My States of Matter

Learning Log

Read, Write & Draw

My Name _____

October 2008

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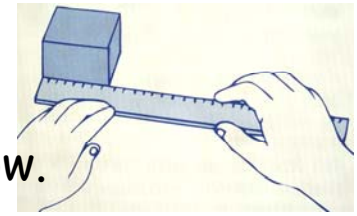
LaFayette CSD, Grimshaw Elementary

NAME: _____

What is a Solid?



1. Observe and measure each block.
   Record your measurements in the chart below.

On the Table		
	Wooden Block	Foam Block
Shape		
Length of Side 1		
Length of Side 2		
Length of Side 3		

2. Now make a prediction. When you place the blocks in the box will the shape and size of the blocks change or remain the same?

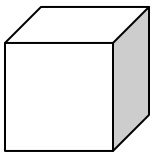
Circle One:

I predict the **shape** of the blocks will…	Change	Stay the Same
I predict the **size** of the blocks will…	Change	Stay the Same

3. Now measure each block as in sits in your box, and record your measurements.

In the Box		
	Wooden Block	Foam Block
Shape		
Length of Side 1		
Length of Side 2		
Length of Side 3		

4. What happened when **the blocks were moved** from the table to the box. Circle the sentence that tells what happened to the shape?



The shape changed. The shape stayed the same.

5. Think about **when the blocks were moved** from the table to the box. Circle the sentence that tells what happened to the size of the space that the block takes up?

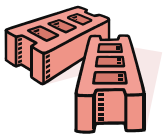
It took up more space.

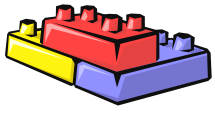
It took up less space.

It took up the same space.

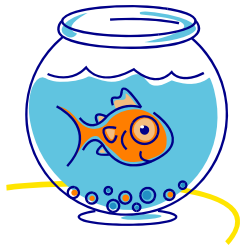
6. One way to decide if a substance is a solid, a liquid, or a gas is to see how it reacts when put into a container. Let's write a rule for matter that is solid. Fill in the missing words.

Solid Rule: When put in a container a solid will take up the same _____ and not change its _____.



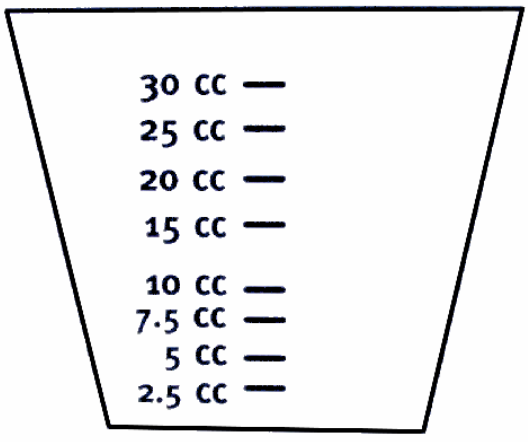


7. Is a fish a solid? Use the rule to help you to decide. Think about what happens **when a fish is placed from a take home bag into a bowl.**



What is a Liquid?

1. Pour the water from your paper cup up to the 30cc mark. Draw a line to show the water level on the picture below.



Write the number of cc of water on the line below:

_____ **cc**

A cubic centimeter (cc) is one way to measure of the size of the space that matter takes up. You can think of this as the amount of room something needs. You may have heard the word "ounce" or "quart". These measure the same property as does a "cc". A cc is much smaller than an ounce. An ounce is a smaller amount than a quart.

What is the measurement of the amount of space that the water takes up in the small cup? _____

Does the water take up all the space in the small cup? _____

You are going to pour the water from the small plastic cup into the large plastic cup.

Predict the size of the space the water will take up in the larger cup.
(Circle your prediction.)

The size of the space the water takes up will be greater.

The size of the space the water takes up will be lesser.

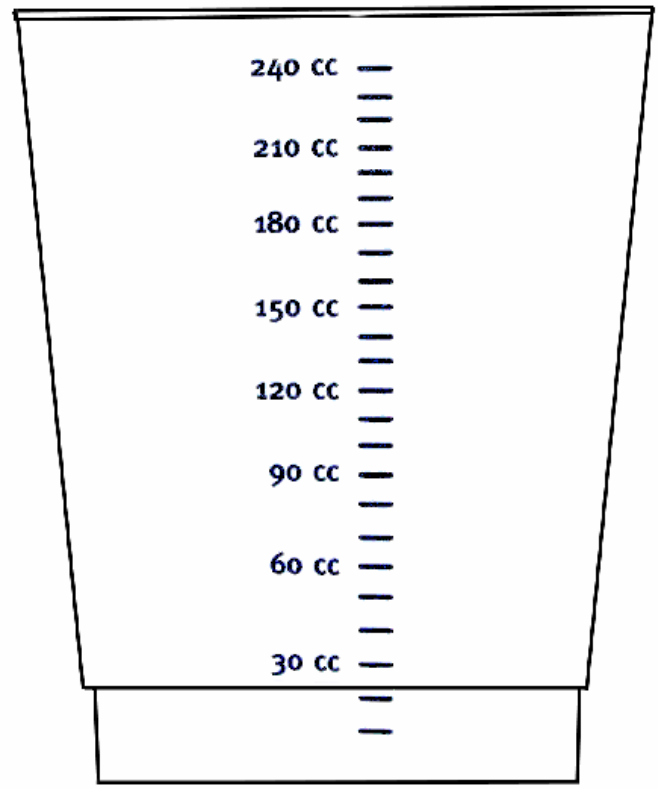
The size of the space the water takes up will not change.

Predict what the shape of the water will be in the larger cup
(Circle your prediction.)

The shape of the water will change.

The shape of the water will stay the same.

2. Pour water from the small plastic cup into the large plastic cup. Draw a line to show the water level on the picture below.

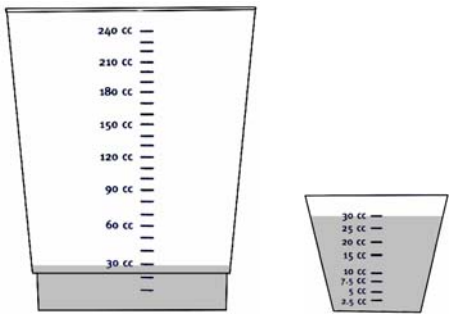


Write the number of cc of water on the line below:

_____ **cc**

A word that describes the size of the space that an object takes up or how much room it needs is **volume.** Volume can be measured in cc or cubic centimeters.

