PiXL

Geography

KS3 Spine

Geographical Connections

Making ***Geographical Connections*** is all about looking at key concepts that stretch across many topics in geography. If you can understand the many links there are between these four concepts and the topics you study in geography, you will do well!

Two of these key concepts are often linked to human geography:
sustainability
development

Two of these key concepts are often linked to physical geography:
processes and landforms
global atmospheric circulation

Sustainability

This word gets everywhere in geography! It was first used widely after a report called the Brundtland Report in 1987.

It was defined as ***"meeting the needs of the present, without compromising the ability of future generations to meet their own needs".***

What does this actually mean?
It suggests that the people living in the present (us!) need to be able to get things from planet earth that we require – e.g. coal, wood, food, water, etc., so that we can live well now. However, we should only do this if it doesn't stop future generations being able to do the same.

It is sometimes useful to think of a series of questions to consider if you want to know if something is sustainable:
- Does it protect or conserve the environment?
- Does it help local people now?
- Does it ensure future generations are not negatively affected?

Connection

Development is better if it is sustainable!

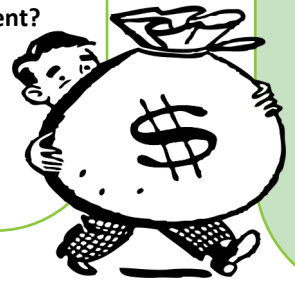
An example of sustainable development

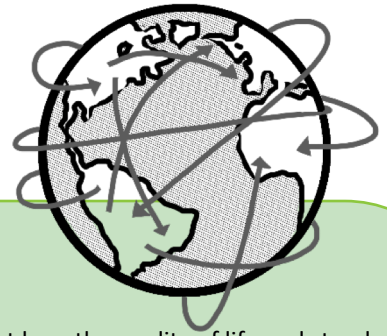
In Sri Lanka, there were many rural areas that had no water in the dry season. To develop the area, the World Bank helped develop 'pumpkin tanks'.

These were large tanks that villagers could build themselves, and maintain, with little cost. In the wet season, they filled up and collected water that could be used in the dry season.

How do we know it is sustainable development?

Did it improve people's standard of living?
Did it conserve the environment?
Did it help local people now?
Are future generations negatively affected?





Development

Development is about how the quality of life and standard of living is improving in an area. Some areas are very well developed and their populations have an excellent standard of living and quality of life. However, some areas in the world are not so well developed.

Development could be considered in many ways, such as economic development (how well the economy is doing) or social development (how well people are doing).

We often categorise countries by their ***economic development*** level by referring to them in the following ways:
- lower income country (LIC) /developing – e.g. Afghanistan
- newly emerging economy (NEE) – e.g. Nigeria
- higher income country (HIC) /developed – e.g. the UK

You can judge the development of a country by using ***indicators of development.*** These are things that tell us how developed a country is. Some indicators tell us how socially developed an area is, such as life expectancy. Other indicators tell us how economically developed an area is, such as gross national income (GNI), a measure of wealth.

Processes and landforms

You have probably already studied many processes and landforms without even realising it!

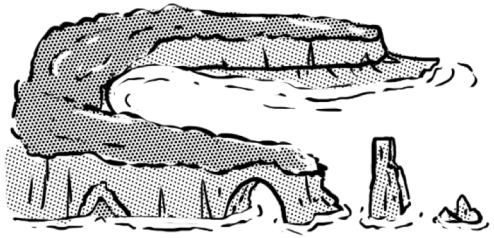
- ***A process*** is a sequence of actions that shape and change environments. An example would be ***erosion.***
- ***A landform*** is a natural feature of the earth's surface. An example would be ***a bay.***

Connection

Often many processes occur in a sequence of events that leads to the creation of one of the earth's landforms.

For example, the process of erosion occurs on cliffs at a coast. Softer rock erodes more quickly than hard rock. This eventually leads to the softer rock eroding further backwards on a coastline, into a C-shaped inlet. We call this a bay and it is one of the earth's wonderful landforms!

There are many more examples of links between processes and landforms, which you will learn about further in the activity booklet!



