PROPERTIES OF MATTER: PHASES

PROMISE

SANFORD RESEARCH

WATCH THE VIDEO AND THINK!

Write down your answers to the following questions.

- What do you think is happening?
- What is the white, cloudy material coming out of the beaker?
- Do you have any questions after watching?

THE PHASES OF MATTER

There are three phases of matter:

SOLID **LIQUID** **GAS**

SOLID

EXAMPLES

- Ice
- Pencil
- Chair

LIQUID

EXAMPLES

- Water
- Milk
- Oil

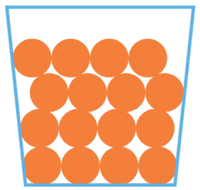
GAS

EXAMPLES

- Steam
- Oxygen
- Methane

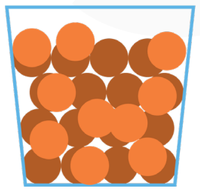
SOLID

- Atoms do not move
- Not much energy



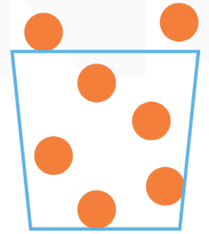
LIQUID

- Atoms move to fit surroundings
- A little energy



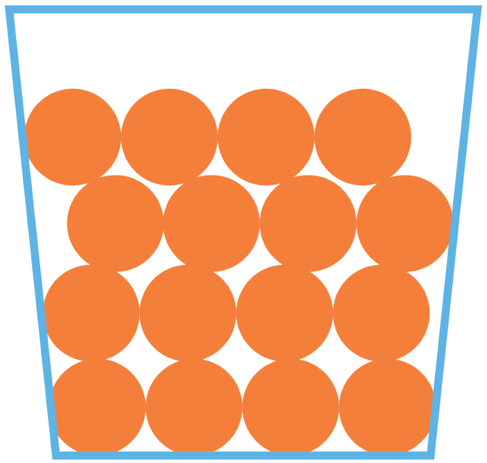
GAS

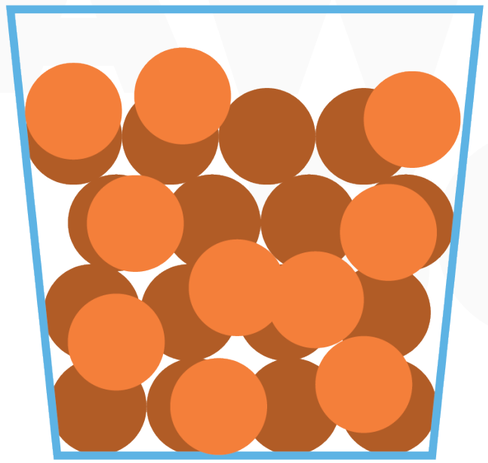
- Atoms move a lot and spread
- A lot of energy

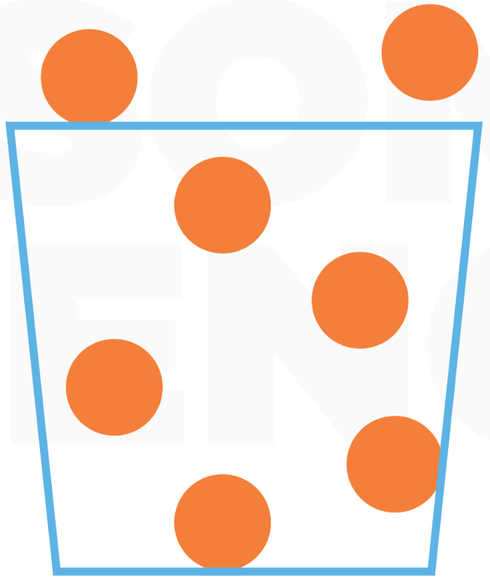


ATOM ACT

Stand up and show off your best atom impression for each phase of matter!







