

YEAR 9 GEOGRAPHY – CYCLE 2 – COLD ENVIRONMENTS

BOX 1: KEYWORDS PART 1	
cold environments	areas with very low temperatures distributed at high latitudes e.g. tundra and polar biomes
global ecosystem	very large ecosystems e.g. desert , tropical rainforest and polar biomes
interdependence	when the components of an ecosystem rely on each other to survive
climate	the average temperature and precipitation in a place over many years
permafrost	layer of permanently frozen ground → found in polar and tundra regions
biodiversity	variety of living things in the world or in a particular habitat

BOX 2: THE TUNDRA BIOME → PHYSICAL CHARACTERISTICS	
distribution	located Arctic areas of Northern Europe , Northern Asia , North America
temperature	long freezing winters -50° C → short cold summers 10° C
precipitation	low → less than 300 mm annually (per year)
soil	<ul style="list-style-type: none"> thin soil layer → plants decompose slowly due to cold → less nutrients enters soil → soil not very fertile permafrost → permanently frozen ground (underneath soil layer) plant growth limited to 60 days in summer when soil thaws
animal adaptation	musk ox → two fur coats → keeps them warm → helps survival
plant adaptation	arctic poppy → turns head to follow sun → maximises photosynthesis → also has small hairs on stem to trap heat and grows close to ground
biodiversity	biodiversity limited by low temperatures → plants and animals find it difficult to survive (but biodiversity is higher in tundra than polar biome)
people	indigenous people and workers employed in mineral extraction

BOX 3: THE POLAR BIOME → PHYSICAL CHARACTERISTICS	
distribution	located around North and South Poles e.g. the Arctic and Antarctica
temperature	long freezing winters -90° C → short cold summers maximum 10° C
precipitation	low → less than 100 mm annually (per year) → usually falls as snow
soil	large thick ice sheets cover the area
animal adaptation	polar bears → insulated with thick fur → survive freezing temperatures
plant adaptation	lichen grows without soil → adapted to grow on rocks
biodiversity	very low biodiversity due to extreme conditions
people	small number of indigenous people and some scientists

BOX 4: KEYWORDS PART 2	
development	to improve an area e.g. improve amenities , jobs and quality of life
opportunities	a chance to improve something
challenges	a problem or difficulty → makes improving something difficult
mineral extraction	mining (digging) raw materials from the ground → e.g. coal , iron ore
infrastructure	places and their connections e.g. roads , water supply and sewage pipes → needed for places to function properly
inaccessibility	when a place is difficult to travel to/from → e.g. not many roads

BOX 5: CHALLENGES OF DEVELOPING COLD ENVIRONMENTS ☹️ → ALASKA	
case study	Alaska → tundra biome
location	largest and most north-westerly state in USA → Northern Hemisphere → high latitude → bordered by Canada → surrounded by Arctic Ocean
1. temperature	extreme → -30° C → 60 days of non-stop night (darkness) during winter → difficult work conditions → limits development
2. inaccessibility	sparsely populated → ice covers roads → towns hard to travel to and from → employment difficult → isolated communities
3. infrastructure	buildings heat permafrost layer → melts → buildings sink into ground

BOX 6: DEVELOPMENT OPPORTUNITIES IN COLD ENVIRONMENTS 😊 → ALASKA	
case study	Alaska → tundra biome
1. mineral extraction	<ul style="list-style-type: none"> over half of income from oil and gas extraction → Trans-Alaskan Pipeline transports oil across Alaska in 2015 Alaska exported \$154 million of gold
2. energy	hydroelectric power provides over 21% of electricity to Alaska
3. fishing	salmon employs around 30,000 people → boosts economy \$1.7 billion
4. tourism	2 million tourists a year → mostly arrive on cruise ships → tourism employs about 39,000 local people → boosts economy \$2.5 billion

BOX 7: KEYWORDS PART 3	
value	importance/usefulness of something → does not always mean the price
wilderness area	natural environment has not been developed or disturbed by humans
fragile environment	environment that is both easily damaged and difficult to restore
strategy	a plan or project (sometimes called a scheme)
economic	economic development → improving money and jobs
conservation	to protect and look after something → e.g. stop habitat destruction
international	across more than one country
agreements	a promise to carry out a plan (often a promise between countries)

BOX 8: WHY SHOULD FRAGILE WILDERNESS AREAS BE PROTECTED?	
wilderness areas → fragile and valuable → need to protect	wilderness areas are fragile and valuable → provide habitats for species that cannot survive anywhere else → allows scientists unique opportunity to study rare areas that are undisturbed by human activity

BOX 9: STRATEGIES TO BALANCE ECONOMIC DEVELOPMENT AND CONSERVATION	
1. technology	Trans-Alaskan Pipeline raised on stilts → stops permafrost melting
2. governments	governments protect fragile wilderness areas e.g. Arctic National Wildlife Refuge (ANWR)
3. international agreements	<ul style="list-style-type: none"> 1959 Antarctic Treaty → bans nuclear activities in Antarctica 1986 Whaling Ban → increased numbers of whales 3% each year
4. conservation	conservation groups → Greenpeace campaigns to protect fragile environments → e.g. to stop oil drilling

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