## تم تحميل هذا الملف من موقع المناهج الإماراتية

## حل مراجعة تجميعة أسئلة وفق الهيكل الوزاري منهج انسباير

موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف التاسع العام ⇦ علوم ⇦ الفصل الثالث ⇦ الملف

تاريخ إضافة الملف على موقع المناهج: 2024-06-09 16:42:04

إعداد: عدي العاصي

## التواصل الاجتماعي بحسب الصف التاسع العام

اضغط هنا للحصول على جميع روابط "الصف التاسع العام"

## روابط مواد الصف التاسع العام على تلغرام

| | | | |
|---|---|---|---|
| التربية الاسلامية | اللغة العربية | اللغة الانجليزية | الرياضيات |

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

| | |
|---|---|
| 1 | مراجعة عامة وفق الهيكل الوزاري |
| 2 | حل مراجعة نهائية للامتحان |
| 3 | تدريب على الاختبار النهائي |
| 4 | الهيكل الوزاري الجديد منهج انسباير المسار العام |
| 5 | الهيكل الوزاري الجديد منهج بريدج المسار العام |

# هيكل 9 عام علوم انسبير

# Science inspire 9 General

الفصل الثالث 2023-2024

اعداد الأستاذ عدي العاصي

| | | | |
|---|---|---|---|
| 1 | Explore the nature of sound waves, compare compression & rarefaction, define amplitude, Explore the hearing process in steps | Textbook, Q.1, figure 6 | 255, 256, 257 |

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 .

Amplitude is related to how close together the particles of the medium are in the compressions.

1. **Explain** how sound travels from your vocal cords to your friend's ears when you talk.

Vocal cord vibrates. These vibrations are transferred to the air as sound waves. The sound waves travel to another person's ears.

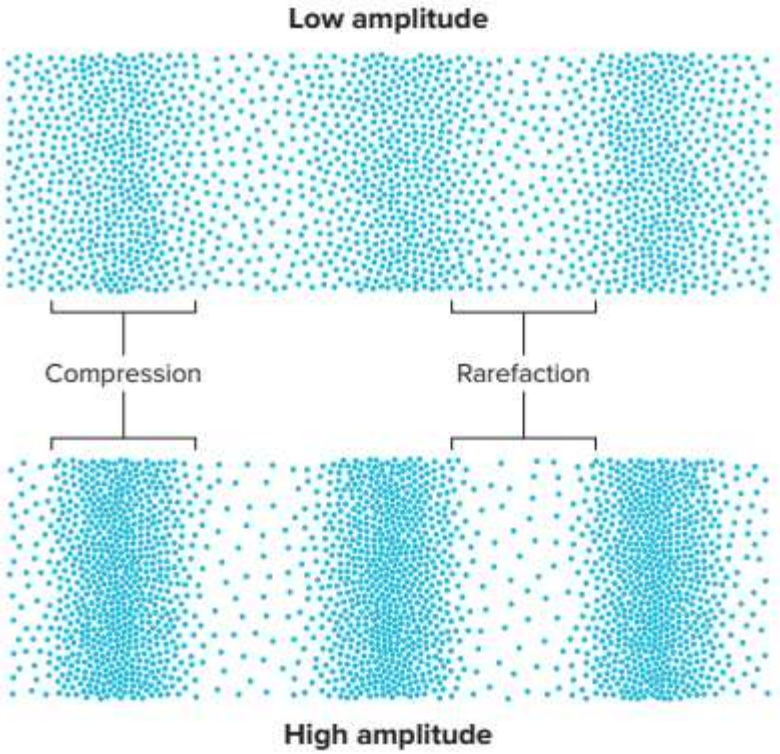


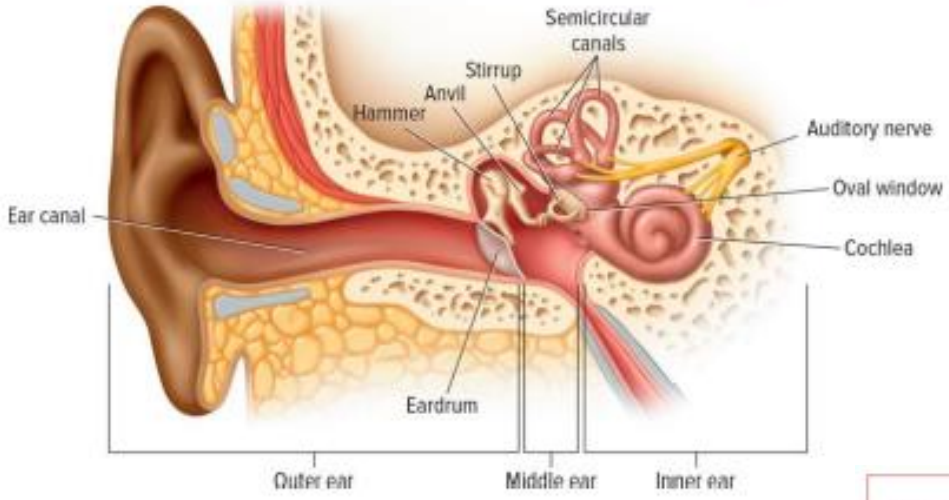

**Figure 6** The amplitude of a sound wave depends on the density of the medium in the compressions and rarefactions.

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

Figure 6 compares longitudinal waves of low amplitude and high amplitude. Increasing the amplitude of a longitudinal wave pushes the particles in that wave's compressions closer together.

Hearing Process.

1. The outer ear includes the part of the ear that we can see, the ear canal, and the eardrum; it gathers sound waves.
2. The middle ear includes the hammer, anvil, and stirrup; it amplifies sound.
3. The inner ear includes the cochlea; it translates sound waves into electrical signals.




6. The place in a longitudinal wave where particles are far from each other is called_____?

A Wavelength
B Compression
C Rarefaction

7. Property of longitudinal wave where particles are close together is called _____?

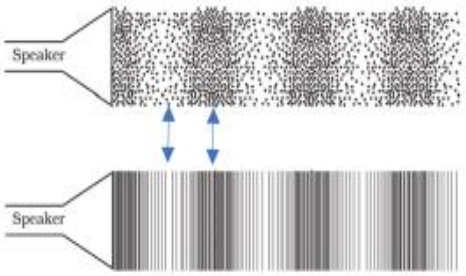
A Compression
B Wavelength
C Rarefaction

8. Sound Waves

A are Surface Waves.
B move in a circular motion.
C are Longitudinal waves.
D are Transverse Waves

Show answers Previous Next

The two types of regions that make up longitudinal waves are _____ .



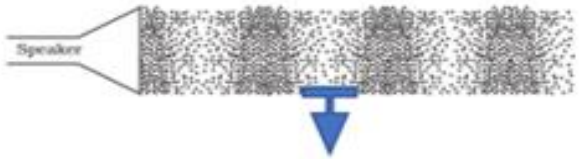

Compressions and extensions

Compressions and transmissions

Vibrations and transmissions

Compressions and rarefactions

**13- The point in the longitudinal wave in which the medium is most spread out is called what ?**



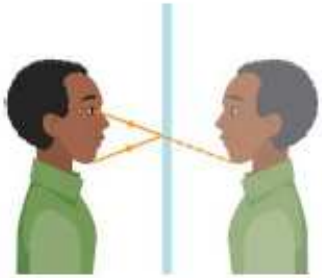
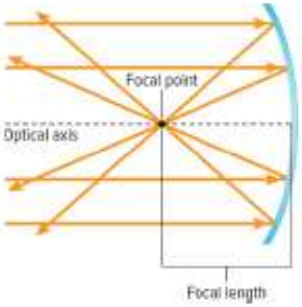
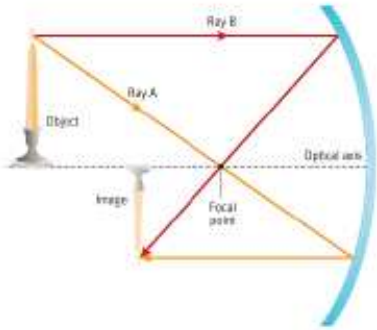

a-compression b- amplitude c- rarefaction d- wavelength

| | | | |
|---|---|---|---|
| 2 | List the properties of the formed image from mirrors or lenses when the object is at a different distance (location of object)<br><br>Explain why the reflected image in a plane mirror appears to be behind the mirror | Tables 1 & 2, figures 3, 4, 5, 6, 7, 8, 10, 11 | 331, 332, 333, 334, 336, 337 |

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

The brain interprets light rays as traveling in straight lines, so the reflected rays seem as though they came from an object that is behind the mirror.

Figures: 3, 4 and 5.

| Figure – 3. | Figure – 4. | Figure – 5. |
|---|---|---|
|  |  |  |
| Plane Mirror.<br><br>The light rays that reflect off of a plane mirror appear to originate behind that mirror. This gives the illusion that objects exist behind the plane mirror. | Concave mirror.<br><br>Parallel rays reflect through the focal point.<br><br>Light rays that travel through the focal point are reflected parallel to the optical axis. | Concave Mirror.<br><br>Ray A first passes through the focal point and then reflects parallel to the optical axis. Ray B is first parallel to the optical axis and then reflects through the focal point.<br><br>An image of the candle forms where the two rays converge. |

Figures: 6, 7 and 8.