Global atmospheric circulation

Global atmospheric circulation sounds complicated but, when you break it down, it is simple:

global – the whole world
atmospheric – to do with the air above us
circulation – moving in circles

So... global atmospheric circulation ***is the movement of the air above our heads in circles around the whole world!***

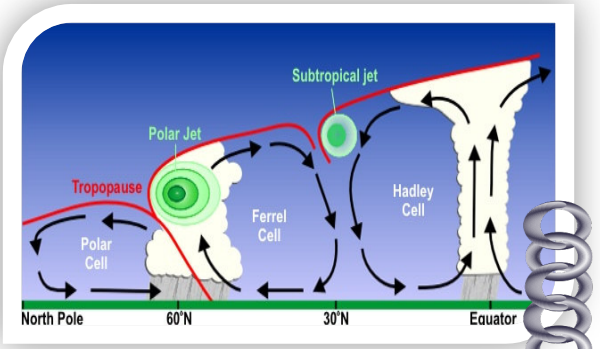
On the diagram you can see three circular movements of air, shown with black arrows. They are spread across the earth from the equator to the poles.
The Hadley Cell is closest to the equator, the Polar Cell is closest to the poles and the Ferrel Cell lies in between the two. These movements are continually happening in the atmosphere on both sides of the equator.

1. Firstly, the equator is very hot as the sun shines directly on it. This heats up the air on the equator, and when air is hot, it rises.
2. Air rises in low air pressure areas, and because the air is rising, there is no pressure put on the planet by the air.
3. As it rises, the moisture in the air cools and condenses to form large rain clouds on the equator. It rains a lot here.
4. Eventually the air hits a 'ceiling' in the atmosphere called the tropopause.
5. As the air can no longer rise, it spreads out sideways.
6. Once it has cooled sufficiently, it begins the move downwards as cold air sinks.
7. These areas have high air pressure because air is pushing down on the earth's surface.
8. This sinking air hits down at around 30^0N and S of the equator.
9. Sinking air cannot create clouds as moisture is not rising, so these areas tend to have calm and stable weather.
10. The sinking air then reaches the earth's surface and spreads out in either direction. This is because air moves from high to low pressure!
11. As you can see in the diagram, this movement is repeated again in the Ferrel Cell and the Polar Cell.

PiXL Geography

KS3 Spine

Geographical Connections



Connection

Global atmospheric circulation links to many things!

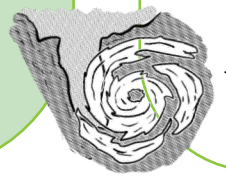
Did you know that tropical rainforests are found surrounding the equator?

Think about it...

They are hot and wet all year round. Look back at the diagram and notice how there are huge rain clouds on the equator. All that rising air and low pressure creates the rainforest we love to learn about!

Did you know that tropical storms always tend to move in the same direction in each world ocean?

Think about it...



They are driven by all that air moving around the global atmospheric circulation model you see above!

Key Question – How effective are the coastal management strategies at Cleveleys coastline?

Erosion and transportation takes place at the coastline. It comes in many different forms. At Cleveleys, coastline longshore drift (LSD) is the main contributor to the shape of the coastline.

Suitability of location – Why choose this location?

There are a number of reasons why we can use Cleveleys for this investigation:

- It is easy to access.
- It is safe: there are paths and walkways.
- There are lots of types of coastal management strategies that can be investigated.

Management strategies at the coastline – How do we try to reduce the impact of longshore drift?

We reduce coastal erosion and transportation by using **management strategies** – at Cleveleys they use **groynes.** We can control the rates of erosion by creating structures or using nature to stop or reduce the amount of erosion at the coastline. **Groynes** work by trapping the sand as it travels along the coastline; once it gets stuck behind the groyne, the particles cannot be pulled back out to sea, leaving a build-up of sediment at the coastline. This beach can then absorb the energy of the wave and will reduce the impact of erosion.

Methods – How do we collect the data?

In order to identify whether the groynes are effective at Cleveleys, we can measure whether longshore drift is occurring and if it is being stopped.

