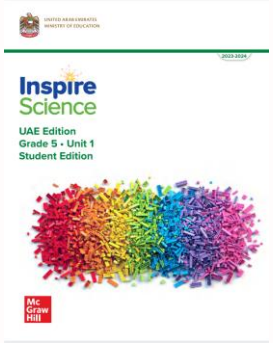
Grade 5

Welcome to Science Class – Inspire Science

With Anitha Raja Ram

Make sure you have the following before we start

Date: 26/09/2023



Textbook

Page:49

Pencil, Eraser, Ruler

Notebook

Fully Charged Laptop

Learning Golden Rules

You agree to:

1. **Listen** to your teacher.
2. **Ask questions** by raising your hand.
3. **Be prepared** to start the lesson by having your resources ready.
4. Be in your **school uniform**.
5. **Keep** your textbook and notebook ready.
6. **Try your best and be an active learner!**
7. **Do not interrupt** when some one is talking.

“Every day is a chance to learn.”

—Someone Famous

Weekly Quiz 4
Wednesday - 27/09/2023
Lesson 2 – Mixtures and Solutions
Lesson 3 – Physical and Chemical Change
Page 19- 36

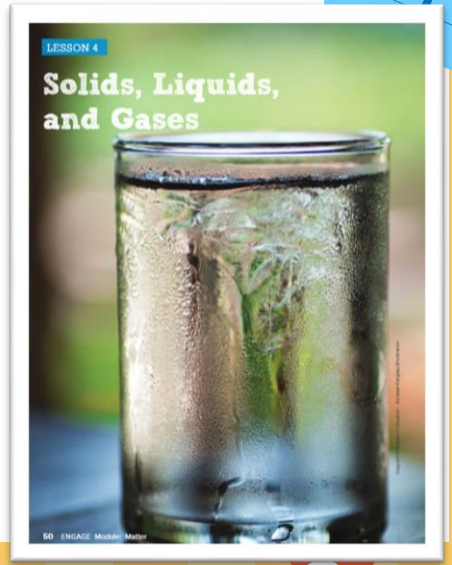
Module 1 - Matter

Date: 20/09/2023

Unit 1: Investigate Matter

Lesson 4: Solids, Liquids and Gases

Textbook Page:49 - 57



LESSON 4 LAUNCH

Starter Activity

Particles in Matter

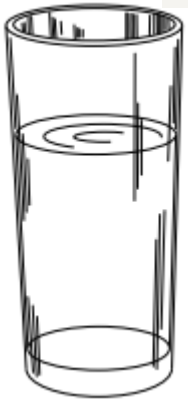
Four friends were talking about the particles that make up matter and give matter its properties. They each had different ideas. This is what they said:

Joyce: *I think you can't see the particles that make up solids, liquids, and gases. They are too small to see.*

Harold: *I think you can see the particles that make up solids, liquids, and gases.*

Royce: *I think you can see the particles that make up solids and liquids, but you can't see the particles that make up gases.*

Benito: *I think you can see the particles that make up solids, but you can't see the particles that make up liquids and gases.*



Who do you agree with most? Joyce

Explain why you agree.

Particles in matter are small to see with ordinary eyes.

03:00

Textbook Page # 49

Learning Objectivies

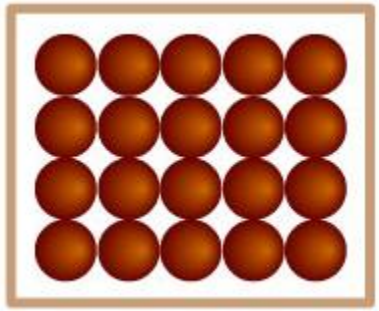
- ✓ Understand the different forms of matter
- ✓ Use models to show the scale and organization of particles in matter.
- ✓ Investigate how the arrangement of particles affect the properties of matter.

Success Criteria:

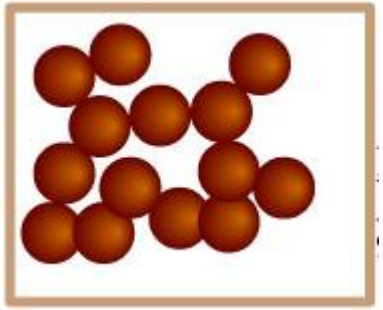
Students will be able

1. To explain about the three states of matter
2. To explain about the arrangement of particles in Matter
3. To explain about how the arrangements of particles affect the properties of matter.

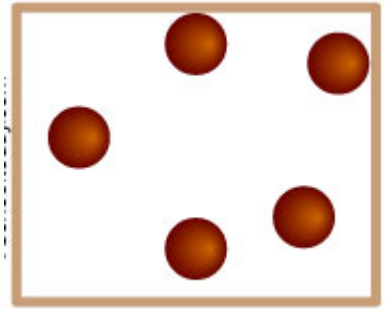
Vocabulary!



Solid



Liquid



Gas

03:00

ENCOUNTER
THE PHENOMENON

Activity

What are the different forms in which matter can appear?

