

Test

Prep

2. Which is an example of a terrestrial ecosystem?
 a. swamp *aqua*
 b. meadow
 c. riverbed *aqua*
 d. ocean floor *aqua*
3. Which is a biotic factor in an ecosystem?
 a. sunlight *abiotic*
 b. water *ab*
 c. bacteria
 d. temperature *ab*
4. Which is required for photosynthesis?
 a. O_2 *output*
 b. $C_6H_{12}O_6$ *output*
 c. CO_2 *input*
 d. NH_3 *ammonium?*
5. Which is NOT one of the Earth's four spheres?
 a. atmosphere
 b. biosphere
 c. geosphere *part of lithosphere!*
 d. lithosphere
6. Which is an example of an aquatic ecosystem?
 a. grassland *terrestrial*
 b. forest *+*
 c. wetland *+*
 d. tundra *+*
8. The lithosphere includes:
 a. mosses *bio*
 b. minerals
 c. moose *bio*
 d. moon *space!*

1. The carrying capacity is the
 a. maximum weight an animal could carry.
 b. capacity of all the decaying organic matter in an ecosystem.
 c. number of producers and decomposers in an ecosystem.
 d. maximum population of an organism that can be supported by an ecosystem.

2. Which of the following is an example of an abiotic factor?

- a. Sunlight
 b. Fish
 c. Bacteria
 d. Mushrooms

3. What was the primary cause of the civilization collapse on Easter Island?

- a. Deforestation
 b. Overfishing
 c. Pollution
 d. All of the statements are incorrect

**too many humans, carrying capacity exceeded, resources depleted*

4. Which statement regarding ecosystems is correct?

- a. Ecosystems have clearly defined boundaries.
 b. Abiotic factors are not able to cross the ecosystem boundary.
 c. Biotic factors are not able to cross the ecosystem boundary.
 d. Abiotic and biotic elements are both able to cross the boundary.

**I don't like this question as a multiple choice, it is more of an Inquiry Question*

11. The relationship of two different plants within the same area requiring the same nutrients from the soil is an example of

- a. Predation
- b. Parasitism
- c. Mutualism
- d. Competition

nutrients are not renewable during a plant's life span

12. The _____ is the name given to the area of the Earth in which living organisms are found.

- a. Hydrosphere
- b. Cryosphere
- c. Biodome
- d. Biosphere

13. Which of the following statements regarding the atmosphere is correct?

a. It is composed of 72% oxygen. *wrong, mostly Nitrogen*

b. Greenhouse gases trap oxygen from escaping into space. $\rightarrow$ traps heat & sun radiation

c. Ninety-nine percent its composition is nitrogen and oxygen.

d. All these are true.

14. A group of individuals of the same species living in the same area is called a

a. community.

b. population.

c. biosphere.

d. keystone species.

1. a. Describe each of these processes:

i. Photosynthesis (/3)

Plants need Sunlight, CO_2 and H_2O to produce $\text{C}_6\text{H}_{12}\text{O}_6$ (sugar) and oxygen

ii. Cellular respiration (/2)

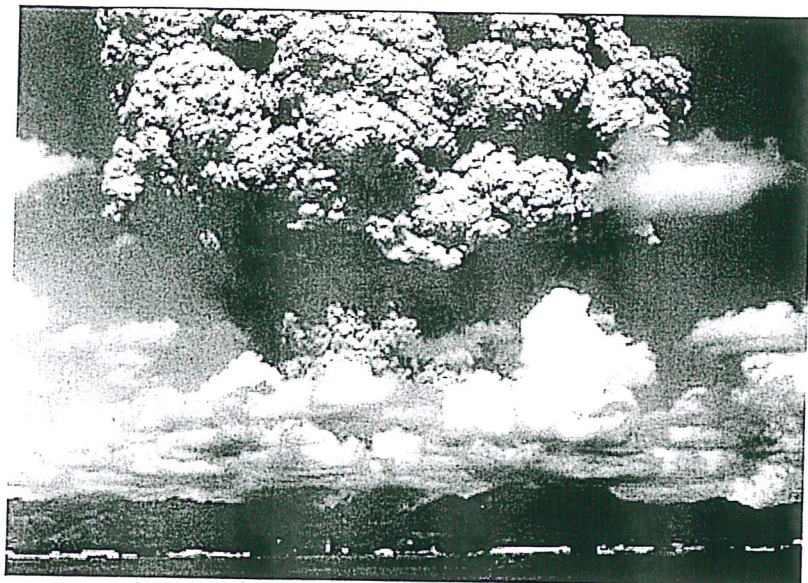
Cells use $\text{C}_6\text{H}_{12}\text{O}_6$ (sugars) and oxygen to make

ATP (energy), CO_2 and H_2O

b. Write the word equations for each of the reactions to illustrate why they are complementary processes. (/4)

The inputs of one are the outputs of the other!

