

مراجعة عامة وفق الهيكل الوزاري منهج انسابير



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ← المناهج الإماراتية ← الصف التاسع العام ← علوم ← الفصل الثالث ← ملفات متنوعة ← الملف

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ملفات اكتب للمعلم اكتب للطالب الاختبارات الكترونية الاختبارات ا حلول ا عروض بوربوينت ا أوراق عمل
منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي للمدرس

المزيد من مادة
علوم:

إعداد: عدي العاصي

التواصل الاجتماعي بحسب الصف التاسع العام



صفحة المناهج
الإماراتية على
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

المزيد من الملفات بحسب الصف التاسع العام والمادة علوم في الفصل الثالث

تجميعه صفحات الكتاب وفق الهيكل الوزاري منهج بريدج مع أسئلة امتحانات سابقة

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الهيكل الوزاري الجديد 2025 منهج بريدج

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دليل تصحيح أسئلة الامتحان النهائي الورقي منهج بريدج

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حل مراجعة تجميعه أسئلة وفق الهيكل الوزاري منهج انسابير

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هيكل 9 عام علوم انسيير

Science inspire 9 General

2025

2024

اعداد الأستاذ عدي العاصي

الفصل الثالث 2024-2025



Multiple Choice Questions

1	Describe what a sound wave is and how it moves through solids, liquids, or gases.	Get it	254	1
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Sound: is a form of energy that travels through matter.

Sound in Different Mediums

- Sound can travel through:
 - **Solids**
 - **Liquids**
 - **Gases**
- The material through which sound travels is called the **medium**.
- Example: Sound travels through water (underwater voices) and solids (like a desk)

The Speed of Sound

What Affects the Speed of Sound?

The speed of sound depends on:

- The **type of medium** (solid, liquid, or gas)
- The **composition** of the medium
- **Temperature**
- **Density**
- **Elasticity**

Medium	Speed of Sound (m/s)
Air (0°C)	330
Air (20°C)	340
Cork	500
Water (0°C)	1,400
Water (20°C)	1,500
Copper	3,600
Bone	4,000

1. Temperature and Sound Speed

- Higher temperature = **faster sound**.
- When temperature increases, particles:
 - Move faster.
 - Collide more often.
 - Transfer energy more quickly.

2. Density and Sound Speed

- **Sound travels faster in solids**, slower in liquids, and slowest in **gases**.
- This is because:
 - In **solids**, particles are **closer together**.
 - In **gases**, particles are **farther apart**.
- Think of it like walking between houses:
 - **Close together** = faster.
 - **Far apart** = slower.

3. Elasticity and Sound Speed

- **Elasticity** = how well a material returns to its original shape after being deformed.
- **More elastic = faster sound**.
 - **Rubber ball** = elastic → rebounds quickly.
 - **Clay** = less elastic → rebounds slowly.
- **Solids** are generally more elastic than liquids, and **liquids** are more elastic than gases.
- So, sound usually travels:
 - **Fastest in solids**
 - **Slower in liquids**
 - **Slowest in gases**

Examples to Remember

- **Sound travels slower in cork than in water:** Cork has many air pockets, making particles farther apart.
- **Two reasons why sound travels faster in solids than gases:**
 1. Particles are closer together in solids.
 2. Solids are more elastic than gases.



Get It?

Identify two reasons why sounds usually travel faster through solids than through gases.

Answer :

1. Particles are closer together in solids.
2. Solids are more elastic than gases.

Table 1 Speed of Sound in Different Mediums

Medium	Speed of Sound m/s
Air (0°C)	330
Air (20°C)	340
Cork	500
Water (0°C)	1400
Water (20°C)	1500
Copper	3600
Bone	4000
Steel	5800

Q1: A sound wave travelled a distance of 2000 m in a 4.0 s through a certain medium. Using Table 1, determine that medium?

Solution:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Speed} = \frac{2000}{4.0}$$

$$\text{Speed} = 500 \text{ m/s}$$

Medium is Cork.

Question

6

A sound wave takes about 0.02 s to move through a material that is 30.0 m long. Using the data in the table below circle the right box to identify the material.

Speed of Sound in Different Materials

Material (at 20°C)	Speed (m/s)
Air	340
Cork	500
Steel	5800
Water	1500

A

Air

C

Steel

B

Cork

D

Water

Practice questions :

1. What causes a sound wave to form?

- A) Light reflection
- B) Electrical discharge
- C) Energy transfer through vibrating matter
- D) Magnetic attraction

4. What are the two regions in a longitudinal wave?

- A) High and low tides
- B) Crests and troughs
- C) Compression and rarefaction
- D) Peaks and valleys

7. Which of the following can sound **NOT** travel through?

- A) Water
- B) Air
- C) Wood
- D) Outer space

2. What type of wave is a sound wave?

- A) Transverse
- B) Longitudinal
- C) Electromagnetic
- D) Circular

5. What is the medium in which sound travels?

- A) Light
- B) Matter
- C) Vacuum
- D) Electricity

9. Sounds are produced by __.

Pitch

Vibrations

frequencies

reverberations

A**B**

A	Sound travels faster between houses in Fig B
B	Sound speed between houses is the same in both figures A and B
C	Sound travels faster between houses in Fig A
D	We can not determine

12. What happens to air particles when a sound wave passes through?

- A) They stay still
- B) They melt
- C) They vibrate and collide with each other
- D) They form a solid

13. Through which states of matter can sound travel?

- A) Only solids
- B) Solids and gases only
- C) Solids, liquids, and gases
- D) Only liquids

14. What factors affect the speed of sound in a medium?

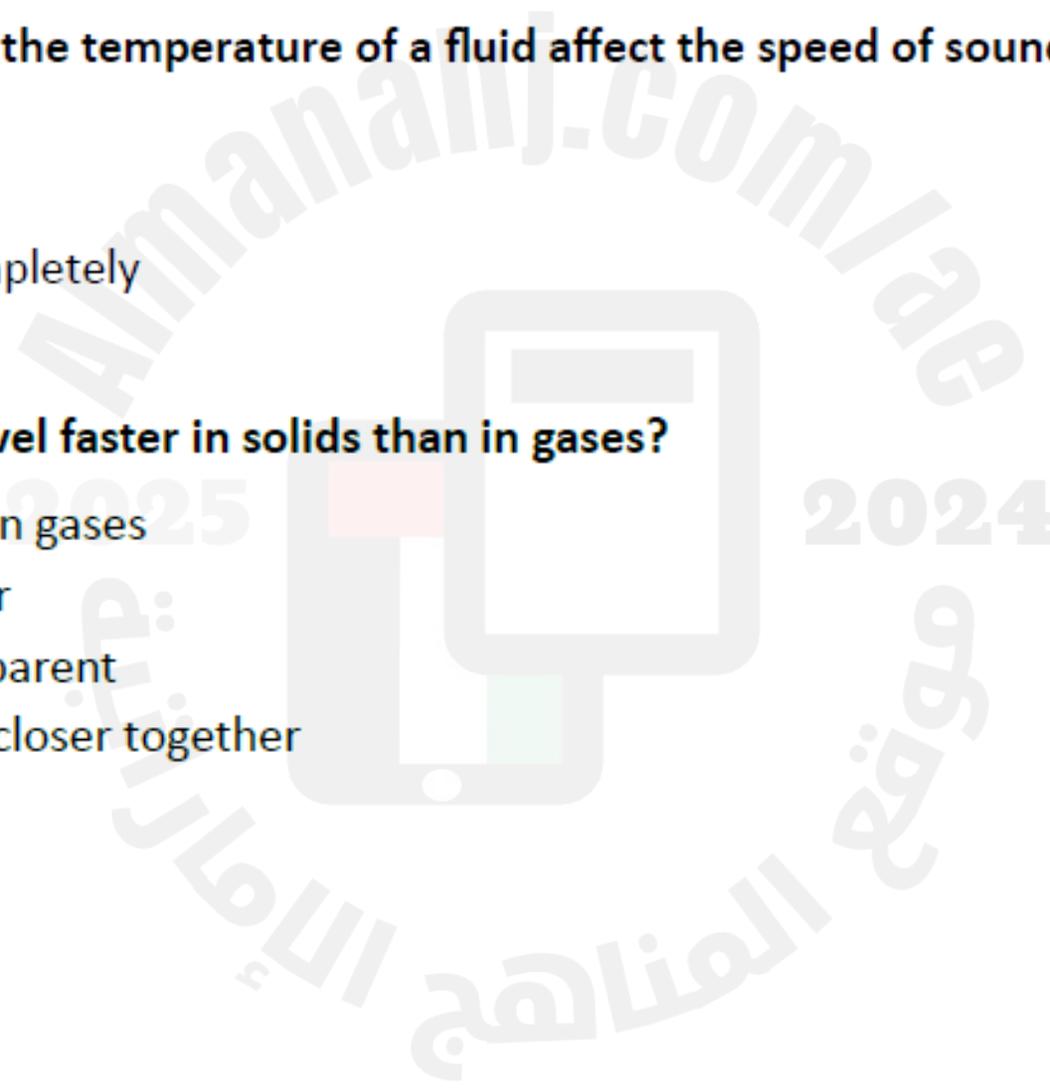
- A) Shape and color of the medium
- B) Mass and volume of the medium
- C) Temperature, density, and elasticity
- D) Pressure and light intensity

15. How does increasing the temperature of a fluid affect the speed of sound?

- A) It decreases the speed
- B) It increases the speed
- C) It stops the sound completely
- D) It has no effect

16. Why does sound travel faster in solids than in gases?

- A) Solids are warmer than gases
- B) Solids have more color
- C) Gases are more transparent
- D) Particles in solids are closer together



17. Which of the following is not true about particle movement in a gas?

- A) Particles are far apart
- B) Particles collide frequently
- C) Sound travels slowly
- D) Energy transfer takes more time

19. Which material would most likely allow sound to travel the **slowest?**

- A) Steel
- B) Water
- C) Air
- D) Glass

20. Why does sound travel more slowly in cork than in water, even though cork is a solid?

- A) Cork has many air pockets
- B) Cork is heavier than water
- C) Water is colder than cork
- D) Cork particles are closer together

21. Which of the following has the highest elasticity?

- A) Water
- B) Air
- C) Clay
- D) Rubber ball

23. How does the temperature of a medium affect the speed of sound waves?

- A. As the temperature of a medium decreases, sound waves travel more quickly through that medium.
- B. Temperature does not affect the speed of sound waves.
- C. As the temperature of a medium increases, sound waves travel more slowly through that medium.
- D. As the temperature of a medium increases, sound waves travel more quickly through that medium.

8. Which is a reason sound travels faster in solids than in gases?

- A. Solids conduct heat better
- B. Molecules in solids are packed more closely
- C. Gases absorb more light
- D. Solids have more space between particles

9. What is another reason sound travels faster in solids than in gases?

- A. Solids are heavier
- B. Solids are colder
- C. Solids allow quicker transfer of vibrations
- D. Gases have higher energy

Hearing Loss

When a person's hearing is damaged, it is usually because **the tiny hair cells in the cochlea are damaged or destroyed**, often by loud sounds. This damage is permanent. The hair cells in the cochlea of humans and other mammals do not grow back when damaged or destroyed.



14. What can cause permanent hearing loss?

- A) Clogged ear canal
- B) Damaged hair cells in the cochlea
- C) Broken stirrup
- D) Dehydration

15. Why is hearing loss from cochlear damage permanent?

- A) Bones do not move anymore
- B) Cochlea loses its liquid
- C) Hair cells do not grow back
- D) Ear canal collapses

What is the best way to protect your ears during a loud music concert?

- A. Sit closer to the speakers.
- B. Wear earplugs or noise-cancelling headphones.
- C. Cover your ears with your hands.
- D. Listen to music at a higher volume later.

2. Which of the following is a possible treatment for hearing loss?

- A. Drinking more water
- B. Using a hearing aid
- C. Wearing sunglasses
- D. Taking antibiotics

3. Which daily habit helps prevent hearing damage?

- A. Listening to music at full volume
- B. Cleaning ears with sharp objects
- C. Keeping volume at a safe level when using headphones
- D. Using cotton balls in your ears all day

Intensity

Is the amount of energy that passes through a certain area in a specific amount of time.

Turn up volume → greater energy is transferred → greater intensity.

Turn down volume → reduce the energy → reduce the intensity.

Loudness

Is the human perception of sound volume and primarily depends on sound intensity.

A **decibel** is a unit of sound intensity.

- Every increase in 10 dB on the decibel scale represents a tenfold increase in intensity.

Example:

18) Which sound wave property is most related to loudness?

