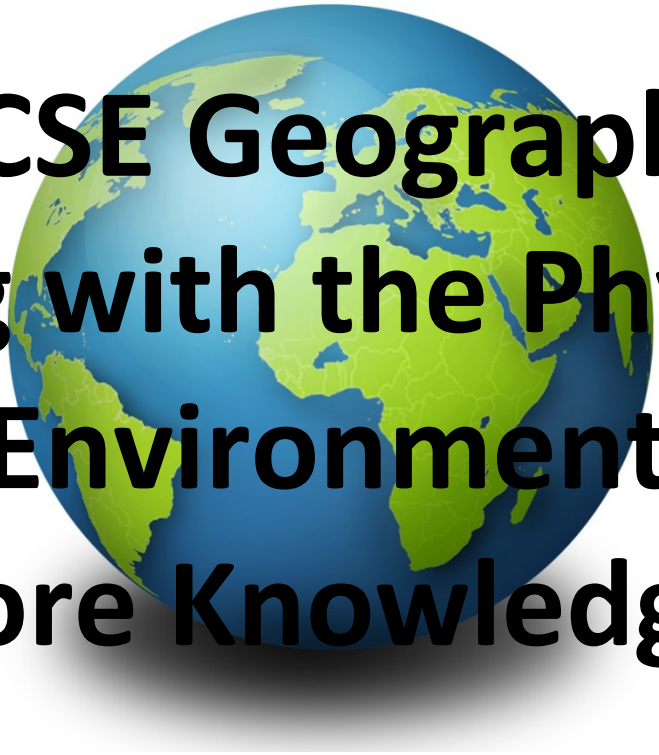
Geography Department



GCSE Geography
Living with the Physical Environment
Core Knowledge

Name:

Class:

Teacher:

Paper 1:

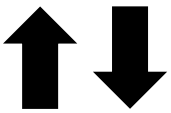
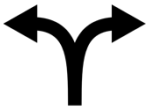
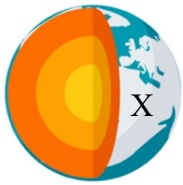
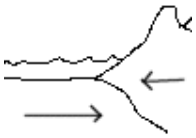
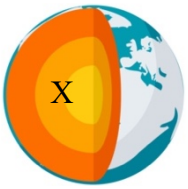
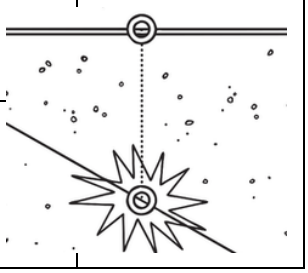
3.1.1 The challenge of natural hazards (Tectonics, Weather and Climate Change) (p.2-9)

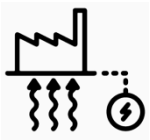
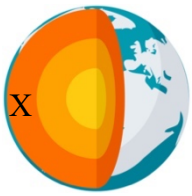
3.1.2 The living world (Tropical Rainforest and Desert) (p.10-14)

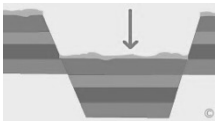
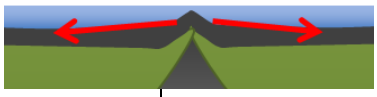
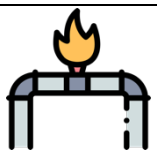
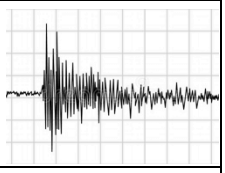
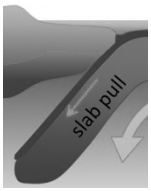
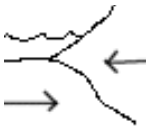
3.1.3 Physical landscapes in the UK (Coasts and Rivers) (p.15-24)

The Challenge of Natural Hazards (Tectonics, Weather and Climate Change)

Tectonic Hazards Glossary

Keyword	Definition	Icon
Aid	Money, food, training and technology given by richer countries to poorer countries after a natural hazard.	
Collison plate margin	Plates of a similar density move together. *The two plates fold upwards to make fold mountains.*	
Conservative plate margin	Plates slide past each other *in opposite directions OR in the same direction at different speeds.*	
Constructive plate margin	Plates move apart. *This allows rising magma to come to the surface.*	
Convection currents	Circular pockets of heat that move in the mantle.	
Crust	The upper layer of the Earth.	
Destructive plate margin	Plates move together. *Oceanic plate is subducted (pushed under) underneath the continental plate.*	
Earthquake	A sudden or violent movement within the Earth's crust followed by a series of shocks / shaking.	
Earth's core	Divided into inner and outer core. Inner core is solid (*due to immense pressure)* and outer core is liquid.	
Epicentre	Point directly above the focus at the surface.	
Focus	Point in the earth's crust where the earthquake starts.	

