

# **UNIT 1: Sustainable Ecosystems Review**

## **Chapter 1: Nutrient Cycles and Energy Flow**

### 1.1: Sustainability – Key Ideas

- Ecosystem
- Sustainable ecosystem
- Biotic
- Abiotic
- Lithosphere
- Atmosphere
- Hydrosphere
- Biosphere
- Nutrients
- Aquatic ecosystem
- Terrestrial ecosystem
- Eutrophication
- The Water Cycle
- The Carbon Cycle
- The Nitrogen Cycle
- The Phosphorus Cycle

### 1.2: The Biosphere and Energy – Key Ideas

- Photosynthesis
  - Trophic level
  - Biomass
  - Bioaccumulation
  - Bioamplification (biomagnification)
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- You should be able to calculate the trophic efficiency which is the measure of how much energy in organisms at one trophic level is transferred to the next higher trophic level; it is always less than 100% because organisms use much of the energy from the biomass they consume for their life functions, and they produce wastes as well.

### 1.3: Extracting Energy from Biomass- Key Ideas

- Cellular respiration
- Fermentation
- Greenhouse gases
- Greenhouse effect
- Acid precipitation
- *Kyoto Protocol*

## Chapter 2: Populations and Sustainable Ecosystems

### 2.1: Populations and Resources – Key Ideas

- Population
- Exponential growth
- Limiting factors
- Carrying capacity
- Equilibrium

### 2.2: Interactions among Species – Key Ideas

- Ecological niche
- Predator
- Prey
- Symbiosis
  - \*mutualism
  - \*parasitism
  - \*competition

### 2.3: Human Niches and Population - Key Concepts

- Humans and carrying capacity
- World population (last 2000 years)

### 2.4: Ecosystem Services – Key Concepts

The following services are provided by sustainable ecosystems:

- The provision of food and clean water
- The cycling of nutrients
- The conversion of atmospheric carbon into biomass
- The pollination of crops and natural vegetation
- The balance of processes such as growth and decomposition

## Chapter 3: Biodiversity

### 3.1: Measuring Biodiversity - Key Ideas

- Biodiversity
- Biodiversity hotspots
- Canopy fogging
- Quadrat sampling
- Transect sampling
- Netting

### 3.2: Communities – Key Ideas

- Dominant species
- Keystone species
- Ecosystem engineer
- Succession

### 3.3: Threats to Biodiversity – Key Ideas

- Habitat loss
- Deforestation
- Alien species eg. Zebra mussels
- Invasive species eg. Zebra mussels
- Overexploitation
- Extinction

### 3.4: Restoration Ecology – Key Ideas

- Restoration ecology
- Reforestation
- **Biocontrol**
- Bioremediation
- Bioaugmentation

### Review Exercises:

- Chapter 1 Review: pg.44 – pg.45 #1-17, 25, 29
- Chapter 2 Review: pg.84 - 85 #1-7, 19
- Chapter 3 Review: pg.122 – 123 #1 – 10

Unit Review: pg. 128 #1-8, pg. 129 #12, 13, 17, 18