- A) amplitude
- B) wave speed
- C) frequency
- D) wavelength

Another word for intensity is _____, and it is measured in _____

answer choices

- Frequency, decibels
- Amplitude, hertz
- Amplitude, decibels
- Frequency, hertz

The loudness (or intensity) of a sound wave is related to its _____

answer choices

- frequency
- duration
- amplitude.
- wavelength

Frequency: is a measure of how many wavelengths pass a particular point each second.

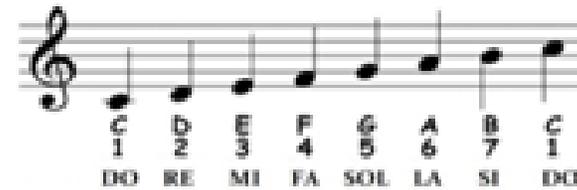
Longitudinal wave (sound) the frequency is the number of compressions or rarefactions that pass by each second.

Measured in hertz (Hz)

One Hz → one wavelength passes by in one second.

Frequency = number of waves/ times

Pitch: is how high or low a sound seems to be.



The pitch of a sound is primarily related to the frequency of the sound waves.

High frequency → High pitch

Low frequency → Low pitch

14) The human perception of pitch primarily depends on ____.

- A) loudness
- B) resonance
- C) intensity
- D) frequency

Frequency is measured in ____

answer choices

- meters
- decibels
- hertz
- seconds

The measure of how high or low a sound is:

answer choices

- the intensity
- how loud or soft a sound is
- the size of the wavelength
- the pitch

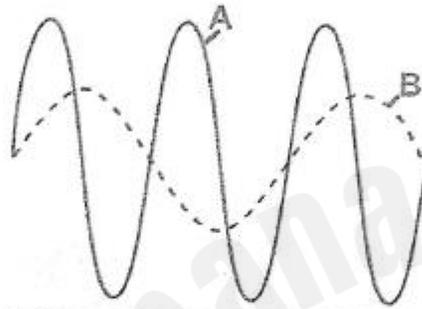
Practice questions :

Question	8
If a sound wave's intensity is increased, how will it affect the sound's loudness?	
A	Loudness will increase
B	Loudness will decrease
C	Loudness will remain unchanged
D	Loudness will depend on the frequency of the wave

What happens to a sound wave when you increase the volume?

- A. The wave gets faster.
- B. The amplitude increases.
- C. The frequency becomes higher.
- D. The wave disappears.

An engineer tests two sound waves, Wave A with a frequency of 600 Hz and Wave B with a frequency of 300 Hz. Which of the following statements best describes the relative pitch and wavelength of these waves?



- | | |
|----------|--|
| A | Wave A has a higher pitch and shorter wavelength than Wave B |
| B | Wave B has a higher pitch and shorter wavelength than Wave A |
| C | Wave A has a lower pitch and longer wavelength than Wave B |
| D | Wave B has a lower pitch and shorter wavelength than Wave A |

5. Which sound wave property is most related to loudness?

- amplitude.
- frequency.
- wave speed.
- wavelength.

Which of the following will change if you turn up a radio's volume?



Intensity and loudness

Wave velocity and intensity

Frequency and amplitude

Intensity and pitch

1. What happens to the loudness of a sound when the amplitude increases?

- A. The sound gets quieter
- B. The pitch becomes lower
- C. The sound gets louder
- D. The frequency increases

2. What does frequency of a sound wave determine?

- A. Loudness
- B. Echo
- C. Pitch
- D. Volume

3. A sound with a high frequency will have:

- A. A low pitch
- B. A loud volume
- C. A high pitch
- D. A low amplitude



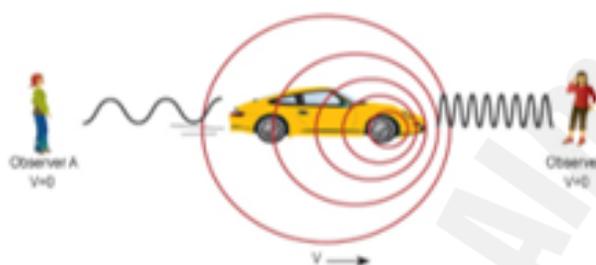


Get It?

Describe the Doppler effect.

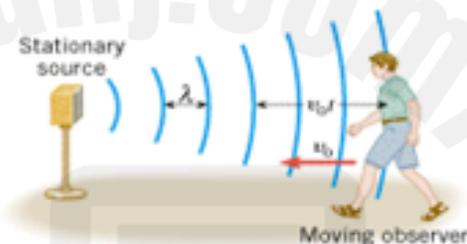
Doppler effect: is the change in wave frequency due to a wave source moving relative to an observer or an observer moving relative to a wave source.

Moving sound sources



Compressions are closer together in front of the car, the frequency is higher and observer B hears a higher pitch than observer A.

Moving observers



The pitch would sound higher as observer moves toward the source and lower as he moves away from it.

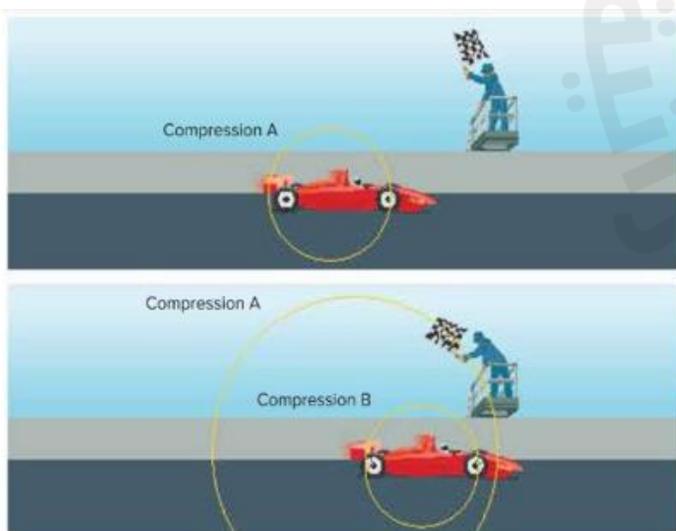


Figure 11 Police use radar guns to measure the speeds of motorists on highways. Radar guns function based on the Doppler effect.

Practice Questions :

1. What is the Doppler effect?

- A. A change in the loudness of a sound over time
- B. A change in the pitch of a sound due to motion of the source or observer
- C. A reflection of sound waves off surfaces
- D. A mixing of two different sound frequencies

2. When a sound source moves toward you, how does the pitch of the sound seem to change?

- A. It stays the same
- B. It gets lower
- C. It gets higher
- D. It becomes silent

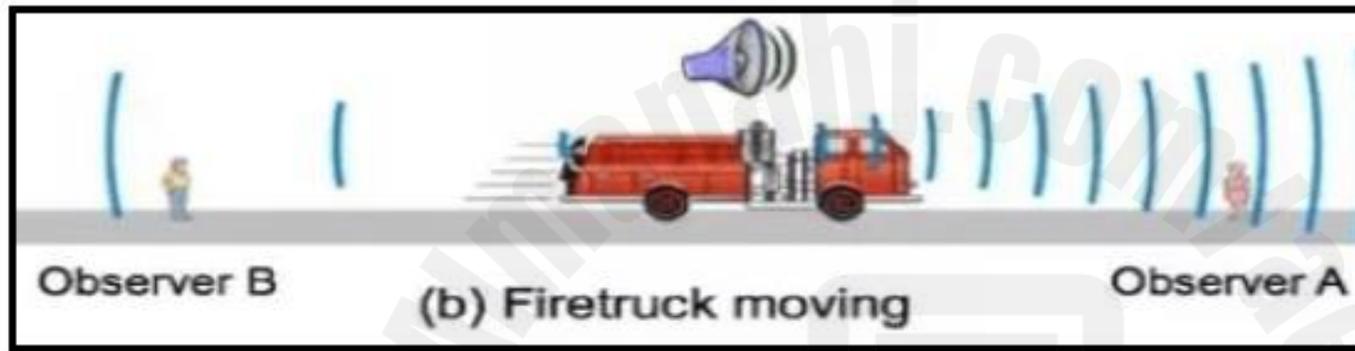
3. What happens to the sound waves when a vehicle with a siren passes by?

- A. The waves disappear
- B. The pitch increases as it moves away
- C. The waves speed up and slow down randomly
- D. The pitch drops after it passes you

(ii) A change in frequency due to the relative motion of wave source and an observer is called as ..

- a. doppler effect.
- b. Frequency.
- c. Refraction.
- d. Reflection.

12. Look at the picture , and answer question (i) and (ii)



i) who is experiencing a higher pitched sound ?

- a. Observer A
- b. Observer B
- c. Both observer A and B.
- d. none.

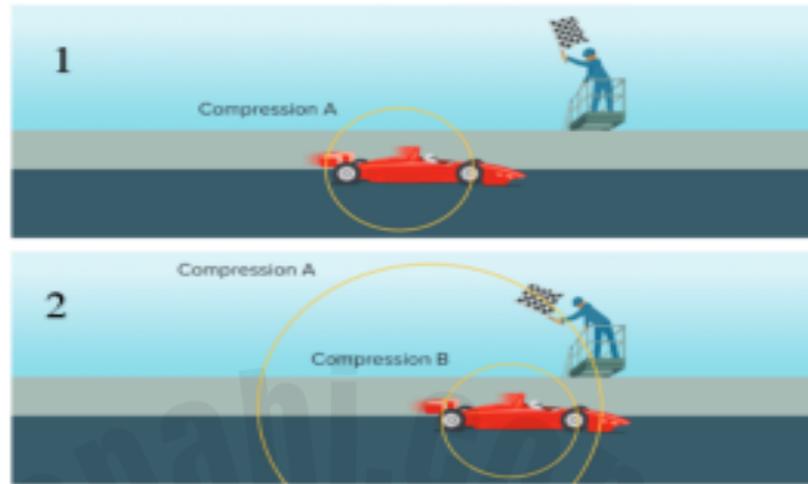
A sound source is stationary, and an observer moves toward it. What effect will the observer's motion have on the frequency they perceive?



<https://demo.webassign.net/ebooks/cj6demo/xlinks/c16-fig-0031.htm>

- | | |
|----------|---|
| A | The observer perceives a higher frequency |
| B | The observer perceives a lower frequency |
| C | The observer perceives no change in frequency |
| D | The frequency changes unpredictably |

15- Which statement is correct according to the image below ?



- a- In 1, the flagger hears a higher pitched sound, and this is related to the Doppler effect
- b- In 2, the flagger hears a lower pitched sound, and this is related to the Compressional effect
- c- In 1, the flagger hears a higher pitched sound, and this is related to the Compressional effect
- d- In 2, the flagger hears a higher pitched sound, and this is related to the Doppler effect

Explain Your Thinking

12. **Explain** why a passing car would exhibit a greater sound frequency change when it moves at 30 m/s than when it moves at 12 m/s.

Answer (Explanation):

The Doppler effect causes a change in the **observed frequency** of a sound when the source is moving relative to the observer.

- When the car moves faster (at 30 m/s), the **sound waves in front of it are compressed more tightly**, resulting in a **higher frequency (pitch)** as it approaches and a **lower frequency** as it moves away.
- The faster the car moves, the **greater the shift in frequency** because the **rate of compression and stretching of sound waves increases**.
- So, at 30 m/s, the frequency change is more noticeable than at 12 m/s because the sound waves are altered more dramatically due to the higher speed.

1. What causes the sound frequency to change when a car passes by?

- A. The engine noise level
- B. The movement of the car relative to the listener
- C. The weight of the car
- D. The color of the car

2. A car moving at a higher speed (e.g., 30 m/s) creates a greater frequency change than a slower car (e.g., 12 m/s) because:

- A. It uses more fuel
- B. It produces higher energy sounds
- C. It compresses and stretches the sound waves more dramatically
- D. It vibrates less

3. As a fast-moving car approaches and then passes you, how does the pitch of its sound change?

- A. It remains constant
- B. It gets lower as it approaches and higher as it leaves
- C. It gets higher as it approaches and lower as it moves away
- D. It disappears when the car is closest

6 Identify different types of mirrors and their properties.

Get it

333

6

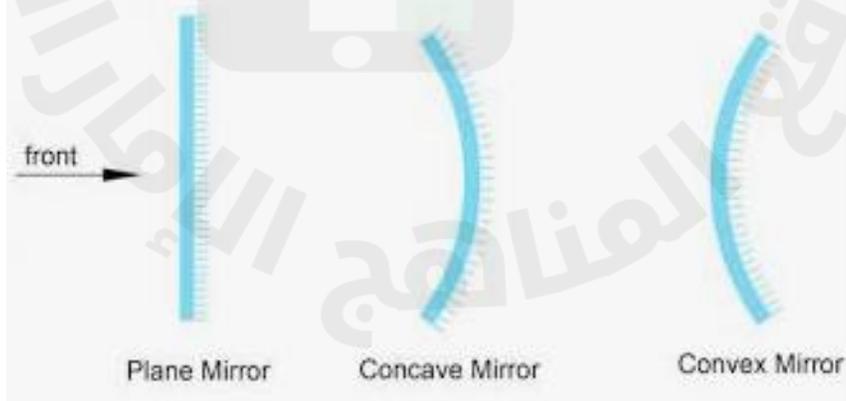
Get it

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7

Table 1 Images Formed by Mirrors

Mirror Shape	Distance of Object from Mirror	Virtual/Real	Image Created Upright/ Upside Down	Size
Plane	any distance	virtual	upright	same as object
Concave	object more than two focal lengths from mirror	real	upside down	smaller than object
	object between one and two focal lengths	real	upside down	larger than object
	object at focal point	none	none	none
	object within focal length	virtual	upright	larger than object
Convex	any distance	virtual	upright	smaller than object





Get It?