At 3m from the coastline, we measured the depth of the material from the top of the groyne to the sand; to do this, we used a long tape measure. The results were recorded. This was done at both sides of the groynes. We repeated this at 5 groynes along the beach.

What are the risks of carrying out this fieldwork?

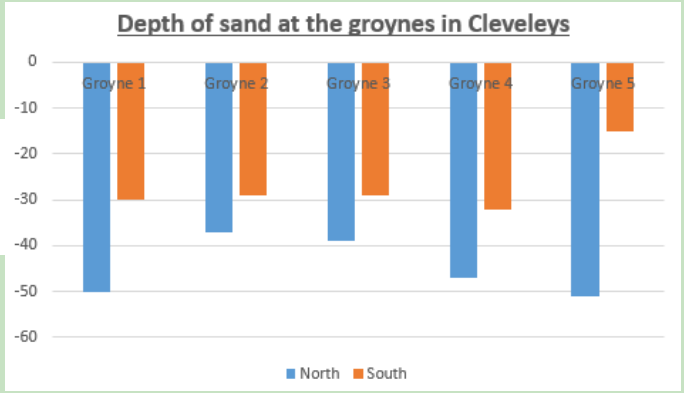
Risk	How can we reduce the risk?
Water risk – the risk of getting swept out to sea	Stay at least 5m away from the coastline at all times.
Trip/fall hazards	Students to walk carefully whilst watching where they are going. Students are not to climb on any of the management strategies.

PiXL Geography

KS3 Spine

Geographical Investigation – Physical Geography

Data presentation



Cleveleys is found on the north-west coast of the UK, in the county of Lancashire, north of Blackpool.

Results and analysis

We found that longshore drift is travelling in the direction of south to north and this can be seen on the reverse bar chart. The bar charts show a clear difference in the amount of sediment on the sides of the groynes, with higher levels of sediment on the south side of the groyne reaching a lower depth of 15 cm (groyne 1), and the sediment on the north side having a higher depth of 51 cm.

For every set of results, we must **analyse** the data. Here we describe the results and then give reasons for the results. For instance, we could work out the **average** depth of material either side of the groyne, and then give reasons for the difference in height of material.

Conclusion

We found that longshore drift is being stopped at Cleveleys. This means that the groynes are effective in reducing the coastal erosion along the Cleveleys coastline.

Evaluation

What went well with this fieldwork?

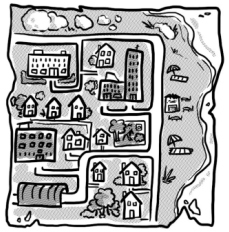
- We obtained clear and accurate data that showed how effective the management strategies were, showing valid conclusions.
- The data was representative of how coastal processes work and how coastal management strategies prevent longshore drift.

What would we change if we did it again?

- We could measure more groynes to get a wider range of data.
- We could visit the site over a series of days to get an average.

Key Question – Do tourist functions decrease with distance from the coastline?

Blackpool is a town located in the north-west of the UK. It is in the county of Lancashire, close to the Irish Sea. Founded in the 1800s, Blackpool developed primarily as a tourist town, and people from all over the country visited the beach and amusement attractions.



