

تم تحميل هذا الملف من موقع المناهج الإماراتية



الملف ملخص الوحدة الأولى ecosystems in energy anf Matter مع تدريبات متنوعة

موقع المناهج ← المناهج الإماراتية ← الصف السابع ← علوم ← الفصل الأول

روابط مواقع التواصل الاجتماعي بحسب الصف السابع



روابط مواد الصف السابع على تلغرام

[الرياضيات](#)

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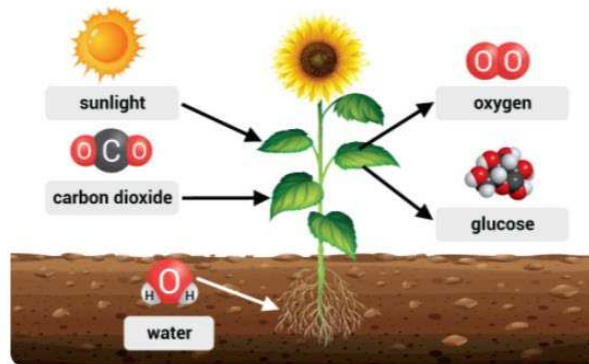
المزيد من الملفات بحسب الصف السابع والمادة علوم في الفصل الأول

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# Matter and Energy in Ecosystems

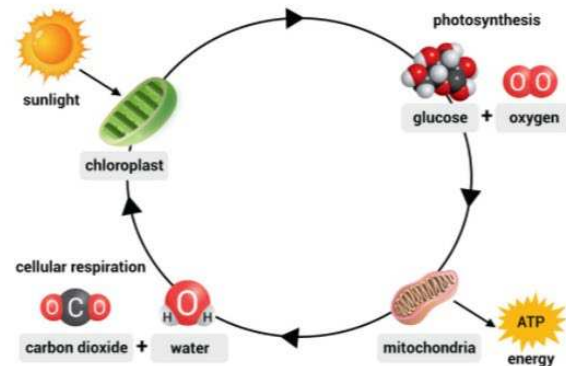
## Photosynthesis and Cellular Respiration

### Photosynthesis



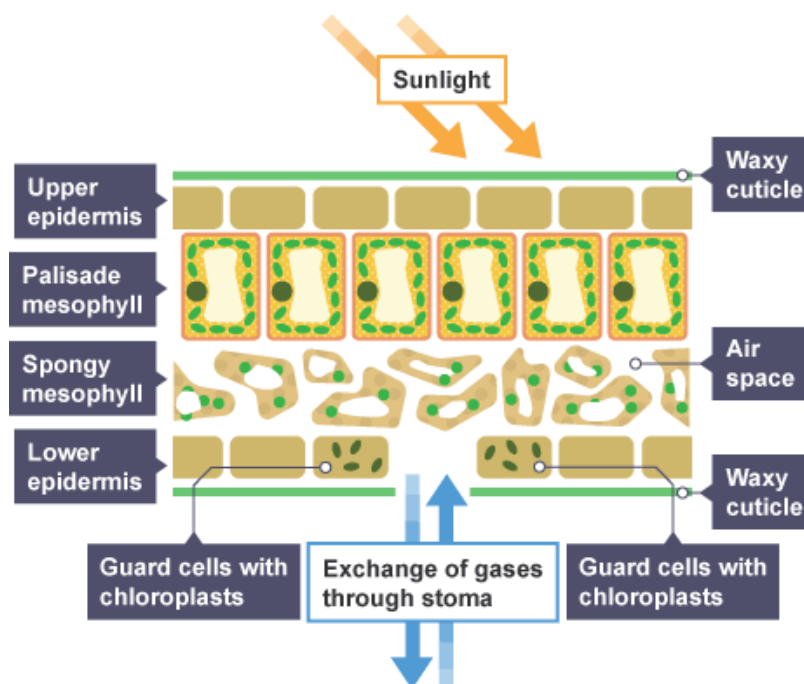
- occurs in plant cells
- requires sunlight
- happens in **chloroplasts**
- reactants: carbon dioxide and water
- products: glucose and oxygen

### Cellular Respiration



- occurs in plant and animal cells
- does not require sunlight
- happens in the cytoplasm and mitochondria
- reactants: glucose and oxygen
- products: carbon dioxide and water

### Leaves have many types of cells



**Epidermal cells**

are flat and irregularly shaped(Protection)

**stomata**

The bottom epidermal layer of most leaves has small openings

- Carbon dioxide, water vapor, and oxygen pass through stomata.
- Epidermal cells can produce a waxy covering called the **cuticle**.

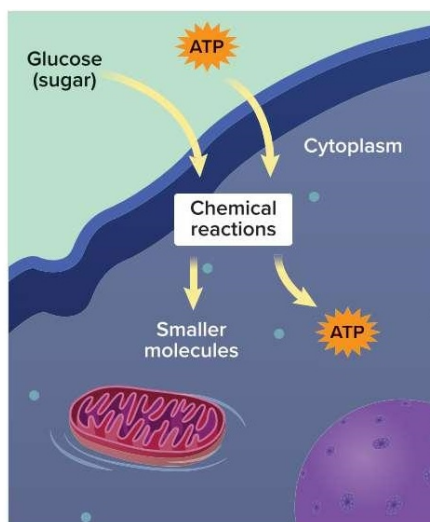
**mesophyll**

cells inside a leaf.