Look at the photo and watch the video. What questions do you have about the phenomenon?

What is causing ice to melt?
Can the same water turn back into ice?
How are ice and water different?

B

03:00

Textbook Page # 51

Essential Question

- What are the differences between solids, liquids, and gases?

Objective: Understand the different forms of matter.

INQUIRY ACTIVITY

https://prod.reader-ui.prod.mheducation.com/epub/urn:com.mheducation.openlearning:enterprise.roster:prod.us-east-1:section:cda7f670-4ce6-11ee-a220-a772a96d3ed9/data-uuid-ee90271690ea438880f13557d441a3e8

Hands On

Observe Matter

Think about the phenomenon of the melting ice. You know that the ice and water are made of the same material, but they appear in different forms.

Make a Prediction Can we easily change the shape of different types of matter?

The shape of some types of matter, such as liquids and gases, can be changed more easily than solids.

Materials

- syringe
- sponge
- number cube
- modeling clay
- large beaker
- water
- graduated cylinder

Textbook Page # 52

Objective: Understand the different forms of matter.

INQUIRY ACTIVITY

Carry Out an Investigation

Station 1

1. Draw air into the syringe and cover the opposite end with your finger.
2. Push on the plunger.
3. Record your observations in the box below.

The plunger gets harder to push down. If I kept pushing, the air was forced out of the end of the syringe.

Textbook Page # 52

Objective: Understand the different forms of matter.

INQUIRY ACTIVITY

Station 2

4. Squeeze the sponge. Observe what happens to its shape. Record your observations in the box below.

The sponge looked crushed when we squeezed it but then returned to its original shape.

Textbook Page # 53

Objective: Understand the different forms of matter.

INQUIRY ACTIVITY

5. Squeeze the number cube between your fingers. Observe what happens to its shape. Record your observations.

The shape of the number cube did not change when I squeezed it.

Textbook Page # 53

Objective: Understand the different forms of matter.

INQUIRY ACTIVITY

6. Squeeze the modeling clay. Observe what happens to its shape. Record your observations.

The modeling clay had an imprint where I squeezed it with my hand and stayed in that shape.

Textbook Page # 54

Objective: Understand the different forms of matter.

INQUIRY ACTIVITY

Station 3

7. Fill the beaker halfway with water.
8. Pour some of the water from the beaker into the graduated cylinder. Record your observations in the box below.

I observed water from the beaker take the shape of the graduated cylinder as it was poured.

Textbook Page # 54

Objective: Understand the different forms of matter.

INQUIRY ACTIVITY

Communicate Information

9. Did your results support your prediction? Explain how your prediction was or was not supported by what you observed.

My results supported my prediction because I could easily change the shape of the gas and the liquid. Each of the stations explored the states of matter and how they behave.

Textbook Page # 54

Make Your Claim

How do the three states of matter change shape?

Make your claim. Use your investigation.

CLAIM

Solids _____. Liquids _____. Gas _____.

keep their shape; take on the shape of the container; expand to fill their container

Textbook Page # 55

Make Your Claim

How do the three states of matter change shape?

Cite evidence from the activity.

EVIDENCE

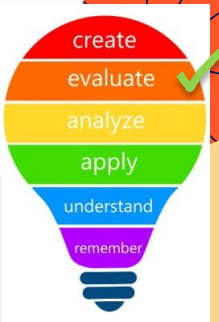
The investigation showed that _____.

the gas pushed against the closed syringe as I pushed the plunger down. The solids had a definite shape and the liquid took the shape of each container into which it was poured.

Textbook Page # 55

Make Your Claim

How do the three states of matter change shape?



Discuss your reasoning as a class. Tell about your discussion.

REASONING

The evidence supports the claim because _____.

the particles in a gas spread far apart. When pressure is added, the particles condense. The particles in a solid are packed tightly together and hold their shape. The particles in a liquid are able to move and take the shape of their container.

Textbook Page # 55

Learning Objectivies

- ✓ Understand the different forms of matter
- ✓ Use models to show the scale and organization of particles in matter.
- ✓ Investigate how the arrangement of particles affect the properties of matter.

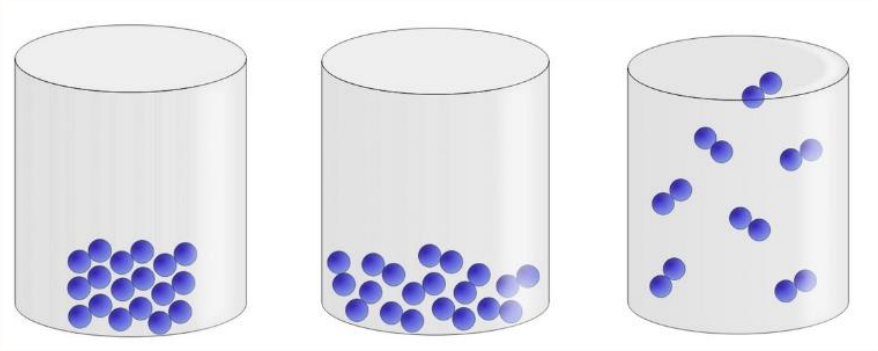
Success Criteria:

Students will be able

1. To explain about the three states of matter
2. To explain about the arrangement of particles in Matter
3. To explain about how the arrangements of particles affect the properties of matter.

