. Students sequence evidence cards (Figure 3) to explain the formation of the rock fragments; to support their work display a diagram showing the processes of freeze-thaw weathering.

To assess their emergent understanding of the formation of scree slopes, at this point the teacher deploys a hinge question and students respond with their choice (Figure 4).

The nature of this whole-class response to a diagnostic question allows teachers to use the responses to elicit the thinking behind their choices. This gives rise to conditions in the classroom where students can act as mutual learning resources and address each other’s misconceptions. To provide a further degree of challenge, teachers can discuss why north-facing slopes in the northern hemisphere might be more conducive to scree slope formation: this can create a useful link between prior learning, about the impact of aspect on mountain climate, and the current enquiry into physical processes and landscape features.

Why is Svalbard so cold?

In a year 8 lesson, part of a scheme of work on Fantastic Places, students carry out an investigation into the physical and human characteristics that make Svalbard a unique location (Figure 5). They explore the question ‘Why does air temperature vary across the world?’ During the sequence of activities students interrogate atlases to locate Leicester and Svalbard, interpret climate graphs of Svalbard and Leicester and consider a map of average global annual air temperature and a diagram showing the sun’s rays meeting the Earth. A hinge question is used at this point to assess where students are in their understanding (Figure 6). The question seeks to establish whether students understand that the spherical nature of the planet helps to explain why places near the Equator are warmer than places near the poles. Typically, year 8 students know that locations near the Equator are hotter and polar regions are colder: but they often do not know, or have many misconceptions about, why this is the case. Hence the learning intention behind the key enquiry question for this lesson.

This question requires all students to think carefully about physical processes on a global scale and select the most appropriate response. If a class responds with C, the teacher can be reasonably confident that the students understand that the shape of the Earth has a significant impact on differences in air temperature across the globe. In the past, year 8

| Water from rainfall or melting snow and ice becomes trapped in a crack or joint. | If the air temperature drops below freezing the water will freeze and expand by 9–10 %, putting pressure on the rock. |
| The ice will melt when the temperature rises above freezing. | If this process happens repeatedly the rock will weaken and eventually shatter into angular fragments. |
| The fragments may then be deposited as scree at the foot of the slope. | Freeze-thaw weathering is most evident where the temperature fluctuates around 0°C, e.g. on north-facing slopes in the northern hemisphere. |
students had offered explanations A, B and D, so these are used as distracters.

In the reflection stage, during which students develop their thinking, the question of global air temperature anomalies usually arises and there is a brief exploration of why these occur. Although this provides an additional degree of challenge to students’ thinking, teachers do not usually dwell on these anomalies: the year 9 curriculum provides opportunities to explore the interactions between global climate patterns, atmospheric circulation, surface albedo and ocean currents.

**Conclusion**

While they can be difficult to devise, hinge questions are a powerful diagnostic tool which can help teachers elicit evidence of student understanding as a geographical enquiry progresses. Additionally, collaborative attempts to devise and refine hinge questions can facilitate subject-specific professional development within a department. Their development and refinement allows groups of teachers to focus squarely on the core learning intentions and geographical concepts which underpin their particular enquiry sequence. Indeed, since the removal of national curriculum levels, Tim Oates, Group Director of Assessment Research and Development at Cambridge Assessment, has suggested teachers should “…think hard about questions they put to children both through question and answer and on paper. They need to really probe pupils’ understanding.” He also urges them to become ‘assessment kleptomaniacs’ – building banks of questions from the internet and other sources – to support learning and to see if a child has understood the key ideas’ (Oates, 2014).

Investing time in the development of hinge questions will allow teachers to begin to curate a range of diagnostic assessment items for their learning sequences which not only probe the extent of student understanding but also, crucially, give teachers the chance to adapt their teaching and explanations to ensure individual and whole-class learning during a geographical enquiry.

**References**


Simon Wall and Rob Manger

Going SOLO to enhance learning and teaching

Simon and Rob explore how use of the SOLO technique has enhanced learning, teaching and assessment in their geography department.

Accompanying online materials

... I like using SOLO because it makes you think about some of the easier ideas first and then gets you to think more about why I think the way I do ... (year 7 student).

‘SOLO’ stands for the ‘Structure of the Observed Learning Outcome’. The SOLO taxonomy was devised by Biggs and Collis (1982) and developed by Hook and Mills (2011). It describes the stages through which a student comes to understand a subject, classified as levels of increasing complexity (Figure 1). We believe that SOLO provides an holistic approach to learning, teaching and assessment by giving teachers and students a common language for learning. This allows students to confidently self and peer-assess progress; and supports teachers in differentiating planning, questioning and resources in the short and medium-term. Through worked examples, this article explores how SOLO has enhanced learning, teaching and assessment in our geography department and shows how this simple, robust taxonomy has been applied to the 2014 National Curriculum.

Higher order thinking (HOT) SOLO hexagons

HOT SOLO hexagons, devised by Pam Hook (Hook and Mills, 2011) are a useful adaptation of the tried and tested ‘mysteries’ technique, as the hexagons do not restrict students to linear sequences: they change the emphasis from sequencing to the justification for the geographical links between a wide range of geographical concepts.

... I like it because there isn’t always a ‘right or wrong’ answer and [it] gets you to think about why one card links to lots of others which means I get to relational [level] really quickly ... (year 9 student).

What were the consequences of the Haiti earthquake for Mrs Antoine?

