MATTER & ENERGY

UNIT 5

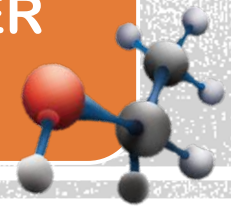
1

El Taller

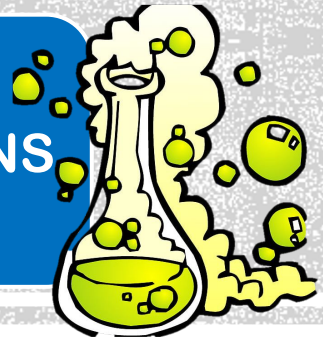
UNIT 5: MATTER & ENERGY

CONTENTS

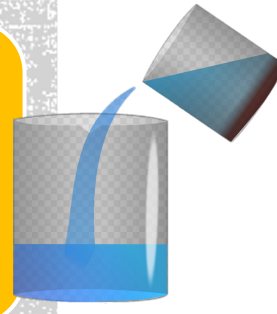
1. MATTER



2. REACTIONS

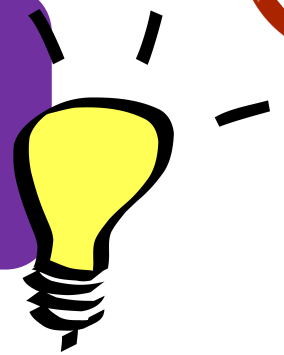


3. MIXTURES



4. ENERGY

5. LIGHT ENERGY



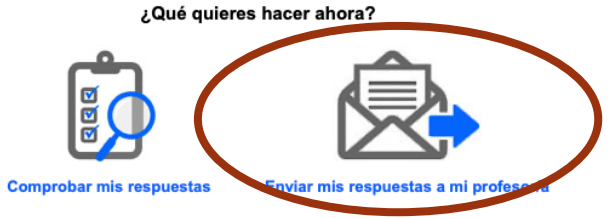
INTRODUCTION

COMPLETE THE FOLLOWING ACTIVITIES TO STAR THIS NEW UNIT:

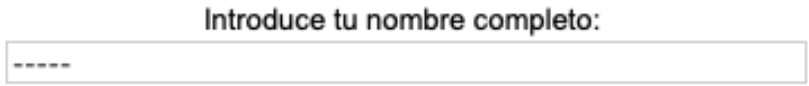
1. EXPERIMENT:

a) Once it is finished. Press…

b) You want to "send"

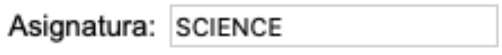


c) Write down your name…



Your grade (4°A-4°B)

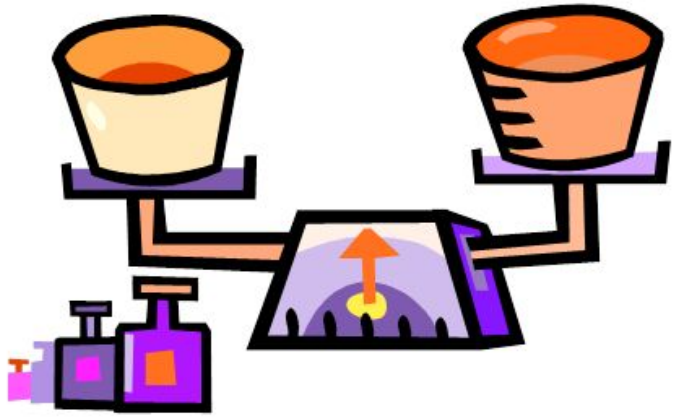
Your subject…



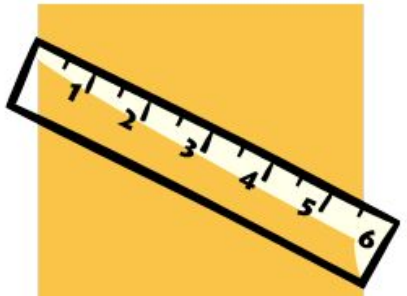
Your teacher's email…

1. MATTER

- Anything that has a **mass** and a **volume**



MASS (g)
The amount of matter.



VOLUME (ℓ)
The space that matter takes up.

