

First term

Science



First Preparatory

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Matter and its characteristics

Matter: It is anything that has a mass and a volume .

Object can be distinguished from each other by physical and chemical properties :

A-physical properties

1-The color ,taste ,and smell

* Color:- it can be used to differentiate among iron, silver and gold

* Taste:-it can be used to differentiate among sugar, table salt and flour.

* The smell:-it can be used to differentiate between vinegar and perfume.

2- Density

It is the mass of unit volume of matter.

Or It is mass of one cubic centimeter of matter.

Massit is the amount of matter that the body contains.

Volumeit is the space that occupied by the object .

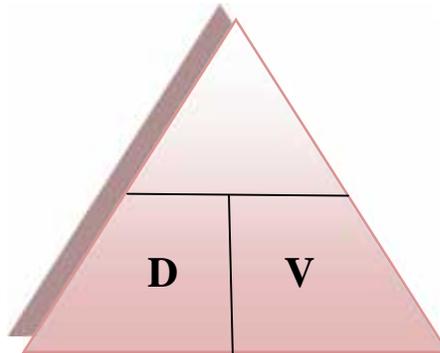
Note:

The measuring unit of mass (kg-gm)

The measuring unit of volume (cm³) **M**

The measuring unit of density (gm/cm³)

Density = mass/ volume



Problem : calculate the density of 35 gm of iron that occupies 25cm³

$$\text{Density} = \text{mass} / \text{volume} = 35/25 = 1.4 \text{ gm/cm}^3$$

G.R

Equal masses of different substances have different volumes.

Because they have different densities .

Note :

Density of water =1 So Materials which have higher density than water sink in it such as iron nail and metallic coin , while other materials which have lower density than water float on its surface such as wood , cork , ice and drops of oil .

3- Melting point

It's the temperature at which a matter begins to change from a solid state to a liquid state.

- Some solid substances have low melting points such as wax , butter ,ice.
- Some solid substances have high melting points such as iron , copper ,table salt .

application on melting process :Life

1- in manufacture of alloys

Copper-gold alloy .

It is an alloy used in making of jewels used for decoration .

Nickel – chrome alloy .

It is an alloy used in making of heating coils .

2- In the manufacture of cooking pans (pots)

They made of steel which does not rust as they have high melting point .

4- Boiling point

It is the temperature at which begins to change from a liquid state to gaseous state.

*Boiling point of water = 100 C^0

application on boiling process :Life

Separation of the components of petroleum oil .

5- Hardness

- Some solid substances are soft at room temperature such as rubber .
- Some solid substances need heat to become soft to be shaped such as metals .
- Some solid substance cannot be soften by heating such as Coal and sulphur .

Life application on hardness:

The screwdrivers are made of steel iron .-

Because it is very hard .

-The rods used in building houses concrete are made of iron not copper

Because the hardness of iron is more than that of copper .

6- Electric conductivity

Substances can be classified according to electric conductivity into :

A- Good conductor of electricity.

B- Bad conductor of electricity.

Good conductor of electricity	Bad conductor of electricity.
Substance allow electricity to flow through.	Substance do not allow electricity to flow through.
<u>Example</u> :metal,iron copper acidic and alkaline solution some salt .	<u>Example</u> : wood ,plastic gases solution of hydrogen chloride in benzene sugary solution some solid element as sulphur phosphorus .

Life application on electric conductivity:

1- Electric wire are made of copper

Because copper is a good conductor of electricity..

7- Heat conductivity

Substances can be classified according to thermal conductivity into :

A- Good conductor of heat.

B- Bad conductor of heat .

Heat conductor	Heat insulator.
Substance allow heat to flow through.	Substance do not allow heat to flow through.
<u>Example</u> :metal,iron copper .	<u>Example</u> : wood ,plastic , air .

Life application on heat conduction

1-Cooking pans are made of aluminum -

Because it is a good conductor of heat

2- handle of cooking pans are made of wood or plastic

Because wood and plastic are bad conductors of heat.

Second chemical activity :

Metal can be classified according to their chemical activity into three groups:

A- very active metals

They are metals which react with oxygen as soon as being exposed to humid air, so they lose their metallic luster.

Examples : (Sodium and potassium)

Sodium and potassium are kept under kerosene surface .

To prevent their reaction with atmospheric oxygen .

B- Less active metals

They are metal which react with oxygen if left in air for some days and a layer of rust is formed .

Examples: (Iron , aluminum and copper)

Steel bridges and the holder of light bulb are painted from time to time .

To protect them from rust and corrosion .

Metallic spare parts of cars are covered with grease .

To protect them from rust and corrosion.

Washing of cooking pans made of aluminum with a rough material.

To remove any layer formed on them .

C-inactive metals :

They are metals which find great difficulty to react with oxygen .

Examples : Silver , Gold ,Nickel ,platinum ,chromium .

Silver and gold are used in making jewels.

Because silver and gold are chemically poor active.

Work sheet (1)

Lesson (1)

Complete the following statements :

- 1- The measuring unit of mass is, while is the measuring unit of volume .
- 2-The density is the of unit volume of a substance and its measuring unit is
- 3-The melting point is the temperature at which matter changes from a state into aone
- 4- is one of solid substance which appear soft at room temperature while anddon't become soft by heating .
- 5- alloy is used in making jewels , while alloy is used in making heating coils .
- 6- and are good conductors of electricity and heat while and are bad conductors of electricity and heat .
- 7-Electric wires are made of or as they are conductors of electricity .
- 8- Steel bridges and the holder of light bulb are painted from time to time to be protected from and
- 9- and are from the substances which have low melting points ,while and are from the substances which have high melting points .

10- and are very active metals ,while and are inactive ones .

Write the scientific term :-

1- The mass of unit volume of the substance . ()

2-The amount of matter that the body contains . ()

3- The space that a substance occupies . ()

4- Metal react with atmosphere oxygen when they are exposed to humid air . ()

Give reason :-

1-A piece of wood floats on water surface ,while a piece of lead sinks in it .

.....

2- An iron nail sinks , while one kilogram of cork floats .

.....

3- Water is not used to put off petrol fires .

.....

4-Iron rods not copper rods are used in building concrete houses .

.....

5- handles of cooking pans are made of wood .

.....

What is meant by :-

Matter :.....

Melting point :

Boiling point :.....

Problems :

1- Calculate the density of iron cube , its mass 70.2 gm and its volume 9 cm³.

.....
.....
.....

2- If the density of copper is 8.9 gm/cm³.find the volume of 0.5 kg of copper .

.....
.....
.....

Matter construction

The molecule :It is the smallest part of matter which can exist freely and it has the properties of matter .

Matter is composed of small building unit called molecules

The properties of the molecules of matter

- 1- Molecules of matter are in a continuous motion.**
- 2- There are intermolecular spaces among the molecules of matter.**
- 3- There are attraction forces among the molecules of matter.**

Molecules of matter are in a continuous motion .1-

Permanganate molecules are dissociated into particles and spread in water gradually in all direction until the color of water has been changed into violet.

Note : The molecules of solid matter have an oscillatory motion ,while the motion of liquids is limited and that of gases is unlimited .

2-There are intermolecular spaces among the molecules of matter.

The volume of a mixture of water and alcohol is less than the sum of their volume before mixing .

