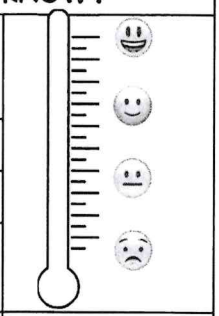
Water and Carbon Crucial Knowledge: What do you need to know?



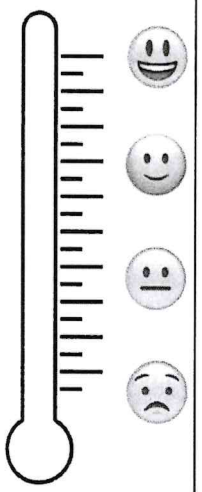
Systems in Geography.

I can describe what a system is and why these are used in the study of Geography.

I can describe the different kinds of systems.

I can describe the different parts of systems and explain how they may be linked.

I can describe and explain the concepts of positive and negative feedback loops, and give examples of both.



Hydrological Cycles.

I can describe the global distribution and size of the major stores of water on our planet.

I can describe the lithosphere, hydrosphere, cryosphere and atmosphere.

I can describe the processes that drive change in and between the different global stores of water including evaporation and condensation.

I can describe the processes of evaporation & condensation including the role of latent heat.

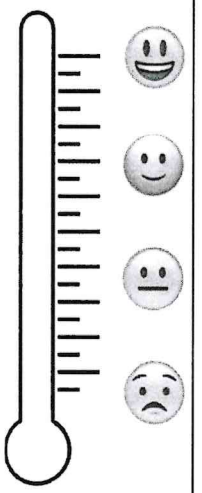
I can describe the processes of cloud formation and the causes of precipitation.

I can describe the drainage basin system in terms of inputs, outputs, stores and transfers.

I can describe and explain the concept of water balance and explain the factors that may affect this.

I can use a flood hydrograph to investigate changes in runoff.

I can describe and explain the natural and man-made changes that occur to the water cycle over varying time scales using an example of Athabasca River Basin in Alberta



Carbon Cycles.

I can describe the global distribution and size of the major stores of carbon on our planet.

I can describe and explain the carbon cycle in detail, including the amounts to which carbon moves between the various stores.

I can describe the processes that drive change in and between the different global stores of carbon including photosynthesis, combustion and carbon sequestration.

I can describe and explain the natural and man-made changes that occur to the carbon cycle over varying time scales.

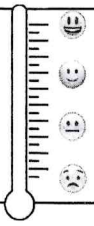
I can explain the concept of the carbon budget.

I can describe and explain the impacts of the changing carbon budget upon land, ocean and atmosphere including global climate.

I can describe the key roles that the water and carbon cycles play in the supporting of life on Plant Earth.

I can describe the relationships between the water and carbon cycles and link this to global warming and climate change.

I can describe and explain how humans try to intervene in the carbon cycle to mitigate the impacts of climate change.



Case Studies.

I can use the case study of a rainforest to illustrate the key themes outlined above.

I can use the case study of a local drainage basin to illustrate the key themes outlined above.

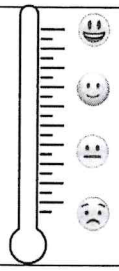
COASTS CRUCIAL KNOWLEDGE: WHAT DO YOU NEED TO KNOW?

Coasts as Natural Systems

I can describe what a system is and why these are used in the study of Geography.

I can describe the characteristic of coastal systems.

I can describe and explain the concepts of positive and negative feedback loops on the coast and give examples of both.



Systems and Processes

I can describe the sources of energy: winds, waves, currents and tides.

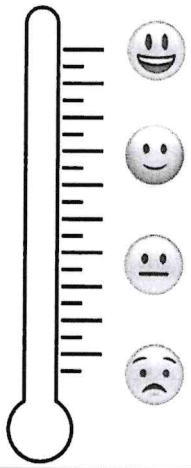
I can describe and explain landscapes of erosion: **Flamborough Head and N. Holderness.**

I can describe the landscapes of deposition: **Spurn Point and Southern Holderness Coast.**

I can describe the characteristics of sediment sources, cells and budgets: **Sediment Cell 2**

I can describe the geomorphological processes that shape the coast: weathering, mass movement **(Holbeck Hall, Scarborough)**, erosion, transportation and deposition.

I can describe and explain distinctive coastal processes: marine: erosion – hydraulic pressure, wave quarrying, abrasion, cavitation, solution, attrition; transportation: traction, suspension (littoral drift) and deposition; sub-aerial weathering, mass movement and run off.



