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	• **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 →	• **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?	1. need area of concentrated insolation → high temperatures → rising air → low pressure → clouds and precipitation 2. must form over **ocean** → ocean temperature must be **above 27° C** 3. **heat** and **moisture** needed → used as **energy** to power the storm 4. **Coriolis effect** needed → causes tropical storm winds to **spin** (no Coriolis effect at Equator so no tropical storms on Equator)
sequence of formation	**Step 1**: **air** above warm tropical ocean is **heated** by **sun** **Step 2**: warm **air rises** rapidly → **low pressure** → **cumulonimbus clouds** **Step 3**: **Coriolis effect** causes the **clouds to spin** → creates **fast winds** **Step 4**: **spinning cumulonimbus clouds** → cause **torrential rain** **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**
features	• **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** • wind speeds reached **314 km per hour** → **Category 5**
primary effects	• **6190 deaths** and **$12 billion** of **damage** • **1.1 million tonnes of crops destroyed** • **90%** of **Tacloban city destroyed** → **airport badly damaged**
secondary effects	• **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	• **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	• 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	• **intense precipitation** → more than one month of rain fell in 2 days • **soil** was **already saturated** from **3 smaller storms** in **November**
social impacts	• **700 families unable** to **return home** for **2 years** • **communities separated**
economic impacts	• **bridges collapsed** → people **could not travel** to **work** • **£1.3 billion of economic damage**
environmental impacts	• **landslides** led to **death of cattle** • **erosion** of the **mountain slopes** e.g. **Helvellyn**
management strategies used to reduce future risk	✓ **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	• **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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