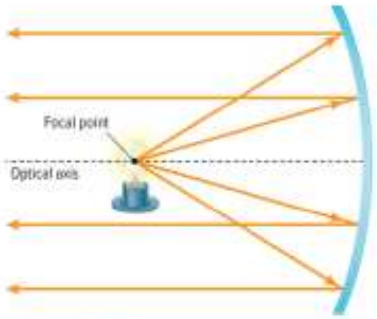
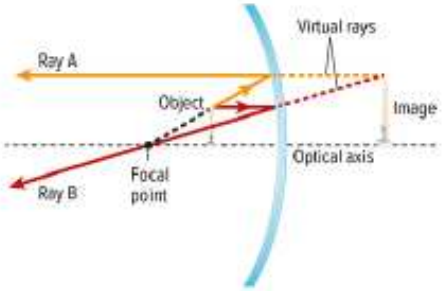
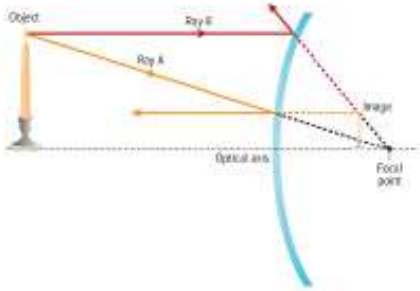
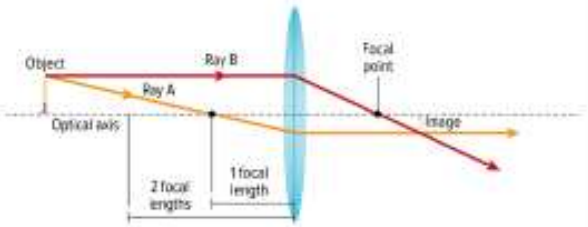
| Figure – 6. | Figure – 7. | Figure – 8. |
|---|---|---|
|  |  |  |
| Concave Mirror.<br><br>A light beam forms whenever someone places a light source at a concave mirror's focal point. | Concave Mirror.<br><br>An enlarged and virtual image forms where the virtual rays converge when an object is placed between a concave mirror and that mirror's focal point. | Convex Mirror.<br><br>Convex mirrors always form reduced, upright, virtual images. |

**Table 1 Images Formed by Mirrors**

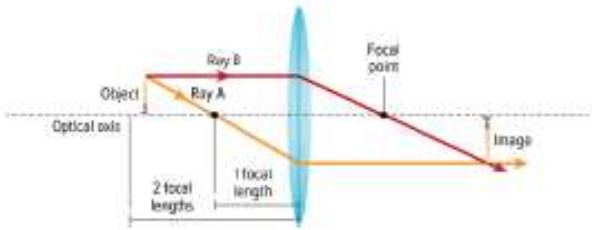
| Mirror Shape | Distance of Object from Mirror | Virtual/Real | Image Created Upright/Upside Down | Size |
|---|---|---|---|---|
| Plane | any distance | virtual | upright | same as object |
| Concave | object more than two focal lengths from mirror | real | upside down | smaller than object |
| | object 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 |

Convex Lens.

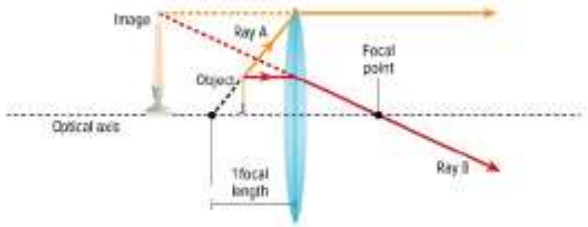
Figure 10 The image that a convex lens forms depends on the relative positions of the lens and the object.




A real, reduced, and upside-down image forms when an object is more than two focal lengths away from a lens.




A real, enlarged, and upside-down image forms when an object is between one and two focal lengths from a lens.




A virtual, enlarged, and upright image forms when an object is less than one focal length from a lens.

Concave Lens.

Figure 11 – A concave lens causes light rays to diverge.

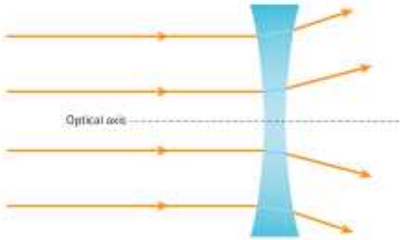



**Table 2 Images Formed by Lenses**

| Lens Shape | Location of Object | Virtual/Real | Image Created Upright/Upside Down | Size |
|---|---|---|---|---|
| Convex  | object beyond 2 focal lengths from lens | real | upside down | smaller than object |
| | object between 1 and 2 focal lengths | real | upside down | larger than object |
| | object within 1 focal length | virtual | upright | larger than object |
| Concave  | object at any position | virtual | upright | smaller than object |

5. Which of the following best describes the image formed by a plane mirror?

A real, upright and the same size as object
B virtual, upright and the same size as object
C real, inverted and reduced
D virtual, inverted and enlarged

6. The image of an object as formed by a plane mirror is located ____.

A any of the above, depending on the object's locaiton
B behind the mirror surface
C on the mirror surface
D in front of the mirror surface

7. A real image is always

A upright
B virtual
C behind the mirror
D in front of the mirror

## Quiz

2-What type of mirror causes rays parallel to the optical axis to be reflected to the focal point?

- a plane mirror
- B a concave mirror CORRECT
- a convex mirror
- a divergent mirror

## Quiz

3-What type of mirror can be used for magnification?

- A a concave mirror CORRECT
- a convex mirror
- a plane mirror
- a divergent mirror

## Quiz

4-What refers to the distance from the center of a mirror to the focal point?

- A focal length CORRECT
- optical axis
- radius of curvature
- index of concavity

## Quiz

5-In which of these locations would you be most likely to find a convex mirror?

- in a bathroom
- in a flashlight
- C on the side of a car CORRECT
- in a makeup kit

3. Image behind the mirror is

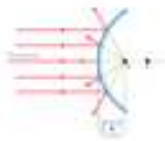
A upright
B real
C virtual
D upside down

4. image above the principal axis (PA) is

A virtual
B upside down
C real
D upright

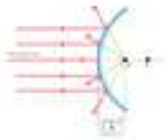
5. if the object is beyond C (2F)

A image is real, bigger and upright
B image is virtual, smaller and upside down
C image is real, smaller and upright
D image is real, smaller and upside down

8. 

In the image, all the rays meet at F, What is F

A focal length
B center of curvature
C focal point
D reflection

9. 

This image is showing a convex mirror because the image i (choose 2 answers)

A image is virtual
B rays meeting behind the mirror
C image is real
D rays meeting behind the mirror

10. this type of mirror is used in supermarkets to see around bends

A plane
B convex
C window
D concave

## Quiz

1-What do lenses do?

- reflect light
- B refract light CORRECT
- diffract light
- interfere with light

## Quiz

2-What kind of image does a convex lens produce when the object is more than 2 focal lengths from the lens?

- real, upright
- B real, upside down CORRECT
- virtual, upright
- virtual, upside down

## Quiz

3-What describes the images produced by a concave lens?

- always magnified
- always upside down
- always real
- D always virtual CORRECT

**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 |

**7) Light is refracted and spread out by**

- A) convex mirrors.
- B) concave mirrors.
- C) concave lenses.
- D) convex lenses.

**11) Which way does the lens shown bend incoming light that is parallel to the optical axis?**

- A) away from its optical axis
- B) toward its optical axis
- C) away from its edges
- D) toward its focal point

Which of the following is correct regarding the figure below?

(1) is concave lens, (2) is convex lens, and (3) is plane mirror

(1) is convex lens, (2) is concave lens, and (3) is plane mirror

Figures (1), (2), and (3) represent different types of mirrors

Figures (1), (2), and (3) form real image

If you stand 2m away from a plane mirror, how far away does your reflection appear to be from you?

**Learning Outcomes Covered**

- SCI.1.1.01.019

a. 2m

b. 4m

c. 8m

d. 1m

What is the difference between a lens and a mirror?

**Learning Outcomes Covered**

- SCI.1.2.01.011

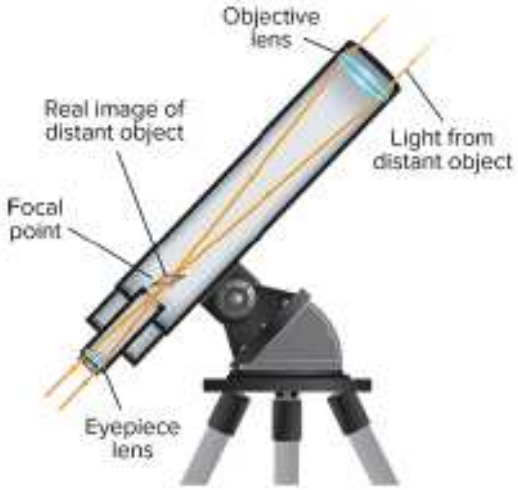
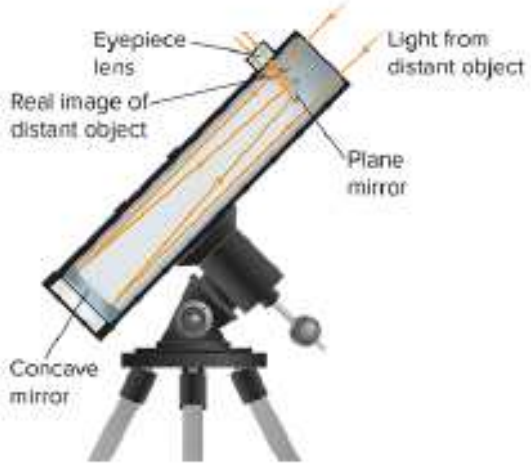
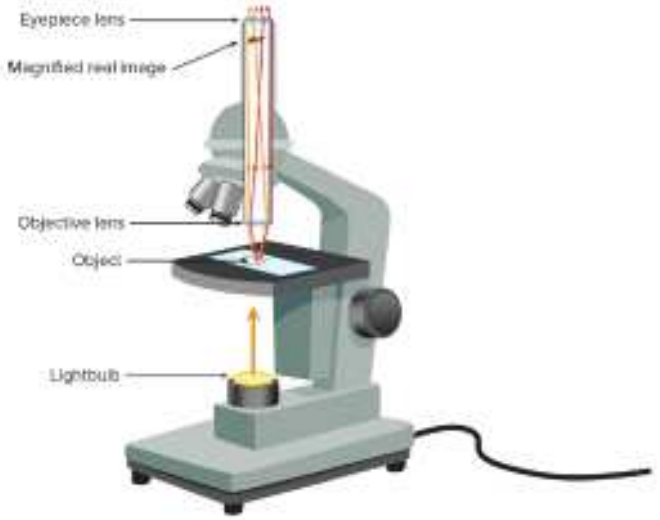
a. A lens does not have a focal point; a mirror has a focal point.

b. A lens reflects light; a mirror refracts light.