The example below outlines how SOLO taxonomy, applied to a mystery, can help students quickly scaffold their ideas and encourage them to think like a geographer. This example is part of an assessment for our ‘Earthquakes, Volcanoes and Tsunamis’ scheme of work, the mystery investigates the plight of Mrs. Antoine, a victim of the earthquake that struck Haiti in January 2010. A hexagon template can be downloaded from http://pamhook.com/solo-apps/hexagon-generator.

Following a brief introductory video to set the scene, students are given a pack of hexagons with prepared statements on them (these can be downloaded from the online resources accompanying this article). The pack also includes additional blank hexagons and sticky notes.

... Sometimes I use hexagon cards to solve mysteries. When you see all the cards you think – where do I start? ... Though what I now do is start with an idea and build it up with other hexagons ... (year 9 student).

Students at the prestructural stage will begin to read the statements on the hexagons but may have very little awareness of how they can be connected. We find that students at this stage begin to loosely categorise by name or geographical concept(s) but are not confident in explaining the relationships between them.

At the unistructural stage, students begin to make confident links through one geographical

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Figure 1: Defining levels of SOLO taxonomy.
idea and are able to explain the connections. In this instance, they have understood that Mrs Antoine is trapped beneath the rubble and made the geographical link with cards which describe the vulnerability of squatter settlements to earth tremors (Figure 2). Other cards allow students to make inferences about population density and how long it took before Mrs Antoine was found.

At the multistructural stage, students have developed a sequence for two other concepts: the causes of the earthquake, and the challenges facing international aid agencies responding to the crisis. This stage of the process allows students to categorise their thoughts on the causes and effects of seismic activity and responses to it and gain confidence in their geographical thinking by focusing on developing one idea at a time.

A key aspect of SOLO is to encourage students to think more deeply about their learning and recognise how ‘loose ideas’ in the initial stages can lead to ‘connected ideas’ at the relational level, enabling them to confidently tell their geographical story. In this instance, students have linked the plight of Mrs Antoine to the time it took international aid to reach Haiti and made generalised links to the physical, human and social factors which led to the death of Mrs Antoine.

Students can move very quickly from the unistructural stage to the relational stage. They become less preoccupied with the ‘right answer’ and more interested in the loose connections they have made between geographical ideas (Figure 3).

The addition of blank hexagons enable students to add more ideas and the sticky notes are so they can pose higher-order questions and consolidate and evidence high-level understanding. Including a ‘So what …?’ hexagon prompts students to generalise and make inferences, thus reaching the extended abstract stage and ‘thinking like geographers’.

In this example, a comment on a sticky note linked to a hexagon outlining the breakdown of community cohesion suggested that extreme poverty made the situation desperate – that the residents have ‘nothing to lose’. A pertinent question – ‘What is Haiti’s government doing about this?’ – encourages students to elaborate on their inferences and conduct further research. This process allows all students to consider alternatives as well as ask questions, so their discussions are focused and inclusive.
Recording geographical ideas

HOT SOLO maps or graphic organisers allow students to visualise their geographical ideas and structure their thoughts in a systematic way by completing an arrangement of boxes. The range of ‘maps’ cater for the whole ability range: more able students are encouraged to progress beyond the relational stage, to generalise, predict and justify their views; less able students are supported by clear suggestions of how many points and links are required to move to the next stage. A ‘key word corner’ on the ‘map’ provides further guidance which supports literacy and suggests initial geographical ideas. Figure 4 is an example from a middle ability year 9 student’s preparation for an assessed extended piece of writing following the hexagon mystery activity about Mrs Antoine.

… I like the boxes sheets when I’ve been using SOLO [hexagons] … I like the key word corner because there are words there that I can use to help me think why; to help me to explain and get to relational. The boxes also have the SOLO diagrams so it’s easy to see … how much I’ve learnt when I do a review at the end of the lesson … (year 9 student).

Reflections

HOT SOLO ‘maps’ are a very effective way of enabling students to visualise their geographical ideas and structure their thoughts systematically. They can record, sequence and substantiate their points from the SOLO hexagons, as well as accurately self or peer-assess their level of progress and steps for improvement, using simple SOLO level descriptors. Crucially, this provides a simple framework for progression and a common language for learning.

We have found SOLO hexagons and HOT maps an excellent way to determine a student’s prior knowledge, as well as challenge and deepen their understanding; though we have also used them to begin a new learning experience.

The 2014 National Curriculum provides an opportunity to extend our use of SOLO by scaffolding learning, progress and outcomes in our schemes of work; as well as open a dialogue in teaching and learning with our feeder primary schools as they come to grips with the new key stage 2 geography Programmes of Study.

Recommended reading


Pam Hook provides a wide range of online resources at http://pamhook.com.

References

A soil is a mixture of inorganic (mineral) and organic particles organised into layers (horizons) by physical, chemical and biological processes. Although the importance of soils cannot be overestimated, some teachers may have had few, if any, lessons themselves on this topic. If they feel less than confident about the topic they might be tempted to relegate soils to a subsection of physical geography or an aside in a unit on farming. However, an understanding of the formation and maintenance of soils is an essential element of geography. This article is an overview of soils and a range of practical class activities to help you feel confident with the topic and enthuse your students.

Soils are mentioned in the 2014 National Curriculum document:

Understand, through the use of detailed place-based exemplars at a variety of scales, the key processes in... physical geography relating to... rocks, weathering and soils (DfE, 2014).