3. What is the volume of water in the large cup? _____



Volume in large cup = 30 cc

Volume in small cup = 30 cc

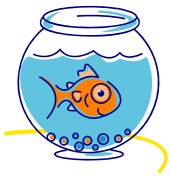
4. What happened to **the volume of the water** when it was poured into two different containers?

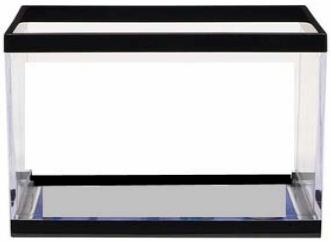
5. What happened to **the shape of the water** when it was poured into two different containers?

6. One way to decide if a substance is a liquid is to see how it reacts when put into a container. Let's write a rule for matter that is liquid. (Fill in the missing words.)

Liquid Rule: When put in a container a liquid will take up the same _____ but may have a different_____.

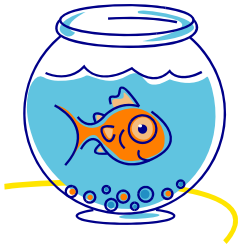
7.





You have a fish bowl and you want to move the fish and the water into a larger fish tank. Tell what happens **when the water is poured into the different container**. (What stays the same? What may be different?)

8. Think about the fish. Think about what happens **when a fish is placed from a bowl into a tank.** Is the fish a liquid? How do you know?



9. Make a list of 6 things that you know are liquids.

_____ _____

_____ _____

_____ _____

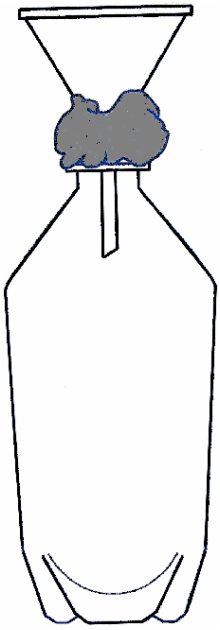
Draw a picture of yourself doing something with a liquid.

Write a sentence telling about your picture.

_____

What is a Gas?

1. Put a funnel in the bottle. Seal the neck of the bottle to the funnel with clay, as shown.



Pour the colored water from the plastic cup **(all at once)** into the funnel. (Read below right after you pour the water.)

2. Draw on the picture above to show above what happened to the water. Use arrows and labels to help describe your drawing.

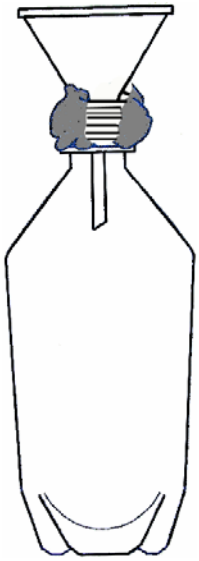
3. <u>Circle</u> the sentence that best tells why that happened.

The funnel was too small for the water to easily pass through.

The air could not get out so the water could not easily go in.

The clay blocked the water from flowing into the bottle.

4. Now loosen the clay seal from around the neck of the bottle and funnel.
5. Draw on the picture above to show above what happened to the water then. Use arrows and labels to help describe your drawing.



6. Circle the sentence below that tells why this happened.

Loosening the clay lets the water flow into the bottle.

Loosening the clay allows the air to leave so the water can enter.

Loosening the clay allowed the water to slip around the funnel.

7. Circle the best words for the blanks.

Air is made up of gases. From this activity you can learn that gases can fill up _____ (a bottle / clay).

Gases can fill up any _____ (object / space).

What is a Gas?

Look at the blown up balloon in front of you. What do you **predict** would happen to **the balloon's shape** if you press on it?

1. Draw a picture of your balloon.

2. Draw a picture of your balloon to show what you think it would look like if you press on it.

3. What do you predict will happen to **the shape of the air** inside of the balloon if you press on it? Circle the sentence that tells your prediction.

   The shape of the air will stay the same.

   The shape of the air will change.

Press gently on the balloon.

4. What actually happened to **the shape of the balloon** when you pressed on it? (Complete the sentence.)

   When I pressed on the balloon, the shape of the balloon

   _____.

5. What actually happened to **the shape of the air inside the balloon** when you pressed on it? (Complete the sentence.)

   When I pressed on the balloon, the shape of the air in the

   balloon _____

6. What happens to the **shape of a gas** when the **shape of the container** is changed? (Complete the sentence.)

   When the shape of a container is changed the shape of the

   gases _____

Gas Rule: When you put a gas in a container it will take up all the _____. It will have the _____ of the container.

7. Draw a picture of something in your classroom that has gases (air) in it.

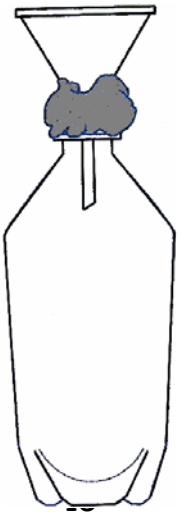
8. All matter takes up space.
Is there **matter** inside a balloon? _____
Write a reason why you think this.

_____

_____

_____

9. Two pieces of matter can not be in the same space at the same time. Air and water are both matter. When the water was first poured into the funnel, where was the water? Where was the air? Use arrows and labels to show on the picture.



Ice

You have been given a 1 ounce cup of frozen water.
When you are told to, record the time on the clock and observe your ice.
Write the time and what you observed in the space provided.
Be sure to record the exact time when your ice melted completely.
Before you start, predict what will happen to the ice over time.
Do this by completing the sentence.

Over time the ice will _____.

Draw your ice at the start	Draw your ice at the end

NAME: _____

WHAT HAPPENS TO ICE?

Time	Observations

What do you think caused **the changes in the ice over time?**

NAME: _____

Matter changes states.

States of Matter
Word Bank

Solid Liquid Gas

Water **changes** states when it **freezes and melts**.

Before freezing, what is **water's state of matter?**

After the ice melts, what is **its state of matter?**

Hurry Up

My team has a plan **for melting our cup of ice faster**. This is **our plan**:

Write a list of items you will need.

