

Building the World Around Us

Lesson summary:

Surveyors design, build, value and manage everything around us. From hospitals to parks, and cinemas to the tallest skyscrapers in the world, surveyors use state of the art technology to make a real difference to the world we live in today.

Geography enables young people to become environmentally informed global citizens. This lesson package is a curriculum linked resource, focussed on students developing their geography skills as they learn about the world of surveying and take on the role of a surveyor.

Ideally, this resource can be delivered as a secondary Geography KS3 lesson, but it is fully-adaptable for a range of learners, subjects and time-frames.

Learning objective:

To develop an understanding of the physical characteristics of the buildings and land around me.

Learning outcome:

- I can use my geographical skills to solve problems
- I can understand the processes behind physical and human geographical features
- I can communicate geographical information in a variety of ways
- I can interpret Ordnance Survey maps, including using grid references and satellite photographs

Subject/s:

- Geography

Age group:

- Key Stage 3, ages 11-14

Timing options:

- 2 hour Geography lesson
- Split into two 1 hour Geography lessons
- Expand into a half-day careers focused Geography Workshop

Resources:

- Access to RICS website
- RICS Mega City game
- Activity Sheet 1 - Step into the Future
- Activity Sheet 2 - Map of Mega City
- Extension Activities
- Clipboards

Starter:

Inform students they will be learning about the role of surveyors and how they perform a very important role in Geography.

Provide students with the following definition from Royal Institution of Chartered Surveyors (RICS):

Chartered Surveyors design, build, value and manage everything around us.

Surveying affects every part of our lives. Chartered Surveyors are involved in designing, building, valuing and managing everything around us. From skyscrapers to sports stadiums, forests to festival sites, shopping centres to the homes we live in, surveyors are involved every step of the way.

Watch the **RICS video** 'What do surveyors do?' <https://www.youtube.com/watch?v=gBLd2HhNsKg>.

After the video, ask students to talk to a partner to describe what they know about surveying, and how they think surveying has affected their own lives e.g. *their school has a playground, they live in a flat or house.*



Top tip

The video introduces some words and phrases used in surveying, which may be unfamiliar to students. If required, use the word bank in the **Teacher Guide** to describe terms like 'due diligence', 'infrastructure' and '3D modelling.'



FUN FACT

Did you know that Captain Cook is one of the most famous surveyors in the world? In the 1770s he sailed into every ocean and surveyed all the areas he discovered.



Main activities:

The Future of Surveying

Chartered Surveyors carry out detailed inspections to assess the conditions of properties and landscapes. This is to ensure these places are in a good enough state to live or work in or for public use. Constant innovation means new technology is changing the face of surveying. From drones to lasers, 3D printers to virtual reality – technology is at the forefront of surveying.

Inform students they are going to work in groups of three or four to inspect areas of the school building. Taking things one step further, they are going to suggest how they would use innovative technology to create futuristic learning spaces.

Hand out **Activity Sheet 1: Step into the Future** on clipboards to each group and give them a different area inside the school to inspect e.g. school hall, school reception, classroom.

Encourage students to think about the futuristic changes they would make to the area they are surveying. If possible, offer students the option to use the internet to explore potential futuristic innovations.

After 15 minutes reconvene the class and ask each group to share their findings and recommendations.

Activity Sheet 1

Step into the Future of Surveying

In the future, surveyors will be creating **Futuristic Learning Spaces** in schools. This means school buildings will be designed, created and controlled using state of the art, interactive technology to help you learn, socialise and move around the building in an engaging way.



Voice controlled robotic assistants



Holography



Artificial Intelligence



Virtual reality

Your group is going to check an area within the school and give suggestions on how to make this into a futuristic learning space.

Which room are you going to do a survey on? e.g. classroom.

walls, windows, whiteboard, books, tables.

the ultimate futuristic learning space?

think outside the box. From robotic is, the possibilities are endless!

in and use this space in the future!

FUN FACT

Did you know that Burj Khalifa in Dubai is one of the tallest buildings in the world? It holds the world record for being the tallest free-standing structure in the world and a Chartered Surveyor worked on it.



