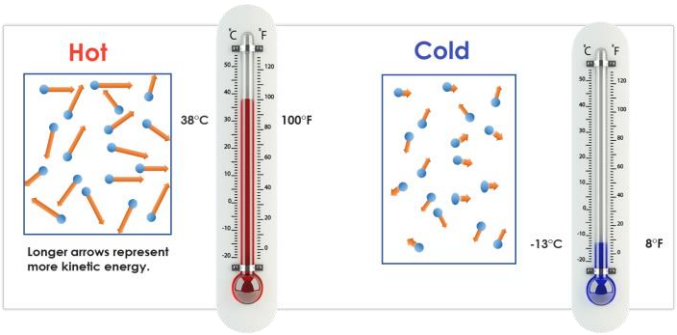
Temperature is a measure of the **average kinetic energy** of all of the **particles in a substance**.

►The **faster the particles move**, the greater the **average kinetic energy**, and the **higher the temperature**.

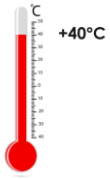
►The **slower the particles move**, the less the **average kinetic energy**, and the **colder the temperature**.

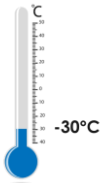
►**Temperature** is **measured** with a thermometer in **Celsius (°C)** or **Fahrenheit (°F).**



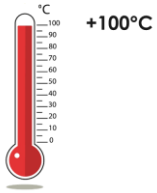
CFU

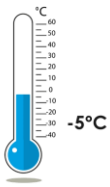
Which thermometer shows a **lower temperature**? Explain.

A 

B 

Which thermometer shows a **higher temperature**? Explain.

A 

B 

Which substance has **greater average kinetic energy**? Explain.

A 
100 °C or 212 °F

B 
27 °C or 80 °F

Which substance has **less average kinetic energy**? Explain.

A 
100 °C or 212 °F

B 
27 °C or 80 °F

Read the Questions. Watch the Video.
Answer the Questions.

1 Why is tea hot? Explain.

2 Why is tea cold? Explain.

3 Even though we cannot see the particles that make up the tea, we still feel hot. Why?

4 What is a science name for "jiggling" particles?

Summary Closure

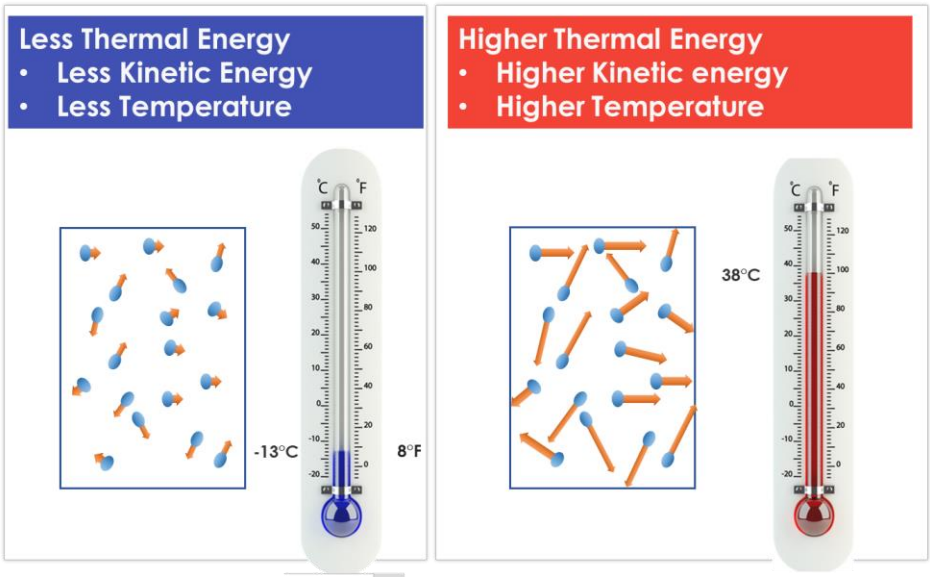
What did you learn today about describing temperature?

_____

_____

Word Bank
average kinetic energy
higher temperature
lower temperate

Thermal Energy is the **total of all kinetic energies within a system**.
▶When the **thermal energy of a substance increases**, its **temperature increases** due to its higher **kinetic energy**.



CFU

Which substance has a **higher thermal energy**? Explain.

A

100 °C or 212 °F

B

27 °C or 80 °F

Which substance has **less thermal energy**? Explain.