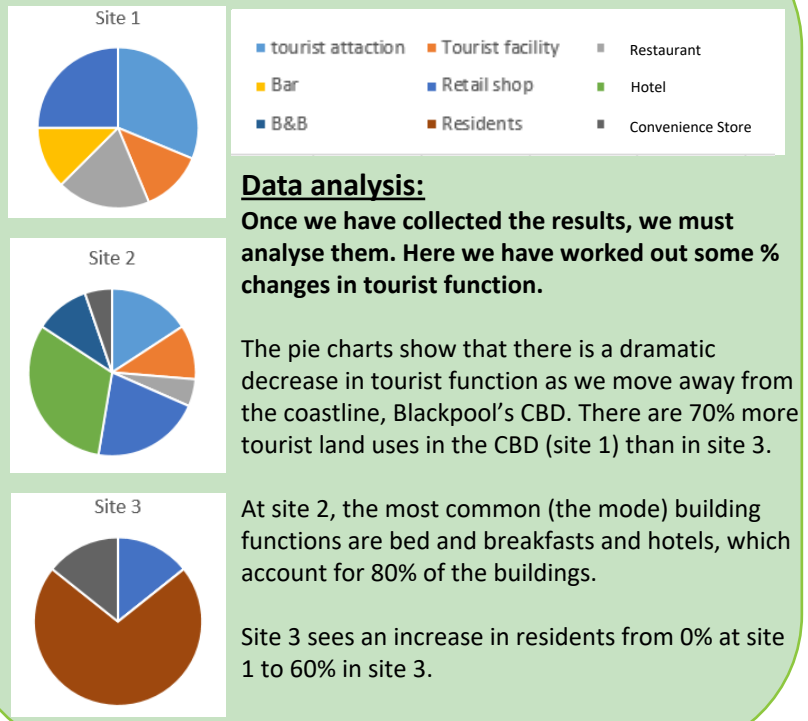
Suitability of location – Why choose this location?

- The area is easily accessible by all types of transport.
- The area is safe for students to carry out their own research.
- This is a typical layout of a tourist area so it will be clear for us to collect results.

What are the risks of carrying out this fieldwork?

Risk	How can we reduce the risk?
Being approached by strangers	Stay in groups at all times. Keep a mobile phone on us with a school contact number stored for emergencies.
Road traffic – being hit by a vehicle	Be aware at all times. Stay on the pavement as much as we can and cross at crossings provided.

Data presentation



Data analysis:

Once we have collected the results, we must analyse them. Here we have worked out some % changes in tourist function.

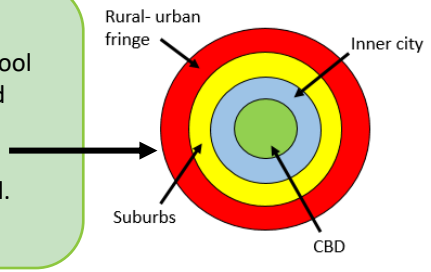
The pie charts show that there is a dramatic decrease in tourist function as we move away from the coastline, Blackpool's CBD. There are 70% more tourist land uses in the CBD (site 1) than in site 3.

At site 2, the most common (the mode) building functions are bed and breakfasts and hotels, which account for 80% of the buildings.

Site 3 sees an increase in residents from 0% at site 1 to 60% in site 3.

Burgess Model

We are going to investigate whether Blackpool follows the same pattern as most towns and cities in the UK. The Burgess Model has a concentric ring pattern. Blackpool is on the coast so would be half of the Burgess Model.



PiXL Geography

KS3 Spine

Geographical Investigation – Human Geography

Methods – How do we collect our data?

We can collect our data by creating a land use transect. Using a map, we can choose three sites in Blackpool: one in the central business district (CBD) - in this case at the sea front - and two others at equal distances as we move further from the centre.

At each site, we can record the function of each building. We will need a key:

Site 1 – City centre close to the sea front

Site 2 – Adelaide Street, at the back of the Hounds Hill Shopping Centre

Site 3 – Church Street, the main street that leads into Blackpool town centre from all the surrounding areas.

Evaluation

What went well?

- The data collected follows the pattern shown in the Burgess Model so the study is representative of our theory, showing our results are valid.
- We collected enough data that it is all comparable to help solve the enquiry.

What would we change if we did this again?

- We could visit a greater range of sites.
- We could measure the quality of the environment at each site.
- We could take photographs at each site.
- We could have gone at different times, e.g. summer and winter.

Conclusion

The results show clearly that tourist functions do decrease with distance from the coastline and that Blackpool does follow the Burgess Model.

From site 1 to site 3, the number of tourist functions decreased and the number of residential facilities increased. This follows the typical Burgess Model pattern.

In conclusion, we can confidently answer that:

*Tourist functions **DO** decrease with distance from the coastline at Blackpool.*

PiXL Geography

Natural hazards

Atmospheric hazards ← → **Geological hazards**

KS3 Spine: Natural Hazards

Atmospheric hazards
Drought, tornadoes, tropical storms (hurricanes, cyclones typhoons), also wind, snow and lightning.