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

d. A lens refracts light; a mirror reflects light.

| 3 | Compare between optical instruments, their parts, and uses | Textbook, figures 17, 18, 20 | 343, 345 |
|---|---|---|---|

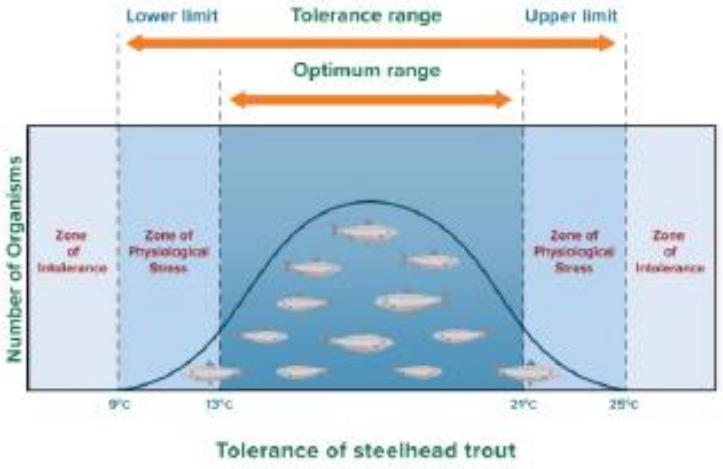
| Figure 17. A refracting telescope uses an objective lens and an eyepiece lens to gather light from distant objects. | Figure 18.A reflecting telescope uses two mirrors and an eyepiece lens to gather light from distant objects. | Figure 20. A microscope uses two convex lenses to magnify small objects. |
|---|---|---|
|  |  |  |
| Refracting Telescopes used for viewing bright, nearby objects like planets and the moon. | Reflecting Telescopes used for observing distant, faint objects like galaxies and nebulae. | In a microscope, unlike in a refracting telescope, more than one lens magnifies the object. |

| | | | |
|---|---|---|---|
| 4 | Compare between biotic and abiotic in an ecosystem and give examples on each<br>Define the terms: limiting factors and range of tolerance and apply them to the survival of "Steelhead Trout" example | Textbook, figures 5, 6 | 8, 9 |

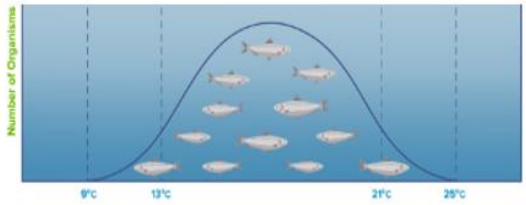
Biotic factor: any living factor in an organism's environment, such as fish, algae, frogs, and microscopic organisms.
Abiotic factor: any nonliving factor in an organism's environment, such as soil, water, temperature, and light availability.

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 induvial 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. |
|---|---|
|  |  |

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




- Zone of physiological stress
- Zone of intolerance
- Optimum range
- Upper limit

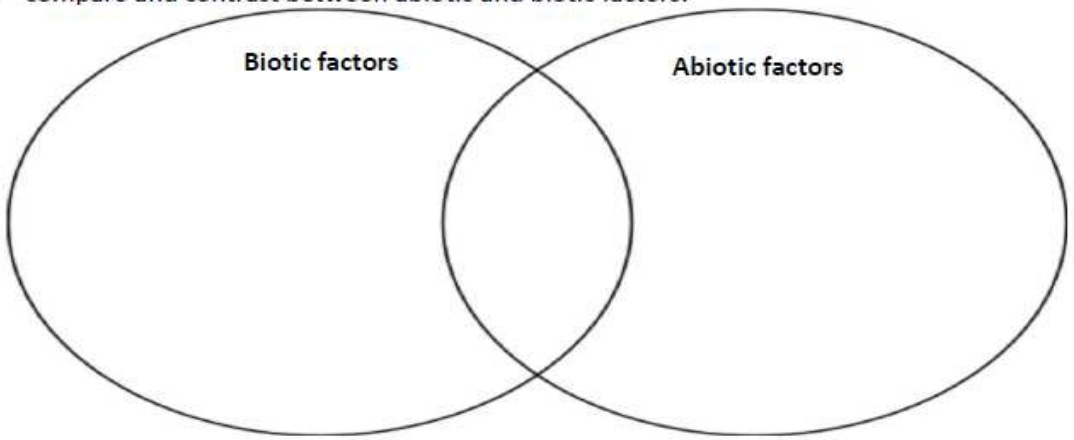
Which of the following is an example on abiotic factor?

Outcomes Covered

CI.4.4.01.094

- An ocean current of cold water
- A polar bear on an ice floe
- A Fungi on a rotting log
- A dense forest of tall trees

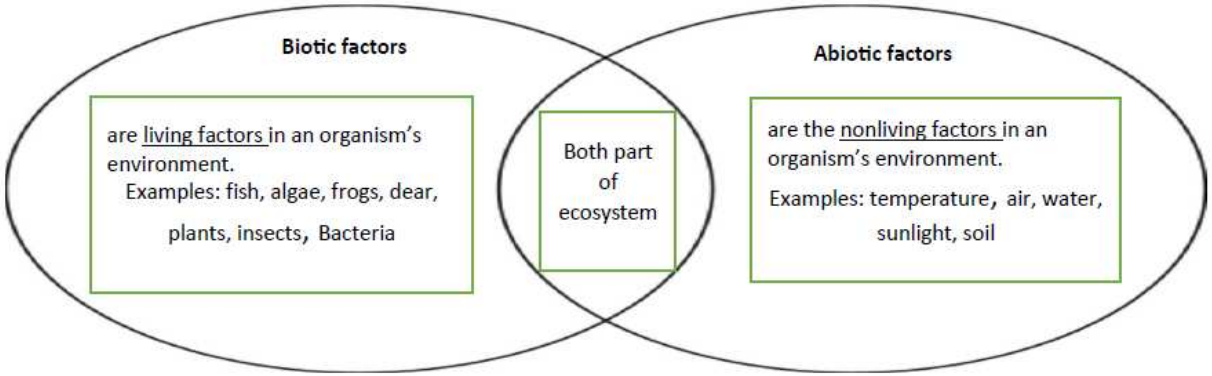
1. compare and contrast between abiotic and biotic factors:




2. Define the following:
   A. Limiting factor:_____
      Example _____

   B. Tolerance range: _____

compare and contrast between abiotic and biotic factors:

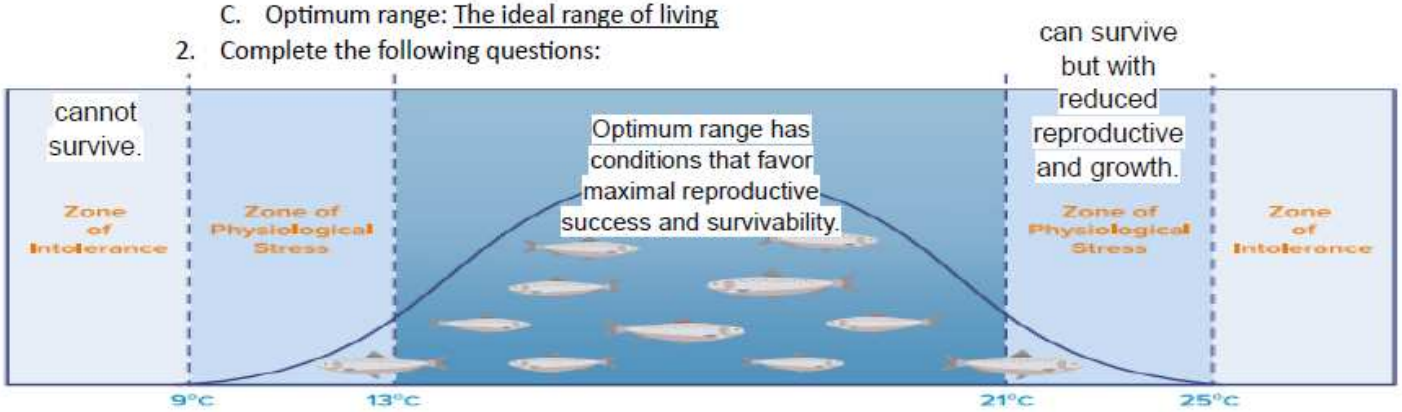



1. Define the following:
   A. Limiting factor: is any abiotic or biotic factor that restricts the numbers, reproduction, or distribution of organisms.
   Example (Temperature, sunlight, diseases, predator, pH)

   B. Tolerance range: is the ability of any organism to survive when subjected to biotic and abiotic factors is.

   C. Optimum range: The ideal range of living

2. Complete the following questions:




Tolerance of steelhead trout

- The limiting factor in the diagram is: ___**The temperature** ___
- Trout can tolerate water temperatures between __**9C-25C**_
- Most trout live in the optimum zone, which is the temperature range is ___**13C-21C**___
- 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 **T>9 – T<25**

| 5 | List the models of energy flow in an ecosystem, and compare avaliable energy, biomass, and population size in ecological pyramids | Textbook, figure 16 | 17, 18 |
|---|---|---|---|

Figure 16. Ecological pyramids are models to represent trophic levels in ecosystems.

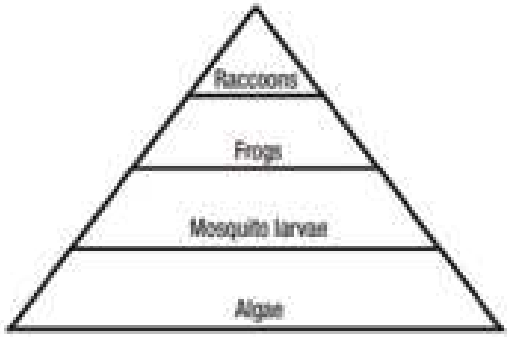

Biomass is total mass of living matter at each trophic level.

In a pyramid of energy, only 10 percent of all energy is transferred to the level above it. This occurs because most of the energy contained in the organisms at each level is consumed by cellular processes or released to the environment as heat.

Usually, the amount of biomass-the total mass of living matter at each trophic level-decreases at each trophic level.

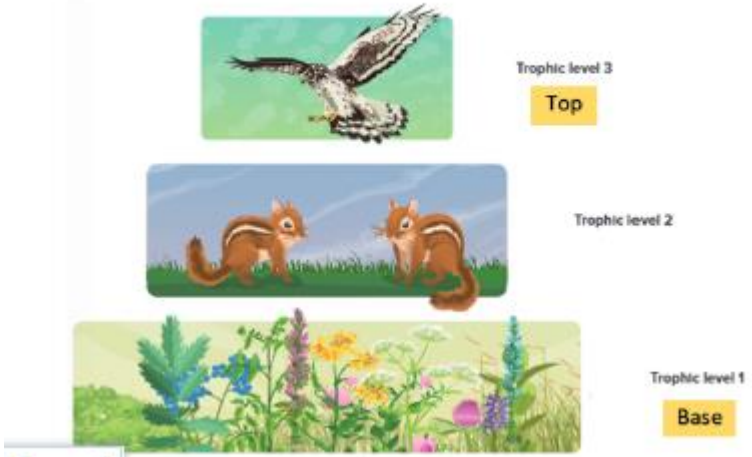
The relative number of organisms at each trophic level also decreases because there is less energy available to support organisms. The ecosystem determines the shape of an ecological pyramid.