This suggests that the teaching of soils fits best alongside weathering and, given the crucial role of weathering in initial soil formation, it is an understandable approach. It is therefore important to be secure in mechanical (physical) weathering processes and chemical weathering processes. The starting point is to explore soil material in general and then study specific types, from named climates or locations. It does make sense to include British examples or include regional studies of soils, working back from the specific soil type(s) found in your chosen location (‘detailed place-based exemplar’). Soil can also usefully be included in other topics such as vegetation, natural resources and economic activity (see Figure 1).

What should you teach at key stage 3?

With air and water, soil is a major natural resource. It is the foundation of all ecosystems; it filters water, provides nutrients for forests and crops and helps regulate the Earth’s temperature. It is the medium in which plants grow and so, directly or indirectly, the source of our food. Students should recognise that there are different types of soil and know how soil develops from a bare surface. Soil is fragile and human activities can both damage and improve soils.

Where do you start?

Here are some suggestions of how to introduce soils to your classes. This YouTube video (www.youtube.com/watch?v=TqGKwWo60yE), marking the International Year of Soils 2015, gives snappy coverage of a number of key ideas. It could also be used synoptically at the end of the topic. Each frame could be made the subject of a group verbal, written or illustrative task.

Take students outside into the school grounds to a number of locations and ask ‘Where is the soil?’ A garden or allotment are obvious choices; but will they realise that there are soils beneath the playing field or buildings? If a path has been worn across a field, or if a concrete or paved area has been ‘extended’, wearing away the grass, there could be discussion as to why nothing is growing. Ask students to think about soils in their gardens or on farms, in parks or in these grounds. Is anything being done by humans to change the soil? Think about cultivation, fertilizer, weed killer, machines etc.

Students may think that soil is unimportant, so prompt them to think about how different groups of people may value soil.

Broaden your horizons

If you dig down into the earth, further than even the most enthusiastic gardener, until you reach something that is rock-like, solid or loose, you should be able to identify layers. These are horizons, and the cross-section your digging reveals is what is called a soil profile (Figure 2). In different soils, the A and B horizons will vary in a number of ways, including colour. At this point, specific soil profiles could be introduced (see the websites listed at the end of the article). You could focus on a local profile and/or those which would be found in chosen regional and national studies.
Organisation of particles into horizons

Particles are dissolved or suspended in soil water, which moves material and nutrients downwards and upwards. Water can move dissolved or suspended minerals and deposit them, causing horizons to form. Earthworms or insects can move soil material around.

Investigating soil

There are some practical activities to investigate the physical properties of soil in Figure 4. These use easy-to-source equipment and can be carried out by groups of students with soil samples brought from home or gathered around the school site and results compared. | TG

Soil formation

All soil profiles are a result of three distinct processes (Figure 3).

Breakdown (weathering) of parent material

This is an opportunity to revisit and reinforce weathering ideas and terminology. It is worth getting students to think about the possible types of bare surfaces, for example volcanic lava flows, glacially eroded land, even cleared concrete.

Decay and incorporation of plants and animals

Decomposition of organic matter is by bacteria and fungi in the soil or in the gut of larger, soil-dwelling animals. Softer plant material like grass rapidly breaks down after death whereas harder, woody plant material breaks down more slowly.

References


Useful websites

British Geological Survey (www.bgs.ac.uk). Type ‘soil’ into the search box to get links to many specific soil topics, including the mySoil app.

Land Information Systems (www.landis.org.uk). This has very good photographs of soil profiles.

UK Soil Observatory (www.ukso.org). This has a dedicated ‘Schools and education’ page. Some resources are American.
Activity 1: What colour are your soils?
The colour of a soil can reveal a great deal about its nature. A soil is usually described in terms of its colour: black, brown, red, grey, yellow, white. Darker colours usually indicate a more nutrient-rich soil. Grey indicates poor drainage. Red usually indicates the presence of iron and poor conditions for plant growth. This activity improves students’ observation and describing techniques.

- Use a piece of A4 or A3 white card to create a table of five columns, headed: location; site; soil; description; comment.
- Have a number of small (teaspoon-size) soil samples, each from a different location. Write the locations in the first column on the chart. Write details about the site, for example the relief (steep slope, flat, etc.) in column 2.
- Press a damp finger into a soil sample then make a smear on the card in the third column.
- Repeat with all samples. Wash hands before doing repeats and then very thoroughly when all have been done.
- Allow the smear to dry then describe the colour as accurately as possible under ‘description’.
- In the last column, comment on what the colour might indicate.

Activity 2: What is in your soil?
Soil has a number of components, both organic and inorganic, resulting from its formation and active processes. This activity reveals some of these, as well as the percentages of the different sizes of soil grains.

- Put 500g of soil onto newspaper.
- Use a magnifying glass to identify organic material and use tweezers to pick out any insects (dead or alive) and bits of plant; put them into separate dishes.
- To measure the coarse grains, tip the remaining soil into a wide-mesh garden or soil sieve and shake it. Put the stones and large pieces of soil left in the sieve into a dish.
- To measure the medium grains, tip the remaining soil into a kitchen sieve and shake. Put the material left in the sieve into a dish. The soil that passed through the sieve is the fine grain; put this into another dish.
- Weigh the contents of each dish. Students compare the weights and work out the percentage of each to make a pie chart.

Activity 3: What is the texture of your soil?
Soil texture is important because it influences how easily water passes through it, whether nutrients will be available to plants, and how the soil will clump (soil structure). This ‘Dirty hands test’ can show the soil texture.