Drought

Definition: an extended period of time with insufficient rainfall.

Characteristics:
- They often occur in areas that have unreliable rainfall patterns.
- Drought affects people, plants and animals.
- Drought can have disastrous impacts on a country's ability to grow food and feed its people.

Facts and figures: according to FAO land and water, "since 1900 more than 11 million people have died as a consequence of drought and more than 2 billion have been affected by drought, more than any other natural hazard".

Place: examples of places that have suffered from drought are Sub-Saharan Africa, Australia and China.

Tornadoes

Definition: a tornado is a rapidly rotating column of air that touches the base of a storm cloud and the Earth's surface.

Characteristics:
- They form when there are very unsettled weather conditions, often associated with a thunderstorm.
- They form a vortex, which is a mass of air that is rotating quickly. This often develops into a funnel shaped cloud.
- Strong winds are the main hazard associated with a tornado. These winds can have a devastating impact as they pass over areas that are inhabited by people.

Facts and figures: a tornado is usually about 20 to 100 metres wide at the surface. Wind speeds range from 75 to 100 mph (120 to 180 km/h).

Place: the area that sees the most violent tornadoes is 'Tornado Alley'. This is located in central USA and includes states such as Kansas and Oklahoma.

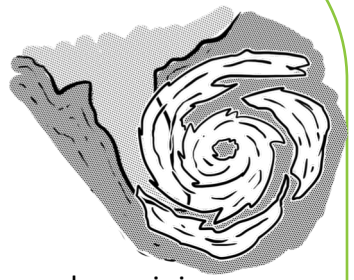
Hurricanes are measured on the Saffir-Simpson scale, category 1 – 5.

In 1989, the Daulatpur-Salturia **Tornado** in Bangladesh caused 1,300 deaths and left 12,000 injured.

Tropical storms

These are called different things depending on where they occur in the world.

North America = **hurricanes**
Asia = **cyclones**
Pacific = **typhoons**



Definition: a tropical revolving storm, formed over warm tropical seas.

Characteristics:
- Tropical storms are areas of intense low pressure where air is rising.
- Tropical storms develop at least 5° - 30° latitude north or south of the equator, as here the Coriolis force takes effect and it is this that makes the storm spin.
- They need sea temperatures of at least 27 °C.
- When wind speeds reach 74 mph, the tropical cyclone is referred to as a hurricane, typhoon or simply a cyclone depending upon where it is on the globe.
- They can be 300 to 500 miles across and up to 5 to 6 miles high.

Facts and figures: in 2018, there were 14 separate billion-dollar weather and climate disaster events across the USA, with a total cost of $91 billion.

Place: some areas that have been affected by hurricanes: New Orleans in the USA by hurricane Katrina, and the Philippines by typhoon Haiyan.

PiXL Geography

KS3 Spine: Natural Hazards

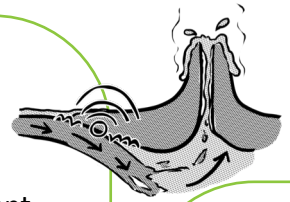
Natural hazards

Atmospheric hazards ← → **Geological hazards**

Geological hazards

1. Tectonic hazards – volcanoes, earthquakes and tsunamis
2. Geophysical – landslides and avalanches

Volcanoes



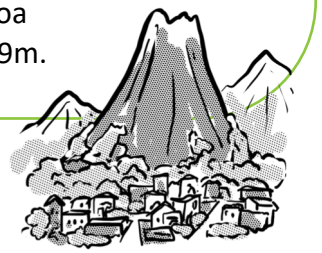
Definition: a mountain or hill that erupts.