A

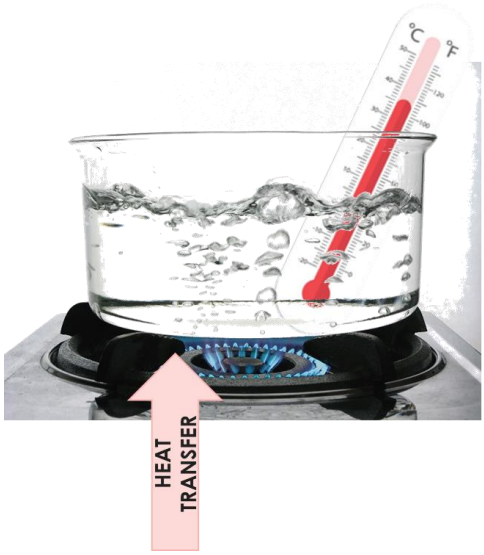
100 °C or 212 °F

B

27 °C or 80 °F

Heat is the movement of **thermal energy** from a substance at a **higher temperature** to one at a **lower temperature**.

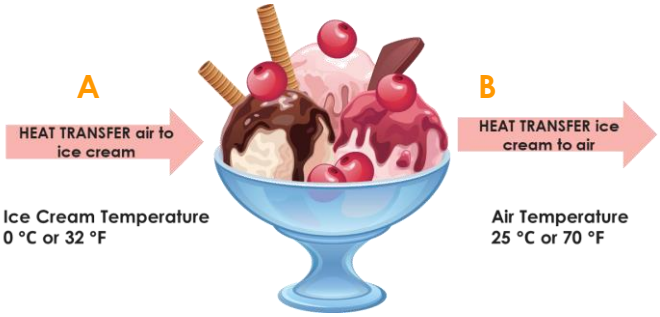
▶When a **substance is heated**, it gains **thermal energy**; therefore, its particles **move faster and its temperature rises**.



CFU

Which **direction is heat going to transfer**? Explain.

Which **direction is heat going to transfer**? Explain.



Heat is the movement of **thermal energy** from a substance at a **higher temperature** to one at a **lower temperature**.

- **Thermal equilibrium** is when **two substances reach the same temperature**.
- At **thermal equilibrium**, the substances **no longer exchange heat energy**.

Thermal Equilibrium

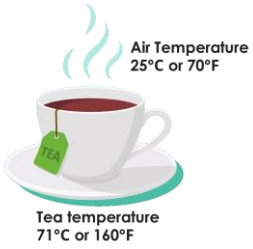
Air Temperature
25°C or 70°F

Milk temperature
25°C or 70°F

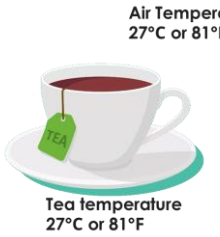
CFU

Which illustrates thermal equilibrium? Explain.

A

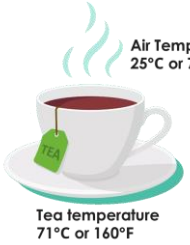


B



Which is not an example of thermal equilibrium? Explain.

A



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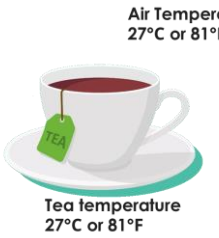

Watch the Video (0 – 4.43 only).
Provide five examples of energy transfer in the video.

	Examples of Energy Transfer
1	
2	
3	
4	
5	

Skill Closure

Which **direction is heat going to transfer**? Explain.

Air Temperature
27°C or 81°F

Refrigerator Temperature
3°C or 37°F

HEAT TRANSFER
Air to refrigerator

HEAT TRANSFER
Refrigerator to air

Heat transfers from _____ because…

Concept Closure

Imelda says that the person is wearing gloves because she wants to keep her hands warm. Explain to Imelda what is happening using the principles of heat transfer. (orally)

Person holding a clay pot that just came out of the oven.

Summary Closure

What did you learn today about describing heat?

_____

_____

Word Bank

thermal energy
higher temperature
lower temperature
thermal equilibrium

Listening

Listen to each scenario.
Explain how heat is transferred.

	Examples of Energy Transfer
1	
2	
3	
4	
5	

Watch the video (experiment).
Answer the questions.

Why did the inflated balloon without water pop right away when put a short distance from the candle? Justify using energy transfer principles.

Why didn't the inflated balloon with water pop when put a short distance from the candle. Justify using energy transfer principles.

Anything else you learned from the experiment.