12 According to the energy pyramid below, which organisms are the primary consumers?




A algae
mosquito larvae
C frogs
D raccoons

Why are there usually few organisms at the top of energy pyramid?




a. Humans hunt for organisms in this level

b. Energy is lost from one trophic level to the next, only 10% of energy is transferred

c. Organisms at the top are larger and require more living space

d. Energy is transferred to other form and only 50% will be available in the next trophic level

# Multiple choice

| | | | |
|---|---|---|---|
| 6 | Find the speed of a sound wave and assign the medium the sound wave is passing through | Textbook, table 1 | 253, 254 |

**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:

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

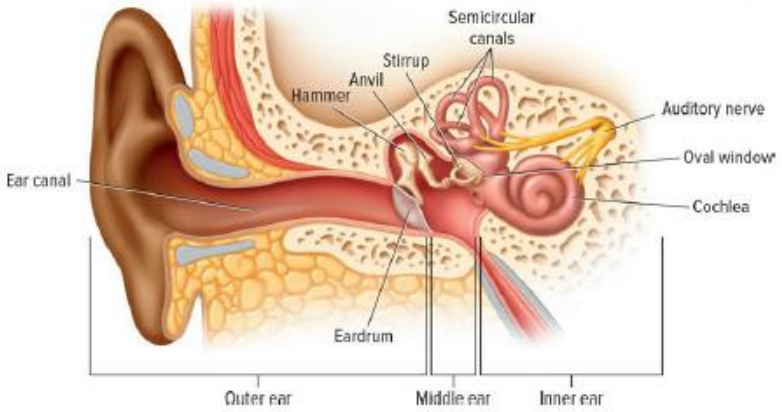
$$\text{Speed} = \frac{2000}{4.0}$$

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

Medium is Cork.

| | | | |
|---|---|---|---|
| 7 | Identify the parts of the human ear, their properties, and functions | Textbook, figures 4, 5 | 255, 256 |

Figure 4: The three sections of the ear gather sound, amplify, and convert sound into an electric signal.




| | The outer ear: (Canal & Drum) | The middle ear: (The three bones: hammer, anvil, and stirrup), semicircular canals and oval window). | The inner ear. (Cochlea and Auditory nerve) |
|---|---|---|---|
| Function | Gathering sound waves and transmitting sound waves into the middle ear. | Amplifying the sound waves. | Convert sound waves to nerve impulses. |

15. Which part of the ear is involved in amplifying sound?

A ear canal
B outer ear
C anvil
D auditory nerve

16. Which part of the ear gathers sound waves?

A middle ear
B auditory nerve
C outer ear
D inner ear

17. Hearing loss is usually the result of damage to which part?

A stirrup
B ear canal
C hair cells
D outer ear

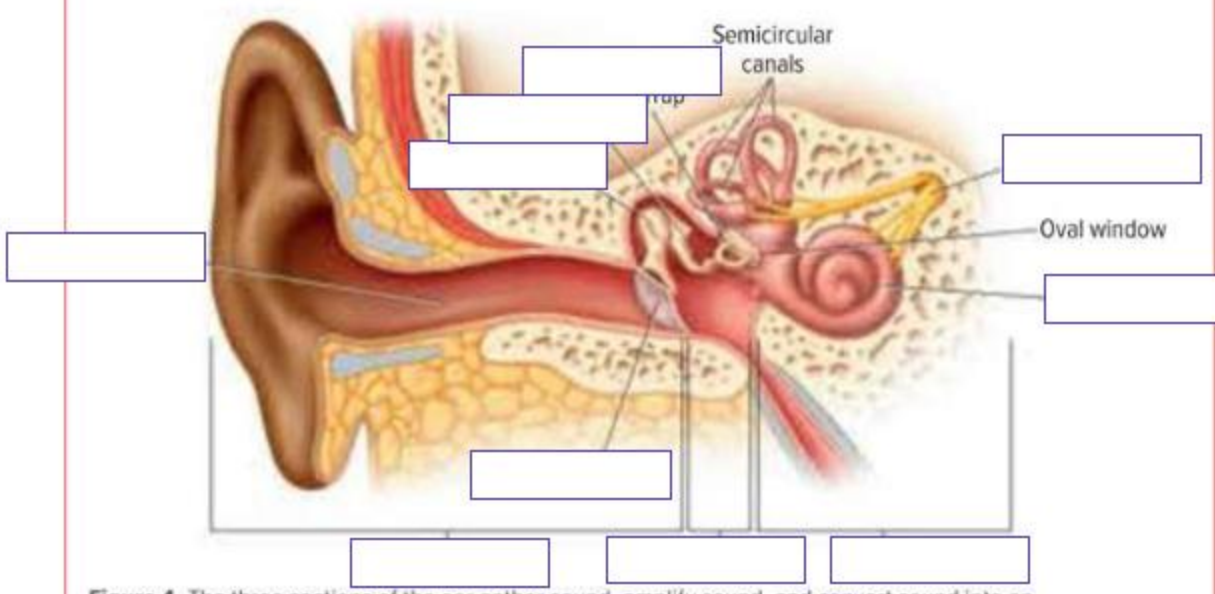



**Figure 4** The three sections of the ear gather sound, amplify sound, and convert sound into an electric signal.

**Identify** *the three sections of the human ear.*

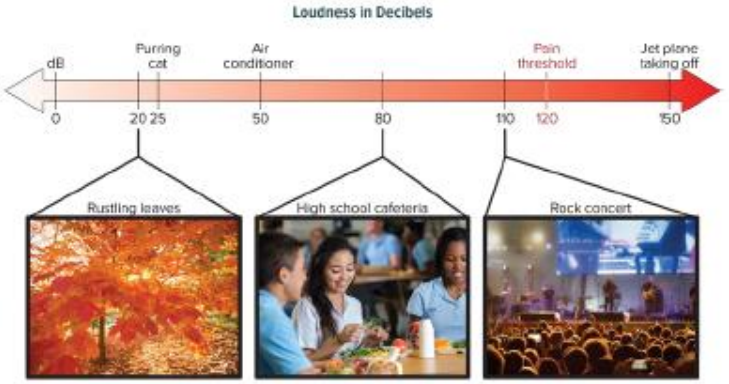
Ear canal
Outer ear
Middle ear
Inner ear
Cochlea
Auditory nerve
Stirrup
Anvil
Hammer

| 8 | Compare and relate loudness and intensity in a sound wave | Textbook, figures 7, 8 | 258, 259 |
|---|---|---|---|

Intensity is amount of energy that flows through a certain area in a specific amount of time.
Loudness is human perception of sound volume, depends primarily on intensity.

Figure 7. The intensity of the sound waves from each computer speaker is related to the rate at which energy passes through an imaginary rectangle and how far the listener is from the speaker.

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




**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

| Intensity | Loudness |
|---|---|
| Is the amount of energy that passes through a certain area in a specific amount of time. | Is the human perception of sound volume and primarily depends on sound intensity. |
| Turn up volume→greater energy is transferred→ greater intensity.<br><br>Turn down volume→ reduce the energy→ reduce the intensity. | A **decibel** is a unit of sound intensity.<br><br>• Every increase in 10 dB on the decibel scale represents a tenfold increase in intensity.<br>**Example:**<br>**50 dB is 10 More intense than a 40 dB.**<br><br>**60 dB is 10 x 10 or 100 times more intense than 40 dB.**<br><br>**100 dB is $10^7$ or 10 million times more than 30 dB** |
| • Sound energy **decreases** with distance???<br>**Because**<br>1. **The energy that a sound wave carries spreads out.**<br>2. **some of the sound's energy is transformed to other forms of energy as it travels.** | **Identify** the following key characteristics of sound intensity.<br>units of sound intensity: decibels (db)<br>level of faintest sound humans can hear: 0 db<br>sustained sound level that damages human hearing: 90 db<br>short-duration sound level that can cause pain: 120 db<br><br>**Wearing ear protection (earplugs) can help to protect ear.** |

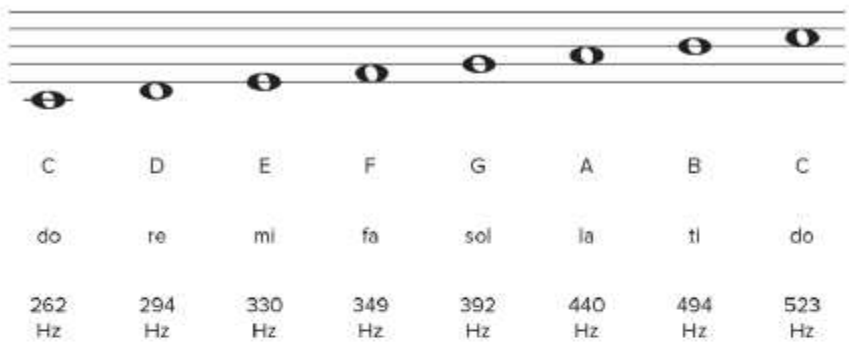
Which of the following will change if you turn up a radio's volume?


a. Intensity and loudness

b. Wave velocity and intensity

c. Frequency and amplitude

d. Intensity and pitch

| Figure 9 Every musical note has a distinct frequency, which gives that note a distinct pitch. | |
|---|---|
|  | Frequency is a measure of how many wavelengths passes a particular point each second, measured in hertz (Hz).<br><br>Pitch is perception of how high or low a sound is; related to the frequency of the sound waves. |

Question. Using the musical scale in Figure 9, make a table showing how many wavelengths will pass you in one minute for each note. What is the relationship between frequency and the number of wavelengths per minute? $t = 60$ s.

$$\text{Frequency } (f) = \frac{\text{number of wavelengths } (n)}{\text{time } (t)} \Rightarrow n = f \times t$$

| Frequency ($f$) | 262 Hz | 294 Hz | 330 Hz | 349 Hz | 392 Hz | 440 Hz | 494 Hz | 523 Hz |
|---|---|---|---|---|---|---|---|---|
| Number of Wavelength (n) | 15720 | 17640 | 19800 | 20940 | 23520 | 26400 | 29640 | 31380 |

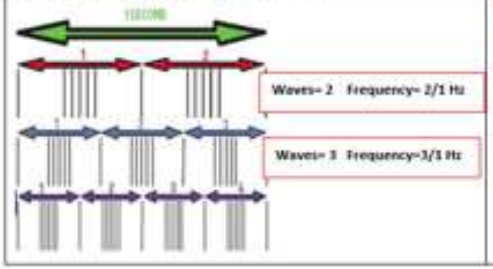
There is a direct proportional relationship between the frequency and the number of wavelengths per minute.