- Mesophyll cells contain chloroplasts, which are the organelles where photosynthesis occurs.

palisade mesophyll cells	Spongy mesophyll cells
Are near the top surface of the leaf. They are <b>packed close together</b> . This arrangement exposes the most cells to light	Are below the palisade mesophyll cells. They have <b>open spaces</b> between them. Gases needed for photosynthesis flow through the spaces between the spongy mesophyll cells

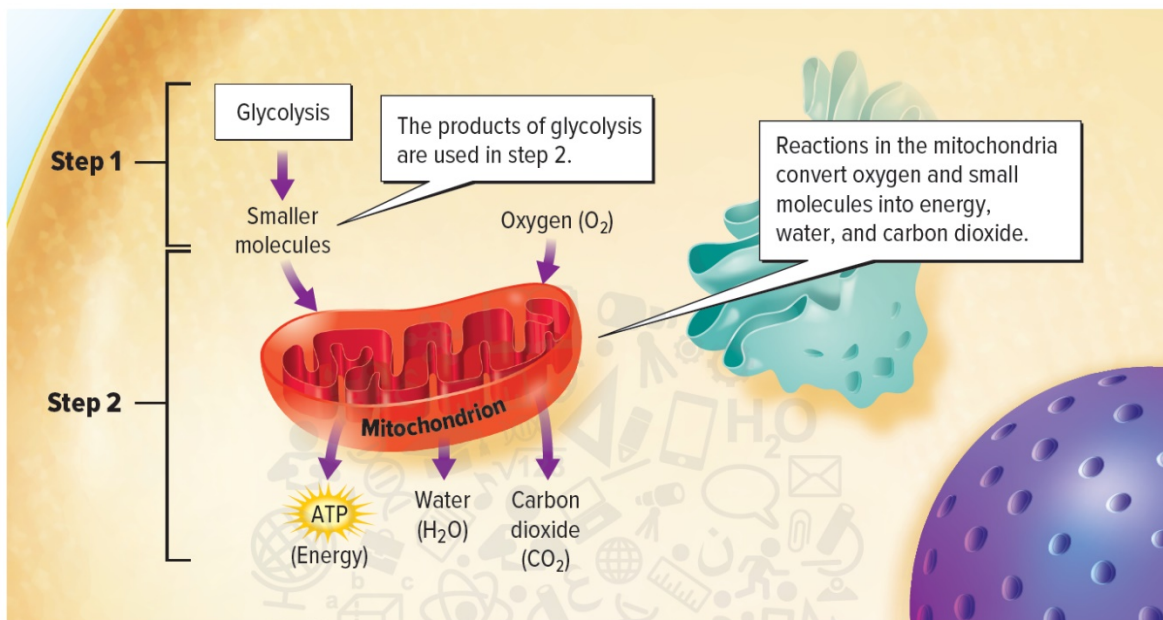
The first step of cellular respiration is **Glycolysis**



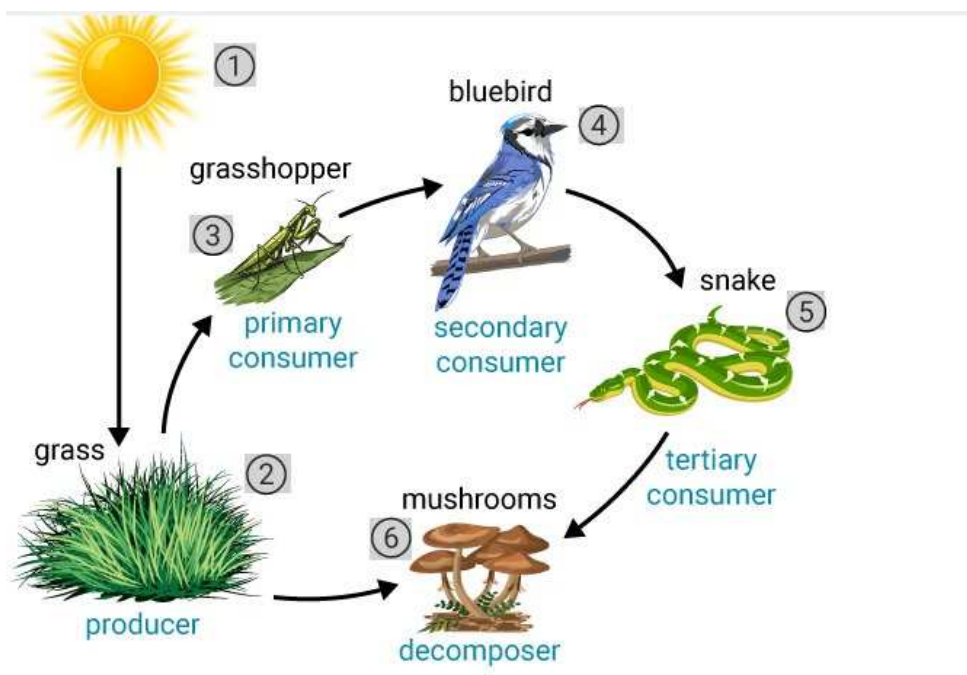
**Glycolysis**

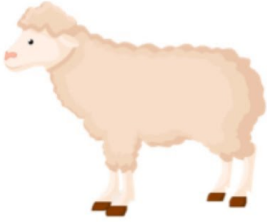


is a process by which glucose, a sugar, is broken down into smaller molecules.