Describe the image formed by a convex mirror.

1. What type of image does a convex mirror always produce?

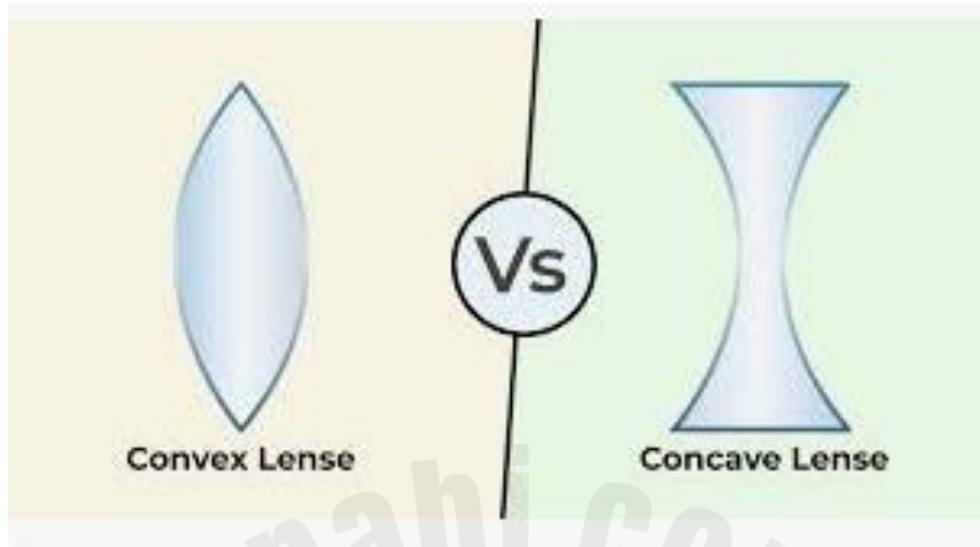
- A. Real, enlarged, and upright
- B. Virtual, smaller, and upright
- C. Real, inverted, and smaller
- D. Virtual, same size, and inverted

2. Which of the following best describes the image location in a convex mirror?

- A. In front of the mirror
- B. On the surface of the mirror
- C. Behind the mirror
- D. At the center of curvature

3. Why are convex mirrors often used for security or in vehicle side mirrors?

- A. They make objects look bigger
- B. They focus light to a point
- C. They show a wider field of view
- D. They create 3D images



1) Match the mirror and lens types with their descriptions.

- | | | |
|----------------|--------|---|
| Plane Mirror | ←————→ | flat and smooth |
| Concave Mirror | ←————→ | curved inward |
| Convex Mirror | ←————→ | curved outward |
| Concave Lens | ←————→ | thinner in the middle than at the edges |
| Convex Lens | ←————→ | thicker in the middle than at the edges |

What is the difference between a lens and a mirror?

A lens does not have a focal point; a mirror has a focal point.

A lens reflects light; a mirror refracts light.

A lens has an optical axis; a mirror does not.

A lens refracts light; a mirror reflects light.

1. Which type of image appears on the screen when an object is placed between F (focal point) and $2F$ in front of a convex lens?

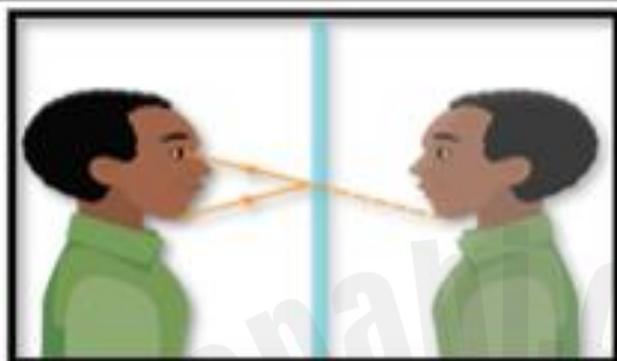
- A. The image is virtual, reduced, and upright
- B. The image is real, enlarged, and upside-down
- C. The image is real, reduced, and upside-down
- D. The image is virtual, enlarged, and upright

2. What type of image appears on the screen when an object is placed at $2F$ (twice the focal length) in front of a convex lens?

- A. The image is real, the same size, and upside-down
- B. The image is virtual, the same size, and upright
- C. The image is real, enlarged, and upright
- D. The image is virtual, reduced, and upside-down

Plane Mirrors

A flat, smooth mirror



Plane mirrors always form:

1. virtual/ same size
2. upright/ behind the mirror

Light from objects (or from you) strikes the mirror and is reflected in all directions. Some of the light rays enter your eyes. Your brain interprets the light rays as if they have traveled in a straight line.

- **A virtual image** is an image your brain perceives even though no light rays pass through the location of the image.

**Get It?**

Explain Why does your reflected image in a plane mirror appear to be behind the mirror?

1. Why does your image in a plane mirror appear to be behind the mirror?

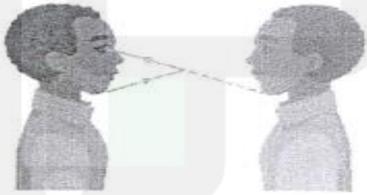
- A. Because the mirror bends light around you
- B. Because your brain traces the reflected light rays in a straight line behind the mirror
- C. Because the mirror stores the image temporarily
- D. Because the light disappears and reappears

2. What kind of image is formed by a plane mirror?

- A. Real and inverted
- B. Virtual and upright
- C. Real and upright
- D. Virtual and flipped vertically

3. What happens to light rays when they hit a plane mirror?

- A. They pass through the mirror
- B. They scatter in all directions
- C. They bend downward
- D. They reflect off the mirror at equal angles

Question	12
<p>A person looks into a plane mirror. Which of the following criteria could be used to evaluate the accuracy of their reflection?</p> 	
A	The reflection is smaller than the person's size
B	The reflection is real and upright
C	The reflection is reversed left-to-right (inversion)
D	The reflection is twice the distance from the mirror as the person

8 Label the parts of the human eye and describe their functions.

Get it

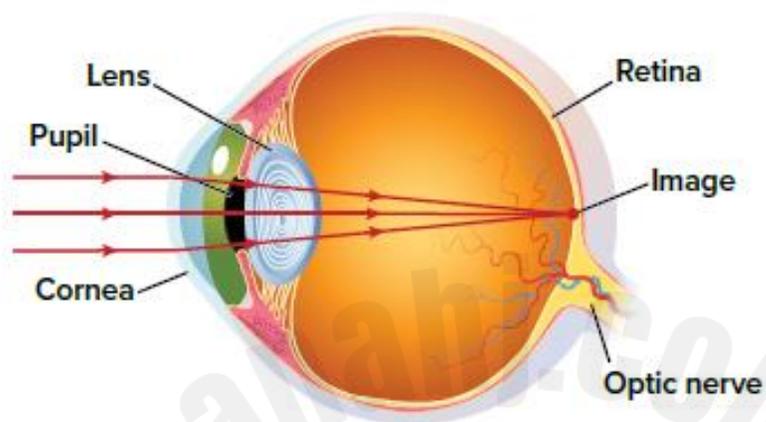
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9

Get it

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10



Get It?

Describe the function of the cornea.

2025

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Get It?

Describe the function of the retina.

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1. What is the function of the cornea in the human eye?

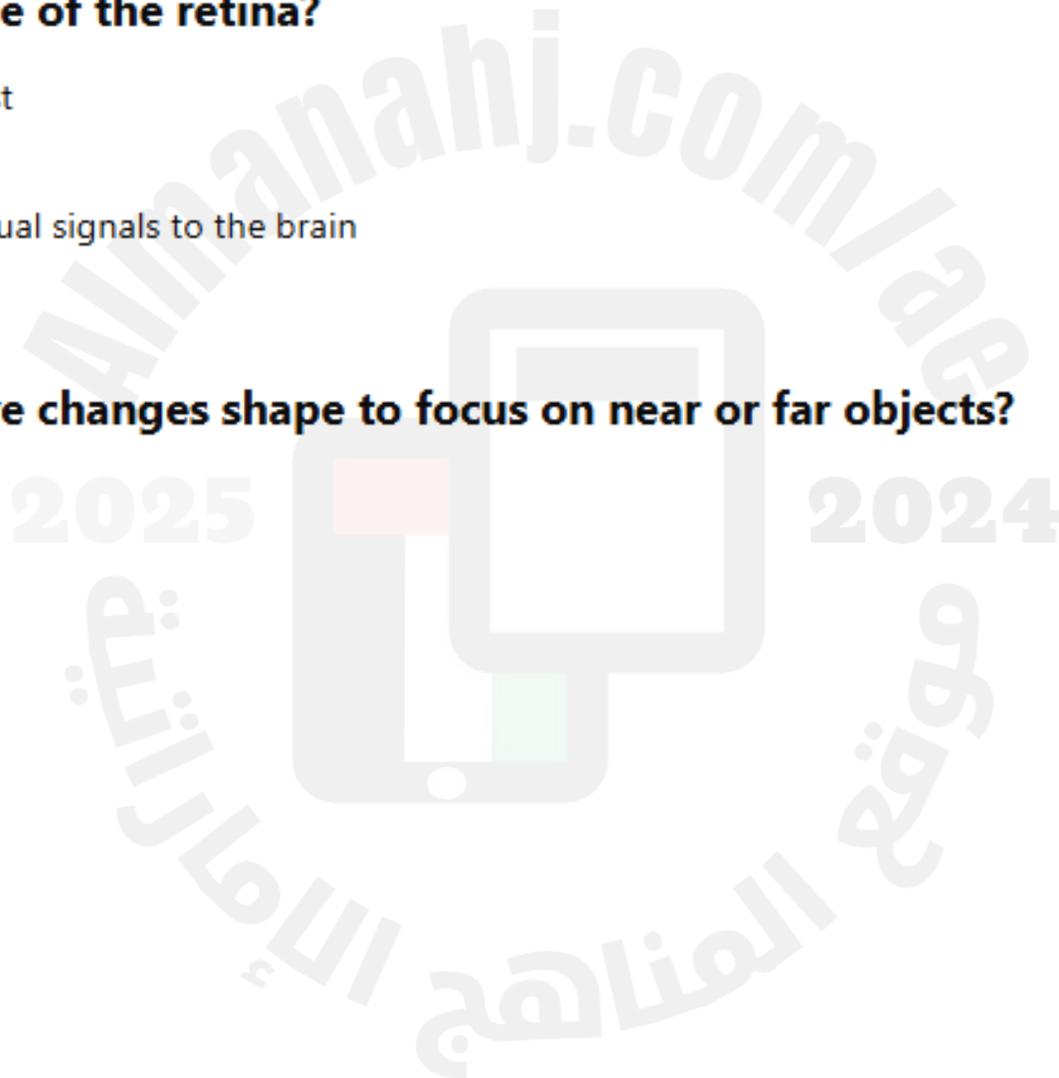
- A. It sends signals to the brain
- B. It controls the amount of light entering the eye
- C. It focuses light entering the eye
- D. It produces tears

2. What is the main role of the retina?

- A. To protect the eye from dust
- B. To regulate eye pressure
- C. To detect light and send visual signals to the brain
- D. To move the eyeball

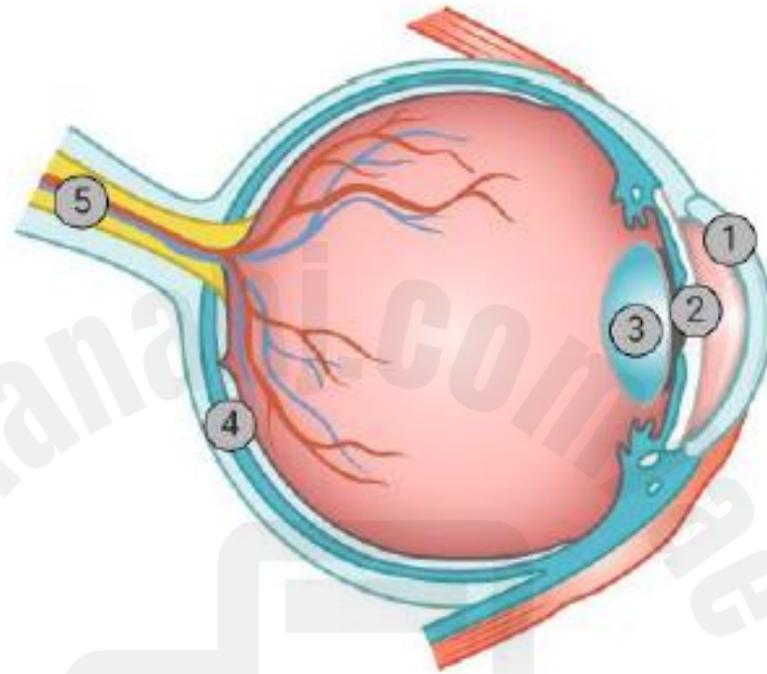
3. Which part of the eye changes shape to focus on near or far objects?

