Pearson Edexcel International Advanced Level Geography Research and Fieldwork guide

Introduction

Students must complete a minimum of two days of fieldwork (excluding research time) to meet the requirements laid out in this specification. It is therefore crucial that students have access to appropriate opportunities for meaningful research.

Teachers must also ensure that the fieldwork activities and environments experienced by students allow them to develop and demonstrate the full range, variety and diversity of skills required.

Research and fieldwork skills in readiness for assessment (**Unit 2**) must include:

- **pre-fieldwork planning and research:**
    1. Identification of the question for investigation
    2. Contextualising the investigation
- **primary fieldwork and data collection:**
    3. Methodology and design
    4. Primary data collection, equipment and recording
- **presentation, analysis, conclusions and evaluation:**
    5. Data processing, analysis and presentation
    6. Explanation and conclusions
    7. Critically reflecting on the results and process

Refer to Appendix 2 page 71 of the specification: Geographical investigation, for more details

Fieldwork, research and enquiry-based learning should also support the wider suite of geographical skills, Appendix 1 page 69.

- Understand the nature and use of different types of geographical information, including qualitative and quantitative data, primary and secondary sources of data, images, factual text and discursive/creative material, digital data, numerical and spatial data and innovative forms of data, including crowd-sourced and 'big data' and including dot maps, kite diagrams, linear and logarithmic scales, dispersion diagrams aerial/oblique/ground/satellite images, and GIS.
- Collect, analyse and interpret such information, and demonstrate the ability to understand and apply suitable analytical approaches for the different information types, including qualitative approaches such as coding and sampling and quantitative approaches such as measures of dispersion, measures of correlation and association from the following statistical tests: t-tests, Spearman's rank, Chi-Squared, Gini coefficient, Lorenz curves.
- Undertake informed and critical questioning of data sources, analytical methodologies, data reporting and presentation, including the ability to identify sources of error in data and to identify the misuse of data
- Communicate and evaluate findings, draw well-evidenced conclusions informed by wider theory, and construct extended written argument about geographical matters.

A recent report (***Lambert and Reiss 2016*** *(Institute of education, University of London, 2014/5*), confirms the significance of high quality fieldwork as an integral part of being a competent geographer. Table 1 presents some reflective ideas that might be considered at the initial stages of thinking about an investigation. A good piece of enquiry work will likely reinforce some of these embedded skills and competencies.

Focus	**Skills and competencies**
Application and evaluation of knowledge and understanding	• Develops skills in "big data" • Embeds competencies in data handling and statistical understanding • Helps with skills of literature research and selection of material; can develop synthesis skills • May help with technology skills, e.g. spreadsheet manipulation or analysis using GIS
Developing "deeper" learning	• Helps "see" things differently • Encourages caution and reflectivity in data analysis, as well as taking geographical meaning • Enables critical thinking and the ability to challenge • Helps with skills of reasoning as well as geographical curiosity.
Social dimensions	• Helps foster independent learning • Creates an atmosphere for co-operation in problem solving • Teaches the skills of procedure which will be transferable to other situations and subjects. • Greater awareness of ethical considerations as part of the enquiry process

Table 1

Structure of this guide

The fieldwork support in this teacher's guide is split into 6 sections:

(1) An overview of the main fieldwork and research themes, plus qualitative and quantitative data and information
(2) Generic sources to help contextualise the fieldwork
(3) Virtual fieldwork
(4) Minimum fieldwork requirements
(5) Planning and developing an integrated fieldwork strategy
(6) GIS IAL Geography

Section 1 – An overview of the main fieldwork and research themes, plus qualitative and quantitative data and information (Coasts and Urban)

Topic 1: Crowded Coasts

Students could investigate questions relating to the following themes, and then use those questions to devise an appropriate methodology:

2.3.3 Coastal ecosystems and environments
Enquiry question: How do coastal ecosystems develop, what is their value and how are they threatened?

- A research (secondary data) and fieldwork (primary data) investigation into the development and structure of sand dune, salt marsh or mangrove coastal ecosystems and an evaluation of the types and impacts of human activities threatening the coastal ecosystem.

2.3.4 Managing coastal change
Enquiry question: How can coastlines be managed in a sustainable way?

- A research (secondary data) and fieldwork (primary data) investigation into the flood and/or erosion risk facing a stretch of coastline and an evaluation of the success of management measures and defences implemented to mitigate risk.

Topic 2: Urban Problems, Planning and Regeneration

Students could investigate questions relating to the following themes, and then use those questions to devise an appropriate methodology:

2.4.2 Transport issues in cities

Enquiry question: Why has transport become a key issue in many cities and how can it be best managed?

- A research (secondary data) and fieldwork (primary data) investigation into the impacts of transport problems in an urban area and an evaluation of the strategies used to manage the situation.

2.4.4 Urban regeneration

Enquiry question: How can the social, economic and environmental aspects of urban areas be improved by regeneration?

- A research (secondary data) and fieldwork (primary data) investigation into the impacts of an urban regeneration scheme and an evaluation of the success of the scheme in social and/or economic terms.

Primary vs Secondary data. Primary data is generally considered to be first hand data collected by a student themselves (or as part of a group). Secondary data (which may be part of the research) means information that has already been collected by someone else. In reality there is some "grey" between these two ideas and approaches, sufficient to say that you should expect to have a reasonable balance between the two types.