The Second steps of cellular respiration



Lesson 2: Flow of Energy



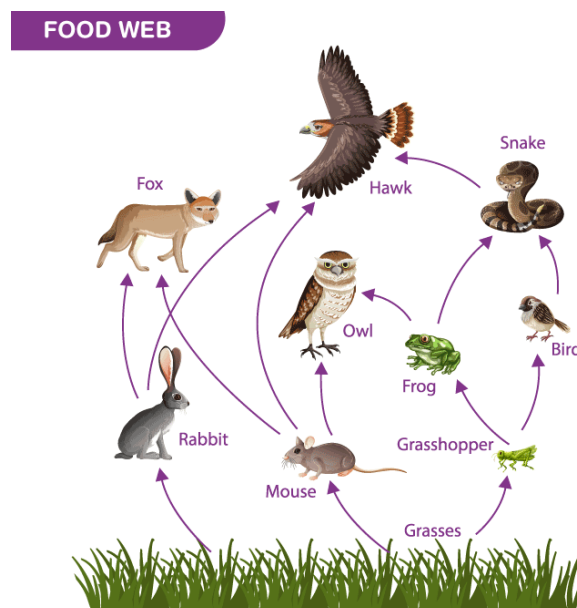
Herbivore	Carnivore	Omnivore
<p>Animals that eat <b>plants</b>.</p> 	<p>Animals that eat <b>meat</b>.</p> 	<p>Animals that eat both <b>plants</b> and <b>meat</b>.</p> 

### Detritivores (decomposers)

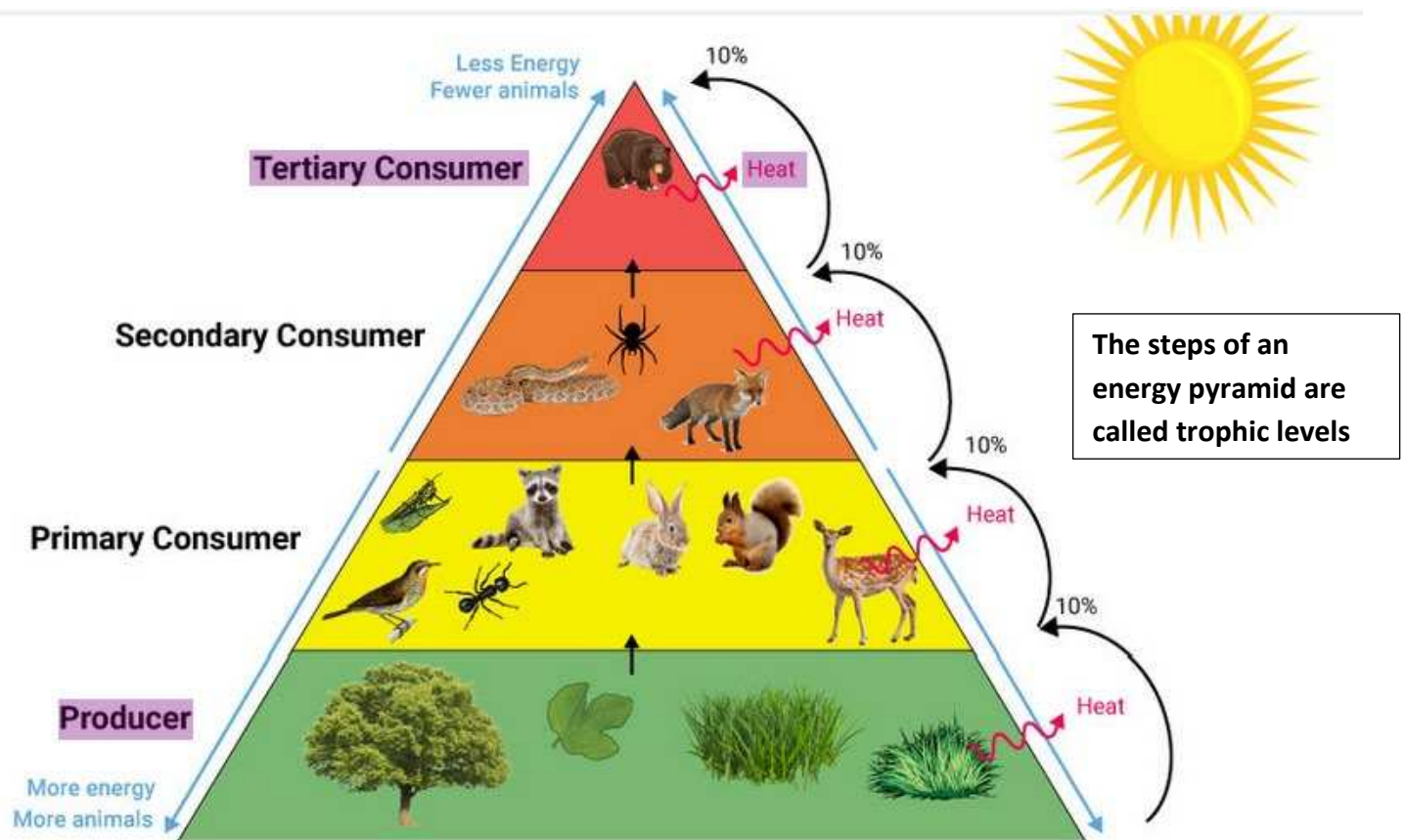
*get their energy by eating dead organisms and help break them down.*

- Detritivores, such as bacteria and mushrooms
- They produce carbon dioxide that enters the air.
- Detritivores help recycle nutrients through ecosystems.
- They also keep dead organisms from piling up in the environment.