Geothermal power	Energy harnessed from super-heated water underground.	
Hazard risk	The probability / likelihood / chance that a natural hazard may take occur.	
Immediate response	The reaction of people as the disaster happens and straight away in the aftermath *(e.g. rescuing people).*	
Long-term response	Later reaction of people normally in the months and years afterwards *(e.g. rebuilding a community).*	
Mantle	The thickest layer of the Earth, directly under the crust.	
Monitoring	Recording physical changes, such as earthquake tremors around a volcano, to help forecast when and where a natural hazard might strike.	
Natural hazard	A natural event (e.g. earthquake, volcanic eruption, tropical storm, flood) that threatens people or has the potential to cause damage, destruction and death.	
Planning	Earthquake drills, survival kits etc. so people know what to do in a natural disaster.	
Plate margins	Place where two plates meet (*e.g. Mid Atlantic Ridge between the North American plate and the Eurasian plate).*	
Prediction	Attempts to forecast when and where a natural hazard will strike based on current knowledge.	
Primary effects	Immediate or direct effects of an eruption/earthquake *(e.g. buildings collapsing following an earthquake).*	
Protection	Actions taken before a hazard strikes to reduce its impacts (e.g. educating people or improving building design).	

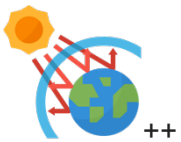
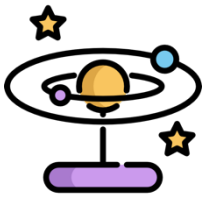
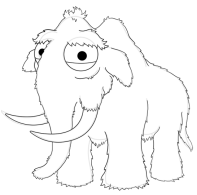
Richter scale	Logarithmic scale which measures the magnitude of the earthquake.	
Rift valley	Found at a constructive plate margin where two continental plates have pulled apart *forming a steep valley where the land has dropped between the plates.*	
Ridge push	Gravitational force that causes a plate to move away from a mid ocean ridge (created at a constructive plate boundary), and into a subduction zone	
Secondary effects	Indirect / after effects of an eruption/earthquake *(e.g. fires occurring due to ruptured gas mains damaged by an earthquake).*	
Seismic waves	Energy that travels through the earth's crust during an earthquake.	
Slab pull	The edge of a subducting plate is much colder and heavier than the mantle, so it sinks, pulling the rest of the plate along with it.	
Subduction zone	The point where the oceanic crust gets pushed underneath continental crust.	
Tectonic hazard	A natural hazard caused by movement of tectonic plates including volcanoes and earthquakes.	
Tectonic plate	A section of the Earth's crust.	
Volcano	An opening in the Earth's crust from which lava, ash and gases erupt.	

Weather Hazards Glossary

Keyword	Definition	Icon
Economic impact	The effect of an event on the wealth of an area or community.	
Environmental impact	The effect of an event on the landscape and ecology of the surrounding area.	
Extreme weather	When a weather event is significantly different from the average or usual weather pattern *(e.g. a severe snow blizzard or heat wave in the UK).*	
Global atmospheric circulation	The worldwide systems of moving air which transports heat from tropical to polar latitudes.	
Hazard risk	The probability / likelihood / chance that a natural hazard may take place.	
Immediate responses	The reaction of people as the disaster happens and in straight away in the aftermath *(e.g. rescuing people).*	
Long-term responses	Later reaction of people normally in the months and years afterwards *(e.g. rebuilding a community).*	
Management strategies	Techniques of controlling, responding to, or dealing with an event.	
Monitoring	Recording physical changes (e.g. tracking a tropical storm by satellite) to help forecast when and where a natural hazard might strike.	
Natural hazard	A natural event (e.g. earthquake, volcanic eruption, tropical storm, flood) that threatens people or has the potential to cause damage, destruction and death.	
Planning	Actions taken to enable communities to respond to and recover from natural disasters. *These might be evacuation plans or warning systems.*	

Prediction	Attempts to forecast when and where a natural hazard will strike based on current knowledge.	
Primary effects	The immediate of direct effects of a natural event on the people and property *(e.g. buildings being partially destroyed by a tropical storm).*	
Protection	Actions taken before a hazard strikes to reduce its impacts (e.g. building cyclone shelters).	
Secondary effects	Indirect / after effects of a tropical storm (*e.g. poor water quality leading to diseases spreading).*	
Social impact	The effect of an event on the lives of people or community effected.	
Tropical storm	An area of low pressure with winds moving in a spiral around a calm central (the eye). *Can be a hurricane, cyclone or typhoon*.	

