A Level Geography

Specification and PLC (Personal Learning Checklist)

AREA OF STUDY: 1: Dynamic Landscapes **Topic 1: Tectonic Processes and Hazards** **Autumn Term**

Overview:

Tectonic hazards – earthquakes, volcanic eruptions and secondary hazards such as tsunamis – represent a significant risk in some parts of the world. This is especially the case where active tectonic plate boundaries interact with areas of high population density and low levels of development. Resilience in these places can be low, and the interaction of physical systems with vulnerable populations can result in major disasters. An in-depth understanding of the causes of tectonic hazards is key to both increasing the degree to which they can be managed, and putting in place successful responses that can mitigate social and economic impacts and allow humans to adapt to hazard occurrence.

Enquiry Question 1: Why are some locations more at risk from tectonic hazards?				
Key Idea	Detailed content	**PLC**		
		RED	**AMBER**	**GREEN**
1.1 The global distribution of tectonic hazards can be explained by plate boundary and other tectonic processes.	a. Describe and comment on the global distribution and causes of earthquakes, volcanic eruptions and tsunamis.			
	b. Describe and explain the distribution of plate boundaries and contrast divergent, convergent and conservative plate movements (oceanic, continental and combined situations).			
	c. Determine the causes of intra-plate earthquakes, and volcanoes associated with hotspots from mantle plumes.			
1.2 There are Theoretical frameworks that attempt to explain plate movements.	a. Discuss the theory of plate tectonics (earth's internal structure, mantle convection, palaeomagnetism and sea floor spreading, subduction and slab pull).			
	b. Explain the operation of these processes at different margins (destructive, constructive, collision and transform).			
	c. Understand the physical processes impact on the magnitude and type of volcanic eruption, and earthquake magnitude and focal depth (Benioff zone).			
1.3 Physical processes explain the causes of tectonic hazards.	a. Differentiate between the types of earthquake wave (P, S and L).			
	b. Understand that earthquake waves cause crustal fracturing, ground shaking and secondary hazards (liquefaction and landslides).			
	c. Explain how volcanoes cause lava flows, pyroclastic flows, ash falls, gas eruptions, and secondary hazards (lahars, jökulhlaup).			
	d. Explain the cause and formation of a tsunami, using terms subduction zone, sea bed and water column displacement.			

Enquiry question 2: Why do some tectonic hazards develop into disasters?				
Key Idea	Detailed content	**PLC**		
		RED	**AMBER**	**GREEN**
1.4 Disaster occurrence can be explained by the relationship between hazards, vulnerability, resilience and disaster.	a. Define natural hazard.			
	b. Define disaster.			
	c. Understand the importance of vulnerability and community's threshold for resilience.			
	d. Recall the hazard risk equation.			
	e. Understand the Pressure and Release model (PAR) and the complex inter-relationships between the hazard and its wider context.			
	f. Describe and evaluate the social and economic impacts of tectonic hazards on the people, economy and environment of contrasting locations in the developed, emerging and developing world.			
1.5 Tectonic hazard profiles are important to an understanding of Contrasting hazard impacts, vulnerability and resilience.	a. Differentiate between Mercalli, Moment Magnitude Scale (MMS) and Volcanic Explosivity Index (VEI) as ways to measure magnitude and intensity of tectonic hazards.			
	b. Compare and contrast the characteristics of tectonic hazards (magnitude, speed of onset and areal extent, duration, frequency, spatial predictability) through hazard profiles.			
	c. Compare and contrast the characteristics of tectonic hazard events showing severity of social and economic impact in developed, emerging and developing countries.			
1.6 Development and governance are important in understanding disaster impact and vulnerability and resilience.	a. Explain how inequality of access to education, housing, healthcare and income opportunities can influence vulnerability and resilience to tectonic hazards.			
	b. Explain how governance (local and national) and geographical factors (population density, isolation/accessibility, degree of urbanisation) influence vulnerability and a community's resilience to tectonic hazards.			
	c. Compare and contrast hazard events in developed, emerging and developing countries to show the interaction of physical factors and the significance of context in influencing the scale of disaster.			

Enquiry question 3: How successful is the management of tectonic hazards and disasters?				
Key Idea	Detailed content	PLC		
		RED	**AMBER**	**GREEN**
1.7 Understanding the complex trends and patterns for tectonic disasters helps explain differential impacts.	a. Describe tectonic disaster trends since 1960 (number of deaths, numbers affected, level of economic damage) in the context of overall disaster trends.			
	b. Conduct and quote research into the accuracy and reliability of the data to interpret complex trends.			
	c. Understand that tectonic mega-disasters can have regional or even global significance in terms of economic and human impacts. Research e.g. 2004 Asian tsunami, 2010 Eyafjallajokull eruption in Iceland (global independence) and 2011 Japanese tsunami (energy policy) and others to illustrate this significance.			
	c. Research the Philippines (e.g.) to illustrate this concept.			
1.8 Theoretical frameworks can be used to understand the predication, impact and management of tectonic hazards.	a. Understand and explain the role of scientists in predicting and forecasting accuracy, which is dependent on the type and location of the hazard.			
	b. Understand the importance of different stages of the hazard management cycle (response, recovery, mitigation, preparedness) and explain the role of emergency planners.			
	c. Compare areas at differing stages of development using Park's Model to compare the response curve of hazard events.			
1.9 Tectonic hazard impacts can be managed by a variety of mitigation and adaptation strategies, which vary in their effectiveness.	a. Evaluate strategies to modify vulnerability and resilience include hi-tech monitoring, prediction, education, community preparedness and adaptation, acknowledging models forecasting disaster impacts with and without modification).			
	b. Evaluate strategies to modify loss (including emergency, short-term and long-term aid) and insurance.			
	c. Comment on the role of NGOs and insurers and the actions of affected communities.			

Topic 1: Geographical Skills			
*Note: These skills are **not** exclusive to the topic areas under which they appear; you will need to be able to apply these skills across any suitable topic area throughout their course of study.*	**PLC**		
	RED	**AMBER**	**GREEN**
Analysis of hazard distribution patterns on world and regional scale **maps**.			
Use of block diagrams to identify key features of different plate boundary settings.			
Analysis of tsunami time-travel **maps** to aid prediction.			
Use of correlation techniques to analyse links between magnitude of events, deaths and damage.			
Statistical analysis of contrasting events of similar magnitude to compare deaths and damage.			
Interrogation of large data sets to assess data reliability and to identify and interpret complex trends.			
Use of Geographic Information Systems (GIS) to identify hazard risk zones and degree of risk related to physical and human geographical features.			

NOTES/CASE STUDIES