*A **food web** is a model of energy transfer that shows how food chains in a community are interconnected*



**energy pyramid** is a model to show the amount of energy available in each step of a food chain

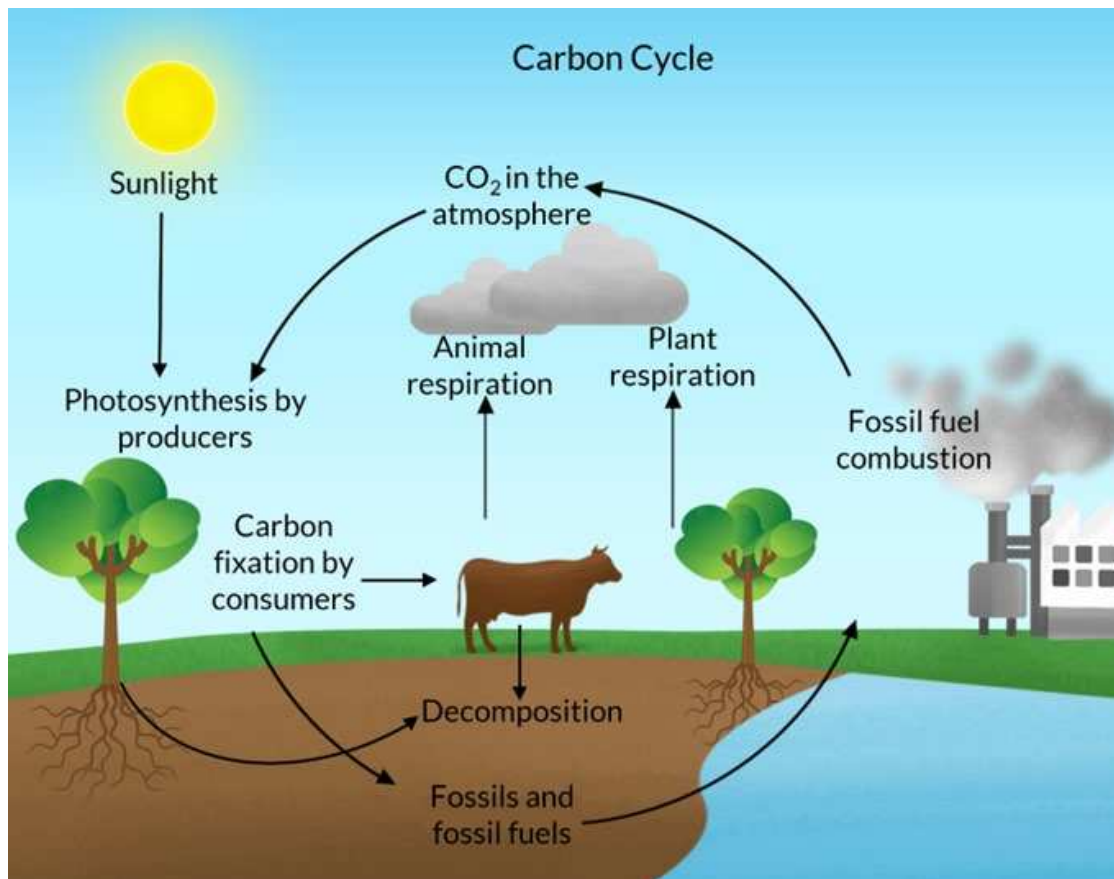


Only about 10 percent of the energy available at one trophic level transfers on to the next trophic level



## Lesson 3: Cycling of Matter

### 1. Carbon cycle



#### Decomposition

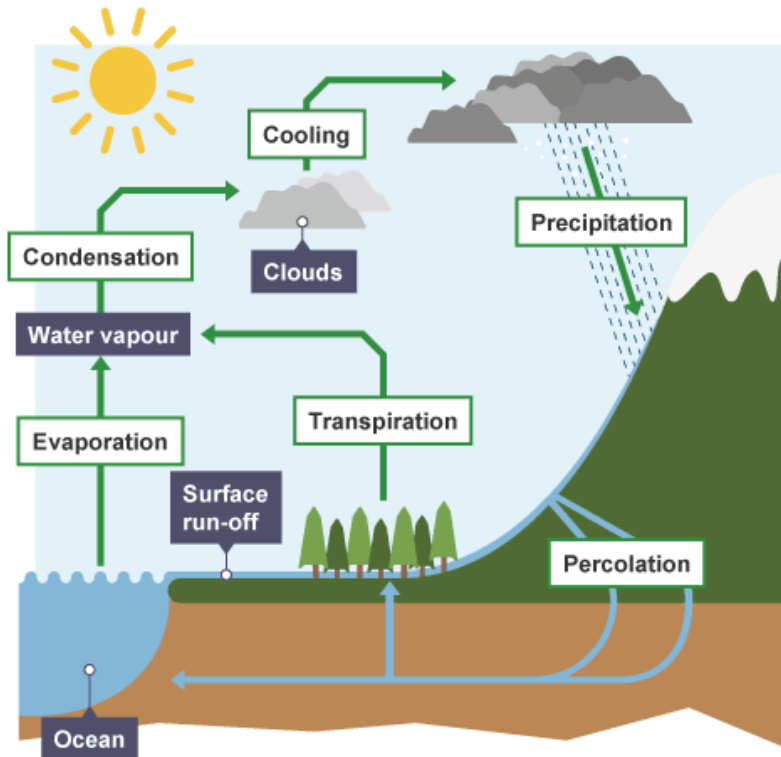
is the breaking down of dead plants and animals.