Climate Change Glossary

Key Word	Definition	Icon
Adaptation	Actions taken to adjust to and cope with changes in the environment such as climate change	
Climate change	Increasing average temperature, changing weather patterns and the overall impacts *(e.g. sea level rise).*	
Enhanced greenhouse effect	Additional heat energy being trapped in the atmosphere due to increased amounts of greenhouse gases that humans have released.	
Global warming	An increase in the overall temperature of the Earth's atmosphere due to the enhanced greenhouse effect.	
Greenhouse effect	When heat is trapped in the Earth's atmosphere and reflected back to the surface by naturally occurring greenhouse gases.	
Mitigation	Action taken to reduce the extent of climate change and it's impacts by reducing greenhouse gas concentrations.	
Orbital change	Changes in pathway of the earth around the sun *(e.g. from circular to elliptical).*	
Quaternary period	The period of geological time about 2.6 million years ago to present.	

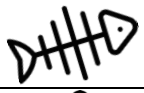
The Challenge of Natural Hazards Pop Quiz

What is a natural hazard?	A natural hazard is any natural event that has the potential to endanger human life, the economy and property.
What are the three types of plate boundary called?	Destructive, constructive, conservative.
At which two plate boundaries are volcanoes created?	Destructive and constructive.
Where is the largest band of active volcanoes found?	The Ring of Fire around the entire Pacific Ocean.
Where do earthquakes normally occur?	In long narrow bands on all types of plate boundary.
What was the magnitude of the Haiti (2010) earthquake in the Caribbean?	7.0
What was the magnitude of the Japan (2011) earthquake?	9.0
How many people died in the Haiti (2010) earthquake?	316,000
How many people died in the Japan (2011) earthquake?	15,854
How much money did the EU give Haiti (2010) to help recover from the earthquake?	$330 million
State two building features that would help in an earthquake	Lattice work steel cage to stabilise building Rubber shock absorbers between foundations and building Latticework steel foundations into the bedrock Window shutters that come down automatically Identification numbers for helicopters to identify damaged buildings Reinforced lift shafts with tensioned cables
Give two ways volcanoes can be predicted	Monitoring seismic waves Monitoring gas emissions Looking for ground deformation Satellite images Remote sensing
State three ways earthquakes can be predicted	Seismometers Laser beams Animal behaviour

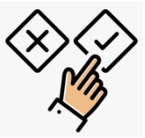
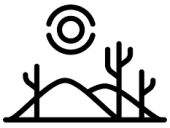
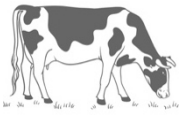
What are the names of the three cells that describe the variation in the world's weather?	Polar cell Ferrel cell Hadley cell
How many people were killed in Typhoon Haiyan?	7400
What are depressions?	Low pressure storm systems bringing unsettled weather to Britain all year round.
What are anticyclones?	Areas of high pressure where air sinks to the earth's surface.
When did Storm Emma and the Beast from the East occur?	February / March 2018
State two negative effects of the Beast from the East	Lost sales in supermarkets amounted to £22 million 14 deaths Over 8000 road collisions
What short term responses were there to the Beast from the East?	Red Cross issued blankets to stranded people at Glasgow airport Armed forced helped rescue stranded drivers and transport NHS staff to work
Give an example of an internal factor that causes climate change	Volcanic activity, tectonic activity, albedo, atmospheric gases
Give an example of an external factor that causes climate change	Sunspots, earth's orbit, earth's tilt
State one reason why carbon dioxide is increasing in the atmosphere	More private transport, more tourism creating more flights, greater demand for electricity and heating
Which coastal city could be lost by 2100 if sea levels rise?	New York
When was the Kyoto Protocol signed?	1997

The Living World:

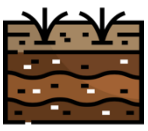
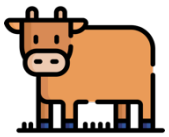
Ecosystems Glossary

Key Word	Definition	Icon
Abiotic	Related to all **non-living** things.	
Biotic	Related to **all living** things.	
Consumer	Creature that eats plants or other animals as they cannot make their own food.	
Decomposer	An organism such as bacteria or fungus which breaks down dead plant or animal tissue which is recycled into the environment.	
Ecosystem	A community of plants and animals that interact with each other and their physical environment.	
Food chain	The simple connections between different organisms (plants and animals) that rely on one another as their source of food.	
Food web	A complex hierarchy of plants and animals with multiple connections between species relying on each other for food.	
Global ecosystem	The large ecological areas on the earth's surface with animals and plants adapting to their environment.	
Nutrient cycling	Processes whereby organisms extract minerals necessary for growth from soil or water, passing them on through the food chain and ultimately (decomposed) back into the soil.	
Producer	An organism or plant that is able to absorb energy from the sun through photosynthesis.	

