science

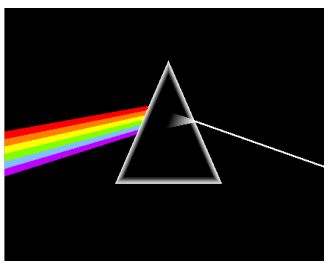
first term

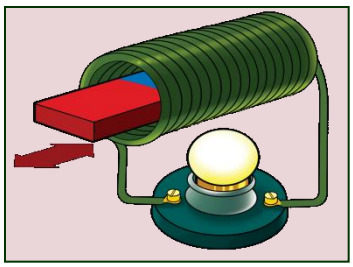
prim 5

By

GEHAN

Abo sheaashaa





The light

It is a form of energy
هو صورة من صور الطاقة .

Visible spectrum

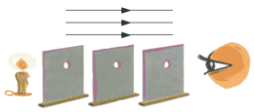
It is the part of light energy that can be seen.
هو الجزء الذي يمكن رؤيته من الطاقة الضوئية

Sources of light

1- the sun (main source)
2- electric lamps.
3- candles.
4- kerosene lamps.

Give reason We can't see in darkness: Due to the absence of light.

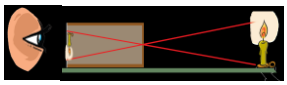
The properties of light: خصائص الضوء



1 Light travels in straight lines. يسير الضوء فى خطوط مستقيمة

Give Reason

- formation of upside down (inverted) images through narrow holes is due to بسبب traveling of light in straight lines.
- Formation of shadow is due to traveling of light in straight lines.


The idea of camera

Shadow It is the darkened area which is formed as a result of falling of light on an opaque object.

2 Light transmits through different materials. ينتقل الضوء خلال المواد المختلفة

The white light can fall on

مواد شفافة **Transparent material**	مواد نصف شفافة **Semi-transparent (translucent) material**	مواد معتمة **Opaque material**
Most of light can pass. We can see objects clearly behind it.	some of light can pass. We can see objects less clearly behind it.	Light can't pass. We can 't see objects behind it.
Glass – air – clear water	*Frosted light – tissue paper*	*Rock – wood –paper –foil paper – people*

- When the colored light all on opaque object , the object appears black because the object absorbs the colored light and doesn't reflect any color.

Give reason :**Cartoon is an opaque material:**
Because the light can't transmit through it and objects can't be seen behind .

Frosted glass is a translucent material.

Clear water is a transparent material.

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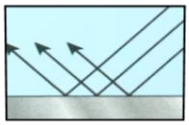
3 Light reflection . انعكاس الضـوء

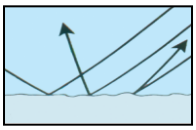
It is the bouncing (returning back) of light rays when light falls on a surface.

هو ارتداد الإشاعة الضوئية عندما تقع على سطح عاكس



Regular reflection:
- It is the reflection of light on a smooth and shiny reflecting surface.
- the light rays are reflected directly in one direction .
- like mirror.

irregular reflection: :



- It is the reflection of light on a rough reflecting surface.
- the light rays are reflected and scattered in different directions.
- like white paper.

A source of light and a reflecting surface are necessary for light reflection.

Give reason Seeing your image in the mirror:
Because the mirror reflects the light rays falling on it.

Give reason We can't see in darkness:
Due to the absence of light.

4 Light refraction . انكـســـار الضـوء

It is the change in the direction of light rays when light passes though the separating surface between two transparent media, due to the change in the light speed.

هو تغيير اتجاه الضوء عندما يمر على سطح فاصل بين وسطين شفافين، بسبب التغيير فى سرعة الضوء.

Give reason :

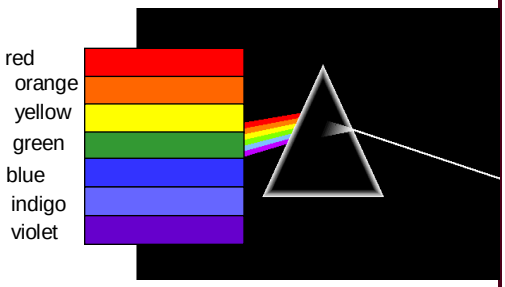
A spoon appears broken when you put it in transparent cup of water.
Due to the refraction of light.

Direction	اتجاه
Through	خلال
Passes	يمر
Separating surface	سطح فاصل
Media	مادة – وسط
Due to	بسبب
Speed	بسرعة
apears	يظهر - يبدو

5 Separation of light . انفصال (تحليل) الضـوء

It is the separation of white light into seven colors called spectrum colors.