- This process returns carbon compounds to the soil and releases carbon dioxide (CO<sub>2</sub>) into the atmosphere

#### examples of carbon reservoirs

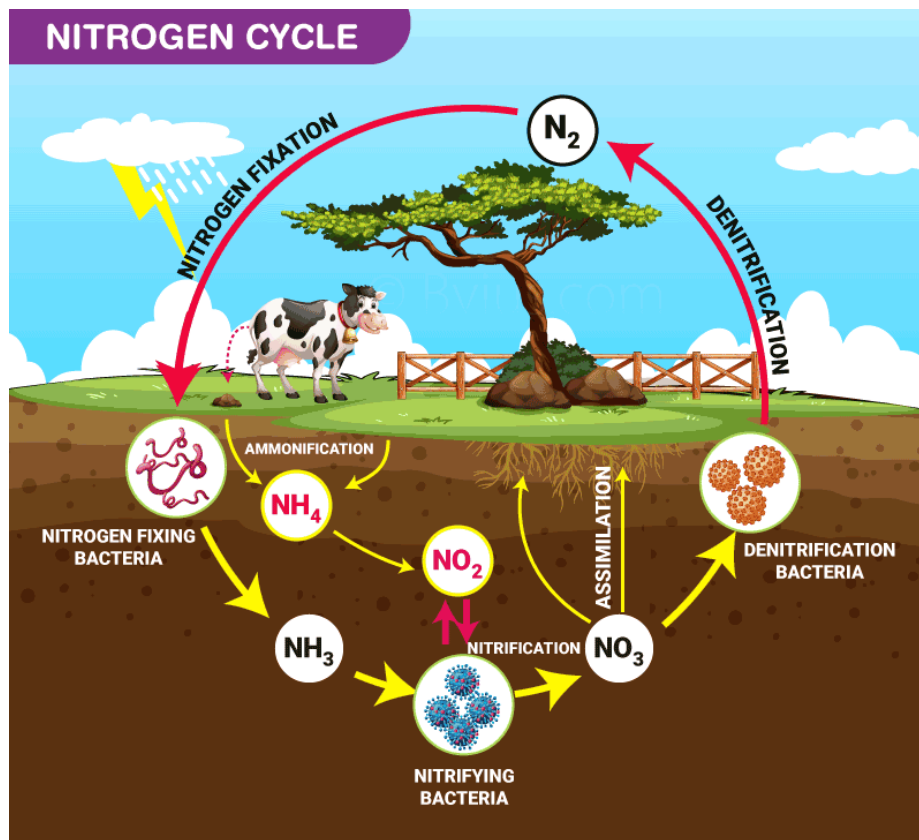
- oceans
- rocks
- plants
- fossil fuels

2. WATER CYCLE

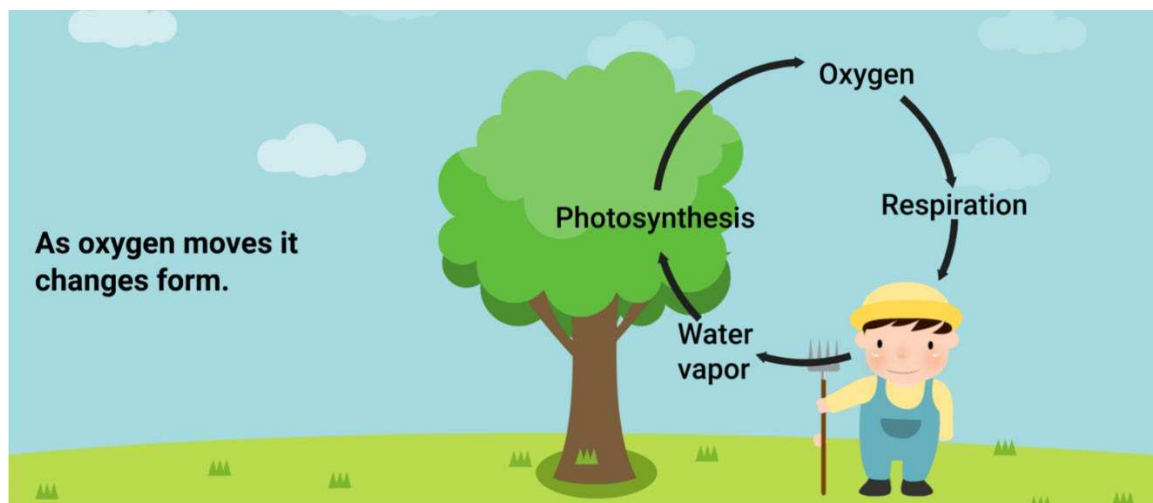




3. NITROGEN CYCLE



4. OXYGEN CYCLE



Matter and Energy in Ecosystems	
Term	Definition
photosynthesis	a series of chemical reactions that convert light energy, water, and carbon dioxide into the food-energy molecule glucose and give off oxygen.
ecosystem	all the living things and nonliving things in a given area.
cellular respiration	a series of chemical reactions that convert the energy in food