2. EXPERIMENT:

Mini Lab

Measure the volume of a stone

You need

- a pen and paper
- a small stone
- a measuring cylinder
- water

Do your experiment

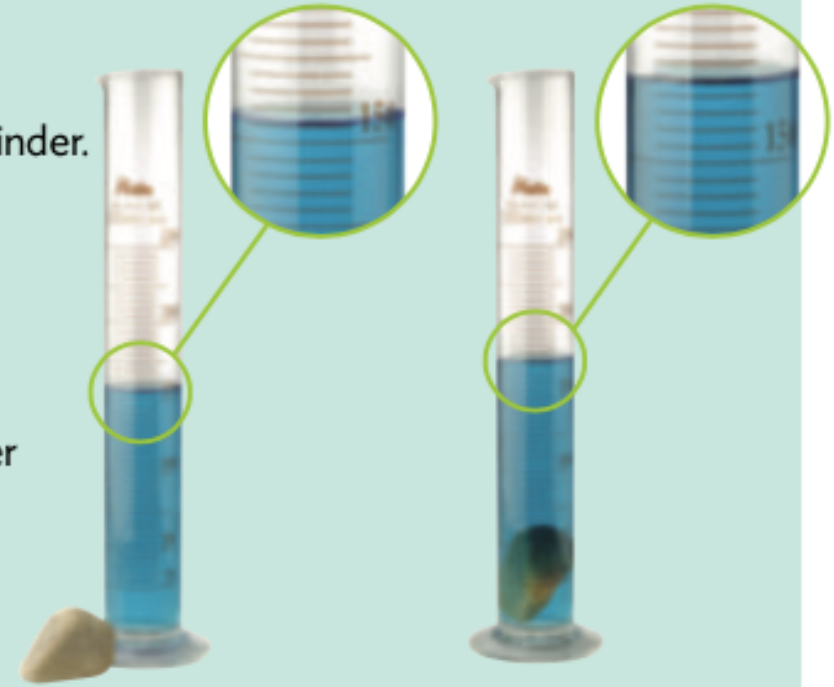
1 Pour some water into the measuring cylinder. The cylinder should be only half full.

2 Measure the volume of the water.

3 Put the stone in the measuring cylinder. Measure the volume again.

4 Subtract the original volume of the water from the new volume of the water with the stone in it. This tells you the volume of the stone.

5 What is your result?



The volume of the water with the stone is 175 millilitres.

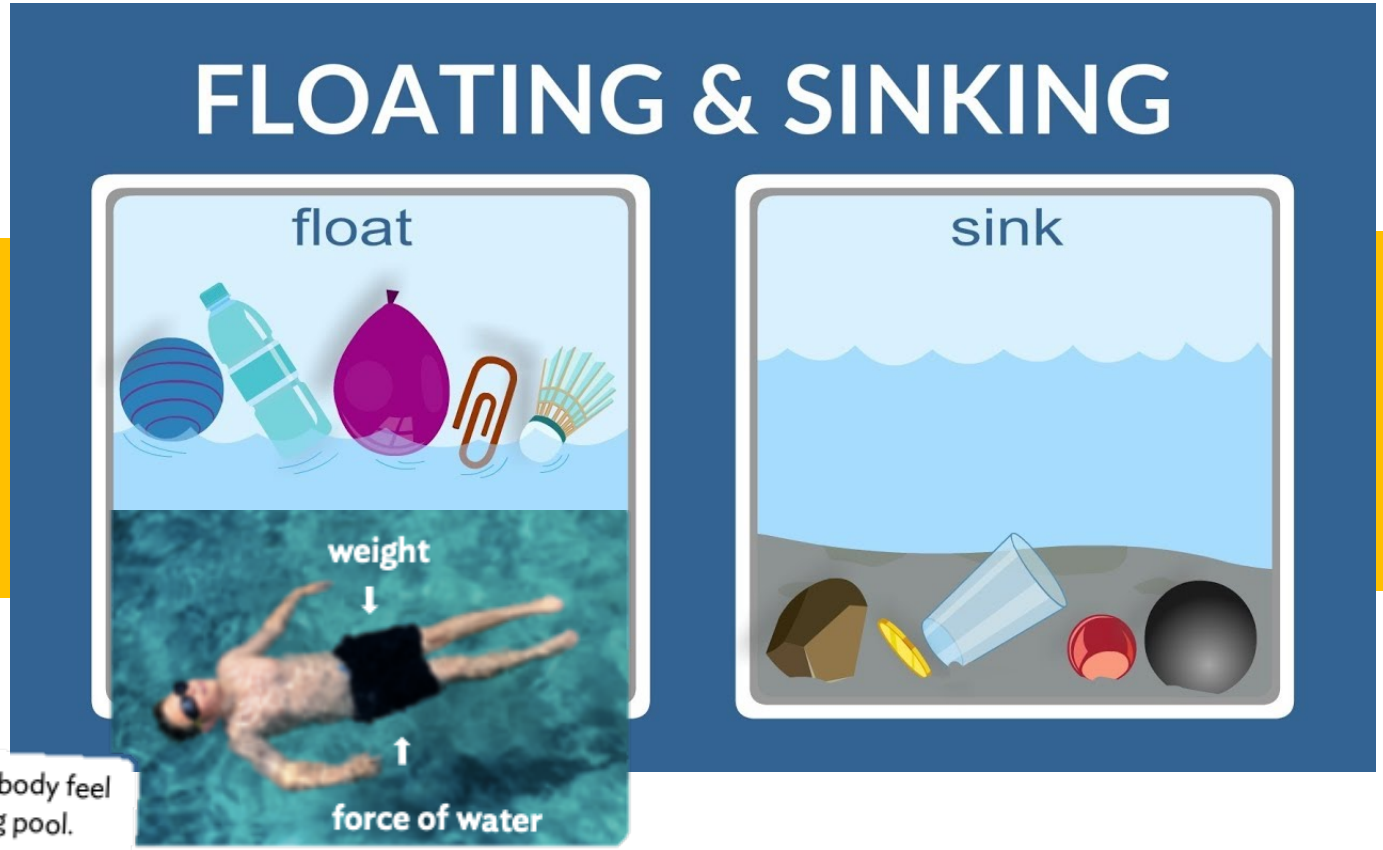
The volume of the stone is...

