DATE: NAME: CLASS:

UNIT 1

Unit 1 Summary

BLM 1-1

Goal • Use this page to review the concepts in Unit 1, Sustaining Earth's Ecosystems.

1 Biomes and ecosystems are divisions of the biosphere.
- Biomes have similar abiotic and biotic components. (1.1)
- Abiotic factors influence the characteristics and distributions of biomes (1.1)
- Adaptations are characteristics that enable organisms to better survive and reproduce (1.1)
- Biomes are often named for their dominant vegetation or for a geographical or physical characteristic. (1.2)
- Abiotic components in ecosystems include oxygen, water, nutrients, light and soil. (1.2)
- Biotic interactions in ecosystems include trophic and symbiotic relationships as well as competition and predation. (1.2)

2 Energy flow and nutrients support life in ecosystems.
- Energy flows from producers to primary consumers to secondary consumers and is modelled in food chains and food webs. (2.1)
- Food pyramids show the loss of energy from one trophic level to another. (2.1)
- The nutrients carbon, nitrogen, and phosphorus move in and out of the abiotic and biotic components of terrestrial and aquatic ecosystems. (2.2)
- Human activities affect nutrient cycles and cause harm to an ecosystem. (2.2)
- Contaminants such as persistent organic pollutants and heavy metals can bioaccumulate and biomagnify affecting consumers and the health of ecosystems. (2.3)

3 Ecosystems continually change over time.
- Adaptive radiation and natural selection are processes that change organisms in response to changes in the abiotic and biotic components of an ecosystem. (3.1)
- Ecological succession changes the abiotic and biotic components of an ecosystem over time. (3.1)
- Natural events such as flooding, tsunamis, drought, and insect infestations quickly change the abiotic and biotic conditions of an ecosystem. (3.1)
- Human activities including deforestation, agriculture, resource exploitation, and the introduction of foreign species change ecosystems and result in habitat loss. (3.2)
- Invasive introduced species can affect native species through competition, predation, disease, parasitism, and habitat destruction. (3.3)

Goal • Use this page to review the Unit 1 Words to Know.

Chapter 1

abiotic
biome
biotic
commensalism
ecosystem
mutualism
parasitism
predation
symbiosis

Chapter 2

bioaccumulation
biodegradation
carbonate
cellular respiration
decomposers

denitrification
food chains
food pyramids
food webs
heavy metals
keystone species
nitrification
nutrients
PCBs
pesticides
photosynthesis
trophic levels

Chapter 3

adaptive radiation
ecological succession
introduced species (foreign species)
natural selection

Goal • Use this page to review the concepts in Unit 2, Chemical Reactions and Radioactivity.

Chapter 4 Atomic theory explains the formation of compounds.

- Atoms are neutral. In ions, the number of electrons and protons differ, giving the ion an electrical charge. (4.1)
- Compounds containing a metal and a non-metal usually form ionic compounds in which positive and negative ions are connected by ionic bonds. Compounds containing only non-metals form molecules in which the atoms are connected by covalent bonds. (4.2)
- Chemical equations are words or symbols that identify the reactants and products in a chemical reaction. (4.3)
- The law of conservation of mass states that the total mass of all the reactants in a chemical reaction is equal to the total mass of all the products. (4.3)

Chapter 5 Compounds are classified in different ways.

- The formula of an acid has an H on the left side. The formula of a base has an OH on the right of a metal. A salt is an ionic compound formed from an acid-base neutralization. (5.1)
- The pH scale is a way of measuring the concentration of the H+ ion. A neutral solution has a pH = 7, an acidic solution has a pH < 7, and a basic solution has a pH > 7. (5.2)
- Oxides that contain a metal react with water to form basic solutions. Oxides that contain only non-metals react with water to form acidic solutions. (5.2)
- Organic compounds are compounds that contain carbon and usually contain hydrogen. (5.3)

Chapter 6 Chemical reactions occur in predictable ways.

- Chemical reactions can be classified as synthesis, decomposition, single replacement, double replacement, neutralization (acid-base), or combustion. (6.1)
- It is possible to predict the identity of the products of a reaction based on its classification and knowledge of the reactants. (6.1)
- Factors that affect the rate of a reaction include temperature, concentration, surface area, and the presence of a catalyst. (6.2)
- A catalyst is a substance that speeds up the rate of a chemical reaction but is still present in its original amounts at the end of the reaction. (6.2)

Chapter 7 The atomic theory explains radioactivity.

- Isotopes are atoms of the same element that differ in the number of neutrons that they possess. (7.1)
- Radioactive decay results from changes in the nucleus of an atom and can produce alpha, beta, and gamma radiation. (7.1)
- A half-life is the length of time required for half the nuclei in a sample of a radioactive isotope to decay into its products. (7.2)

- Nuclear reactions involve the splitting of heavy nuclei (fission) or the joining together of lightweight nuclei (fusion), both of which can release large amounts of energy. (7.3)
- Radioactive decay, fission, and fusion reactions are symbolized using nuclear equations. (7.3)

Goal • Use this page to review the Unit 2 Words to Know.