Play the Mega City game

Inform students there are many different types of professional surveyors. As they play the Mega City game, they will now get the chance to take on some of these surveying roles. Their mission will be to use state of art technology to budget, map, design, build and manage a megacity. Please refer to the **Teacher Guide** for guidance on how to play the Mega City game.

Play the game as a whole class and try to balance the budget while ensuring the best decisions are made. Remember to pause in between each of the four challenges to check students' understanding of the different roles and experiences in surveying.

megafutures.RICS.org.



Top tip

Suggest that students play this game individually and remind them the cheapest option is not always the best option!

Four-Figure Grid References

Due to advances in technology, Chartered Surveyors use the most up to date geographic information systems (GIS) and electronic distance measuring instruments (EDMs). These instruments include drones, prism reflectors and other sophisticated technology to locate places on maps digitally. Although surveyors use technology as part of their job, they still need to be able to read coordinates on maps to help find places and objects.

Show students the **Activity Sheet 2: Map of Mega City**, the megacity from the digital game.

Four-figure grid references help us locate specific grid squares on maps. Inform students they will be using four-figure grid references to find places on the map of Mega City, by using the grid lines and grid numbers. The horizontal grid lines are called **eastings** (first two numbers) and the vertical grid lines are called **northings** (second two numbers).

Using the example shown on the activity sheet, show students how to locate the shopping centre in Mega City (where the easting and the northing grid lines meet), then ask students to continue with the rest of the activity sheet with a partner or independently.

Activity Sheet 2

Four-Figure Grid References - Map of Mega City

Four-figure grid references are used to locate a particular grid square on a map. The grid squares on the map of Mega City show us where things are located in and around the megacity.

- The vertical gridlines are called **northings** and they increase as you move northwards.
- The horizontal gridlines are called **eastings** and they increase as you move eastwards.
- The grid reference for the shopping centre is **13,30**. The first two numbers are the eastings and the second two number are northings.

A great way to remember how we would write down a grid reference is:

Along the corridor and up the stairs!

Answer these questions using the map of Mega City.

- Find the train station on the map. Which of these is the correct four-figure grid reference?
a) 13,32 b) 14,30 c) 14,31
- Find the school on the map. Which of these is the correct four-figure grid reference?
a) 13,32 b) 12,31 c) 12,32
- What is the name of the park on the map in grid square 14,32?
- What is located in grid square 12,30?
a) Shopping centre
b) Residential Buildings
c) Church
- What is located in grid square 13,32?
a) College
b) Financial District
c) Hospital
- Why would a surveyor use grid square references to read maps?
- Can you name a type of equipment a surveyor might use to read maps?

FUN FACT

Greek people were the first to use maps in the 6th century. The earliest Greek known to have made a map of the world was Anaximander.



Plenary:

Now that students have learnt about the world of surveying, ask them if they were surprised at their findings, what they enjoyed and how this lesson has helped them consider a future career in surveying or another profession.

Hand out the **Student Letter** and encourage students to play the game independently at home or in school via the link:

megafutures.RICS.org.

For additional learning resources, tips and inspiration on the world of surveying, see the **Resources Section** and encourage them to look on the RICS website.

A Brilliant Future in Surveying

Well done for your amazing efforts to learn about the exciting world of Chartered surveying. We hope this has inspired you to look at the buildings and landscapes around you in a completely different way.

Why is Surveying so exciting?

Surveyors are involved in the planning, building and maintaining of everything from roads, bridges, skyscrapers, shopping centres and football stadiums. Constant innovation means new technology is changing the face of surveying. From drones to lasers, 3D printers to virtual reality – technology is at the forefront of surveying.

Routes into Chartered Surveying

If surveying sounds like a career you would like to consider in the future, the entry routes are endless. From degree apprenticeships to the traditional university route – there's something for everyone!

You can even start now, by contacting your local surveying practice for a work experience placement.