Quantitative data and information is that which includes numbers and numerical data, whereas **qualitative** is descriptive and can include things such as photographs or written texts. See below for what students should know about, in the context of this IAL:

Qualitative data and information	a) Use and understand a mixture of methodological approaches, including using interviews. Interpret and evaluate a range of source material including textual and visual sources, such as oral accounts, newspapers, creative media, social media, aerial/oblique/ground photographs, sketches and drawings. b) Understand the opportunities and limitations of qualitative techniques such as coding and sampling, and appreciate how they actively create particular geographical representations. c) Understand the ethical and socio-political implications of collecting, studying and representing geographical data about human communities.
Quantitative data and information	a) Understand what makes data geographical and the geospatial technologies (e.g. GIS) that are used to collect, analyse and present geographical data. b) Demonstrate an ability to collect and to use digital, geo-located data, and to understand a range of approaches to the use and analysis of such data. Use, interpret and analyse geographical information including dot maps, kite diagrams, linear and logarithmic scales, dispersion diagrams, satellite images, GIS. c) Understand the purposes and difference between the following and be able to use them in appropriate contexts: i. descriptive statistics of central tendency and dispersion ii. descriptive measures of difference and association from the following statistical tests: t-tests, Spearman's rank, Chi-Squared; inferential statistics and the foundations of relational statistics, including measures of correlation and lines of best fit on a scatter plot iii. measurement, measurement errors, and sampling

Section 2 - Generic sources to support fieldwork and research

A number of these sources may have information to help contextualise the fieldwork and add relevance to the issue / topic being studied.

The **Field Studies Council** have an excellent fieldwork website http://www.geography-fieldwork.org/index.htm. They also have a range of specialist identification guides (fold out charts) for many of the fieldwork topics in the specification http://field-studies-council.org/publications/foldout-charts.aspx

You will also find some useful information from the **Barcelona Field Studies** website http://geographyfieldwork.com/Fieldwork%20Methodology.htm

NAFSO (National Association of Field Studies Officers) has a published directory of UK Field Centres http://www.nafso.org.uk/index.php?option=com_sobi2&catid=2&Itemid=62

The **RGS** (Royal Geographical Society) have a directory of international field centres ("World Resister").
http://www.rgs.org/OurWork/Fieldwork+and+Expeditions/World+Register+of+FieldCentres/World+Register+of+Field+Centres.htm

Geofile and ***Geofactsheet***. These publications of a range of topics that may be relevant to particular topic. Although aimed an AS / A2 audience, they can provide some useful background reading to contextualise a topic area.

Topic Eye Geography is a new magazine series for students written by leading authors and examiners. http://crossacademe.co.uk/series/23/a-level-geography

Geography Review and ***WideWorld*** are now available online and searchable through an online magazine subscription service. http://magazines.philipallan.co.uk/Magazines/Geography-Review.aspx

Newspapers – especially *Independent, Guardian, Telegraph, The Times*. Also search their blogging areas for background opinion. Look at local newspapers for a more in-depth focus on local issues (especially editorial sections).

***BBC website*.** Look at the local section for reactions to particular issues.
YouTube may provide clips of documentaries as well as uploaded local videos.
For stretch search the online databases of the ***Economist***, ***Ecologist*** and ***New Scientist*** for some up-to-date and accessible resources.
Also consider subscribing to relevant Twitter and RSS feeds.

Academic articles and literature should also form part of the fieldwork reading. Much of this can be accessed for free from the internet, or via a school library login, e.g. http://www.jstor.org/

Section 3 - Virtual Fieldwork

Virtual fieldwork, in the context of this specification, is a term that refers to either:

1. Pre and post fieldwork that supports the main focus of the fieldwork opportunities. This might include Google Maps and Google StreetView for instance, as a tool to select appropriate sites. Or photographs / video from past field visits (when conditions were different) to demonstrate particular features / landscapes / process etc. YouTube may be useful in this respect. Virtual fieldwork may also be used as a tool to help teach field-skills before the visit, or prepare a risk assessment.
2. A simulation exercise, where, because of constrained circumstances, candidates cannot collect the data personally in the field. In this instance alternative data will need to be sourced (see page 24 of the specification).

It should be stressed that virtual fieldwork is not intended to be used as a way of short-cutting or bypassing the original fieldwork opportunities which are central to the delivery of this specification. Whilst option 2 (simulation exercise - above) may offer a workable, practical and satisfactory alternative to real fieldwork, this approach is not without limitations:

- virtual trips cannot replicate real objects (e.g. rocks, plants, smells and noises) – only visual aspects (e.g. views of landscapes) can easily be simulated
- students may treat a virtual field trip as similar to a computer game and thus not learn the analytical approaches or problem-solving in the same way as when they are confronted by the 'real thing'
- a virtual environment cannot recreate the challenges of doing an enquiry in an unfamiliar setting which develops self-reliance
- it cannot recreate the social benefits of fieldwork, especially the value of residential experiences
- it is difficult to develop and embed the skills and experiences associated with real fieldwork (which form part of the assessment)

There are many examples of virtual fieldwork tours on the internet, e.g. British Ecological Survey http://www.britishecologicalsociety.org/educational/fieldwork/virtual_tours.php . Here, the user is able to select an environment to investigate and then to see individual transects where data was collected. Detailed photography allows a realistic simulation of the data collection process, through a systematic sample.

ArcGIS online gives access to range of industry standard GIS mapping tools with an educational subscription. This can help with number skills for example. There is also a free, individual subscription. GIS is also considered at the end of this guide.

Section 4 - Miniumum Fieldwork Requirements

IAS students must complete a minimum of two days of fieldwork (excluding research time). Centres will be required to provide evidence of this fieldwork in the form of a written fieldwork statement. See Appendix 3, page 73 (below and also available in the specification): Fieldwork statement.

Students are required to carry out fieldwork in relation to Topic 1: Crowded Coasts **or** Topic 2: Urban Problems, Planning and Regeneration.