1. MATTER

DOES IT FLOAT OR SINK?

Some objects sink in water. Other objects float in water.

- **Objects float when their density is lower than the density of the water.**



- **Objects sink when their density is higher than the density of the water.**

Buoyancy makes your body feel lighter in the swimming pool.

1. MATTER

DOES IT FLOAT OR SINK?

3. EXPERIMENT:

Predict

Will these objects sink or float in water?
Tell your partner.

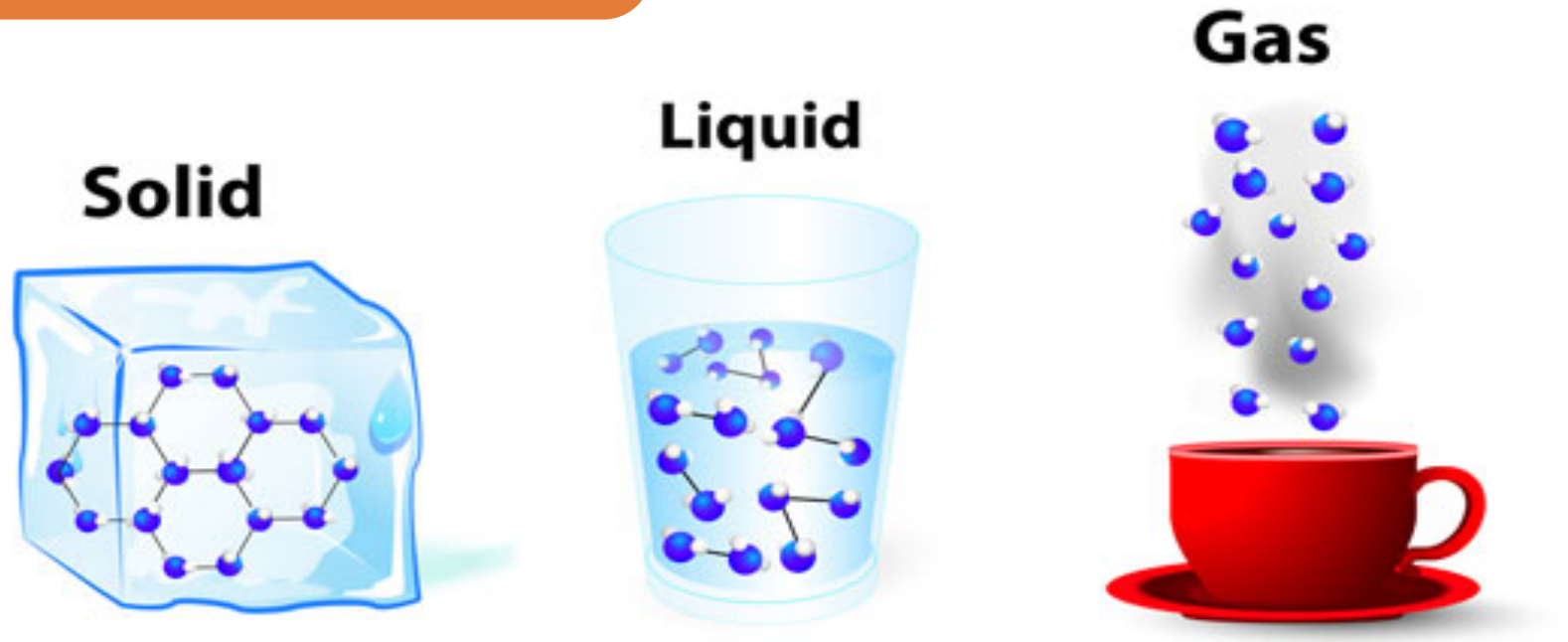
table tennis ball	*coin*	*pencil*
plastic spoon	*metal ball*	*cork*

- Do the experiment. Fill a container with water. Carefully place each object on the surface of the water. Observe, then compare your predictions and the results with a partner.

TAKE A PHOTO AND SEND IT TO YOUR TEACHER BY CLASSDOJO.

STATES OF MATTER

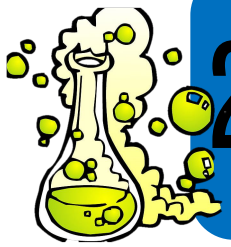
There are three states of matter:



Solids have a fixed volume and a fixed shape.