GCSEs / Highers / A Levels

University Degree

Degree Apprenticeship

Graduate Surveyor

Mega City Game

Don't forget to play the Mega City Game at home. Your mission is use state of the art technology and problem solving to budget, map, design, build and manage a megacity.

Play the game on the [RICS website] to make the best decisions for the city. Check out the exciting careers profiles within the game to learn more about the roles of surveyors. But most importantly, get your family and friends involved in the game to experience the world surveying and have fun!

RICS

For further information on careers and entry routes into surveying, speak to your school careers advisor, or get in touch with us today and we'd be happy to help!

Email: careers@rics.org

Website: www.rics.org/uk/careers/employers/inspire-programme

Extension activities:

If you would like to provide your students with additional resources and inspiration on the world of surveying, here are some extension activities:

State of the Art Technology

Introduce the video '*Technology and the built environment*' to your students to demonstrate how technological advancements continue to change the face of surveying.

Refer to students' futuristic findings from **Activity 1**, and discuss the importance of keeping up technology, because of the range of exciting opportunities this can bring.

<https://www.youtube.com/watch?v=Bmp9jgzkUYc>

Surveying Fun Facts Quiz

Take students to an area where they can move around freely. On opposite walls, display true and false signs. Read the statements below and ask students to move to the appropriate true/false area once each statement has been read. If appropriate, ask them why they have chosen the true or false statement. If space is limited, ask students to remain seated, but to raise or lower their hands for true/false statements.

Surveying is one of the oldest professions in the world.	TRUE – surveying originates from Ancient Egypt, about 3,000 years ago.
Surveyors need to be able to think on their feet and have a keen interest in properties.	TRUE – They also need to be very organised and have good people skills.
Surveyors do not travel much to do their jobs.	FALSE – many surveyors travel the world to explore and give advice on buildings and landscapes.
Greek people were the first to use maps.	TRUE – the earliest Greek known to have made a map of the world was Anaximander during the sixth century.
Captain Cook is one of the most famous surveyors in the world.	TRUE – In the 1770s he sailed into every ocean and surveyed all the areas he discovered.
Surveyors plant trees to bring more oxygen into the environment.	FALSE – There are Environmental Surveyors who give advice on how to be environmentally friendly, but generally, surveyors design, build, value and manage everything around us.
Surveyors use state of the art technology to do their jobs.	TRUE – Constant updates in new technology is changing the surveying profession. From drones to lasers, 3D printers to virtual reality – technology is at the forefront of surveying.
Surveyors only work on building sites.	FALSE – Surveyors design, build, value and manage everything around us, including parks, lakes and farms.
Some surveyors map out and measure land space.	TRUE – Geometric Surveyors use drones and other special tools to map out the space.

School Visit

Contact a local Chartered Surveyor to arrange a talk in an assembly or careers session. Ask them to talk about a 'day in the life of a surveyor' and how they got into the profession. Alternatively, arrange a class visit or work experience placements at your local surveying practice.

More information

For more information on surveying and entry routes into this exciting profession, visit the RICS website: www.rics.org/careers.

Curriculum Links:

England: Geography

Key Stage 3:

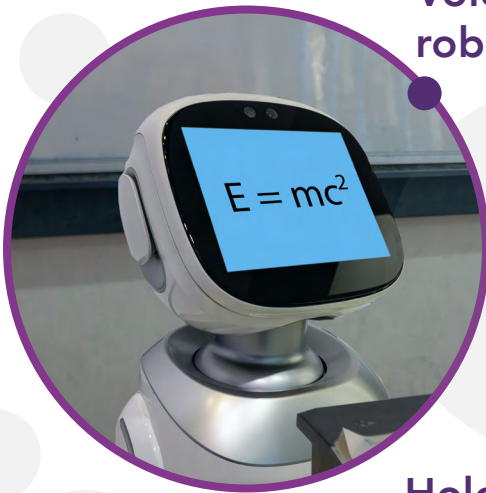
- To collect, analyse and communicate with a range of data gathered through experiences of fieldwork that deepen their understanding of geographical processes
- To understand the processes that give rise to key physical and human geographical features of the world
- To interpret a range of sources of geographical information, including maps, diagrams, globes, aerial photographs and Geographical Information Systems (GIS)
- To communicate geographical information in a variety of ways, including through maps, numerical and quantitative skills and writing at length
- To 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

Step into the Future of Surveying

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This means school buildings will be designed, created and controlled using state of the art, interactive technology to help you learn, socialise and move around the building in an engaging way.