Coastal Landscape Development

I can describe the origin and development of landforms and landscapes of coastal erosion: Cliffs and wave cut platforms; **Selwick's Bay** and cliff profile including stacks; **High Stacks.**

I can describe and explain the origin and development of landforms and landscapes of coastal deposition: simple spit - **Spurn Point**, beaches and sand dunes – **Seal Sands**

I can describe the formation of estuarine mudflat/saltmarsh environments and associated landscapes; **Essex Marshes** and maybe behind **Spurn Point**

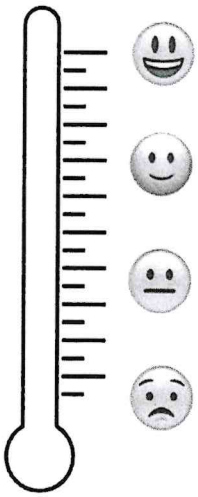
I can describe the eustatic, isostatic and tectonic sea level change: major changes in sea level in the last 10,000 years

I can describe and explain the formation of coastlines of emergence: raised beaches, marine platforms – **Stonehaven and West Coast of Scotland**

I can describe and explain the formation of coastlines of submergence: rias – **Cornwall at Falmouth**, fjords - **Norway**, Dalmatian coasts - **Croatia.**

I can outline the recent and predicted climatic change and potential impact on coasts.

I can describe relationships between process, time, landforms and landscapes on coasts.



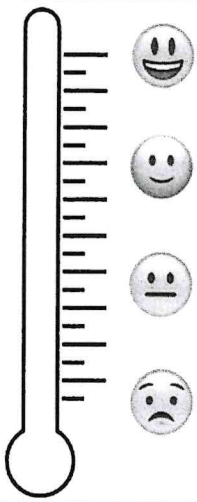
Coastal Management

I can use case studies to illustrate traditional approaches to coastal flood and erosion risk: hard engineering – **Holderness**, soft engineering – no specific case study, and managed retreat – **Essex Marshes.**

I can use case studies of sustainable approaches to coastal flood risk and coastal erosion management: Shoreline management – **Essex Marshes** ICZM - **Odisha**

I can use a case study of coastal environment at a local scale to illustrate and analyse fundamental coastal processes, their landscape outcomes as set out above and engage with field data and challenges represented in their sustainable management: **Holderness**

I can use a case study of a contrasting coastal landscape beyond the UK to illustrate and analyse how it presents risks and opportunities for human occupation and development and evaluate human responses of resilience, mitigation and adaption: **Odisha**



Hazards Crucial Knowledge: What do you need to know?

The concept of hazard in a geographical context.

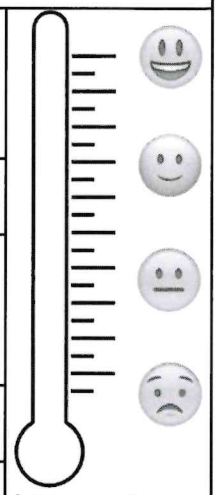
I know the nature, forms and potential impacts of natural hazards (geophysical, atmospheric and hydrological).

I understand hazard perception and its economic and cultural determinants.

I know characteristic human responses – **fatalism, prediction, adjustments/adaption, mitigation, management, risk sharing – and their relationship to hazard incidence, intensity, magnitude, distribution and level of development.**

I understand and can explain the Park model of human responses to hazards.

I understand and can explain the Hazard Management Cycle.



Assessment:

Plate tectonics.

I can explain the earth's structure and internal energy sources.

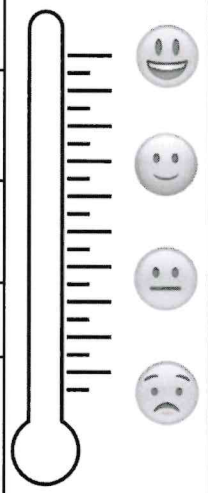
I can explain plate tectonic theory of crustal evolution: **tectonic plates; plate movement; gravitational sliding; ridge push, slap pull; convection currents and sea-floor spreading.**

I can explain the formation of destructive **(South American Andes),** constructive **(East African Rift and Mid Atlantic Ridge)** and conservative plate margins **(San Andreas)**

I can explain their characteristic processes: seismicity and vulcanicity.

I can explain the formation of their associated landforms: young fold mountains **(Himalayas),** rift valleys **(East African Rift Valley),** ocean ridges **(Mid Atlantic Ridge),** deep sea trenches and island arcs, volcanoes.

I know what magma plumes are and their relationship to plate movement.