Undertaking fieldwork in both environments

Appendix 3: Fieldwork statement

Pearson Edexcel International Advanced Subsidiary in Geography (XGE01)	
Centre name:	Centre number:
All students must carry out **two** days of fieldwork outside of the classroom and school grounds.	
Details of fieldwork	
Fieldwork day 1 Fieldwork date:_____ Location:_____ Number of students:_____ Summary of geographical issues/questions investigated:	**Fieldwork day 2** Fieldwork date:_____ Location:_____ Number of students:_____ Summary of geographical issues/questions investigated:

Section 5 - Planning and developing an integrated fieldwork strategy

Centres must ensure that:

- the chosen research and fieldwork investigation is appropriately linked to at **least one** of the enquiry questions in Topic 1 or Topic 2
- the investigation involves collecting a range of primary data, using both suitable quantitative and qualitative techniques
- secondary sources of data are available for students to use, and these can assist with answering key questions/hypotheses and provide a geographical context for the investigation
- the methods chosen for primary data collection yield data that can be presented and analysed in appropriate ways, including numerically and statistically

The following are possible suggestions and *are **not** intended as explict or approved recommednations*. Fieldwork and research should be contextualised for a partiuclar local environment, and wherever possible linked to teaching and learning contained within the specification topics. Careful consideration should be also given to the follow-up activities so that students are prepared for the exam. *There is no requirement to hand in individual written work or coursework.*

It is strongly recommended that centres plan their fieldwork opportunities as part of an integrated one year strategy, making clear the links between the fieldwork and the knowledge / understating of the content in Unit 2. In that respect, the order of teaching Units should largely dictate the programme of fieldwork (or vice-versa).

Good practice should allow for students to follow the geographical investigation process and for students to be fully engaged in the decision-making processes in relation to their research and fieldwork investigation.

Geography Subject Advisor support is available here TeachingGeography@pearson.com for any enquries relating to the suitablity of any fieldwork or research.

Crowded Coasts: 2.3.3 Coastal ecosystems and environments

Enquiry question: How do coastal ecosystems develop, what is their value and how are they threatened?

<table>
<tr><th>Activity</th><th>Fieldwork opportunities</th><th>Pre and post fieldwork</th></tr>
<tr><td>Planning and research</td><td>Locating the study area (maps / GIS etc).

Designing an investigation:

Identification of a question and aims linked to geographical theory

Fieldwork equipment considerations to ensure accuracy and reliability

Discussion of health and safety</td><td>Contextualising the study wider significance of the topic area etc.

Research into relevant background information, e.g. internet, magazines and articles

Use of past data to understand scale

Fieldwork design – where and how many sites (justified)

Possible development /customisation of recording sheets</td></tr>
<tr><td rowspan="2">Two example fieldwork techniques</td><td>Ecosystem transect - transects across the ecosystem look for change, zonation etc.</td><td rowspan="2">Discussion of methods to measure and record data with reference to secondary data, field sketches of the data collection sites using secondary resources and also the sampling strategy to be employed.</td></tr>
<tr><td>Development vs conservation conflicts – views of different stakeholders, questionnaires, conflict matrices, photographic evidence.</td></tr>
<tr><td>Data presentation</td><td colspan="2">Data presentation using a range of graphs, diagrams and annotations.
Data must be collated prior to presentation.</td></tr>
<tr><td>Analysis of information</td><td colspan="2">Undertaking simple tests of the secondary data, for example calculating the mean pebble size at each site (basic statistical tests). Analysing data, drawing conclusions with reference to the aims of the investigation, evaluating the techniques used and the conclusions drawn.</td></tr>
<tr><td>Conclusions and evaluation</td><td colspan="2">Describe the findings, explain possible reasons and make links between patterns etc. Students should return to the original predictions/hypotheses. A review of the fieldwork process (including any additional research information).
Evaluation of methodology, accuracy, validity and reliability of the conclusions.</td></tr>
</table>

Crowded Coasts: 2.3.4 Managing coastal change

Enquiry question: How can coastlines be managed in a sustainable way?

<table>
<tr><th>Activity</th><th>Fieldwork opportunities</th><th>Pre and post fieldwork</th></tr>
<tr><td>Planning and research</td><td>Locating the study area (maps / GIS etc).
Designing an investigation:

Identification of a question and aims linked to geographical theory

Fieldwork equipment considerations to ensure accuracy and reliability

Discussion of health and safety</td><td>Contextualising the study wider significance of the topic area etc.

Research into relevant background information, e.g. internet, magazines and articles

Use of past data to understand scale

Fieldwork design – Identify sampling strategy - where and how many sites

Possible development / customisation of recording sheets</td></tr>
<tr><td rowspan="2">Two example fieldwork techniques</td><td>Cliff profiles – recording structure, angle, stability assessment etc. (erosion risk)</td><td rowspan="2">Discussion of methods to measure and record data with reference to secondary data and field sketches of the data collection sites using secondary resources.</td></tr>
<tr><td>Views on the success of management – questionnaire design to various stakeholders; past record and evidence.</td></tr>
<tr><td>Data presentation</td><td colspan="2">Data presentation using a range of graphs, diagrams and annotations. Data must be collated prior to presentation.</td></tr>
<tr><td>Analysis of information</td><td colspan="2">Undertaking simple tests of the secondary data, for example calculating the mean temperature at each site (basic statistical tests). Analysing data, drawing conclusions with reference to the aims of the investigation, evaluating the techniques used and the conclusions drawn.</td></tr>
<tr><td>Conclusions and evaluation</td><td colspan="2">Describe the findings, explain possible reasons and make links between patterns etc. Students should return to the original predictions/hypotheses. A review of the fieldwork process (including any additional research information). Evaluate the process, the accuracy, validity and reliability of the conclusions.</td></tr>
</table>

Urban Problems: 2.4.2 Transport issues in cities

Enquiry question: Why has transport become a key issue in many cities and how can it be best managed?

<table>
<tr><th>Activity</th><th>Fieldwork opportunities</th><th>Pre and post fieldwork</th></tr>
<tr><td>Planning and research</td><td>Locating the study area (maps / GIS etc).
Designing an investigation:

Identification of a question and aims linked to geographical theory

Fieldwork equipment considerations to ensure accuracy and reliability

Discussion of health and safety</td><td>Contextualising the study wider significance of the topic area etc.