Give reason : the formation of the spectrum color.
Due to splitting of white light into seven spectrum color



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The seven spectrum colors ألوان الطيف

Red – orange – yellow – green – blue – indigo - violet

Primary colors الألوان الأساسية

They are colors can't produce by mixing two other colors.

Red – yellow - blue

secondary colors الألوان الثانوية

They are colors can produce by mixing two primary colors.
Orange – cyan - violet

When white light falls on

- **Opaque object**: it reflects its color
- **Translucent material**: pass some light.
- **Transparent material**: pass most light.
- **Colored transparent material**: Absorbs all colors and pass its color.

When one color light falls on

or

When light from colored transparent sheet falls on

→ Opaque object → The object seems black **Because** it absorbs the colored light and doesn't reflect any color.

Give reason

- **The red transparent ruler appears red when white light falls on it.**
  Because it absorbs all the light colors transmits only the red light color.
- **we can see the white paper as it is.**
  Because it reflects all colors.
- **we can see the the black board as it is.**
  Because it absorbs all colors.
- **we can see the the red apple as it is.**
  Because it absorbs all light colors and reflects the red light color.

MAGNITEZM المغناطيسية

It's a type of rocks has an attractive force to any material made of iron.

Natural Magnet	• It is a black rock. • It is one of the iron ores which is known as "Magnetite".
Artificial magnet	• It has different shapes and sizes.

Magnetic materials	They are the materials which are attracted to the magnet. Iron – nickel- steel and cobalt
Non-magnetic materials	They are the materials which are not attracted to the magnet. Chalk – glass- paper aluminium - copper-wood –leather- plastic

Give reason : **The magnet attracts iron, but doesn't attract copper.**
Because iron is a magnetic material, but copper is a non-magnetic material.

The properties of the magnet

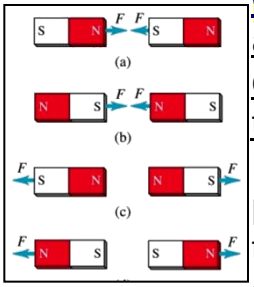
1 **The magnet has two poles ,the attraction force concentrated on them.** للمغناطيس قطبين تتركز فيهما قوة الجذب

Two poles of magnet (magnetic poles):
The regions (areas) of magnet at which most of the magnetic materials are attracted.

Give reason : When you approach a magnet to some paper clips, the clips are attracted to the two poles of the magnet.
Because the attraction force of the magnet is concentrated at the two poles of magnet

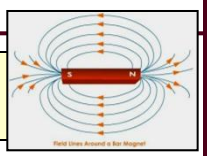
2 **The freely moving** الحر الحركة **(suspended) magnet always takes a fixed** ثابت **direction, which is North-south direction.** يتخذ المغناطيس الحر الحركة اتجاهًا ثابتًا و هو اتجاه الشمال والجنوب

3 **The like (similar) magnetic poles repel each other, but the unlike (opposite) magnetic poles attract each other.**
الأقطاب المتشابهة تتنافر والأقطاب المختلفة تتجاذب



Give reason : The north pole of a magnet attracts the south pole of another magnet, but repels the north pole.
Because the opposite magnetic poles attract each other, while the similar magnetic poles repel each other.

4 **The magnet is surrounded by an area called "Magnetic field".**
المنطقة المحيطة بالمغناطيس تسمى المجال المغناطيسى



Magnetic field:
It is the space around the magnet in which the effect of magnetic force appears.

Magnetic force:
It is the ability of the magnet to attract the magnetic materials existed in its field.

The importance of the magnetic compass
It used to identify the four geographical directions.

Give reason : The compass is used to locate (determine) the main four directions.
Because the north and south poles of its magnetic needle always point to the north and south directions of the Earth.

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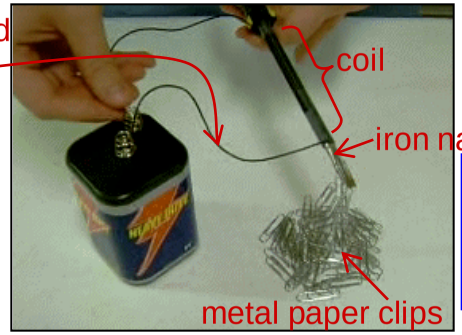
Magnetism and Electricity

There are two relationships

Electric current can generate a magnetic field.

The electric current can be generated by a magnetic energy.