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Draw a picture of how you are going to use these items.

Tell about your plan. Tell how you will carry out your plan.

NAME: _____

Predict: Make a prediction about your ice melting faster.

I predict that my ice will take _____ minutes to melt.

Share: HOW DID YOUR PLAN WORK?

How long did it take for your ice to melt? _____

Write about how well your plan worked. What might you do different next time?

NAME: _____

Record the time and your observations of your melting ice:

Time	Observations

Slow Down

My team has a plan **for melting our cup of ice slower**. This is **our plan**:

Write a **list** of items you will need.

_____ _____

_____ _____

_____  _____

_____ _____

_____ _____

Draw a picture of how you are going to use these items.

Tell about your plan. Tell how you will carry out your plan.

NAME: _____

Predict: Make a prediction about your ice melting slower

I predict that my ice will take _____ minutes to melt.

Share: HOW DID YOUR PLAN WORK?

How long did it take for your ice to melt? _____

Write about how well your plan worked. What might you do different next time?

NAME: _____ What slows melting?

Record the time and your observations of your melting ice:

Time	Observations

Melting

Melting is the process by which a solid material changes into a liquid. What do you think made the **ice melt**—to **change from a solid to a liquid?** Complete the sentence.

The ice changed from a solid to a liquid because _____

_____

_____

Write one word for **what was added to the solid ice to cause it to become liquid?**

_____

Besides ice, what other solids have you seen become a liquid? Write down two.

_____

_____

Using a Thermometer

1. *Place a thermometer stem into a cup of warm water.*
   What happens to **the red liquid in the thermometer?**
   (Circle one sentence.)

   The red liquid moves up.

   The red liquid moves down.

   The red liquid does not move.

2. *Place a thermometer stem into a cup of ice water.*
   What happens to **the red liquid in the thermometer?**
   (circle one sentence.)

   The red liquid moves up.

   The red liquid moves down.

   The red liquid does not move.

Snap a back onto each thermometer.

3. What is the temperature of the warm water? _____

4. What is the temperature of the ice water? _____

Pour warm water into the ice water.

5. What happens to **the red liquid in the thermometer?**
   Circle the sentence that tells what happened.

   The red liquid moves up.

   The red liquid moves down.

   The red liquid does not move.

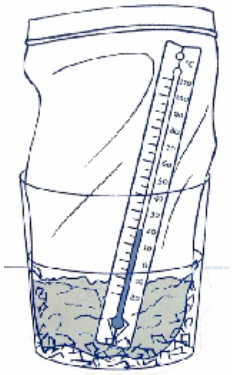
6. What happens to **the temperature?**
   Circle the sentence that tells what happened.

   The temperature goes up.

   The temperature goes down.

   The temperature does not change.

Measuring Melting Points



Our Experiment:

1. Place one thermometer into the bag of ice.

2. Place one thermometer into the bag of solid butyl stearate.

3. Reseal the bags tightly.

4. Place each bag in a cup of warm water.

5. Read the thermometer every 3 or 4 minutes.

6. Record the temperature and the appearance of the substance on the correct charts.

NAME: _____ What is a melting point?

Results Charts

Reading 1:

Ice	Butyl Sterate
Temperature: _____ Observation:	Temperature: _____ Observation:

Reading 2:

Ice	Butyl Sterate
Temperature: _____ Observation:	Temperature: _____ Observation:

NAME: _____ What is a melting point?

Results Charts

Reading 3:

Ice	Butyl Sterate
Temperature: _____ Observation:	Temperature: _____ Observation:

Reading 4:

Ice	Butyl Sterate
Temperature: _____ Observation:	Temperature: _____ Observation:

NAME: _____

Results charts

Reading 5:

Ice	Butyl Sterate
Temperature: _____ Observation:	Temperature: _____ Observation:

Melting Point:

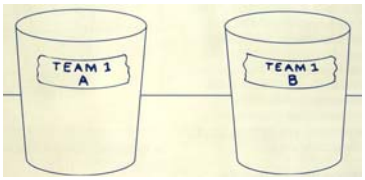
Tell about the melting point by filling in the letter blanks. You are given the first letter for each word.

The melting point is the **t** __ __ __ __ __ __ __ __ __ __ __ at

which a **s** __ __ __ __ changes to a **l** __ __ __ __ __ .

From Liquid to Gas

You and your partner will do an experiment to see how water changes from liquid to gas.



1. Label yours and your partner's 1-oz plastic cup with your names. Pour 10cc of water into each of the 1-oz cups.

2. Place one of your cups in sunlight or under a lamp.
   Place the other cup out of direct light.
   Leave the cups in the same place for 5 days.

Make some predictions on the chart below. Write the number of cc of water that you predict will be in your cup at the end of each day.

PREDICTIONS:

Will there be more water or less water **as each day passes**? Will it stay the same? Why do you think that?

3. At the end of each day, record the number of cc of water in each cup. Estimate the number, if the water level is between cc marks. Record your data in the chart below.

RESULTS:

Number of cc of Water

End of Day	In Light	Not in Light
Start		
1		
2		
3		
4		
End		
Difference Start – End =		

4. Use a drawing to tell about any **changes in water levels** in the cups by the **end of the week**. Show a cup at the beginning and the end of the week. Use labels to describe your drawing.

5. Use a drawing to show the **difference** between a cup that was placed **in the light** and one that was **not in the light**. Compare the end results for these two cups. Use labels to describe your drawing.

6. The matter in the cups changed. The water changed from one form to another. Use the word bank to fill in the blanks.

Word bank: gas heat liquid evaporation

A _____ changed to a _____.

_____ was added to cause the change.

The word that is used to describe this change is

_____.

NAME: _____

What is condensation?

From Gas to Liquid

1. Put red water and red ice cubes in a cup.
2. Put a lid on the cup.

   What happens?

3. Draw on the cups below show how it looked at the beginning of the activity and again at the end of the activity. Use your red crayon.

My cup at the **beginning** of the experiment:

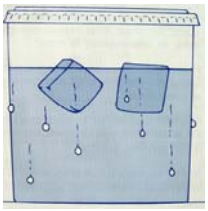
My cup at the **end** of the experiment:

4. What are **the clear drops on the outside of the cup** made of?

_____

_____

5. Where did **the drops** come from?



Circle the sentence that answers the question.

