مؤسسة الإمارات للتعليم المدرسي
EMIRATES SCHOOLS ESTABLISHMENT

AL SALAMAT SCHOOL
CYCLE 2 - AL AIN

ALSALAMAT SCHOOL

(TRIMESTE 2) (2023-2024)

GRADE (8) SCIENCE

FINAL REVISION

MR. ISSA WASWAS

Very Important

SCIENCE FINAL REVISION
المراجعة النهائية لمادة العلوم

أعزاءي الطلاب يرجى الانتباه للملاحظات التالية:

1- موعد اختبار العلوم النهائي **يوم الاثنين المو افق** **18/03/2024**

2- يحتوي الاختبار على **20** سؤال.

3- ينقسم الإختبار إلى قسمين، القسم **الإلكتروني** في سويفت يحتوي على **15** سؤال (**اختيارمن متعدد**) **(60 علامة)** ، والقسم **الورقي** يحتوي على **5** أسئلة **كتابية** **(40 علامة).**

4- أرفق اليكم في هذه المراجعة **أهم الأفكار** التي وردت من المؤسسة في هيكلة الامتحانات.

5- تمنياتي بالتوفيق للجميع.

الأسئلة الموضوعية (اختيار من متعدد)

MCQs

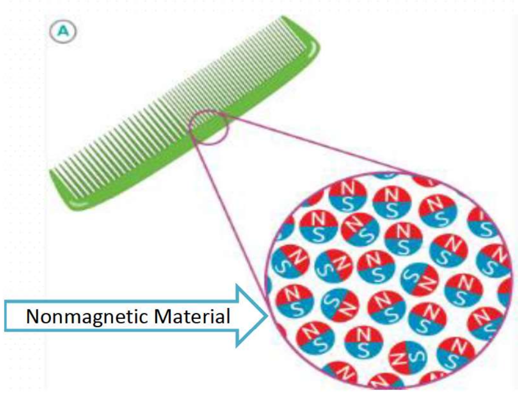
SwiftAssess

Q1) Identify the magnetic domains in different types of material (nonmagnetic and magnetic) Compare between temporary and permanent magnets.

Magnetic Domain

- A **magnetic domain** is a region in a magnetic material in which the **magnetic fields** of the atoms **all point in the same direction**.

Plastic comb → **Nonmagnetic material** → **Not grouped into magnetic domain**

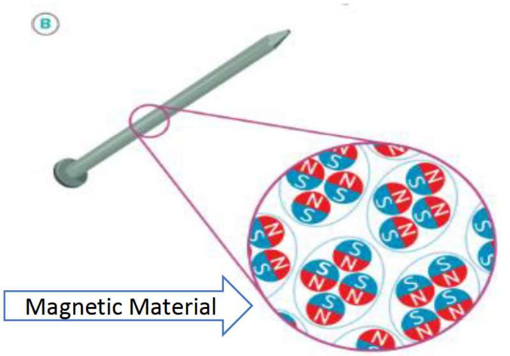


The magnetic fields of **atoms** points in many **different directions**.

Random magnetic fields **cancel each other**.

There nonmagnetic materials do not have any magnetic properties and **cannot be made into magnets**.

Steel Nail → **Magnetic material** → **Grouped into a magnetic domain**

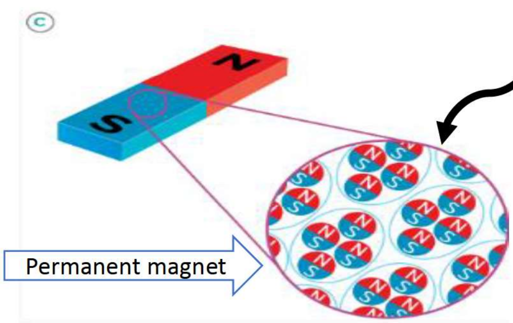


The magnetic fields of the **domain** point in **different directions.**

The magnetic fields of these domains **cancel each other.**

steel nail is a **magnetic materials,** it is **not a magnet.**

Magnetic materials can become **magnets** when the magnetic fields of the **magnetic domains line up in the same direction.**



The magnetic fields of the magnetic domains of a **bar magnet** are lined up in the **same direction**.

Temporary and permanent magnets

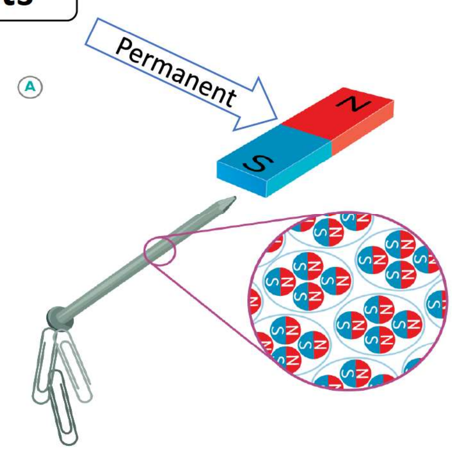
The magnetic field around the **bar magnet applies a force** to the **nail's** magnetic domains.

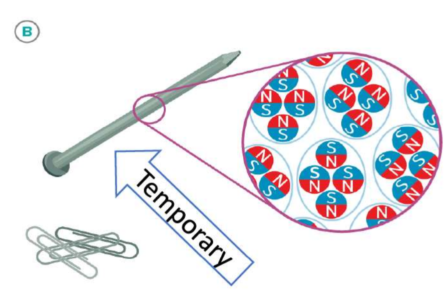
The domains in the **nail** become **align in the same direction**, the **nail** becomes a **temporary magnet**.

When the nail is **moved away** from the bar magnet, **the nail is no longer a magnet.**

Temporary Magnet	A magnet that **remains a magnet only** when they are **near a permanent magnetic** field.
Permanent Magnet	A magnet that **remains a magnet after being removed** from another magnetic field

Some magnetic materials can be made into permanent magnets by **placing them in a very strong magnetic field**.





Questions

Why will a plastic spoon never act like a magnet?

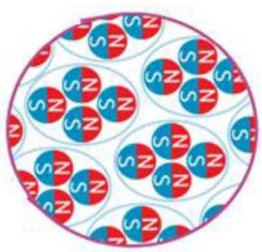
A- it has atoms grouped into magnetic domains.

B- It is a magnetic material.

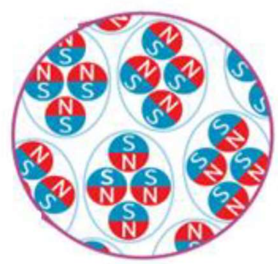
C- it does not have atoms grouped into a magnetic domains.

D- the magnetic fields of the plastic spoon are lined up in the same direction.

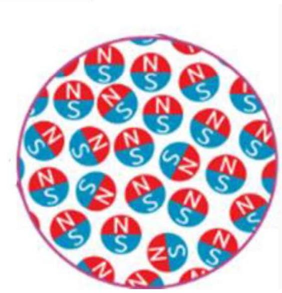
Which model explain why will a plastic spoon never act like a magnet?



A

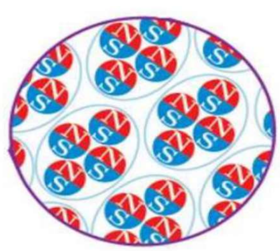


B



C

What is the difference between the two materials shown in the figure below?



1

2

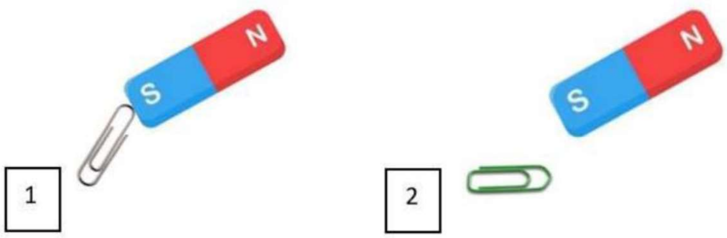
A- Material 1 is a nonmagnetic material while 2 is a permanent magnet

B- Material 1 is a permanent magnet while 2 is a nonmagnetic material

C- Materials 1 and 2 can be made using an electrical magnetizer

D- Materials 1 and 2 are magnetic materials and can be used to produce magnetic field

Sara have made an experiment to investigate the material of two different paper clips using a par magnet and, as seen in the figure below magnet **1** is attracted to the magnetic bar while **2** didn't, what can you conclude?



A- Paper clip (1) is made from steel, while (2) is made of plastic

B- Paper clip (2) is made from steel, while (1) is made of plastic

C- Paper clip (1) is made from steel, while (2) is a magnet itself

D- Paper clip (1) and (2) are made of plastic

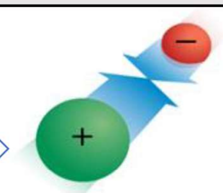
Q2) Explain how electric charges interact and list the factors that electric field strength depends on.

Electric Charges

There are **two types of electric charge:** → **Positive** charge (+) and **Negative** charge (-)

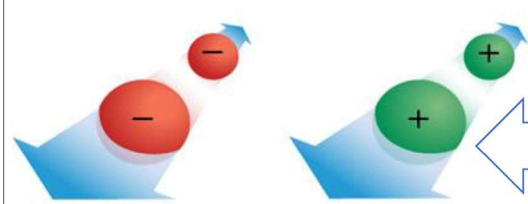
Oppositely charged particles **attract** each other

Attraction Electric Force



Positively and negatively charged objects attract each other.

Similarly charged particles **repel** each other.



Two negatively charged objects repel each other.

Two positively charged objects repel each other.

Repulsion Electric Force

The **invisible region surrounding a charged** object is called an **electric field.**

❑ It applies an electric force without touching. → **Electric force is a noncontact force.**

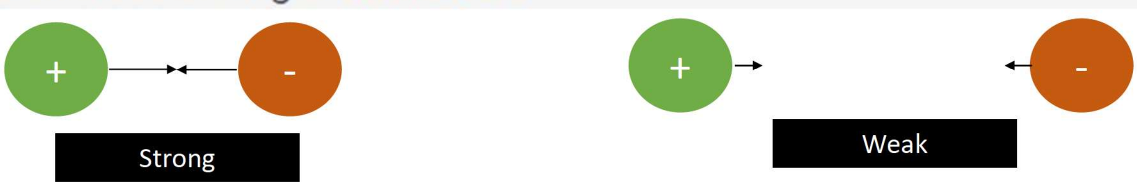
Why the women's hair sticks up?

In the photo positive charges accumulate on the woman. The charges spread out and push away from each other. When the charges accumulate on hair, each hair will repel away from every other hair. This is why her hair sticks up.

Electric field Strength

The electric field around an electric charge can be strong or weak. The **electric field strength** depends on two factors:

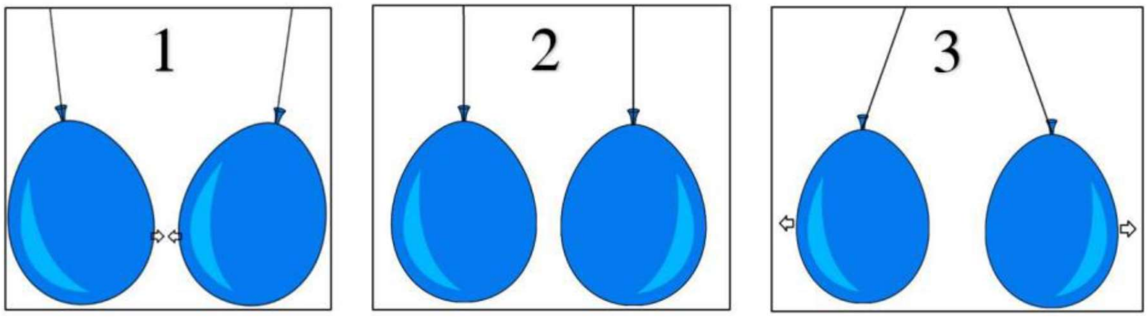
- Distance - as you move **further away** from an electric charge, the electric field strength **decreases**.



- Charge - as the size of the charge **increases**, the electric field strength also **increases**.

Questions

Which of the following balloons have **opposite** charges?



A- The pair in figure 1, because they attract each other

B- The pair in figure 3, because they repel each other

C- The pair in figure 1, because they repel each other

D- The pair in figure 2, because they attract each other

While doing laundry, Jamal pulls clothes from the dryer. Some socks cling to a blanket. Which statement explains why the socks cling to the blanket?