- Take a small handful of soil and dampen.
- Roll between the fingers to feel for ‘grittiness’ and whether it sticks together.
- Does the soil feel gritty? Can you make a thread that breaks easily? This is a sandy soil.
- Can the soil be made into a thread but does not feel sticky? This is a loamy soil.
- Does the soil feel a bit sticky and make a thread that does not break easily? This is a clay-loam soil.
- Is the soil sticky and easy to make into a ring? This is a clay soil.
- Wash hands thoroughly when finished.

Activity 4: How much air is there in your soil?
Air sits between the particles in the soil. Soils ‘breathe’ by a delicate exchange of gasses, a process called aeration. The oxygen in the air is needed by micro-organisms to break down plant and animal material into humus. Humus releases nutrient (carbohydrate) energy which is taken up by plant roots and soil organisms so aeration needs to take place continuously. Soil processes release carbon dioxide which passes upwards to the atmosphere. A soil with tiny air spaces, or pores, and so less air, will not allow water or oxygen to pass through easily, and plant growth will be slow. Too much human disturbance, e.g. ploughing, breaks up the pore spaces, releasing carbon dioxide very quickly, which contributes to global warming.

- Put some soil into a measuring cylinder or jug up to the 200ml mark.
- Shake the container gently to get the surface level. Check the amount and add more if necessary.
- Carefully pour 200ml of water onto the soil.
- When the water has settled, read off the level at the top of the water.
- The difference between your level and 400ml is the amount of air in your soil.

Activity 5: How acid is your soil?
Soil acidity affects what can grow in a soil and how well it grows. Most plants do best in a soil slightly more acidic than neutral but some need a very specific level of acidity to do well. The acidity can depend on the parent material, the rainfall and what is growing in it. People can change the acidity of the surface levels of a soil.

- Bring about 1 litre of distilled water to boiling point then cool a little.
- Chop up about half of a red cabbage and put into the water. Stir and leave for about an hour then sieve into a jug.
- Put samples of soil into clean glass jars and add some red cabbage water. Shake gently then allow to settle.
- Compare the colours of the soil water. The pinker it is, the more acidic; the bluer, the less acidic.

Activity 6: What type of soil?
The mySoil app from the British Geological Survey (BGS, © NERC) can be used on a Smart phone or tablet. Once loaded, you can access map-based soil information for the whole country. When you first use the app, it should show you the map of your own area. If not, tap the GPS symbol at the top right corner of the map. Students can identify the characteristics of the soils at various locations or with a whole class go to www.ukso.org/SoilsOfEngWales/home.html and click the Map Viewer. This takes you to a blank map and dialogue box into which you type a postcode or place name. Soil information will be revealed for that place when the map has reloaded for the appropriate location.

Figure 4: Practical activities to investigate the physical properties of soil. A full version of these activities is available to download.
Raphael Heath

Raphael demonstrates how the new functionality of online GIS enhances geographical investigations and promotes collaborative projects between schools.

A world-wide geographical investigation using online GIS

A few years ago, at an open morning, a visiting parent asked about how we were using GIS in our teaching. At the time GIS was not easily accessible to schools and I sidestepped the question with mentions of using Google Earth and a few other mapping websites. However the question made me wonder if we could be making more use of computerised mapping to enhance our subject and invigorate our teaching. So I set about signing our school up, initially to ESRI’s ArcGIS desktop and more recently to the online version. I know if you are new to GIS it can seem very intimidating – I was in that position only very recently – but it really does not take long to start using it in your teaching. I think GIS gives geography teaching a spark of innovation which positions the subject as both modern and relevant to young people. It also adds a good skills component to our palette of teaching methods. GIS is not just a fieldwork tool: it provides opportunities for students to interrogate up-to-date or live map data in an interactive way, for example looking at maps of live hurricane or earthquake data in ArcGIS online. In a few years I moved from knowing nothing about GIS to running an international GIS event and our school being recognised as one of ESRI UK’s GIS Centres of Excellence!

GIS for collaborative projects

What has particularly interested me is how web-based GIS has provided great opportunities for collaborative investigations between schools. Typically, school geography fieldwork is confined to collecting small sets of primary data from a particular location, so it is hard to accumulate data sets large enough for sophisticated analysis. While such studies can be improved by incorporating valuable secondary sources of data, students are often most engaged with their own original data sets. Working alongside ESRI UK, and using freely available online GIS applications, I developed a simple quality of life survey and invited as many schools as possible to get their students involved: my aim was to create a new world record for the largest geography investigation.

The event, held in November 2014, was promoted by the GDST (Girls’ Day School Trust) and ESRI UK, and attracted interest from around the world. Over 11,500 students participated in the investigation, creating a new ESRI world record and a challenge for us to beat in the future.

Methodology

I chose to survey variations in quality of life globally because I wanted something which everyone could easily get involved with. It would produce good spatial data for analysis and be relevant to topics such as deprivation, migration and environmental quality. After consulting with

On a scale of 1 to 10:

1 how peaceful and quiet are the streets in the area you live in?
2 how clean do you feel the air you breathe is in the area you live in?
3 how would you rate the quality of parks and public open spaces in the area you live in?
4 how clean and tidy are the streets and buildings in the area you live in?
5 how safe would you feel walking around your home area at night?
6 how would you rate the quality of medical facilities in your area?
7 do you think climate change over the next 50 years will bring more benefits or problems to the area you live in?
8 how would you rate the area you live in overall?

Figure 1: The questions used to investigate quality of life.

