

Careers with Geographical Information Systems

● Module overview

Careers with Geographical Information Systems (GIS)

Aims and Objectives

These activities should provide students with a good idea of what GIS is and how it is applied in the real world. Students will be provided with a sound knowledge of the types of jobs available in this sector and the geographical skills needed to do those jobs.

Activities can be selected to be combined to provide a full lesson of material or integrated separately within lessons to fully embed careers education into your curriculum.

Key questions

- What is GIS?
- What skills do geographers have that are used in GIS careers?
- What jobs are available in GIS?
- How does GIS get used in the 'real world'?

Context

What is GIS?

A geographic information system (GIS) is a system that creates, manages, analyzes, and maps all types of data. GIS connects data to a map, integrating location data (where things are) with all types of descriptive information (what things are like there). This provides a foundation for mapping and analysis that is used in science and almost every industry. GIS helps users understand patterns, relationships, and geographic context. The benefits include improved communication and efficiency as well as better management and decision making (Source: Esri <https://www.esri.com/en-us/what-is-gis/overview>)

Organisations across the globe are increasingly relying on location intelligence to make better decisions. As a result, careers in GIS are in demand more than ever. Equipped with data visualization and spatial analysis skills, GIS professionals qualify for occupations in countless fields (Source: Esri, <https://www.esri.com/en-us/what-is-gis/careers>)

For full information about what is GIS and how it is used, go to the Esri website <https://www.esri.com/en-us/what-is-gis/overview>

The RGS-IBG website provides a good overview of skills and careers within this sector <https://www.rgs.org/professionals/career-resources/use-geography-careers-in-mapping-gi-datascience/>

Example jobs in this sector

Analyst, Defence Geographic Centre
Crime and Disorder Advisor, MAPCITE
Data Collector, Ordnance Survey



Geographic Information Analyst, Metropolitan Police
 GIS Analyst, Animal Health and Veterinary Laboratories Agency
 Hydrologist, WS Atkins
 Hydrometry and Telemetry Officer, Environment Agency
 Land Requirements Geospatial Officer, Ministry of Defence
 Training and Education Services Manager, Esri UK
 Lead Specialist Advisor for Geospatial
 Project Manager, Mapping Scotland's Paths
 Geospatial Consultant, Arup
 GIS Analyst, Forestry Commission
 Assistant GIS Consultant, WSP
 Data analyst, HS2
 Geospatial Information Specialist, Ministry of Defense
 GIS Manager, Milton Keynes Council
 Senior GIS Analyst - Offshore Wind
 Flood Risk and GIS Analyst
 Head of Business Intelligence and Spatial Data Science
 Cartographer
 Land surveyor
 Geospatial Technician

Activities

Name and information	Timings	Resources
I am a Geographer <ul style="list-style-type: none"> - Exploring the types of jobs GIS specialists do and the pathways they follow to get those jobs - Identifying the skills these geographers use in their jobs - Understanding how these GIS related jobs relate to 'real world' geography 	20 – 25 mins	GIS - I am a Geographer Profile 1: Richard Martin, GIS Analyst Profile 2: Andrew Fielding, Flood Risk and GIS Analyst Profile 3: Terri Freemantle, Senior Earth Observation Specialist Profile 4: Patrick Rickles, Head of Business Intelligence and Spatial Data Science Profile 5: Katie Hall, GIS Education Consultant
Job adverts and salary bands <ul style="list-style-type: none"> - Several job adverts with salaries, desired skills and roles and responsibilities (for info only) - Could be used to support activities focused on skills needed to work in GIS and how GIS is used in the 'real world'. 	For information only	GIS - Job adverts and salary bands GIS - Job adverts and salary bands - Assistant GIS Consultant, WSP GIS - Job adverts and salary bands - Data analyst HS2 GIS - Job adverts and salary bands - Geospatial Information Specialist, Ministry of Defense GIS - Job adverts and salary bands - GIS Manager, Milton Keynes Council GIS - Job adverts and salary bands - Senior GIS Analyst - Offshore Wind
GIS in practice – Ordnance Survey	Up to 1 hour (could be made	GIS in practice – Ordnance Survey