A- The socks and blanket dried together which caused them to cling to each other

B- The socks and blanket are conductors that picked up some positive charges that keep the clothes together

C- The socks and blanket are insulators that picked up some negative charges that keep the clothes together

D- The clothes picked up opposite charges. The opposite charges are attracted to each other

Q3) Illustrate how electric particles flow, differentiate closed circuits from open circuits, and list the factors that affect an electrical current.

Electric current → Is the **flow** of electrically **charged particles**

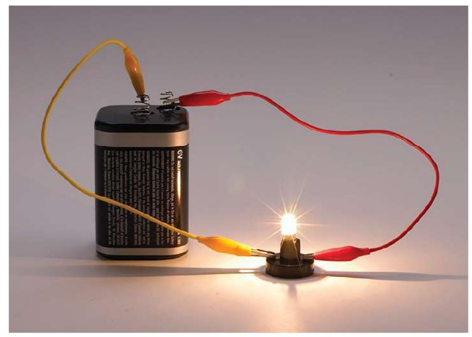
Electric circuit → A closed path where the electric current flows to and from a source of energy.

- ❑ **All simple circuits** contain:

1- a **source** of electric energy (Battery)

2- an electric **device** (Light bulb)

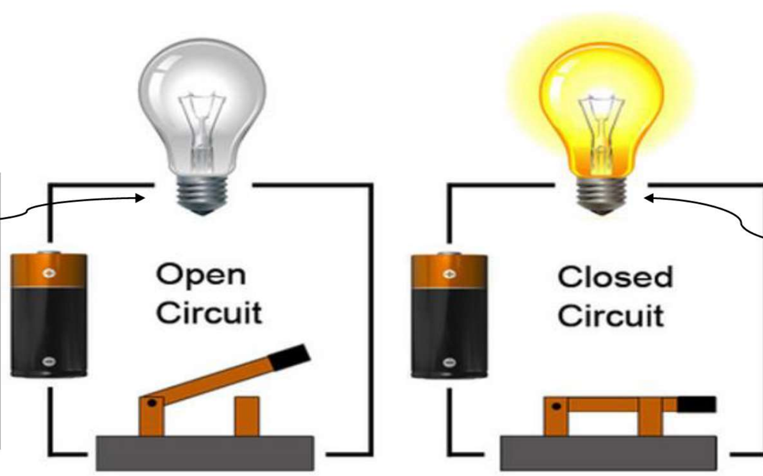
3- an electric **conductor**. (Copper wires)



- ❑ A **switch** is used to change a circuit between open and closed.

Open circuit

- ❑ not a complete circuit.
- ❑ Electric energy does not flow .

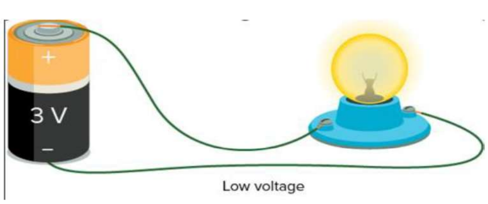


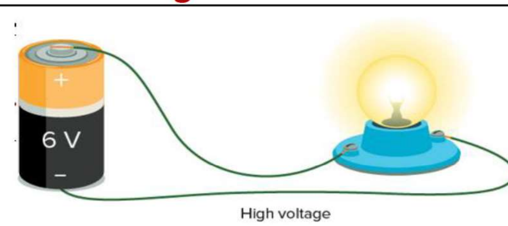
Closed circuit

- ❑ a complete circuit.
- ❑ Electric energy flows.

How can we make the light bulb **burn brighter** ?

→ By **increasing the energy or the current** by using **stronger battery** or **adding more batteries**.





Questions

Which phrase best describes an electric current?

A- A force that repels between electric charges

B- A force that attracts between electric charges

C- A flow of electrically charged particles

D- An unmoving charge on an object

A 1.5 V battery is connected to a light bulb with some wires. One of the wires is cut, breaking the circuit.

What is the electrical potential energy difference across the light bulb after the wire is cut?

- A 0.0 V
- B 1.5 V
- C −1.5 V
- D Need more information.

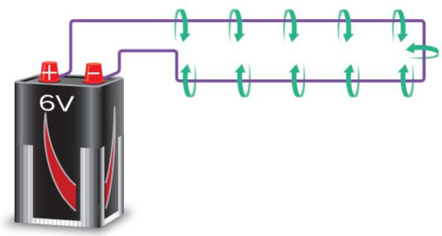
After the wire is cut, what is the electrical potential energy difference across the two ends of the cut wire?

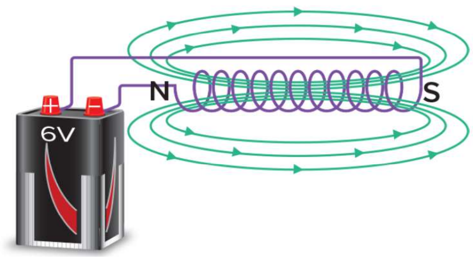
- A 0.0 V
- B 1.5 V
- C −1.5 V
- D Need more information.

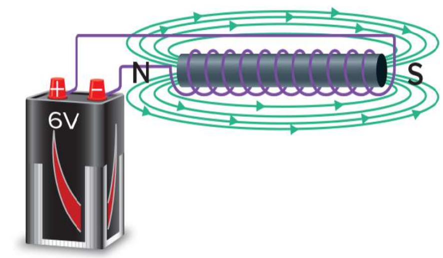
Q4) Determine how to make an electromagnet and compare electric motors and electric generators.

Electromagnet → is a **temporary magnet** made with a **current-carrying wire** coil wrapped around a **magnetic core**.

To **make** an **electromagnet** you need → a **closed circuit** with an **electricity source** and a **wire coil** with a **magnetic material** inside the coil.







An **electric current** in a wire produces **a magnetic field** around the wire.

The magnetic field with **a north pole and a south pole**.

Placing an **iron core within the coil** greatly **intensifies the magnetic field**.

This electromagnet has a **strong magnetic field**. It is used to **separate magnetic materials** from nonmagnetic materials. →

What makes electromagnets useful?

First → The magnetic field around an electromagnet **can be turned off**.

When the current is turned off, it **loses its magnetic properties** and will **stop attracting** magnetic materials.

Second → The **strength** of an electromagnet **can be controlled.**

by Changing the **number of loops** in the wire coil. The **more loops**, the **stronger** the magnetic field.

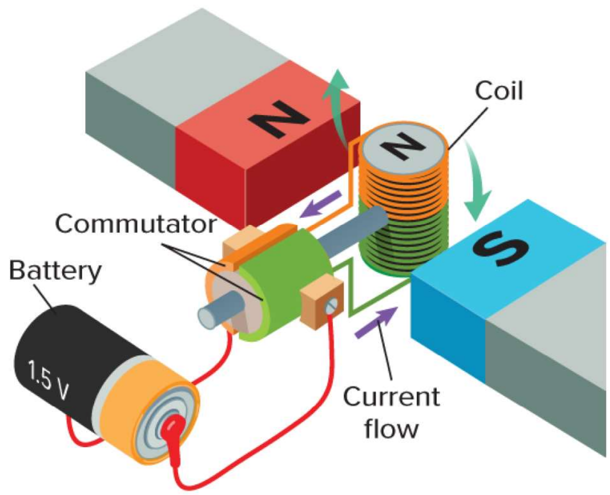
Also, **increasing the current** in the coil **strengthens** the magnetic force.

Third → The **poles** of an electromagnet **can be reversed.**

Changing the direction of the current **reverses** an electromagnet's **north and south magnetic poles**.

Electric motor → is a device that uses an **electric current to** produce **motion**

A **simple electric motor** has **three main parts**



Electric motor

1. A **coil** of wire connecting to **rotating shaft**.
2. A **permanent magnet**.
3. A **source** of electric **energy** (battery).

When a current flows in a wire coil, the coil becomes an **electromagnet**.

Some electric motors require a commutator. A **commutator** is a type of **electrical switch** that **reverses** the current in the coil.

Q5) Explain how can magnets produce an electrical current, differentiate between the positive voltage and negative voltage produced from the motion of coil in a magnetic field.

To **produce** an **electric current** Case 1

Generating electric current

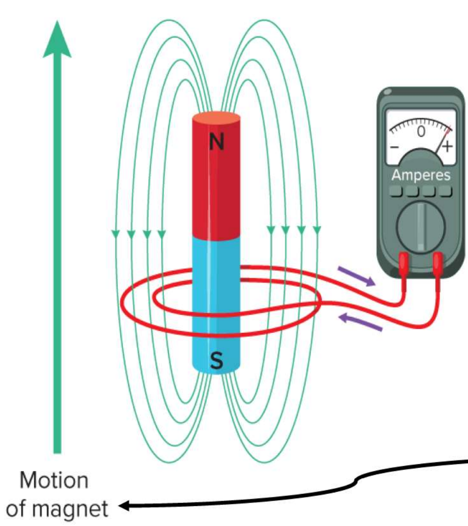
a **magnet** is **moved through a wire coil.**

The **magnetic field** produce an **electric current** through the wire.

This happens **because** the **magnetic field from the magnet** exerts a **force** on the charged particles **causing them to move** in the wire.

When the **magnet stops moving**, there is **no current** in the circuit.

The **direction of the current depends** on the **direction in which the magnet moves**.



To produce an electric current Case 2

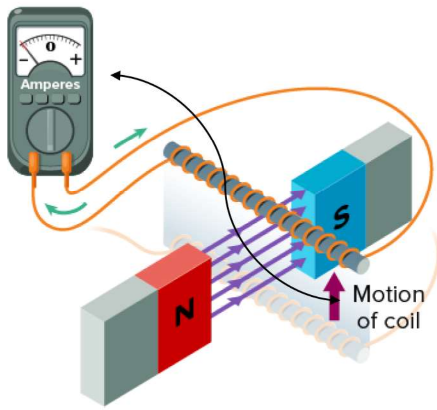
A **wire coil** is **moved** through a **magnetic field**.

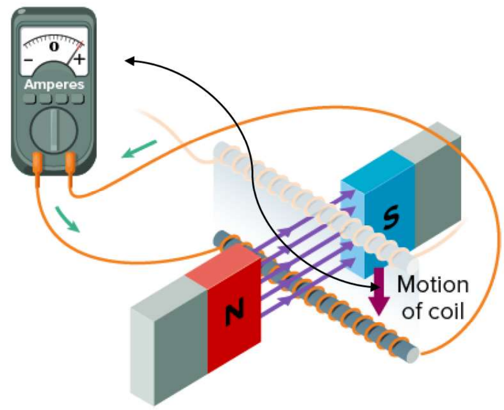
The **magnetic force** between the **magnet and the charged particles** in the wire causes the **particles in the wire to move** as a **current** in the wire.

Motion of the coil (**up**)

Positive voltage

(+)





Motion of the coil (**down**)

Negative voltage

(-)

Electric generator → is a device that transfer **mechanical energy** to **electric energy**.

---

a **hand generator** in a circuit.

The **crank rotates a wire coil** through the **magnetic field** of a small permanent magnet.

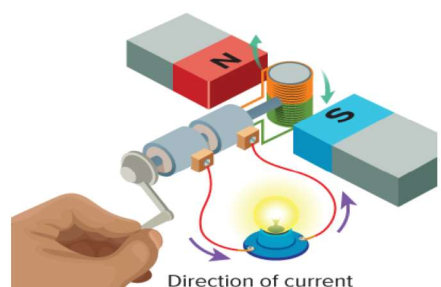
An **electric current is produced** in the circuit.

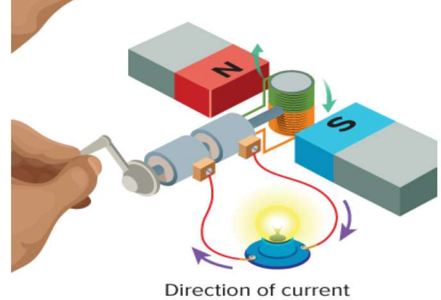
A wire loop inside the generator is connected in a closed circuit.

The loop is between poles of a magnet.

As the crank is turned, a wire coil rotates through a magnetic field producing an electric current in the circuit.

The current continues as long as the crank is turned, rotating the wire coil within the magnetic field.