The water came from inside the cup.

The water came from the air outside the cup.

The water came from the air inside the cup.

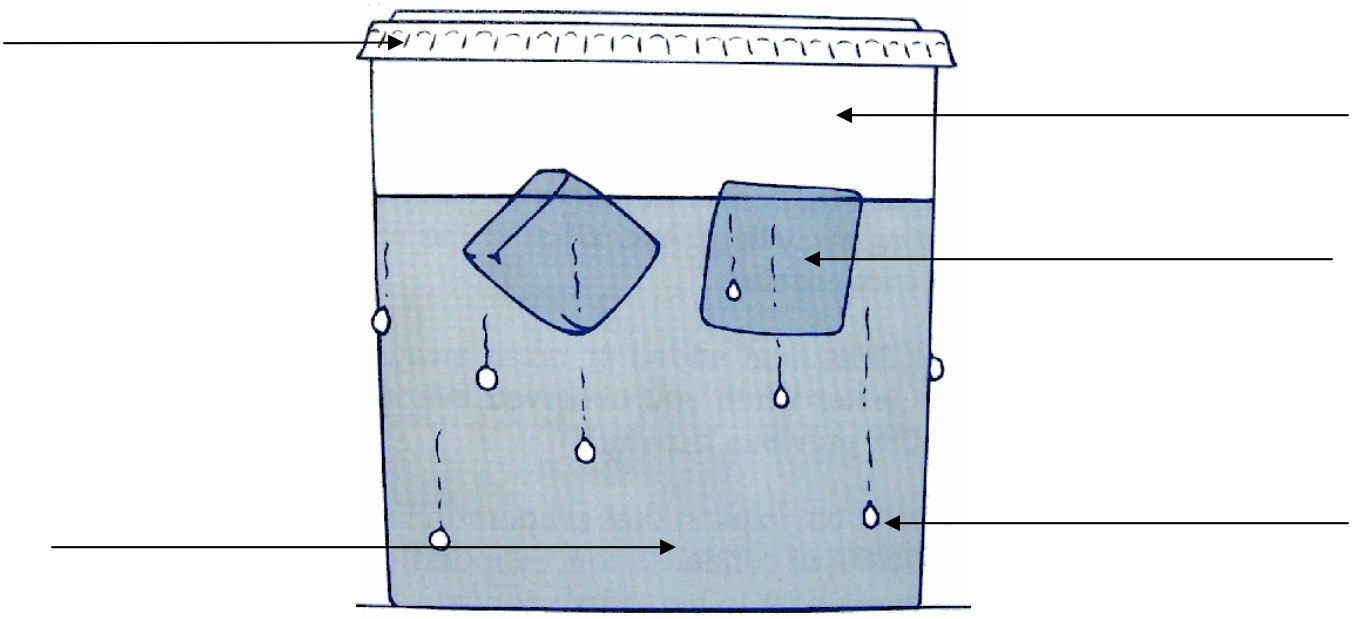
6. What do you call **the process that caused the drops to form on the cold cup**? _____

7. What **caused** that to happen?
Circle the sentence that answers the question.

The air around the cup cooled down.

The water in the cup became cooler.

3. On each arrow write if it points to a solid, liquid or a gas.



Review: Write the word heated or cooled to tell what causes each of the changes.

Solid — melts → Liquid _____

Liquid — evaporates → Gas _____

Gas — condenses → Liquid _____

From Liquid to Solid

SESSION 1:

1. Write your name on a strip of masking tape. Use it to label a 1-oz plastic cup. Fill the cup with 20cc of water.

PREDICT:

What will happen to the **water if it is placed overnight in the freezer?** Circle the sentence that tells what you think will happen.

The water will not change.

The water will change.

2. Place the cup of water on a tray and put it in the freezer overnight.

3. Observe **the cup of water that was in the freezer overnight**.

   Did the water change? _____

   What is the water like now?

SESSION 2:

1. Observe a bag of liquid butyl stearate.
   Do not open the bag.

PREDICT:

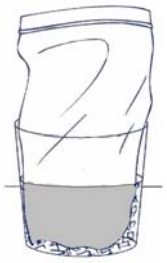
What will happen to the **butyl stearate** if it is placed **overnight in the freezer**? Circle the sentence that tells what you think will happen.

The butyl stearate will not change.

The butyl stearate will change.

2. Place the bag of butyl stearate in a cup of ice water.

4. Observe the butyl stearate after it had been in the tumbler of ice water for a while.



Did the butyl stearate change? _____

What is the butyl stearate like now?

5. Put the butyl stearate into a tumbler of warm water. Leave it for a while.

Did the butyl stearate change? _____
What is the butyl stearate like now?

6. Liquid — freezes → Solid

Fill in the blanks with a correct word.

In order to change a liquid to a solid, the liquid must be cooled. We can also say that heat is _____from the liquid. When a liquid is cooled the temperature will _____.

Measuring Freezing Point

In this experiment you will be trying to freeze three difference substances. Record the appearance and temperature of each.

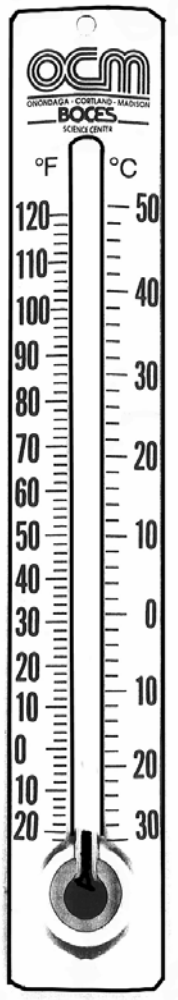
Substance	Appearance	Temperature (°C)	Freezing Point (°C)
Butyl Stearate			
Substance A: Water			
Substance B			

In the table above, write down the freezing point of each substance
Did the three substances have the same freezing points? (Circle one)

Yes **No**

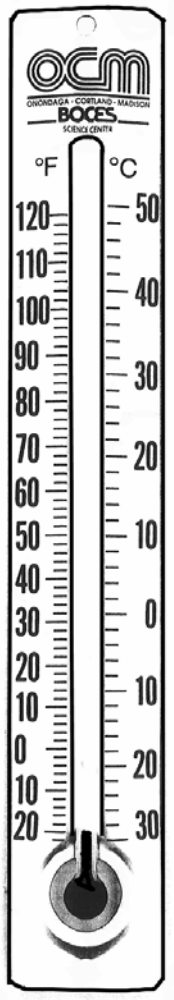
Freezing Points of Substances

Use a red colored pencil to color in the three thermometers. Show the freezing points for the three substances. Below each thermometer write the freezing point temperature.



