Chapter 5 – Energy and Ecosystems

How does energy enter an ecosystem?

The ultimate source of energy in an ecosystem is the sun, which provides light to be converted into chemical energy by autotrophs.

How is energy transferred between organisms in the ecosystem?

Producers are photosynthetic organisms which produce organic substances from inorganic substances:

$$Carbon\ dioxide + water + light\ energy \rightarrow glucose + oxygen$$

Consumers will directly consume other organisms to obtain energy from producers and other consumers in lower trophic levels. Energy can be transferred between organisms in a food chain.

What is meant by the terms, trophic level, food chain, food web, producer, consumer and decomposer?

Food chain: The feeding relationship between consumers and producers

Trophic level: Each stage in the food chain

Producer: photosynthetic organisms which produce organic substances from inorganic substances

Consumer: directly consume other organisms to obtain energy from producers and other consumers in lower trophic levels

Decomposer: organisms which break down complex materials into simple components after an organism dies e.g. fungi/bacteria

What percentage of energy is transferred from one trophic level to the next? How is energy lost along a food chain?

Approximately 10% of the energy falling on a plant will be converted into organic molecules (gross production), even some of this is used in respiration so the overall energy stored is the net production:

Net production = gross production - respiratory losses

Primary producers are so inefficient for several reasons:

- Not all wavelengths of light are suitable for photosynthesis
- Some light is reflected off the plant/falls on non-photosynthetic parts
- Limiting factors reduce the rate of photosynthesis