

Geographical skills in the National Curriculum and GCSE and A level examination specifications (in 2016)

Geography National Curriculum

Geographical skills

- build on their knowledge of globes, maps and atlases and apply and develop this knowledge routinely in the classroom and in the field
- interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs
- use Geographical Information Systems (GIS) to view, analyse and interpret places and data
- use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information.

GCSE subject content

GCSE specifications in geography should enable students to build on their key stage 3 knowledge and skills to:

- develop and extend their competence in a range of skills including those used in fieldwork, in using maps and Geographical Information Systems (GIS) and in researching secondary evidence, including digital sources; and develop their competence in applying sound enquiry and investigative approaches to questions and hypotheses (study like a geographer)
- apply geographical knowledge, understanding, skills and approaches appropriately and creatively to real world contexts, including fieldwork, and to contemporary situations and issues; and develop well-evidenced arguments drawing on their geographical knowledge and understanding (applying geography).

GCSE specifications should require students to develop and demonstrate the following skills throughout their study of the specifications as a whole.

Maps

The use of a range of maps, atlases, Ordnance Survey maps, satellite imagery and other graphic and digital material² including the use of Geographical Information Systems (GIS), to obtain, illustrate, analyse and evaluate geographical information. To include making maps and sketches to present and interpret geographical information.

Use of data

'Data' should include both qualitative and quantitative data and data from both primary and secondary sources: fieldwork data; GIS material; written and digital sources; visual and graphical sources; and numerical and statistical information. Using data should include its collection, interpretation and analysis, including the application of appropriate quantitative and statistical techniques (a list of required skills and techniques is given in the Appendix); it also includes the effective presentation, communication and evaluation of material.

Formulating enquiry and argument

The ability to identify questions and sequences of enquiry to write descriptively, analytically and critically, to communicate their ideas effectively, to develop an extended written argument, and to draw well-evidenced and informed conclusions about geographical questions and issues.

Appendix: Use of mathematics and statistics in geography

The list below outlines the range and extent of mathematical and statistical techniques considered appropriate to geography GCSE. The following should all be covered in any specification. Examples in italics are to aid understanding and suggest range, and these are not compulsory.

Cartographic skills

- use and understand gradient, contour and spot height on OS maps and other isoline maps (e.g. *weather charts, ocean bathymetric charts*)
- interpret cross sections and transects
- use and understand coordinates, scale and distance
- describe and interpret geo-spatial data presented in a GIS framework (e.g. *analysis of flood hazard using the interactive maps on the Environment Agency website*)

Graphical skills

- select and construct appropriate graphs and charts to present data, using appropriate scales and including bar charts, pie charts, pictograms, line charts, histograms with equal class intervals
- ☒ interpret and extract information from different types of graphs and charts including any of the above and others relevant to the topic (e.g. triangular graphs, radial graphs, wind rose diagrams, proportional symbols)
- ☒ interpret population pyramids, choropleth maps and flow-line maps

Numerical skills

- demonstrate an understanding of number, area and scale and the quantitative relationships between units
- design fieldwork data collection sheets and collect data with an understanding of accuracy, sample size and procedures, control groups and reliability
- understand and correctly use proportion and ratio, magnitude and frequency (e.g. 1:200 flood; and logarithmic scales such as the Richter scale, in orders of magnitude)
- draw informed conclusions from numerical data

Statistical skills

- use appropriate measures of central tendency, spread and cumulative frequency (median, mean, range, quartiles and inter-quartile range, mode and modal class)
- calculate percentage increase or decrease and understand the use of percentiles
- describe relationships in bivariate data: sketch trend lines through scatter plots; draw estimated lines of best fit; make predictions; interpolate and extrapolate trends
- be able to identify weaknesses in selective statistical presentation of data

A level subject content

AS and A level specifications must enable students to:

- become confident and competent in selecting, using and evaluating a range of quantitative and qualitative skills and approaches, (including observing, collecting and analysing geo-located data) and applying them as an integral part of their studies

- apply geographical knowledge, understanding, skills and approaches in a rigorous way to a range of geographical questions and issues, including those identified in fieldwork, recognising both the contributions and limitations of geography
- develop as critical and reflective learners, able to articulate opinions, suggest relevant new ideas and provide evidenced argument in a range of situations

Awarding organisations must aim to:

- promote understanding of the rationale for, and applications of, skills and approaches used, together with a considerable degree of independence in selecting and using a wide range of geographical methods, techniques and skills, involving both qualitative and quantitative methods

In the context of landscape systems:

- emphasise the use of quantitative approaches including developing observation skills, measurement and geo-spatial mapping skills, together with data manipulation and statistical skills applied to field measurement. Qualitative approaches may be used if appropriate

Geographical skills

Competence in using geographical skills should be developed during study of core content and non-core content, not as a separate theme or topic. While the relative balance of quantitative and qualitative methods and skills will differ between each of the core and non-core themes, students must be introduced to a roughly equal balance of quantitative and qualitative across the specification as a whole.

AS and A level specifications must require students to:

- understand the nature and use of different types of geographical information, including qualitative and quantitative, primary and secondary, images, factual text and discursive/creative material, digital data, numerical and spatial data and innovative forms of data, including crowd-sourced and 'big data'
- collect, analyse and interpret such information, and demonstrate the ability to understand and apply suitable analytical approaches for the different information types
- 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 level specifications must require students to demonstrate all the following skills. AS level specifications must include a selection from both qualitative and quantitative skills listed below, as appropriate to the specification content.

Students must demonstrate the following skills specific to qualitative data:

- use and understand a mixture of methodological approaches, including using interviews
- interpret and evaluate a range of source material including textual and visual sources
- understand the opportunities and limitations of qualitative techniques such as coding and sampling, and appreciate how they actively create particular geographical representations
- understand the ethical and socio-political implications of collecting, studying and representing geographical data about human communities

Students must demonstrate the following skills specific to quantitative data:

- understand what makes data geographical and the geospatial technologies (e.g. GIS) that are used to collect, analyse and present geographical data
- 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;
- understand the purposes and difference between the following and be able to use them in appropriate contexts:
 - descriptive statistics of central tendency and dispersion
 - descriptive measures of difference and association, inferential statistics and the foundations of relational statistics, including (but not limited to) measures of correlation and lines of best fit on a scatter plot
 - measurement, measurement errors, and sampling