The electromagnet consists of electric current and coil

Steps : get buttery ,iron nail, metal paper clips and copper wire.
turn the wire around the nail.

Observation : The iron nail attracts the paper clips.

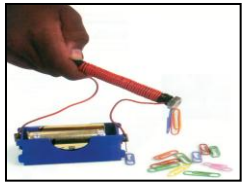
Conclusion : The iron bar becomes a temporary magnet that is called **" the electromagnet ".**

The magnetic force of the electromagnet can be increased by:

- increasing the number of coil turns.
- increasing the number of batteries, where the intensity of the electric current passing through the coil increases.

Give reason :

A wrought iron الحديد المطاوعnail is used for making the electromagnet.

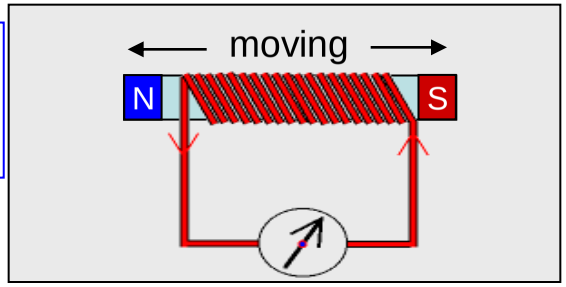


Because the wrought iron nail gains يكتسب and loses يفقد the magnetism easily.

Uses of electromagnet:

1- In winch (crane) to move heavy Iron blocks.
2- Electric bell.
3- Electric Mixer.
4- Disc drive.
5- Television

The Dynamo consists of coil and magnet

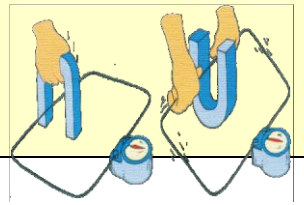


The electric current can be generated in a coil of dynamo by:

a. Moving the coil in the magnetic field between the two poles of the magnet.
b. Moving a magnet inside the coil.

The Methods to increase the produced amount of electricity from the dynamo by:

- using a strong magnet.
- increasing the number of coil turns.
- Increasing the motion of magnet or coil.



Give reason :

In the dynamo, we must increase the motion of the coil between the two poles of magnet.
To increase the generation of the electric current.

Uses of dynamo

1- in the bike we use small dynamo to lighting the bulb.
2- In electric power stations they use a huge electric generators for lightening cities.

Mixtures المخاليط

Pure substance:
It is the substance that is made of only one type of identical particles. (Distilled water الماء المقطر - Sugar - Baking soda)

Mixture:
It is the substance that consists of more than one type of particles.
(Concrete أسمنت - Milk - Tomato sauce)

Give reason : Both sugar and distilled water are considered pure substances.
Because each of them is composed of only one type of identical particles.

Give reason : Both milk and concrete are considered mixtures.
Because each of them is consists of more than one type of particles.

Types of Mixtures

Solid Solid M	Liquid Liquid M	Solid Liquid M	Gaseous Gaseous M	Gaseous Liquid M

Each of *solid-solid*, *liquid-liquid* and *solid-liquid* mixtures is divided into two types:

Homogeneous mixture:
A type of mixtures in which, we cannot distinguish between its components. (Milk - Mixture of salt and water)

Heterogeneous mixture:
A type of mixtures in which, we can distinguish between its components. (Mixture of sand and iron fillings)

The properties of mixture

- The components of the mixture do not join (react) together and can be separated easily.
- Each component in the mixture keeps its own properties,
- The components of the mixture can be mixed at any ratio.

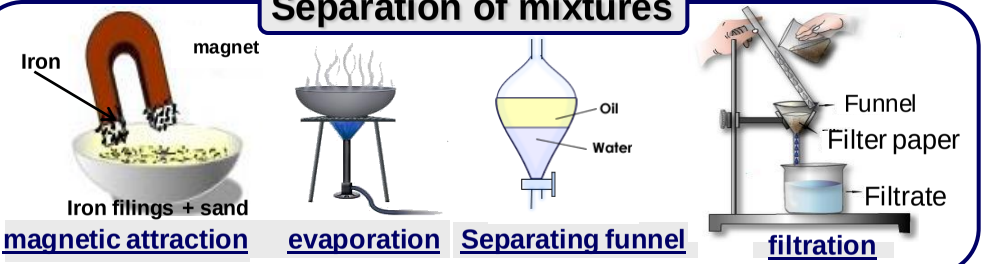
Give reason : A mixture of sand and iron filings can be separated easily.
Because the components of the mixture do not react together.