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

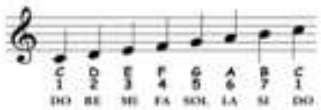
Longitudinal wave (sound) the frequency is the number of compressions or rarefactions that pass by each second.

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.




**How pitch changes when frequency increases?**


**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

**15) Which will you hear as the highest pitch?**

- **A)** sound wave with frequency of 10,000 Hz
- **B)** sound wave with frequency of 50 Hz
- **C)** sound wave with frequency of 15,000 Hz
- **D)** sound wave with frequency of 30,000 Hz

**16) The __ is the frequency at which a material tends to vibrate when it is disturbed.**

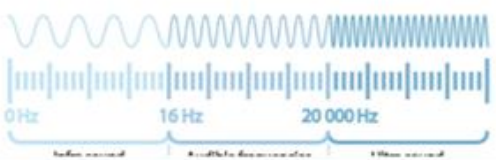
- **A)** pitch
- **B)** quality
- **C)** resonance
- **D)** natural frequency

**21)** Fill in the blanks using the available answer choices.

**Increasing the frequency of a sound wave will change the _____ of a sound.**
(Blank 1)

Blank 1 options
- loudness
- intensity
- pitch

Which sound will you hear as the highest pitch?




- Sound wave with frequency of 15,000 Hz
- Sound wave with frequency of 30,000 Hz
- Sound wave with frequency of 10,000 Hz
- Sound wave with frequency of 50 Hz

Frequency is measured in ___

answer choices

- meters
- hertz
- decibels
- seconds

_____ is the number of times a sound wave vibrates in a given time.

answer choices

- intensity
- frequency
- wavelength
- amplitude

The measure of how high or low a sound is:

answer choices

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

| 10 | Define the Doppler effect and apply it on examples: moving sound sources, moving observers, and electromagnetic waves | Textbook, figures 10, 11 | 261, 262 |
|---|---|---|---|

Doppler effect is the change in the wave frequency that occurs due to the relative motion of the wave as it moves toward or away from an observer.

Figure 10

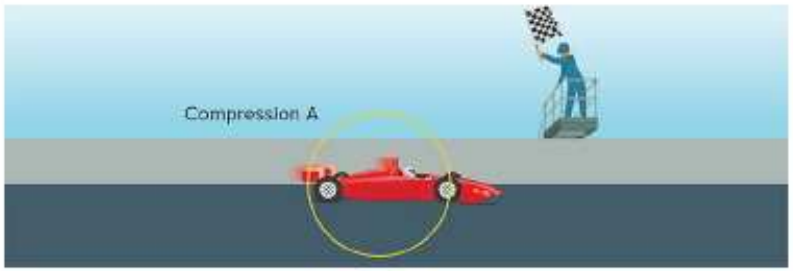
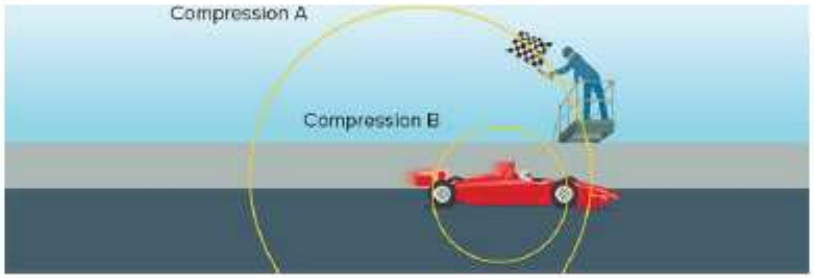
| The car sends out a sound wave as it moves, producing compression A. Compression A continues to move outward, and the car continues to move forward. | The car is closer to the flagger when it creates compression B. Compressions A and B are closer together in front of the car, so the flagger hears a higher pitched sound. |
|---|---|
|   |   |

Figure 11.

| | |
|---|---|
|  | Police use radar guns to measure the speeds of motorists on highways. Radar gun's function based on the Doppler effect.<br><br>Question: 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. The compressions would be closer together in front of and farther apart behind the faster moving car. This results in a greater frequency in front of the faster moving car but a lesser frequency behind the faster moving car. |

v

What is the Doppler Effect?

answer choices

A change in frequency due to the relative motion of a wave source and an observer

When a wave overlaps with another wave

When a wave bounces off of another object

When a wave bends due to traveling through a different medium

You are standing on the side of the road when a police car races past you with its siren on. After the police car passes you, what happens to the pitch of the siren?

answer choices

It increases

It decreases

It turns red

When the car moves AWAY from you, its horn seems...

answer choices

Low pitched

High pitched

Normal

Look at the picture. Who is experiencing a higher pitched sound?

answer choices

Observer A

Observer B

There's no difference

When an ambulance move TOWARD you it sounds _____ pitched.

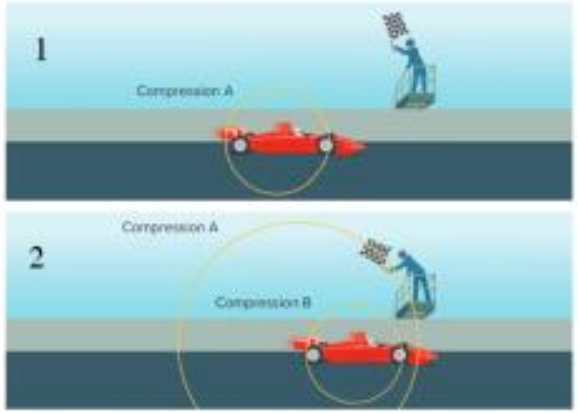
answer choices

high

low

medium


Which statement is correct according to the image below?



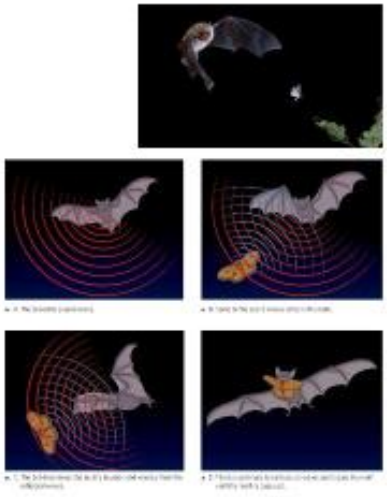
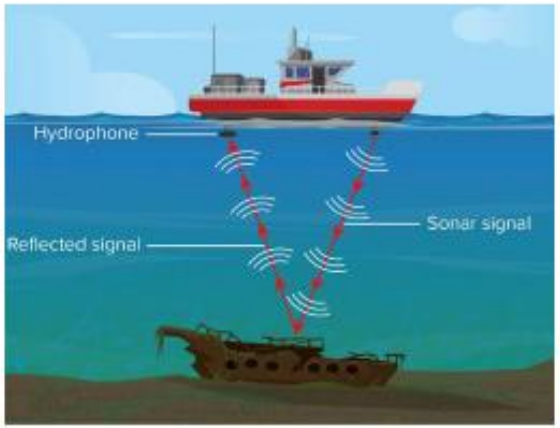

a. In 1, the flagger hears a higher pitched sound, and this is related to the Doppler effect

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

| 11 | Describe different ways how sound is used and give examples on each | Textbook, Figures 19, 20, 21, 22 | 269, 270, 271, 272 |
|---|---|---|---|

| Figure – 19. | Figure – 20. | Figure – 21. | Figure – 22. |
|---|---|---|---|
|  |  |  |  |
| Cloth drapes, cushioned seats, and carpeted floors help reduce reverberations in this concert hall. | Bats and dolphins navigate and locate prey by using echolocation. | People use sonar to find objects that are underwater. | Ultrasonic waves are directed into a pregnant woman's uterus to form images of her fetus. This allows doctors to safely monitor the fetus's growth. |

Acoustics: Study of sounds.

Echolocation: process by which objects are located by emitting sounds and interpreting the sound waves that are reflected from those objects.

SONAR: SOund Navigation And Ranging: use of sound waves to detect and measure objects underwater.

Ultrasound: sound waves with a frequency above 20,000 Hz; cannot be heard by humans.

1. Which is the study of sound?

- sonar
- B acoustics CORRECT
- echolocation
- radar

Quiz

3. Which process does this illustration represent?

- echolocation
- C sonar CORRECT
- acoustics
- ultrasound

2. Which process do bats use to find food?

- A echolocation CORRECT
- acoustics
- sonar
- ultrasound

Quiz

4. Which process is used in medicine to examine parts of the body, including the heart, liver, gallbladder, pancreas, spleen, kidneys, breasts, eyes, and unborn babies?

- echolocation
- sonar
- B ultrasound CORRECT
- radar

Which of the following describe the process shown in the figure below?

a. Echolocation

b. Ultrasonic

c. Resonance

d. Reverberation

What is the name of the signal used to locate a sunken ship as shown in the figure below?


Echolocation

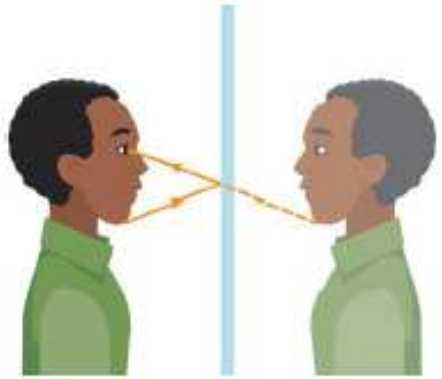
Ultrasound

Sonar

Ultrasonic

| 12 | Describe the characteristics of plane mirror image (virtual, upright, reversed left to right, and same size as object) | Textbook, figure 3 | 330 |
|---|---|---|---|

Figure 3 The light rays that reflect off of a plane mirror appear to originate behind that mirror. This gives the illusion that objects exist behind the plane mirror.



Images formed by a plane mirror are always:

1) virtual
2) upright
3) reversed left to right.
4) same size as object

5. Which of the following best describes the image formed by a plane mirror?

A real, upright and the same size as object
B virtual, upright and the same size as object
C real, inverted and reduced
D virtual, inverted and enlarged

6. The image of an object as formed by a plane mirror is located ____.

A any of the above, depending on the object's locaiton
B behind the mirror surface
C on the mirror surface
D in front of the mirror surface

7. A real image is always

A upright
B virtual
C behind the mirror
D in front of the mirror

1. 