Liquids have a fixed volume, but take the shape of the container they are in.

Gases do not have a fixed volume or a fixed shape.



2. REACTIONS

Water changes state. It can be a liquid, a solid or a gas, but it is always water.

These changes are called physical changes because the substance stays the same.

Chemical changes take place when a substance changes into one or more different substances.

When milk changes into yogurt, it is no longer milk. The original substance cannot be recovered.

2. REACTIONS

Physical Change

The structure DOESN'T change

It can change…

- **the shape**
- **the place**
- **the state**
- **the temperature**

2. REACTIONS

Chemical Change

The matter is changed FOREVER.

It can change...

When an apple rots

When iron ruts

When wood burns

When milk ferments

2. REACTIONS

AYUDA

QUIMICOS	FISICOS
Cuando se enciende una vela, cuando se quema el papel, cuando una estatua de bronce se pone verde, cuando la masa se transforma en pan... ocurren cambios químicos. En todos los casos nombrados anteriormente, se empieza con unas sustancias y éstas se transforman en otras sustancias diferentes  	Cuando los materiales cambian de forma, se recortan, se estiran, se rayan... ocurre un cambio físico. El agua cuando cambia de estado, es decir, al congelarse se transforma en hielo, pero sigue siendo agua  

2. REACTIONS

4. EXPERIMENT:

Mini Lab

Melt and solidify substances

You need

- butter
- two tins
- wooden pegs
- ice cream
- a candle

Do your experiment

1 In groups, plan your experiment. You are going to melt and solidify butter and ice cream.

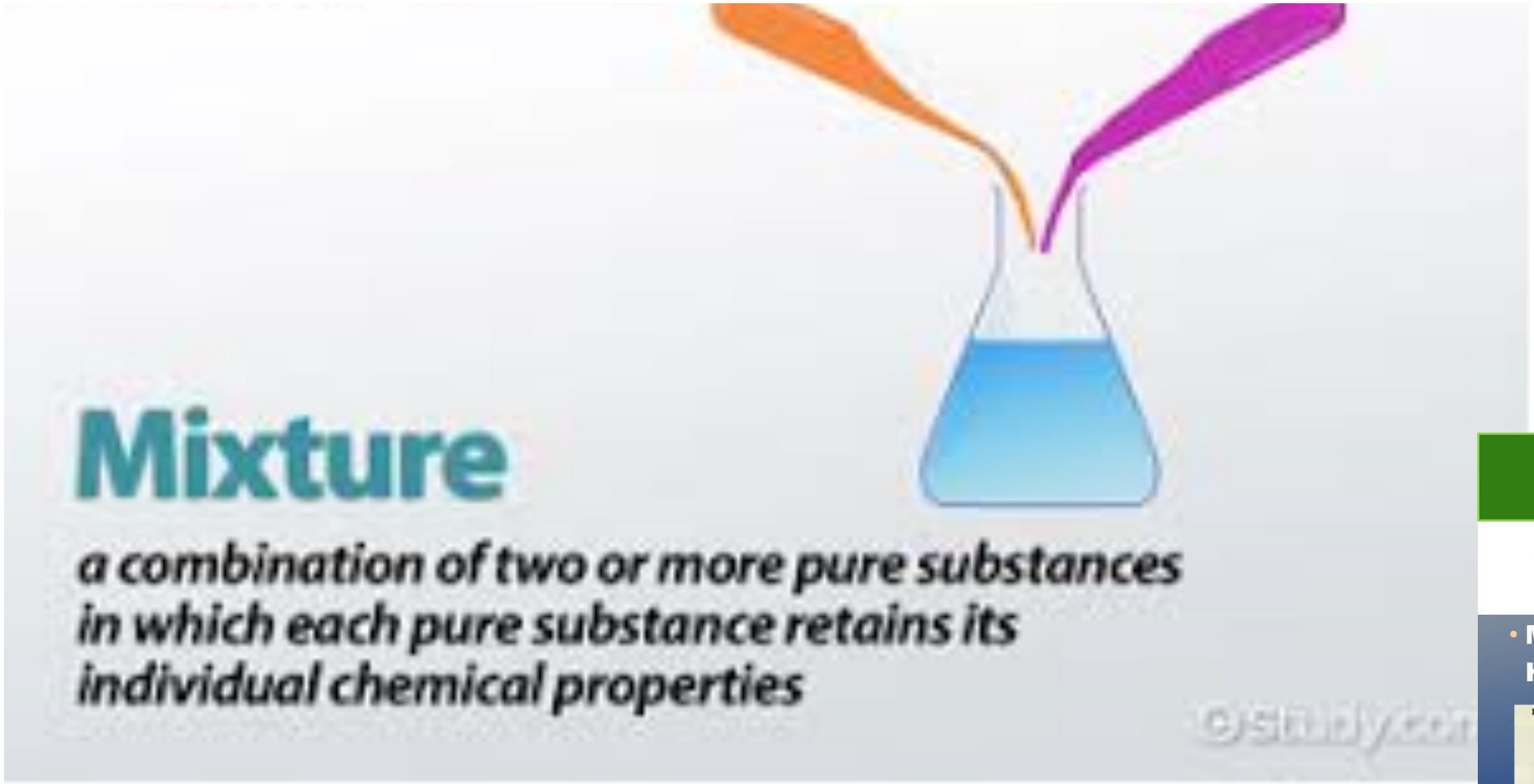
2 Be very careful with the flame! Discuss safety rules with the class. Watch your teacher do the experiment.