Hot Deserts Glossary

Key Word	Definition	Icon
Appropriate (Intermediate) Technology	Technology best suited to the needs, skills, knowledge and wealth of the locals. *Important in LICs.*	
Biodiversity	The variety of life in the world or a particular habitat.	
Desertification	The process where land becomes drier and degraded, as a result of climate change or human activities, or both.	
Hot desert	Parts of the world that have high average temperatures and less than 250mm of precipitation per year.	
Mineral extraction	Removing mineral resources from the Earth *(e.g. metals, precious gems and coal).*	
Overcultivation	Exhausting the soil by overusing the land to grow crops.	
Overgrazing	Grazing too many livestock for too long on a piece of land, meaning it is unable to regrow and recover its vegetation cover.	

Tropical Rainforests Glossary:

Key Word	Definition	Icon
Biodiversity	The variety of life in the world or a particular habitat.	
Commercial farming	Farming to sell produce for a profit.	
Debt reduction	Countries are relieved of some of their debt in return for protecting their rainforests.	
Deforestation	The chopping down and removal of trees to clear an area of the forest.	
Ecotourism	Responsible travel to natural areas that conserves the environment and supports the livelihood of locals.	
Logging	The business of cutting down trees and transporting timber to mills for processing and sale.	
Mineral extraction	Removing mineral resources from the earth *(e.g. metals, precious gems and coal).*	
Selective logging	Cutting down trees which are mature or inferior, encouraging the growth of remaining trees within the forest.	
Soil erosion	Removal of soil faster than it can be replenished. *This may be due to natural causes such as flooding, or human activity such as farming.*	
Subsistence farming	Farming that produces enough food to sustain and benefit the farmer and family.	
Sustainability	Actions that meet the needs of the present without reducing the ability of future generations to meet their needs.	

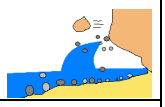
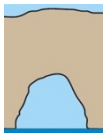
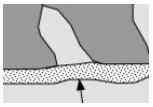
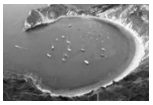
The Living World Pop Quiz

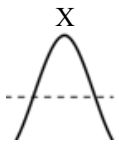
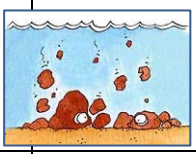
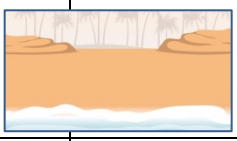
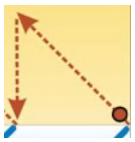
What is an ecosystem?	A community of plants and animals that interact with each other and their physical environment.
State three areas of a freshwater pond ecosystem	Pond margin, pond bottom, mid pond water, pond surface, air above pond
Give an example of a producer in a freshwater pond	Water lily Algae
Give an example of a consumer in a freshwater pond	Great diving beetle Heron Fish Midge larvae
What is the difference between a food web and a food chain?	Food chains follow a single path of energy. Food webs display how plants and animals are connected in many ways with multiple food sources to help them all survive.
What is a biome?	A biome is a large scale ecosystem. *It has distinctive plant and animal groups, which are adapted to that particular environment.*
List the structure of a tropical rainforest from the ground up	Shrub layer, lower canopy, canopy, emergent layer
State two tropical rainforest vegetation adaptations	Lianas, buttress roots, leaves with flexible bases, thin branchless trunks, smooth bark, epiphytes, emergent, drip-tips
Describe the soil in a tropical rainforest	Red in colour *due to high iron and aluminium content.* Infertile with a thick layer of leaf litter and decomposing organic leaf matter on the surface.
What is rainforest soil called?	Latosol
Explain the nutrient cycle	1. Trees shed leaves all year round 2. Decaying vegetation decomposes rapidly releasing nutrients 3. Nutrients enter the soil surface but don't get a chance to sink in 4. Shallow roots quickly take up the nutrients 5. The nutrients help the trees to grow rapidly
State two effects of deforestation	Loss of biodiversity, climate change, conflict between indigenous tribes and newcomers to the area, less CO2 absorbed from the atmosphere, water pollution, decrease in unemployment rate
What is extracted from mines in the Amazon rainforest?	Iron, nickel, tin, zinc and gold
What is the BR163?	A dirt track running through huge sections of Amazon forest which was to be tarmacked and turned into a superhighway.
Define the term "sustainable use of the rainforest."	Uses that allow current generations to make a living from the forest without damaging the forest for future generations.