<ul style="list-style-type: none"> - Using the OS Housing Demo to decide where to locate a new housing estate using geospatial data - Dinosaur apocalypse activity to demonstrate how GIS can be used in an emergency situation to solve problems and find solutions - What does Ordnance Survey do? Links to sectors that use OS data, case studies of OS data use and videos produced about OS work 	<p>into a 10 min demo)</p>	<p>GIS in Practice OS - Housing Demo Teachers Notes GIS in Practice OS - Dinosaur Apocalypse Teachers Notes</p>
<p>GIS in practice – Esri</p> <ul style="list-style-type: none"> - Careers with GIS – profiles of professionals that work in GIS and details of their career pathways - Classroom display activity - GeoMentors – professionals to visit your school 	<p>Up to 1 hour (could be made into a 5 min overview segment)</p>	<p>GIS - GIS in practice - Esri UK</p>
<p>Geovisualisation</p> <ul style="list-style-type: none"> - Visualisations / maps created by researchers, academics and professionals to show data in an interesting and useful way (also linked to ‘real world’ use of geography) 	<p>5 – 10 minutes</p>	<p>GIS - Geovisualization</p>
<p>Geography superheroes</p> <ul style="list-style-type: none"> - Introduction to Dawn Wright, a geographer, oceanographer and Chief Scientist of Esri who maps ocean floor - Create your own GIS superhero 	<p>Up to 45 minutes (could be made into a 5 min start or plenary)</p>	<p>GIS - Geography Superheroes Geography Superheroes - Dawn Wright</p>

Unlocking the power of location: The UK’s geospatial strategy

<https://www.gov.uk/government/publications/unlocking-the-power-of-locationthe-uks-geospatial-strategy>

“Location data is already pervasive and its benefits will continue to increase throughout the economy and across all regions supporting economic recovery, attracting investment, creating jobs and boosting UK exports in an environmentally sustainable way. Initial research carried out in 2018 suggested that location data has a potential economic benefit to the UK of up to £11 billion per year.” Source: <https://www.gov.uk/government/publications/unlocking-the-power-of-locationthe-uks-geospatial-strategy>

Page 13 onwards of the report found below shows nine location data opportunities.

Infrastructure: Building data for the future. Case study showing creation of an underground map of pipes and cables that will save lives and prevent disruption.

Transport: Putting ourselves in the fast lane. Case study of the development of self driving cars and the locational data needed (road markings, street furniture etc, as well as real-time updating of maps after accidents and traffic jams).

Housing and local planning: Laying solid foundations for growth. Case study of how satellite data can be used to evaluate planning potential and monitor building progress.

The environment: Protecting the world around us. Case study showing how the production of high-resolution data about greenhouse gas emissions could be used to generate estimates of the carbon footprints of specific buildings or facilities.

Public health: Tracking and preventing disease. Case study showing how locational data was used to track the spread of covid-19, monitor social distancing and movement and also the location of medical resources.

Emergency response: Harnessing data to save lives. Case study of how mobile phone location data can help 999 services pinpoint people to incredible accuracy, including firefighters within a smoke filled building.

Ocean economy: Discovering uncharted seas. Case study showing how locational data can be used to identify and protect mangrove forests.

Retail: Locating customer demand. Case study showing how locational data can be linked to ONS data to spatially identify highstreets.

Finance: Mapping risk to protect and grow markets. Case study highlighting the use of data by the insurance industry to identify risk.

Teachers can use the case studies in this report as short snippets of information about the use of GIS in the 'real world'. Talking about flood risk in the UK? Why not highlight to students that GIS analysts use geospatial data to assess levels of risk across areas which in turn can lead to insurance companies deciding how high premiums will be in different areas. Get students thinking about how the use of this data and the analysis of it may have an impact on their own lives - do any of the students live near a river? Can they find out if their house insurance premiums are higher because of that?

Additional links

Esri – careers in GIS <https://www.esri.com/en-us/what-is-gis/careers>

Esri – what is GIS showcase (examples of how GIS is used in the 'real world').