Assessment:

Volcanic hazards

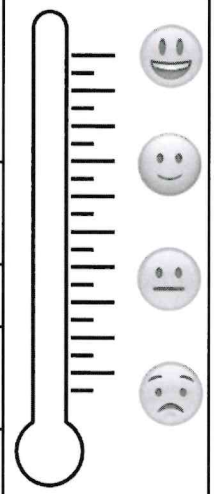
I can explain the nature of vulcanicity and its relation to plate tectonic: forms of volcanic hazard: nuees ardentes, lava flows, mudflows, pyroclastic and ask fallout, gases/acid rain, tephra.

I can describe their spatial distribution, magnitude, frequency, regularity and predictability of hazard events.

I can describe the impacts: primary/secondary, environmental, social, economic, political.

I can describe the short and long-term responses: risk management designed to reduce impacts of the hazard through preparedness, mitigation, prevention and adaptation.

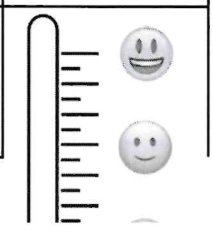
MINI CASE STUDY - I know the impacts and human responses as evidenced by a recent volcanic event: **Eyjafjallajökull, 2010 and Montserrat, 1995 onwards**

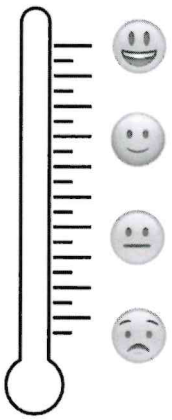
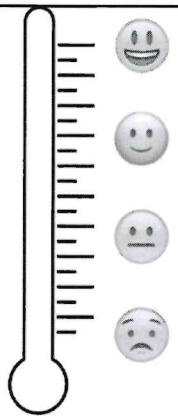
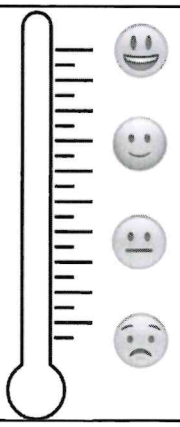


Assessment:

Seismicity

I know the nature of seismicity and its relation to plate tectonics: forms of seismic hazard: earthquakes, shockwaves, tsunamis, liquefaction and landslides.



I can describe the spatial distribution, randomness, magnitude, frequency, regularity and predictability of hazard events.	
I can describe the impacts: primary secondary; environmental, social, economic, political.	
I can explain the short and long term responses; risk management designed to reduce the impacts of the hazard through preparedness, mitigation, prevention and adaptation.	
MINI CASE STUDY - I can explain the impacts and human responses as evidenced by a recent seismic event: **Tohuku Earthquake and Tsunami, 2011, Haiti 2010.**	**Assessment:**
Storm Hazards I can describe the nature of tropical storms and their underlying causes.	
I can explain how a storm hazard forms, including high winds, storm surges, coastal flooding, river flooding and landslides.	
I can describe the spatial distribution, magnitude, frequency, regularity, predictability of hazard event.	
I can describe the primary/secondary, environ, social, econ and pol impacts of storm hazards.	
I can explain the short and long-term responses: risk management designed to reduce the impacts of the hazard through preparedness, mitigation, prevention and adaptation.	
MINI CASE STUDIES I can explain the impacts and human responses as evidenced by two recent tropical storms in contrasting areas of the world: **Hurricane Jeanne and Katrina**	**Assessment:**
Fires in Nature I can describe the nature of wildfires. I can describe the conditions favouring intense wildfires including vegetation type, fuel characteristics, climate and recent weather and fire behaviour.	
I can explain the causes of fires: natural and human agency.	
I can explain the impacts: primary/secondary, environmental, social, economic and political.	
I can explain the short and long term responses: risk management designed to reduce the impacts of the hazard through preparedness, mitigation, prevention and adaptation.	
MINI CASE STUDY – I can explain the impact and human responses as evidenced by a recent wildfire event: **Fort McMurray, Canada, 2016**	**Assessment:**
CASE STUDIES 1. Multi-hazardous environment beyond the UK to illustrate and analyse the nature of the hazards and the social, economic, and environmental risks presented. I can explain how human qualities and responses such as resilience, adaptation, mitigation and management contribution to its continuing human occupation: **Haiti, Earthquakes 2010, 2021 and Jeanne.**	
2. Case study at a local scale of a specified place in a hazardous setting to illustrate the physical nature of the hazard and analyse how the economic, social and political character of its community reflects the presence and impacts of the hazard and the community's response to the risk: **UK floods, 2013**	