Objective: Use models to show the scale and organization of particles in matter.

States of Matter



State is a ..... of matter.

A. physical property
B. chemical property

Textbook # 56

Objective: Use models to show the scale and organization of particles in matter.

States of Matter

https://phet.colorado.edu/sims/html/states-of-matter-basics/latest/states-of-matter-basics_en.html

https://javalab.org/en/status_solid_liquid_gas_en/

Watch the simulation and read page 56 and complete the table.

Textbook # 56

Objective: Use models to show the scale and organization of particles in matter.

States of Matter

https://phet.colorado.edu/sims/html/states-of-matter-basics/latest/states-of-matter-basics_en.html

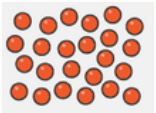
Watch the simulation and read page 56 and complete the table.

Properties	Solid	Liquid	Gas
Shape			
Volume			
Arrangement of particles			
Movement of particles			
Diagram of the particles			

Textbook # 56

Objective: Use models to show the scale and organization of particles in matter.

States of Matter

Properties	Solid	Liquid	Gas
Shape	Definite shape	No definite shape	No definite shape
Volume	Definite volume	Definite volume	No definite volume
Arrangement of particles	Tightly packed together, Regular pattern	Less tightly packed, Random arrangement	Much farther apart, Random arrangement
Movement of particles	Vibrate in the place	Can move and slide past one another	Move around in all directions
Diagram			

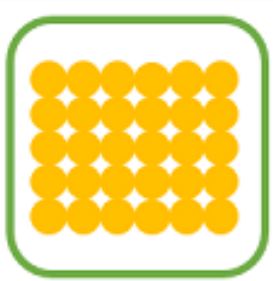
Textbook # 56

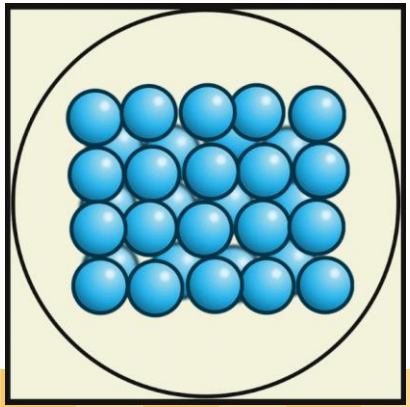
Objective: Use models to show the scale and organization of particles in matter.

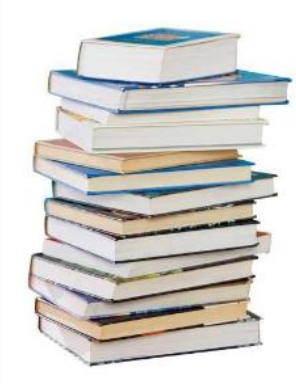
States of Matter

Solid

- A **solid** has a definite shape and takes up a definite amount of space.
- The particles in a solid are tightly packed together and vibrate in place.
- They are often packed in a regular pattern.







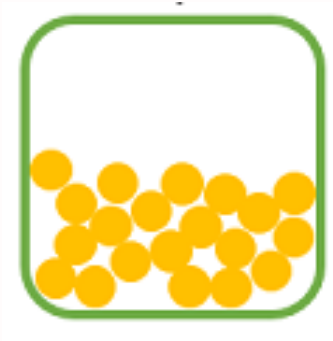
Textbook # 56

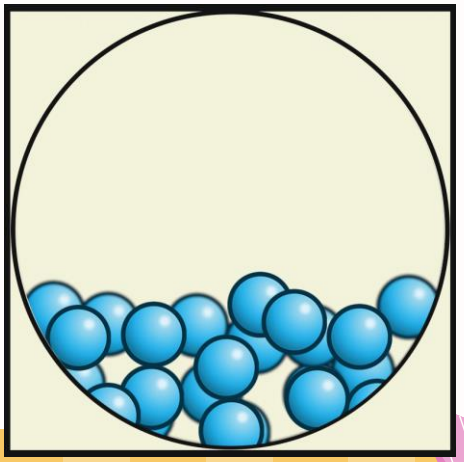
Objective: Use models to show the scale and organization of particles in matter.

States of Matter

Liquid

- A **liquid** has a definite volume and does not have a definite shape.
- The particles in a liquid are less tightly packed together and can move and slide past one another.





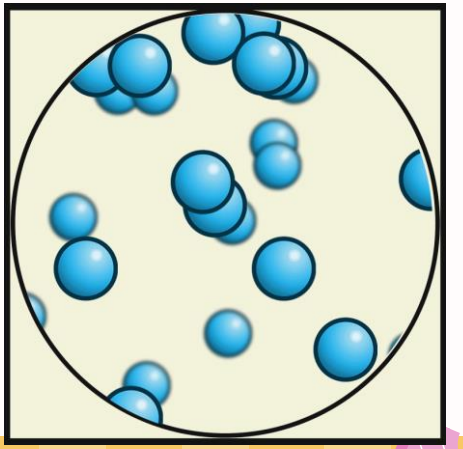
Textbook # 56

Objective: Use models to show the scale and organization of particles in matter.