- A. Retina
- B. Lens
- C. Cornea
- D. Iris



Question 2: Choose the correct part of the eye: (5 marks)

(optic nerve , eye lens , pupil , retina , cornea)



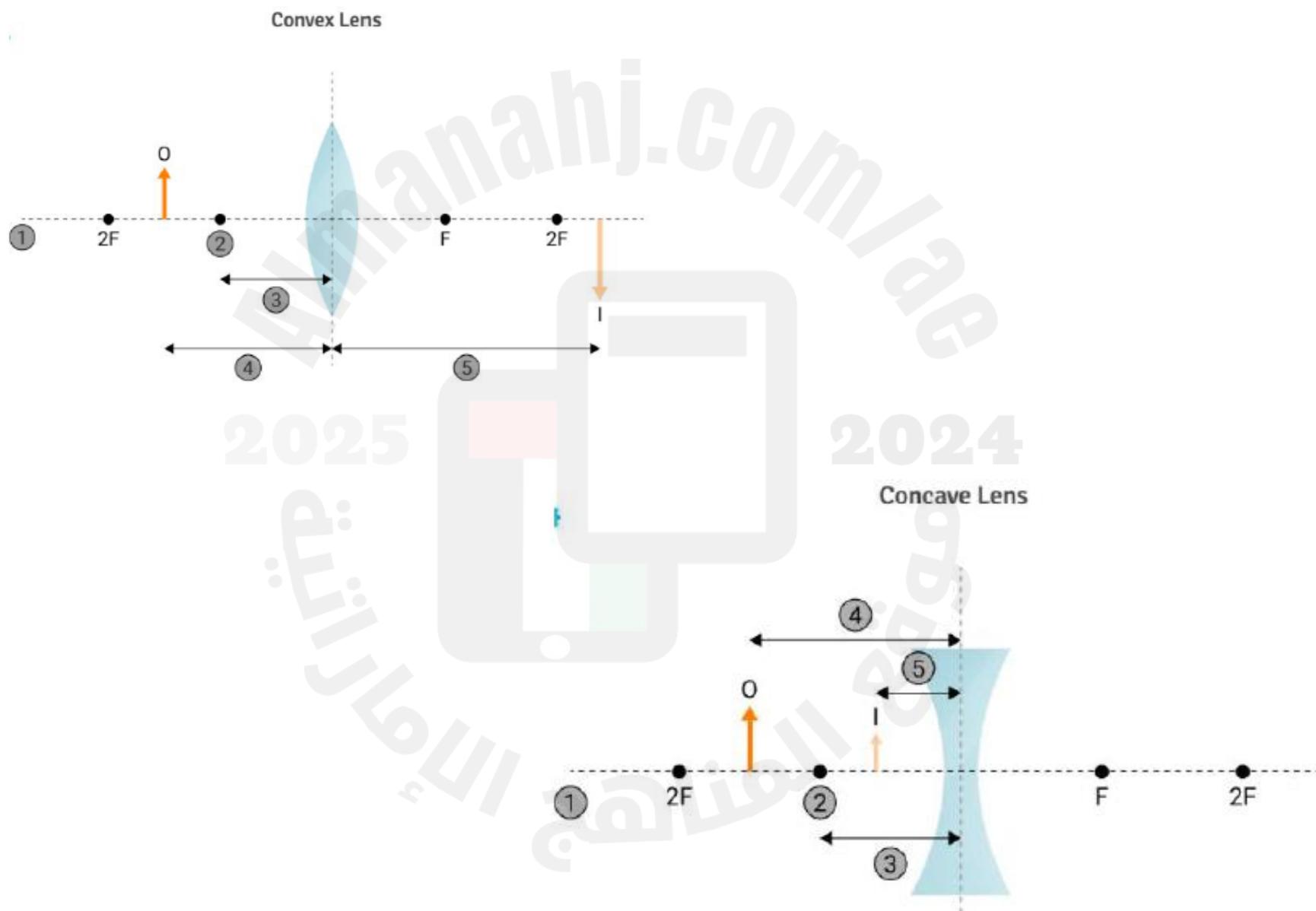
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موقع المناهج الإلكترونية

Q2 : Drag and drop the correct term in label below :

(Focal point , image distance , focal length , object distance , optical axis)



APPLY SCIENCE

Identify the Problem

A 5-cm-tall object is placed at different distances from a convex lens with a focal length of 15 cm.

$$\frac{1}{\text{focal length}} = \frac{1}{\text{object distance}} + \frac{1}{\text{image distance}}$$

Using this equation, calculate the image distance when the object is placed at a distance of 60.0 cm from the lens.

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11

Identify and describe how biotic and abiotic factors can limit the number of organisms in an ecosystem.

Get it

8

13

Range of Tolerance

9

14

Biotic factor: any living factor in an organism's environment, such as fish, algae, frogs, and microscopic organisms.

Abiotic factor: any nonliving factor in an organism's environment, such as soil, water, temperature, and light availability.

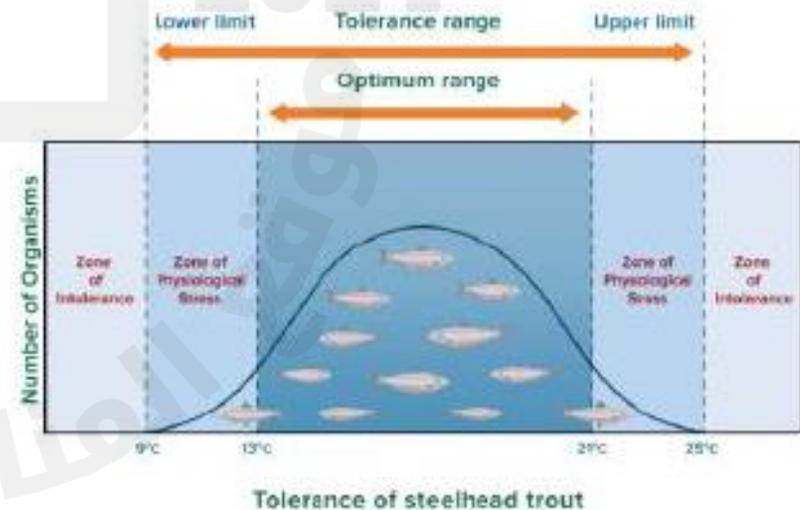
Limiting factor: biotic or abiotic factor that restricts the number, distribution, or reproduction of a population within a community.

Tolerance: organism's ability to survive biotic and abiotic factors. As the body becomes less responsive to a drug, an individual needs larger and more frequent doses to achieve the same effect.

Figure 5. The deer standing on this rock is a biotic factor in this stream community. Other organisms in the water, such as frogs and algae, also are biotic factors.



Figure 6. steelhead trout are **limited** by the **temperature** of the water in they live.





Get It?

Compare and contrast abiotic and biotic factors shown in the photo at the beginning of this module.

1. Which of the following is a biotic factor in the image?

- A. Water
- B. Rocks
- C. Deer
- D. Sunlight

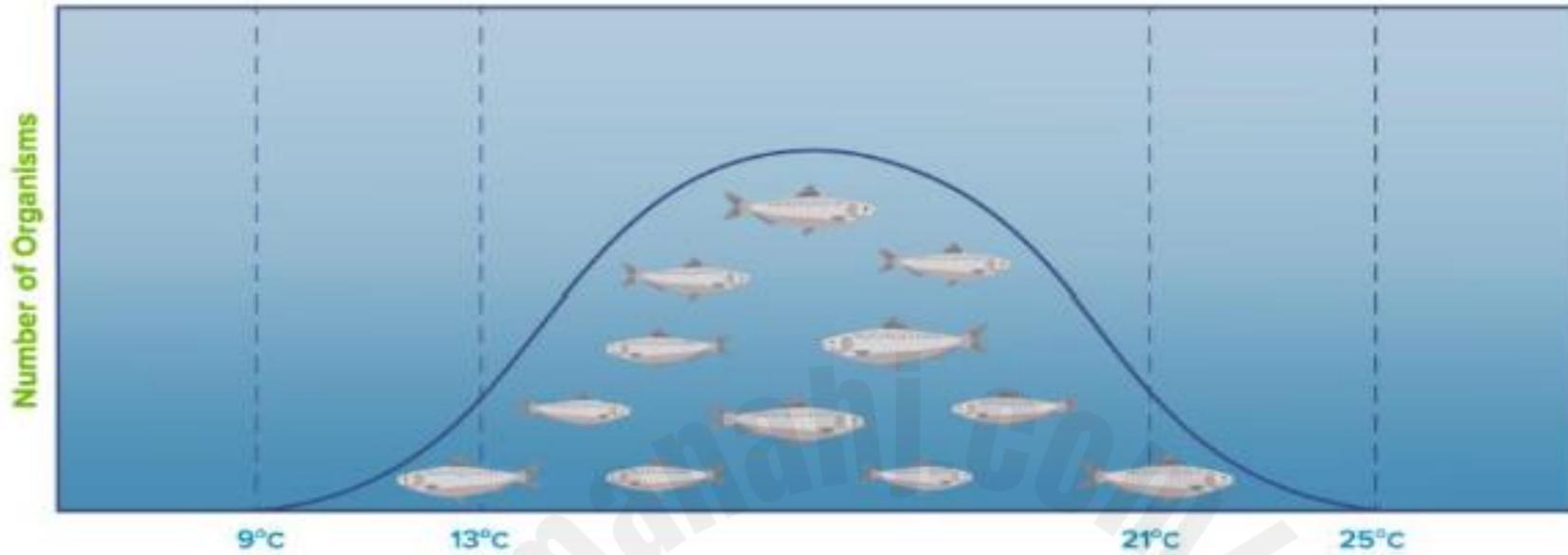
2. Which of the following is an abiotic factor shown in the image?