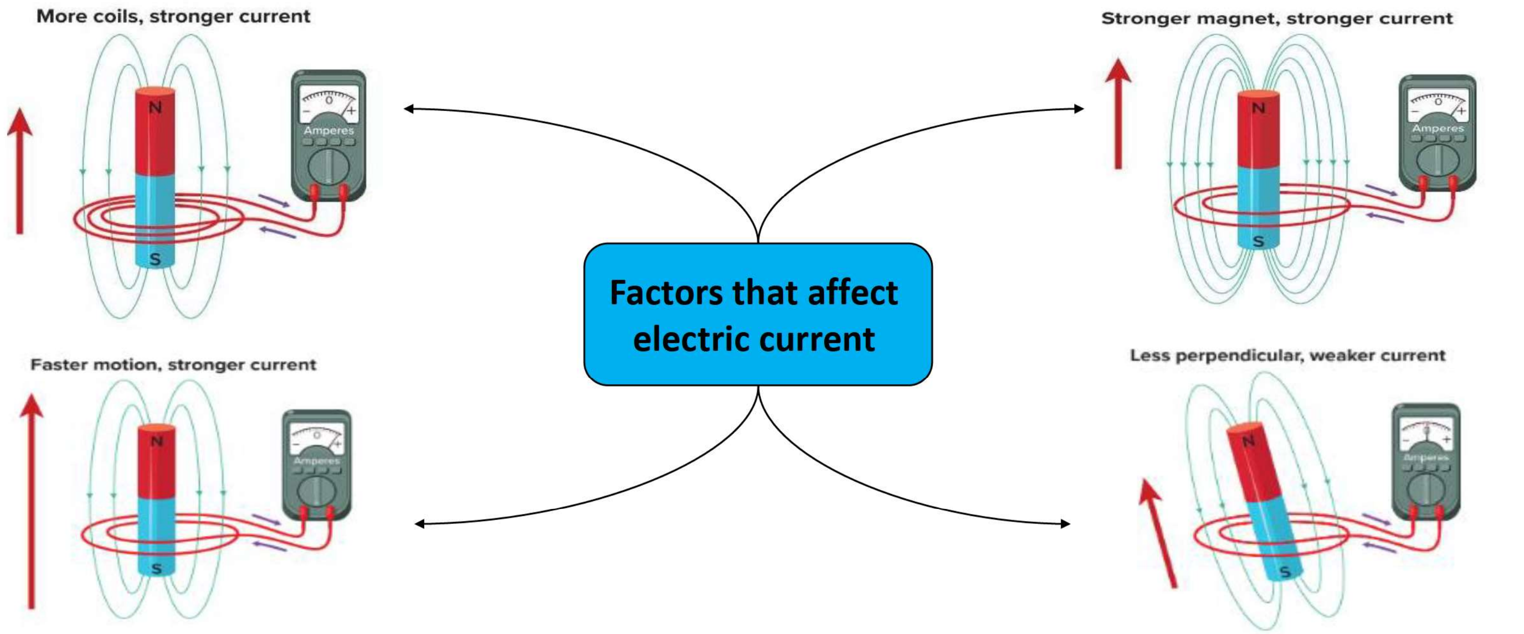




Electric Generator

Types of currents

- flows **in one direction** is (DC) direct current. (Battery)
- **changes direction in a regular pattern** is (AC) alternating current (Generator)

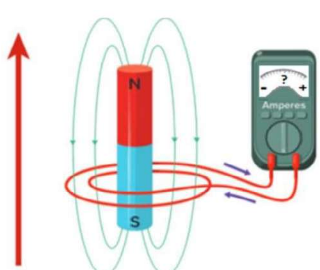


Questions

In the following figures electrical current is being produced by a magnet, which of the following methods will read the **least** amperes on the ammeter?

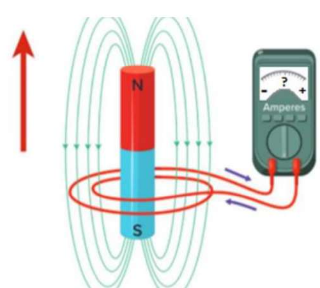
A-

Fast motion
(increasing the speed of magnet movement)



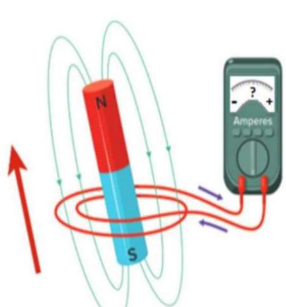
B-

Stronger magnet
(Increasing the strength of the magnet used)



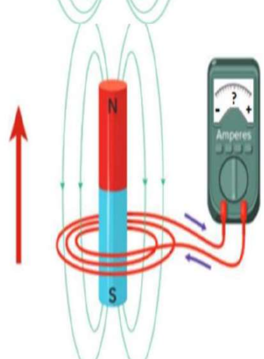
C-

Less perpendicular
(Moving the magnet in an angel less than 90° to the current)



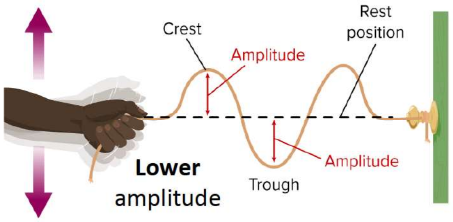
D-

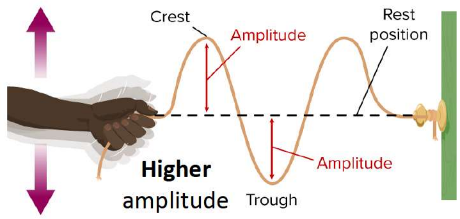
More coils
(Increasing the number of coils around the magnetic core)

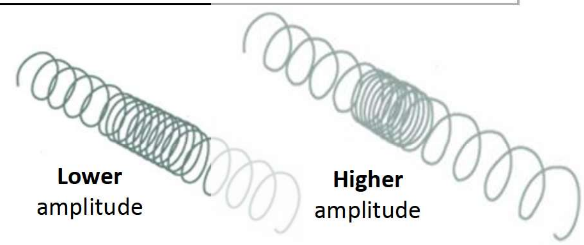


Q6) Define Amplitude, Intensity, loudness, and pitch of a wave, and relate to real-life examples.

Amplitude is the **maximum distance** that the wave **moves from its rest position.**







The **more energy** a sound has, the **larger the amplitude**, and the higher **loudness & Intensity.**

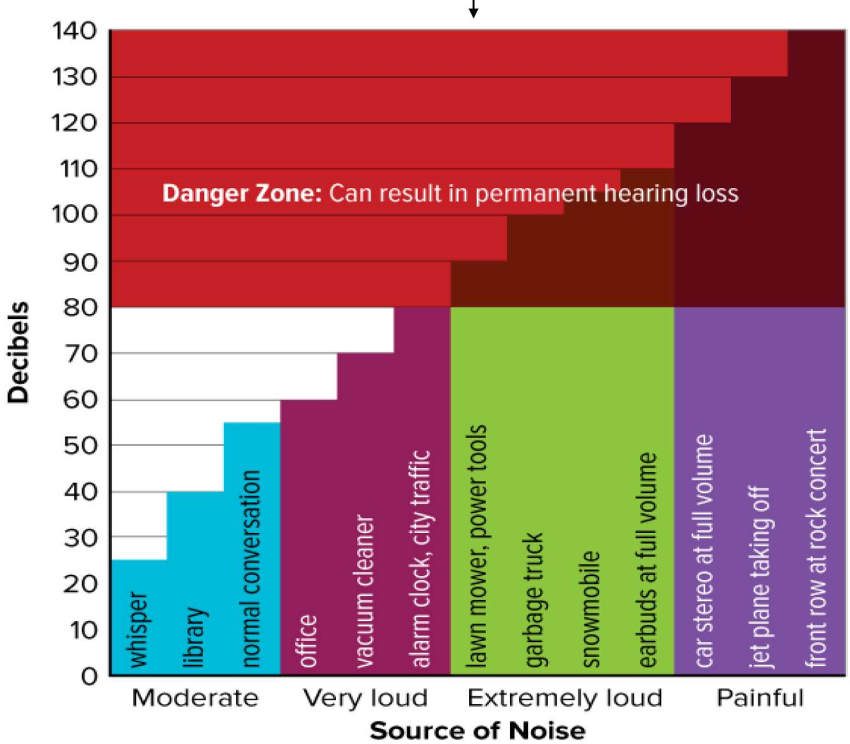
Loudness is how you **perceive the energy** of a sound wave.

Intensity is the **amount of sound energy** that **passes** through a **square meter of space** in **one second**.

decibel

The **decibel (dB)** is the **unit of measure** that **describes** the **intensity or loudness** of sound.

Decibel level of common sounds



Each increase of 10 dB indicates that the sound is about **twice as loud** and has about **10 times more energy**.

- ❑ The decibel level of **city traffic** is about **85 dB**.
- ❑ The level of a **rock concert** is about **105 dB.**

This means a concert, which **is 20 dB higher**, has about 10 x 10, or **100 times, more energy** than traffic.

As sounds get louder, the amount of time you can listen without hearing loss gets shorter.

Pitch → The perception of **how high or low a sound** seems.

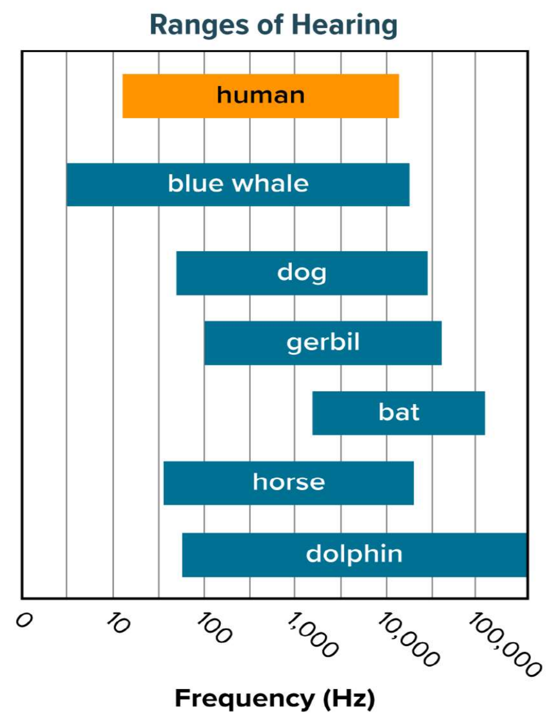
A **higher frequency** produces a **higher pitch**.

an adult male voice might range from 85 Hz to 155 Hz.

An adult female voice might range from about 165 Hz to 255 Hz.

The human ear can detect sounds with frequencies between about **20 Hz and 20,000** Hz.

Frequencies above this range are called **ultrasound**.



Questions

Joni plays a scale on her clarinet. As she plays from low notes to high notes, what happens to the sound waves that the clarinet creates?

- ○ A The amplitude of the sound waves decreases.
- ○ B The frequency of the sound waves increases.
- ○ C The intensity of the sound waves increases.
- ○ D The wavelengths of the sound waves increase.

Sound	Decibel Level
Tornado siren	140 dB
Jackhammer	130 dB
Chain saw	100 dB
Lawn mower	90 dB
Vacuum cleaner	75 dB
Dishwasher	60 dB

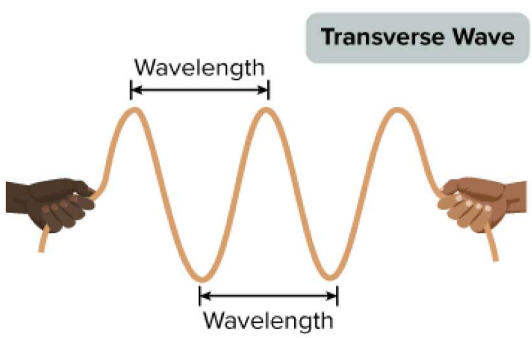
MATH Connection

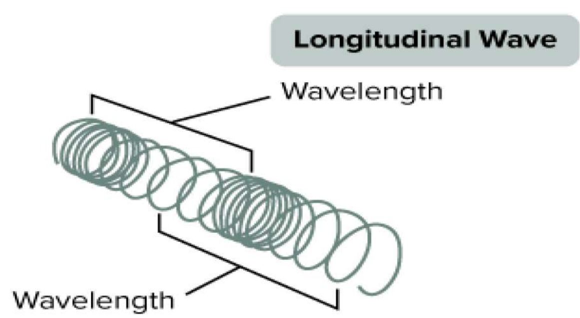
3. The table to the left shows the decibels produced by a number of objects. According to the table, which sound has 1,000 times more energy than the sound of a dishwasher?

- ○ A chain saw
- ○ B jackhammer
- ○ C lawn mower
- ○ D tornado siren

Q7) Find and calculate the wave characteristics (wavelength, frequency, and amplitude).

Wavelength → the **distance from one point** on a **wave** to **the same point** on **the next wave**. (measured in units of distance, such as **meters**)





Wavelength of a transverse wave
the distance from one crest to the next crest.
Or
the distance from one trough to the next trough.