Global Systems Revision List

Global systems	Case study(ies)	Resourc es prepare d	Reviewed and recapped	Tested using past questions
Dimensions of globalisation: flows of capital, labour, products, services and information; global marketing; patterns of production, distribution and consumption.				
Factors in globalisation: advancements in technologies, systems and relationships, including financial, transport, security, communications, management and information systems and trade agreements.				
Form and nature of economic, political, social and environmental interdependence in the contemporary world.				
Issues associated with interdependence including how: Unequal flows of people, money, ideas and technology with global systems can sometimes ac to promote stability, growth and development but can also cause inequalities, conflicts and injustices for people and places. Unequal power relations enable some states to drive global systems to their own advantage and to directly influence geopolitical events, while others are only able to respond or resist in a more constrained way				
International trade and access to markets				
Global features and trends in the volume and pattern of international trade and investment - with globalisation				
The nature and role of Transnational Corporations (TNCs) including their spatial organisation, production, linkages, trading and marketing patterns with a detailed reference to a specified TNC and its impacts on those countries.	Apple			
Trading relationships and patterns between large, highly developed economies such as the United States, the European Union, emerging major economies such as China and India and smaller, less developed economies such as those in sub-Saharan Africa, southern Asia and Latin America	Trade blocs such as the EU and NAFTA			
Differential access to markets associated with levels of economic development and trading agreements and its impacts on economic and societal well-being				
The world trade of a manufactured product or a food commodity product: The world trade of bananas and Fairtrade	Bananas			
Analysis and assessment of the geographical consequences of global systems to specifically consider how international trade and variable access to markets underly and impact on students' and other people's lives across the globe.				
Globalisation critique				
The impacts of globalisation to consider the benefits of growth, development, integration, stability against the costs in terms of inequality, injustice, conflict and environmental impact				
Global governance and the 'global commons'				
Emergence and developing role of norms, laws and institutions in regulating and reproducing global systems.				
Issues associated with attempts at global governance, including how: • agencies, including the UN in the post-1945 era, can work to promote growth and stability but may also exacerbate inequalities and injustices. • interactions between the local, regional, national, international and global scales are fundamental to understanding global governance.	The UN, WTO, World Bank, IMF			
The concept of the 'global commons'. The rights of all to the benefits of the global commons. Acknowledgement that the rights of all people to sustainable development must also acknowledge the need to protect the global commons.				
Case study of a global common: Antarctica				
An outline of the contemporary geography, including climate, of Antarctica (including the Southern Ocean as far north as the Antarctic Convergence) to demonstrate its role as a global common and illustrate its vulnerability to global economic pressures and environmental change.				
Threats to Antarctica arising from: Climate change, fishing and whaling, the search for mineral resources, tourism and scientific research				
How Antarctica is governed by international (UN and by NGOs such as ASOC) to reduce threats and to promote sustainability	ASOC, CCMALR, IWC, IAATO, AOA, SCAR, WWF, Greenpeace			
Critical appraisal of governance of Antarctica. International government organisations: United Nations (UN) agencies (UNEP) and the International Whaling Commission. Antarctic Treaty (1959), the Protocol on Environmental Protection to the Antarctic Treaty (1991); IWC Whaling Moratorium (1982) – purpose, scope, systems for inspection and enforcement.				
Analysis and assessment of the geographical consequences of global governance for citizens and places in Antarctica and elsewhere to consider how global governance underlies and impacts on students' and other people's lives across the globe.				