	molecules into a usable form of energy called ATP.
glycolysis	a process by which glucose, a sugar, is broken down into smaller molecules.
producer	an organism that uses an outside energy source, such as the Sun, and produces its own food.
consumer	an organism that cannot make its own food and gets energy by eating other organisms.
detritivore	an organism that consumes the bodies of dead organisms and wastes produced by living organisms.
food chain	a model that shows how energy flows in an ecosystem through feeding relationships.
food web	a model of energy transfer that can show how the food chains in a community are interconnected.
energy pyramid	a model that shows the amount of energy available in each link of a food chain.
evaporation	the process of a liquid changing to a gas at the surface of the liquid.
condensation	the process by which a gas changes to a liquid.
precipitation	water, in liquid or solid form, that falls from the atmosphere.
nitrogen fixation	the process that changes atmospheric nitrogen into nitrogen compounds that are usable by living things.

## Questions

### 1. Multiple-choice

Q. Which of the following *removes* carbon from the atmosphere?

- A. Decomposition of organic matter
- B. Aerobic cellular respiration
- C. Photosynthesis by autotrophs
- D. Burning a piece of wood

### 2. Multiple-choice



Q. If the cat population was caught by animal control, which species would decrease as a result?

- A. Lettuce
- B. Greenfly

- C. Ladybird
- D. Thrush

### 3. Multiple-choice

Q. What is the source of all energy for this ecosystem?

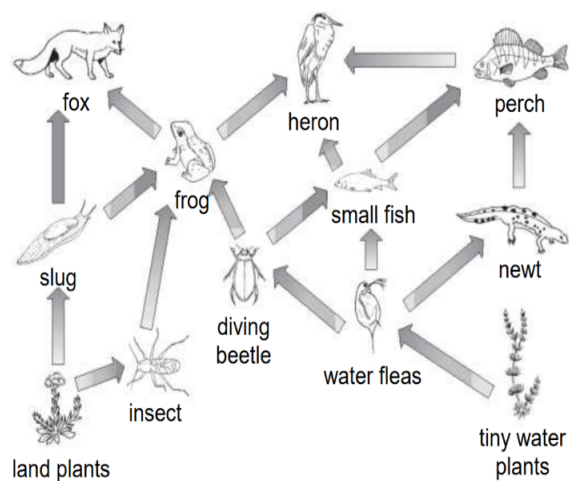
- A. Glucose
- B. ATP
- C. ADP
- D. Sunlight

### 4. Multiple-choice

Q. Most producers get energy from the Sun using the process of

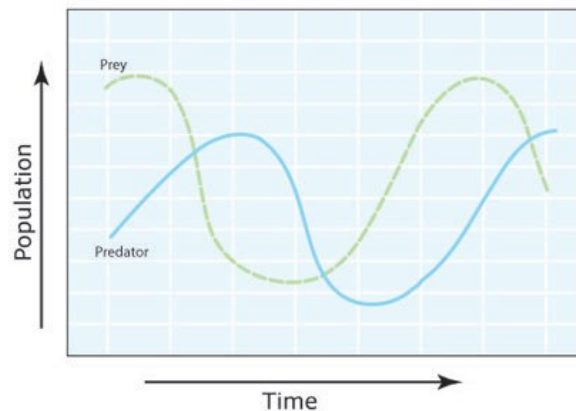
- A. cellular respiration
- B. chemosynthesis
- C. photosynthesis
- D. consumption

### 5. Multiple-choice



Q. Which organism has the largest available energy in this ecosystem?

- A. Frog
- B. Perch
- C. Land Plants
- D. Thrush

**6. Multiple-choice**

**Q. Which of the following is true about predator/prey relationships?**

- A. As predators increase, prey decrease
- B. As prey increase, predators decrease
- C. predator population levels are solely reliant on prey populations
- D. Prey population levels are solely reliant on predator populations

**7. Multiple-choice**

**Q. Decomposers are important to ecosystems because they**

- A. return vital nutrients to the ecosystem
- B. capture energy from the Sun
- C. are producers
- D. can be omnivores

**8. Multiple-choice**

**Q. A consumer gets energy by**

- A. absorbing sunlight.
- B. breaking down dead organisms.
- C. soaking it up from the ground.
- D. feeding on other organisms.

**9. Multiple-choice**

**Q. The cycling of matter is important because**

- A. Matter can be created and destroyed
- B. Only a limited amount of matter is available so it has to be recycled
- C. Matter can only be found in a solution
- D. Bacteria use matter to convert organisms into solar energy

**10. Multiple-choice**

**Q. What gas do plants release as by-product of photosynthesis?**

- A. nitrogen
- B. oxygen
- C. water
- D. carbon dioxide

**11. Multiple-choice**

**How does energy move from the environment into the community (living things)?**

- A. Producers trap it in sugar using photosynthesis
- B. Producers trap it in sugar using respiration
- C. Consumers trap it in sugar using photosynthesis
- D. Producers trap it in sugar using respiration

**12. Multiple-choice**

**Q. The component that is NOT used in photosynthesis is:**

- A. carbon dioxide
- B. glucose
- C. water
- D. sunlight

**13. Multiple-choice**

**Q. Energy cannot be created or destroyed but it can transfer to other locations**

- A. Law of Conservation of Mass
- B. Law of Conservation of Energy
- C. evaporation
- D. condensation