- A. Deer
- B. Grass
- C. Rocks
- D. Trees

3. How are biotic and abiotic factors different?

- A. Biotic factors are non-living; abiotic factors are living
- B. Biotic factors affect only plants
- C. Biotic factors are living; abiotic factors are non-living
- D. Abiotic factors breathe air



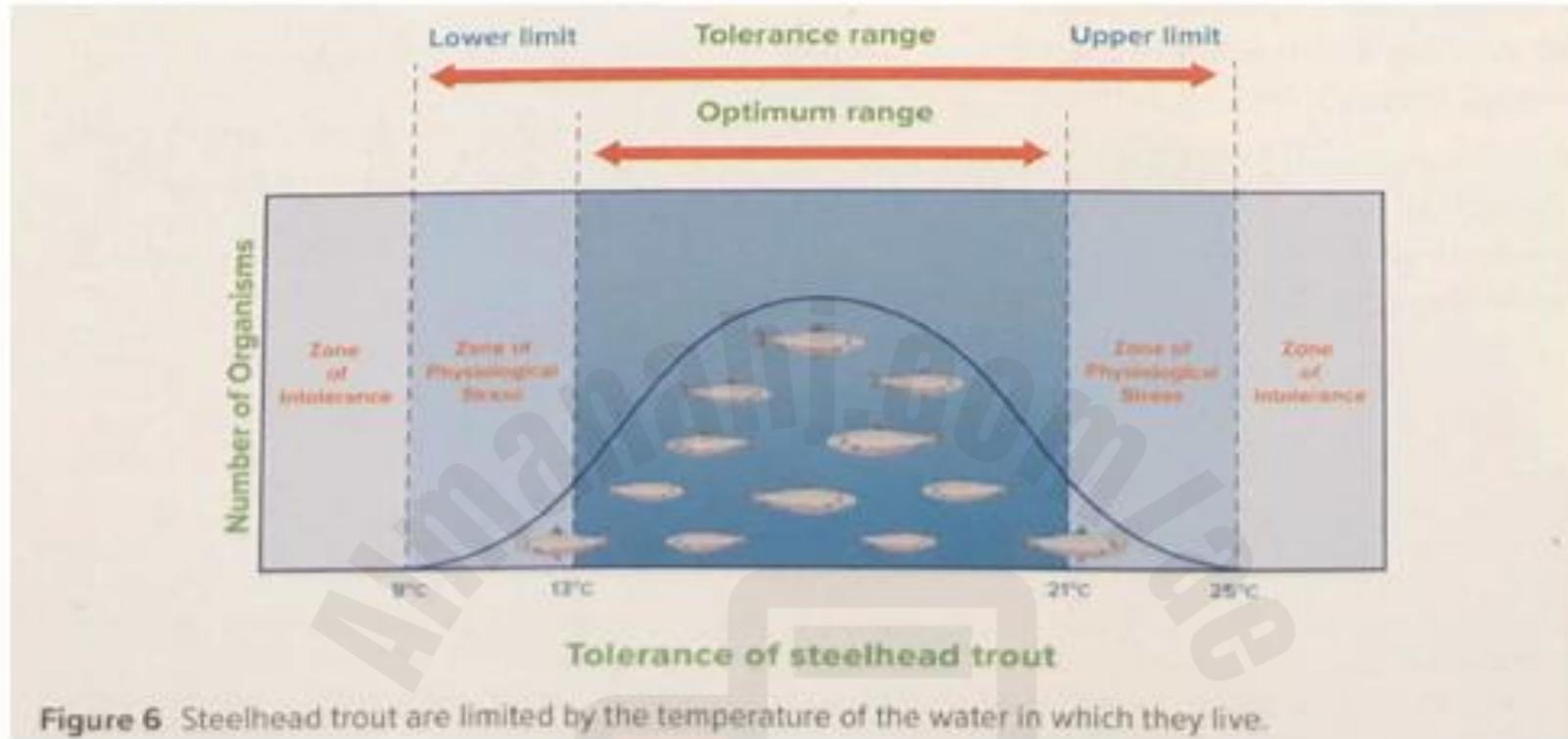


Tolerance of Steelhead Trout

What does the portion of the graph from 13°C to 21°C represent?

- A. zone of physiological stress
- B. optimum range
- C. zone of intolerance
- D. upper limit

Question 2: Use the figure below to complete the following sentences with correct word:



- The limiting factor in the diagram is: _____
- Trout can tolerate water temperatures between _____
- Most trout live in the optimum zone, which is the temperature range is _____
- Trout fish that live in physiological stress could not be able to grow or reproduce. (True or False)
- Trout can't tolerate water temperatures in _____

Demonstrate Understanding

Explain how photosynthesis and cellular respiration provide energy in each step of a food chain.

1. What is the main purpose of photosynthesis in a food chain?

- A. To release carbon dioxide
- B. To absorb oxygen
- C. To produce glucose and oxygen using sunlight
- D. To break down food into energy

2. Which organisms in a food chain perform photosynthesis?

- A. Herbivores
- B. Carnivores
- C. Decomposers
- D. Producers

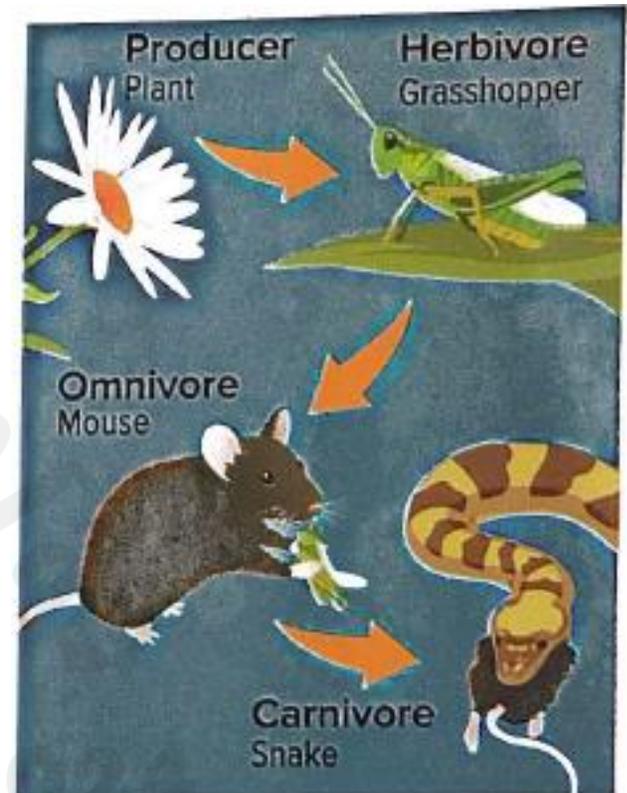


Figure 14 A food chain is a simplified model representing the transfer of energy from organism to organism.

3. What does cellular respiration do for consumers in a food chain?

- A. Creates light
- B. Stores energy from the sun
- C. Breaks down food molecules to release energy
- D. Converts oxygen into carbon dioxide for photosynthesis

4. How are photosynthesis and cellular respiration connected in the food chain?

- A. Both take in sunlight
- B. The products of photosynthesis are used in cellular respiration
- C. They are unrelated processes
- D. Both produce food for plants



FOCUS QUESTION

How does matter flow through an ecosystem?

1. How does matter primarily enter an ecosystem?

- A. Through animal movement
- B. Through photosynthesis in producers
- C. Through wind and sound
- D. Through respiration of consumers

2. What role do decomposers play in the flow of matter?

- A. They stop matter from cycling
- B. They recycle nutrients back into the soil
- C. They consume sunlight
- D. They produce oxygen

3. Which of the following best describes how matter moves through an ecosystem?

- A. In one direction and never returns
- B. In a circular pattern through cycles
- C. It disappears once used
- D. Only through plants

4. Which group of organisms starts the flow of matter in most food chains?

- A. Carnivores
- B. Herbivores
- C. Producers
- D. Decomposers

5. What happens to matter when an animal dies?

- A. It disappears forever
- B. It evaporates into the air
- C. It is broken down by decomposers and returned to the soil
- D. It becomes unusable in the ecosystem

Explain Your Thinking

6. **Describe** the flow of energy and matter through a food web that begins with algae at the lowest level.

1. In a food web that starts with algae, what role does algae play?

- A. Decomposer
- B. Consumer
- C. Producer
- D. Predator

2. What happens to energy as it moves up each level in a food web?

- A. It increases
- B. It stays the same
- C. It decreases
- D. It changes into matter

3. Which of the following organisms would most likely eat algae?

- A. Small fish or zooplankton
- B. Birds
- C. Sharks
- D. Frogs

4. What happens to matter when an organism in the food web dies?

- A. It is passed directly to top predators
- B. It is lost from the ecosystem
- C. It is broken down by decomposers and recycled
- D. It disappears into the air

5. What is the main source of energy that drives the food web beginning with algae?

- A. Heat from the ocean floor
- B. Movement of water currents
- C. Sunlight
- D. Electricity

Demonstrate Understanding

1. **Distinguish** producers, consumers, and decomposers from one another.

1. What is the role of a producer in a food chain?

- A. Breaks down dead organisms
- B. Eats other organisms
- C. Uses sunlight to make food
- D. Eats only plants

2. Which of the following is an example of a consumer?

- A. Grass
- B. Mushroom
- C. Cow
- D. Algae

3. What role do decomposers play in a food web?

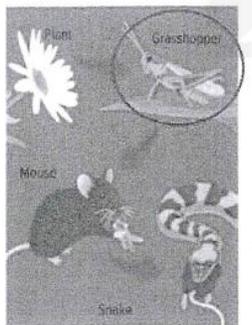
- A. They eat primary consumers
- B. They recycle nutrients back into the soil
- C. They produce oxygen
- D. They store sunlight

4. Which set correctly matches each organism with its role?

- A. Tree - Decomposer, Fox - Producer, Bacteria - Consumer
- B. Grass - Producer, Rabbit - Consumer, Fungi - Decomposer
- C. Sun - Consumer, Deer - Decomposer, Algae - Consumer
- D. Fish - Producer, Worm - Producer, Human - Decomposer

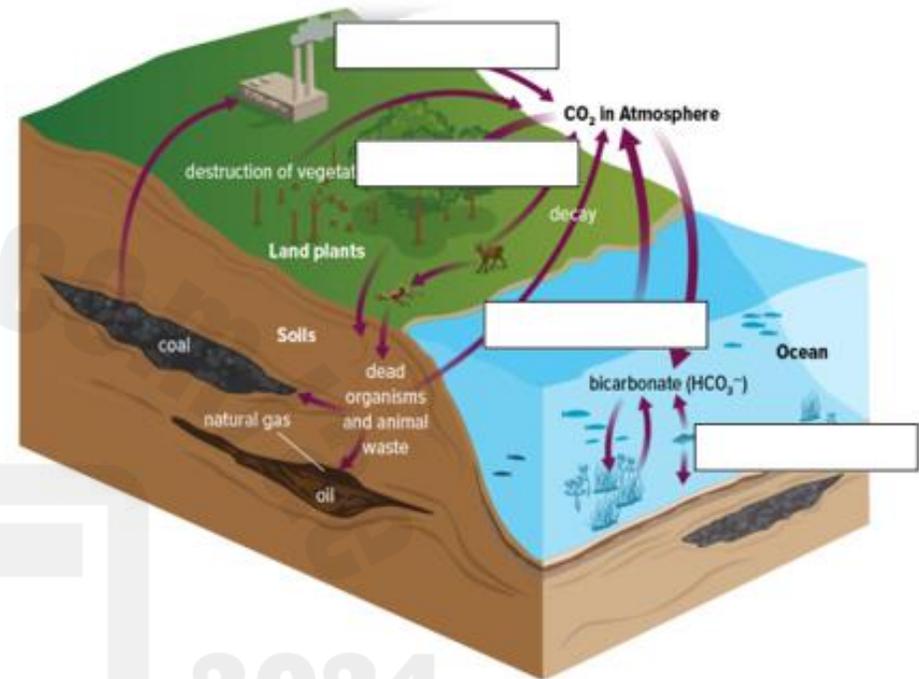
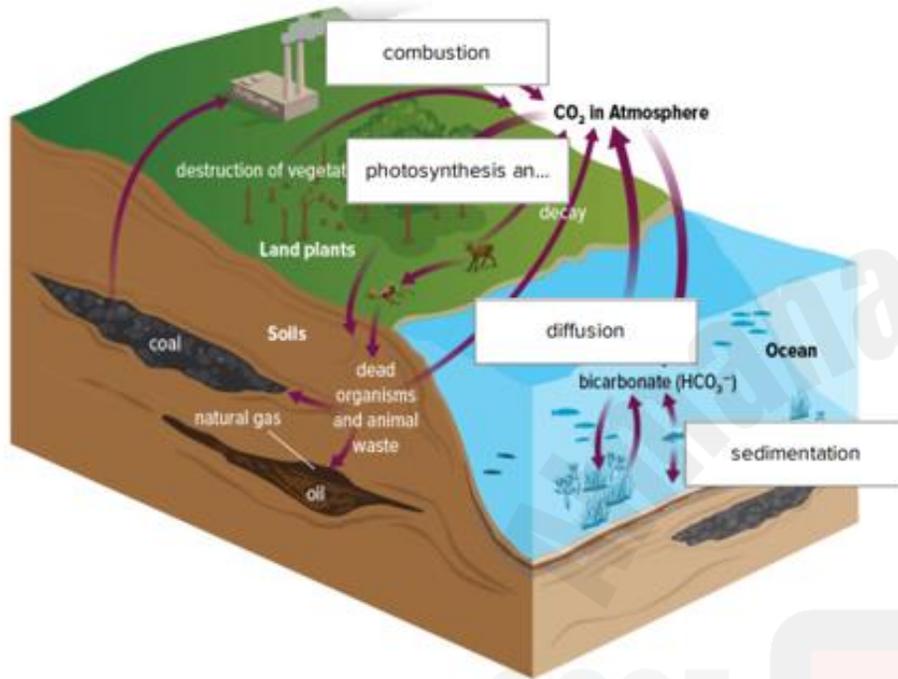
5. In a food web, what would most likely happen if all decomposers disappeared?

- A. There would be more producers
- B. Energy would increase
- C. Dead organisms would pile up and nutrients wouldn't return to the soil
- D. Consumers would become decomposers

Question		17	
What is the category for the labeled grasshopper in the following food chain?			
			