Type of mirror found in a bathroom...

A Plane
B Concave
C Convex

If you stand 2m away from a plane mirror, how far away does your reflection appear to be from you?

**utcomes Covered**

1.1.01.019

2m

4m

8m

1m

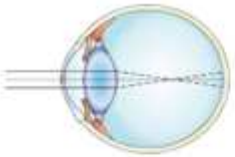
| 13 | Describe the eye vision problems and assign the type of lens to correct it | Textbook, figures 14, 15 | 340, 341 |
|---|---|---|---|

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

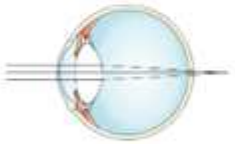
Corrected by a convex lens.

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.

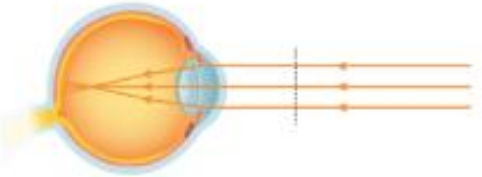
54.  The image shows someone who is suffering from?

(A) short sightedness
(B) no eye condition
(C) long sightedness

55.  The image shows someone who is suffering from?

(A) no eye condition
(B) short sightedness
(C) long sightedness

This diagram of a human eye illustrates a common vision problem. Which of the following statements is correct?



a. The vision problem is nearsightedness and the type of lens to correct it is concave

b. The vision problem is nearsightedness and the type of lens to correct it is convex

c. The vision problem is farsightedness and the type of lens to correct it is convex

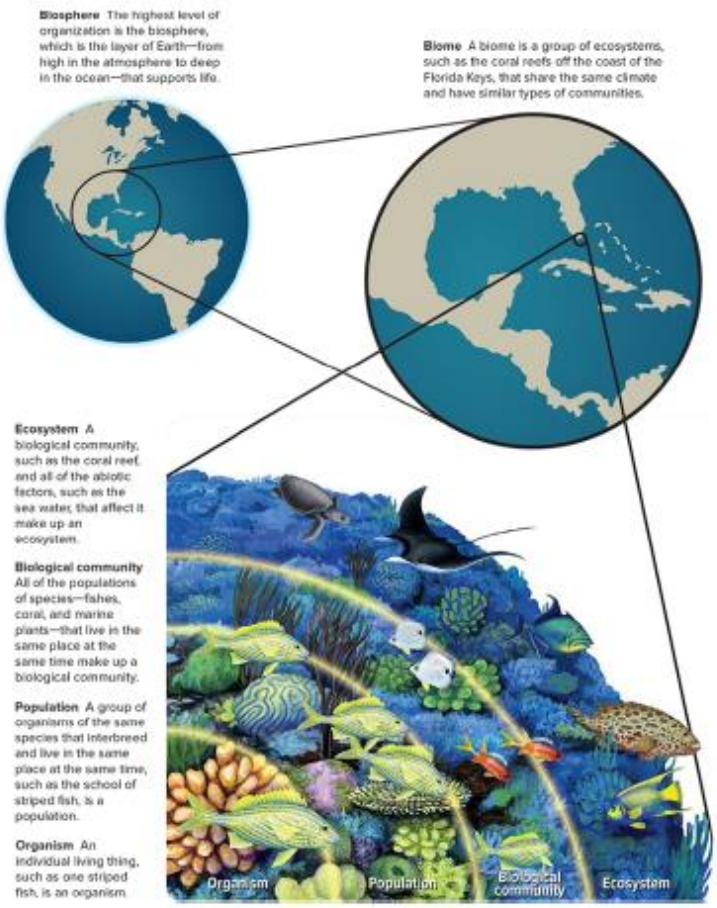
d. The vision problem is farsightedness and the type of lens to correct it is concave

| 14 | Define the levels of organization in the environment and order them from the simplest level (organism) to the most complex level of the biosphere | Textbook, figure 7 | 10, 11 |
|---|---|---|---|

# LEVELS OF ORGANIZATION

organism → population → biological community → ecosystem biome → biosphere

Figure 7. Visualizing Levels of Organizations.




Population: group of organisms of the same species that occupy the same geographic place at the same time.

Biological community: Al the interacting populations of different species that live in the same geographic location at the same rime.

Biome: Large group of ecosystems that share the same climate and have similar types of communities.

Habitat: Physical area in which an organism lives.

Niche: role, or position, of an organization in its environment.

Ecosystem: biological community and all the nonliving factors that affect it.

5-What is the name for **a group of interacting populations** that occupy the **same area** at the same time?

A. ecosystem

B. habitat

C. biological community

D. biotic collection

6- Which defines **habitat**?

A. all of the biotic factors in an ecosystem

B. an area where an organism lives

C. an area in which various species interact

D. the role or position that an organism has

Which of the following descriptions about the organization of an ecosystem is **correct**?

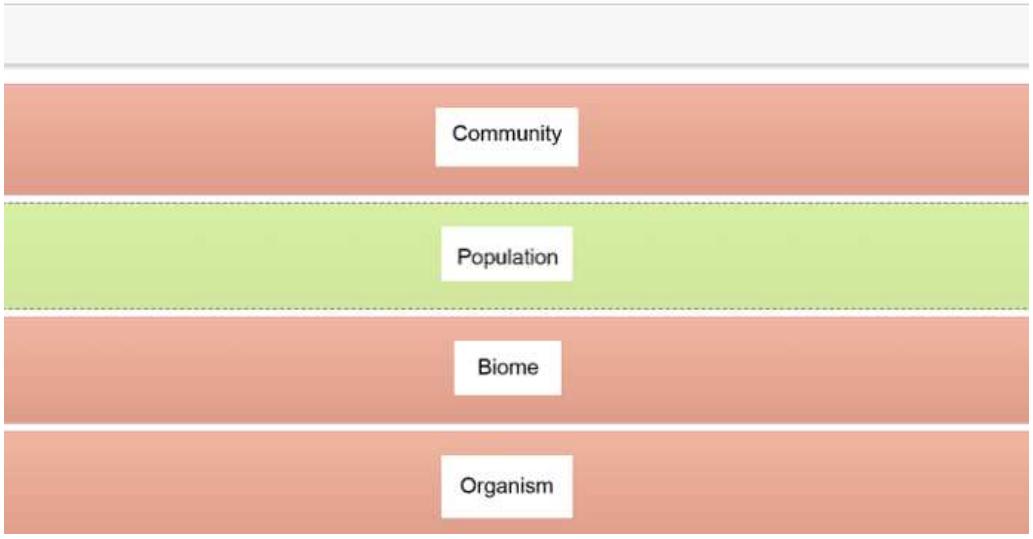
a. Communities make up organisms, which make up populations.
(Communities < organisms < populations)

b. Populations make up organisms, which make up communities.
(Populations < organisms < communities)

c. Organisms make up communities, which make up populations.
(Organisms < communities < populations)

d. Organisms make up populations, which make up communities.
(Organisms < populations < communities)

What level of organization is all of the same species in a specific area or region at a certain time?



Ecology is concern in studying organisms and their interaction with the environment in the biosphere. Which of the following is included in the ***Biosphere?***

| | |
|---|---|
| i. | Earth's surface, surrounding atmosphere, and all locations below Earth's surface that support life |
| ii. | All living and non-living things in an area that make up an ecosystem |
| iii. | Landmasses, bodies of freshwater and saltwater |

a. i only

b. i & ii only

c. i & iii only

d. i, ii & iii

| 15 | List the symbiotic relationships between organisms, and relate to examples | Textbook, figures 9, 10, 11 | 12, 13, 14 |
|---|---|---|---|

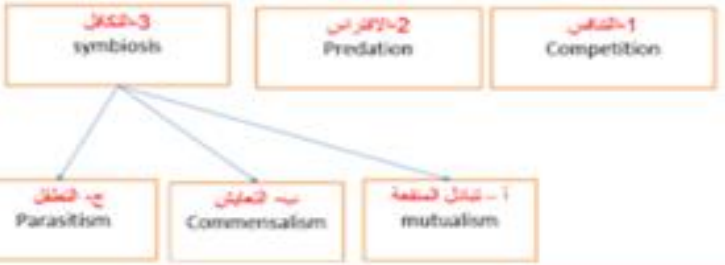
Symbiosis: Close mutualistic, parasitic, or commensal association between two or more species that live together.

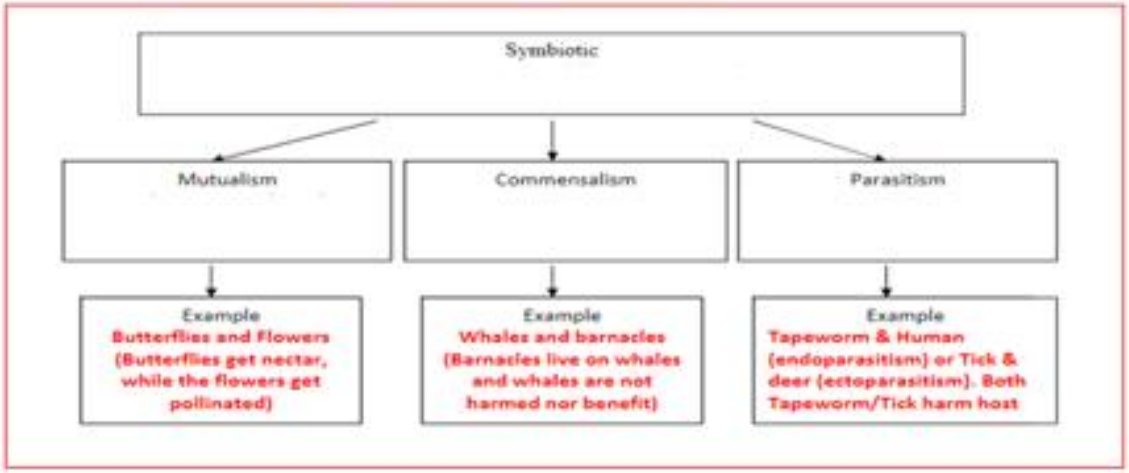
There are three different kinds of symbiosis: mutualism, commensalism, and parasitism.