States of Matter

Gases

- **Gases** has a no definite volume or shape.
- The particles in a gas are much farther apart from each other.
- They can move around each other very easily.



Textbook # 56

Objective: Use models to show the scale and organization of particles in matter.

Three-Dimensional Thinking

2. Liquid has _____. Select all that apply.

☐	A	definite volume
☐	B	definite shape
☐	C	no definite volume
☐	D	no definite shape

B

Textbook # 63

Objective: Use models to show the scale and organization of particles in matter.

AFL

https://wordwall.net/resource/60884245

	no definite shape and no definite volume	no definite shape	
Particles can slide past each other	Definites Shape	large space between particles	random arrangement
Particles move freely, randomly, and rapidly	Fixed volume	Definite volume	tightly packed together
Particles vibrate in fixed positions		Regular pattern	

Solid		Liquid		Gas	

Objective: Use models to show the scale and organization of particles in matter.

Peer Assessment

Complete the following:

1. A …….. Stays in its definite shape with a definite volume unless it is changed by an outside force.
2. No matter what type of container, a book will still keep the shape. (T/F)
3. The ……. Fills the shape it is pored into from the bottom up.
4. The liquid from a bottle is able flow because it does not have a definite shape. (T/ F)
5. Water is more dense than ice. (T/F)
6. The air in the basket ball will be sphere shaped too. (T/F)
7. Gases spreads out and completely fill a closed container. (T/F)

Learning Objectivies

- ✓ Investigate how the arrangement of particles affect the properties of matter.

Success Criteria:

Students will be able

1. To explain about how the arrangements of particles affect the properties of matter.

Objective: Investigate how the arrangement of particles affect the properties of matter.

INQUIRY ACTIVITY

https://nt7-mhe-complex-assets.mheducation.com/nt7-mhe-complex-assets/INS_SIM_C/INS_SIM_C_Particles_in_Matter/index.html

Simulation

Particles in Matter

Go online

Explore the simulation *Particles In Matter*. Record data from the simulation in the table below.

Make a Prediction How does temperature affect the state and mass of different types of matter?

Changes in temperature can change the state of matter.
The matter's mass should stay the same.

Textbook Page # 57

Objective: Investigate how the arrangement of particles affect the properties of matter.

INQUIRY ACTIVITY

Simulation

Particles in Matter

Type of Matter	Temperature	State of Matter	Mass
Iodine	−10° C	solid	500 g
	200° C	gas	500 g
Ethanol	−10° C	liquid	500 g
	200° C	gas	500 g
Olive Oil	−10° C	solid	500 g
	200° C	liquid	500 g

Textbook Page # 57

Objective: Investigate how the arrangement of particles affect the properties of matter.

INQUIRY ACTIVITY

Simulation

Particles in Matter

1. Explain the movement of the particles as you add energy to each substance.

When energy is added, the particles speed up and spread out.

2. What happens to the mass of the materials in the simulation regardless of whether heat is added or removed?

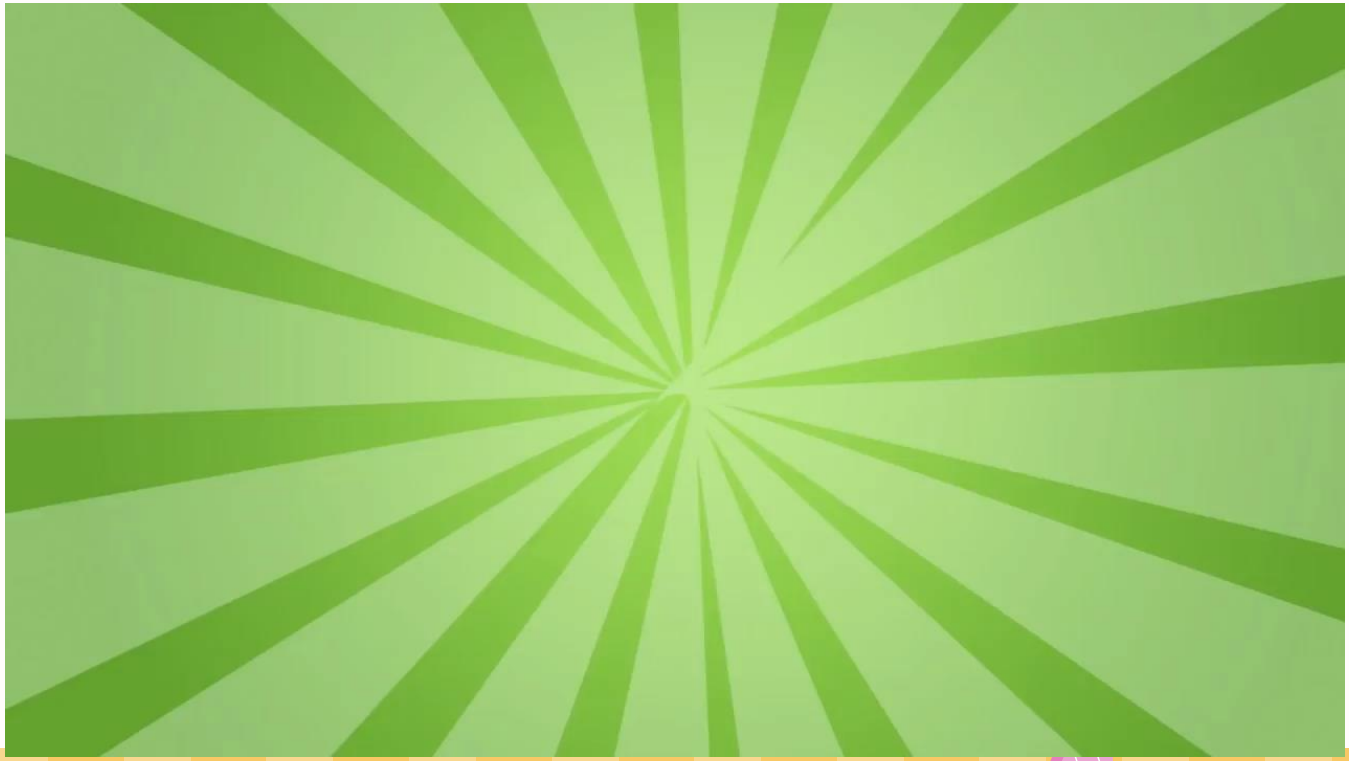
The mass of the materials stays the same.