A	Carnivore	C	Detritivore
B	Omnivore	D	Herbivore

Question		13	
Studying the energy flow of an ecosystem, if autotrophs are removed from an ecosystem, what is the likely impact on heterotrophs?			
A	Heterotrophs may face a shortage of food and energy, leading to population declines		
B	Heterotrophs would find alternative sources of energy and remain unaffected		
C	Heterotrophs would increase in number due to the lack of competition		
D	There would be no impact on heterotrophs since they produce their own food		

8) Label the image of the carbon and oxygen cycle.



- A) photosynthesis and respiration
- B) combustion
- C) diffusion
- D) sedimentation

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1. What process is represented by box 1 in the diagram (carbon released by animals)?

- A. Photosynthesis
- B. Respiration by animals
- C. Decomposition
- D. Combustion

2. Which process is shown in box 2, where plants take in carbon dioxide?

- A. Respiration by plants
- B. Feeding
- C. Photosynthesis
- D. Combustion

3. What process is happening at box 3 when the animal eats the plant?

- A. Respiration
- B. Feeding
- C. Photosynthesis
- D. Combustion

5. What does box 7 represent, where carbon from dead organisms is stored underground over millions of years?

- A. Respiration by animals
- B. Combustion
- C. Formation of fossil fuels
- D. Photosynthesis

Writing Part

1	Describe what a sound wave is and how it moves through solids, liquids, or gases.	Get it	253, 254, and pdf	1
	Explain how amplitude affects loudness and frequency affects pitch.	Intensity and Loudness	257	2
	Interpret a decibel scale and describe ways to protect the ear from loud sounds.	The Decibel Scale	259	3



Get It?

Identify two reasons why sounds usually travel faster through solids than through gases.

Answer :

1. Particles are closer together in solids.
2. Solids are more elastic than gases.



Figure 2 A vacuum is a region where no matter is present. Outer space is not a perfect vacuum, but there is too little matter for sound waves to travel through outer space. Therefore, these astronauts must use radios to communicate with each other.

Explain why the astronauts need radios in order to talk to each other.

- **Astronauts use radios** to communicate in space because:
 - There is no air to carry sound waves.
 - Radios convert sound into electromagnetic waves, which **can** travel through space.

If an astronaut popped a balloon on the moon, would his partner hear it?

- A. No, although the sound waves will travel to his partner, the sound waves will not be transmitted through his partner's helmet.
- B. No, the moon has no atmosphere, so there is no medium through which the sound waves can be transmitted.
- C. Yes, the air expanding out of the balloon as it popped will transmit the sound waves to his partner.
- D. Yes, the sound waves will first be transmitted through the astronaut's body, then through the ground, and finally through his partner's body.

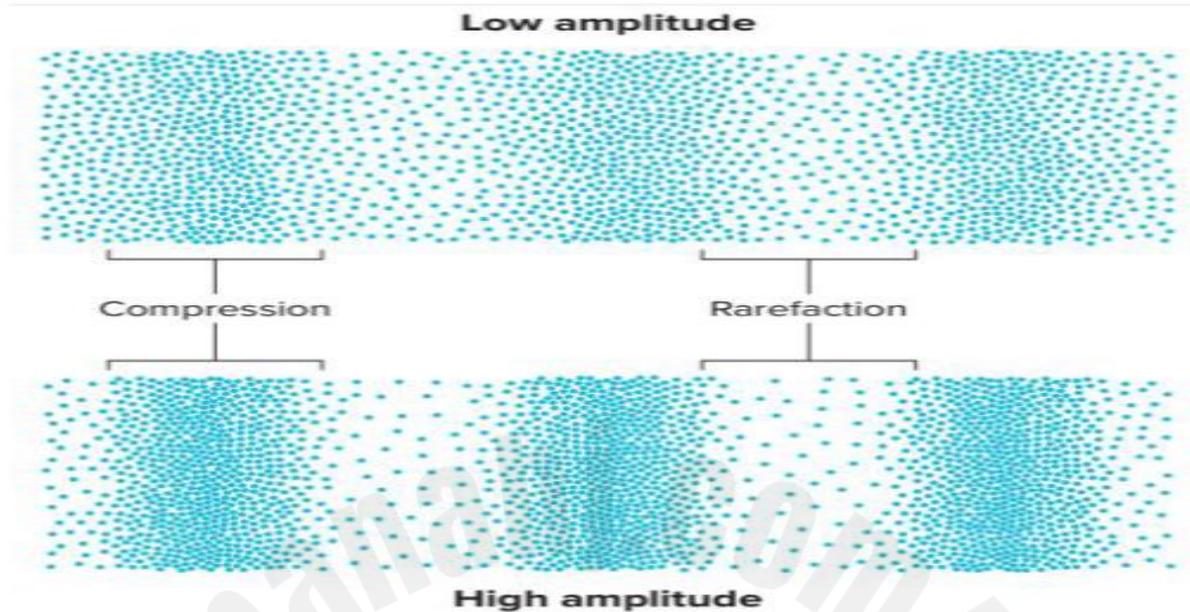


Figure 6 The amplitude of a sound wave depends on the density of the medium in the compressions and rarefactions.

Identify the areas of highest and lowest density for each wave.

A sound wave is a periodic vibration transmitted through particles in matter.

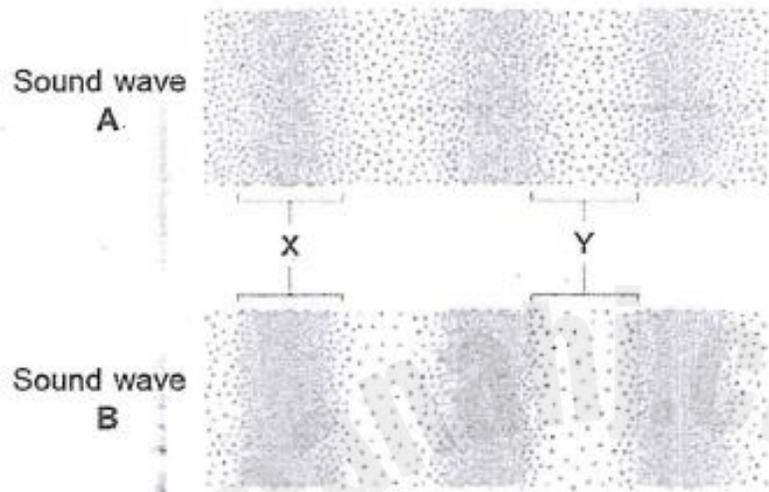
longitudinal waves : a wave that vibrates particles back and forth , parallel to the direction of wave travel

compressions : where the particles are pressed closer together .

rarefactions : where the particles are far a part .

A. Using the following figures of two sound waves (A, B).

Answer the questions that follow.



1) What are the areas of highest and lowest density of the medium called?

- X:
- Y:

2) Which one of these sound waves has the higher amplitude? **Explain.**

.....

.....

.....

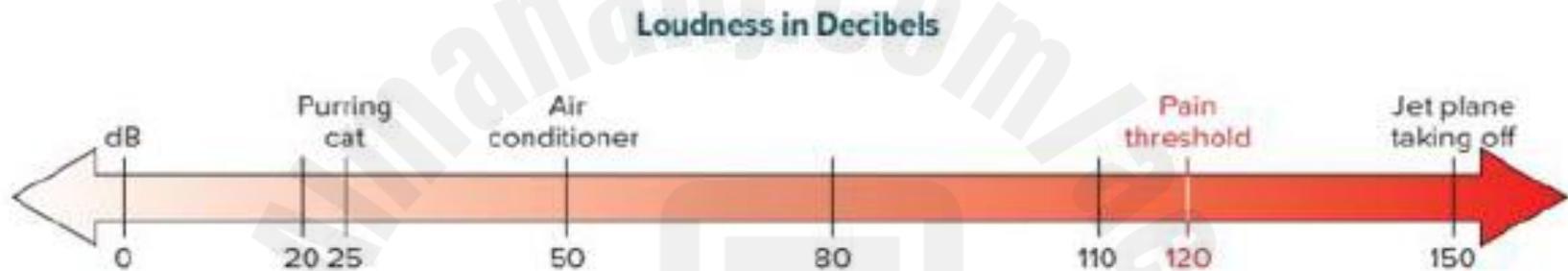
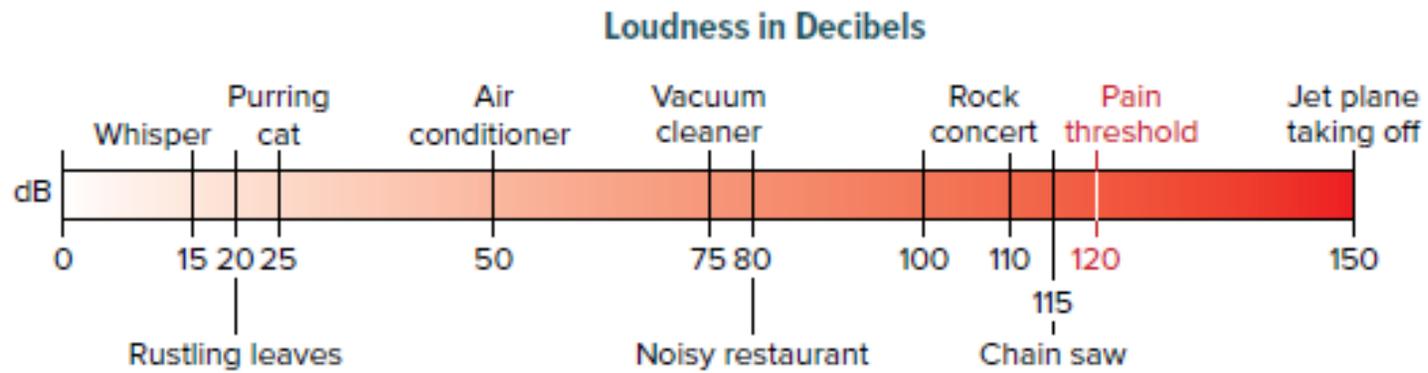


Figure 8 The volumes of different sounds are often measured in decibels.

Identify where a normal speaking voice would fall on the decibel scale.

✓ **Answer:**

A normal speaking voice typically falls around 60 decibels (dB).

What is the best way to protect your ears during a loud music concert?

Wear earplugs or noise-cancelling headphones.

2	Use a mirror to explore how images are formed.	Get it	333	4
	Describe the properties of images in plane mirrors.	pdf	pdf	5
	Label the parts of the human eye and describe their functions.	Eye Sight and Lenses	338	6
	Explain nearsightedness and farsightedness.	Vision Problems	pdf	7
Check Your Progress		341	8	

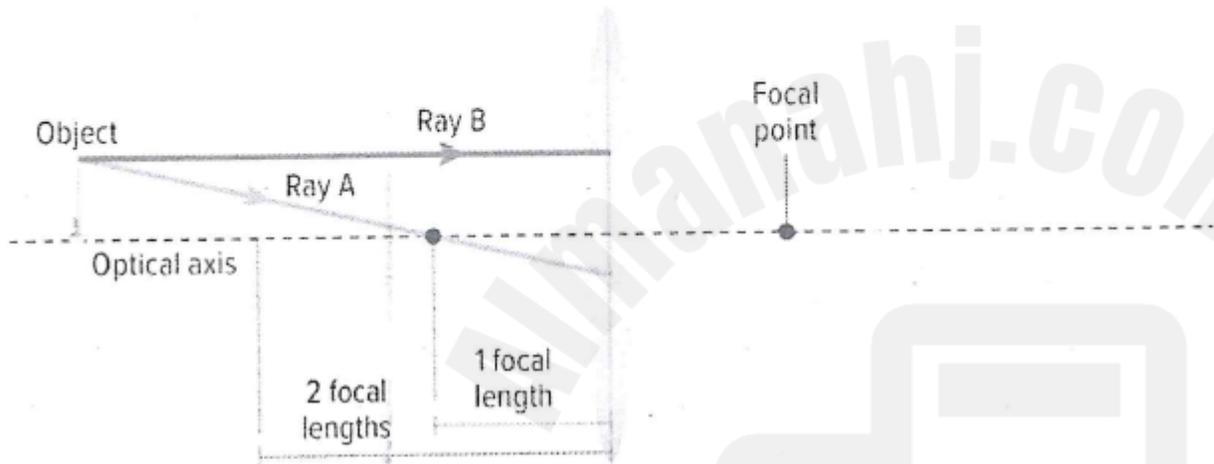
Table 1 Images Formed by Mirrors

Mirror Shape	Distance of Object from Mirror	Virtual/Real	Image Created Upright/ Upside Down	Size
Plane	any distance	virtual	upright	same as object
Concave	object more than two focal lengths from mirror	real	upside down	smaller than object
	object between one and two focal lengths	real	upside down	larger than object
	object at focal point	none	none	none
	object within focal length	virtual	upright	larger than object
Convex	any distance	virtual	upright	smaller than object