Chapter 4

atomic number
atoms
balanced chemical equation
binary covalent compound
Bohr diagram
chemical equation
chemical reaction
compound
conservation of mass
covalent bonding
electrons
ionic bonding
ionic compounds
ions
Lewis diagram
molecule
neutron
polyatomic
products
proton
reactants
skeleton equation
subscript
symbolic equation
valence electrons

Chapter 5

acids
alcohol
bases
bromothymol blue
concentration
hydrocarbon
indigo carmine
inorganic
litmus paper
metal oxide
methyl orange
non-metal oxide
organic
organic chemistry
oxide
pH indicators
phenolphthalein
salts
solvent

Chapter 6

catalyst
catalytic converter
combustion
decomposition
double replacement
neutralization (acid-base)
precipitate
rate of reaction
single replacement
surface area
synthesis

Chapter 7

alpha particle
beta particle
chain reaction
daughter isotope
decay curve
fission
fusion
gamma radiation
half-life
isotopes
light
mass number
nuclear equation
nuclear reaction
parent isotope
radiation
radioactive decay
radiocarbon dating

Goal • Use this summary to review the concepts in Unit 3, Motion.

Chapter 8 Average velocity is the rate of change in position.

- Vector quantities, such as displacement and velocity, have both a magnitude and a direction. (8.1)
- An object in uniform motion will travel equal displacements in equal time intervals. (8.1)
- An object in uniform motion is represented as a straight line on a position-time graph. (8.1)
- Average velocity is the rate of change in position. (8.2)

- Average velocity is calculated by $\vec{v}_{av} = \Delta \vec{d} / \Delta t$. (8.2)
- The slope of the line on a position-time graph is average velocity. (8.2)

Chapter 9 Acceleration is the rate of change in velocity.

- Acceleration is the rate of change in velocity. Change in velocity is calculated by $\Delta \vec{v} = \vec{v}_f - \vec{v}_i$. (9.1)
- When an object's velocity and acceleration are in the same direction, the object's speed increases. When an object's velocity and acceleration are in opposite directions, the object's speed decreases. (9.1)
- Zero acceleration means that the object is moving at a constant velocity. (9.1)
- The slope of a velocity-time graph is average acceleration. (9.2)
- The relationship between acceleration, change in velocity, and time interval, is given by $\vec{a} = \Delta \vec{v} / \Delta t$. (9.2)
- In the absence of air resistance, the acceleration due to gravity near the surface of Earth is 9.8 m/s^2 downward. (9.2)

Goal	• Use this page to review the Unit 3 Words to Know.

Chapter 8	Chapter 9
average velocity displacement distance position position-time graph scalars slope speed uniform motion vectors velocity	acceleration acceleration due to gravity air resistance average acceleration change in velocity constant acceleration deceleration gravity velocity-time graph

Goal	• Use this page to review the concepts in Unit 4, Energy Transfer in Natural Systems.

Chapter 10 The kinetic molecular theory explains the transfer of thermal energy.

- Matter has thermal energy due to the kinetic energy of its particles, which are in constant motion. (10.1)
- Temperature is a measure of kinetic energy, and heat is the amount of thermal energy transferred. (10.1)
- Heat can be transferred by conduction, convection, and radiation. (10.1)
- Earth's atmosphere is a complex system with four layers. (10.2)
- Solar radiation transfers heat to Earth, and conduction and convection transfer heat throughout the atmosphere. (10.2)
- Weather is the condition of the atmosphere at a specific time and place. (10.2)
- The Coriolis effect deflects winds due to Earth's rotation. (10.2)
- Differences in atmospheric pressure cause prevailing winds, local winds, and extreme weather. (10.2)

Chapter 11 Climate change occurs by natural and human processes.

- Climate describes long-term weather patterns for a region. (11.1)
- Earth has undergone a number of ice ages and periods of warming. (11.1)
- Earth's atmosphere produces a natural greenhouse effect. (11.1)
- Many natural processes affect climate. (11.1)
- Evidence shows that climates worldwide are changing. (11.2)
- Earth's average global temperature is increasing. (11.2)
- Many human activities contribute to the enhanced greenhouse effect. (11.2)
- Many individuals and nations are making an effort to address climate change. (11.2)

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Chapter 12 Thermal energy transfer drives plate tectonics.

- Geologic evidence suggests that at one time the continents were joined as a supercontinent. (12.1)
- The process of sea floor spreading provides a mechanism for continental drift. (12.1)
- Earth's surface is made up of solid but mobile pieces of rock called tectonic plates. (12.1)
- Mantle convection causes tectonic plates to converge, diverge, or slide past one another. (12.2)
- Subduction zones occur where one plate slides beneath another; mountains form where two plates bump together. (12.2)
- Earthquakes and volcanic eruptions can result at the boundaries between tectonic plates. (12.2)

Goal • Use this page to review the Unit 4 Words to Know.

Chapter 10

atmosphere
conduction
convection
Coriolis effect
heat
kilopascals
kinetic molecular theory
prevailing winds
thermal energy
tornado

Chapter 11

El Niño
greenhouse gases
La Niña
ozone layer
permafrost

Chapter 12

asthenosphere
continental drift theory
converging plates
diverging plates
earthquakes
epicentre
fault
hot spot
inner core
lithosphere
mantle
mantle convection
outer core
paleoglaciation
plate boundary
plate tectonic theory
primary waves
ridge push and slab pull
rift valley
secondary waves
spreading ridge
subduction zone
surface waves
tectonic plates
transform fault
trench
volcanic belt
volcanic island arc
volcanoes