Textbook Page # 57

Objective: Investigate how the arrangement of particles affect the properties of matter.

Changing States of Matter

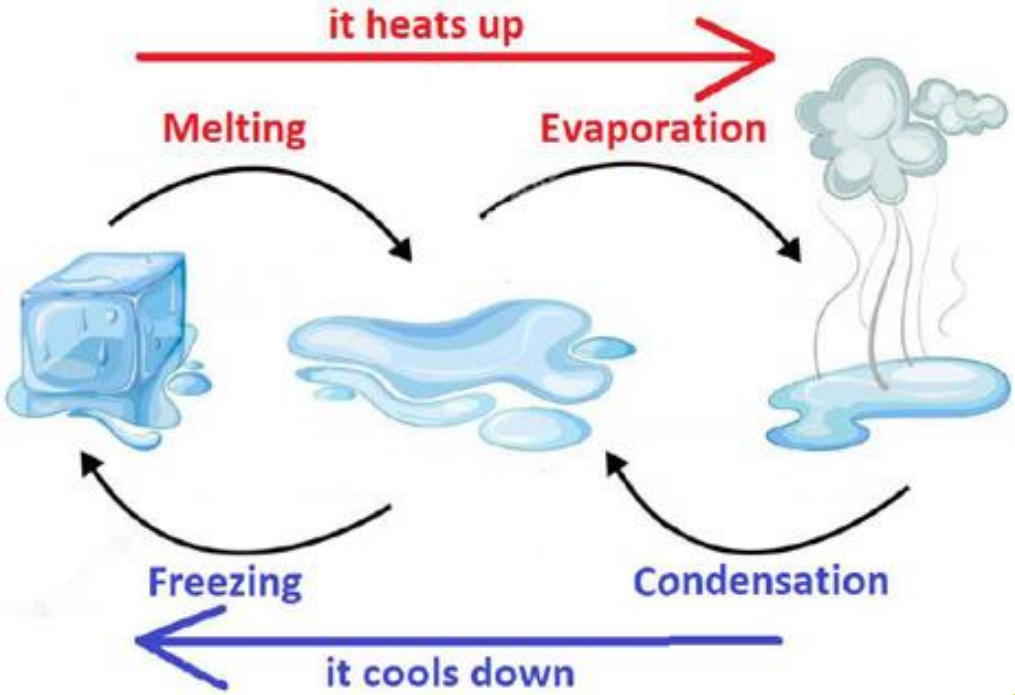
https://www.youtube.com/watch?v=DE3LCPfP8N8



Objective: Investigate how the arrangement of particles affect the properties of matter.