Formation of mixtures

Mixture can be formed by different methods such as,
Shaking الرج, **Stirring** التقليب , **Grinding** الطحن

- Solid and liquid materials can be mixed by shaking and stirring
- Solid materials can be mixed by shaking and grinding.
- Liquid materials can be mixed by shaking and stirring.

Separation of mixtures



magnetic attraction | evaporation | Separating funnel | filtration

1- magnetic attraction → to separate a magnetic material from a solid mixture.
2- filtration process → to separate solid materials that are insoluble in water.
3- evaporation process → to separate solid materials that are soluble in water such as salt.
4- Separating funnel → to separate heterogeneous liquid mixtures such as water and oil mixture.

Give reason : Filtration process is used to separate sand from sugary solution.
Because filtration process is used to se3parate the solid materials (as sand) that are insoluble in water.

solution

المُذاب **solute** + المُذيب **solvent** —**Solubility process** عملية الإذابة→ **solution** المحلول

It is the substance which dissolves in the solvent	It is the substance which the solute dissolves in.	It is the process which the solute dissolves in the solvent, and the solute disappear and form solution.	It is a homogenous mixture , the solute breakdown into basic particles and spread in it.

- The homogenous mixture is a **solution** has **a soluble**.
- The heterogeneous mixture is **a suspension** has an **insoluble.**

Give reason : salty solution is a homogeneous mixture
Because its components break down and can't be distinguished.

Give reason : apple juice is a solution.
Because apple particles breakdown and disappear in the water.

Give reason : sugar is considered the solute in the sugary solution
Because it dissolves in the solvent (water) to form solution.

Factors affecting solubility process

① **The quantity of solvent and solute.**

- By increasing the solvent , the solubility increases and vise versa.
- By increasing the solute, the solubility decreases and vise versa.

② **The temperature.**

By increasing the temperature , the solubility increases and vise versa.

③ **The stirring.**

By increasing the stirring , the solubility increases and vise versa.

④ **The kind of solute .**

The speed of the solubility process depends on the kind of solute.

Food relationships among living organisms

1 **Predation:** الأفتراس

It is a food relationship among living organisms, where one living organism devours another one. هى علاقة بين الكائنات الحية التي يفترس أحدهما الآخر

Predator :
it is the living organism which devours the other.

Prey :
it is the living organism which is devoured.

- **Predation in animals**.

(a lion prey a deer - a wolf preys a rabbit - a cat preys a rat.)

- **insectivorous plant**. آكلات الحشرات

They Cannot absorb some compounds from the soil to make protein.
So , they prey insects to make protein. (Drosera – Halphila)

Give reason : Drosera is an insectivorous plant.
Because it preys تفترس some insects to get the required elements العناصر المطلوبة for making protein.

How living organisms defend تحمى themselves

Camouflage: التمويه والتخفي
the living organism changes its color to simulate the color of its surrounding environment.
(fish, frogs, birds, chameleon الحرباء and most insects as butterflies.)

Give reason : A chameleon simulates the color of the surrounding environment.
To protect itself (hide) from the enemies.

Mimicry: المحاكاة
The harmless living organisms imitate other harmful or poisonous living organisms to fear their enemies and escape from them.

Give reason : Some bees look like wasps in forming stripes on their bodies.

To fear their enemies which get afraid from wasps and escape from them.

2 **Commensalisms**: التعايش هى علاقة بين كائنين مختلفين يستفيد إحداهما من الآخر ولا يضره ، والآخر قد يستفيد أو لا يستفيد.

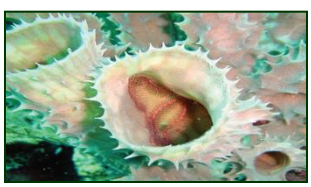
It is a common food relationship between two different living organisms, one of them benefits from the other and does not harm it, but the other may or may not benefit from the first.

Mutualism: تبادل المنفعة
It is a food relationship in which, both of them get benefit from the other and is not harmed. **الاثنان يستفيدان**

• The relationship between nodular bacteria البكتريا العقدية and leguminous plants النباتات البقولية. The bacteria give the nitrogen to the plant and takes the sugar from it.
• The relationship between insects and flowers of plants.
• The relationship between hippopotamus and some birds.

Give reason : The relation between a bee and flowers of plants is a mutual relationship.
Because the bee feeds on the nectar of flowers, and it transfer the pollen grains from a flower to anther to help plant to multiply.