Changing Places Revision list

The nature and importance of place	Case study(ies)/ Examples	Resources prepared	Reviewed and recapped	Tested using past questions
Defining place – location, locale, sense of place. Examining the importance of place in human life and experience.				
Insider and outsider perspectives on place				
How place can be categorised - near places and far/distant places. Experienced places and media places.				
Factors contributing to the character of place: endogenous (location, geography, physical geography, land use, built environment infrastructure, demographic and economic characteristics) and exogenous factors that shape place (relationships with other places including migration and multinational corporations).	Yarm Liverpool			
Changing places – relationships and connections				
Places are dynamic (not static) and are constantly changing due to a range of external forces.	Yarm Liverpool			
Relationships and connections, meanings and representation-how these affect continuity and change in the nature of our places and our understanding.	Yarm Liverpool			
Ways in which students' own lives and those of others are affected by continuity and change in the nature of places	Yarm Liverpool			
The demographic, socio-economic and cultural characteristics of places are therefore shaped by shifting flows of people, resources, money and investment.	Yarm Liverpool			
Characteristics and impacts of external forces operating at different scales from local to global including government policies or decision of TNCs or international/global institutions	Yarm Liverpool			
Changing places – meaning and representation				
The perceptions of place can vary with individuals. The way we understand a place depends upon how attached we are to them. Insiders are attached well to a place, and outsiders are not. The level of attachment to a place can change over time.	Yarm Liverpool			
Attachments to place can be experienced on a range of scales – nationally, regionally and locally. Everyday place meanings (attachments) vary according to identity, perspectives and experiences.	Yarm Liverpool			
Places can be represented artistically (through qualitative sources such as film, photography, art, story, song etc.) and statistically (through quantitative sources such as census data and cartography).	Yarm Liverpool			
Places can be manipulated by external agencies (government, corporate bodies or community groups) through regeneration. These create specific place meanings and shape the actions and behaviours of individuals, groups, businesses and institutions.	Yarm Liverpool			
Places can be manipulated by external agencies (government, corporate bodies or community groups) through rebranding. These create specific place meanings and shape the actions and behaviours of individuals, groups, businesses and institutions.	Yarm Liverpool			
The past (history and heritage) and present processes of development can influence the social and economic characteristics of an area and be implicit in present meanings.	Yarm Liverpool			
Place studies				
A study of two places – a local place study and a contrasting place study. An exploration of their character using a variety of data sources (census data statistics, maps, and photographs).	Yarm vs Liverpool			
A study of two places – People's lived experience of the place in the past and at present. Comparing their economic change and social inequalities.	Yarm vs Liverpool			

Population Revision List

The relationship between population and the environment	Case study(ies)/ Examples	Resources prepared	Reviewed and recapped	Tested using past questions
Elements in the physical environment – climate, soils, water supply, geology and other resource distributions – and impacts of this on population density				
Key population parameters-distribution, density, numbers, change. Key role of development processes. Global patterns of population numbers, densities and change rates				
Two climatic types-distribution and characteristics. Relationship between climate, human activity and numbers.	Polar climates v. Tropical Monsoon climates			
Climate change and agriculture	UK/Canada vs India and south east Asia			
Global and regional patterns of food production and consumption – agricultural systems such as commercial, subsistence and intensive farming and agricultural productivity				
Two types of zonal soils-characteristics and distribution to show relationship between soils and human activities (agriculture)	Podsol and latosol zonal soil types			
Key physical environment variables affecting agricultural capability – differing climates, waterlogging, soil erosion, salinisation of soils and the structural deterioration of soils				
Strategies used to ensure food security (food availability, access, use and stability)	Rwanda and Uganda / Burkina Faso projects			
Global patterns of health – mortality, infant mortality and morbidity, communicable and non-communicable disease and the epidemiological transition				
Environmental variables and their links to the incidence of disease – climate, topography, air quality, water quality. Socio-economic factors affecting health such as poverty, diet and human behaviours	Stockton-on-Tees - variations by ward			
The global prevalence of and distribution of a biologically transmitted disease, its links to the physical and human environment, its impacts on health and wellbeing, and how it can be prevented and managed/mitigated	Malaria			
The global prevalence of and distribution of a non-communicable disease, its links to the physical and human environment, its impacts on health and wellbeing, and how it can be prevented and managed/mitigated	Coronary Heart Disease (CHD)			
The role of international agencies and NGOs in promoting health and combating disease	WHO, Oxfam, Red Cross, Action Aid, MSF, CARE, Save the Children			
Analysis of relationship between place and health related to its physical environment, socio-economic character and the experience/attitudes of its populations	Eaglescliffe vs Stockton Town Centre			
Key vital rates – birth and death rates, life expectancy, longevity, fertility rates, IMR, natural change, migration and the factors affecting fertility and mortality rates.				
The demographic transition model, population structures and the concept of a demographic dividend				
International migration – causes, processes and impacts of migration on the origin and host countries and impacts to population structures. Demographic, environmental, social, economic, health and political implications of migration	Syrian refugee crisis			
Country experiencing specific patterns of population change. Analysis of the character, scale and pattern of change as well as relevant environmental and socio-economic factors. Implications for the country.				
Population growth dynamics – under-population, over-population and optimum-population, carrying capacities and ecological footprints	China's One Child Policy			
The population, resources and pollution model – positive and negative feedback mechanisms				
Contrasting perspectives on population growth – pessimistic and optimistic theories	Malthus and Boserup/Simon			
Global population futures – health impacts of global environmental change (skin cancer, cataracts, thermal stress, changing distribution of vector-borne diseases, agricultural productivity and nutritional standards)				
Global population futures – prospects for global population change				