 **Get It?**

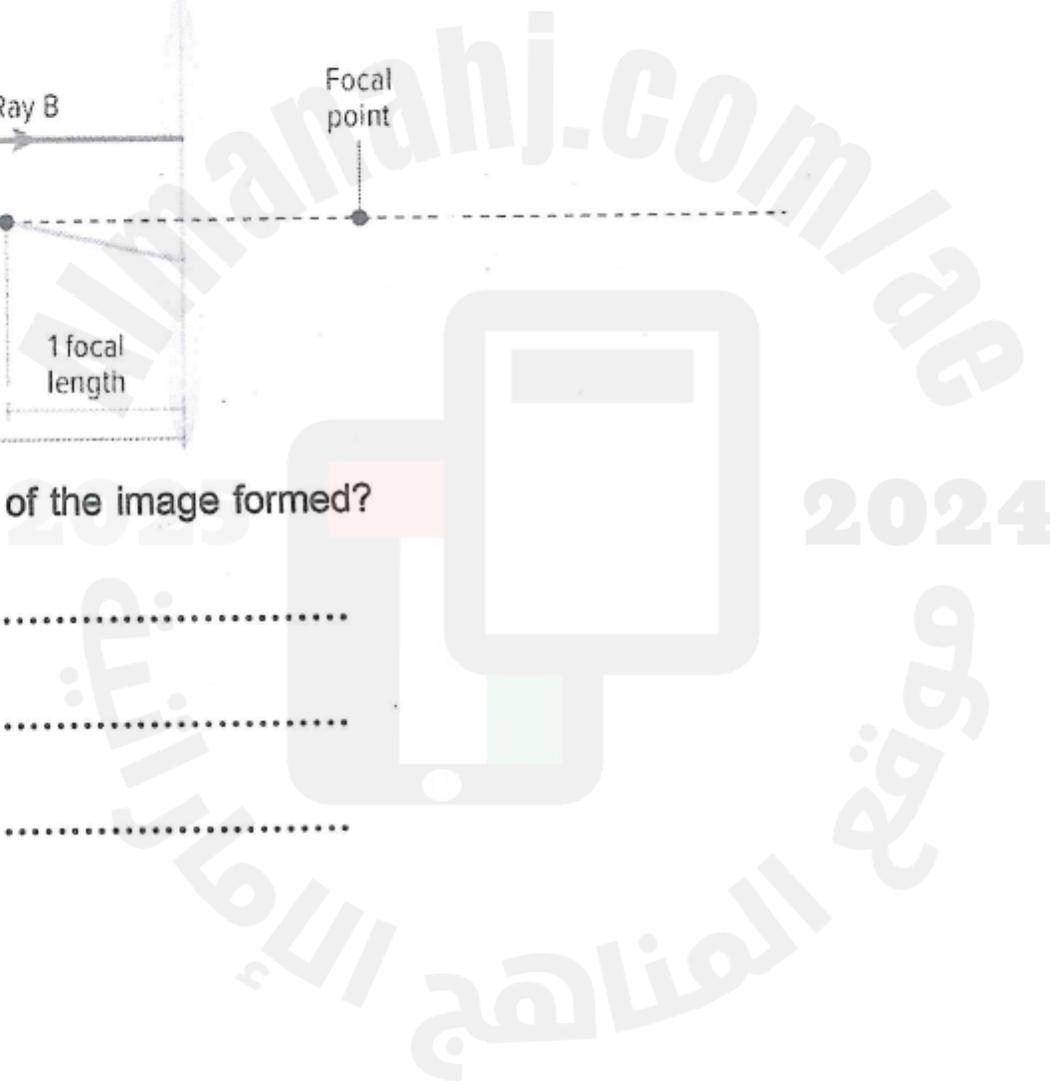
Describe the image formed by a convex mirror.

- a. Complete the following diagram by drawing the image that will be formed for the object.

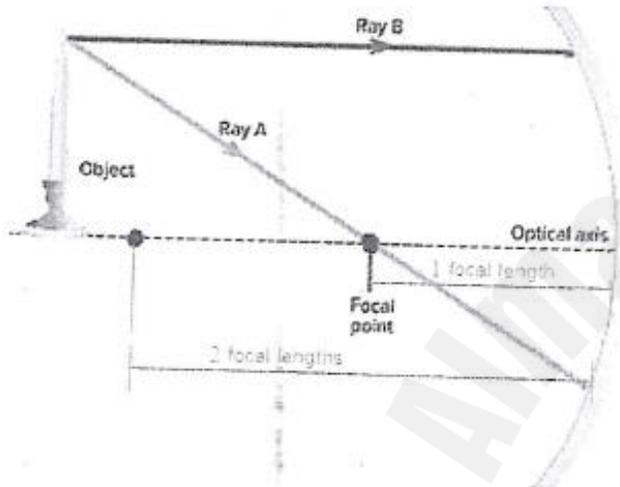
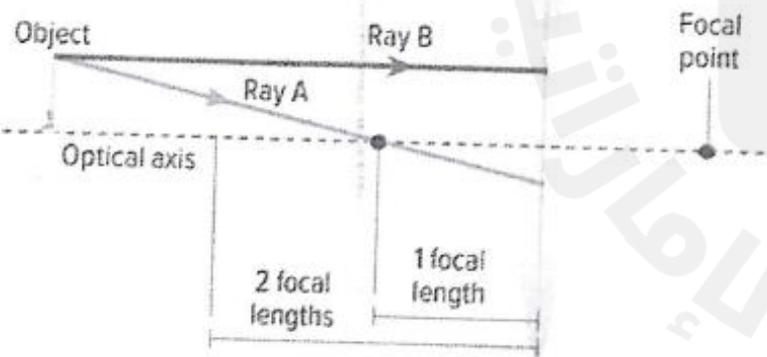


- b. What are the properties of the image formed?

1.
2.
3.



1. Consider figures A and B. What are the properties of the formed image?
 Fill in the blanks, to the right of each figure, with the properties of the formed image.

Distance of Object from Mirror/Lens	Image Properties
<p>A.</p> 	<p>1.</p> <p>2.</p> <p>3.</p>
<p>B.</p> 	<p>1.</p> <p>2.</p> <p>3.</p>

 **Get It?**

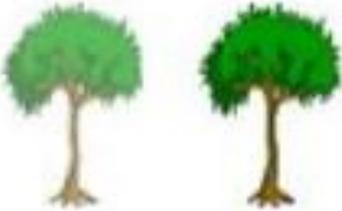
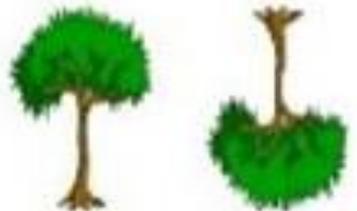
Evaluate What are the benefits and drawbacks of using convex mirrors instead of plane mirrors on automobiles?

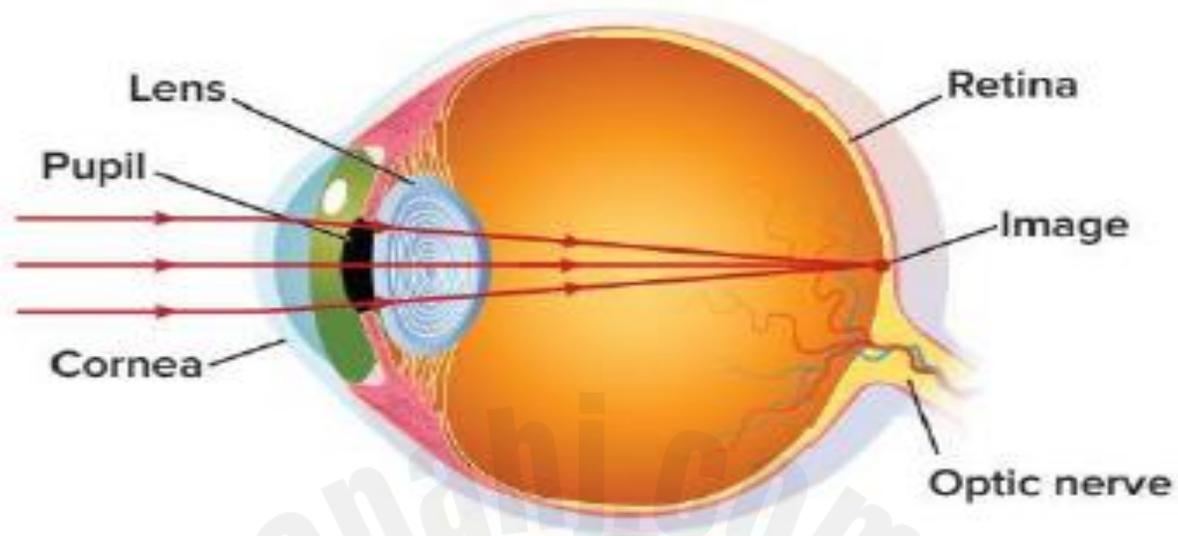
Answer: They show a wider field of view

The object below was placed in front of a **plane mirror** and the observations recorded are in the table.



Cycle the correct observation in each column in the table.

Type	Size	Image created: Upright or Upside Down (inverted)
 <p data-bbox="268 1396 535 1437">Virtual or Real</p>	 <p data-bbox="787 1372 1186 1404">Larger, same, or smaller</p>	 <p data-bbox="1512 1372 1858 1412">Upright or inverted</p>



Use words from the eye diagram to complete the sentences below.

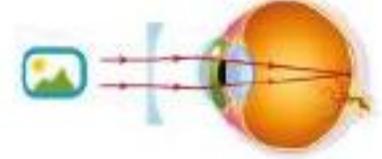
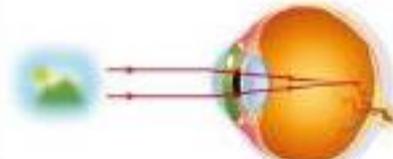
Light first enters the eye through the _____. After passing through the pupil, light is focused by the _____. The focused light forms an image on the _____ at the back of the eye. The _____ carries signals from the eye to the brain.

Figure 14: A farsighted person can see faraway objects clearly, but he or she has trouble focusing on nearby objects.



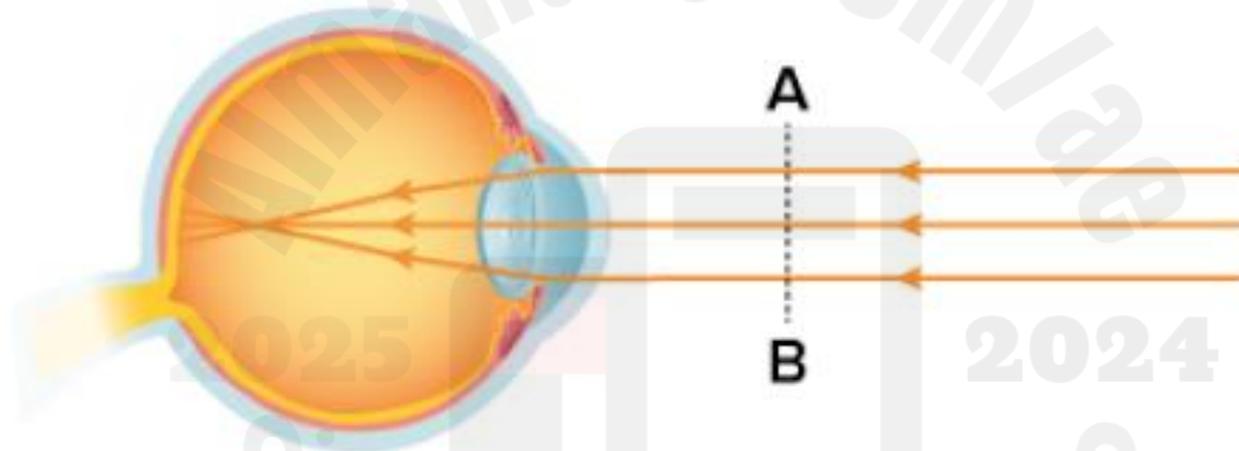
Corrected by a convex lens.

Figure 15: A nearsighted person can see nearby objects clearly, but he or she has trouble focusing on faraway objects.



Corrected by a concave lens.

This diagram of a human eye illustrates a common vision problem.



- i. Identify the vision problem.
- ii. Which type of lens corrects it?