Wavelength of a longitudinal wave
the distance from one compression to the next compression.
Or
The distance from one rarefaction to the next rarefaction.

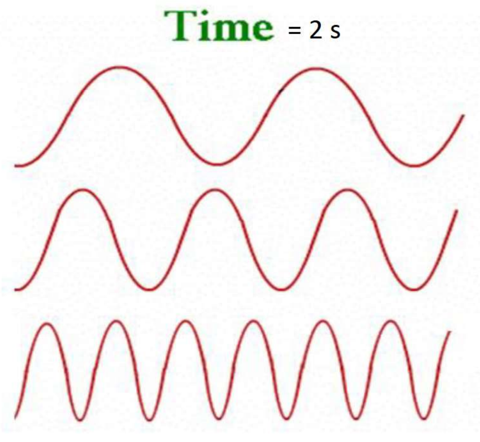
Frequency

Measured in Hertz (HZ)

- the number of times the **pattern repeats** in a **given time.**
- the number of **vibrations** the vibrating object makes **each second**.

To calculate the frequency of waves:

$$\text{Frequency} = \frac{\textit{Number of waves}}{\textit{Time}}$$



The **amount of energy** transferred by waves in a given time is **proportional** to the **frequency**.

If the **frequency** of the wave's **doubles**, the **energy** of the wave also **doubles**.
If the **frequency decreases by half**, the **energy** will also **decrease by half**.

Wavelength and Frequency (Inverse relationship)

As the **frequency** of a wave **increases**, the **energy increases**, and its **wavelength decreases**.

Longer wavelength

one wavelength passes in **4 s.**

(**lower** frequency)

$F = \frac{1}{4} = 0.25$ Hz

Shorter wavelength

two wavelengths pass in **4 s.**

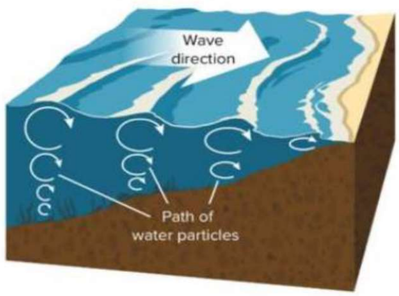
(**higher** frequency)

$F = \frac{2}{4} = 0.5$ Hz

Questions

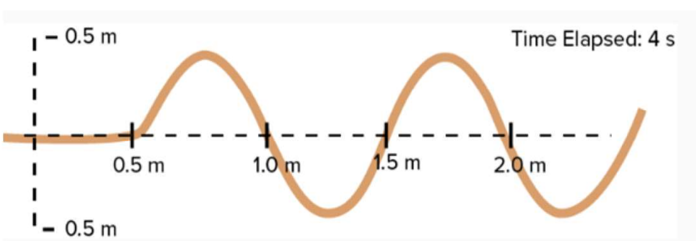
MATH Connection You can express the relationship of wavelength and frequency with ratios. The wave on the left has a ratio of 1:4 wavelength to frequency. For every one wavelength, four seconds passed. What would the ratio be for two waves that traveled a total of 12 seconds?

Which types of mechanical waves is the water waves shown in the figure below?



A- Longitudinal   B- Transverse   C- Vacuum   D- Transverse and Longitudinal

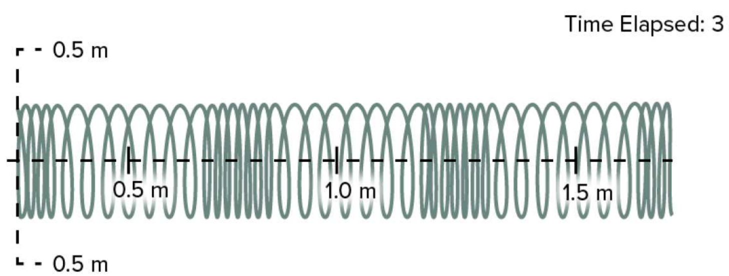
Determine the wavelength, frequency, and amplitude for each wave.



Wavelength: ______ m

Frequency: ______ Hz

Amplitude: ______ m

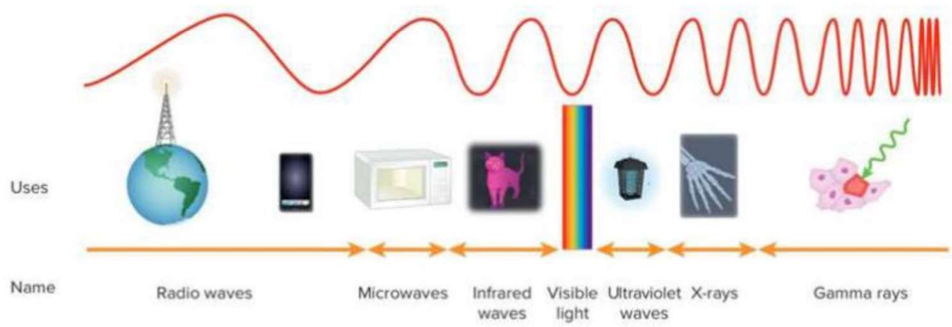


Wavelength: ______ m

Frequency: ______ Hz

Amplitude: ______ m

What is the relationship you can conclude between frequency, wavelength and energy for the electromagnetic radiation shown below?



A- There is no relationship between wavelength, frequency, and energy

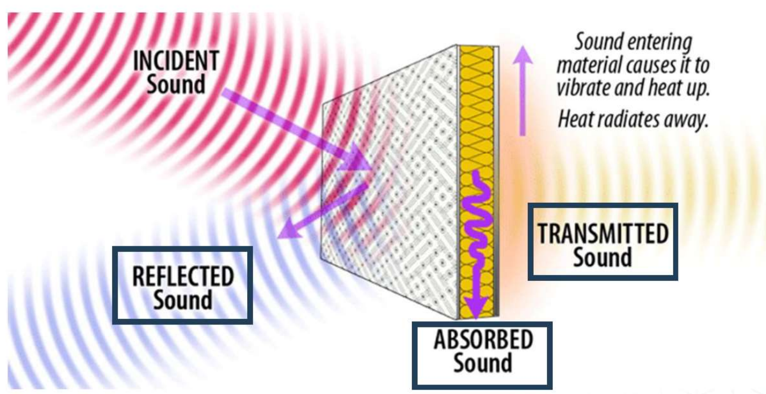
B- As wavelength increases, both energy and frequency decrease

C- As wavelength increases, both energy and frequency increase

D- As wavelength increases, energy increases but frequency decreases

Q8) Explain how sound wave interact with matter and relate to real-life examples.

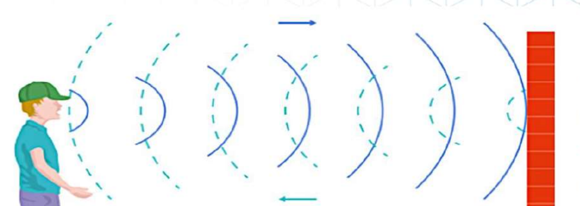
Sound waves interact with matter in many ways.



Reflection is the **bouncing** of a wave **off** a surface.

- **All waves reflect** when they hit a surface.
- Reflection causes waves to **change direction.**

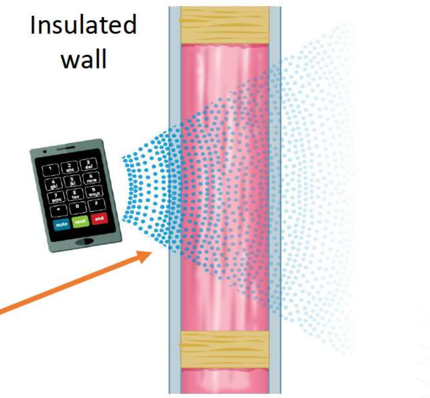
An **echo** is an example of a **sound wave reflecting**



Absorption

is the **transfer of energy by a wave to the medium** through which it travels.

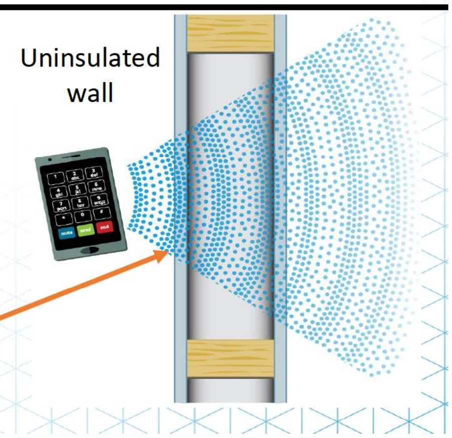
The sound from the cell phone is **absorbed** by the **insulation of the wall**



Transmission

is the **passage of a wave through a medium**

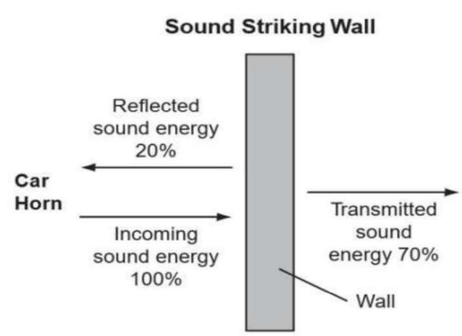
The sound from the cell phone is **transmitted** easily **through an uninsulated wall**.



Questions

The diagram below models a sound wave from a car horn hitting a wall.

Which statement best describes what happens to the sound energy when the sound wave hits the wall?



A- Ten percent (10%) of the sound energy is absorbed by the wall

B- Thirty percent (30%) of the sound energy is absorbed by the wall

C- Eighty percent (80%) of the sound energy is reflected by the wall

D- Eighty percent (80%) of the sound energy passes through the wall

Why recording studios have foam materials on their walls, as shown in the figures below?

A- To be used as a decoration because sound is not affected by types of material

B- To reduce noise and background sounds

C- To enhance echo while recording

D- To allow sounds to be transmitted from outside through the walls to human's ear

Q9) Calculate the speed of sound in different materials.

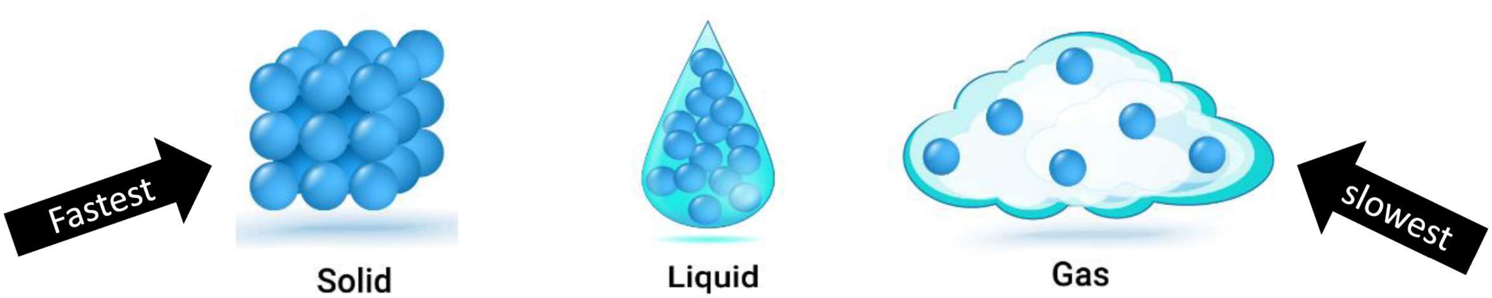
Speed of Sound

Sound waves can travel through **gases, liquids and solids**.

sound wave's speed depends on 1- the **density** of the material. 2- the **strength of the forces between the particles** in the material.

The **denser** the material is, the **faster** a sound wave can move through it. **Solid > liquid > gas**

The **stronger** the forces (**closer particles = more collisions**) **faster** sound wave. **Solid > liquid > gas**



The effect of temperature in the speed sound waves

In gases

The **speed** of a sound wave **increases** as the **temperature** of the material **increases**.

(More collisions)

In solids and liquids

The **speed** of a sound wave **decreases** as the **temperature** of the material **increases**.

(particles get farther)

The Speed of Sound	
Medium	**Speed (m/s)**
Air (0°C)	331
Air (20°C)	343
Water (20°C)	1,481
Water (0°C)	1,500
Seawater (25°C)	1,533
Ice (0°C)	3,500
Iron	5,130
Glass	5,640

Questions

To calculate the speed of sound:

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

Calculate the speed of sound for each distance.

