



Unit One Lesson One Matter

Matter المادة

- Everything around us on the earth's surface is called "matter".
- Any matter has a mass and volume .

Mass الكتلة

it is the amount of matter that the body contains .

Volume الحجم

It is the space that is occupied by the body

matter المادة

- It is anything that has a mass and volume
- OR
- It is anything that has a mass and occupies space

1 | Physical properties

- 1) The colour , taste and smell
- 2) Density
- 3) Melting point
- 4) Boiling point
- 5) Hardness
- 6) Electric conduction
- 7) Thermal conduction



Colour , taste and smell

- Colour : we can differentiate between iron , silver and gold by colour .
- Taste : we differentiate between sugar , table salt and flour by taste .
- Smell : we can differentiate between vinegar and perfume by smell .

Density

- Density : it is the mass of unit volume of a substance .

OR

It is the mass of one cubic centimeter of a substance

Notes :

- The measuring unit of density is gm/cm^3 .
- Each substance has its own density .
- Each volume of different substances have different masses .
- Equal masses of different substances have different volumes .

What is meant by : the density of water is 1 gm/cm^3 ?

Answer : this means that the mass of 1 cm^3 of water equals 1 gm .

Conclusion :

- Materials which have **higher density** than water **sink** in it such as an iron nail and a metallic coin .
- Materials which have **lower density** than water **float** on its surface such as wood , cork , ice and drops of oil .



• Give reasons for:

1) Water is not used to put out (extinguish) petrol fires .

- Because the density of petrol is less than the density of water so, petrol floats on water surface and water doesn't put out the fire .

2) Balloons filled with hydrogen or helium rise up in the air carrying flags during festivals .

- Because the density of helium and hydrogen are less than the density of air .

Melting point

- Melting point : it is the temperature at which matter begins to change from a solid state to a liquid state .

هي الحرارة اللازمة لتغيير المادة من حالة صلبة الى حالة سائلة

What is meant by: the melting point of ice = 0°C ?

Answer: this means that ice begins to change into water at 0°C .

Conclusion: Each substance has a definite melting point .

Notes:

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



1) In the manufacturing of cooking pans (pots) , where

They are made of aluminum or stainless steel alloy which doesn't rust as it has high melting point .

Notes :

- Coper-gold alloy that is used in making jewels .
- Nickel-chrome alloy that is used in making heating coils .

Boiling point

Boiling point : it is the temperature at which matter beings to change from a liquid state to a gaseous state .

What is meant by : the boiling point of water = 100°C ?

Answer : this means that water beings to boil and change into water vapour at 100°C .

Hardness

Solid substance are devided
According to hardness into :

- 1) soft solid substance at room ordinary temperature as rubber .
- 2) Solid substance become soft by heating to be shaped easily as metals.
- 3) solid substances can't be soften by heating as coal and sulphur .



- Give reasons for.....:

- 1) The screwdrivers are made of steel iron .
 - Because it is very hard .
- 2) The rods used in building concrete houses are made of iron not copper .
 - Because the hardness of iron is more than that of copper

Electric conduction

- Good conductors of electricity (substances allow electricity to flow through)

Examples :

- metals as : iron , silver , copper , aluminum
- some solutions as : acidic solutions alkaline solutions and some salt solutions .

- bad conductors of electricity (substances don't allow electricity to flow through)

Examples :

- gases .
- some solid substances as : Sulphur , phosphorus , wood and plastic .
- some solutions as : -solution of hydrogen chloride in benzene .
-sugary solutions .



Thermal conduction

- Good conductors of heat (substances allow heat to flow through)

Examples :

- metals as : iron , copper , aluminum

- bad conductors of heat | substances don't allow heat to flow through)

Examples :

- wood and plastic .

- Give reasons for:

1) Cooking pans are made up of aluminum .

- Because aluminum is a good conductor of heat and it has a high melting point .

2) Handles of cooking pans are made up of wood or plastic .

- Because wood and plastic are bad conductors of heat .

2) Chemical properties

Metals and chemical activity

A. Very active metals :

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



Examples : sodium and potassium .

B. Less active metals :

They are metals which react with oxygen if they are left in air for some days forming a layer of rust .

Examples : iron , aluminum and copper .

• Give reasons for:

- 1) Steel bridges and the holders of light bulbs are painted from time to time .
 - To protect them from rust and corrosion .
- 2) Metallic spare parts of cars are covered with grease .
 - To protect them from rust and corrosion .
- 3) Aluminum cooking pans are washed with a rough material .
 - To remove any layer formed on them .