Because some molecules of alcohol occupy the intermolecular spaces among water molecules .

3-There are attraction forces among the molecules of matter.

It is difficult to break an iron piece with your finger .

Because there is a strong attraction force among iron molecules .



Note :

solid	liquid	gas
They have definite shape and volume .(limited -oscillatory motion)	They have definite volume and indefinite shape.(more free)	They have indefinite shape and indefinite volume .(completely free)
Narrow intermolecular spaces .	Intermediate intermolecular spaces .	Large intermolecular spaces .
Very strong intermolecular forces .	Weak intermolecular forces.	Very weak intermolecularforce .

G.R :-Melting : It is the change of matter from the solid state to liquid state by heating .

Because solid substance absorb heat so :-

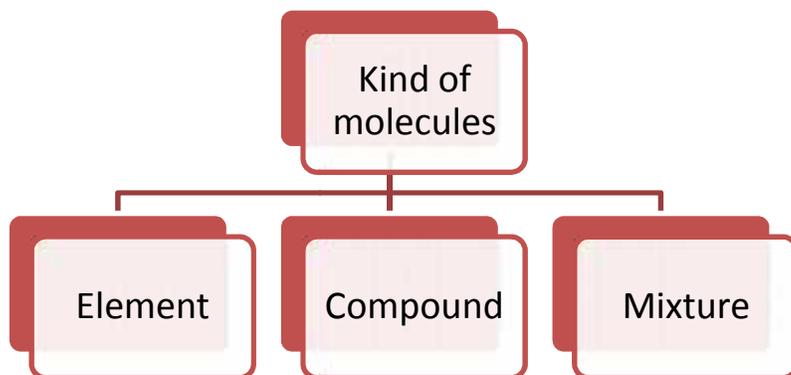
Its motion will be increase , intermolecular space increase and intermolecular force decrease so its change from solid to liquid .

G.R :- VaporizationIt is the change of matter from the liquid state to gases state by heating .

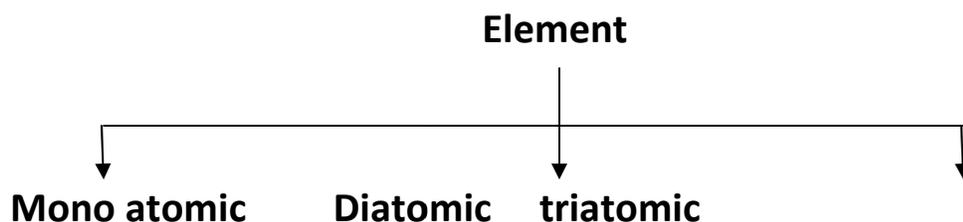
Because liquid substance absorb heat so :-

Its motion will be increase , intermolecular space increase and intermolecular force decrease so its change from liquid to gas .

The molecule is composed of tiny structural units called 'Atom'



The element :- It is the simplest pure form of matter which can't be analyzed .



Element molecules formed of only one atom (monatomic)	Element molecules formed of two atom (diatomic)	Element molecules formed of three atom (triatomic)
Solid as copper sulphur Liquid is mercury Gas are noble gas (Helium- neon argon - krypton – xenon – radon)	Liquid is bromine Active gases are (oxygen- hydrogen- chlorine – nitrogen – fluorine)	Ozone gas



Note

Active gases are diatomic while noble gases are monoatomic

Mercury is liquid it composed of one atom while bromine is liquid it composed of two atom .

The compound :-It is substance which is formed from combination of atoms of two or more different elements with constant weight ratios .

Compound molecule	The types and number of atoms
1- sodium chloride (Table salt) NaCl	It consists Of two different elements
2- water H ₂ O	It consists of three atom of two different elements
3- ammonia NH ₃	It consists of four atom of two different elements

Work sheet(2)

Lesson (2)

A)complete

- 1-..... takes the shape of the container , while have definite shape.
- 2- Matter consists of small building units called which consist of smaller building units called
- 3- The liquid element which consists of one atom is , while that consists of two atoms is
- 4- Hydrogen molecules is composed ofatom , while argon molecule is composed of atom .
- 5- Table salt compound is consisting of atom and atom .

Write the scientific term :-

- 1- The smallest part of matter which can exist in a free state and keep the properties of matter . ()
- 2- space that found among the molecules of matter . ()
- 3- The simplest state of matter which cannot be decomposed into a into a simpler one by chemical means . ()
- 4- The combination of two or more different elements . ()
- 5- The compound molecule which is formed of three hydrogen atom and one nitrogen . ()

Give reason:

1-The odour of perfume spreads all over the room when the bottle is open .

.....

2-the volume of a mixture of water and alcohol is less than the sum of their volume before mixing .

.....

It is difficult to break down a piece of iron with your hand .

.....

Atomic structure of matter

The chemical symbols of element :

Element	Symbol	Element	Symbol
Hydrogen	H	Chlorine	Cl
Helium	He	Argon	Ar
Lithium	Li	Potassium	k
Carbon	C	Calcium	Ca
Nitrogen	N	Iron	Fe
Oxygen	O	Copper	Cu
Fluorine	F	Zinc	Zn
Neon	Ne	Bromine	Br
Sodium	Na	Silver	Ag
Magnesium	Mg	Iodine	I
Aluminum	Al	Gold	Au
Silicon	Si	Mercury	Hg
Phosphorus	P	Lead	Pb
Sulphur	S		

The atom :- It is the fundamental building unit of matter .

Or it is the smallest individual unit of matter which can share in chemical reaction .

The atomic construction :-

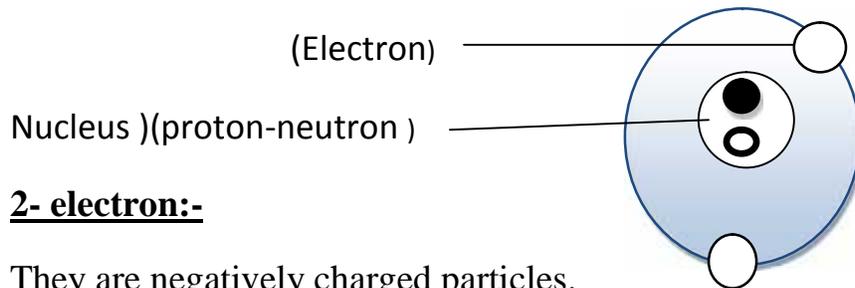
1- Nucleus

It is the central core of the atom ,where the mass of the atom is concentrated in it .

It is positively charged because it contain :

a- Protons (+ ve)

b-Neutrons (\pm ve) (electrically)



2- electron:-

They are negatively charged particles.

They move around the nucleus in orbits with very high speed.

The electron has a negligible mass relative to that of the proton or neutron , so the mass of the atom is concentrated in the nucleus .

G.R

The atom is electrically neutral in its ordinary state .

The number of negative electron which revolve around the nucleus is equal to the number of positive proton in the nucleus .

Note:-

Atomic number: it is the number of proton in the nucleus of an atom OR number of electron .

it is written below the symbol from the left side .



Mass number

It is the sum of the numbers of proton and neutrons in the nucleus of an atom .

: it is written above the symbol

Problem

1- If the nucleus of sodium atom contains 11 proton and its mass number is 23 , find the atomic number and the number of neutrons .