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Lesson 1 What is GIS?
Lesson 2 What is the use of GIS?
Lesson 3 How is GIS being used in the real world?
Lesson 4 How does GIS help me understand my local area?
Lesson 5 How can GIS help solve problems?
Lesson 6 How can I start using GIS?
Lesson 7 What influences quality of life?
Lesson 8 How does quality of life vary locally and globally?
Lesson 9 Evaluating the study.
a small group of expert teachers I used a rating scale from 1 to 10, with 10 being the best score, on which students would rate a diverse range of factors relating to the quality of life in their home area (see Figure 1).

Teaching resources
The final element was to create a range of educational materials so both students and teachers could engage fully with the event and the investigation (Figure 2). I used the ESRI story map templates in ArcGIS online to create schemes of work based on introducing GIS uses to students. These contained a range of interactive resources and videos to explain what GIS is, how it is being used and to link to the world record event data entry and analysis. I used screen casting software to produce various ‘how to’ videos which explained key skills in using the GIS applications for inputting and processing data for the event.

How to collect GIS data
There are various ways to enter data into GIS maps including using mobile devices and tablet apps. For the global quality of life survey we used the recently released ArcGIS online ‘form builder app’ for data entry. This is a useful addition for fieldwork data input by students, as the form allows the questions to be clearly set out for each variable and provides a simple map interface for students to pinpoint the location to which their data refers. We invited schools to enter data between 17 and 21 November 2014 (the week around GIS Day). All the data is publicly accessible on the ArcGIS platform by adding the layer called ‘local data mapper’ to any map. Schools can always perform their own quality of life surveys in the local area and compare their findings with this data set.

For my year 8 class I wanted to focus specifically on using GIS to study the geography of crime (Figure 3). Students focused on the findings for Question 5, on personal safety at night, and linked this to their knowledge of local crime patterns (see weblinks at the end of the article).

Using web tools to enhance data analysis
Analysing the large amount of spatially scattered data we collected is a real challenge. We do not often present students with such detailed and unprocessed data to examine, and getting them to consider how to process it is a really useful exercise. Normally data like this would be summarised into regional or local ward-scale summary maps: people who are confident with ArcGIS analysis tools can produce such analysis, but the majority will find it difficult. Fortunately ArcGIS have recently released a number of web apps designed to simplify the analysis process. One is called a ‘summary viewer’: it allows the user to zoom to any location and it continuously produces fresh calculation of the average scores for the data within the map view (Figure 4). For greater depth of analysis there is the custom web

Figure 3: Year 8 students at Royal High School Bath analysing the fear of crime responses to the world record survey. Photo: Raphael Heath.
app builder, which we used to add a wider range of analytical tools. These include the facility to:

- query the data and highlight, for instance, locations which scored below 4 for personal safety at night
- produce a summary graph of the average scores for any area traced on the map (see Figure 5)
- select different layers from the quality of life primary data responses and secondary data such as UK employment and multiple deprivation (Figure 6). This gives users considerable power to manipulate the data, seek comparisons and look at correlations with other secondary data.

Reflections and the future

I have focused on the process involved in setting up a GIS event and the various freely available tools to support it, rather than the data itself. There were, however, many interesting results from the data. I also used ESRI’s story map app to highlight some of the patterns and findings such as the levels of pollution identified in Chinese cities and the quality of life in Dubai. (See weblinks to find more about the data.)

Teachers and students in different schools are increasingly able to collaborate on a number of GIS projects to enrich our geography lessons. It is an exciting time: we are able to extend learning not just beyond the classroom but beyond our school groups. I see the world record event as part of a very positive movement towards increasing inter-school collaboration where geographers are naturally placed to lead the way.

Questions for departmental discussion

- Is your department making use of online GIS applications?
- What are the barriers to using GIS and how can they be overcome?
- Should GIS be taught as a distinct unit or incorporated within schemes of work?
- Does your department plan for progression in GIS skills across the key stages?
- What opportunities are there for collaborative projects with other schools?

Useful weblinks

http://arg.is/1KV03Ce Link to live earthquake map in ArcGIS online (last accessed 27 August 2015).
http://gisrecord2014.jimdo.com Website to support the world record event (last accessed 15 March 2015).
http://gisrecord2014.jimdo.com/how-to-videos Screen cast on how to produce videos showing GIS skills for data entry and analysis (last accessed 15 March 2015).
http://rhsb.maps.arcgis.com/apps/MapJournal/?appid=38cb13997c074c32a1f0e6d84640aa7ec Story map developing a scheme of work around introducing GIS and the world record event (last accessed 15 March 2015).
http://bit.ly/1Tr5o8R Story map with resources relating to data entry for the world record event (last accessed 15 March 2015).
http://esrieducation.arcgis.com/apps/GeoForm/index.html?appid=7e4958d70a475841d2f6ef689a8c&webmap=2da5aa0a30f3d4139890b3b49e9e0e24b The data entry form application linked to ArcGIS online for the world record event (last accessed 15 March 2015).
http://rhsb.maps.arcgis.com/apps/MapJournal/index.html?appid=88c3f7165894866b2e028571b33e6 Story map highlighting some key results and patterns from the world record data (last accessed 15 March 2015).

Note

If you would like to find out more about the November 2015 GIS Day global event ‘Ashcloud Apocalypse’ go to www.gisevent.wix.com/gisday2015

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The daring discourses of Teaching Geography?

Teachers should have a sense of their own history in order to help mediate the dominant and often derogatory discourse surrounding their profession (Apple, 1986, p. 187).

