

6.11 Satellite systems

Syllabus 2026 - 2028

WHAT YOU NEED TO KNOW

- Characteristics, uses, advantages and disadvantages of satellite systems, including GPS, satellite navigation, GIS and media communication systems (satellite television and satellite phone)

Global Positioning System (GPS)

GPS is a network of satellites orbiting the Earth. A GPS receiver (in a phone, car or ship) receives signals from several satellites. It works out how far away each one is from the time the signal took to arrive, and uses this to calculate its exact position.

- Uses:** navigation, tracking vehicles and deliveries, mapping, finding a lost phone, and guiding ships, aircraft and farm machinery

Satellite navigation

A satellite navigation system combines a GPS receiver, stored maps and software. It finds the position of the vehicle, works out a route and gives directions.

Advantages	Disadvantages
+ No paper maps are needed	- Maps can be out of date and give wrong directions
+ Finds the shortest or fastest route and can show traffic and speed limits	- The signal can be lost in tunnels, tall buildings or bad weather
+ Updates the route if the driver takes a wrong turn	- Can distract the driver, and may suggest unsuitable roads

Geographic Information Systems (GIS)

A GIS captures, stores, analyses and displays geographic data. Different layers of information (roads, rivers, buildings, population) are shown on one map.

- Uses:** town planning, emergency services, environmental monitoring, land use, tracking the spread of disease, and mapping utilities such as pipes and cables

Advantages	Disadvantages
+ Many types of data can be combined and compared	- Software and data can be costly
+ Maps are easy to understand and help with planning	- Users need training, and data can become out of date

Media communication systems

System	How it works	Advantages and disadvantages
Satellite television	A signal is sent up to a satellite, which sends it down to dishes over a large area.	Many channels and good coverage, even in remote areas. But needs a dish and subscription, and heavy rain can weaken the signal.
Satellite phone	Calls go through a satellite instead of a local mobile mast.	Works almost anywhere with a clear view of the sky, such as at sea or in remote areas. But the phone and calls are costly, and there can be a delay.

EXAM TIP

For GPS, say that the receiver uses signals from several satellites to work out its position. Many students only write 'it finds where you are', which earns no marks.

Key terms

Term	Meaning
GPS	A satellite system used to find the position of a receiver.
Satellite navigation	A system that uses GPS and maps to guide a driver along a route.
GIS	Geographic Information System: software that stores and displays map data in layers.
Satellite	An object that orbits the Earth and sends and receives signals.