THE PHASES OF MATTER

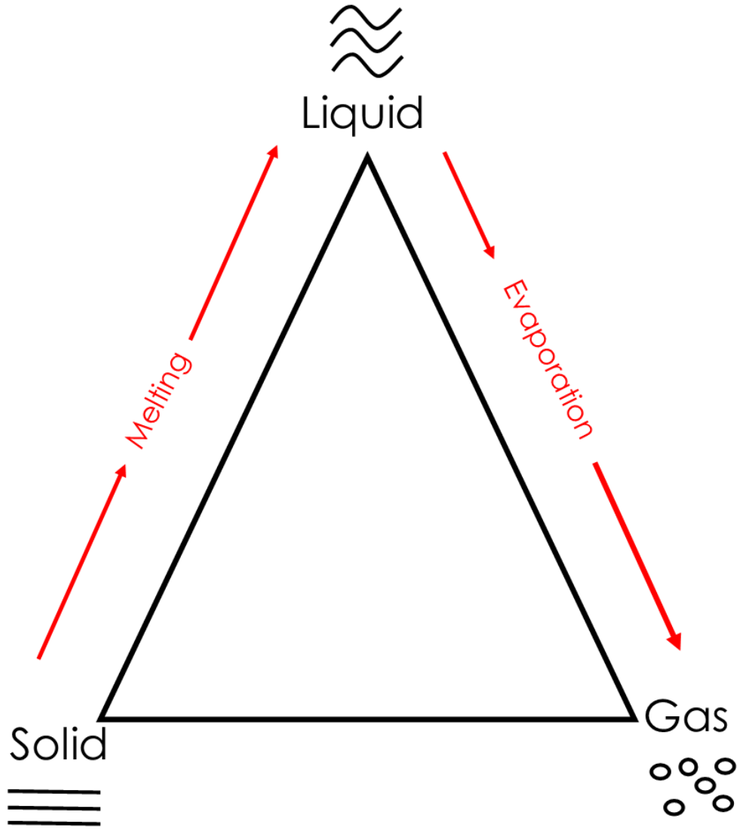
Phases change when energy is added or taken away.

This happens when matter is heated or cooled.

ADDING ENERGY

When heat is added, solids change to liquids by **melting**.

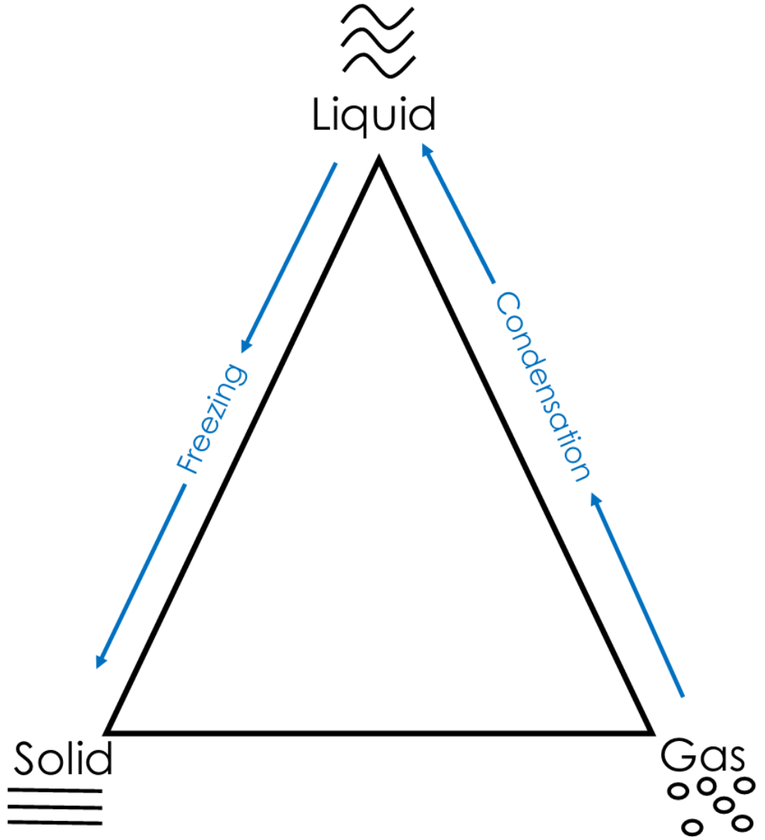
When heat is added, liquids change to gases by **evaporation**.