3 First, place each substance in a tin. Next, hold the tin over the flame with the wooden pegs. Then, remove the tin from the candle. Finally, leave the tin in a safe place until it cools.

4 Copy and complete the table in your notebook.

substance	state before heating	state after heating	state after cooling
butter	solid	...	...
ice cream	...	...	...

3. MIXTURES



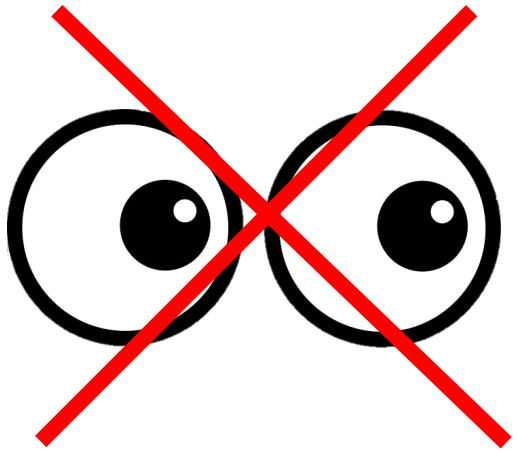
AYUDA

Tipos de mezclas

- Mezclas Heterogéneas
- Mezclas Homogéneas

3. MIXTURES

1 Homogeneous mixtures



We CAN'T see the substances

SOLUTION

SOLUTE + SOLVENT

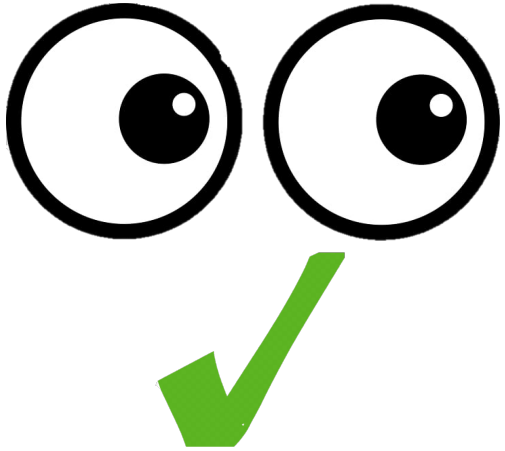
SOLUTE + SOLVENT

Dissolving of Sugar in Water

3. MIXTURES

We CAN see the different substances

THEY CAN'T MIX



2

Heterogeneous mixtures

- Examples

Salad

Fruit salad

Paella

Milk and cereals

Chickpeas

3. MIXTURES

5. EXPERIMENT:

Mini Lab

Make a mixture

You need

- cornflour
- water
- a small transparent bowl
- a dropper
- a teaspoon
- a fork
- a cup

Do your experiment

1 Put a tablespoon of cornflour into the bowl.

2 Fill the cup with water. Use the dropper to add 20 drops of the water to the cornflour, one drop at a time.

3 Then, stir the cornflour with the fork.

4 Add more drops, one at a time. After every 20 drops, stir the cornflour with the fork again.

Analyse your results

- What happens when the water first touches the cornflour?
- What happens as you add more water?

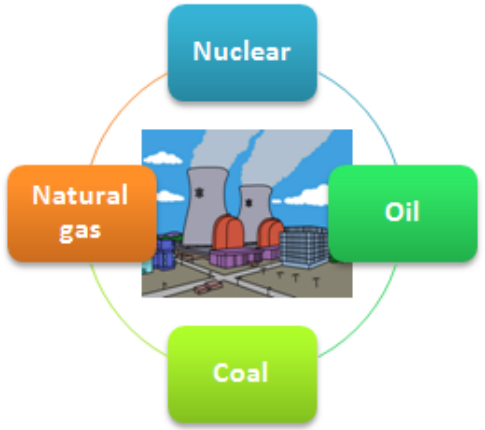
Write your conclusions

This type of mixture is a ... . It is made from ... and ... .
When water touches the cornflour it ... . When we add more water ... .