3	Describe how organisms interact in a food chain or web.	pdf	pdf	9
	Identify different types of relationships between organisms.	pdf	pdf	10
		pdf	pdf	11
	Identify biotic and abiotic parts of different ecosystems.	pdf	pdf	12

Arrange the levels of organization in order from smallest to largest.

- i. Biome
- ii. Ecosystem
- iii. Organism
- iv. Biosphere
- v. Population
- vi. Biological community

Answer :

 **Correct Order:**

1. Organism (iii)
2. Population (v)
3. Biological community (vi)
4. Ecosystem (ii)
5. Biome (i)
6. Biosphere (iv)

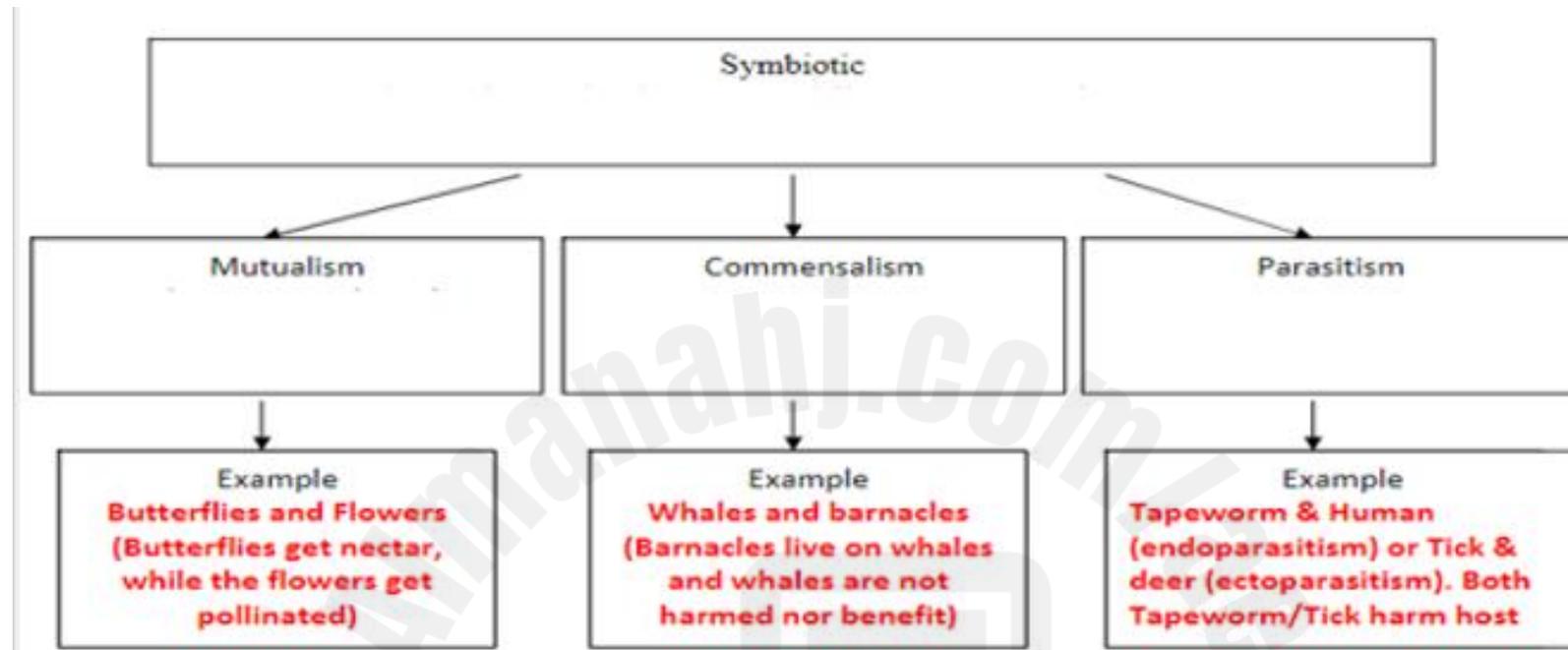
Identify different types of relationships between organisms.



Choose the type of relationship that best defines the scenarios below.

	competition	parasitism	predation	commensalism
Red-tailed hawks and black racer snakes prey on the same species of rodents in the same habitat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
One organism benefits, while another is unharmed during a long-term relationship between the two.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A tick becomes lodged on the skin of a hiker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coyotes eat mice and rabbits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Compare and contrast mutualism and parasitism.



Categorize the following factors as either abiotic or biotic.

Temperature Algae Soil pH Soil bacteria content Wind Plant life Predators Water

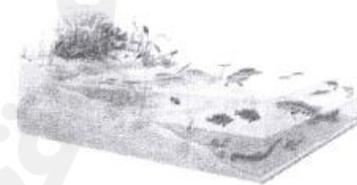
Biotic	Abiotic

a. Compare and contrast between abiotic and biotic factors shown in the figure below, according to the following table.



	Biotic Factors	Abiotic Factors
Definition
Example (Using the figure above)

Fill in the blanks in the following table to compare and contrast between biotic and abiotic factors shown in the figure below.



	Biotic Factors	Abiotic Factors
Definition
Example

4

Explain how energy moves through producers, consumers, and decomposers.

pdf

pdf

13

Describe how organisms interact in a food chain or web.

pdf

pdf

14

Describe the carbon cycle.

pdf

pdf

15

Compare photosynthesis and cellular respiration.

Check Your Progress

24

16

Describe how matter is reused in living systems.

Check Your Progress

18

17

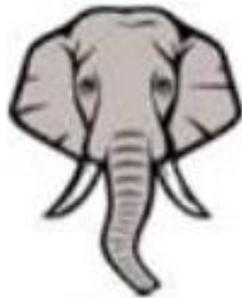
Write producer, consumer, or decomposer for each living thing.



grass



earthworm



elephant



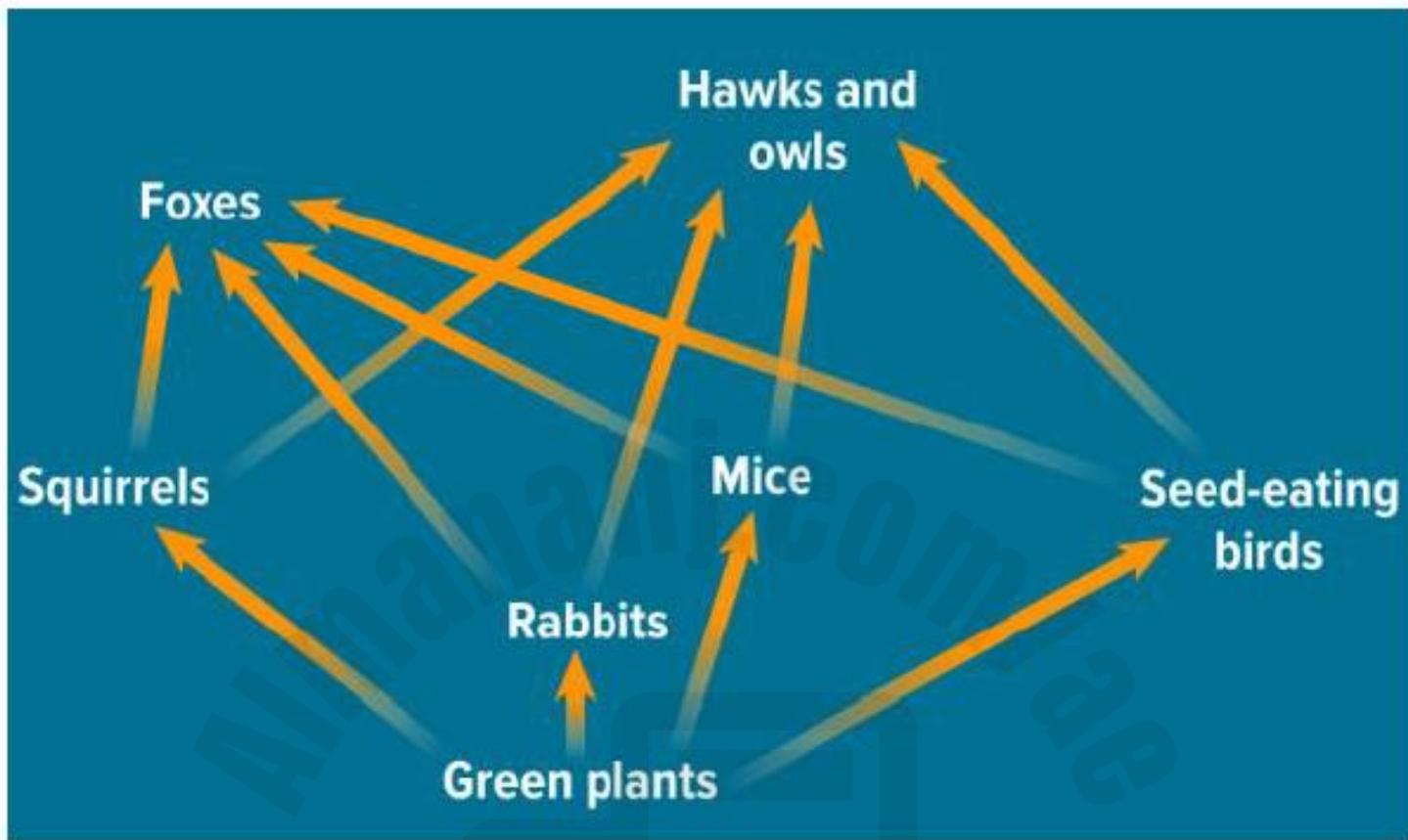
mushroom



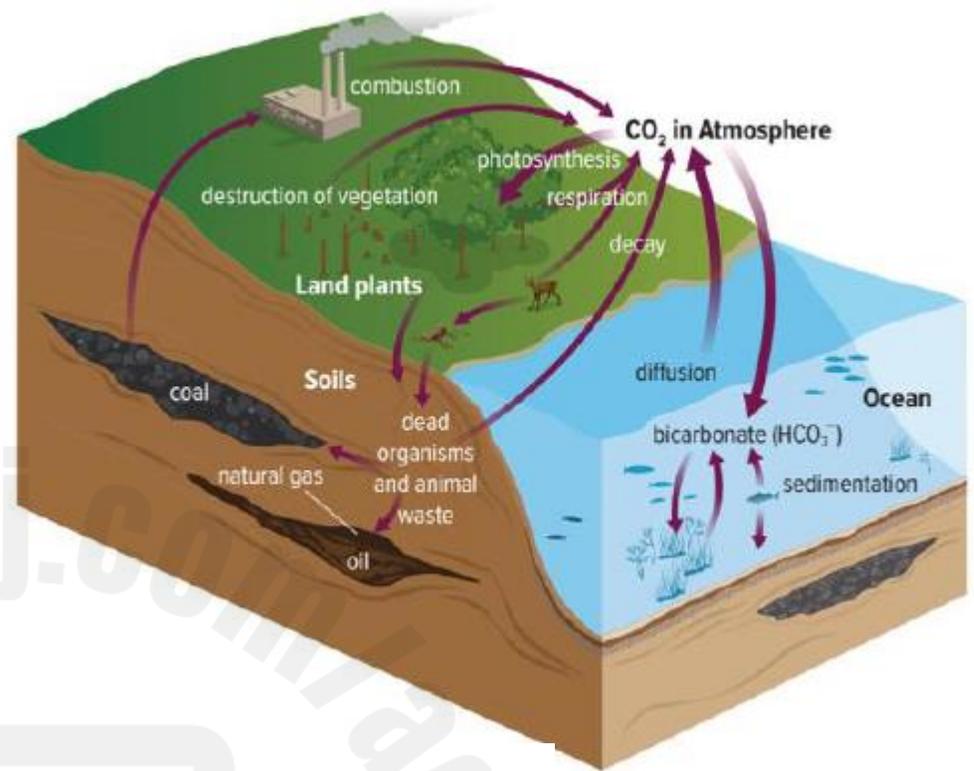
bacteria



blackberry plant



- i. Which organisms in the illustration are an autotroph?
- ii. What would the most **direct negative effects** if hawks and Owls disappeared from the image?



Study the carbon and oxygen cycle above.

Fill in the blanks using the correct words from the image.

- I. When plants and animals die, their remains break down in a process called _____, which returns carbon to the soil.
- II. Carbon dioxide in the atmosphere can move into the ocean through the process of _____.
- III. Animals release carbon dioxide into the atmosphere during the process of _____.
- IV. The process that removes trees and reduces the number of land plants is called _____.
- V. Waste from animals and dead organisms adds carbon to the _____ as it breaks down.

Check Your Progress

2. **Analyze** the role of photosynthesis and cellular respiration in the carbon cycle.

Check Your Progress

3. **Classify** a pet dog as an autotroph or heterotroph and as an herbivore, carnivore, or omnivore. Explain.