Professional journals such as Teaching Geography provide powerful ‘discourses’ – ways of speaking – that help readers put their own practices into perspective. As they attempt to control the dissemination of legitimate knowledge and to earn cultural capital, journals are where issues are contested. What gets published depends on market forces and political legitimacy (Apple, 1986). This article explores the discourses revealed by the Editorials in Teaching Geography.

Teaching Geography, founded in 1975 and now celebrating its 40th year, represents and interprets geography education from the GA’s perspective. As the only subject association representing school geography in England, the GA has considerable authority in shaping the discourse about school geography. Teaching Geography has played a key role in debates about why, what and how geography should be taught in English schools. These debates are part of the wider struggle over who controls education and for what purpose. The birth of the national curriculum for England in the late 1980s and its subsequent reviews have been a major part of this ongoing struggle.

Discourses about geography education

Discourse analysis is based on the premise that texts, as in journals, not only depict particular versions of reality but also help create and sustain them (Denscombe, 2007). Discourse analysis accepts that texts are ‘products’ and that considerable time, money and effort are required to produce them, so it is important to ask questions about their purpose.

The purpose of analysing Teaching Geography as a ‘text’ was not only to explore its representation of reality, but also to understand who and what wields influence in geography education. The focus of the discourse analysis was primarily on Teaching Geography’s Editorials, as these are where strong statements about the purposes and practices of geography teaching are made. Editorials have the power to set agendas, frame debates and shape opinion and are, thus, political in nature (Le, 2010). Editorials from 134 journal issues (volume 1, 1975 to volume 35, 2010) were analysed. Editorial themes were compared with concepts and issues found in wider educational discourse. The study asked to what extent the journal:

- reinforces certain educational ideologies
- reflects particular social, political or historical conditions
- exerts power or influence
- portrays a representative version of events
- excludes or suppresses certain ideas or voices.

The dominant discourses of Teaching Geography

For 40 years Teaching Geography has professed to be at the ‘forefront of the curricular debate’ and claimed to help ‘formulate teacher opinion so it becomes effective opinion’ (Bailey, 1979). Teaching Geography’s first editor, Patrick Bailey (1977) argued that the ‘rights and wrongs’ of government policy were ‘not the concern of Teaching Geography’: rather, the journal ‘would make public statements about geography’s contribution to education’. Ironically, this declaration positioned the journal outside the most significant educational debate of the time. The ‘Great Debate’ signalled a sharp change in educational ideology, challenging as it did the principle that ‘no one but the teacher has any right to say what goes on in schools’ (Jones, 2003, p. 95). The Great Debate set the ‘ball rolling for the politicisation and growing influence of right-wing politicians on educational policy’ (Rawling, 2001, p. 30) and marked the move, during the 1980s, towards increased centralization and state control over the school curriculum (Lambert and Morgan, 2009, p. 148).

Despite the politicisation of educational discourse in the 1980s, in which the new Conservative government blamed a decentralized and largely autonomous curriculum for causing educational ‘failure’ and ‘low standards’, the journal’s ‘apolitical’ stance continued. Rawling (1987) noted how the journal was ‘well placed’ to ensure the national curriculum debate centred on the GA’s ‘Case for Geography’. This confidence in the journal’s ability to influence government policy was, however, challenged by certain correspondents. A letter to the journal’s editor from Fred Martin (1987) accused the GA of ‘inertia’; this was reiterated by J. Lewis, who argued that ‘geographers’ knowledge and expertise is wasted by a coy reluctance to make public statements … in the “real world” of political wheeling and dealing’ (Lewis, 1987, p. 194).

Accusations of inertia within the GA may have been reflective of the more general lack of debate during the 1980s about what school geography should be. Rawling (2001, p 64) has subsequently argued that the geography education community, at the time, failed to manage the
struggle between older and newer geographies. Unfortunately for geography, this lack of debate meant that inherent subject differences were ‘glossed over’, and left the subject ‘dangerously exposed’ (Rawling, 2001). At the time, the GA was engaged in making sure that geography was deemed a worthy subject for inclusion in the evolving national curriculum, and so chose to go along with a utilitarian version of the subject, rather than traditional or more progressive approaches.

Rawling (2001, p. 30) later confessed that the geography education community had wrongly assumed the government would call upon their expertise during the curriculum negotiations of the 1980s. Geography educators were out-maneouvred and some, like Walford (2001), believed the government ‘butchered’ the Geography Working Group (GWG) recommendations. As Editor of Teaching Geography, Rawling (1988) warned at the time that ‘15 years of curriculum development … were at risk’. She later reiterated that the GA effectively chose to reinforce the dominant New Right rhetoric of ‘real subject’ and ‘utilitarian value’ during curriculum negotiations (Rawling, 2001, p. 42).

Following the publication of the 1991 Geography Orders, Teaching Geography complemented the new government guidelines with practical advice on how to plan for and implement the national curriculum (Rawling, 2001, p. 73). In effect the journal ruled out an alternative, more progressive discourse, and alternative versions of school geography – ‘enquiry-based learning’, ‘issues-based investigation’ and ‘values’ education were effectively removed from the 1991 Geography Orders (Rawling, 2001, p. 47).

New Labour’s ‘Education, Education, Education’

In January 1997 Elizabeth Barratt Hacking admitted that during a time of such unprecedented educational change the journal had neglected the crucial role of offering teachers space to discuss alternative ideas. She tried to reassure readers that the journal would reposition itself at the ‘forefront of new ideas, stimulating reflection, debate, dialogue and action’. This repositioning coincided with the election of a Labour government in 1997, who were swept to power on the promise that they would prioritise education.