Mutualism: relationship in which both organisms benefits.
Commensalism: symbiotic relationship in which one organism benefits and the other organism is neither helped nor harmed.
Parasitism: symbiotic relationship in which one organism benefits at the expense of another organism.

| Figure 9. During droughts, animals compete for water; when water is plentiful, competition decreases. | Figure 10. Algae live in this sloth's fur as part of a symbiotic relationship. | Figure 11. This tomato hornworm is host to a number of pupating wasps. This case of parasitism is unusual because the wasps will likely kill their host. |
|---|---|---|
|  |  |  |
| Competition. | Mutualism | Parasitism |

Organisms that live together in a biological community constantly interact. These interactions, along with the abiotic factors, shape an ecosystem. Interactions include.




Direction: Study the pictures below. Choose the correct ecologocal relationship that corresponds to the picture. Just click the correct answer.

COMMENSALISM
PREDATION
MUTUALISM
PARASITISM

COMMENSALISM
PREDATION
MUTUALISM
PARASITISM

COMMENSALISM
PREDATION
MUTUALISM
PARASITISM

COMMENSALISM
PREDATION
MUTUALISM
PARASITISM

Using the following example and the figure below, what is the type of symbiotic relationship shown?

- The sloth receives protection by camouflage from the green colored algae.

  The algae take the sloth's fur as shelter and the fur provide the algae with moisture it need to survive.

a. Mutualism

b. Parasitism

c. Commensalism

d. Predator–prey

What is the type of symbiotic relationship shown in the example below?

- The tomato hornworm is infected with cocoons of wasp.

  The pupating wasps will mostly likely kill their host.

Mutualism

Parasitism

Commensalism

Predator-prey

| 16 | Define autotrophs, heterotrophs, and detritivores and compare their importance in the ecosystem and impact on energy flow | Textbook, figure 12, 13 | 15, 16 |
|---|---|---|---|

| Figure 12. | Figure 13. |
|---|---|
|  |  |
| This wolf is a heterotroph that is about to consume another heterotroph, a moose. | This fungus is obtaining food energy from the dead log. Fungi are decomposers that recycle materials found in dead organisms. |

Autotroph: Organisms that captures energy form sunlight or inorganic substances to produce its own food; provides the foundation of the food supply for other organisms; also called a producer.

Heterotroph: Organisms that cannot make its own food and gets its nutrients and energy requirements by feeding on other organisms; also called a consumer.

Herbivore: heterotroph that eats only plants.
Carnivores: heterotroph that preys on other heterotrophs
Omnivores: heterotroph that consumes both plants and animals.

Detritivores: heterotroph that decomposes organic material and returns the nutrients to soil, air, and water, making the nutrients available to other organisms.

1- **Identify** how **energy flows** through an ecosystem in a typical food chain.

A. from an autotroph to a heterotroph
B. from a heterotroph to an autotroph
C. from a carnivore to an herbivore
D. from an omnivore to an herbivore

2- What type of **organism is the foundation** of all ecosystems?

A. autotroph
B. herbivore
C. heterotroph
D. decomposer

3- How do **detritivores** obtain their energy in an ecosystem?

A. They feed on fragments of dead plants and animals.
B. They feed on organisms by releasing digestive enzymes.
C. They get energy from inorganic substances to make food
D. They use chlorophyll to capture energy from the sun

4- Which type of organism exists at all trophic levels **except the first trophic level**?

A. carnivores
B. herbivores
C. autotrophs
D. Heterotrophs

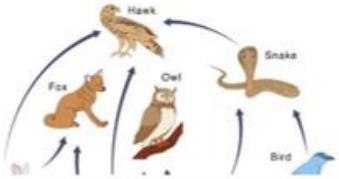
5- What type of **organism returns nutrients** to an ecosystem?

A. decomposer
B. primary producer
C. secondary producer
D. top level consumer

18- A (an) ____ **collects energy** from sunlight or inorganic substances to **produce food**.

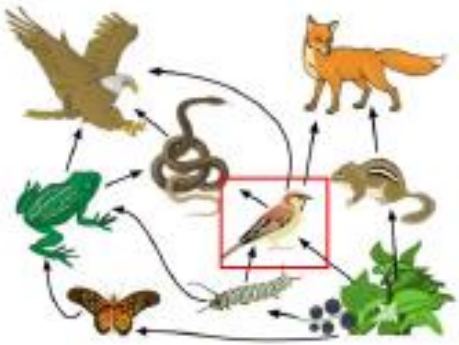
A) heterotroph
B) herbivore
C) detritivore
D) autotroph

In the following food web, under what category the labeled grasshopper is classified?



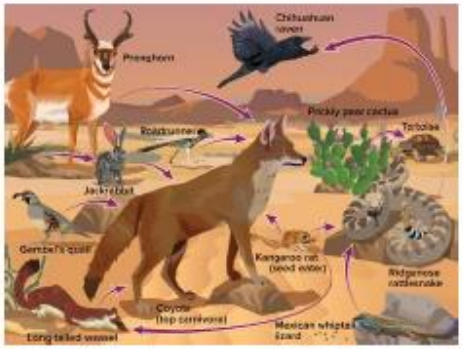

Autotroph
Omnivore
Detritivore
Herbivore

In the following food web, under what category the labeled mockingbird is classified?

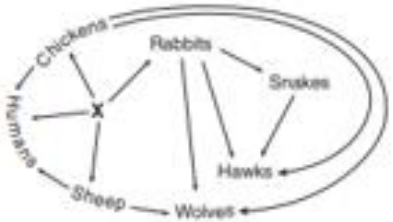


a. Autotroph
b. Omnivore
c. Detritivore
d. Herbivore

| 17 | Label organisms in food chains, food webs and ecological pyramids to be herbivores, carnivores, or omnivores | Textbook, figure 14, 15, 16 | 15, 16, 17 |
|---|---|---|---|

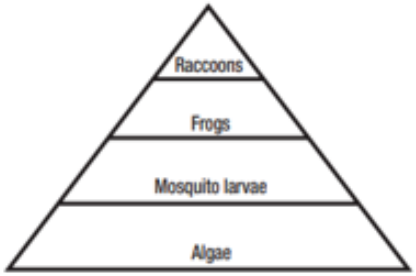
| Figure 14. | Figure 15. | Figure 16. |
|---|---|---|
|   |   |   |
| A food chain is a simplified model representing the transfer of energy from organism to organism. | A food web is a model of the many ways in which energy flows through organisms. | Ecological pyramids are models to represent trophic levels in ecosystems. |

**9** A food web is represented in the diagram below. What does the X mostly likely represent?



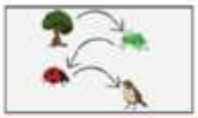

**A** autotrophs
**B** decomposers
● heterotrophs
**D** parasites

**12** According to the energy pyramid below, which organisms are the primary consumers?




**A** algae
● mosquito larvae
**C** frogs
**D** raccoons

The picture below refers to: تشير الصورة المبينة أدناه الى:



○ only consumers فقط المستهلكون .a
○ Trophic levels المستوى الغذائي .b
○ food web شبكة غذائية .c
○ food chain سلسلة غذائية

| | | | |
|---|---|---|---|
| 18 | Assign on a diagram the processes that occur in a biogeochemical cycle (water, oxygen and carbon, nitrogen, and phosphorous)<br>Predict the environmental impact of disturbance of concentration levels any of them and how it disrupt thier cycle | Textbook, figures 18, 19, 20, 21 | 20, 21, 22, 23 |

Figure 18. The water cycle is the process by which water is continuously cycled through the biosphere.

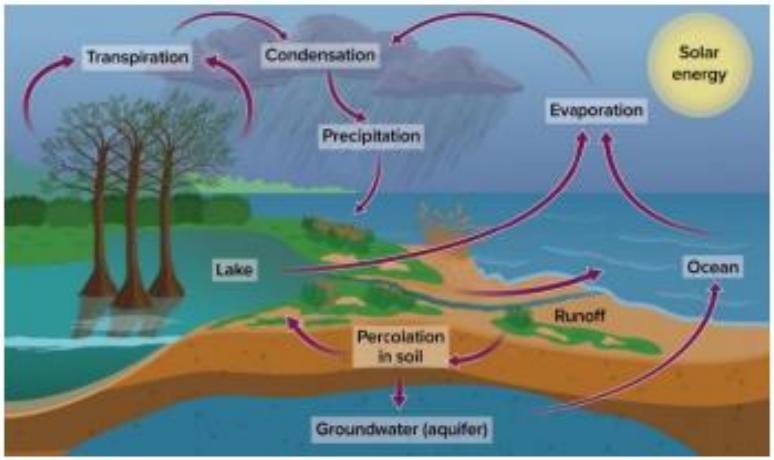



Figure 19. The diagram shows how carbon and oxygen cycle through the environment.

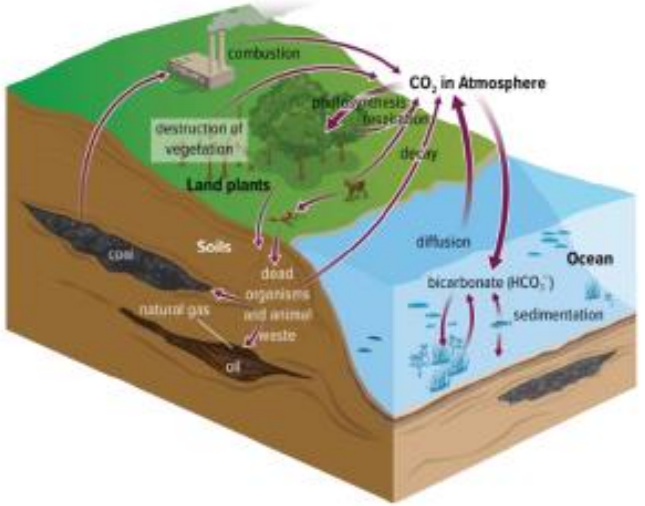


Figure 20. The white cliffs in Dover, England, are composed almost entirely of calcium carbonate, or chalk. The carbon and oxygen found in these cliffs are in the long-term part of the cycle for carbon and oxygen.

Figure 21. Nitrogen is used and reused as it is cycled continuously through the biosphere.