Characteristics:

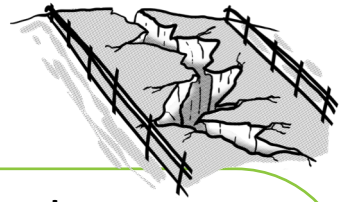
- They can be described as active, dormant or extinct.
- Volcanoes are usually found at plate boundaries or hot spots.
- There are 2 main categories: lava volcanoes and ash (pyroclastic) volcanoes.
- Types of volcano include shield volcanoes that are low hills with gentle sloping sides and composite volcanoes, which are higher mountains with steep sides.
- The top of the volcano is called a crater. If this collapses, a caldera can form.

Facts and figures: 350 million, or one in 20 people in the world live within "danger range" of an active volcano

Place: the world's largest active volcano is Mauna Loa in Hawaii standing at 4,169m.



Earthquakes



Definition: a sudden violent shaking of the ground, caused by movements within the earth's crust.

Characteristics:

- About 90% of the world's earthquakes happening around the "Ring of Fire".
- Earthquakes occur at destructive, collision and conservative plate boundaries.
- Seismographs are used to monitor the movements on the Earth's surface.
- Some earthquakes trigger tsunamis.
- Retrofitting is used to add strength to existing structures, such as buildings and bridges, to reduce the impact of earthquakes.

Facts and figures: the largest recorded earthquake in the world was a magnitude 9.5 in Chile on May 22, 1960.

Place: areas regularly affected by earthquakes include: California in the USA, Japan and New Zealand.

Tsunamis

Definition: a long, high sea wave caused by an earthquake or other movements in the surface of the Earth. Tsunami means "great harbour wave" in Japanese.

Characteristics:

- Tsunamis are most common in the Pacific Ocean.
- They can be caused by volcanoes but most commonly earthquakes.
- Tsunami waves can rise 35m or higher.
- The Pacific Tsunami Warning System, based in Hawaii in the USA, detects tsunamis and sends out warnings.

Facts and figures and place: 'The Boxing Day' earthquake in the Indian Ocean off Indonesia in December 2004 caused a tsunami that killed over 200,000 people in 14 countries.

In March 2011, the Tohoku earthquake in Japan caused a tsunami that killed over 150,00 people.

Landslides and avalanches

Landslide definition: a collapse of a mass of earth or rock down a mountain side or cliff.

Avalanche definition: a fast moving mass of snow, or ice, falling rapidly down a mountainside.

Characteristics:

- Disastrous avalanches occur when massive slabs of snow break loose from a mountainside and fall downhill.
- They can travel at speeds of 80 miles (130 km) per hour.

Facts and figures and place: the earthquake in Nepal in April 2015 triggered an avalanche that killed 19 climbers at Base Camp on Everest.

KS3 Spine – *Thinking like a Geographer*

Thinking like a Geographer is all about looking at a variety of information and using it to make a decision about a particular issue. This skill helps you to develop your critical thinking skills.

Thinking like a Geographer

When you are faced with Geographical decisions to make, following the process set out below should help you.

1. Carefully examine all of the evidence given to you.
2. Ask if you are unsure about any of the information.
3. Read the questions associated with the decision and use the evidence to answer the questions.
4. Identify the advantages and disadvantages for each of the options you have been given.
5. Finally, make a decision and justify it.

The issue: 'Second homes should be banned in the small town of St Ives, Cornwall.'

Popular tourist locations in the United Kingdom are becoming very crowded, especially during the summer months. Visitors who like these areas sometimes choose to buy a property in these places, known as a 'second home'.

St Ives: Housing

165,095 people in the UK say they have a second home for holidays. Records show that in Cornwall in 2015, 242,213 were main residence homes, with 29,065 being second homes.
The number of second homes in St Ives has risen to around 25% of the total, according to the town council. According to Rightmove, the average price of a property in St Ives is £377,320 (up 7% on 2015). This is more than 24 times the average Cornish wage of £15,458.