Sample Data Table

Distance from Wall	Time to Clap 25 Times	Speed of Sound
30 m	5.03 s	
40 m	6.49 s	
50 m	7.89 s	

Speed of Sound in Different Materials	
Material (at 20°C)	**Speed (m/s)**
Air	343
Glass	5,640
Iron	5,130
Water	1,481

A sound wave takes about 0.03 s to move through a material that is 10.3 m long. What is the material?

A air

B glass

C iron

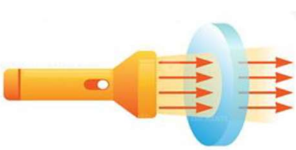
D water

Q10) Recognize how light interacts with matter and Differentiate between transparent, translucent, and opaque.

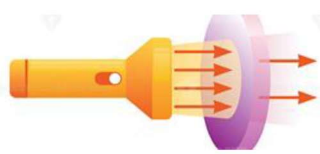
Light waves interact with matter in different ways.

Transparent ← **Transmission** → **Translucent**

A material that allows almost **all the light** to **pass through**, and through which objects **can be seen clearly. (air/glass)**



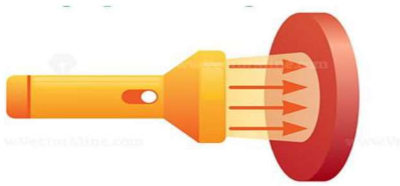
A material that allows **most of the light** to **pass through**, but through which objects **appear blurry. (wax paper/ frosted glass)**



Absorption

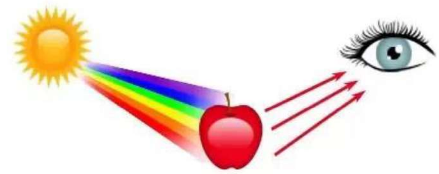
Opaque → A material through which **light does not pass.**

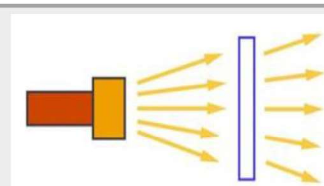
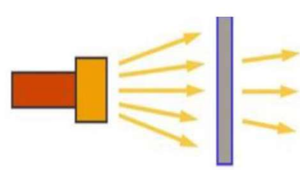
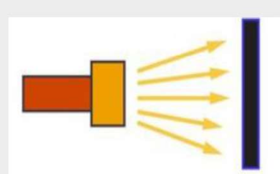
It absorbs most of the light. , you cannot see objects through them. **(Wood / Curtain)**



Reflection

Reflected light allowed the object to be **seen**.



Type of the material	Definition	Ray model	Wave interaction
Transparent (air or glass)	**All or most light** passes through. Forms **clear** image.		**Transmitted** absorbed
Translucent (wax paper or frosted glass)	**Some light** passes through. Forms **blurry** image.		**Transmitted** **absorbed**
Opaque (wood / curtain)	Light **does not pass** through. Forms **no image**.		Reflected **absorbed**

Questions

Which of the following statements is **Not** correct regarding light properties and how it interacts with matter?

A- People tint windows dark to increase light absorption

B- The brightness of a light is determined by intensity of light waves

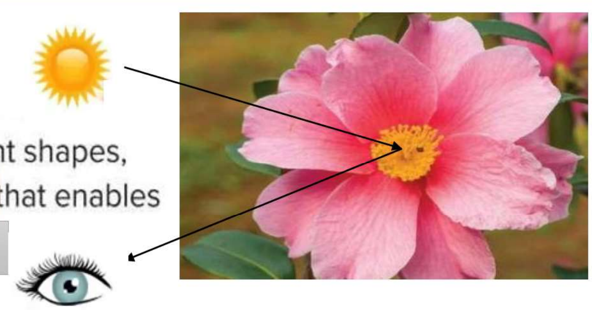
C- Light travels faster in air than in water

D- When light strikes a transparent material, most of the light is reflected

Q11) Explain how humans see things around them.

Seeing a Flower

When we look at flowers, we see that they come in many different shapes, sizes, and colors. What happens between a flower and our eyes that enables us to see it?



To **see** the flower

Light reflect off the flower and **enter your eyes, we can see** it

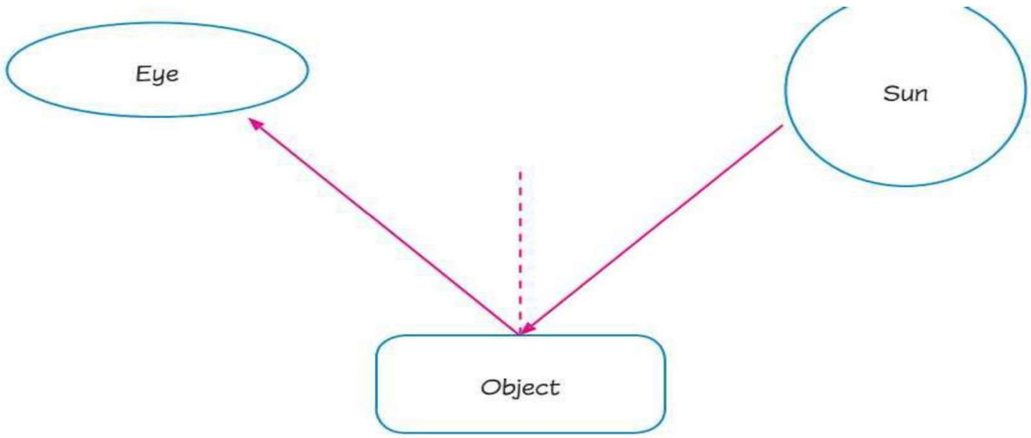
If there is **no light to reflect** off the flower, we will **not see** it

---

What happen when **light reflects off a smooth, flat surface** ?
(Plane mirror)

When light interact with opaque object (flat mirror)

The light will **bounce off (reflected regularly** to **form an image.**



Seeing a Flower

Questions

When we look at flowers, we see that they come in many different shapes, sizes, and colors. What happens between a flower and our eyes that enables us to see it? Circle the answer that best matches your thinking.

A. The light in the room lights up the flower so our eyes can see it.

B. Something goes from our eyes to the flower so we can see it.

C. Something goes from the flower to our eyes so we can see it.

D. Particles of color travel to our brain so we can see the flower.

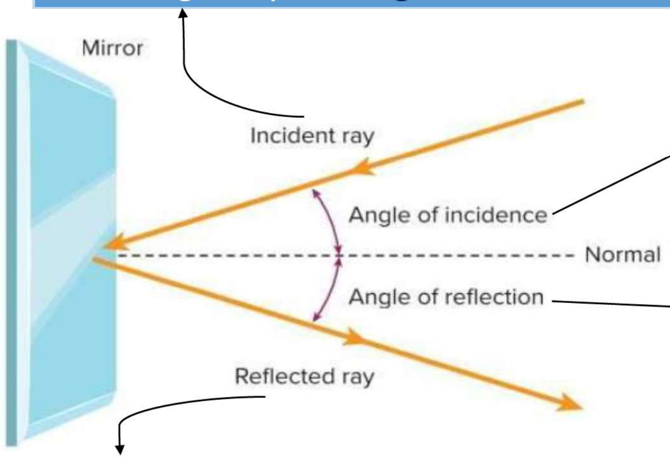
E. Something goes back and forth between our eyes and the flower so we can see it.

Q12) State the law of reflection and assign the angles of incidence and reflection on a smooth surface or on rough surface.

Reminder

- **Light moves** in **straight lines**.
- Reflection is the **bouncing** of a wave **off** a surface.

The light ray **moving toward** the surface.



The light ray **moving away** from the surface.

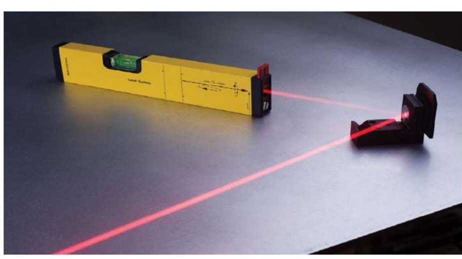
The **angle** formed where an **incident ray meets the normal**.

An **imaginary line perpendicular** to a reflecting surface

The **angle** formed where a **reflected ray meets the normal**.

The law of reflection

when a wave is reflected from a surface, the **angle of reflection** is **equal** to the **angle of incidence.**



Reflection Examples

A surface that **reflects light** to forms an image is a **mirror**.

Your **brain** knows that **light travels in straight lines**.

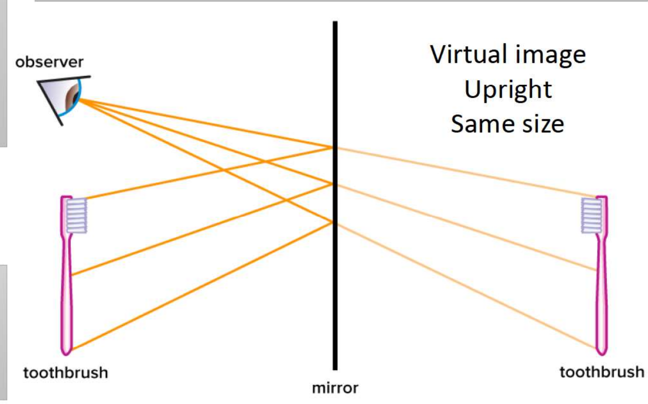
Your brain **perceives** where the light rays appear to **come from**, **not their actual paths.**

Virtual Image

is an **image** that forms from light rays that **diverge or change direction**.

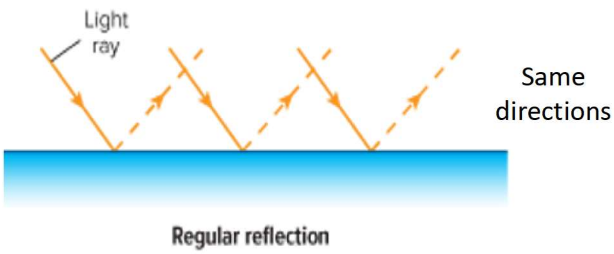
plane mirror

has a **flat reflecting surface**.



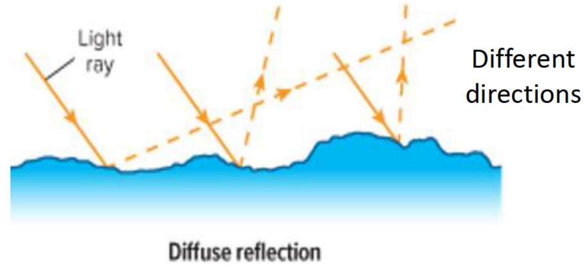
Regular reflection

Reflection of light from a **smooth, shiny surface**. (even surface)



Diffuse reflection

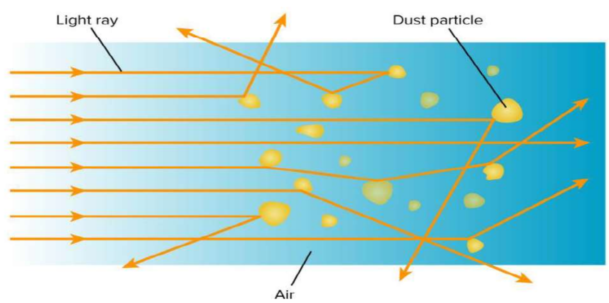
Reflection of light from a **rough surface**. (uneven surface)



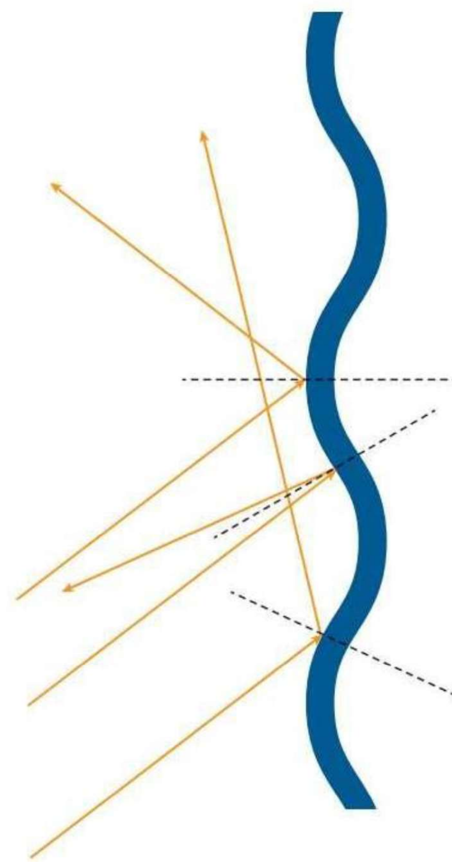
Scattering

when **waves** traveling in **one direction** are **made** to travel in **many different directions**.