The atomic number = no. of proton = 11

The number of neutron = mass number – atomic number = 23 – 11 = 12 .

Atomic no. = no. of proton = no. of electron .

Mass no. = no. of proton (atomic no.) + no. of neutrons

Number of neutron = mass no. – atomic no.

The energy levels:-

They are imaginary regions around the nucleus in which the electron move according to their energies .

The maximum number of energy levels is seven levels (K-L-M-N-O-P-Q)

The first energy levels k has the least energy ,Q has the highest energy .

Quantum :-

It is the amount of energy lost or gained by an electron when it transfer from one energy level to another .

The excited atom :-

It is the atom that gains a quantum of energy

The no. of electron which saturates the first four energy levels can be calculated from $2n^2$

The no. of energy level (k) = $2 \times (1)^2 = 2$

(L)=8 (M)=18 (N)=32

Note:-

The rule $2n^2$ is not applied to calculate the number of electron of the energy levels higher than four because the atom is not stable .

The outer most energy level of any atom can't take more than 8 electron except k which saturated with 2 electron .

Active gas	Inactive gas
<p>The outer level contain less than 8 electron.</p>	<p>The outer level is completely filled with 8electrons (except He)</p>
<p>They take part in chemical reaction.</p>	<p>They don't take part in chemical reaction.</p>
<p>Their molecules are formed of two atoms.</p>	<p>Their molecules are formed of one atoms.</p>

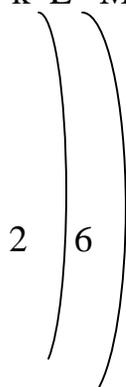
Proplem

Write the electronic configuration of the following

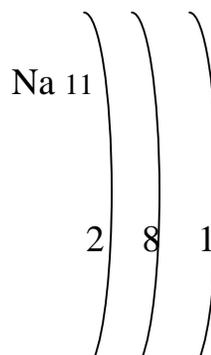
O₈ Na 11

K L k L M

O₈



Na 11



Work sheet (3)

Lesson (3)

Complete the following :-

1- The symbol of sodium atom is, while that of sulphur atom is

2- The mass number is the sum of number and, which exist in the nucleus .

3- Electron are particles with charges , while proton are particles with charges .

4- The second energy level (L) is saturated with, while the fourth one (N) is saturated with electron

5-Active element should have than 8 electron in outermost energy level .

Write the scientific term :-

1- The fundamental building unit of matter that can take part in the chemical reaction . ()

2- The number of positive proton in the nucleus . ()

3- The sum of the number of proton and neutrons in the nucleus . ()

4- The number of negative electron that rotate around the nucleus .()

5- Negatively charged particles of negligible mass that revolve around the nucleus . ()

6- Imaginary places around the nucleus in which the electron move according their energy . ()

7- The amount of energy lost or gained when an electron transfer from one energy level to another . ()

What is meant by :-

The atom :-.....

Atomic number :-

Write the symbol :-

1- Sodium

2- Potassium

3- Calcium

4- Chlorine

5-Nitrogen

6- Aluminum

Write the name of the element :-

1-H

2-He

3- Au

4-Ag

5-Pb

6-S

Unit 2

Lesson 1 :- Energy resources and forms

Work :-When a force acts on a body, it moves a distance in the direction of such force . it's said that a work is done on such object.

Energy :- It's ability to do work .

The measuring unit of work (energy) is joule .

$$\text{Work(W) = force (F) X displacement (d)}$$

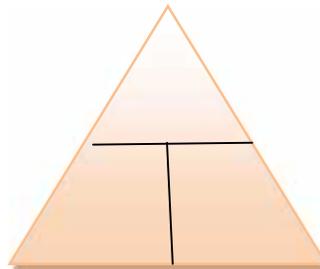
(joule)

(newton)

(meter)

W

F x d



Energy resources:-

- *The sun (permanent source of energy).
- *The wind (renewable source of energy).
- *The food (through chemical reaction).
- *The movement of water .
- * The nuclear energy.

Energy forms

***Mechanical energy** (potential energy+ kinetic energy)

Ex :-(Waterfall - the energy stored in the stretched spring).

Electric energy*Ex :-** (wind generator – solar cell).

***Light energy** **Ex :-** (Electric lamp).

***sound energy** **Ex :-** (radio).

***Heat energy** **Ex :-** (Oven – Heater).

***Nuclear energy** **Ex:-** (Reaction in the nucleus of an atom).

***Chemical energy** **Ex:-**(The energy stored in the food or car battery)

The mechanical energy

It is the summation of potential and kinetic energies of the body .

$$\text{Mechanical energy} = \text{potential energy} + \text{kinetic energy}$$

Note

*By decreasing potential energy of the bode ,the kinetic energy increase , and vice versa.

* Each body has a constant value of mechanical energy

If we have a body moves between two point :-

- At maximum height :- the mechanical energy = potential energy.
- At the lower point :- the mechanical energy = kinetic energy.
- At the middle point :- the potential energy = kinetic energy.
the mechanical energy = 2X kinetic energy

Or 2Xpotential energy

- At any point :-the mechanical energy = kinetic energy + potential energy
-

The potential energy

It is the stored energy in the object duo to the work done on it

***The factors affecting the potential energy**

1- Weight of the object .

2- Height of the object .

1- Weight of the object :-

The potential energy increase by increasing the weight.

$$\text{Weight (newton)} = \text{mass (k.g)} \times 9.8$$

2- Height of the object :-

The potential energy increase by increasing the height

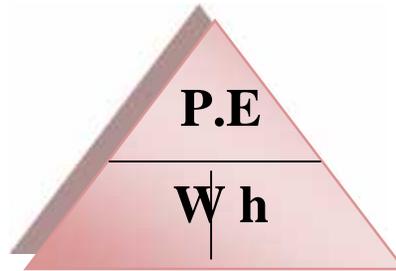
*So we can calculate the potential energy from the relation :-

$$\text{Potential energy (p.E)} = \text{weight (w)} \times \text{Height (h)}$$

Joule

Newton

meter



Problem

An object ,its mass =10 k.g and it is an a height = 5 m . calculate the potential energy .

$$\text{Weight} = \text{mass} \times 9.8 = 10 \times 9.8 = 98 \text{ N}$$

$$\text{Potential energy} = \text{Weight} \times \text{height} = 98 \times 5 = 490 \text{ J}$$

Kinetic energy

It is the work done during the motion of an object .

*The factors affecting the kinetic energy

1- Velocity (speed) of the object .

2-Mass of the object .

1- Velocity (speed) of the object :-

The kinetic energy increase by increasing the speed .

2-Mass of the object :-

The kinetic energy increase by increasing the mass.

*So we can calculate the potential energy from the relation :-

$$\text{Kinetic energy (K.E)} = \frac{1}{2} \times \text{Mass (M) X (Velocity)}^2 \text{(V)}^2$$

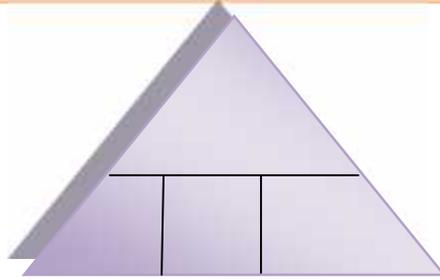
Joule

K.g

(m/sec)²

K.E

$$\frac{1}{2}MV^2$$



Problem

A racing bike is moving with velocity of 20 m/s². calculate the kinetic energy by knowing that the mass of bike is 8 kg.

$$\text{Kinetic energy} = \frac{1}{2} \text{ mass X (velocity) }^2$$

$$\text{K.E} = \frac{1}{2} \times 8 \times (20)^2 = 1600 \text{ Joule .}$$

At maximum height :- potential energy max and kinetic = zero

At lower point :- kinetic energy max and potential energy = zero

Work sheet

Lesson 1 unit 2

Give reason for:

1. The K.E at maximum height equal zero.

.....
.....