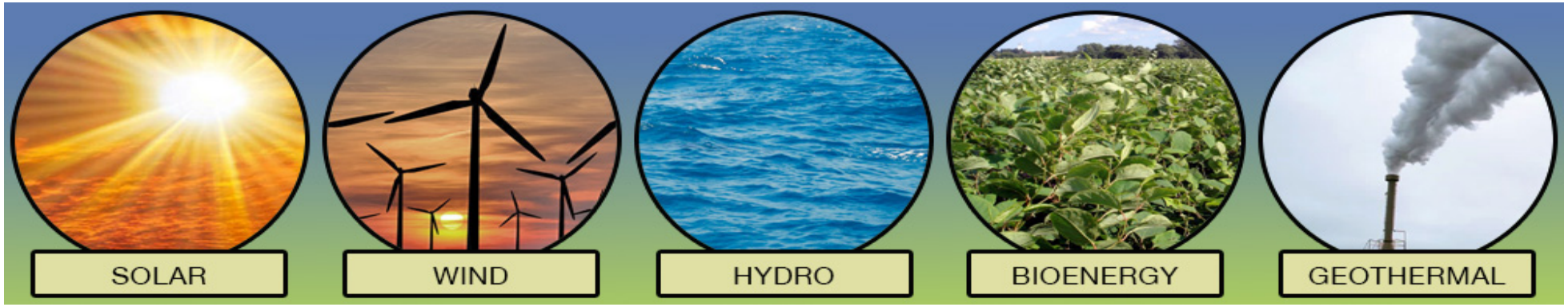
4. ENERGY

Energy Sources

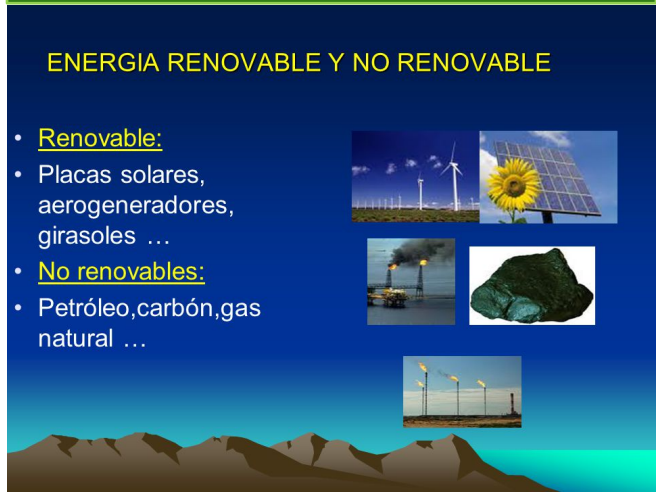
- There are two forms of energy sources:
  1. Non-renewable energy sources.