Changing States of Matter

https://phet.colorado.edu/sims/html/states-of-matter-basics/latest/states-of-matter-basics_all.html

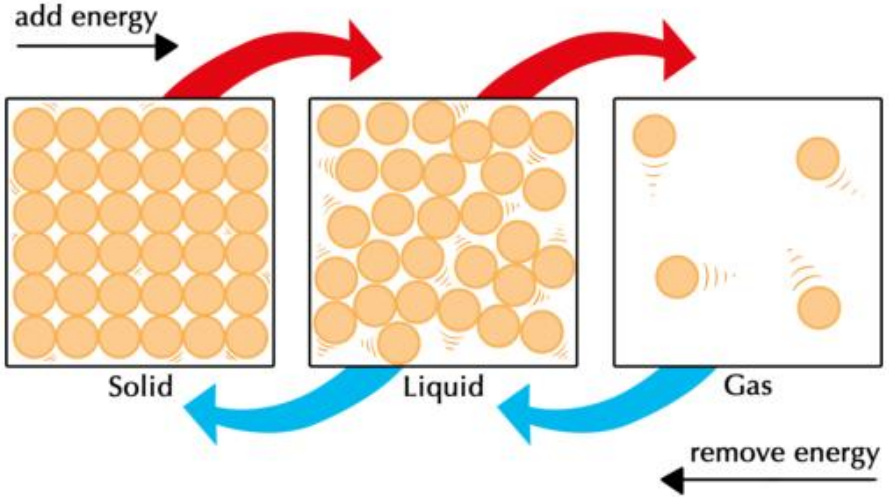


Textbook # 58

Objective: Investigate how the arrangement of particles affect the properties of matter.

Changing States of Matter

- **Temperature** is the average movement of particles in an object.
  - When **energy is added**, the particles **move faster**.
  - When **energy is lost** the particles move **more slowly**.

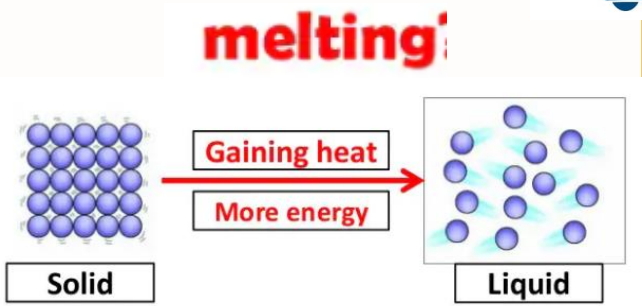


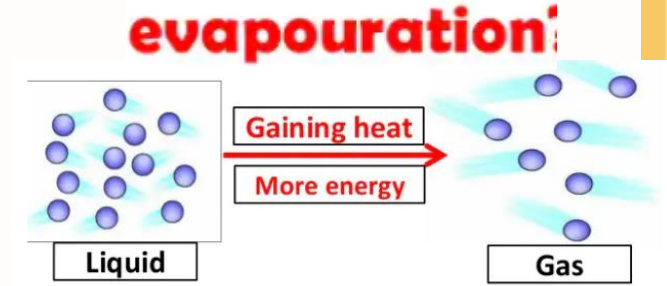
Textbook # 58

Objective: Investigate how the arrangement of particles affect the properties of matter.

Changing States of Matter

Adding Energy When energy is added to a solid, the particles start to move more quickly. When the particles move quickly enough that they slide past each other, the solid becomes a liquid by melting. If even more energy is added to this liquid, the particles' speed continues to increase and they move away from each other. As the particles spread out enough, liquid evaporates, becoming a gas.



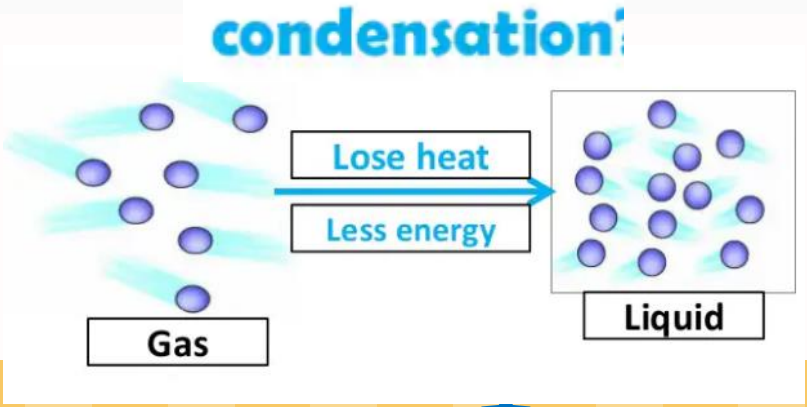


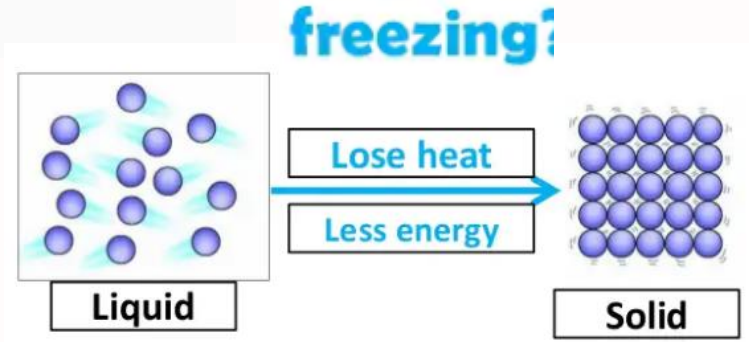
Textbook # 58

Objective: Investigate how the arrangement of particles affect the properties of matter.