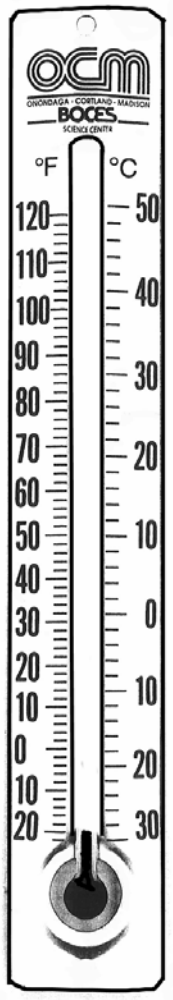
Butyl Stearate

_____ °C



Substance A: Water

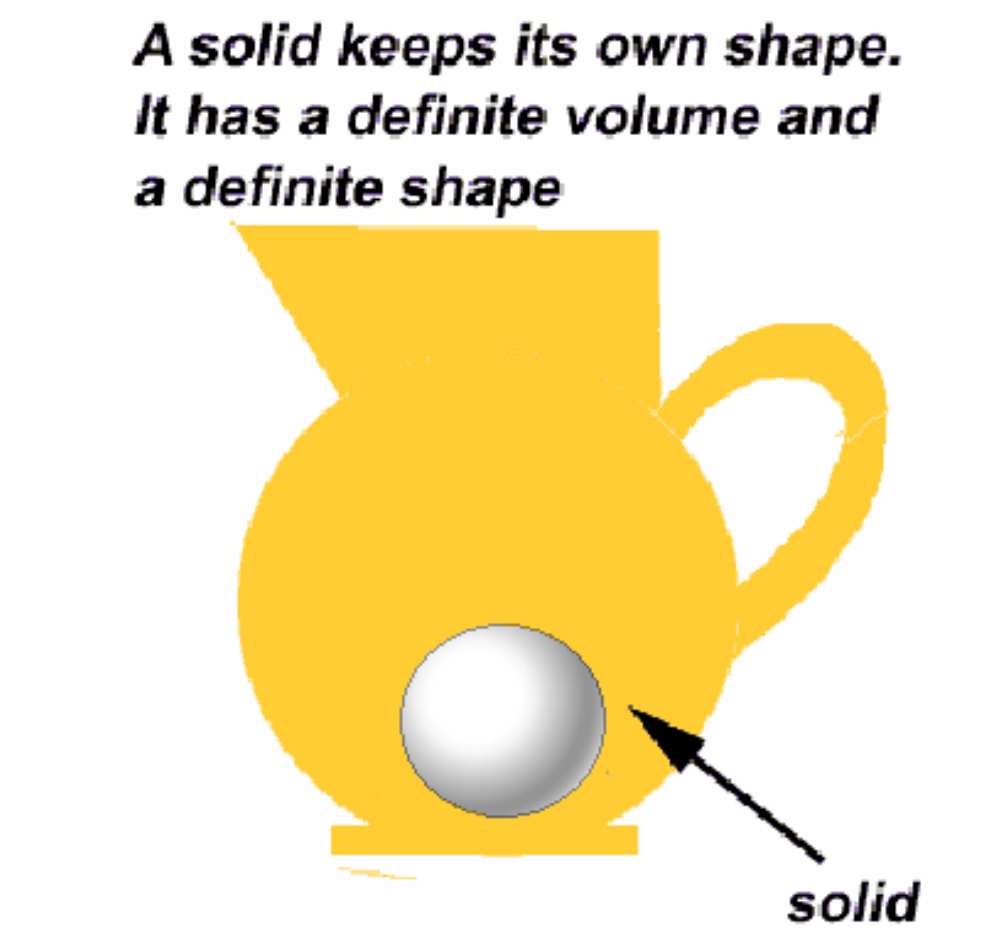
_____ °C



Substance B

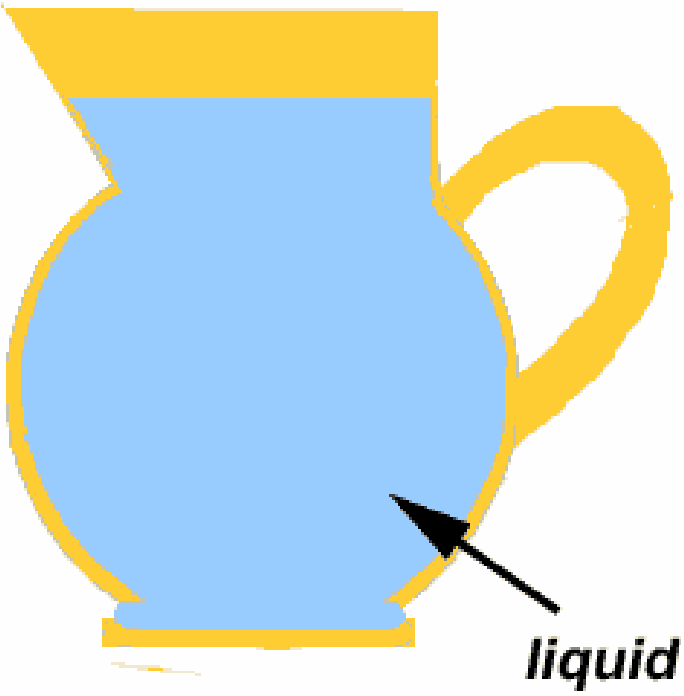
_____ °C

What are the properties a solid?