#### 14. Multiple-choice

Q. Where does most of the matter in a producer come from?

- A. the sun and the air
- B. the air and the water
- C. the water and the soil
- D. the air and the soil

#### 15. Multiple-choice

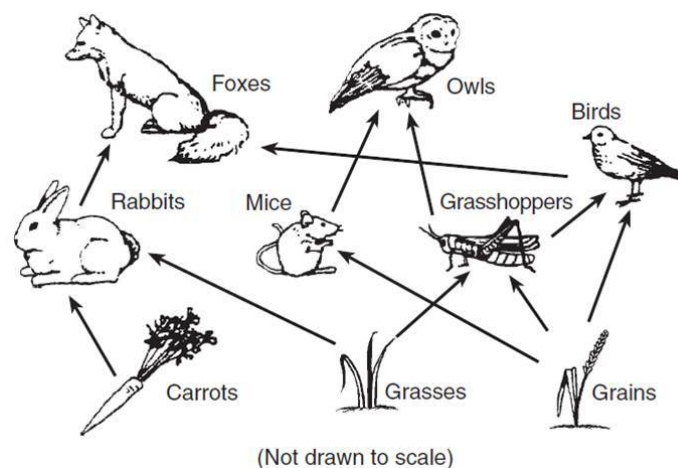
Q. Eventually, all the matter currently in sugar in a plant will...

- A. end up in the environment as heat.
- B. return to carbon dioxide and water.
- C. return to sugar and oxygen.
- D. be used up and evaporate.
- E. be destroyed by a decomposer.

#### 16. Multiple-choice

Q. What do decomposers do to matter in dead organisms and waste?

- A. Convert it to energy
- B. Destroy it
- C. Turn it into sugar
- D. Break it down to raw materials





**17. Multiple-choice**

**Q. What is the owl in this food web?**

- A. Producer
- B. Primary Consumer
- C. Secondary Consumer
- D. Tertiary Consumer

**18. Multiple-choice**

**Q. What is the fox in this food web?**

- A. Producer
- B. Primary Consumer
- C. Secondary Consumer
- D. Tertiary Consumer

**19. Multiple-choice**

**Q. What is this called?**

- A. Food Web
- B. Food Chain

**20. Multiple-choice**

**Q. Who is an omnivore in this food web?**

- A. Fox
- B. Rabbit
- C. Bird
- D. Mouse

**21. Multiple-choice**

**Q. Who is a carnivore in this food web?**

- A. Fox
- B. Rabbit
- C. Bird
- D. Mouse

**22. Multiple-choice**

Q. If grains decrease, so will birds.

True

False

**23. Multiple-choice**

Q. If owls decrease, so will mice.

True

False

**24. Multiple-choice**

Q. Which choice has a group of only consumers?

- A. grass, cows, birds
- B. tigers, turtles, seaweed
- C. owl, snake, bear
- D. castus, sun, mushroom

**25. Multiple-choice**

Q. Which choice has a group of only producers?

- A. red wolf, coyote, grey wolf
- B. sunflower, grass, pine tree
- C. mushrooms and worms
- D. seaweed, algae, mushrooms

**26. Multiple-choice**

Q. What do the arrows represent in a food chain?

- A. Stop
- B. Start
- C. "Gives energy to"

**27. Multiple-choice**

Q. Primary consumers are \_\_\_\_\_.

- A. autotrophs
- B. herbivores
- C. carnivores
- D. top carnivores

**28. Multiple-choice**

Q. How much energy is lost as heat and waste?

- A. 10%
- B. 50%
- C. 90%
- D. Energy cannot be lost.

**29. Multiple-choice**

Q. A pyramid of ENERGY always decreases in size as you move up t

True

False

**30. Multiple-choice**

Carbon Dioxide    Water

Glucose (Energy)    Oxygen

Q. This equation represents the process of \_\_\_\_\_.

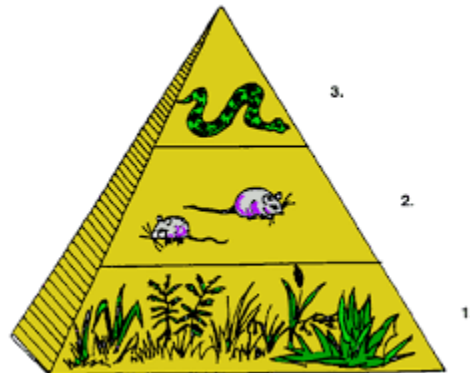
- A. photosynthesis
- B. cellular respiration

- C. ecological succession
- D. glycolysis

**31. Multiple-choice**

Q. In the energy pyramid here, which organisms have the most energy available?

- A. Producers
- B. Carnivores
- C. Herbivores
- D. Top Predator

**32. Multiple-choice**

Q. If there is 1000 Kcal available in the producers in trophic level 1, how much energy is available in the herbivores in trophic level 2?