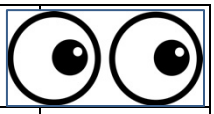
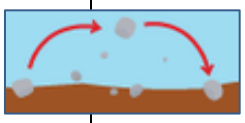
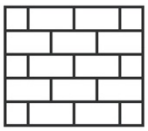
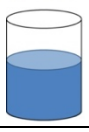
How much rainfall does a desert receive per year?	Less than 250mm
Describe one way that a camel is adapted to live in the desert	Long eyelashes to keep out sand/dust and sun, fat stored in hump so it can survive periods with no food, fur for insulation (cold nights and hot days), nostrils can close to keep out blowing sand and broad feet so they don't sink into sand
Where is the Thar Desert located?	On the border between India and Pakistan.
What are the main problems in Jaisalmer due to tourism?	The demand for water in the fort in the city has increased 12x. Waste water passes under the foundations undermining them.
What is the benefit of the Indira Ghandi canal in the Thar?	It brings water to major cities such as Jaisalmer, but also water to irrigate the land.
State three development opportunities in hot deserts	Tourism, subsistence farming, commercial farming, mineral extraction, energy use
How many people in the Sahel region of Africa faced hunger due to desertification in 2014?	20 million
What is the Acacia Project?	In Senegal, FAO and the Forestry Service provided Acacia seeds and seedlings and taught the people how to grow Acacia trees and extract and market the gum they produce.

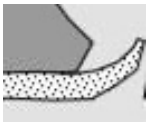
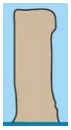
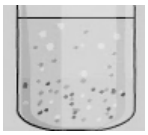
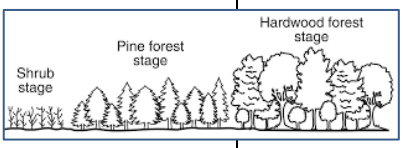
Physical Landscapes in the UK:

Coastal Landscapes Glossary

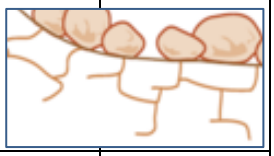
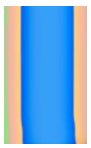
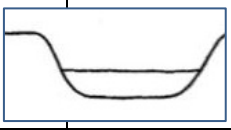
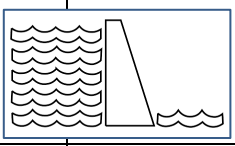
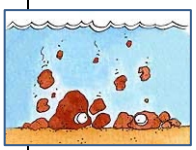
Keyword	Definition	
Abrasion (Corrasion)	Rocks are flung and scraped against the cliff by powerful waves, eroding them.	
Arch	A cave becomes bigger due to hydraulic action and abrasion. Eventually the cave breaks through a headland to create an arch.	
Attrition	Pebbles collide making them smaller and smoother over time.	
Backwash	When a wave moves back down the beach due to gravity.	
Bar	A spit which has grown across a bay to join two headlands. *It forms a bar of sand with a freshwater lake trapped behind it.*	
Bay	Bays are created out of less resistant (soft) rock. *They form between areas of more resistant rock (headlands) and often contain beaches.*	
Beach	Deposited sand / rock / pebbles that have built up over time.	
Beach nourishment	Adding new material to a beach artificially.	
Cave	A large hole in a cliff eroded by waves.	
Chemical weathering	The break-down of rock caused by a chemical change.	
Cliff	A steep, high rock face formed by weathering and erosion.	
Constructive waves	Waves with a strong swash and weak backwash which deposits material.	
Corrosion	Waves containing weak acids dissolve certain rock types *(e.g. limestone).*	