Research into relevant background information, e.g. internet, magazines nd articles

Use of past data to understand scale

Fieldwork design – where and how many sites (justified)

Possible development / customisation of recording sheets</td></tr>
<tr><td rowspan="2">Two example fieldwork techniques</td><td>Traffic hotspot maps – recording location, types, CO2 pollution etc.</td><td rowspan="2">Discussion of methods to measure and record data with reference to secondary data and field sketches of the data collection sites using secondary resources.</td></tr>
<tr><td>Views on the success of management – questionnaire design to various stakeholders; past record and evidence, plus location of schemes</td></tr>
<tr><td>Data presentation</td><td colspan="2">Data presentation using a range of graphs, diagrams and annotations. Data must be collated prior to presentation.</td></tr>
<tr><td>Analysis of information</td><td colspan="2">Undertaking simple tests of the secondary data, for example calculating the mean temperature at each site (basic statistical tests). Analysing data, drawing conclusions with reference to the aims of the investigation, evaluating the techniques used and the conclusions drawn.</td></tr>
<tr><td>Conclusions and evaluation</td><td colspan="2">Describe the findings, explain possible reasons and make links between patterns etc. Students should return to the original predictions/hypotheses. A review of the fieldwork process (including any additional research information). Comments on the accuracy, validity and reliability of the conclusions.</td></tr>
</table>

Urban Problems: 2.4.4 Urban regeneration

Enquiry question: How can social, economic and environmental aspects of urban areas be improved by regeneration?

<table>
<tr><th>Activity</th><th>Fieldwork opportunities</th><th>Pre and post fieldwork</th></tr>
<tr><td>Planning and research</td><td>Locating the study area (maps / GIS etc).

Designing an investigation:

Identification of a question and aims linked to geographical theory

Fieldwork equipment considerations to ensure accuracy and reliability

Discussion of health and safety</td><td>Contextualising the study wider significance of the topic area etc.

Research into relevant background information, e.g. internet, magazines and articles

Use of past data to understand scale
Fieldwork design – where and how many sites (justified)

Possible development / customisation of recording sheets</td></tr>
<tr><td rowspan="2">Two example fieldwork techniques</td><td>Regeneration survey – recording location of flagship buildings, EAQ, pedestrian flows</td><td rowspan="2">Discussion of methods to measure and record data with reference to secondary data and field sketches of the data collection sites using secondary resources.</td></tr>
<tr><td>Views on the success of schemes – questionnaire design to various stakeholders;
past record and evidence</td></tr>
<tr><td>Data presentation</td><td colspan="2">Data presentation using a range of graphs, diagrams and annotations.
Data must be collated prior to presentation.</td></tr>
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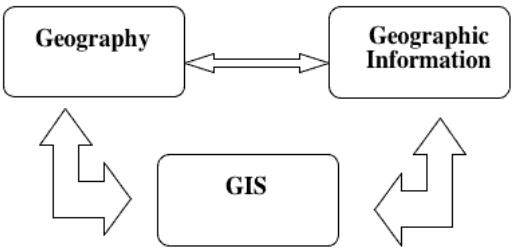
<tr><td>Conclusions and evaluation</td><td colspan="2">Describe the findings, explain possible reasons and make links between patterns etc. Students should return to the original predictions/hypotheses.
A review of the fieldwork process (including any additional research information).
Evaluate the accuracy, validity and reliability of the conclusions.</td></tr>
</table>

(6) GIS. Context - IAL Geography

GIS or Geographical Information Systems are becoming an important part of a 21st century way of life. GIS has evolved into a technology that is used by a huge number of industries and agencies to help plan, design, engineer, build and maintain information infrastructures that effects our everyday lives. There really is no limit to the type of data that can be included in a GIS. Consequently GIS can be used in a huge range of geographical contexts, and is increasingly being used in real time disaster management, to quickly map areas of damage (using GPS), identify services, locate possible refugee sites etc.

The aim of this short paper is to provide teachers of Edexcel Geography with some background information relating to GIS, as well as how the technology fits within different parts of the specifications. We have also provided a section of web-links at the end of the guidance that centres may also find useful.

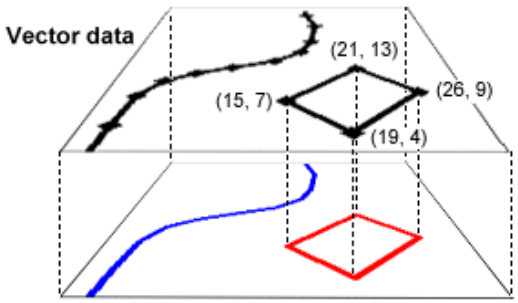


Source RGS http://www.gis.rgs.org/0.html

GIS Basis – the system

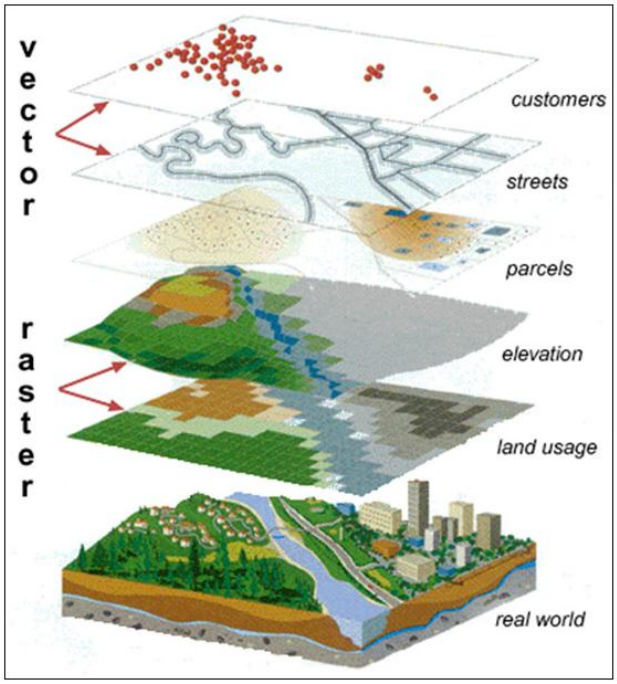
Geographic information is simply information that is a digital coded description of the locations of objects and features. It relates to the distribution of any physical and human features that are found on the Earth's surface. Types of geographic information are varied including socio-economic and demographic data as well as physical and environmental data. The data can be expressed as points, lines or areas, e.g. 'vectors' or 'polygons'. This is commonly called attribute data, which is coded into coordinates.