$\text{CO}_2 + \text{H}_2\text{O}$ $\xrightarrow{\text{photosynthesis}}$ $\text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$



Eruption of Mount Pinatubo in 1991. Image courtesy of USGS.

a. Identify how this natural event affects three of the four spheres (/3).

Atmosphere

- ash and CO_2 would spread through the atmosphere (wind!)

Hydrosphere

- ash & CO_2 would dissolve in rain clouds and fall into the watersheds & water cycle

Lithosphere

- Lava would change the soils (pH) around the mountain

b. Describe three sphere-sphere interactions. (/3)

(i) The smoke (CO_2) would mix with water in clouds, form an acid, precipitate on land, and create acidic soils, (Atmosphere $\rightarrow$ Hydro $\rightarrow$ Litho)

(ii) The lava would disturb the biosphere around the mountain, burning the plants/trees would increase the CO_2 in the atmosphere (Litho $\rightarrow$ Bio $\rightarrow$ Atmosphere)

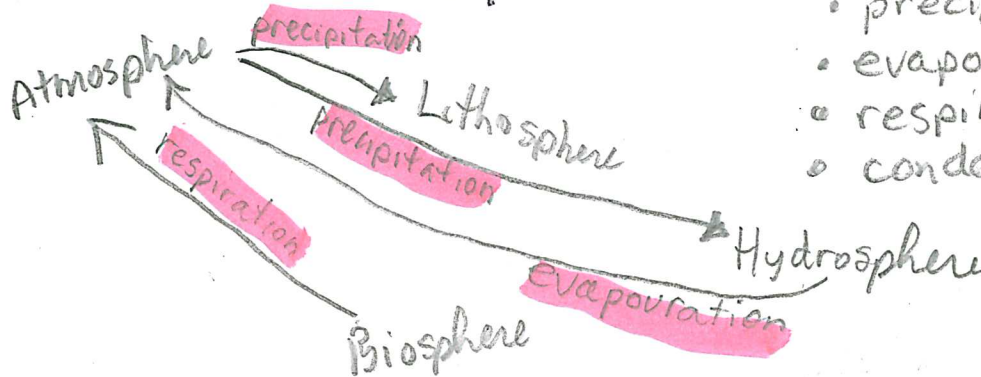
(iii) The CO_2 and smoke in the atmosphere would block plants from getting sun for photosynthesis (Atmosphere $\rightarrow$ Bio)

Part B. Matching (10 marks)

On the line to the left of each phrase in Column I, write the letter for the word in Column II that best matches that phrase. Each word in Column II may be used once or not at all.

Column I	Column II
<u>K</u> the existence of a wide variety of species	a. <u>carrying capacity</u>
<u>J</u> non-living factors present in an ecosystem	b. <u>atmosphere</u>
<u>E</u> the study of the atmosphere and how it determines Earth's weather	c. <u>biosphere</u>
<u>H</u> living parts of the ecosystems	d. <u>limiting factor</u>
<u>A</u> largest population of a species an environment can support	e. <u>meteorology</u>
<u>D</u> prevents a population from exceeding its carrying capacity	f. <u>population</u>
<u>F</u> all species members living in an area at a particular time	g. <u>oceanography</u>
<u>B</u> body of air which surrounds our planet	h. <u>biotic</u>
<u>G</u> the study of Earth's oceans	i. <u>aquatic ecosystem</u>
<u>C</u> composed of all living organisms	j. <u>abiotic</u>
	k. <u>biodiversity</u>
	l. <u>terrestrial ecosystem</u>

Describe how water interacts between all of the spheres:



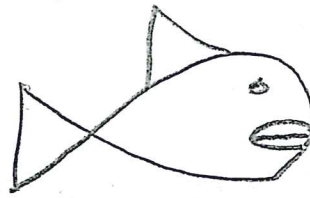
use words:

- precipitation
- evaporation
- respiration
- condensation

Part D. Application

1. Suggest two ways overcrowding might lead to a reduction in population size.
2. After a forest fire, why are the original organisms not able to re-establish themselves right away, but instead the wildflower populations flourish?
3. The manager of a provincial park decides to ban deer hunting for five years. After three years, nearby farmers report crop damage by deer foraging for food. Explain why the hunting ban may be responsible for this.