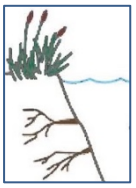
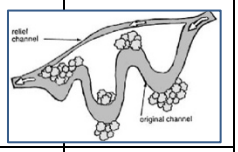
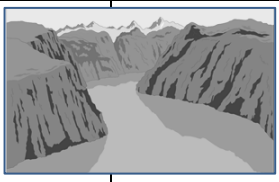
Crest	Top of a wave.	
Deposition	Occurs when material carried by the sea is dropped as energy decreases.	
Destructive wave	Waves with a weak swash and strong backwash which erode material.	
Dune slack	The wind can form depressions between dunes where ponds may form.	
Embryo dune	The youngest dune closest to the sea.	
Erosion	This is the wearing away of the land by moving water.	
Fetch	The distance that wind blows over the sea before reaching land.	
Fore dune	These are older, slightly higher dunes, further from the sea.	
Gabion	A steel wire mesh filled with boulders. *It is a type of hard engineering defence.*	
Groyne	A wooden barrier built out into the sea to stop longshore drift, helping to accumulate material on a beach.	
Hard engineering	Building artificial structures to reduce or stop the impact of coastal processes.	
Hydraulic action	Water and air is forced in to cracks in the cliff, gradually weakening rock making the cracks bigger.	
Landslide	Blocks of rock sliding downwards.	
Longshore drift (LSD)	Transportation of sediment along the coastline in a zigzag motion. *Waves approach the beach at an angle, then backwash moves straight down the beach, and transport material (sediment) up and down the beach.*	

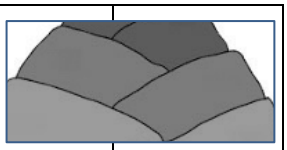
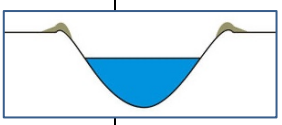
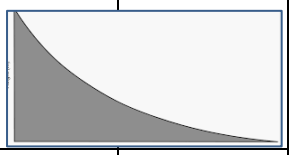
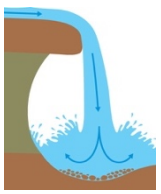
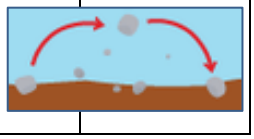
Managed retreat	Allow the sea to erode the coastline but monitor the retreat occurring.	
Mass movement	The movement of material downslope under the influence of gravity.	
Physical weathering	Caused by the effects of changing temperature on rocks, causing the rock to break apart *(e.g. freeze thaw weathering).*	
Pioneer plant	Tough plants (e.g. Marram grass) take root on the sand dunes and help hold them in place.	
Relief	Relief describes the height (altitude) and how steep (gradient) a landscape is	
Rockfall	Individual rocks fall from a cliff.	
Rock armour	A coastal defence where large boulders are placed on the beach.	
Saltation	Pebbles bounce along the sea bed in a leap-frogging motion.	
Salt marsh	Low lying (below sea level) coastal wetland. *Often forms behind a spit.*	
Sand dune	Sand hill above the high tide mark, shaped by wind action and covered with grasses and shrubs.	
Sea wall	Concrete wall built to protect the coast by deflecting wave energy.	
Slumping	Rapid mass movement where a whole segment of a cliff moves downslope.	
Soft engineering	Sustainable approach (using natural resources) to managing the coast *(e.g. beach nourishment and dune regeneration).*	
Solution	Material dissolved in sea water.	

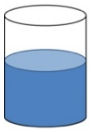
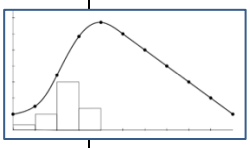
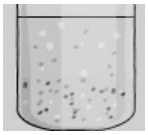
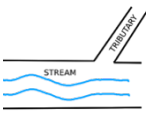
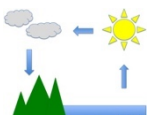
Spit	A finger of new land made of sand and pebbles which juts out in to the sea from the coast.	
Stack	An isolated column of rock formed when an arch has collapsed.	
Stump	A stack gets eroded by erosion and weathering to form a short column of rock, *only visible at low tide.*	
Suspension	Lighter particles float along within the water (they are suspended in water)	
Swash	When a wave moves up the beach.	
Traction	Heavy rocks (boulders) are rolled along the sea bed.	
Vegetation Succession	Sequence of vegetation that colonise (take over) an environment.	
Waves	Ripples from the transfer of energy from the wind blowing over the sea's surface. *The largest waves are formed when winds are very strong, blow for lengthy periods and cross large expanses of water.*	
Wave-cut notch	Small indent cut in to a cliff between the level of high and low tide.	
Wave-cut platform	Wide sloping surface at the base of a cliff.	
Yellow dune	Tall sand dunes.	