2. Renewable energy sources.

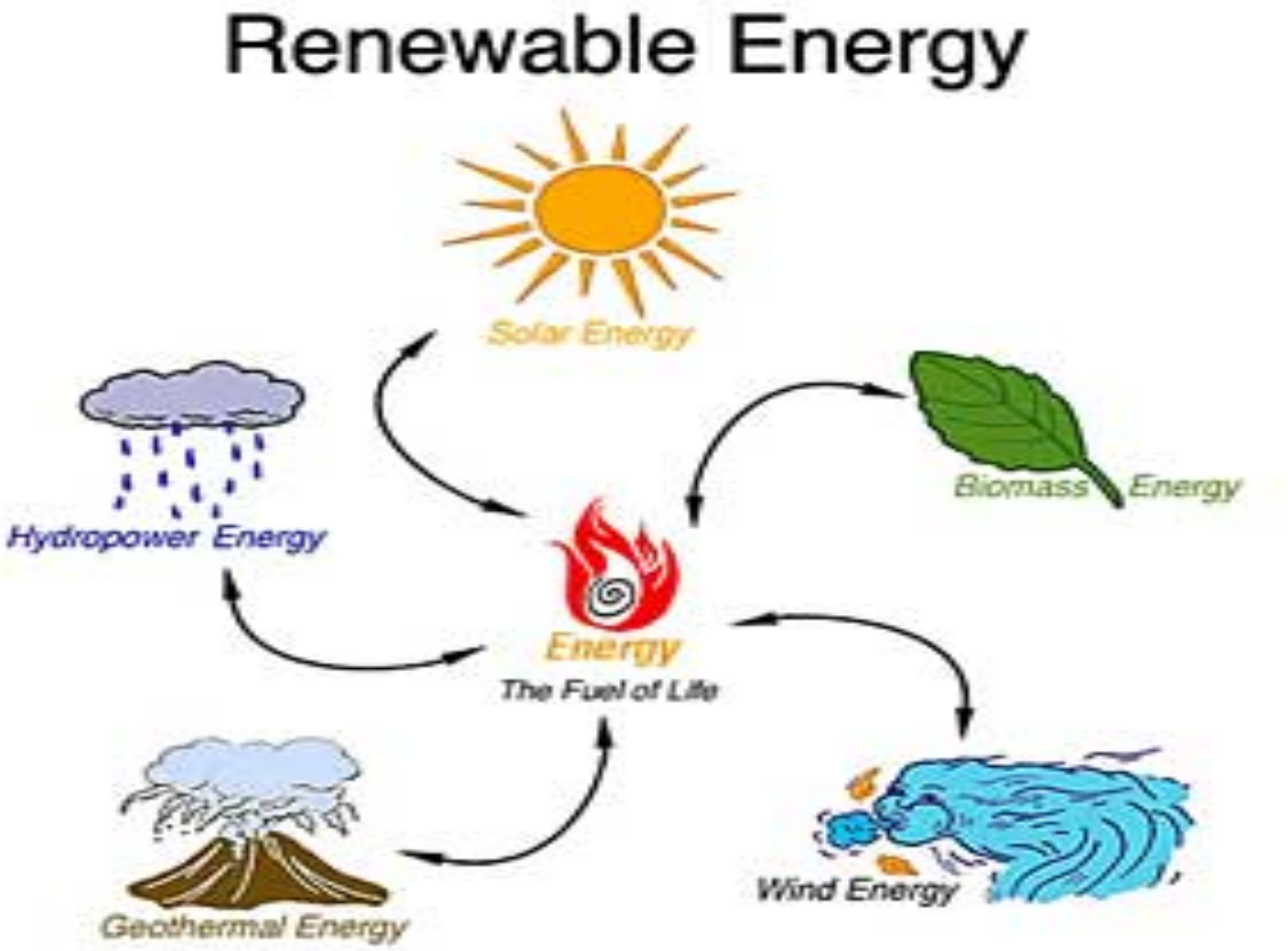


AYUDA



4. ENERGY

RENEWABLE ENERGY SOURCES, like energy from the Sun or the wind. They will never run out.

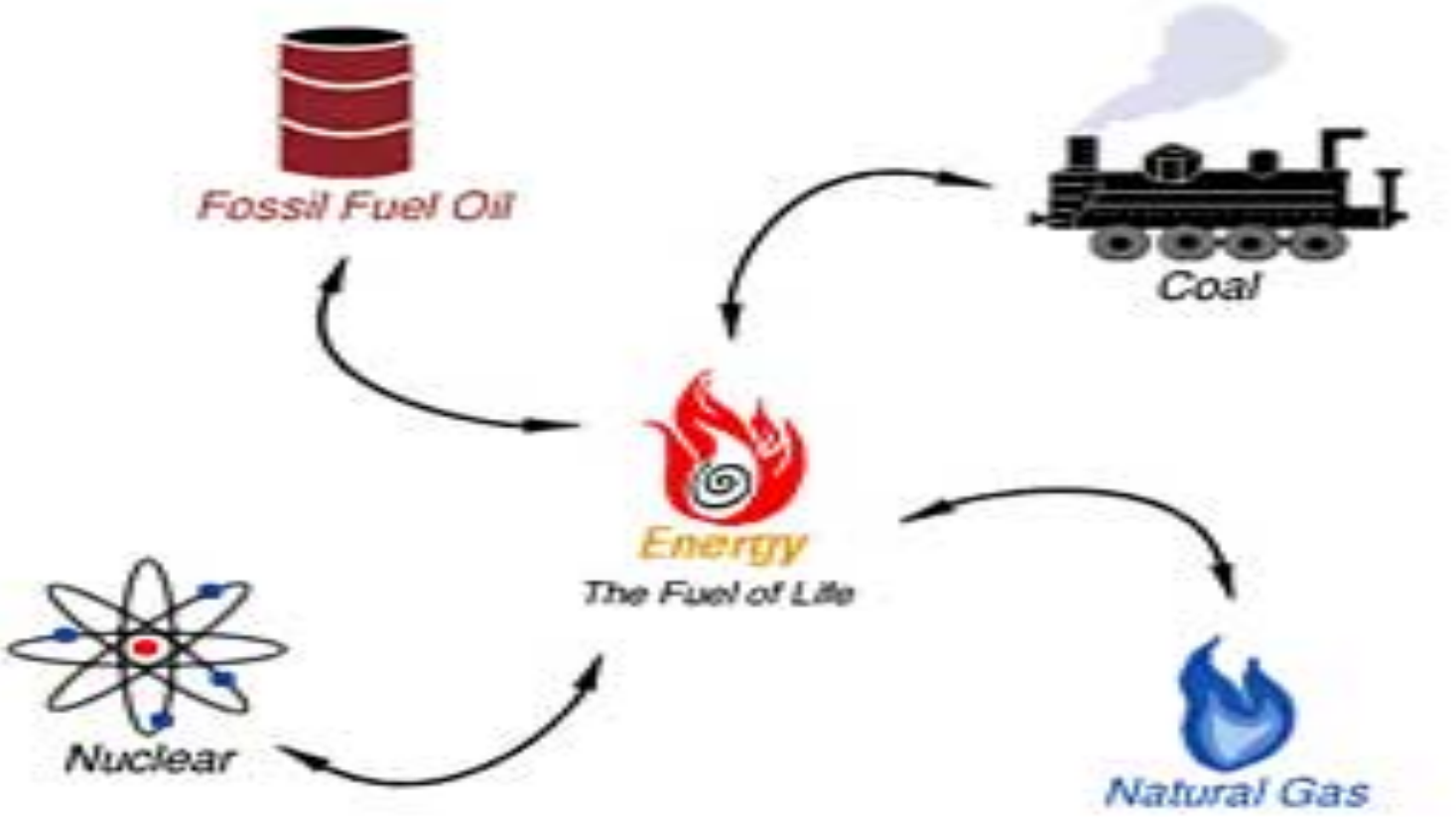


4. ENERGY

Non-Renewable Energy

NON-RENEWABLE ENERGY SOURCES are coal, petroleum, natural gas and nuclear fuels. They will run out one day. These sources cannot be replaced.