- ① (a) Food resources will run out.
(b) Predator populations will increase
- ② Wildflowers must be better adapted to the new conditions, through ecological succession the biodiversity will return gradually
- ③ Deer from the park have had to expand into areas outside of the park for food because of their numbers increasing



1. What is the difference between the 4 biotic interactions? (use examples)

Predation : Predator kills and eats prey

Parasitism : One organism benefits at the expense of another

Mutualism : Both organisms benefit

Competition : Organisms fight over common resources

2. Describe the difference in niches for:

(a) squirrels vs. chipmunks : where they live
↓ trees ↓ holes (burrows)

(b) fox vs. coyote : where they live
↓ forest ↓ grassland
biome biome

(c) raccoon vs. deer : what they eat
↓ omnivore ↓ apples, trees, grass
bugs, fruits, frogs

(d) geese vs. robin : what they eat
↓ algae, grass, small bugs ↓ worms

(e) spider vs. dragon fly : how they behave
↓ webs to catch food ↓ fly around to hunt

(f) frogs vs. small mouth bass : how they behave
↓ amphibious ↓ water only
land & water

3. What is the difference between a habitat and a niche?

Habitat

↓
environment
conditions where something lives

Niche

↓
the unique role
an organism
plays in
habitat

4. Name the biomes of Canada:

i. Boreal forest iv. freshwater aquatic

ii. Tundra v. ocean aquatic

iii. Temperate
Deciduous Forest

5. What is a unique factor in each biome above and how does this affect the species that live there?

i. Acidic Soils: plants that can grow in low pH soils thrive

ii. Low Temperatures: plant life is limited by short growing seasons

iii. Moist Summers & cool winters: broadleaf trees shed their leaves during one season

iv. Low Salinity → plants/animals must be adapted to salt free freshwater

v. High Salinity → plants & fish must be adapted to salt H₂O

6. Describe how a population is affected when its carrying capacity is exceeded?

the population will compete for resources and decrease via starvation.

7. What happens to the biodiversity of plants when a tornado rips apart a forest?

The biodiversity would go down, only certain species would survive the disturbance and rest would take time to return (ecological succession)

8. What is an example of a human disturbance on an ecosystem?

Landfill, chemical spill, clear cut deforestation, hydrodams, urbanization, overfarming etc.,...

9. What occurs in an ecosystem after it experiences a disturbance?

it is restored slowly - ecological succession

10. What are the signs of toxicity?

- | | | |
|-------------------|-----------------|-----------------|
| i. loss of energy | iv) acne | vii) mental fog |
| ii. memory loss | v) allergies | |
| iii. depression | vi) vision loss | |

11. Name a probable cause of each cellular malfunction:

Itchy skin → antibacterial soap overuse

Weak bones → too much fluoride in body

Chronic Whooping cough → Asbestos / Air Fresheners

Cracked toe nails → nail polish

Muscle spasms → carbon monoxide poisoning

Hair loss → stress, air pollution

12. Which sphere has the greatest impact on the growth of an individual? (animals)
- the biosphere provides energy for most individuals
 - the atmosphere provides energy for plants which are at the base of the food chain = ^{SUN} most impact!

13. Describe the role of each sphere during photosynthesis:
- atmosphere - provides sun & CO_2
 - hydrosphere - provides the H_2O
 - lithosphere - provides nutrients
 - biosphere - bacteria break down dead things to release nutrients
- * not learned yet
14. Describe the role of each sphere during cellular respiration

- atmosphere - provides O_2
 - hydrosphere - } provides nutrients for plants
 - lithosphere - } who will act as the source of $\text{C}_6\text{H}_{12}\text{O}_6$
 - biosphere - provides the source of sugar ($\text{C}_6\text{H}_{12}\text{O}_6$)
15. Which two Human Electricity sources release greenhouse gases?

- coal
 - natural gas
- } fossil fuels

16. What does renewable energy mean?

Renewable sources in theory would never run out.

✱ wind, tidal, hydro, geothermal, solar

Nonrenewable resources have a fixed amount on earth, they will run out: fossil fuel
nuclear

17. What are the two main forces that drive the water cycle?

gravity & solar evaporation

18. Why are melting glaciers a concern for all ecosystems?

- they are our life savings of fresh water, once they melt, the water is destined for the oceans which will make it salty (we need this)

19. Give an example of a watershed:

All ^{local} rivers flow into the Nation River, that flows into the Ottawa River, which flows into the St. Lawrence and into the Atlantic Ocean

20. Why does thawing permafrost create concerns for humans?

- landslides, unstable land
- sink holes
- an increase of CO_2 into atmosphere

21. What is a benefit of thawing permafrost?

- Active layer thickens, biodiversity of plants will increase.

22. What are the flow factors of a watershed?

- geology (rocks, sand, mud etc.)
- topology (hills, flatland etc.)
- vegetation (trees, grass, shrubs)
- urbanization
- deforestation

How diet is related to
Cellular Respiration?

What is a microbiome
and how does it relate
to an individual's
overall fitness (wellness)?
