

YEAR 10 GEOGRAPHY – CYCLE 2 – WEATHER HAZARDS

BOX 1: KEYWORDS	
tropical storms	a natural hazard e.g. hurricanes, cyclones and typhoons
extreme weather	when a weather event is significantly worse than the usual weather
Coriolis effect	the rotation of the Earth causes winds to curve as they move
cumulonimbus	very large and tall thunderclouds
Saffir-Simpson Scale	shows wind speed on scale from category 1 to category 5 (strongest)
weather hazards	e.g. drought, floods, storms, heatwaves, snow

BOX 2: GLOBAL ATMOSPHERIC CIRCULATION	
at Equator	concentrated sunlight → hot → air rises → low pressure → wet
at Poles	less concentrated sunlight → cold → air sinks → high pressure → dry
pressure belts	<ul style="list-style-type: none"> low pressure along the Equator high pressure near Tropic of Cancer and Tropic of Capricorn high pressure at the North Pole and South Pole
surface winds	across the Earth's surface air moves from high pressure to low pressure areas e.g. winds from the Tropic of Cancer and Capricorn move towards Equator → these winds move heat and moisture around the planet

BOX 3: TROPICAL STORM DISTRIBUTION	
tropical storms are distributed →	<ul style="list-style-type: none"> in-between the Tropic of Cancer and Equator (5° to 30° north) in-between the Tropic of Capricorn and Equator (5° to 30° south)

BOX 4: FORMATION OF TROPICAL STORMS	
What do tropical storms need to be able to form?	<ol style="list-style-type: none"> need area of concentrated insolation → high temperatures → rising air → low pressure → clouds and precipitation must form over ocean → ocean temperature must be above 27° C heat and moisture needed → used as energy to power the storm Coriolis effect needed → causes tropical storm winds to spin (no Coriolis effect at Equator so no tropical storms on Equator)
sequence of formation	<p>Step 1: air above warm tropical ocean is heated by sun</p> <p>Step 2: warm air rises rapidly → low pressure → cumulonimbus clouds</p> <p>Step 3: Coriolis effect causes the clouds to spin → creates fast winds</p> <p>Step 4: spinning cumulonimbus clouds → cause torrential rain</p> <p>Step 5: tropical storm reaches land → no heat and no moisture from ocean to power storm → starts to lose energy → also friction with land slows storm → so tropical storm starts to weaken → disappears</p>
features	<ul style="list-style-type: none"> eye → calm area in center of tropical storm → no rain or wind eye wall → fast winds, cumulonimbus clouds, heavy precipitation

BOX 5: HOW MIGHT CLIMATE CHANGE AFFECT TROPICAL STORMS?	
1. distribution	warmer ocean → tropical storms may form in different areas
2. intensity	1° C increase in ocean temperature may increase wind speeds by 3-5%
3. frequency	warmer ocean → more intense storms may occur more often

BOX 6: TROPICAL STORM CASE STUDY – TYPHOON HAIYAN	
location	Typhoon Haiyan, Philippines (Asia) → November 2013
primary effects	<ul style="list-style-type: none"> wind speeds reached 314 km per hour → Category 5 6190 deaths and \$12 billion of damage 1.1 million tonnes of crops destroyed 90% of Tacloban city destroyed → airport badly damaged
secondary effects	<ul style="list-style-type: none"> 4.1 million people homeless oil leak from ship → 800,000 litre oil spill → environment damaged looting and 8 deaths in stampede for rice flooding → caused water to become contaminated with sewage
immediate responses	<ul style="list-style-type: none"> President made a televised warning 800,000 people evacuated 1 million food packs and 250,000 litres of fresh water distributed curfew imposed to reduce looting
long-term responses	<ul style="list-style-type: none"> plan of 'building back better' and also 'no dwelling zone' along coast new storm surge warning system replanted mangrove trees along coast → as natural barrier

BOX 7: REDUCING THE EFFECTS OF TROPICAL STORMS	
monitoring	satellites and unmanned aircraft collect weather data
prediction	supercomputers can give warning 5 days before tropical storm
protection	storm shutters, installing emergency generators, securing loose objects
planning	'National Hurricane Preparedness Week' in USA

BOX 8: UK EXTREME WEATHER CASE STUDY – STORM DESMOND	
location	Storm Desmond, Cumbria (UK) → December 2015
causes	<ul style="list-style-type: none"> intense precipitation → more than one month of rain fell in 2 days soil was already saturated from 3 smaller storms in November
social impacts	<ul style="list-style-type: none"> 700 families unable to return home for 2 years communities separated
economic impacts	<ul style="list-style-type: none"> bridges collapsed → people could not travel to work £1.3 billion of economic damage
environmental impacts	<ul style="list-style-type: none"> landslides led to death of cattle erosion of the mountain slopes e.g. Helvellyn
management strategies used to reduce future risk	<ul style="list-style-type: none"> ✓ raised height of flood embankments → to try to stop future floods ✓ £24 million for new flood defences for town called Kendal ✓ many buildings have been rebuilt 1 metre higher from the ground

BOX 9: EVIDENCE THAT WEATHER IN THE UK IS BECOMING MORE EXTREME	
evidence	<ul style="list-style-type: none"> increase in extreme weather events in UK since 1980s UK temperatures have increased by 1°C since 1980s frequency and severity of winter flooding has increased from 1980s

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