2. Two cars of mass 5 kg and 15 kg respectively are moving with the same velocity which one has the highest K.E?

.....
.....
.....

Problems

2- A body of mass 2 kg. falls freely from rest from a distance 40 m height by a speed = 5 m/sec

Knowing That $g = 10 \text{ m / s }^2$.

Calculate K.E and P .E

.....
.....

Calculate the K.E of a car moves with velocity 10 m / s if it mass is 900 kg ?

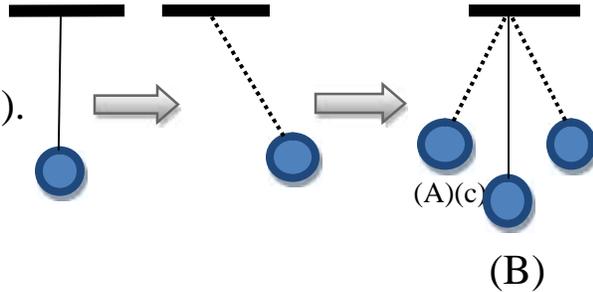
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Lesson 2 Energy transformation

*The conservation law of mechanical energy .

-The vibrating body moves on both sides around its original position (B).

-The velocity of the vibrating body decreases as it goes away from its original position .

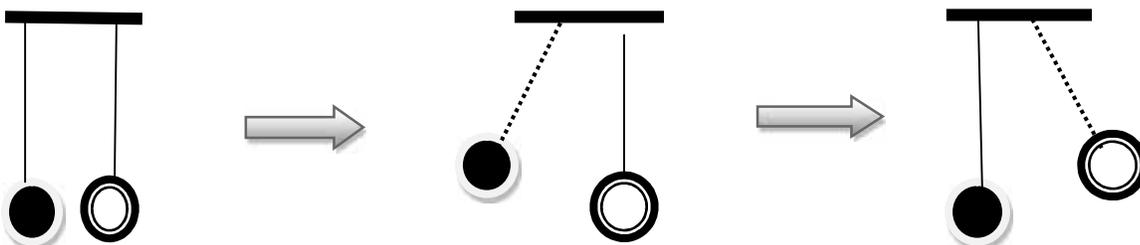


-**When** the ball passes its original position (B) its velocity is maximum
So, Kinetic energy is a maximum value ,and potential energy is the minimum value .

-**When** the ball reaches the maximum height (A&C) ,its velocity is zero
So , Kinetic energy is zero Potential energy is the maximum

-If we have two pendulums :-

When the ball of the moving pendulum strikes the ball of the rest one , the second pendulum moves and the moving one will stop .



*The object keep its mechanical energy which alternates between potential energy and kinetic energy .

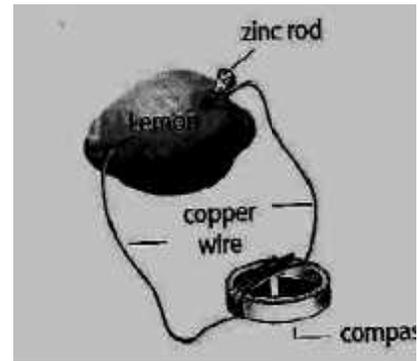
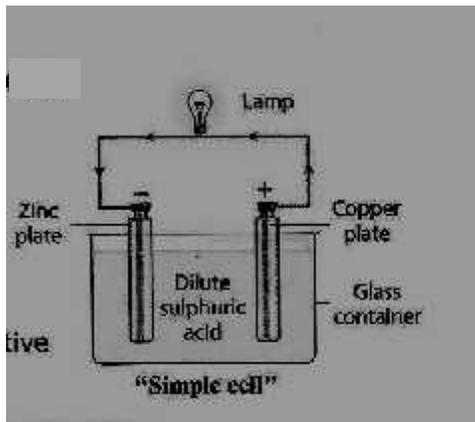
Energy transformation

Energy is neither created nor destroyed, but it is converted from one form to another .

Examples on energy transformation

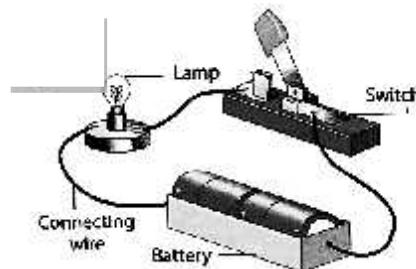
1- Energy transformation in the simple cell .

(It converts the chemical energy to electric energy)



2- Energy transformation in the electric lamp

(It convert electric energy to light energy)



3- Energy transformation inside the car

Car constituents	Energy transformation
*car engine	-Chemical energy into heat energy. -Heat energy into mechanical energy.
*car dynamo	- Mechanical energy into electric energy.
*car lamps	- Electric energy into light energy.
*car radio	- Electric energy into sound energy.
*car air conditioner	- Electric energy into heat energy.

4- Technological application on energy transformation

Application	Energy changes
*Sewing machine	- Electric energy into mechanical energy.
*Solar cell	- Solar energy into electric energy.
*Television	- Electric energy into light and sound energy.
*Alarm clock	- Chemical energy into kinetic and sound energy.
*A cellular phone	- Radiant energy into sound energy.

Harms of technological applications

car exhaust	Chemical pollution of air which causes chest and eye diseases
Military explosions	Pollution of air - diseases - death
Chemical pesticides	Pollution of (air - water – soil) So it causes (cancer- food poisoning)
Nuclear weapons	Massive destruction
The webs of wireless	Electromagnetic pollution causing heart diseases
Loud speakers	Sound pollution

Work sheet

Lesson 2

. Write the scientific term:

1. It is used to convert the mechanical energy into to electrical energy.
[.....]
2. It is composed of an acid solution with two different metals dipped in.
[.....]
3. Energy is neither created nor destroyed but it changed from one form to another.
[.....]

- Complete:

1. In the electric lampenergy is converted intoenergy.
2. On leaving the pendulum to move freelyenergy is converted toand
this confirm the law of
3.from the technological application that causes air pollution.
4. Electric energy is changed intoenergy in the electric bell
5. Friction convertsenergy to energy.
6. The Lemon containssolution.

Lesson 3 Heat energy

We get heat by many ways such as :-

Sun - Friction

The heat energy :- It is a form of energy which is transferred from the object of higher temperature to that lower one .

The temperature :- It is the heat condition which states the direction of heat energy whether from or to the object when it comes in contact with another .

