GRADE 11 STUDY GUIDE | 2025

Fluvial and Slope Geomorphology

Geography

1. The Hydrological Cycle

- Precipitation: water falling from atmosphere as rain, snow, hail
- Evaporation: liquid water to water vapour from water bodies
- Transpiration: water vapour released by plants
- Evapotranspiration: combined evaporation and transpiration
- Infiltration: water entering the soil
- Surface runoff: water flowing over land into streams/rivers
- Throughflow: water moving through soil laterally to streams
- Groundwater flow: water moving through permeable rock to springs/rivers

2. River Features -- Upper, Middle, Lower Course

Upper Course (near source)

- Steep gradient; fast velocity; high energy
- Processes: VERTICAL EROSION dominates (downcutting)
- Features: V-shaped valleys, waterfalls, rapids, interlocking spurs, gorges

Middle Course

- Gentler gradient; medium velocity; LATERAL EROSION increases
- Features: meanders begin to form; wider valley floor
- Deposition begins on inside of meanders (point bars)

Lower Course (near mouth)

- Low gradient; slow velocity; DEPOSITION dominates
- Features: floodplain, oxbow lakes (cut-off meanders), levees, delta, braided river
- Flooding: river overtops banks; fine silt deposited on floodplain -- fertile soil

3. River Processes

- EROSION types: Hydraulic action (force of water), Abrasion/corrasion (rock fragments scrape bed/banks), Solution/corrosion (chemical dissolving of rock), Attrition (fragments collide and become smaller/rounder)
- TRANSPORT: Traction (rolling large boulders), Saltation (bouncing pebbles), Suspension (fine sediment carried in flow), Solution (dissolved minerals)
- DEPOSITION: occurs when velocity decreases (river loses energy); heaviest particles deposited first

4. Slope Processes and Mass Movements

- Weathering: breakdown of rock IN PLACE -- physical (freeze-thaw, exfoliation), chemical (oxidation, hydrolysis, carbonation), biological (roots, organisms)
- Soil creep: very slow downslope movement of soil particles; fence posts tilt downhill
- Solifluction: saturated soil flowing over frozen subsoil (periglacial environments)
- Mudflow: very wet, fast-moving mixture of water and fine sediment; associated with heavy rain
- Landslide: sudden mass movement of rock or soil along a slip plane
- Rock fall: free fall of rock fragments from a steep cliff