TAKING AWAY ENERGY

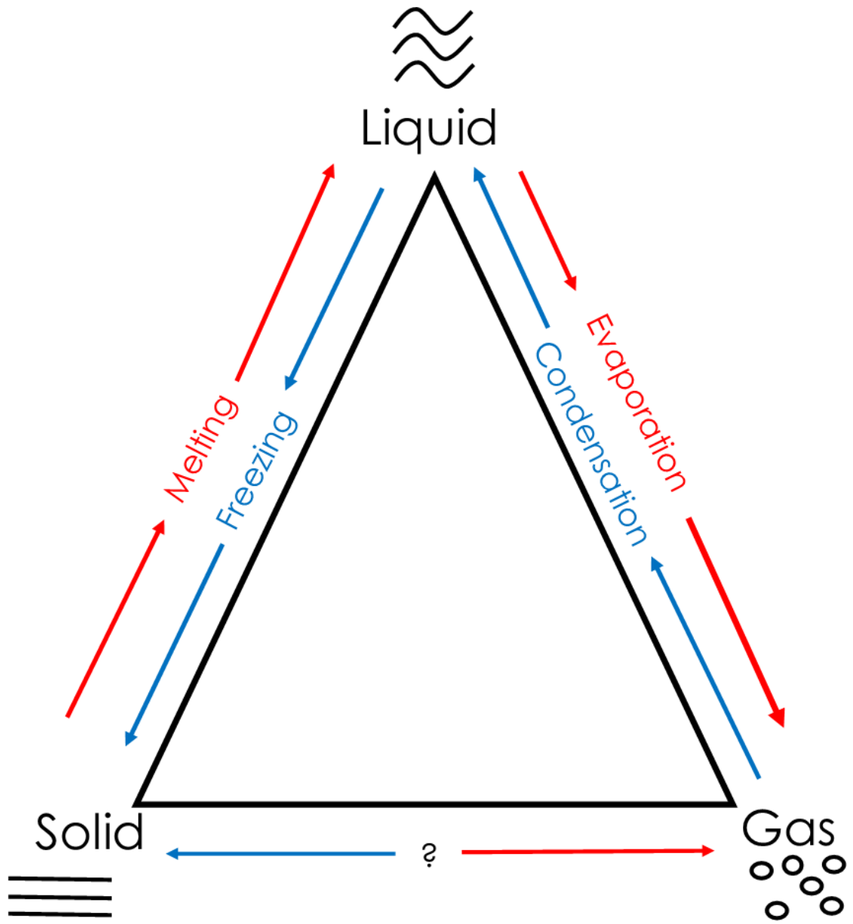
When heat is removed, gases change to liquids by **condesation**.

When heat is removed, liquids change to solids by **freezing**.



SKIPPING PHASES

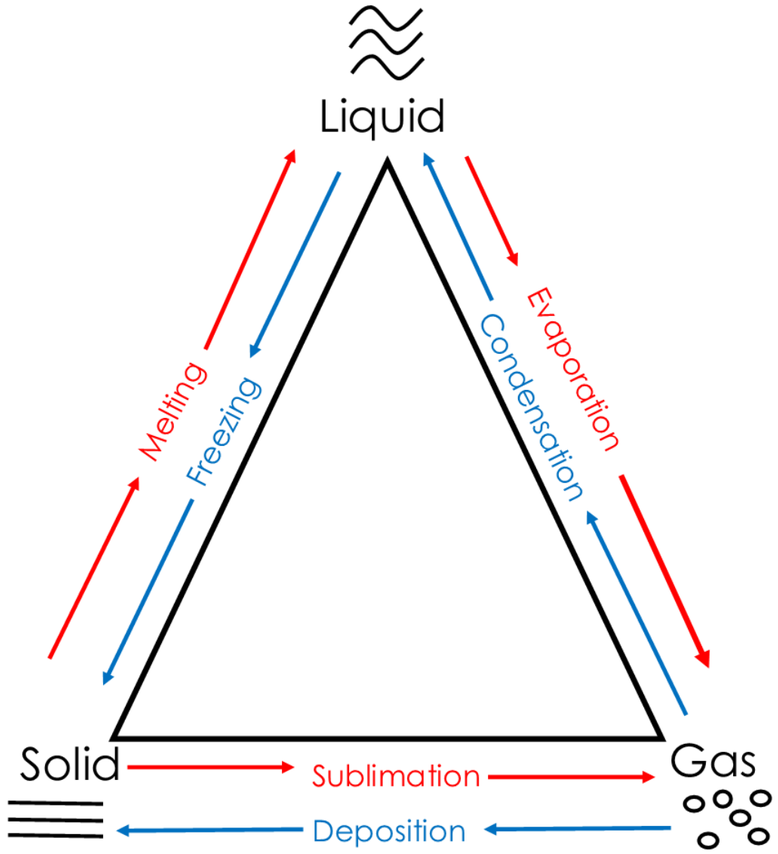
Can a gas turn into a solid? Or a solid to a gas?