A **point** is defined by a single pair of coordinate values. A **line** is defined by a sequence of coordinate pairs defining the points through which the line is drawn. An **area** is defined in a similar way, only with the first and last points joined to make a complete enclosure.



Source Ordnance Survey http://www.ordnancesurvey.co.uk/oswebsite/gisfiles/section1/page5.html

GIS systems work as a set of layers that the user can turn on and off. This is the great advantage of GIS since users can customise maps and areas to suit their own needs and demands. Maps, can for instance just show physical information such as elevation, rivers, geology etc. Alternatively the human 'footprint' on the landscape can be overlaid, e.g. settlement patterns, transport nodes and networks, land use etc. GIS has the advantage in that the user turns off or on the layers that they want to see, either adding complexity or simplifying the map.
One of the most useful (but more complex aspects of GIS) is that it can be used to perform network analysis. Network analysis is the mathematical processing of the shape of a link/node layer, enabling the identification of all possible routes around that network, along with the distances and times involved. This means that, using an accurate road data layer, the software can identify possible routes between two locations and calculate the shortest distance. This is how the 'sat-nav' works. The technology is very important in the logistics and distribution services.



The table below provides some examples of how GIS can be used in a variety of geographical situations.

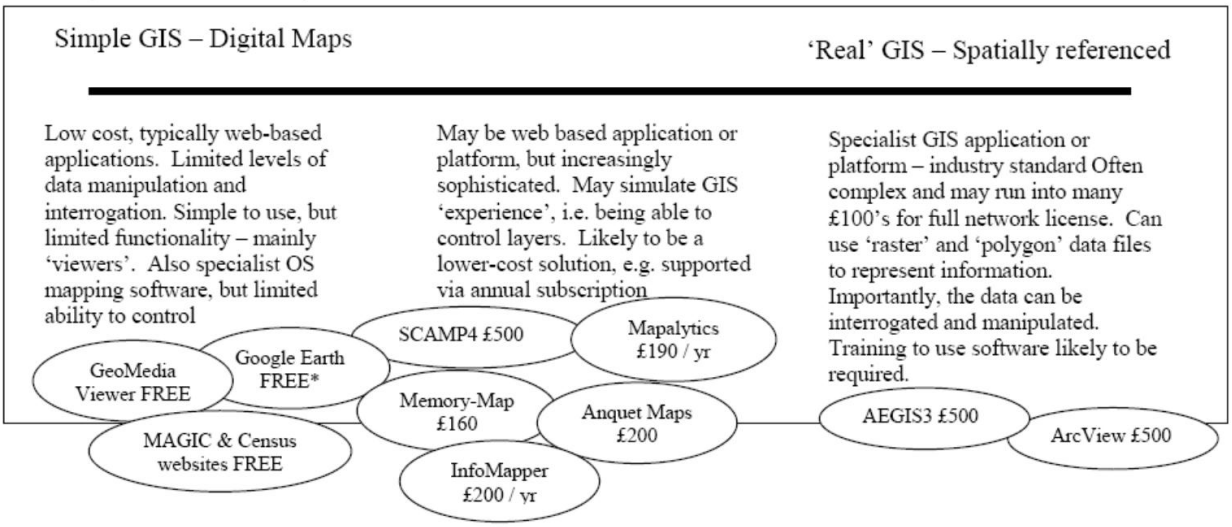
Example overlay	**Application**
Population density	Flood risk; pollution from particular point sources
Maps of crime	Crime 'hotspots'; links to people's perception of crime
Roads	Ambulance / police / fire to find quickest route (network)
Disease maps	Monitoring / modelling and predicting disease outbreaks, e.g. swine-flu
Town retail catchments	To help with the location of a new shopping centre or supermarket

Overall, the use of modern GIS offers many advantages over paper maps:

- Can cope with larger amounts of data
- Can cover large study areas (the whole world if necessary)
- Can conveniently select any sub-study area
- Can cope with unlimited and frequent edits and changes
- More robust and resistant to damage
- Faster and more efficient
- Requires less person time and money

GIS spectrum

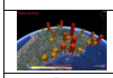
The idea behind the GIS spectrum is that there are different types of GIS systems that vary in terms of their complexity, sophistication and flexibility to do tasks. Simple examples of GIS are Google Earth, Google Maps, Microsoft Bing etc and then more sophisticated types including Anquet Maps, Infomapper, Aegis and ArcMapper. Please refer to the 'GIS spectrum' diagram. The industry standard platform for GIS, is however ArcGIS and its Online version, ArcGIS Online.



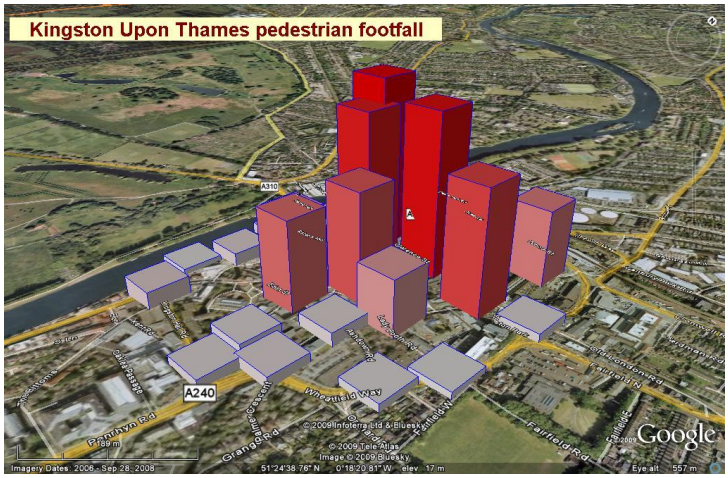
Free + low cost web-based GIS and digital maps