However, New Labour reinforced neo-conservative educational ideology by emphasising accountability, standards and reliance on market forces (Rawling, 2001, p. 123). Its policies promoted ‘targets’ and ‘performance measures’ and moved educational discourse towards the language of ‘excellence’. By 1999, Guest Editor Roger Carter (1999) used the term ‘Meccano model’ to describe the way the new government made the national curriculum by ‘adding bits and taking bits off’. Carter (1999) warned that despite political priorities switching to the promotion of citizenship and environmental sustainability, there was still no ‘clear overall rationale’ for the national curriculum.

Teaching Geography Editorials in the early 2000s embraced the notion of ‘raising standards’. As Guest Editors of the 2000 October ‘special’ issue, Julia Jones and Rob Lodge (2000) highlighted three articles within the issue that addressed assessment for raising standards (target setting, exam technique and ICT assessment). They also highlighted the possible integration of geography with certain GNVQ courses, key skills, IT and the marketing of geography to students and parents, all to raise standards (Jones and Lodge, 2000).

The discourse of curriculum politics

Some argued that the journal’s acceptance of the discourse of standards, targets and excellence jeopardized geography’s integrity and distinctiveness as a discipline (Rawling, 2001, p. 139). Others accused the GA of failing to engage more critically in curriculum politics. According to Lambert and Morgan (2009, p. 154), some geographers thought the GA ‘colluded’ with New Labour to deliver the government’s geography curriculum agenda. This agenda embraced the themes of citizenship and sustainable development and moved away from an emphasis on subject disciplines (Rawling, 2001, p. 74). Furedi (in Whelan, 2007, p. 7) argued that this shift away from subjects was an ‘erosion of integrity’ and that subject knowledge was being threatened by partisan dispute and political experimentation.

In the late 2000s the journal expended considerable effort on describing new curriculum-making opportunities made possible by the 2006 Action Plan for Geography (APG). The APG was set up to fund curriculum development and CPD in the wake of the key stage 3 curriculum review. Key concepts and processes formed part of the restructured curriculum and Roberts’ (2007a) reassured teachers that geography’s ‘key concepts and processes are not new and should not be feared’. In trying to reassure teachers and by praising the review for creating ‘exciting challenges to make the curriculum more meaningful’, Roberts (2007a) encouraged teachers to rediscover their self belief and use their ‘professional judgment’. This message was reaffirmed by Biddulph (2009), who applauded the 2009 GA manifesto for speaking to teachers as expert professionals who are able to discuss the purpose of geography, rather than as technicians who simply deliver subject content.

While Teaching Geography has not explicitly engaged in the wider debate about teachers’ professional status, the journal has championed the cause of geography specialists. As far back as 1979, Patrick Bailey predicted that cost cutting was likely to mean non-specialists would teach geography. The 1980s push for ‘humanities’ integration was seen as a major threat to geography’s disciplinary integrity, and Editors were adamant that specialist geography teachers
needed to be trained and recruited. Boardman (1992) was keen to promote the IGU’s Charter for Geography, which argued geography should be an autonomous subject taught by specialist teachers. Similarly, Roberts (2008) stressed that the geography education community needed to ‘argue the case for specialist geography teachers’. The ‘slenderer’ 2007 key stage 3 programmes of study could not simply be ‘delivered’ (Roberts, 2007b). A ‘re-thinking’ was required by specialist geography teachers who could, argued Biddulph (2010a), use ‘different forms of enquiry’ that ‘think beyond the positivist models’ and which champion ‘young people’s geographies’ (Biddulph, 2010b).

Conclusion
Over the course of the last 40 years Teaching Geography has been instrumental in creating a legitimate version of school geography. In the past the journal has called for compliance and adherence to professional and curriculum standardization. More recently the journal accommodated New Labour’s constantly changing curriculum agenda. The new political landscape of a Conservative government now influences how the journal discusses school geography. Given this new dynamic, it is essential that geography teachers have a sense of both their own and their discipline’s history. | TG

References

Teaching Geography Editorials

Online resources
The complete archive of Teaching Geography is now available online to all subscribers. Go to www.geography.org.uk/tg and a link will take you to a fully-searchable archive hosted by JStor where you will be able to find all the Editorials mentioned here.

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I recently went through the process of appointing a new member of staff to my department and was surprised by the lack of information about their fieldwork experience in applicants’ CVs or letters of application. There was plenty of coverage of curricula taught, qualifications obtained, areas of expertise and their numerous key skills: but so very little about something that could well have proved to be most interesting – namely fieldwork. With fieldwork now prominent in the new GCSE and A-level specifications and the 2014 National Curriculum, there is a strong argument that fieldwork is more central to secondary school geography than ever. I would assert that fieldwork creates the sort of experiences that make job applicants interesting.

Having asked over 30 heads of geography for their views on how prominent fieldwork should be in a job application, it would be fair to say that not all think fieldwork is as important as I do, but all recognise the advantages of including it in an application. Much of what follows is advisory: as it is always key to be guided by the job specification first and foremost. Whether the post you are applying for is geography teacher or head of department, give your fieldwork skills and experiences equal billing with all the rest of your teaching experience. Equally, if you are responsible for writing the job specification, make any reference to fieldwork explicit.