The dust particles scatter the light waves in the sunbeam



Questions



Which object has a surface structure that reflects light rays in the functional manner shown in the model above?

A convex mirror

B glass window

C polished silver spoon

D pond with ripples

What type of reflection is modeled?

A diffuse reflection

B real image

C virtual image

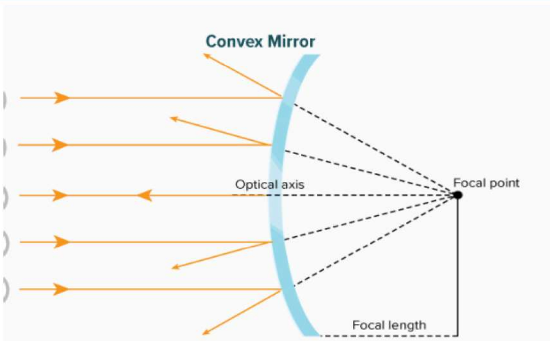
D regular reflection

Q13) Conclude the type of image that will form from concave or convex mirrors depend on the object's position (FB).

Curved Mirrors

Convex mirror

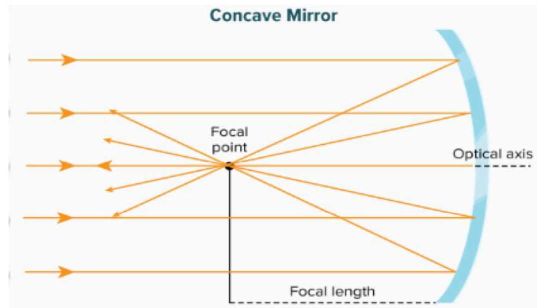
A mirror that **curves outward**, like the back of a spoon



light rays **spread apart** **(diverge)** after they strike the surface of a convex mirror.

Concave mirror

A mirror that **curves inward**, like the front of a spoon



Light rays **come together** (**converge)** after they strike the surface of concave mirror.

optical axis: line **perpendicular to the center** of the mirror

Focal point: is the point where **light rays** parallel to the optical axis **converge** (**meet**).

Focal length: is the **distance** along the optical axis **from the mirror to the focal point**.

Convex mirrors and **plane** mirrors form only **virtual images**.

Concave mirrors can form **virtual images and real images**.

The image a concave mirror forms **depends on the object's location** to the **focal point**.

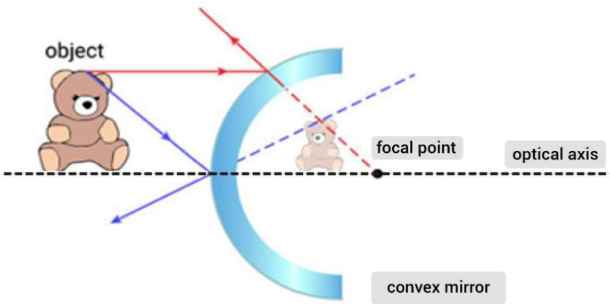
A **virtual image** forms if the **object** is **between the focal point and the mirror**.

A **real image** forms if the **object** is **beyond the focal point**.

A **real image** is an image that forms **where rays converge**.

Type of images

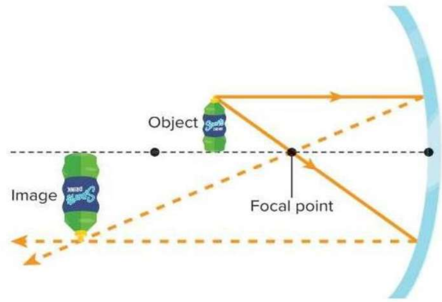
Convex mirror



A convex mirror always produces **a virtual image** that is **upright** and **smaller** than the object being reflected.

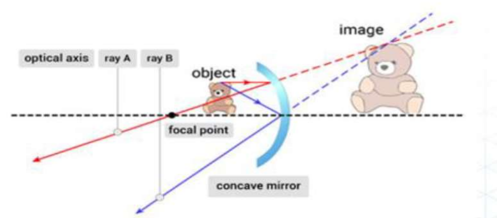
Concave mirror

Beyond the focal length



Real
Upside down
Larger

Within the focal length



Virtual
Upright
Larger

Questions

How does the structure of convex mirrors support the function of side mirrors on cars ?

A- convex mirror only reflect images to the driver makes with the normal on the mirror.

B- convex mirror will spread the angles out so the driver can see much larger amount of space behind the vehicle.

C- convex mirror will spread the angles out so the driver can see much smaller amount of space behind the vehicle.

Q14) Explain how does a lens affects the size of an image, and relate to it real-life examples, define index of refraction and its value in different mediums.

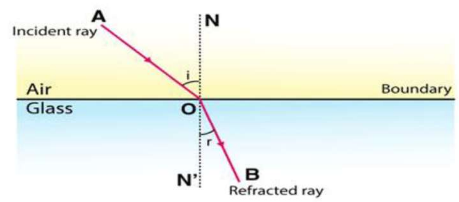
Light travel **very fast in vacuum** 300,000 Km/s

Light travels **more slowly** when it moves through a medium such as **air, glass, or water**.

because the **atoms of the material** interact with the light waves and **slow them down.**

As a light wave moves from one medium into another, **its speed changes**. the wave will **change direction**.

Refraction → The **change in direction** of a wave as it changes speed while moving from **one medium to another.**



The **index of refraction** indicates **how much a medium** can **change the direction of light**.

- Medium with **high refractive index** called **slow** because light moves more slowly through it.
- Medium with **low refractive index** called **fast** because light moves faster through it.

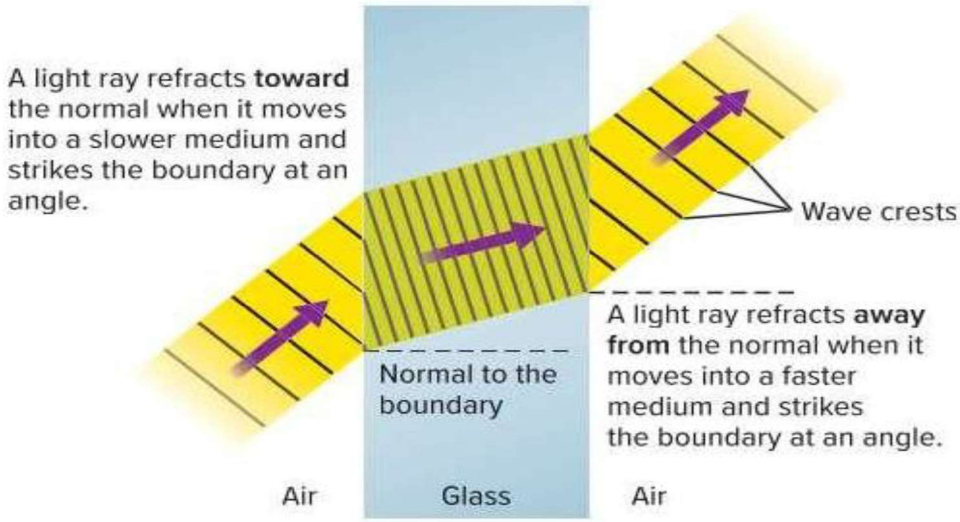
Material	Index of Refraction	Wave Speed (km/s)
Vacuum	1.0000	300,000
Air	1.0003	299,920
Water	1.333	225,100
Glass	1.55	193,000

You always see the fish further a way than the fish actually is. (Virtual image)

Light travels at different speeds through different mediums.

A light wave traveling from a **fast** to a **slow** medium bends **towards the normal**.

A light wave traveling from a **slow** to a **fast** medium bends **away from the normal**.



Questions

Which of the following arguments identifies the best explanation about a concave lens being used to start a fire?

A A concave lens will focus the Sun's light into a point that will cause a piece of paper to catch on fire.

B Because the Sun's light comes from all directions, a concave lens will straighten the light onto the paper causing the paper to catch on fire.

C Because a concave lens diverges the light, the Sun's light will not focus on the paper and no fire will occur.

D A concave lens will focus the Sun's light before the light can reach the paper, and no fire will occur.

Through the Lens

The **size of the image** depends on the **shape of the lens**.
The curvature of the lens has an effect on the size of the image.

A camera lens can make an image larger or smaller. How does a lens affect the size of an image? Circle the answer that best matches your thinking.

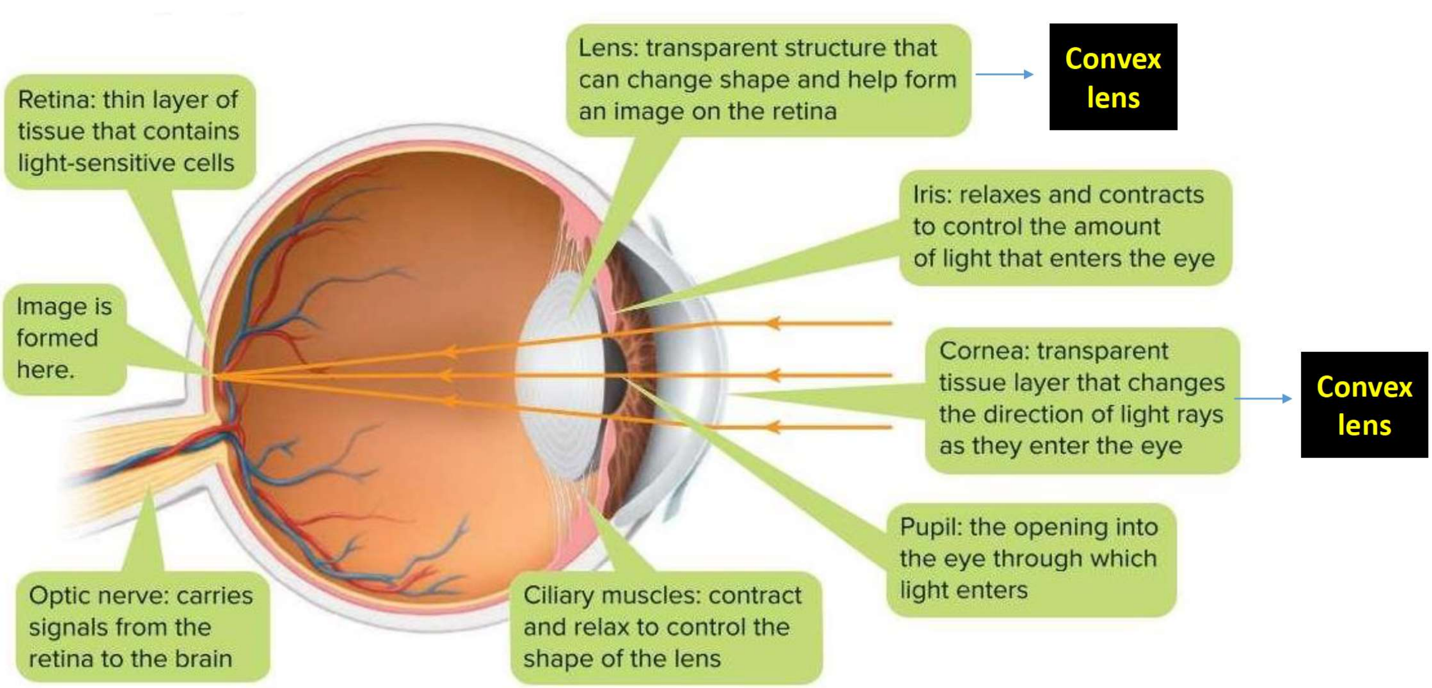
A. When a lens is moved back and forth, an image will become bigger or smaller but will always remain sharp.

B. The shape of the lens does not matter because light always passes straight through transparent objects.

C. The size of the image depends on the diameter of the lens.

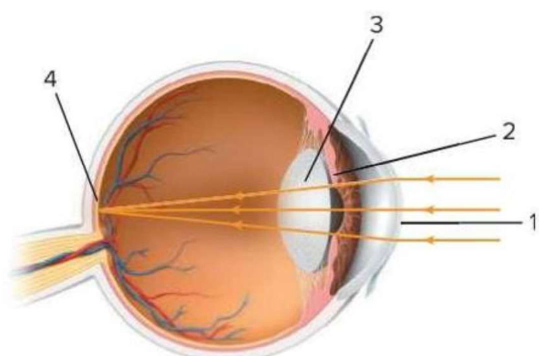
D. The size of the image depends on the shape of the lens.

Q15) Illustrate the function of human eye and its main parts and their importance in how it can enable a person to see.