C. Inactive metals :

They are metals which find great difficulty in reacting with oxygen .

Examples : silver , platinum , nickel , gold and chromium .

• Give reasons for:

- 1) Silver and gold are used in making jewels .
 - Because they are chemically poor active .

▪ QZ (1) Complete the following statements :

1. Matter is anything that has and
2. You can distinguish between gold and silver by their different
3. You can differentiate between table salt and sugar by their different
4. Equal volumes of different substances have different as they differ in their
5. and float on water surface as they have density than that of water.
6. The mass of one cubic centimeter of a matter is known as
7. The temperature at which the solid substance changes into liquid is called
8. and are from the substances which have low melting point, while and are from the substances which have high melting point.
9. is one of the solid substances that appear soft at room temperature.
10. Sugary solution is conductor of electricity, while acidic solution is
11. Gases are conductors of electricity, while metals are conductors of electricity.
12. Screwdrivers are made of while their handles are made of or
13. Active metals lose their when they are exposed to moist air.
14. Spare parts of cars are covered with to protect them from rust and corrosion.

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▪ (2) Choose the correct answer :

- 1- The measuring unit of density is
a- gm/cm b- gm/cm^2 c- $gm / m.^3$ d- gm / cm^3
- 2- The volume of water in cm^3 is always.....its mass in grams
(knowing that the density of water is $1 gm / cm^3$).
a-double b-less than c- more than d- equal to.
- 3- Heating coils are made of.....alloy .
a- iron and copper. b- nickel and iron.
c- nickel and chrome . d- chrome and copper.
- 4- Cooking pans are made of.....
a- iron only b- aluminum only.
c- stainless steel only. d- (b) and (c) are correct.
- 5- All the following substances sink in water except.....
a- nails b-coins c- wood
- 6- All the following substances conduct electricity except.....
a- iron . b- aluminum c- copper d-wood
- 7- All the following solutions conduct electricity
except.....solution.
a- salty solution. b- acidic. c- alkaline. d- sugar.
- 8-are very active metals which react with oxygen when
they are exposed to moist air .
a- Sodium and iron . b- Copper and aluminum.
c- Sodium and potassium. d- Silver and gold.

▪ (3) Write the scientific term for each of the following :

- 1 - The mass of unit volume of the substance.
[.....]
- 2 - Anything that occupies a space and has a mass.
[.....]
- 3 - An alloy used in the manufacture of heating coils.
[.....]
- 4 - An alloy used in making gold objects.
[.....]
- 5 - Substances that allow electricity to flow through them.
[.....]
- 6 - A solid substance which appears soft at room temperature.
[.....]
- 7 - Metals that are used in the manufacture of electric wires.
[.....]
- 8 - Substances that don't allow electricity to flow through them.
[.....]

▪ (4) Give reason for each of the following :

- 1 - Equal volumes of different substances have different masses.
.....
- 2 - Petrol fires are not put out by water.
.....
- 3 - Balloons which are full of hydrogen or helium rise up in the air.
.....
- 4 - Cooking pans are made of aluminum and stainless steel.
.....
- 5 - Aluminum and copper are used in making electric wires.
.....

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6 - Handles of cooking pans are made of wood or plastic.

7 - Steel bridges and lamp posts are painted from time to another.

8 - Electric conductivity can be used to differentiate between wood and copper.

▪ (5) Mention an example for the substance that :

1 - Appears soft at room temperature.

2 - Is used in making electric wires.

3 - Doesn't conduct heat and electricity.

4 - Is used to plate other metals.

5 - Doesn't become soft on heating.

6 - Loses its metallic luster when it is exposed to moist air.

7 - More active than iron and copper.

8 - Less active than iron and copper.

▪ (6) What is meant by each of the following :

1 - Matter :

2 - Density :

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▪ (7) Problems :

- When a piece of iron ;n, its mass is 87 gm is put in a graduated cylinder containing 100cm^3 of water, the reading of the cylinder becomes 110 cm^3 . Calculate the density of iron.
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▪ (8) Complete the following table, then answer the given questions :

Body	Mass	Volume	Density
A	16gms	2 cm^3	_____
B	8 gms	4 cm^3	_____
C	4 gms	8 cm^3	_____
D	8 gms	16 cm^3	_____

a - Which of these bodies float on water surface? Why?

.....

b - Which of these bodies sink in water? Why?

.....

4 - If the density of alcohol is 0.8 gm / cm^3 , find the volume of 80 grams of it.

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