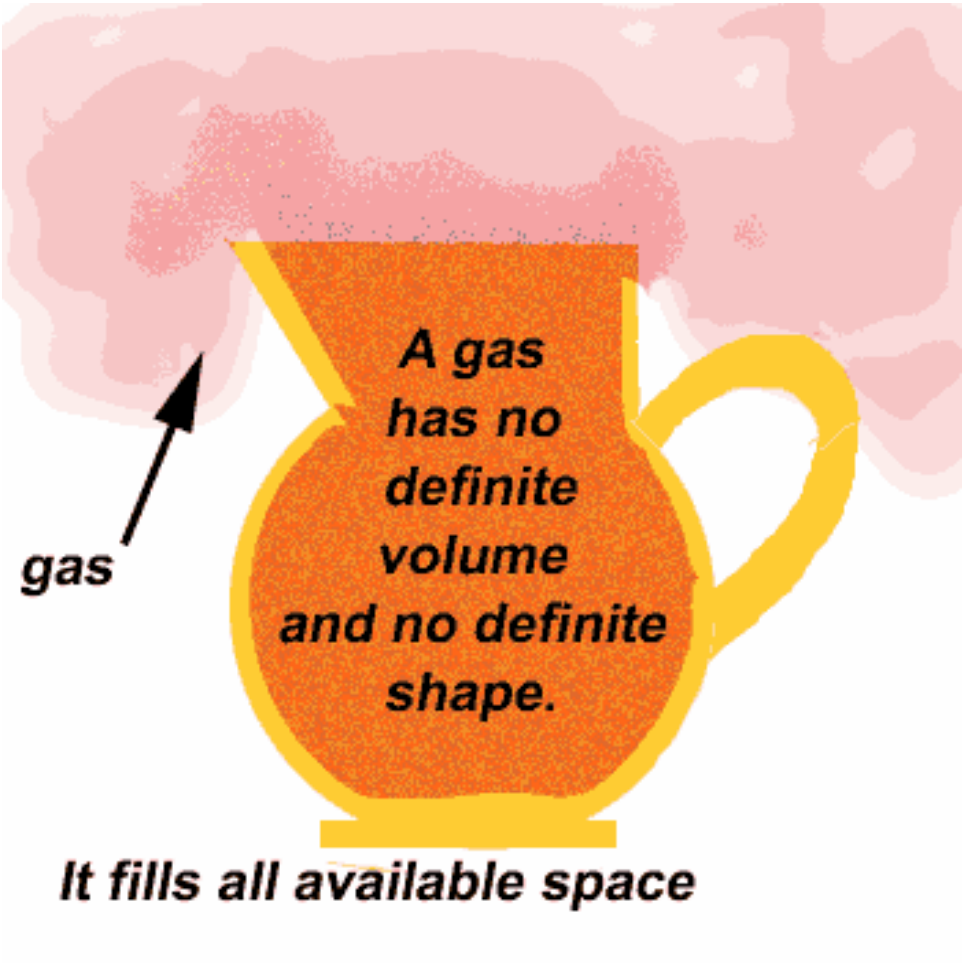


What are the properties a liquid?

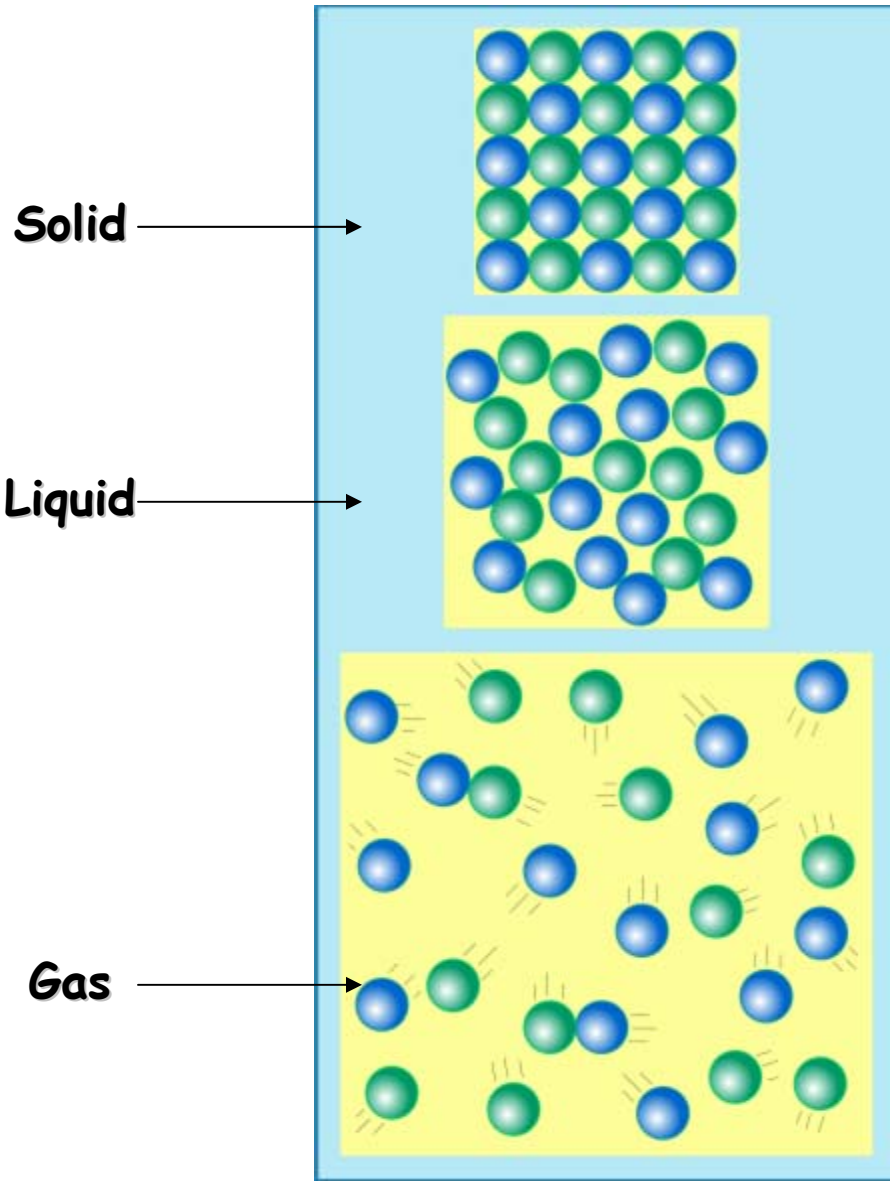
A liquid takes the shape of its container. It has a definite volume but no definite shape.



