Options and fieldwork

IB DP Geography optional themes (Paper 1) and the fieldwork internal assessment

Options and fieldwork

- explain how the optional themes are examined in Paper 1;
- learn the key processes, management choices and one case study for each of the seven options;
- plan a fieldwork inquiry from question and **hypothesis** to **sampling** and data collection;

Options and fieldwork (2)

- test a relationship with Spearman's rank and chi-squared, and evaluate the method;
- meet the **internal assessment** criteria.

How the options are examined

- In Paper 1 each option has 20 marks.
- The first part is a set of short **structured questions** (10 marks), often about a map, graph or table.
- Then you choose one of two essays (10 marks).
- SL students answer two options in 1 hour 30 minutes; HL students answer three in 2 hours 15 minutes.

Freshwater

- A **drainage basin** is the area of land that a river and its tributaries drain.
- Rain that falls on it can be stored (in soil, lakes and groundwater) or move to the river: over the surface (**surface runoff**) or more slowly through the soil and rock.
- A **storm hydrograph** shows how a river's **discharge** (the volume of water passing a point each second) changes after a storm.
- **Discharge** rises along the **rising limb** to a **peak** and falls along the falling limb.

Oceans and coastal margins

- Waves shape coasts.
- They erode rock by **hydraulic action** (water and air forced into cracks) and **abrasion** (rocks thrown against the cliff).
- Where waves lose energy, they deposit sand and shingle as beaches and **spits** .
- Where hard and soft rocks meet the sea, the soft rock is eroded into bays and the hard rock is left as headlands; caves, arches and stacks form at the headlands.

Extreme environments

- **Extreme environments** are cold (high mountains, polar and glacial areas) or dry (hot deserts).
- Ice erodes valleys into a U shape and leaves piles of rock called **moraines** .
- In hot deserts, wind builds dunes and rare flash floods cut steep valleys called wadis.
- People see these places as both **opportunities** (minerals, tourism, solar energy, scientific research) and **challenges** (cold or heat, little water, poor access, a fragile environment).

Geophysical hazards

- The Earth's surface is broken into **tectonic plates** that move a few centimetres a year.
- Most volcanoes and earthquakes happen at **plate margins** :
- **Hazard risk** grows with three things: how strong and frequent the hazard is, how many people and buildings are in its path (**exposure**), and how easily they are harmed (**vulnerability**).
- Poverty, weak buildings and poor warning systems raise **vulnerability**.

$$\text{risk} = \text{hazard} \times \text{exposure} \times \text{vulnerability}$$

Leisure, tourism and sport

- The **Butler model** describes how a tourist destination changes over time.
- A few visitors explore it; local people start to provide services; companies build hotels and visitor numbers grow fast.
- Growth slows as the place reaches its **carrying capacity** , the number of visitors it can take before the environment or visitor experience suffers.
- Then it stagnates, and either declines or is rejuvenated by new investment.

Food and health

- **Food security** means that all people can get enough safe and healthy food at all times.
- A **famine** often happens not because there is no food, but because people cannot afford or reach it.
- The economist Amartya Sen argued that in the Bengal **famine** of 1943 food was available, but prices rose far faster than the wages of the poor.
- This links to the "access" pillar of **food security** in topic 02.

Urban environments

- More than half of the world's people live in cities.
- A **megacity** has more than 10 million people.
- Shenzhen grew from a small border town in 1980 to about 17.6 million people in the 2020 census.
- **Land-use models** describe how a city is arranged.

Fieldwork: geographic inquiry and sampling

- The fieldwork report is worth 25% at SL and 20% at HL.
- It is a report of up to 2,500 words, marked out of 25, on **primary data** that you collect yourself in the field.
- You cannot measure everything, so you take a sample:
- **Worked example.** Question: *Does the number of pedestrians fall with distance from the central square?* **Hypothesis**: pedestrian numbers fall as distance increases.

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)} = 1 - \frac{6 \times 158}{8 \times 63} = 1 - \frac{948}{504} \approx -0.88$$

Sources for this lesson

- International Baccalaureate, *Geography guide* (first assessment 2019), the options and the **internal assessment** criteria.
- State Council investigation report on the Zhengzhou rainstorm of 20 July 2021 (2022).
- Environment Agency, Holderness and Medmerry coastal management reports.

Sources for this lesson (2)

- R. Butler, "The concept of a tourist area cycle of evolution", *Canadian Geographer* (1980).
- US Geological Survey and Japan Meteorological Agency reports on the 2010 Haiti and 2011 Tōhoku earthquakes.

Common errors

- Writing an option essay with general points and no named place, date or figure.
- Saying **hard engineering** "solves" flooding or erosion; it often moves the problem downstream or down the coast.
- Judging a hazard by its size alone; the death toll depends on **exposure** and **vulnerability** (Haiti 2010 against Tōhoku 2011).

Common errors (2)

- Treating Burgess's and Hoyt's models as descriptions of real cities rather than models to test.
- Writing a fieldwork question too wide to answer with your own data.
- Saying a significant Spearman's result proves cause; it shows a relationship that something else may explain.

Key terms

- **Lag time**: the time between **peak** rainfall and peak river **discharge**.
- **Longshore drift**: the movement of sediment along a coast by waves that approach at an angle.
- **Carrying capacity**: the number of visitors a place can take before it is damaged or visitors' enjoyment falls.

Key terms (2)

- **Epidemiological transition**: the change from infectious diseases to diseases such as heart disease and cancer as the main causes of death.
- **Systematic sampling**: taking samples at regular intervals, such as every 50 metres.
- **Spearman's rank correlation**: a test of the strength of a relationship between two sets of ranked data.
- **Null hypothesis**: the statement that there is no relationship, which a test tries to reject.

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Check yourself

- 1.
- Why do urban areas usually have a shorter **lag time** than rural ones? 2.
- Give one hard and one soft strategy for managing a coast, with a problem of each. 3.
- The 2010 Haiti earthquake (magnitude 7.0) killed far more people than the shaking of the much stronger 2011 Tōhoku earthquake (magnitude 9.0).