Changing States of Matter

Removing Energy If a gas loses energy, its particles slow down and move closer together. They start to slide past each other again. A liquid forms through a process called condensation. If the liquid loses enough energy, freezing occurs and a solid forms.



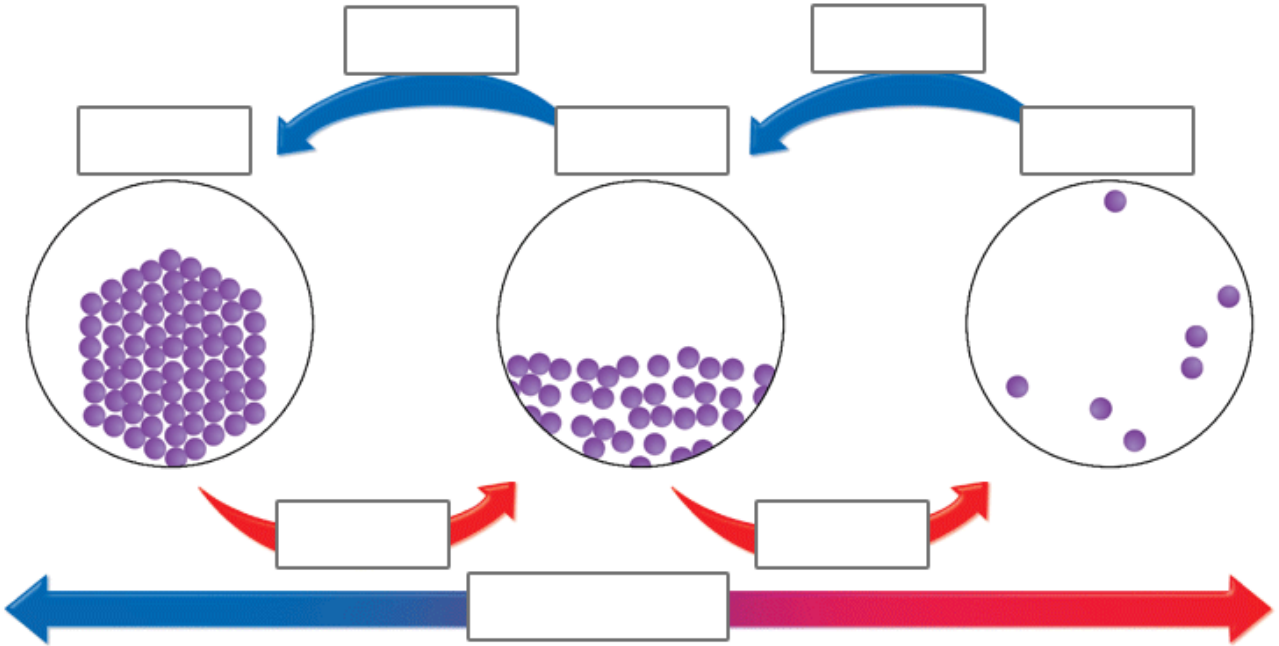


Textbook # 58

Objective: Investigate how the arrangement of particles affect the properties of matter.