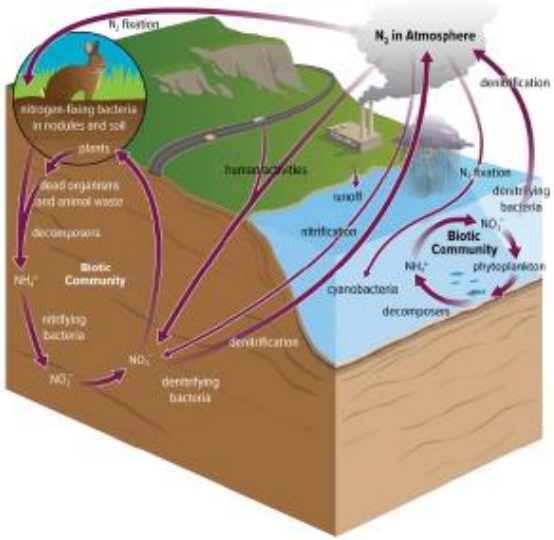
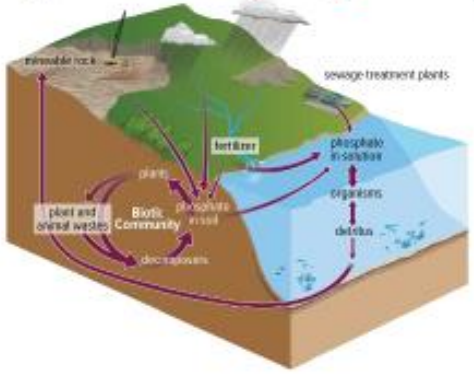



Figure 22. The phosphorus cycle has a short – term cycle and a long – term cycle.



| | | | |
|---|---|---|---|
| 19 | Define biodiversity, genetic biodiversity, species diversity, and ecosystem diversity<br>And list the importance of biodiversity: direct economic value, indirect economic value, aesthetic and scientific values | Textbook, figures 1, 2, 3, 4 | 30, 31, 32 |

| Figure 1. | Figure 2. | Figure 3. |
|---|---|---|
|  |  |  |
| These Asian ladybird beetles, *Harmonia axyridis*, demonstrate some visible genetic diversity because of their different colors. | Many species gather at this watering hole, making it a habitat rich in species diversity. | This map shows the distribution of bird species in North and Central America. As you move toward the tropics, biodiversity increases. |

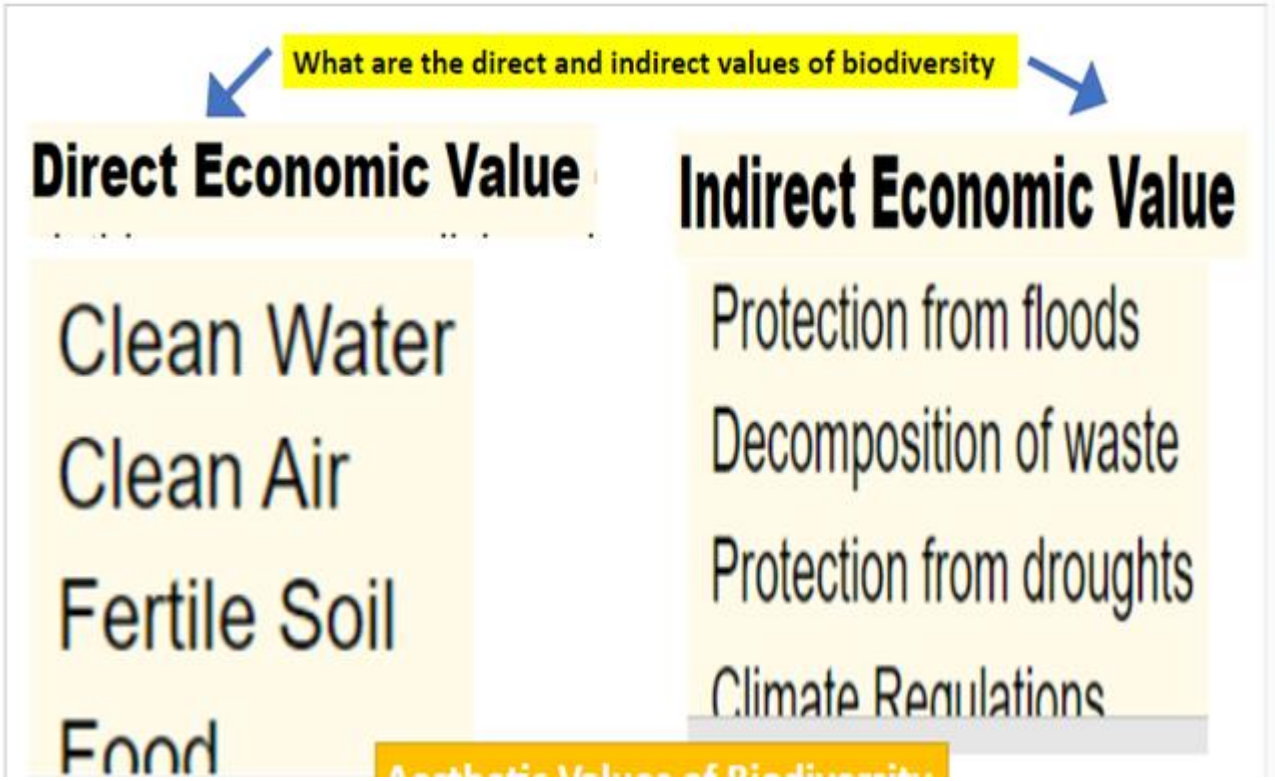
| Figure 4. Ecosystems with diverse abiotic factors support a variety of organisms. | |
|---|---|
|  |  |
| Puffins in the Arctic. | Rainforest in South America. |

Biodiversity: number of different species living in a specific area.
Genetic biodiversity: variety of inheritable characteristics or genes in an interbreeding population.
Species diversity in a biological community is the number and abundance of different species.
Ecosystem diversity: is the variety of ecosystems in the biosphere.

Ecosystems with diverse abiotic factors support a variety of organisms.

The importance of biodiversity:

1. Direct economic value. Humans depend on plants and animals to provide food, clothing, energy, medicine, and shelter.
2. Indirect economic value: a healthy biosphere provides many services to humans and other organisms that live on Earth, for example, green plants provide oxygen to the atmosphere and remove carbon dioxide. Natural processes provide drinking water that is safe for human use.
3. Aesthetic and scientific values: sustaining biodiversity helps humanity by preserving landscapes of recreational or inspirational.



| | | | |
|---|---|---|---|
| 20 | List the factors that threaten biodiversity and assign them to examples | Textbook, figure 12, 13, 14, 15 | 39, 40, 41, 42, 43, 44 |

Factors That Threaten to the Biodiversity are:

Overexploitation: Excessive use of species that have economic value.
Overexploitation of mahogany tree populations and illegal logging have led some varieties of this tree to border on extinction.

Habitat Loss: (Figure 12) If a habitat is destroyed or disrupted, the native species might have to relocate, or they will die. For example, humans are clearing areas of tropical rain forests and are replacing the native plants with agriculture crops or grazing land.

Fragmentation of habitat: (Figure 13) Separation of an ecosystem into small pieces of land.
Edges of a forest near a road have different abiotic factors, such as temperature, wind, and humidity, than does the interior of a forest.

Climate Change: such as temperature increase. Scientists predict that climate change will threaten approximately 25 percent of all land species by 2050.

Pollution: (Figure 14) pollution changes the composition of air, soil, and water.
Pesticides, such as DDT (dichloro-diphenyl-trichloro oethane), and industrial chemicals, such as PCBs (polycho rinated biphenyl), are examples of substances that are found in food webs.

Invasive Species: (Figure 15) Species that significantly modify or disrupt habitat.
The imported fire ant is a species that was accidently introduced to the United States through the port of Mobile, Alabama, in the 1920s by ships from South Africa.

Figure 12. A declining population of one species can affect an entire ecosystem. When the number of harbor seals and sea lions declined, killer whales ate more sea otters. The decline in sea otter population led to an increase in sea urchins, which eat kelp. This led to the ultimate decline in kelp forests.


Figure 13. The smaller the habitat size, the greater percentage of the habitat that is subject to edge effects.

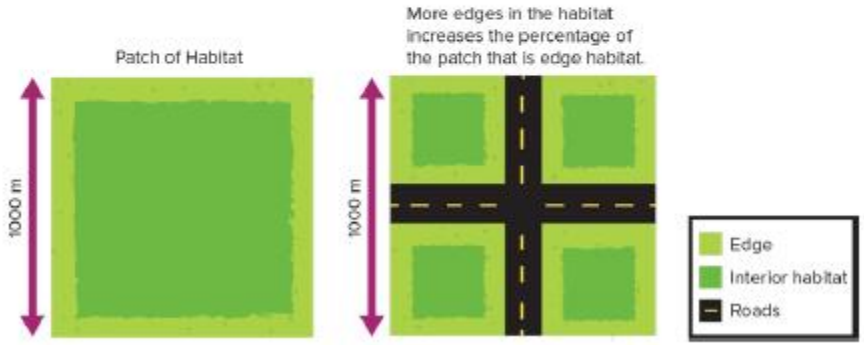



Figure 14. The concentration of toxic substances increases as the trophic level in a food chain increases.

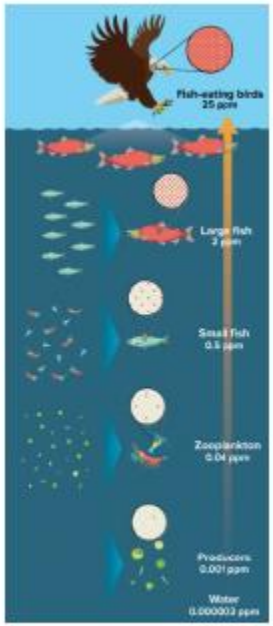



Figure 15. Invasive species, such as the fire ant, can negatively affect biodiversity.

At one time, a huge flocks of passenger pigeons would darken the skies during their migration. But by the early 1900s, they had become extinct. This is an example of .....

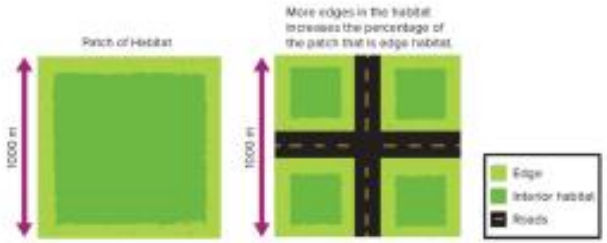
a. Overexploitation

b. Biological magnification

c. Eutrophication

d. Invasive species

Which of the following is a method used to maintaining and improving biodiversity between habitat fragments?




Habitat fragmentation

a. Corridors

b. Bioremediation

c. Nature reserves

d. Legislative actions

In the following figure the concentration of toxic substances increases as the trophic level in a food chain increases, what this type of pollution is called?

Overexploitation

Biological magnification

Habitat fragmentation

Invasive species

GOOD LUCK