Symbiosis: التكافل
It is a food relationship between two living organisms where, one of them benefits from the other, while the other neither gets benefits nor is harmed. واحد يستفيد والآخر لا يستفيد ولا يضر



• A bird picks up food remains بقايا الطعام between the teeth of crocodile.
• Tiny aquatic living organisms get food and shelter ملجأ from the canals and fissures شقوق found inside the sponge. The sponge neither gets benefit nor is harmed from the existence of these living organisms.

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3 **Saprophytism**: الترمم

It is a food relationship in which saprophytes (decomposers) get their food by decomposing food remains or bodies of dead organisms.

Give reason : Bread mold fungus فطر عفن الخبز is saprophytic organism.
Because it gets its food by decomposing food remains (moist bread).


4 **Parasitism:** التطفل

It is a food relationship between two different living organisms, one benefits from the other, while the other is harmed.

• **the parasite الطفيل** : it is a living organism which benefits from the host.

• **the host العائل** : it is a living organism which harmed from the parasite.

Give reason : The death of the host is considered a loss to the parasite.
Because the parasite will lose its source of food and shelter ملجأ.

External parasitism:

The parasite lives externally on the host's body and feeds by sucking يمتص the blood of the host. The parasite conveys ينقل diseases to the host.

Fleas can convey small pox disease to man.

Mosquitoes conveys ينقل diseases to the man such as
• Flaria worm that causes elephantiasis disease.
• Malaria diseases

Lice sucks man's blood.
القمل يتطفل على جلد رأس الإنسان ويمتص دمه

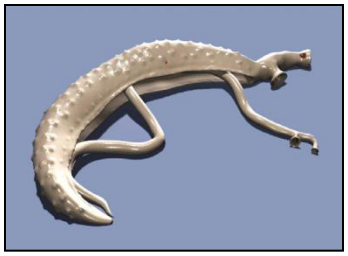
Jawless lamprey sucks fish's blood.
سمكة الامبري عديمة الفكوك تمتص دم السمكة

Internal parasitism:

The parasite lives internally inside the host's body and shares the host its digested food or feeds on its tissues and cells.
يعيش الطفيل فى جسم العائل ويشاركه الغذاء أو يتغذى على أنسجة وخلايا جسمه

(Liver worms – Tape worms – Ascaris worms – Flaria worms – Bilharzia worms.)

Ascaris worms cause anaemia.



Bilharzia worms cause bilharziasis disease

Flaria worm causes elephantiasis disease

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Ecosystem النظام البيئي

It is any natural area that contains living organisms (as plants and animals) and non-living things (as water, soil, air and air gases).

Any ecosystem consists of two components which are **Living organisms** and **Non-living things**

plant and the soil
The plant depends on the soil to absorb water that is necessary to make its own food by photosynthesis process.

plants and animals:
Animals feed on plants to get food and energy.

The relationship between different animals:
Some animals feed on other animals to get food and energy.

Environmental balance:
التوازن البيئي

It is the balance between the components of the ecosystem.

Factors harm (disturb) the environmental balance: عوامل تخل بالتوازن البيئي

1. The changing in the natural conditions ecosystem التغير فى الظروف الطبيعية للنظام البيئى
causes a disturbance that leads to Disappearance of some organisms and Appearance of other organisms.
This disturbance may take a short or a long period of time until a new balance occurs in this environment.

2- Man interference: تدخل الإنسان
Some human activities such as cutting down trees, burning forests, polluting environment, and eroding the soil lead to disturb the environmental balance.

Factors keep the environmental balance: عوامل تحافظ على التوازن البيئي

predation and saprophytism play an important role to keep the environmental balance.

Q- Give reason: Predation relationship plays an important role in keeping the balance of the ecosystem.
Because predation organizes the number of preys populations.

Q - What happens if Rabbits are introduced into an island that has a suitable environment with much food and no natural enemies?
The environmental balance will be disturbed as لأن the number of rabbits increases and the food resources become not enough for them. Competition appears among rabbits populations so, they will die.

❖ **The saprophytic organisms (decomposers) play an important role in keeping the balance of ecosystem by:**
1. Getting rid التخلص of bodies of dead organisms by decomposing them.
2. Recycling the chemical elements found in the bodies of dead organisms (as carbon, nitrogen and phosphorus) to the environment to make other living organism benefit from them.

Q- What happen if saprophytes (as bacteria) disappear from the planet earth ?
The environmental balance will be disturbed because the bodies of dead organisms will be remained and the element in their bodies(carbon and Nitrogen) can't recycle.

Q. How does man benefited from saprophytic organisms in the industry? In medical to make antibiotic. Uses in some cheese and yogurt.