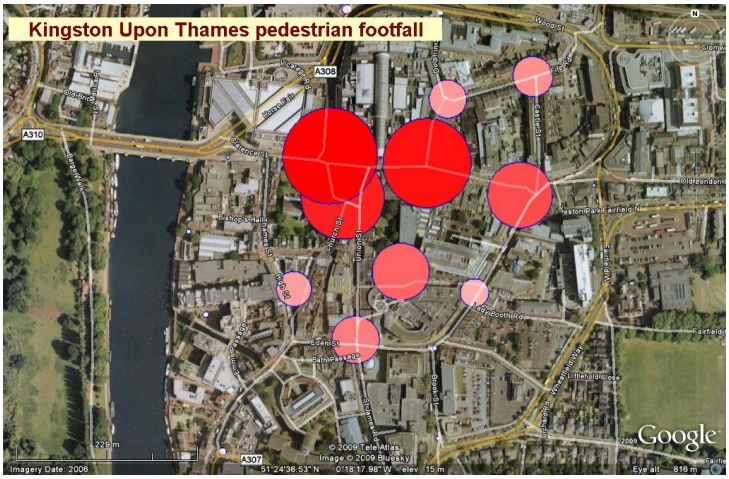
Virtually all students studying AS Geography will have already used a GIS system, because **Google Earth** and **Google Maps** are both GIS systems, although they are web based.

The table below suggests some of the sites that could be used as examples.

Mapping and web-based GIS websites	
multimap.com	Online maps for everywhere. Change scales and also view by air photo. www.multimap.co.uk. This is still a 'standard' source for many maps, but the site is often cluttered with adverts.
Google Local UK BETA	http://maps.google.co.uk/ Google Local also provides maps. Can select particular items to search for, e.g. "Indian restaurant restaurants in SY1". Clever stuff! Creating your own login ID allows users to customise their own maps
Windows Live Local powered by Virtual Earth Beta	http://local.live.com/ this website allows you to get maps and air photos at high resolution for locations in UK. Use postcode search. Better resolution than G. Earth for rural locations. An experimental site www.flashearth.com brings together Google Local and Windows local. Clever stuff.
quikmaps beta	Draw pictures and label things on a Google map using simple clicks and drags. Easily move the map to anywhere in the world. www.quikmaps.com The user-friendly nature of the site makes it ideal for students to create maps of their local or personal geographies and fieldwork activities.
FLASH EARTH	Flash Earth www.flashearth.com lets you select the best resolution air photo / satellite image from a range of sources. This is good for detail in rural areas.
Google Earth	http://earth.google.com - A visually stunning 3D interface on the planet. Download the 11MB programme (for free) and watch it go. You will need a fast internet connection. Interesting overlays can be found at http://www.googleearthhacks.com , e.g. live weather feeds, earthquakes etc
os Ordnance Survey	The OS website – our link takes you direct to the 'get a map' section where you can download any 1:50000 or 1:25000 map extract for the UK ("Get a Map" function). Very useful in c – try important / inserting into MS Word www.ordnancesurvey.co.uk
	It is possible to add graphs as 'kml' overlays to Google Earth using another free application – 'GeGraph'. There is a free download available for this at http://www.sgrillo.net/googleearth/gegraph.htm (it is now compatible with the latest version of Google Earth.
CHCC	CCG Online GIS Atlas – is an interactive web based visualization tool giving access to 88 key census variables from 1971 -2001. It aims to deliver a simple mechanism for mapping statistics from GB census – information is displayed as a cartogram. http://www.ccg.leeds.ac.uk/teaching/chcc/index.html
old-maps .co.uk	Providing access to Britain's most extensive digital historical map archive. Maps are generally 1900. Copy and paste. www.old-maps.co.uk. Can be used to look at changes in the shape and form of settlements for example.
	'Where's the path' (http://wheresthepath.googlepages.com/wheresthepath.htm) is a really top-draw site that allows the user to select and compare different types of map / satellite imagery side-by-side. The only problem is that the OS have limited the number of hits to 30,000 which means the site does work well in the afternoons!
	Open source postcodes http://dev.openstreetmap.org/~random/postcodes/ Does as it says on the tin – interactive map where the user can find postcodes. Good for sphere of influence type surveys, i.e. plotting how far people have come from.
u MAPPER	http://www.umapper.com/ Umapper is the first web-based universal map authoring tool. The user can create their own GIS maps (I think more powerful than Google maps). A range of tools are provided for students' use.

One of the big benefits of this free web-based technology is that overlays can be added, e.g. using GE Graphs – see examples immediately below.