SKIPPING PHASES

When heat is added, solids change to gases by **sublimation**.

When heat is removed, gases change to solids by **deposition**.

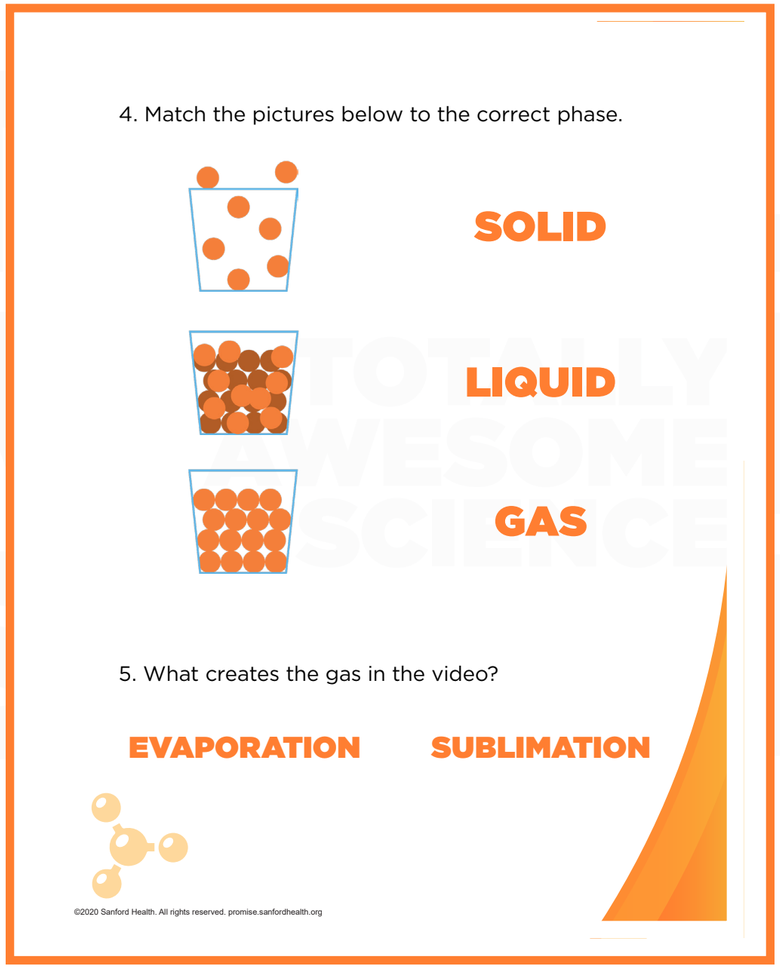


RECALL THE VIDEO

- Is the water turning to gas?
- Is the ice turning to gas?
- Which phase change do you see?

EXPERIMENT TIME!

1. Make sure you've answered questions 1-6 in your lab book.
2. Combine 30 mL of water and 40g of cornstarch in a cup. Mix well.
3. Touch the mixture. Move the cup around. What do you notice?
4. Is the mixture a solid, liquid, or gas?

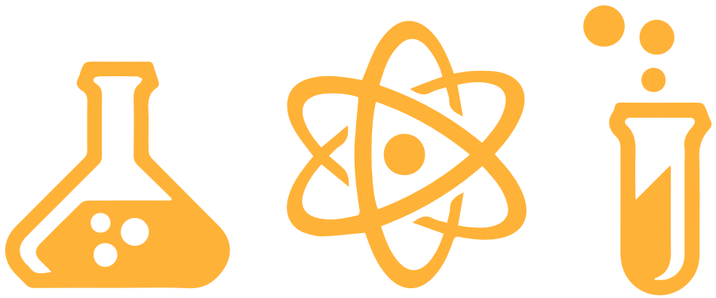


YOU MADE OOBLECK!

Oobleck is actually a non-Newtonian fluid. This means that when you press on it, it is solid. When you don't touch it, it is a liquid.

- What else can you find out about it?
- What is the mass of a small pinch?
- What is the density of it?

ANSWER THE REMAINING QUESTIONS IN YOUR LAB NOTEBOOK!



8. Write at least three things you learned about phases of matter.

Here's what I did today!

I visited the virtual Sanford Research PROMISE lab to learn about the phases of matter. Matter can exist in many phases including solid, liquid, and gas. I learned that matter can change phase when heat is added or removed. I also made Oobleck, which is both a solid and a liquid at the same time.