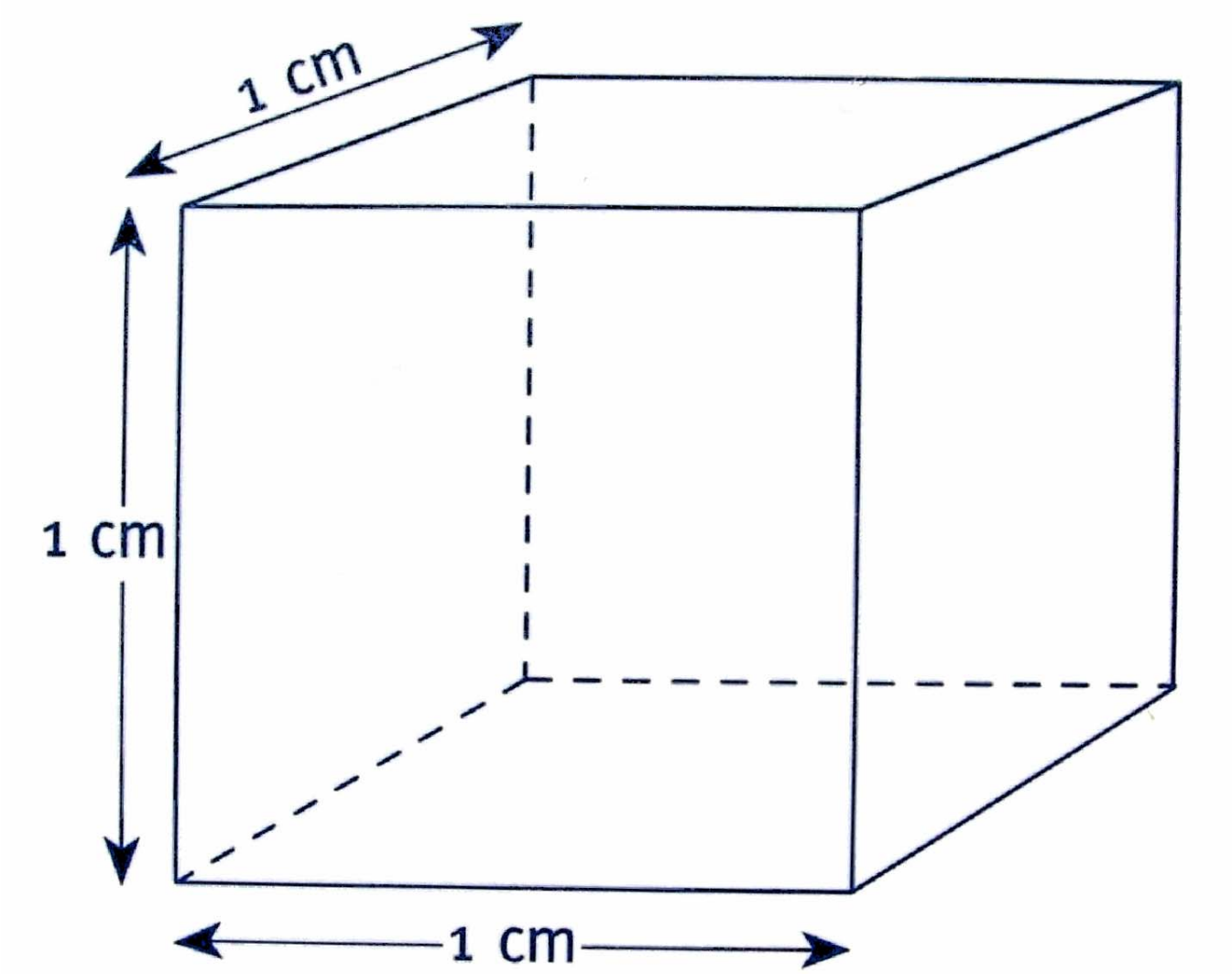
What are the properties a gas?