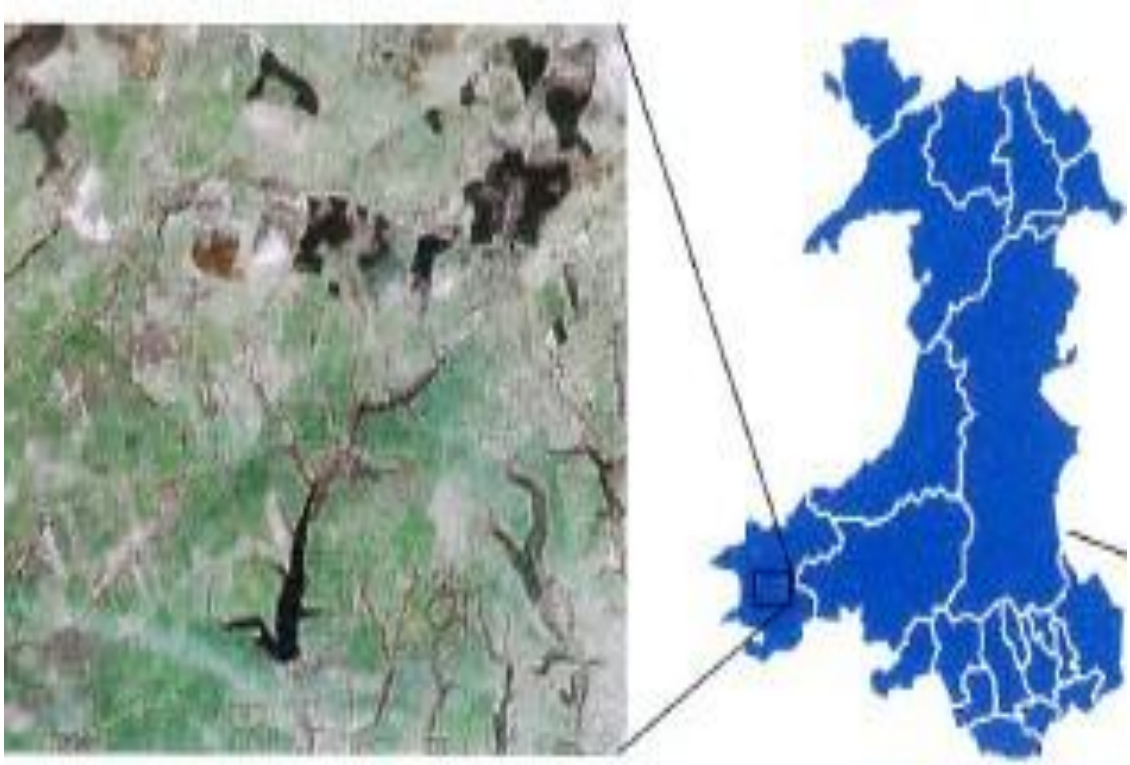




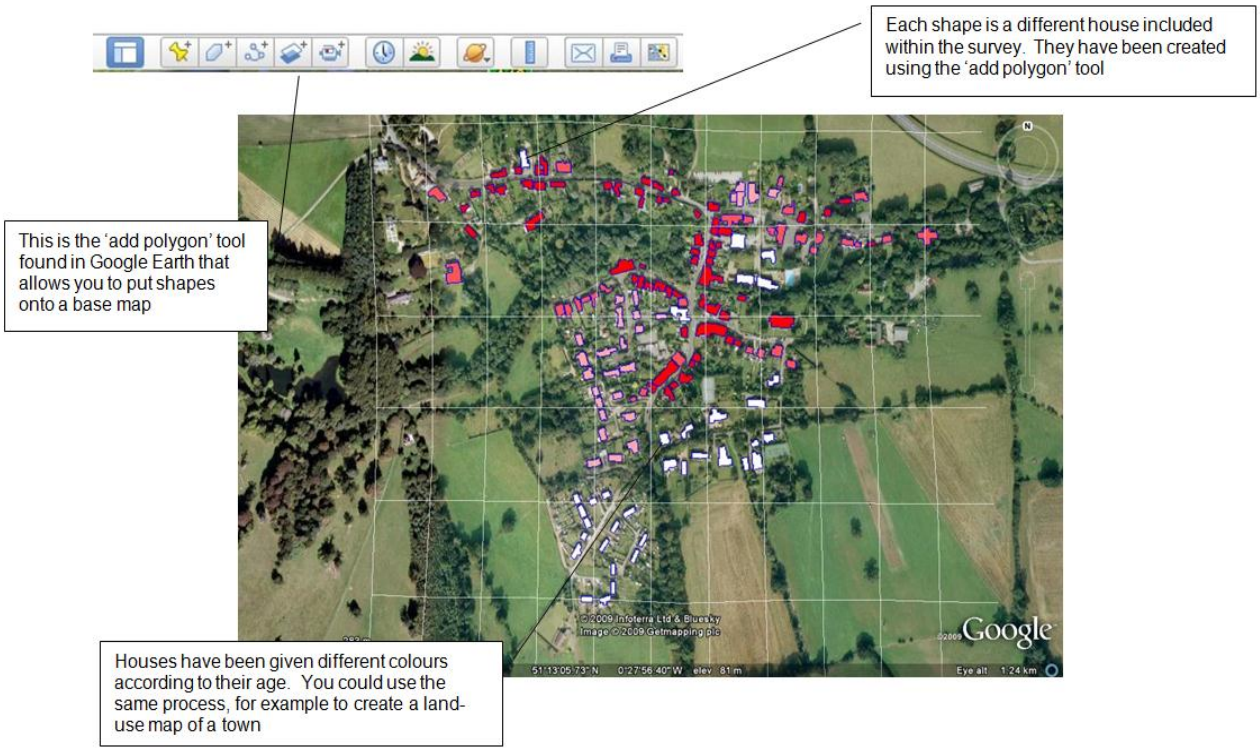
Source FSC Juniper Hall

Simple GIS has been unwittingly used by students for many years now – the example on the left shows how Google Maps for example has been used in the legacy coursework to locate an area.

Below is an extract from the Edexcel GCSE B Geography workbook, indicating the use of placemarks and overlays.



Google Earth and Google Maps allow users to create their own 'placemarks' and 'overlays'. This could be used in your controlled assessment to showing the location and ages of different types of housing for instance, or you may choose to add labels to the map to provide reasons for choosing a particular site.



Map created by Jason Lock / FSC Juniper Hall. Google map derived.