Voice controlled robotic assistants



Holography



Artificial Intelligence



Virtual reality



Your group is going to check an area within the school and give suggestions on how to make this into a futuristic learning space.

Which room are you going to do a survey on? *e.g. classroom.*

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Describe the things you can see in this room e.g. *painted walls, windows, whiteboard, books, tables.*

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Technology is constantly changing, so be creative and think outside the box. From robotic assistants to interactive walls and holographic 3D images, the possibilities are endless!

[illegible]

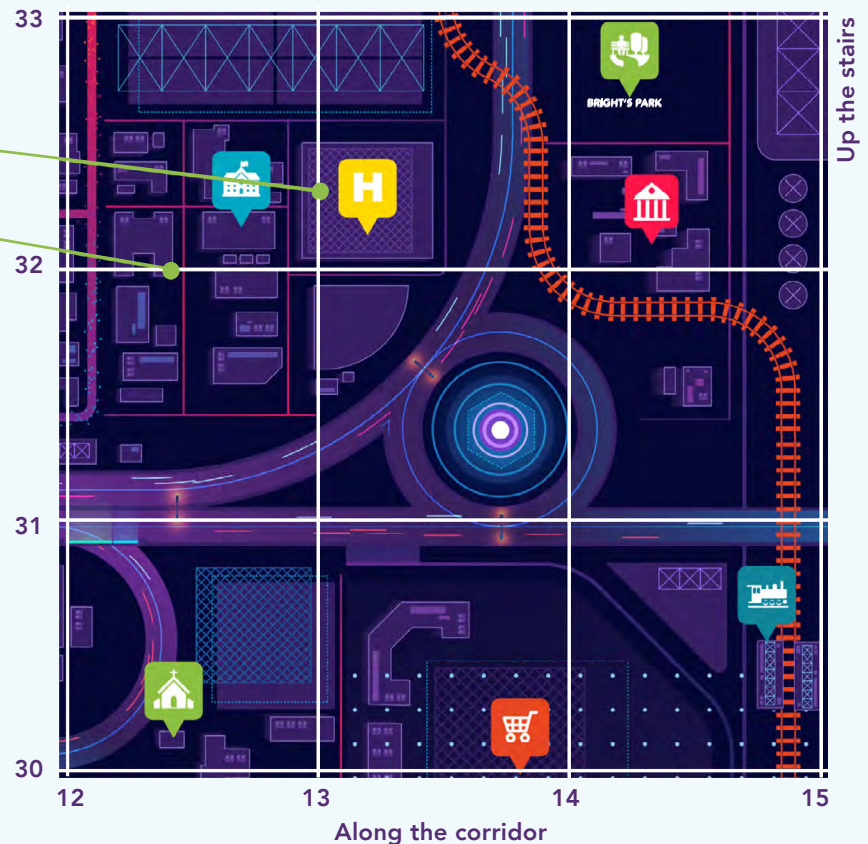
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up the stairs!



Answer these questions using the map of Mega City.

1. Find the train station on the map. Which of these is the correct four-figure grid reference?

a) 13,32 b) 14,30 c) 14,31

2. Find the school on the map. Which of these is the correct four-figure grid reference?

a) 13,32 b) 12,31 c) 12,32

3. What is the name of the park on the map in grid square 14,32?

4. What is located in grid square 12,30?

a) Shopping centre
b) Residential Buildings
c) Church

5. What is located in grid square 13,32?

a) College
b) Financial District
c) Hospital

6. Why would a surveyor use grid square references to read maps?

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7. Can you name a type of equipment a surveyor might use to read maps?

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