River Landscapes Glossary

Keyword	Definition	Icon
Abrasion (Corrasion)	Stones transported in the river are thrown at and scraped along the bed and banks.	
Attrition	Stones in the river collide making them smaller and smoother over time.	
Bankfull discharge	The height at which a flood could occur on a storm hydrograph. The maximum capacity of a river before water spills over the banks.	
Channel straightening	Removing meanders from a river to make it straighter. *This allows it to carry more water quickly downstream.*	
Confluence	Where two rivers meet.	
Corrosion (Solution)	Weak acids within the river water react with the rocks on the beds and banks.	
Cross profile	The side to side cross section of a river channel.	
CUMEC	Cubic metres per second	m3/s
Dam	A barrier built across a valley to interrupt river flow which creates a man-made lake (reservoir) which stores water and controls the discharge of a river.	
Deposition	Material carried by a river is dropped as energy decreases.	
Discharge	Volume of water passing a certain point every second (measured in CUMECs)	
Drainage basin	Area of land drained by a river system.	
Embankments	Raised banks constructed along a river – they effectively make the channel deeper so it can carry more water.	

Erosion	This is the wearing away of the land by water.	
Estuary	The tidal mouth of a river (where it meets the sea).	
Falling limb	Shows a river as its level falls after a rainfall event (shown on a storm hydrograph).	
Flood	River water spills onto the surrounding land *(often the floodplain).*	
Flood relief channels	Building artificial channels to divert rivers away from settlements and areas of value.	
Flood risk	The predicted frequency of floods in an area.	
Flood warning	Provide reliable advance warning of a flood allowing people time to evacuate.	
Floodplain	Flat land made by deposition on either side a river in the middle and lower valley.	
Floodplain zoning	Land close to the river cannot be built upon. It can be used for low value land use (farming and park land).	
Fluvial processes	Processes relating to erosion, transport and deposition in a river.	
Gorge	A narrow, steep sided valley created as a waterfall retreats upstream.	
Hard engineering	Building artificial structures to reduce or stop the impact of river processes.	
Hydraulic action	Water and air is forced in to cracks in the river banks, gradually weakening the rock making the cracks bigger.	

Interlocking spurs	A river winds its way around more resistant rock in the upper valley of a river.	
Lag time	Time difference between peak rainfall and peak discharge on a storm hydrograph.	
Landslide	Blocks of rock slide downwards.	
Levee	Ridge of higher material at rivers edge in the middle and lower valley.	
Long profile	A way to display the slope of a river channel from source to mouth.	
Mass movement	The movement of material downslope.	
Meander	A bend in a river.	
Mouth	End of a river	
Ox bow lake	A cut off meander bend.	
Physical weathering	Caused by the effects of changing temperature on rocks, causing the rock to break apart *(e.g. freeze thaw weathering)*	
Plunge pool	Formed at the base of a waterfall.	
Relief	Relief describes the height and how steep a landscape is.	
Rising limb	Indicates how quickly water is reaching a river channel and represents the water rising in a river (shown on a storm hydrograph).	
Saltation	Pebbles bounce along the river bed in a leap-frogging motion.	

Slumping	Rapid mass movement where a whole segment of a river bank moves downslope.	
Soft engineering	Managing a river using natural materials and mimicking natural processes to protect more vulnerable areas.	
Solution	Material is dissolved in river water.	
Source	Start of a river.	
Storm hydrograph	A graph showing river discharge and its changes over time in response to rainfall.	
Suspension	Lighter particles are floating along within water.	
Traction	Heavy rocks (boulders) are rolled along the river bed.	
Tributary	A smaller river joining a larger river.	
Waterfall	Occur where a band a hard rock overlies a band of soft rock in the upper valley.	
Watershed	Edge of a drainage basin. *Generally this is the highest point of land and is shown by a dashed line on a diagram.*	
Water cycle	Series of processes by which water is evaporated and eventually condenses and precipitates over land.	

Physical Landscapes in the UK Pop Quiz

Describe the swash and backwash of constructive waves.	Strong swash, weak backwash.
What type of beach do destructive waves create?	Steep.
How many times per minute do destructive waves break?	10-12.
When temperatures fall below 0°C, what type of weathering may occur?	Freeze-thaw weathering.
State the different types of mass movement	Soil creep, slumping, rock fall, landslide
Material is transported along a coastline. What is this called?	Longshore drift.
What is the difference between erosion and weathering?	Erosion involves material being carried away whereas with weathering, the weakened material does not move.
State the four types of river transport	Traction, saltation, solution, suspension.
How does the process of caves, arches, stacks and stumps begin?	Hydraulic action widening cracks in a headland.
What landform will be created along a coastline that has alternating bands of hard and soft rock?	Headlands and bays.
What is a discordant coastline?	Alternating bands of hard and soft rock at right angles to sea.
If a wide wave cut platform forms in front of a cliff, what happens to the rate of erosion? Why?	It slows down because the wave's energy is reduced from travelling over the material.
How would a spit become a bar?	Form across a bay and link two headlands.
Why do spits often form curved ends?	Secondary wind direction.
Explain how the stems of marram grass are adapted to survive in sand	They can grow quickly and the stems elongate, enabling the plant to emerge from the sand.
What are sand dunes?	Accumulations of deposited sand and other sediment gathered on a beach.
What is another name for a sand dune system?	Psammosere.
State two types of hard engineering.	Sea wall, revetment, rip rap, gabion, groyne, offshore reef.
State one type of soft engineering.	Beach nourishment, cliff regrading, managed retreat.