**Applying for a post as a geography teacher**

**Skills** – dependent upon your current post, you could have experience of planning, budgeting, conducting risk assessments (including in the field) and leadership. Other experiences and qualifications you could draw upon to demonstrate your fieldwork skills are things like a First Aid qualification, an outdoor leadership qualification or minibus driving experience.

**Responsibility** – whether it be a local investigation into the school’s microclimate or an international trip to study deserts in Morocco, both demonstrate a degree of responsibility. It may be that you have never led any fieldwork, or that your field trips took place in centres where staff have done the work for you: in both cases you should describe how your role improved geographical learning.

**Personal qualities** – this is your opportunity to convey your genuine passion for the subject. Describe your engagement with fieldwork, and show your energy, enthusiasm and dynamism. If you are newly qualified, with limited experience of leading or even accompanying fieldwork, you should carefully consider what fieldwork means to you and convey that clearly.

**Applying for a post as a head of geography**

**Responsibility** – Make sure you have experience of planning and leading fieldwork under your belt. The new fieldwork requirements at A level and GCSE focus on breadth as well as contrast, so include a variety of field trip locations and their rationales and be prepared to evaluate their success. Your interview could be an important opportunity to argue the case for fieldwork as an integral part of the school year – you should come prepared.

**Leadership** – Fieldwork offers an opportunity to demonstrate some of the core skills of ‘management’ without being a manager – planning an activity, liaising with parents, and producing a budget are all skills that you develop on a field trip that can be transferred to your new role as HoD.

**Learning** – Have a clear view of the value and role of fieldwork in learning. As well as making the case for fieldwork you should show how to make fieldwork possible – this skill is critical in demonstrating your ability to do ‘change management’ or ‘curriculum planning’, particularly if you have not had experience of significant change during your current role.

In addition to this there are a variety of skills derived from fieldwork that are well suited for senior management roles, particularly as so much of what is done depends upon close and careful liaison with students, staff, parents and external organisations.

So, if you are applying for jobs in this ‘Year of Fieldwork’ celebrate your fieldwork experiences, champion its role in geographical learning, extol its strengths in developing leadership and building rapport; and most of all, get out there and enjoy every minute of it. | TG
From the archive: Fieldwork past and present

Since Teaching Geography was first published in 1975, it has included numerous articles on fieldwork. It is interesting, therefore, to delve into the archive and select a few of these articles to look at how the role and value of fieldwork has changed over the years. While important methodological differences can be identified that reflect changing pedagogical priorities within geography, and education more widely, fundamental to all these articles is an emphasis on the importance of fieldwork to geography. The articles I have selected are in no way meant to be a comprehensive reflection of changes in geographical education. However, I hope they encourage you to explore the archive for inspiration.

Five decades of fieldwork guidance

Eleanor Rawling’s ‘fieldwork research’ article (Rawling, 1975) advocated a more ‘modern’ approach to fieldwork. Alongside more traditional observational surveys she suggested ‘testing a hypothesis or solving a problem by the collection and interpretation of relevant field data’ (p. 7). Ten years later, Adam et al. (1985) championed the importance of regional geography in an article on regional disparity in which a variety of quantitative and qualitative techniques were discussed. The spatial scale was narrowed further by Rex Walford: his article explored different ways to use the local shopping parade, through both field surveys and library investigation activities (Walford, 1995). Acknowledging the still all-too-familiar pressures of time and money, Walford recommended the use of the local environment: ‘[i]t is unlikely that residential fieldwork will be an experience for any but a few senior school pupils’ (p. 112).

By 2005 a new concept in fieldwork was being discussed: ‘virtual fieldwork’. Richard Taylor defined virtual fieldwork as ‘a representation of a specific geographical area using digital images and/or photographs/video’ (Taylor, 2005, p. 157). Virtual fieldwork responds to the time and financial constraints identified by Rex Walford; it also gives students access to environments that would otherwise be too difficult or dangerous to visit, extends the 2-D representation of places in textbooks, and recognises the value of pre-fieldwork preparation. Taylor argued that while virtual fieldwork could not replace actual field trips, it should be used alongside ‘real’ fieldwork in the twenty-first century geography curriculum to allow students to ‘appreciate localities in various differing ways’ (p. 160).

Perhaps the article that most clearly articulates the need for the ongoing development of fieldwork techniques is House et al.’s (2012) discussion of ‘risky fieldwork’. They argued that ‘risky fieldwork’ will enable students to develop ‘skills that traditional fieldwork techniques may not provide’ (p. 62). ‘Risky fieldwork is not hazardous to personal safety, but can challenge the mindset of those experiencing it – and more specifically those responsible for leading the learning experience. With risky fieldwork the outcomes are not guaranteed; aims and objectives are clear, but the outcomes are unpredictable, and even subsequently can be hard to define. The work undertaken can be unconventional in the topics, locations or methodologies used. The level of risk is determined by an individual’s pre-existing comfort zone’ (p. 60). Their article stressed the need for adaptation and change to ensure that the place of fieldwork within the discipline does not ‘stagnate’ (p. 62).

Looking to the future

The common theme running through these articles is the unwavering belief in the value of geographical fieldwork, from the opportunity to develop core knowledge, understanding and skills to the more elusive, and sometimes overlooked, chance to participate in a shared ‘fieldwork experience’ (Adams and Croft, 1985). As we enter the ‘Year of fieldwork’ it is important to remember that the fundamental reasons why we take our students into the field have not changed. They are the essence of what it means to ‘be a geographer’ and will lie at the heart of future developments in fieldwork teaching and learning.

References

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