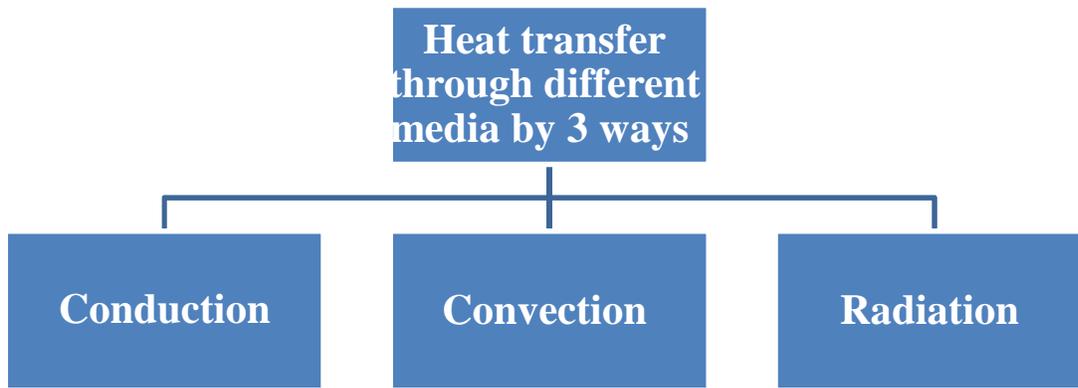
The production of heat energy

- By sun
- By friction (mechanical energy change into heat energy)

The transfer of heat

- Heat transfer from higher temperature to lower temperature
- Heat transfer stop when the temperature of 2 object are equale .

*Ways of heat transfer



- Heat transfer by conduction :-

It is the transfer of heat through solids from the part of higher temperature to the part of lower temperature.

*Heat can transfer during good conductor of heat .

and can't transfer during a bad conductors of heat .



* Cooking pots are made of aluminum .

Because the aluminum is a good conductor of heat

*Handles of cooking pan are made of plastic .

Because plastic is a bad conductor of heat.

- **Heat transfer by convection :-**

It is the transfer of heat in gases and liquid ,where hot molecules which have less density rise upward ,while colder molecule which have more density fall down.

Life application

- The air conditioner is fixed at the upper part of the room
- The freezer of the fridge is found at the top.

Because the cooled air has higher density so it goes down and hot air has lower density goes up .

- The electric heater is placed at the bottom of the room .

Because the hot air has low density so it goes up and cooled air has higher density goes down so heater can warm all the air in the room .

Heat transfer by radiation :-

It is the transfer of heat from the hot object to another without any need for a material medium through which heat transfers .

G.R * Wearing dark clothes during winter .

To absorb heat of the sun

*Wearing light color clothes in summer .

To reflect light and heat



The sun

It is the cleanest form of energy on the earth

Important of the sun (solar cell)

1-In plants the solar energy is stored as a chemical energy by the photosynthesis process.

2-In fuel and petroleum the solar energy is store as chemical energy.

3-The solar energy are responsible for evaporation of water from seas oceans and rivers to form clouds .

4-The solar energy Is the cause of the wind which is used to generate the electric energy .

Work sheet
Lesson 3

Give reason for:

1. Solar heater is preferred than the gas heater.

.....
.....

2. The freezer is found at the top of the fridge.

.....
.....

Complete

1. As theof molecules increases theenergy increases so the temperature.....

2- Heat is a form of energy that is transferred frombody to body.

3. Heat is transferred through Iron bywhile it transfers through Milk by

4is the main source of most energies on the surface of the Earth.

5.,.....andare from the technological applications that are used to produce heat energy.

6. The heat of the Sun is delivered to Earth by

7is a permanent source of energy whileis a non-permanent source.

Unit 3

Lesson 1 Living organisms diversity

First :- Diversity of animals

We can differentiate between the animals according to its characteristics such as

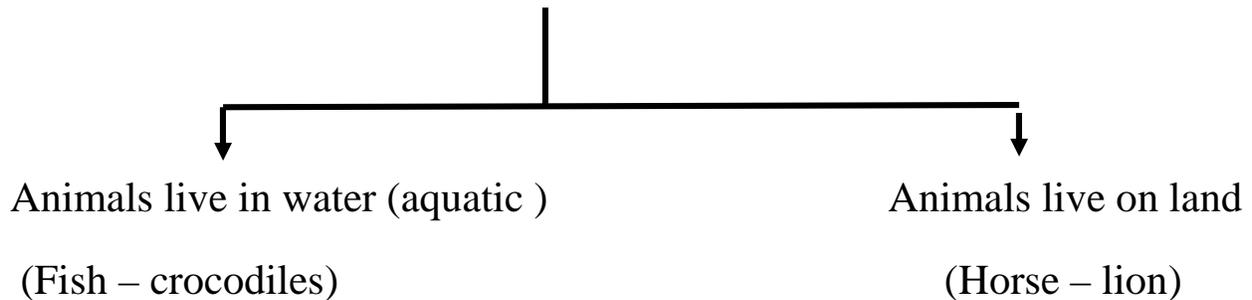
1- The shape

2- The way of feeding

3- The size → Small animals (rabbit - rat – lizard)

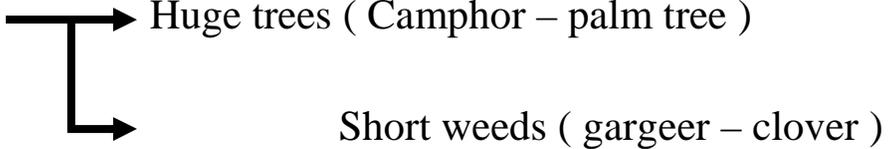
Big animals (elephant – rhinoceros)

4- The environment where this animal live



Second :- Diversity of plants

We can differentiate between plants according to its characteristics such as

1- The size 

2- The size of leaves 

Third :- Diversity of micro-organisms

Micro-organisms :-They are living organisms that can't be seen by naked eyes (they are unicellular organisms) , but they spread everywhere around us .

Micro-organisms differ from each other in shape and the way of movement .