Give three disadvantages of hard engineering.	Expensive, man-made, ugly.
What methods of coastal management does Overstrand have?	Cliff regrading, rock armour, revetments, groynes, gabions, sea wall
What are the cliffs along the North Norfolk coastline made of?	Soft impermeable clay and permeable sands and gravels
What are the names of the start and end of a river?	Start – source. End – mouth.
What three landforms are found in the upper course of a river?	V-shaped valley, interlocking spurs and waterfalls.
What four landforms are found in the lower course of a river?	Ox-bow lake, floodplains, levees, deltas and estuaries.
What needs to happen for a waterfall to be created?	A river needs to cross a band of soft rock after flowing over hard rock.
What feature forms on the inside bend of a meander?	Slip off slope.
Name the waterfall in the River Tees.	High Force.
Why does the removal of vegetation increase the chances of flooding?	Because less rainfall is intercepted before it hits the ground, meaning that it moves down towards rivers more quickly.
Which graphs are used on a storm hydrograph? What do they show?	Histogram for rainfall. Line graph for discharge.
How is the normal discharge of river shown on a storm hydrograph?	Base flow (dashed line).
What does the recession limb of a storm hydrograph show?	Falling flood water in a river.
State three hard engineering river defences.	Embankments, dams, channelisation, flood walls, flood relief channels, storage areas.
State two soft engineering river defences.	Warning systems, floodplain zoning, afforestation, washlands.
When did the flood of River Wansbeck in Morpeth occur?	6th – 7th September 2008.
How many residents were evacuated as a result of the River Wansbeck (Morpeth) flood?	400.
Overall how much did the new flood management scheme in Morpeth cost?	£26 million.

Wider reading list

These are some suggestions of useful books to read to further your understanding of the topics you are studying this year.

Please let your geography teacher know if you read any these or if you come across any other great geography books we can add to the list.

The living world:

Author	Title	Type
Horrible Geography	Bloomin Rainforests	Non-fiction
Simon Chapman	Borneo Rainforest (Expedition diaries)	Non-fiction
Gerard Cheshire	The Tropical Rainforest (Nature unfolds)	Non-fiction
Richard Platt	The Vanishing Rainforest	Non-fiction
Michael Palin	Sahara	Non-fiction
Eva Ibbotson	Journey to the River Sea	Fiction
Louis Sachar	Holes	Fiction
Katherine Rundell	The Explorer	Fiction

Challenge on natural hazards:

Author	Title	Type
Catherine Chambers	Can we Protect People from Natural Disasters?	Non-fiction
Gail Herman	What is Climate Change?	Non-fiction
Baby Professor	What Every Child Should Know about Climate Change?	Non-fiction
Philip Steele	Analyzing Climate Change: Asking questions, evaluating evidence and designing solutions	Non-fiction
Philip Steele	Climate Change (Can we really stop it?)	Non-fiction
Mark Maslin	Climate Change (A very short introduction)	Non-fiction
Julie Bertagna	Exodus	Fiction
Sue Reid	Pompeii	Fiction
Saci Lloyd	The Carbon Diaries	Fiction
Lauren James	The Quiet at the End of the World	Fiction

Physical landscapes:

Author	Title	Type
Richard Girling	Sea Change: Britain's coastal catastrophe	Non-fiction
Nicholas Crane	Coast: Our Island Story	Non-fiction
Horrible Geography	Cracking Coasts	Non-fiction
James Nixon	Let's Explore Britain: Coasts	Non-fiction
Samantha S Bell	Engineering for Disaster: Engineering for floods	Non-fiction
Corona Brezina	Engineering Solutions for Floods and Tsunamis	Non-fiction
Michael Morpurgo	Why the Whales came	Fiction
Chris Vick	Storms: Every storm breaks in the end	Fiction
Lara Maiklem	Mudlarking	Fiction