<https://doc.arcgis.com/en/what-is-gis/showcase/>

Careers with GIS video from Esri UK <https://www.youtube.com/watch?v=dOUYf5CyLQY>

Esri UK <https://careers-with-gis-esriukeducation.hub.arcgis.com/pages/schools>

Ordnance Survey GIS activities <https://www.ordnancesurvey.co.uk/education/gis-schools/gis-day-schools>

Ordnance Survey – use of data in the 'real world' <https://www.ordnancesurvey.co.uk/insights>

RGS-IBG Geovisualisation - Discover how geographers bring a unique perspective to presenting data in innovative and understandable ways <https://www.rgs.org/geography/geovisualisation/>

RGS-IBG I am a Geographer <https://www.rgs.org/iamageographer/>

Prospects job profile: GIS Officer <https://www.prospects.ac.uk/job-profiles/geographical-information-systems-officer>

RGS-IBG Use geography: careers in mapping, GI and data science

<https://www.rgs.org/professionals/career-resources/use-geography-careers-in-mapping-gi-datascience/>

RGS-IBG YouTube video: Use Geography: careers in mapping, GI and data science

<https://www.youtube.com/watch?v=vm1EJEgrlTk&t=8s>

RGS-IBG Impact of Geography <https://www.rgs.org/geography/advocacy-and-impact/impact/?keyword=geospatial>

Geography Directions blog <https://blog.geographydirections.com/?s=GIS>

Time for Geography: Careers with GIS and Geography <https://timeforgeography.co.uk/videos-list/geography-careers/careers-with-gis-and-geography/>

National Careers Service- Geospatial Technician <https://nationalcareers.service.gov.uk/job-profiles/geospatial-technician>

National Careers Service- Land Surveyor <https://nationalcareers.service.gov.uk/job-profiles/land-surveyor>

National Careers Service - Cartographer <https://nationalcareers.service.gov.uk/job-profiles/cartographer>

Climate Just: shaping more socially-aware responses to climate change – University of Manchester <https://www.rgs.org/geography/advocacy-and-impact/impact/climate-just-shaping-responses-to-climate-change/>

Global mangrove watch – Aberystwyth University <https://www.rgs.org/geography/advocacy-and-impact/impact/global-mangrove-watch/>

Fatbergs and flooding in the Thames Valley – Esri <https://www.rgs.org/geography/advocacy-and-impact/impact/fatbergs/>

Measuring the healthiness of places - CDRC <https://www.rgs.org/geography/advocacy-and-impact/impact/casestudy-healthyplaces/>

Remote sensing and hazard risk management with Dr Ekbal Hussain <https://www.rgs.org/schools/teaching-resources/remote-sensing-and-hazard-risk-management-with-dr/>

How to use ArcGIS in geography with Jason Sawle <https://www.rgs.org/schools/teaching-resources/how-to-use-arcgis-in-geography-with-jason-sawle/>

Responsible and ethical use of location data with Doug Specht <https://www.rgs.org/schools/teaching-resources/responsible-and-ethical-use-of-location-data-with/>

Do you know what the Countryside Survey is? <https://www.rgs.org/schools/teaching-resources/do-you-know-what-the-countryside-survey-is/>

The beauty of Earth Observation: Dr Fleur Visser <https://www.rgs.org/schools/teaching-resources/the-beauty-of-earth-observation-dr-fleur-visser/>

GIS Teaching Resources <https://www.rgs.org/schools/teaching-resources/?categories=GIS&loadall=0&pageindex=1>

Disaster risk in the humanitarian sphere: what about information management and mapping? <https://www.rgs.org/geography/online-lectures/disaster-risk-in-the-humanitarian-sphere/>

The art and science of geovisualisation for disaster risk management <https://www.rgs.org/geography/online-lectures/the-art-and-science-of-geovisualisation/>

Feminist theory and Geographical Information Systems - Anwen Davis <https://www.rgs.org/geography/online-lectures/feminist-theory-and-gis/>

The United Nations and global geospatial information - James Norris <https://www.rgs.org/geography/online-lectures/the-united-nations-and-global-geospatial-info/>

What is customer loyalty worth? My career in data science - Edwina Dunn <https://www.rgs.org/geography/online-lectures/what-is-customer-loyalty-worth/>