Classification of living organisms

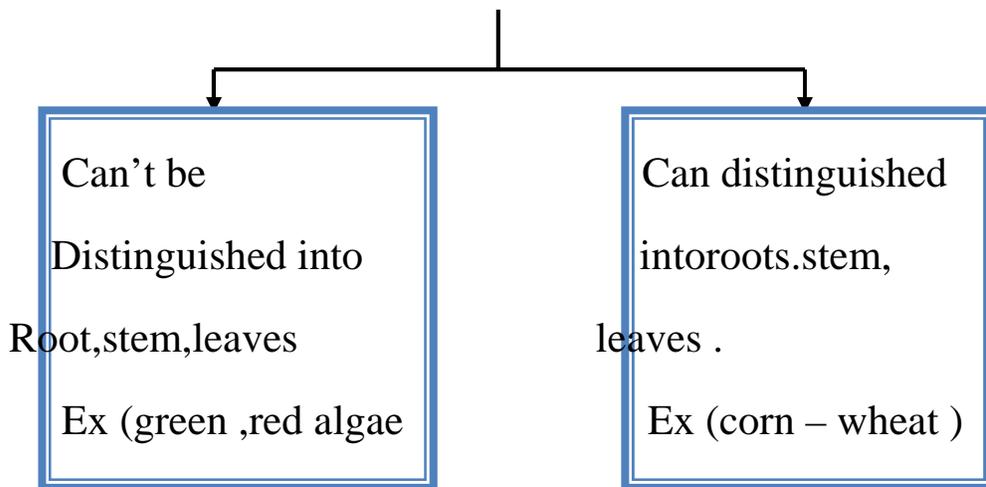
Classification of living organisms

First :- classification of plants

Plants can be classified according to

- External shape
- Way of reproduction

1- Classification of plants according to external shape



2- Classification of plants according to their way of reproduction

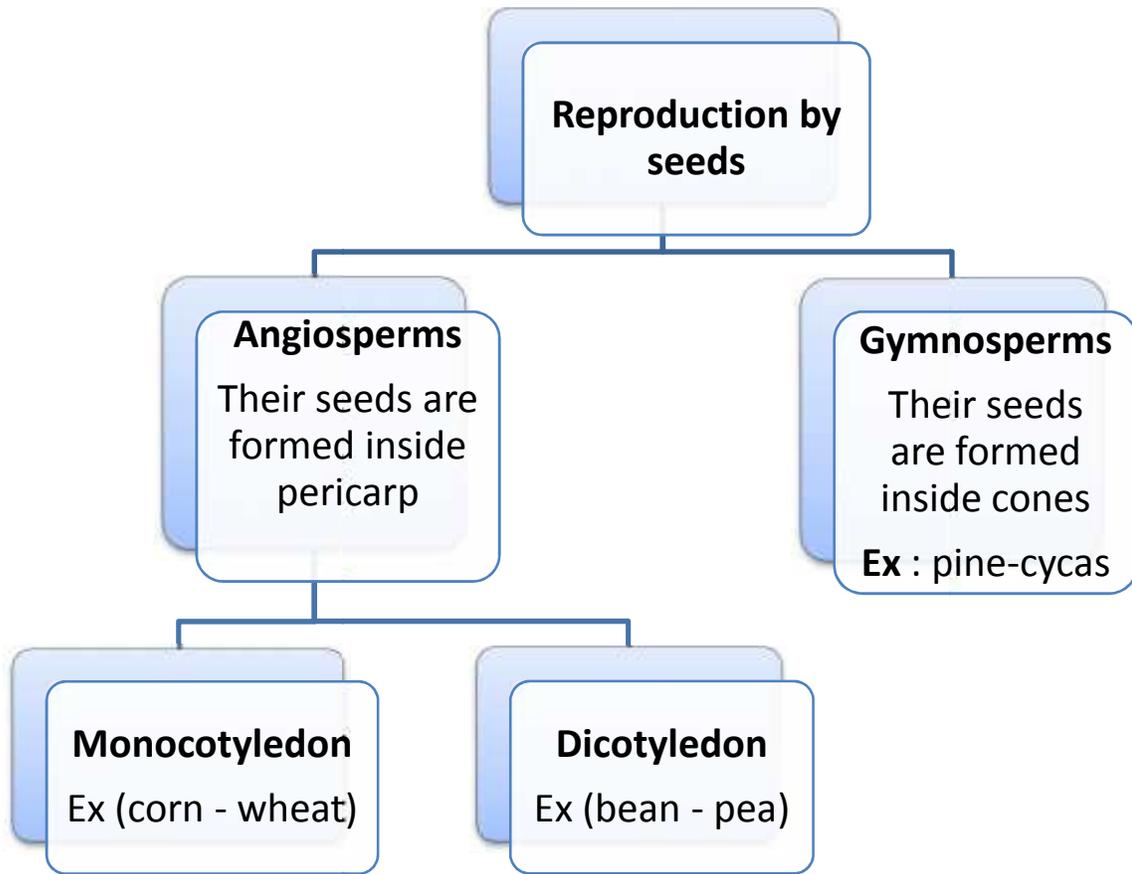
Reproduction of plants by

- Formation of spores.
- Formation of seeds.

A) Plants reproduce by formation of spores

(Ex:- vougheir – adiantum)

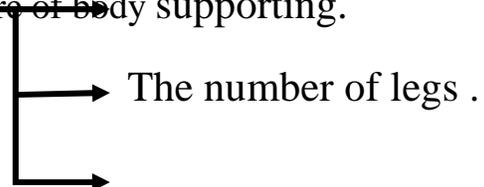
B) Plants reproduce by formation of seeds



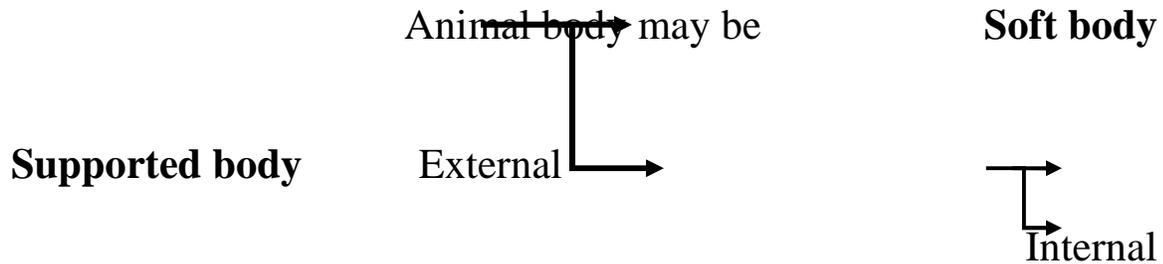
Second :- classification of animals

Animals classified according to Nature of body supporting.

The number of teeth.



1- Classification of animals according to the nature of body supporting



1- Soft body(doesn't have support)

(Ex :- jellyfish – worms)

2- Supported body

A) Animals with an external support

(Ex:- Mussel – snails)

B) Animals with an internal support.

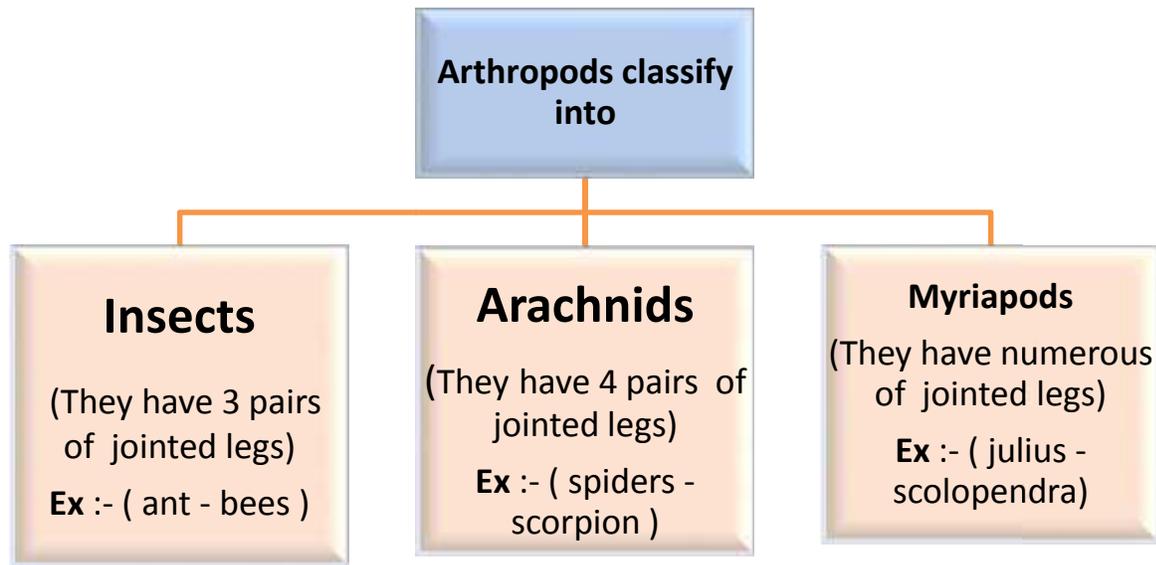
(Ex :- Fish – birds – cat)

Note

Some animals has external and internal support as turtle .