The Phases of Matter

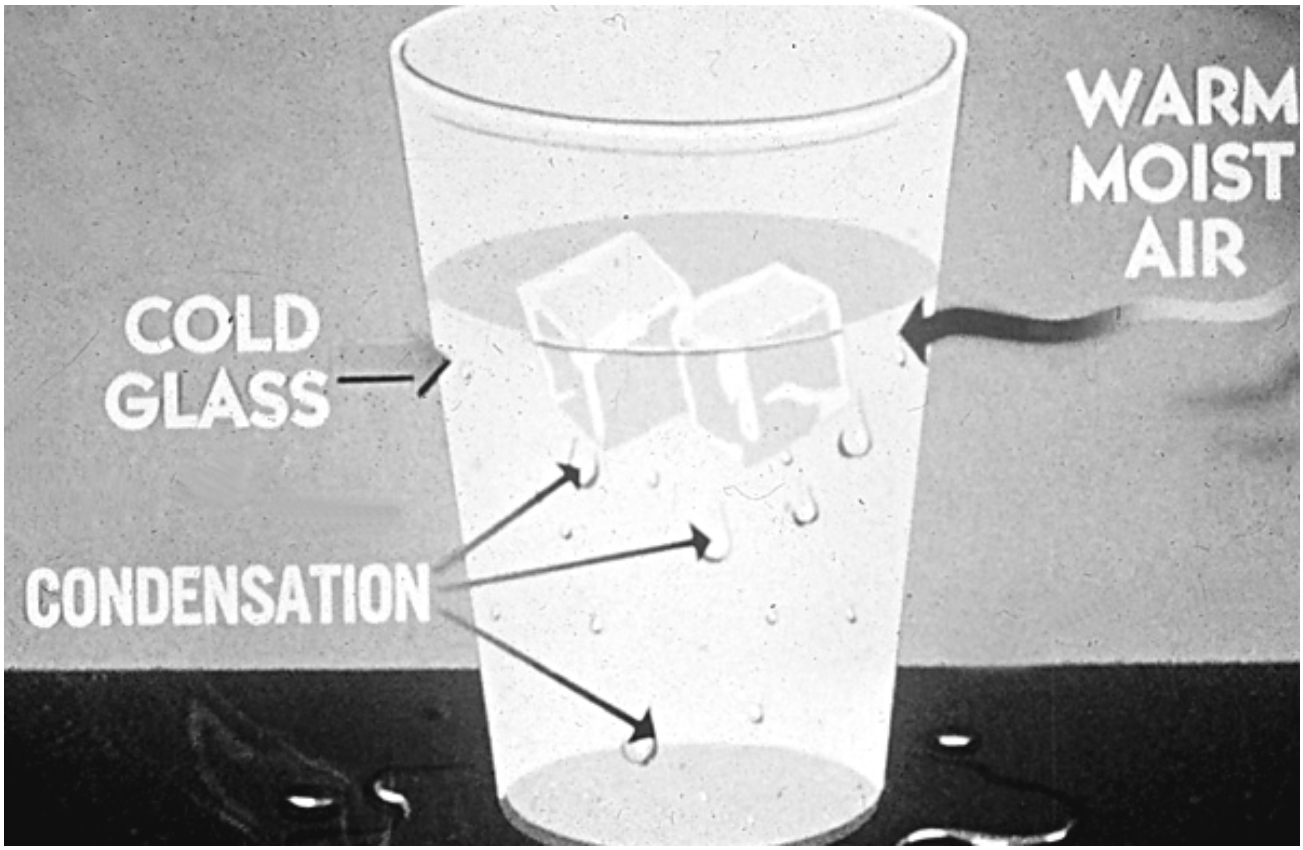


What is a Cubic Centimeter?

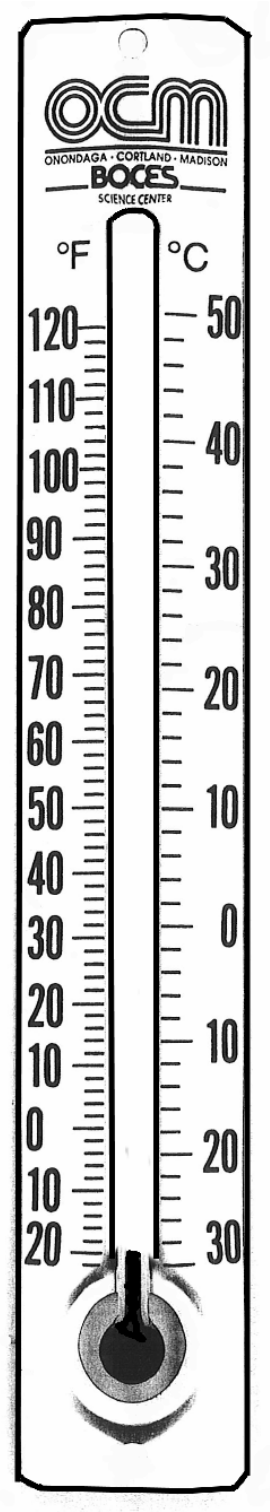


cubic centimeter (cm^3, or cc)

Condensation

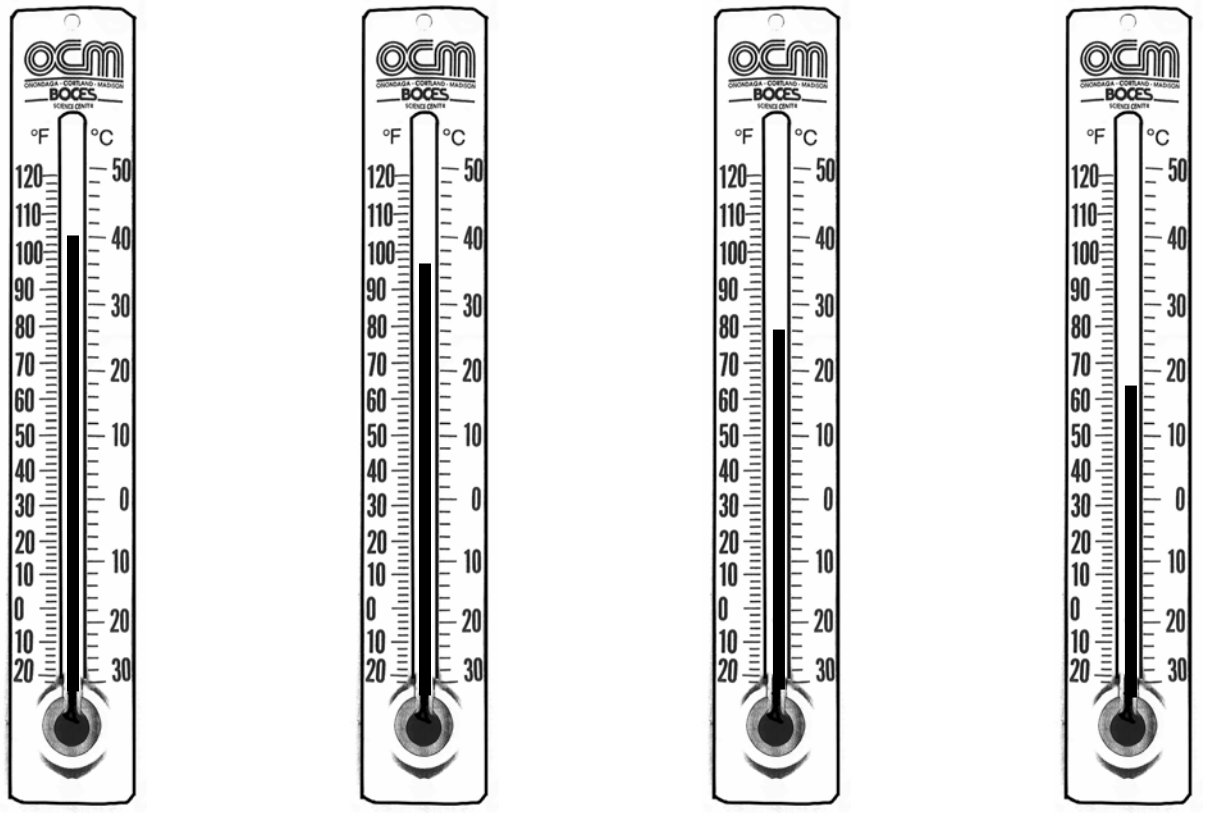


Thermometer



Reading a Thermometer

Read each thermometer.
Write the temperature in the box below the thermometer.



A B C D

Look at the temperature measurements from thermometer A to D.

Is the temperature going up or down? _____

Is it getting warmer or cooler? _____