They are found UNDER the ground.



5. LIGHT ENERGY

LIGHT is the form of energy that allows us to SEE.

5. LIGHT ENERGY

Natural Light

Natural light sources are those which are not man-made.

SUN

STARS

FIRE-FLY

THEY COME FROM THE SUN

5. LIGHT ENERGY

Artificial Light

Artificial light sources are man-made.
They include candles; lamps and matches

LAMP

MATCHES

CANDLE

THEY CHANGE ELECTRICAL ENERGY INTO LIGHT ENERGY

5. LIGHT ENERGY

LIGHT TRAVELS THROUGH DIFFERENT MATERIALS

Light passes easily through them.	Only some light passes through.	NO Light passes through them.

5. LIGHT ENERGY

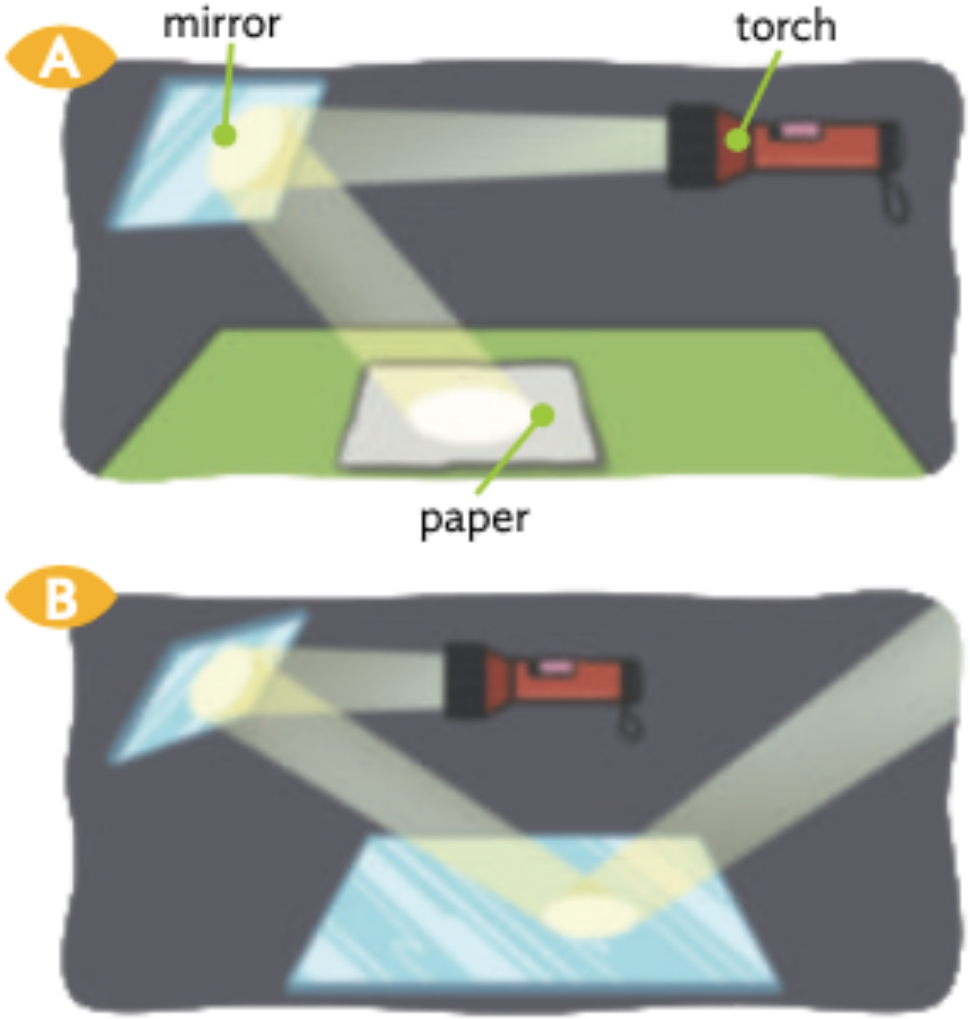
6. EXPERIMENT:

Investigate light and mirrors.

a. In a dark room, shine a torch onto a mirror. Where does the light beam go? Move the mirror a little. Does the light change direction?

b. Use two mirrors. Can you bounce the light from one mirror to another mirror?

c. Look at diagram A. Then copy and label diagram B in your notebook.



THE END