2-Classification of arthropods according to the number of legs

Arthropods :-They are invertebrate animals that are characterized by the presence of jointed legs .



3-Classification of mammals according to the kind and number of teeth.

Mammals may be

- Edentates (teethless)
- Having teeth

1- **Edentates** (teethless mammals)

Ex:- (Sloth – armadillo)

2- **Mammals having teeth** are divided into

A) Animals have front teeth extending outwards to capture insects.

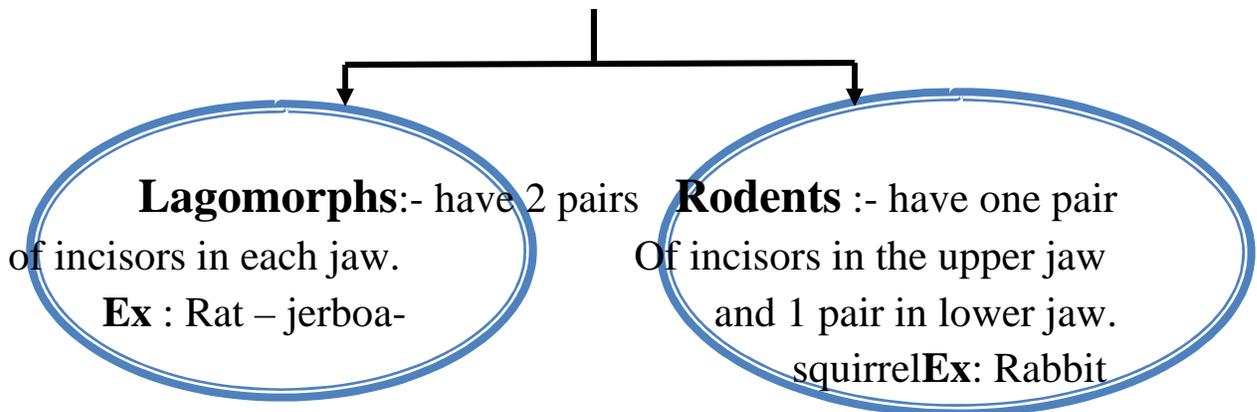
Ex:-(Hedgehog)

B) Animal have pointed canine and molars with sharp projection .

Ex:-(lion –tiger)

C) Animal have sharp incisors

They are divided according to the number of incisors in each jaw into



Taxonomy :- It is a branch of biology that searches for the similarities and the differences among living organisms and places the similar ones in groups according to a certain system in order to ease their study.

Species :- It is a group of similar living organisms in shape that can reproduce to give new fertile individuals which are able to reproduce and keep the existence of the species .

Work sheet

Lesson 1 unit 3

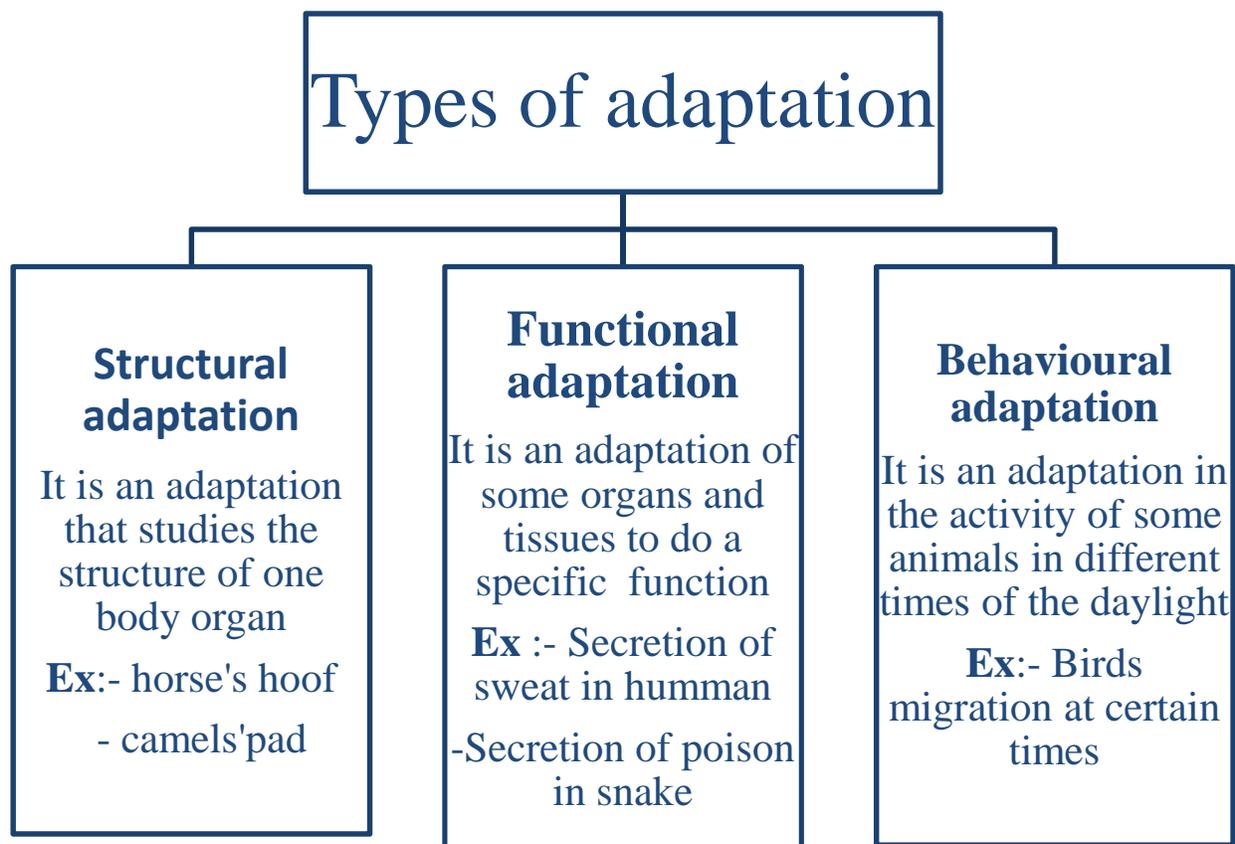
Complete

1.can't be seen by naked eyes.
2. Some plants can't be distinguished into roots, stems and leaves such as ,
.....and
3. Voughair and Adiantum reproduce by
4. Plants that reproduce by the formation of seeds are divided intoand
5. Angiosperms are divided intoand
6.andare from the Dicotyledons plants.
7. Maize and Wheat plants are fromplants .
8.are invertebrate animals that characterized by a type of legs known
as jointed legs.
9. Arthropods can be classified according to the number of legs into ,
..... and
10. Animals that have sharp incisors are divided according to their number in each jaw
intoand

Lesson 2 :- Adaptation and diversity of living organisms

The place which living organisms live are the most important reason that lead to living organisms diversity in order to cope with the environmental changes like (**Climate change – Food diversity – Existence of water**).