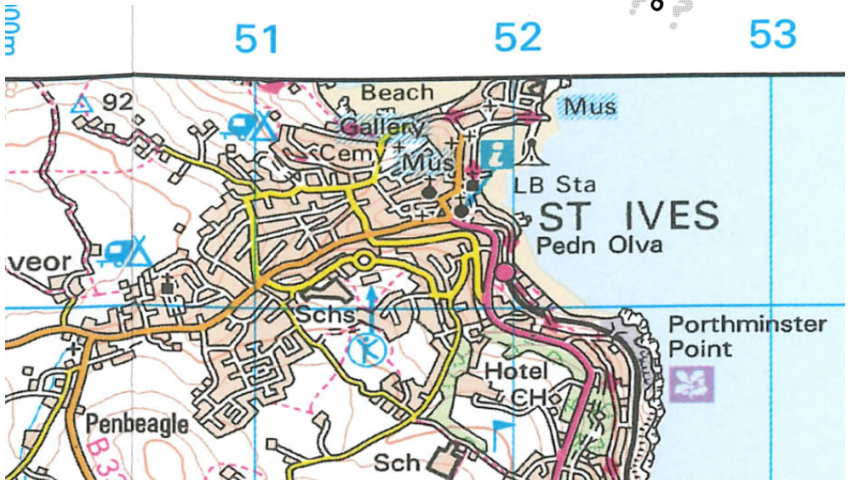
Change over time of the cost of one property in St Ives: a traditional Cornish cottage, two-bedroom terraced house with sea views	
1998	£48,000
2006	£165,000
2014	£200,00
2018	£255,000
Source: Rightmove.	

St Ives

Location: St Ives is seaside town, in the county of Cornwall. Cornwall is in the south-west of England.
Background: St Ives has cliffs and bays. It is famous for its beautiful beaches, which are popular with surfers. Artists have used the natural beauty of St Ives as inspiration and, as a result, it has lots of art galleries. It is a small town with narrow streets and winding roads. It attracts lots of tourists, especially in the summer months.

UK hotspots for second homes		
Local Authority	Second homes as a % of all homes	Number of second homes
South Hams, Devon	9.8	4,113
North Cornwall	9.6	4,000
Berwick-upon-Tweed	9.5	1,344
North Norfolk	9.1	4,753
Penrith, Cornwall	8.5	2,779
South Lakeland, Cumbria	7.2	3,743
Purbeck, Dorset	6.9	1,480
Source: Knight Frank, Dept for Communities and Local Government		

KS3 Spine – Thinking like a Geographer



Ordnance Survey Maps

You have access to an OS map for the St Ives area. This map will help you with your decision making.

Opposition to the plan to ban second homes

A local firm has taken legal action over the decision to ban the building of second homes. Local building companies claim that any homes built are good news for Cornwall.

When properties are rented by visitors it means that they will visit the area and spend money in shops and restaurants. The tourist industry generates jobs and therefore income for local people. Holiday homes are rented out so they are occupied throughout the summer months, with a large proportion of them being occupied all year round.

St Ives: the future

St Ives wants to reduce the number of second homes being built.

The residents held a referendum to ban construction of second homes.

There is a shortage of affordable housing.

The plans mean new housing projects will get planning permission only if reserved for full-time residents.

More than 80% of voters backed the ban.

In the summer, beaches are very busy and there is litter dropped which can impact on marine wildlife. **Peter Green, *Cornwall Clean Beach Campaign***

The second home ban will mean there will be more affordable housing, so I might get a home in the town where I grew up in. **Lucy Smith, *local resident***

In the summer, the narrow roads are full of tourists, parking is impossible and visitors park over driveways and coaches get stuck. **Priya Patel, *local resident***

We need second homes as they offer the tourist industry a huge boost. ***Cornwall Tourist Board***

Local communities, like St Ives, are being threatened by our severe drought of genuinely affordable homes in this country and, understandably, more and more people are demanding solutions. **Roger Harding, *from the charity Shelter***

St Ives is jam-packed with holiday lets, so it is lively in the summer but in the winter there are hardly any customers. **George Jones, *local shop owner***

We live in a society where we have free markets [and] if you do not build new homes, second home owners may start buying existing homes; this could "squeeze up" current prices. **Christopher Balch, *professor of planning at Plymouth University***

There was a 42.7% turnout, of which 83.2% voted for the ban. **Cornwall Council**