- Some **vision problems** are **caused by the cornea's structure.**
- When the cornea **fails to form an image** on the back of the eye.
- **Corrective lenses can be used** to direct the light.
- **Some lenses diverge** the light because **the cornea is overly curved.**
- **Other lenses converge** the light because **the cornea is too flat.**

Questions



Which part of the eye can change its structure as a function to form a focused image?

A 1

B 2

C 3

D 4

الأسئلة المقالية (كتابي)

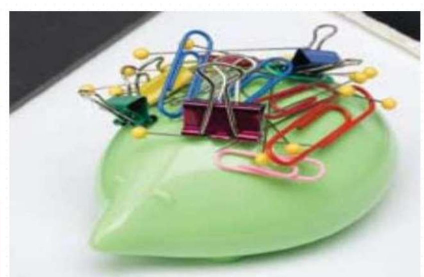
FRQs

Q16) **1. Assign magnetic poles according to repulsion and attraction forces and explain why any piece of a magnet will be a smaller magnet with two poles 2. Assign magnetic strength and label it on magnetic fields 3. using a compass needle assign the direction of magnetic field.**

Magnet is an object that **attracts iron or other metallic materials.**

Magnetic material is a material that is **attracted to a magnet**.

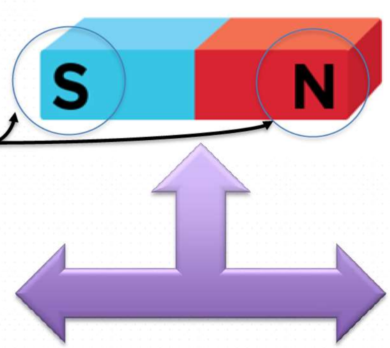
Magnetic materials often contain **ferromagnetic elements** include **iron, nickel, and cobalt**.

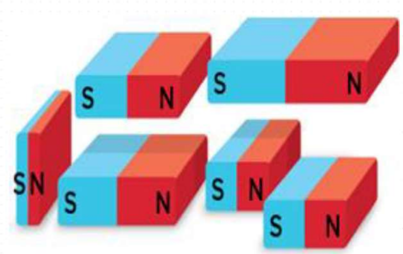


Magnetic pole is a place on a magnet **where the force** it is **strongest**.

All magnets have **two magnetic poles**—a **north** pole and a **south** pole.

if a **magnet is broken** into pieces, **each piece will have a north pole and a south pole. (New magnets)**

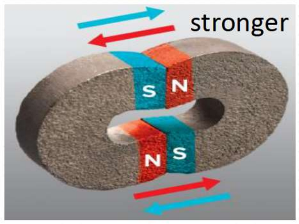




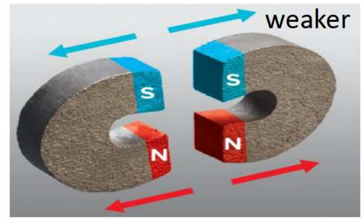
Magnetic force is a **noncontact** force which means it can apply a force **without touching**.

opposite poles the magnets **attract**

Attraction magnetic Force



simiar poles the magnets **repel**

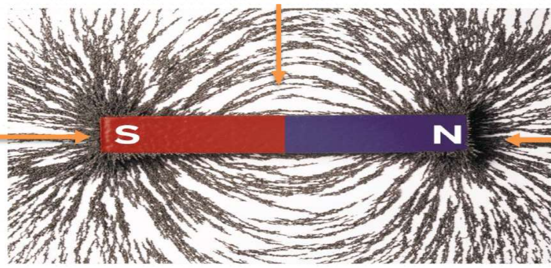


Repulsion magnetic Force

Magnetic field is the **space around a magnet (invisible)** where there is a magnetic force

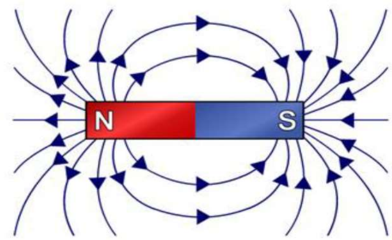
Farther apart
Weakest

Closer together
Strongest



Closer together
Strongest

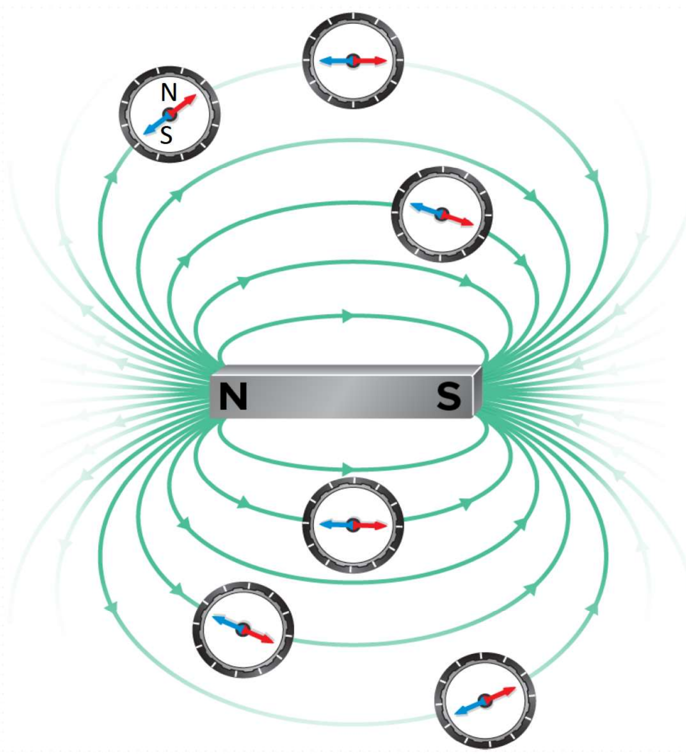
Always magnetic field lines move **from north to south**.



The **needle** of a compass is a **small magnet**. it has a **north pole and a south pole**.

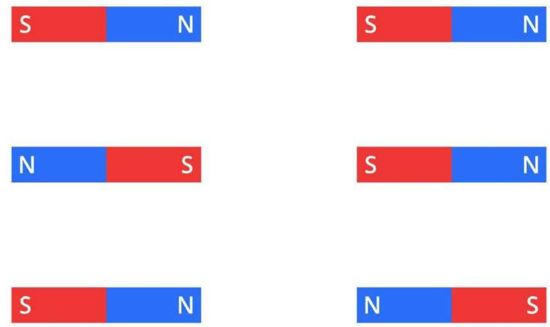
If a compass needle is within any magnetic field, it will **line up with the magnet's field lines**.

The needle **aligns with the field lines and points in the direction of the field lines**.



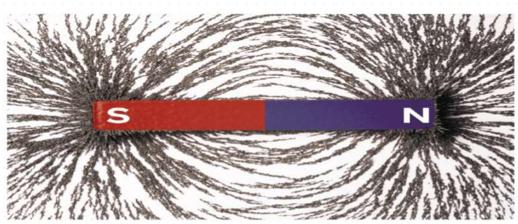
Questions

Draw the field lines for the magnets below.



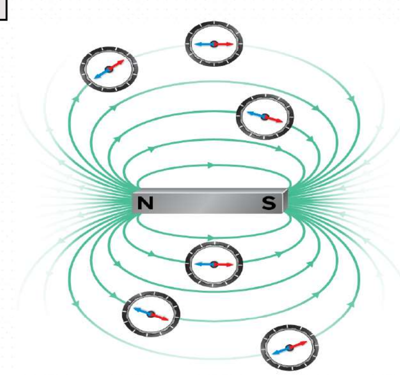
When you break an iron magnet into two pieces, you will get.

Assign magnetic strength and label it on magnetic fields.



Using a compass needle to assign the direction of magnetic field.

Model a compass needle when it is near the north end of the magnet.



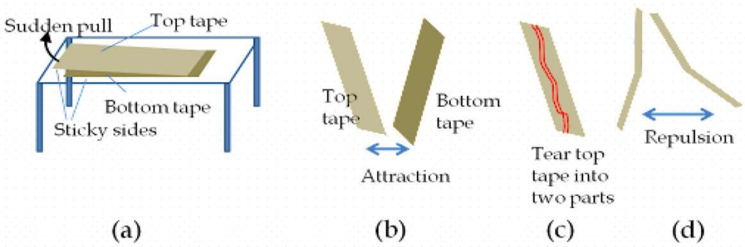
Q17) 1. Explain how matter and charged particles interact, and define repulsion, attraction, electrical forces, and electric field 2. explain what factors affect an electric current and draw a simple electrical circuit.

why does the balloon attract the water ?

The **water is neutrally charged** (made of positive and negative charged particles).

The **balloon is negatively charged** after rubbing.

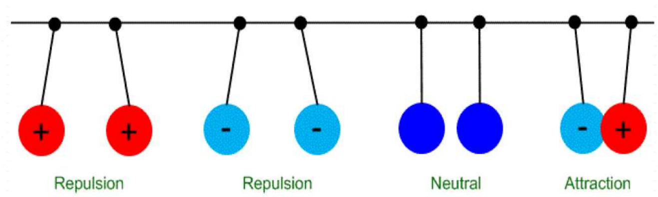
The **negatively charged balloon** will **attract** the **positive** charged particles **in the water**. (**attraction**)



	Top	Bottom
Top	repel	attract
Bottom	attract	repel

Reminder

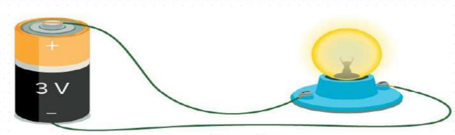
Similar charges **repel.**
opposite charges **attract.**
Electric force is a **noncontact force.**
It can be attraction or repulsion.



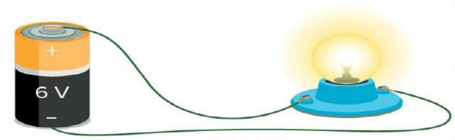
The **invisible region surrounding a charged** object is called an **electric field.**

Voltage is the **electrical potential energy difference** between **two places** on a circuit. Measured in **volt (V)**

The **3 V battery** has a potential energy difference of **3 V between the positive and negative** side.



6-V battery produces about **two times** the light and thermal energy than the **3-V battery.**



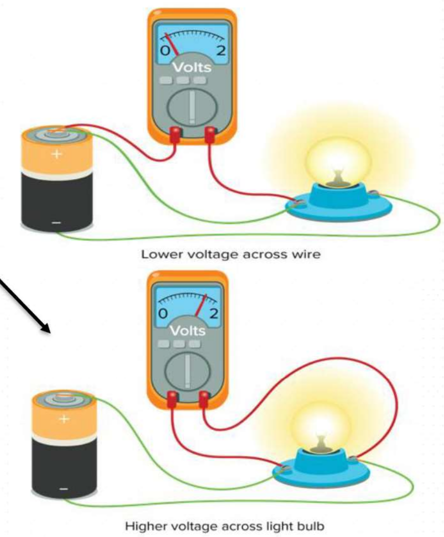
- A circuit with a **high voltage source** transfers **more electric energy. = brighter lamp**
- **More voltage = more current** (proportional relationship)

When electric energy is transferred to a light bulb, the **electric energy becomes light** and **thermal energy**.

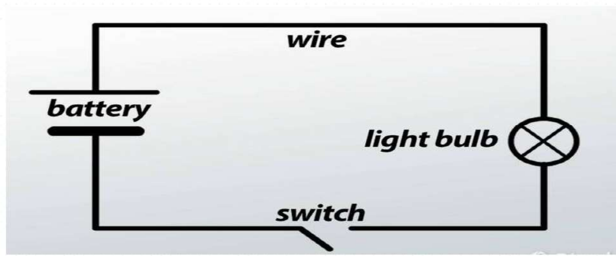
The voltage measured across a portion of a circuit indicates **how much energy is transferred** in that portion of the circuit.

Voltage or energy transferred measured by the **voltmeter**.

The **best conductor** is **copper**.



Electric circuit

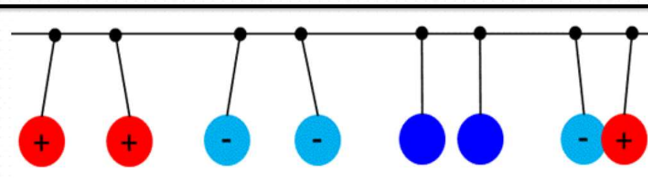


why does the balloon attract the water ?