Adaptation :- It is a modification of living organisms behavior ,body structure , or organs biological function to become more adapted to the environmental condition which it lives .



Reasons of adaptation :-

- 1- To get food .
 - 2- To escape from their enemies .
 - 3- For plants :- Due to the environmental conditions.
-

Adaptation and motion in mammals

The mammals	The modification in its limbs	The aim of modification	The type of adaptation
Whales – dolphin – sea lion	The two forelimbs are modified to become paddles	To perform the function of swimming and diving in water	Structural adaptation
Bat	The two forelimbs are modified into two wing like structure	To perform the function of flying.	Structural adaptation
Horse	Its limbs are modified to end with a strong hoof.	To perform the function of running on the rocky soil.	Structural adaptation
Monkey Gorilla	The bones of the forelimbs and fingers are elongated.	To enable it to climb trees and catch things .	Structural adaptation

Adaptation and nature of food in birds :-

The birds	The modification of its beaks and legs
(birds which feed on meat) Ex Hawks and vultures	Beaks :- Strong and sharp crooked beaks . Legs :- Four fingers ending with strong and sharp claws .
(birds which feed on shallow water warms) Ex Heron and hoopoe	Beaks :- Long thin beaks . Legs :- Long thin legs ending with thin fingers .
(birds which feed on mosses and fish) Ex ducks and geese	Beaks :- Wide intended beaks . Legs :- palm legs .

Adaptation in insectivorous plants :-

They can make carbohydrates ,but they can't make proteins .

So , some parts of these plants are adapted and modified to pounce and digest proteins

Ex :-Dionaea – Drosera – Halophila

Work sheet

Lesson 2

. Give an example for:

1. A predatory bird.

.....

2. An insectivorous plant.

.....

3. A flying mammal.

.....

Compare between :

1- Insect , Arachnids according to no. of legs .

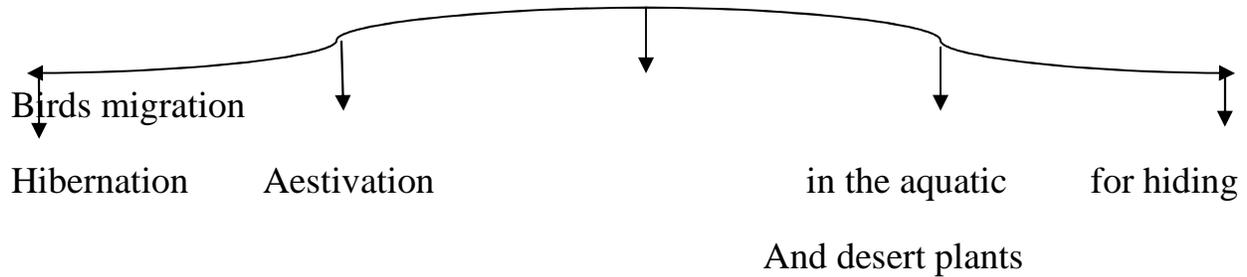
.....

2- Octopus – caw according to body support .

.....

Lesson 3 :- Adaptation and continuity of life

Adaptation of living organisms



Hibernation :- It is the behavior that some animals do by hiding in burrows to avoid the low temperature in winter .

In winter :- some animals hide in burrows as **some reptile** and **insects**.

Or bury themselves in mud , stop feeding as **frogs**.

Aestivation :-It is the behavior that some animals do by hiding in humid burrows to avoid the extreme rising of temperature in summer .

Ex(Jerboa – desert snail – some insects)

Birds migration:- It is the inherited behavior in some species birds where they migrate from cold and polar regions to more lighted and warmer regions for reproduction . **Ex** :- (Quail bird)

Adaptation for hiding

Camouflage :-It is the ability of some living organisms to be hidden from their enemies or to capture the preys in the predatory species.

Examples

<p><u>Leaf insect</u> It is look like plants leaf exactly</p>	<p><u>Stick insect</u> It look like the branches of plants as well</p>	<p><u>Chameleon</u> It colors It self with the dominant color of the environment.</p>
--	---	--

Adaptation in the aquatic plants

Aquatic plants are divided into  Totally submerged in water (Elodea)
Partially submerged (Hyacinth)

Adaptation in the Elodea plants

Roots LeavesStem

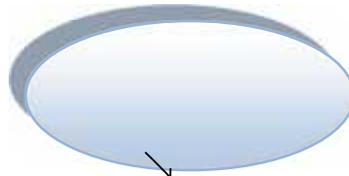
They are weak
Because they are not
Fix the plant or
Not absorb water

They are small size
they are sessile.
(neckless) so , it
connect strong with
Stem

It is elastic .
It contain many air
chambers(vacuoles)
to store the oxygen

Adaptation in the desert plants

Roots



Extend vertically

In the soil for great

Depth

Ex (calamagrostis)

Succulent (juicy)

leaves

Ex (cactus)

Spread

horizontally

Ex (opuntia)

Leaves



Small size , may be ribbon-like and spiralled
Ex (Calamagrostis)

They are used storing water
Ex (cactus)

They are surrounded with a waxy layer
Ex (cactus)

They are modified into spines
Ex (opuntia)

Stem



Short to avoid the

Strong wind

Ex (cactus)

Rich with chloroplast

Ex (opuntia)

Camel is the desert ship

The camel is considered one of the most adapted animals to live in desert

Some features of adaptation in the camel:

1. Lacrimal glands and eyelashes

It has a plentiful number of lacrimal glands and two rows of long eyelashes.

To protect its eyes from, the dispersing sand on time of sandstorms.



2. Nostrils

It controls opening and closing of its nostrils.

To prevent the entrance of sand inside the nose during sandstorms.



3. Upper lip and teeth enamel

It has a forked upper lip and strong enamel of its teeth.

To enable it to eat the spiny and dry desert plants without harming it.



4. Ears

It has small ears covered from inside with dense hair.

To obstruct dust and sand.



5. Legs

Its limbs have flat pads with thick hooves.

G.R.

To protect it from the hot sand and prevent it from sinking into the sand.



6. Body fur

Its fur thickness differs at different body regions.

G.R.

- It is denser at the vital body regions to provide protection from the extreme cold at night.
- It is less dense at other body regions to ease heat loss by radiation during daylight.



7. Blood temperature

Its blood temperature is not constant as in other mammals.

G.R.

- It changes from 34°C in the morning to 41°C during daylight hours, so the camel has no need for sweating.

8. Sweat glands

Sweat glands do not start sweating unless the blood temperature reaches 40°C to decrease loss of water.

9. Storing fats

It stores fats in its hump to keep it for 3 - 4 months without eating any food.

10. Drinking of water

- It can drink 100 liters of water within 10 minutes only without affecting its blood composition.
- This amount of water survives it for a week or more without drinking any additional amounts of water.

11. Losing of weight

- It can lose 25% of its body weight when water and food are not available and its blood composition remains constant.
- This rate exceeds that of other mammals ability by twice nearly.

Work sheet

Lesson 3

II. Give reason for :

1. Some species of birds migrate from one region to another during the year.

.....
.....

2. Jerboa and desert snail become dormant and hide in humid burrows.

.....
.....

3. The leaves of the aquatic submerged plants are ribbon like small sized.

.....
.....