Science 10

Unit D: Energy flow in global systems

Factors affecting solar input

Winter shadows

- At a lower solar angle, the same incoming energy spreads over a larger surface area.
- Shorter winter days also reduce the time available for solar-energy input.

Angle of Sun	season, latitude, day length
Albedo	ice/snow reflect more than forest
Clouds and aerosols	scatter and absorb incoming solar radi

Axial tilt and seasons

- Earth’s tilt changes the solar angle and the length of the day.
- Axial tilt is the main cause of the seasons; distance from the Sun plays a minor part.
- A lower Sun spreads the same beam over more ground and sends it through more air.
- Name the mechanism, such as reflection or a longer path through the air.

Key terms

solar angle

Angle at which sunlight strikes a surface.

albedo

Fraction of incoming radiation reflected by a surface.

day length

Time between sunrise and sunset at a location.

aerosol

A small solid particle or liquid droplet suspended in air.

Surface solar energy

- A low Sun spreads the same beam over more ground.
- Longer days mean more hours of input.
- Bright surfaces reflect more. Clouds and particles can scatter or absorb.
- Seasons follow the tilt of Earth's axis. Earth's distance from the Sun barely changes them.

Angle of Sun	season, latitude, day length
Albedo	ice/snow reflect more than forest
Clouds and aerosols	scatter and absorb incoming solar radi

Factor and mechanism

- Match each factor to reflection, absorption, scattering, or how long the energy arrives.
- Name the physical mechanism. ‘It increases’ is a start; an explanation also names the cause.

Angle of Sun	season, latitude, day length
Albedo	ice/snow reflect more than forest
Clouds and aerosols	scatter and absorb incoming solar radi

Factor and mechanism

- Match each factor to reflection, absorption, scattering, or duration of input.
- A complete answer names a physical cause for the change.

Angle of Sun	season, latitude, day length
Albedo	ice/snow reflect more than forest
Clouds and aerosols	scatter and absorb incoming solar radi