Label the diagram

AFL

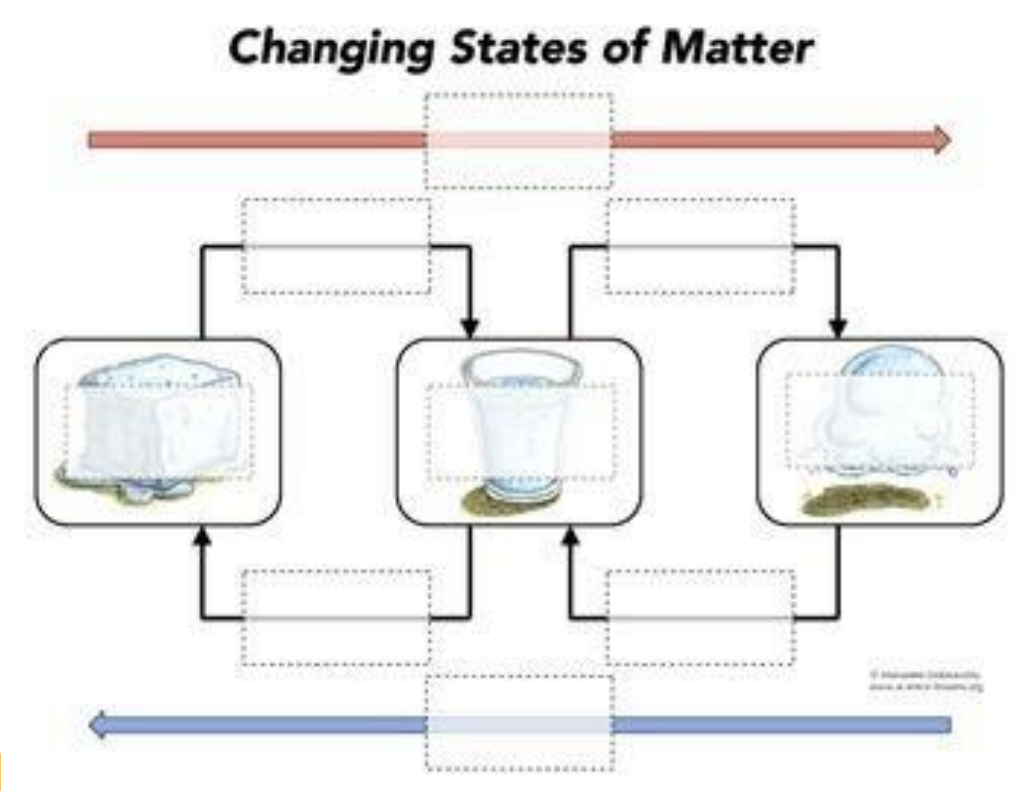


Textbook # 58

Objective: Investigate how the arrangement of particles affect the properties of matter.

Label the diagram

Peer Assessment



Objective: Investigate how the arrangement of particles affect the properties of matter.

Self Assessment

https://wordwall.net/resource/27373354

1. What happens when you boil water?
   - A ☐ The water evaporates and changes to a gas.
   - B ☐ The water freezes and changes to a solid.
   - C ☐ The water condenses and changes to a liquid.
   - D ☐ The water doesn't change a state.

2. What will happen to ice cubes if you put them in a sunny place?
   - A ☐ The ice cubes will freeze and turn into a solid.
   - B ☐ The ice cubes will melt and turn into liquid.
   - C ☐ The ice cubes will turn into water and boil.
   - D ☐ Nothing will happen to the ice cubes.

3. Which will change state if you put it in the freezer?
   - A ☐ Sand
   - B ☐ A bowl
   - C ☐ A pencil
   - D ☐ Juice

4. How can you turn liquid water into a solid?
   - A ☐ Boil it on the stove.
   - B ☐ Put it in a sunny place.
   - C ☐ Keep it in the dark.
   - D ☐ Put it in the freezer.

5. What happens when matter condenses?
   - A ☐ It changes from a liquid to a gas.
   - B ☐ It changes from a gas to a liquid.
   - C ☐ It changes from a solid to a liquid.
   - D ☐ It changes from a liquid to a solid.

6. Why do wet clothes dry when you hang them outside on a hot, sunny day?
   - A ☐ Because the water in the clothes freezes
   - B ☐ Because the water in the clothes melts
   - C ☐ Because the water in the clothes condenses
   - D ☐ Because the water in the clothes evaporates

7. Why would a pair of eye glasses fog up when brought from a cold place to a warm place?

   - A ☐ Water vapor condensed from the air onto the glasses.
   - B ☐ Water vapor evaporated from the air onto the glasses.
   - C ☐ Water vapor melted from the air onto the glasses.
   - D ☐ Water vapor froze from the air onto the glasses

Lesson Practice

https://www.liveworksheets.com/w/en/science/439847

https://wordwall.net/resource/21743527

https://quizizz.com/admin/quiz/614741873ff02e001d9bfe0b/states-of-matter

https://quizizz.com/admin/quiz/61423a3fc3592b001d19d54c/states-of-matter

Objective: Investigate how the arrangement of particles affect the properties of matter.

Model Matter

You have learned about the three main states of matter and how the organization of their particles affects how they behave.

Choose an object for each of the three states of matter. Draw each object. Use unit cubes to **develop and use a model** to show **the scale** of the volume and number of particles in the object and how the particles in each object are organized. Add this information to your drawings. Below each model, describe how the arrangement of the particles determines the properties of each of the objects.

Solid	Liquid	Gas
		

Textbook # 59

Objective: Solid, liquid and gases

WRITING Connection Read the Investigator article *Slower Melting Ice Cream*. How does the article provide an example of how the particles in matter determine its state? Use the graphic organizer below to organize your thinking. Write your response on the lines below. Use a separate piece of paper if you need to.

Cause	Effect
Scientists have found a way to add protein to ice cream to make its particles hold together at higher temperatures.	The ice cream will not melt as quickly because its particles will stay closer together for longer time.

Write the answers in the textbook.

Textbook Page # 61

Lesson Review

Summarize It

Use what you have learned to explain what you know about the particles in solids, liquids, and gases. Use the space below to write a summary or draw a diagram of what you learned.

Sample answer: The particles in a solid are tightly packed together and vibrate in place. The particles in a liquid are less tightly packed than those in a solid (except for water) and can move and slide past one another. The particles in a gas are far apart and can move around each other very easily.

Textbook # 62

Lesson Review

Three-Dimensional Thinking

1. How does matter change from one state to another? Circle all that apply.

- adding energy
- removing energy
- C. adding mass
- D. removing volume

2. Liquid has _____. Circle all that apply.

- definite volume
- B. definite shape
- no definite volume
- D. no definite shape

Textbook # 63

Lesson Review

3. Use evidence to support the argument that particles in water change when heat energy is added.

The particles begin to move faster and faster when heat is added. They also start to move farther apart, forming water vapor, which is a gas.

Textbook # 63

How well do you understand today's lesson?

EXIT TICKET

Thank You