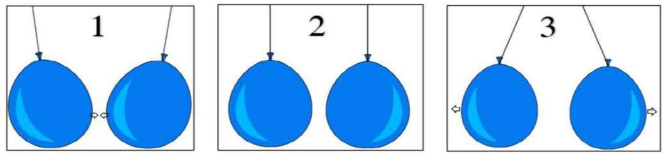
Define Electric force ?

Define Electric field ?

Assign attraction or repulsion of each balloon pairs.



Which balloon pairs represent attraction, and which represent repulsion? and why?



Explain what factors affect an electric current?

Draw an electric circuit that includes an energy source, device, conductor, and switch.

Q18) Differentiate between types of waves(mechanical and electromagnetic) and give examples on them.

A **wave** is a **disturbance** that **transfers energy** from one place to another **without transferring matter.** / all waves need **energy source** called **vibration**.

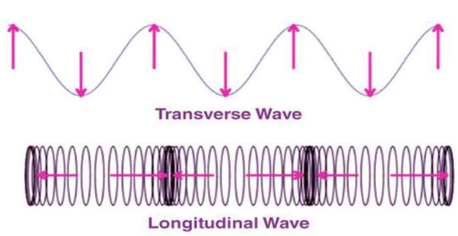
Types of waves

Mechanical Waves

Travels **only through matter or medium** (**Solids, liquids, and gases**).

Cannot travel through a vacuum (space)

Mechanical waves can be either **transverse** waves or **longitudinal** waves.



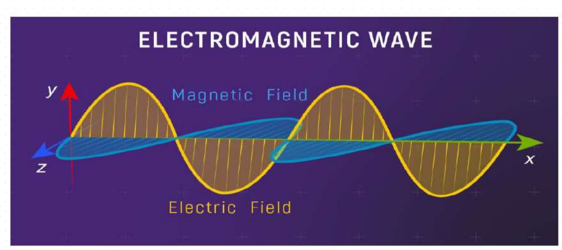
Electromagnetic Waves

Does not require a medium to travel.

Travel through **matter and vacuum** (space).

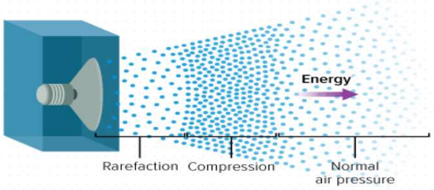
Created because of **vibrations between** an **electric field and a magnetic field**.

Transverse only

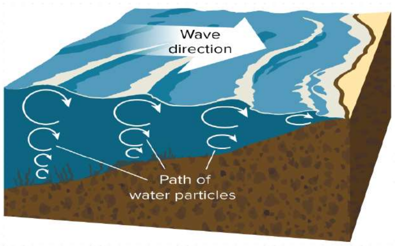


Mechanical Waves ← **Types of waves** → **Electromagnetic Waves**

Examples of Electromagnetic Waves



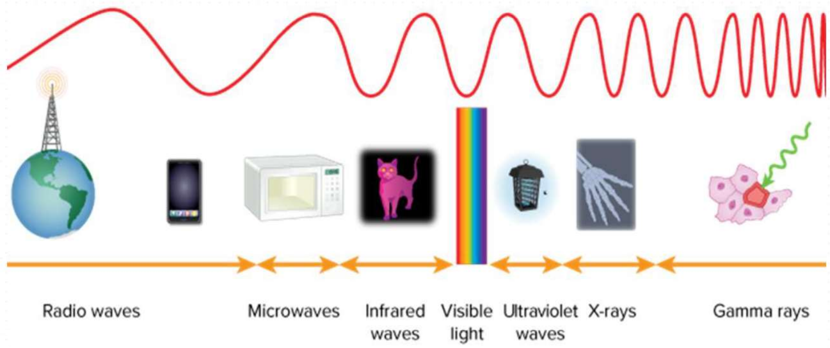
Sound waves (longitudinal)



Water waves (Transverse and longitudinal)

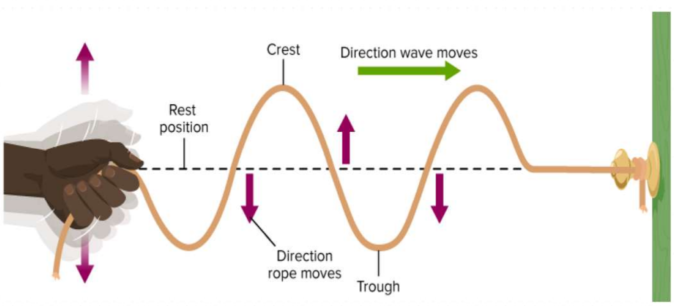
Mechanical waves or sound waves travel **faster in solid, liquid, then gas**.

Examples of Electromagnetic Waves

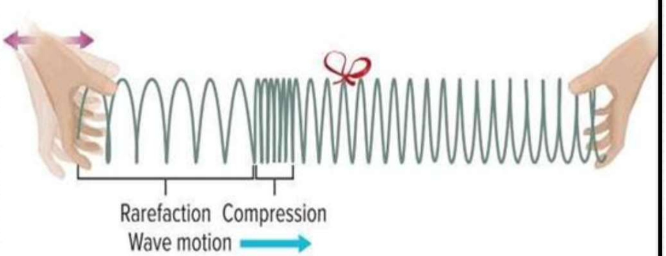


Electromagnetic waves or Light waves travel **faster in vacuum, air, liquid, then solid**.

Transverse / Perpendicular / up and down



Longitudinal / parallel / back and forth



- The <u>wavelengths of light waves</u> are **very short.** measured in **<u>nanometers (nm).</u>**
- The wavelengths of light waves range from about <u>700 nm to about 400 nm</u>.

The **brightness** is a <u>person's perception of intensity</u>.

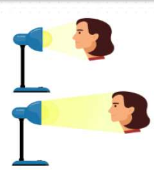
The **intensity of light** is the <u>amount of energy</u> that passes through a <u>square meter</u> of <u>space in one second</u>.

The **intensity of light** depends on:

1- the **amount of energy** emitted by the source.

2- **distance** from the Source.

3- the **environment**.

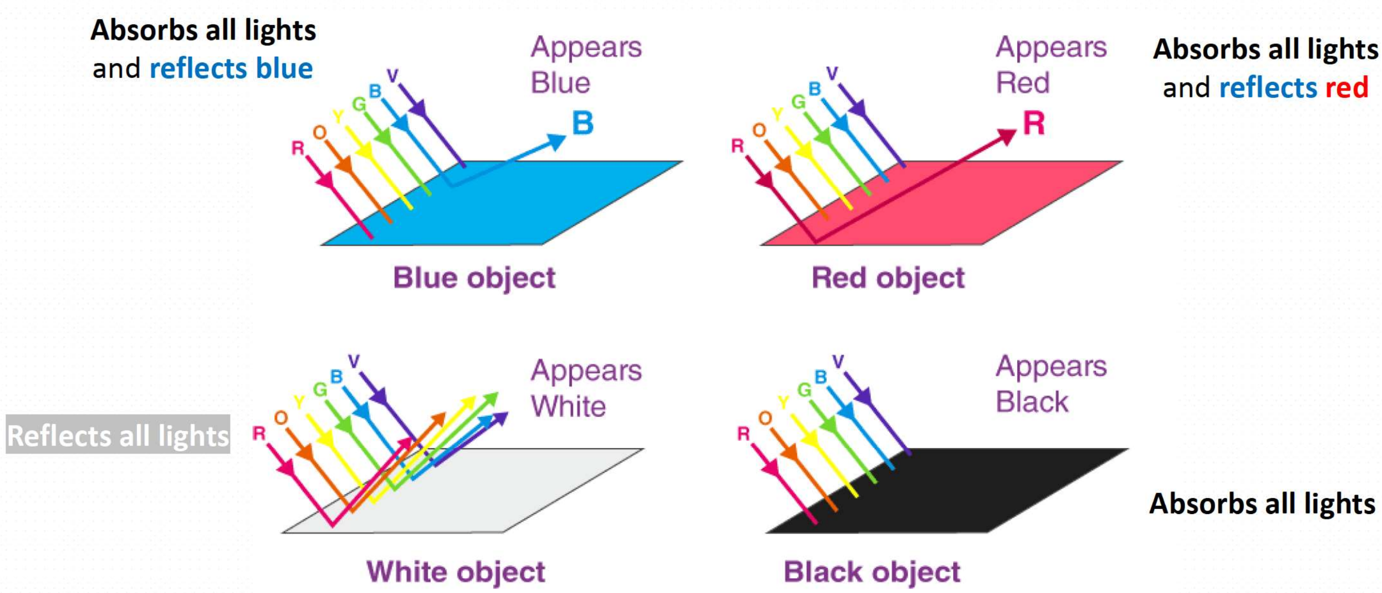


Differentiate between types of waves(mechanical and electromagnetic) and give examples on them

Parameter of Comparison	Mechanical Waves	Electromagnetic Waves
Medium		
Types		
Speed		
Examples		

Q19) 1. Describe how waves interact with matter (Reflection, Absorption, Transmission, Diffraction) and draw a model to represent the interaction 2. Explain how the human eye sees the colors of objects and how color filters change the color of objects.

Colors of objects



Describe the way waves interact. Create a model of each type interaction.

Interaction	Description	Model
Reflection		
Absorption		
Transmission		
Diffraction		

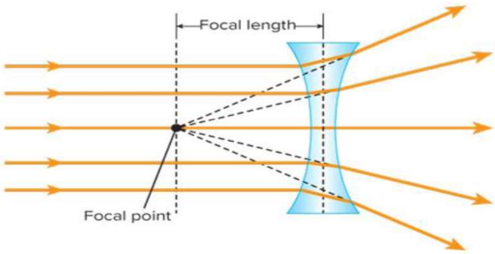
Explain how humans see colors of objects.

Explain how filters change the colors of objects.

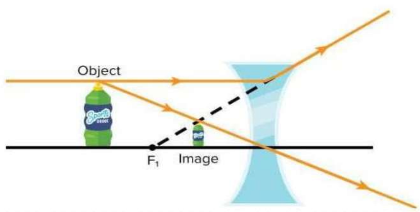
Q20) Compare between concave and convex lenses and draw the pathway of the light rays passing through a lens.

Concave lens → **Thinner** in the middle (curved **inward**)

Light refracted and **spread out into all directions.** (**Diverge**)

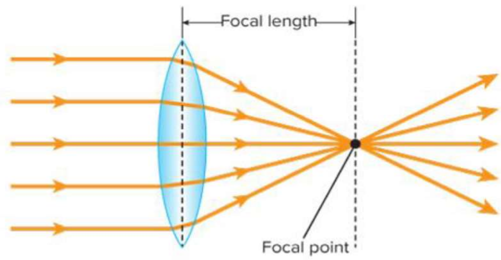


Can form **virtual image only**

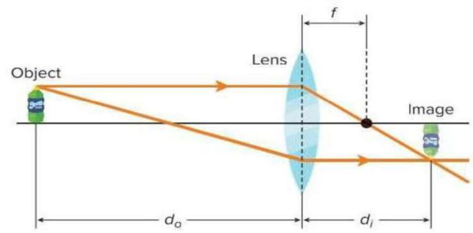


Convex lens → **Thicker** in the middle (curved **outward**)

Light refracted and **pass through the focal point.** (**converge**)

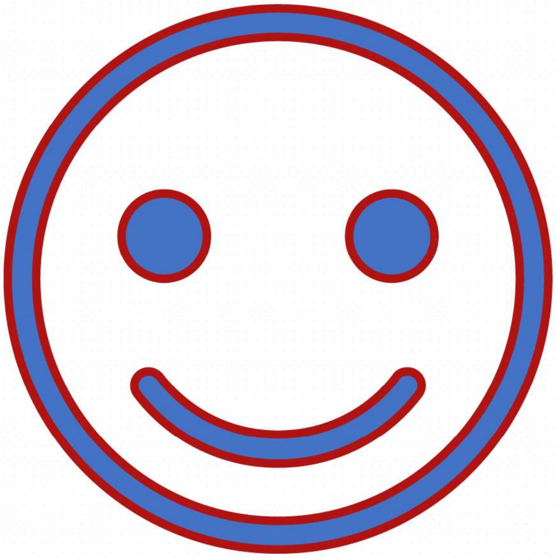


Can form **virtual or real image**



Compare between concave and convex lenses and draw the pathway of the light rays passing through a lens.

Lens	Direction of curvature	Direction of refractive light	System model
Concave			
Convex			



تمنياتي لكم بالتوفيق
والنجاح بإذن الله

THE END

TEACHER
ISSA
WASWAS