More sophisticated

School GIS packages

Company	Product	Primary	Secondary	e-Learning credits	Price	Contact details
The Advisory Unit Computers in education	**AEGIS3** An award-winning GIS for secondary schools with worksheets containing maps, data tables, text and pictures for popular topics plus free local Ordnance Survey maps for LA schools during the MapPilot. Download a free AEGIS Viewer and worksheets from the Advisory Unit website.		Y	Y	**Single** £100.00 + VAT **Network** from £250.00 + VAT to £500 + VAT. See Note A.	The Advisory Unit Computers in Education Phone: 01707 281102 Email: sales@advisory-unit.org.uk Website: www.advisory-unit.org.uk
Soft Teach Educational	**Local Studies** introduces students to computer mapping and GIS at Key Stage 1 (using Infant Local Studies – a simpler version to use and pre-loaded with keys suitable for Infant use) and at Key Stage 2. The complete Local Studies (Local Studies, Extended keys, Town & Country surveys, Map Importer and Symbol draw) is available as a Full Site Licence at £230.00	Y	Y	Y	**Primary** From £55.00 + VAT + p&p **Secondary** From £70.00 + VAT + p&p.	Soft Teach Educational Phone: 01985 840329 Email: Info@soft-teach.co.uk Website: www.soft-teach.co.uk
Soft Teach Educational	**Local Studies Map Importer** Additional Local Studies module to include Ordnance Survey digital map data.	Y	Y	Y	From £30.00 + VAT + p&p	Soft Teach Educational Phone: 01985 840329 Email: Info@soft-teach.co.uk Website: www.soft-teach.co.uk
Soft Teach Educational	**Mapping Skills** Teaches students the elements of map-reading skills. Includes Ordnance Survey mapping at 1:10 000, 1:25 000 and 1:50 000 scales and Land-Line® data	Y	Y	Y	**1–10 Computers** £90.00 **1–20 Computers** £120.00 **Site Licence** £165.00 + VAT (p&p not included)	Soft Teach Educational Phone: 01985 840329 Email: Info@soft-teach.co.uk Website: www.soft-teach.co.uk
Pebbleshore	**Scamp-4 with Scamp-5** Provides a range of topics and prepared studies based on 2001 Census data of your chosen area. The Mapshore GIS provided can be used for a wide range of other purposes such as using included Ordnance Survey digital map data.		Y	Y	£60.00 + VAT no extra charge (RM CC3 compatible version available)	Pebbleshore Phone: 0845 5210754 Email: pebbleshore@btinternet.com Website: www.pebbleshore.co.uk

Extract from the OS guide to GIS.

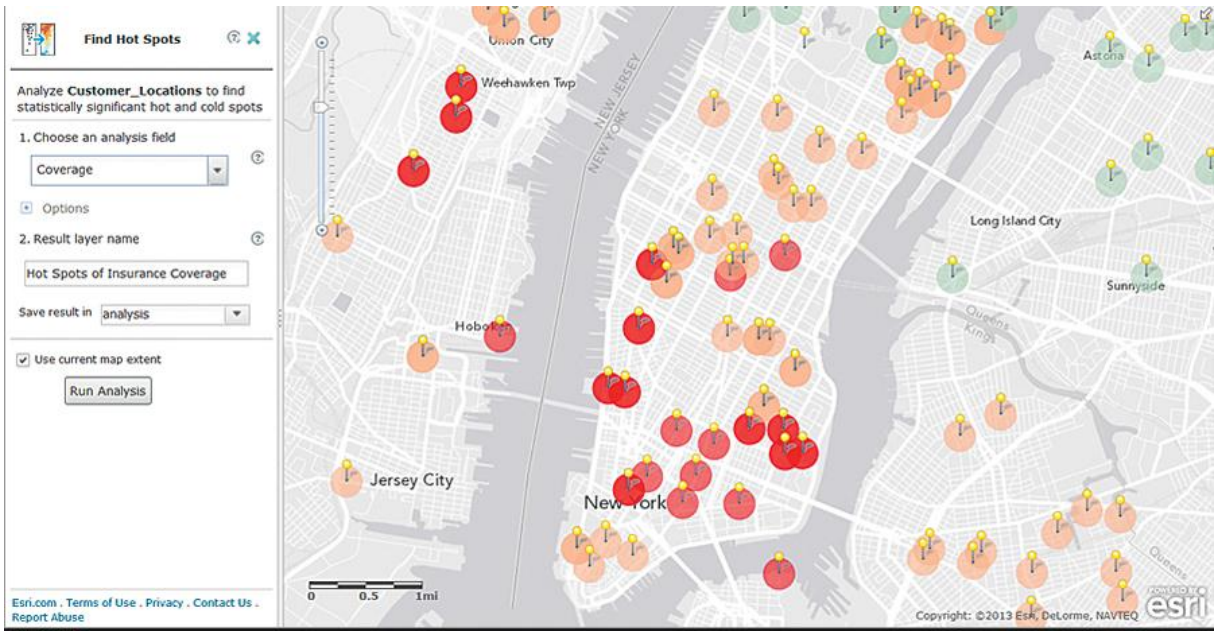
GIS

There are a range of specialist software products that can support GIS usage in schools. The most commonly used application is AEGIS3 http://www.advisoryunit.org.uk/ . This is a specialist schools based product which comes with a range of free data.
The leader in professional platforms is ESRI who have products such as ArcView and ArcInfo which are now widely used in some schools.
http://www.esriuk.com/ . Other examples of GIS systems are available and are listed by the Ordnance Survey – see extract
http://www.ordnancesurvey.co.uk/oswebsite/education/mappingnews/previouseditions/33/p38-39.pdf Paid-for packages have greater flexibility and sophistication than their web based counterparts, but they are more complex, often requiring specialist training for teachers and students. You can find out more about GIS also from the Geographical Association who have a support book http://www.geography.org.uk/shop/shop_detail.asp?ID=575&section=4

Linkage to GIS within the Edexcel geography specifications

Both the Geographical Association http://www.geography.org.uk/gtip/thinkpieces/gis/#top and the RGS have recognised the importance of GIS in school education
http://www.rgs.org/OurWork/Schools/Resources/GIS/Getting+started+with+GIS.htm . In fact, GIS is specifically mentioned within the GA's Geography Manifesto: *"GIS can be the source of innovative teaching approaches, both inside and outside the classroom".*

ArcGIS Online provides the best of both worlds – full GIS analysis tools, but runs through a web browser.



Web links and additional resources

Ordnance Survey GIS pages http://www.ordnancesurvey.co.uk/oswebsite/GISfiles/

GIS for the Curious http://gge.unb.ca/Resources/GISForTheCurious/

USGS web poster http://erg.usgs.gov/isb/pubs/GIS_poster/

GIS.com http://www.GIS.com/whatisGIS/index.html

ESRI GIS basics http://www.esri.com/industries/k-12/basicGIS.html

GeoExplorer - what is GIS? http://www.geoexplorer.co.uk/sections/GIS/GIS_explained.htm