- A. 10 Kcal
- B. 1 Kcal
- C. 100 Kcal
- D. 1000 Kcal

**33. Multiple-choice**

Q. Which organism receives the least amount of energy from the producer?

- A. Owl
- B. Grasshopper
- C. Lilypad
- D. Mouse

**34. Multiple-choice**

Q. What is the green pigment that "traps" sunlight?

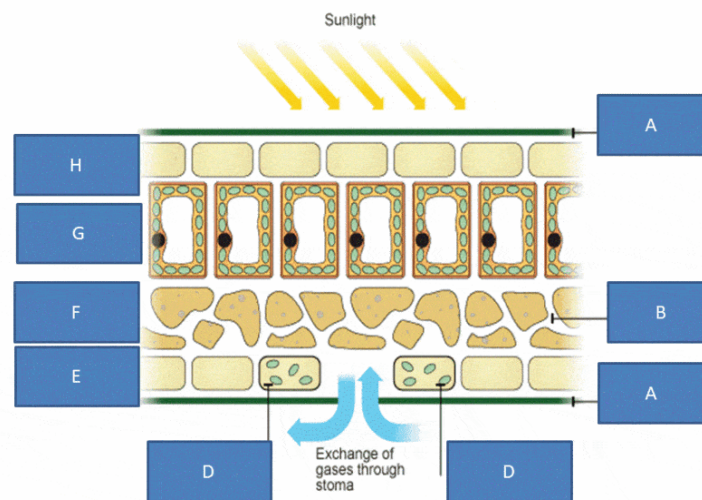
- A. Chlorophyll
- B. Chloroplasts
- C. Photosynthesis
- D. ATP

**35. Multiple-choice**

Q. What major energy transformation occurs during photosynthesis?

- A. Thermal --> Chemical
- B. Kinetic --> Radiant
- C. Chemical --> Radiant
- D. Radiant --> Chemical

## 36. Multiple-choice



Q. What is the name of the clear layer of cells (H) on top of the leaf?

- A. Cuticle
- B. Air space
- C. Guard cell
- D. Upper epidermis

## 37. Multiple-choice

Q. The leaf has a shiny, waxy cuticle around it to

- A. increase the rate of photosynthesis
- B. attract more light
- C. control water loss
- D. stop carbon dioxide and oxygen gases escaping

## 38. Multiple-choice

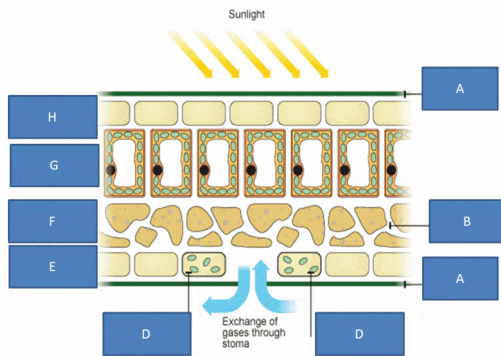
Q. The role of the guard cell is to

- A. help control the temperature of the plant
- B. control how much water enters the leaf



- C. control how much glucose is stored
- D. control the movement of water vapour & gases

### 39. Multiple-choice



Q. What is the name of the elongated, packed cells (part G) directly under the upper epidermis?

- A. Palisade cells
- B. Guard cell
- C. Spongy layer
- D. Lower epidermis

### 40. Multiple-choice

Q. which is **not** an example of carbon reservoir?

- A. sun
- B. rocks
- C. plants
- D. fossil fuels

### 41. Multiple-choice

Q. All organisms contain carbon.

True

False

**42. Multiple-choice**

Q. \_\_\_\_\_ is the process during which liquid water changes into a gas called water vapor.

Condensation

Evaporation

Precipitation

**43. Multiple-choice**

Q. \_\_\_\_\_ is the process during which water vapor changes into liquid water.

- A. Condensation
- B. Evaporation
- C. Precipitation

**44. Multiple-choice**

Q. Water that falls from clouds to Earth's surface is called \_\_\_\_\_.

- A. condensation
- B. evaporation
- C. precipitation

**45. Multiple-choice**

Q. Nitrogen does not exist in proteins.

- A. True
- B. False

**46. Multiple-choice**

Q. Which ones are examples of how nitrogen cycles through an environment?

- A. Decaying matter and animal waste to bacteria in soil converting nitrogen compounds into nitrogen gas

- B. Lightning changes nitrogen gas in the atmosphere to nitrogen compounds. The nitrogen compounds fall when it rains to nitrogen compounds in the soil.
- C. Cow waste to decaying organic matter and animal waste

**47. Multiple-choice**

Q. Animals and plants can take in and use the nitrogen that is in the atmosphere.

- A. True
- B. False

**48. Fill-in-the-Blank**

Q. The process that changes atmospheric nitrogen into nitrogen compounds that are usable by living things is called....

- A. nitrogen fixation
- B. alternatives
- C. Nitrogen Fixation
- D. Nitrogen fixation

**49. Multiple-choice**

Q. Decomposition releases \_\_\_\_\_ into the soil

- A. hydrogen
- B. oxygen
- C. nitrogen
- D. helium

**50. Multiple-choice**

Which of the following is NOT a "cycle"?

- A. Water
- B. Energy
- C. Nitrogen
- D. Carbon

**51. Multiple-choice**

Plants rely heavily on \_\_\_\_ in the nitrogen cycle to incorporate nitrogen into organic compounds

- A. bacteria
- B. viruses
- C. fungi
- D. oxygen

**52. Multiple-choice**

**Q. How do animals obtain nitrogen stored in plants?**

- A. Denitrifying bacteria
- B. Nitrogen fixing bacteria
- C. Directly from the atmosphere
- D. They eat the plants

**53. Multiple-choice**

**Q. The following are part of the carbon cycle EXCEPT \_\_\_\_\_.**

- A. cellular respiration
- B. precipitation
- C. decomposition
- D. photosynthesis