

6th grade Science Packet #4

The April Packet



<u>Thermal Energy:</u>	is the total amount of energy in a substance due to the motion of the particles in a system.
<u>Particle:</u>	is a small piece of matter.
<u>Kinetic Energy:</u>	is energy due to mass and speed of the object.
<u>Temperature:</u>	is a measure of the average kinetic energy of the particles in a system.
<u>Mass</u>	The amount of matter (number of particles) in an object.

Name		Period	
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Day of the Week	Lesson Details
Monday 4/6	• Complete the Concept review Vocab • solid, liquid, gas, plasma • temperature, thermal energy, particles. I can Statement • I can determine which container has the most thermal energy Standard • PS3.A: Temperature is a measurement of energy (Average Kinetic Energy) of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present
Tuesday 4/7	• Complete the Insulator and conductor reading Vocab • insulator and conductor I can Statement • i can explain what insulators and conductors are. Standard • PS3.B: Conservation of Energy and Energy Transfer • The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature, the size of the sample, and the environment of matter. • energy is spontaneously transferred out of hotter regions or objects and into colder ones.
Wednesday 4/8	• Complete the Vocab boxes Vocab • Insulator, conductor, heat, Celsius, conduction, convection, radiation, mass, volume, matter I can Statement • i can explain what insulators and conductors are. Standard • PS3.B: Conservation of Energy and Energy Transfer • The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature, the size of the sample, and the environment of matter. • energy is spontaneously transferred out of hotter regions or objects and into colder ones.
Thursday 4/9	• Watch Bill Nye: Heat and take 10 notes on it. • Click here to watch or look up Bill Nye Heat Vocab • Insulator, conductor, heat, Celsius, conduction, convection, radiation, mass, volume, matter I can Statement • i can explain what insulators and conductors are. Standard • PS3.B: Conservation of Energy and Energy Transfer • The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature, the size of the sample, and the environment of matter. • energy is spontaneously transferred out of hotter regions or objects and into colder ones.
Friday 4/10	Make a playlist of 6 songs that have a science word in them

Concept Review

1. Define the following vocab words (Use the second packet for help)

Vocab Word	Definition
Solid	
Liquid	
Gas	
Plasma	

2. Draw the 4 states of matter

Solid	Liquid	Gas	Plasma

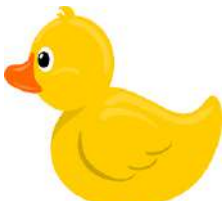
Answer the following questions

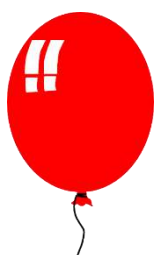
3. What is thermal energy?	
4. What is the difference between thermal energy and temperature?	
5. What are particles?	
6. What is mass?	
7. What would have more thermal energy? The Sun or a bathtub full of hot water?	

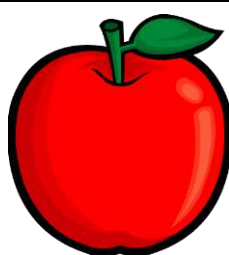
Answer the following questions

8. What would have more thermal energy? The Moon or a blackhole?	
9. What would have more thermal energy? A soda in the fridge or a soda at room temperature?	
10. What would have more thermal energy? A bathtub at room temperature or a bathtub at 100 degrees F?	

11. Classify the following with the correct state of matter

Object	 Pencil	 Cloud	 River	 Rubber Duckie
State of matter				

Object	 Apple Juice	 The Helium in the Balloon	 Strawberry Smoothie	 Smog
State of matter				

Object	 Green Tea	 Apple	 Iced Coffee	 Carbon Dioxide
State of matter			Hint this one has 2 states of matter	

Insulators and Conductors Reading

Insulators and Conductors

Do you like toast? Did you ever look inside a toaster while it's toasting bread? When you push down the lever to turn on the toaster, the metal heating element inside starts to glow orange or red, almost instantly. You can see the glowing heating element inside this yellow toaster. The glowing metal shows that the heating element has become very hot. It gets hot so quickly because metals are good conductors of thermal energy.



Thermal Conductors

Conduction is the transfer of thermal energy between particles of matter that are touching. Thermal conduction occurs when particles of warmer matter bump into particles of cooler matter and transfer some of their thermal energy to the cooler particles. Conduction is usually faster in certain solids and liquids than in gases. Materials that are good conductors of thermal energy are called **thermal conductors**. Metals are especially good thermal conductors because they have freely moving electrons that can transfer thermal energy quickly and easily.

Besides the heating element inside a toaster, another example of a **thermal conductor** is a metal radiator, like the one in the picture. When hot water flows through the coils of the radiator, the metal quickly heats up by conduction and then radiates thermal energy into the surrounding air.



Thermal Insulators

One way to retain your own thermal energy on a cold day is to wear clothes that trap air.

That's because air, like other gases, is a poor conductor of thermal energy. The particles of gases are relatively far apart, so they don't bump into each other or into other things as often as the more closely spaced particles of liquids or solids. Therefore, particles of gases have fewer opportunities to transfer thermal

energy. Materials that are poor thermal conductors are called **thermal insulators**.

Down-filled snowsuits, like those in the **picture**, are good thermal insulators because their feather filling traps a lot of air.



Fine, soft feathers like these fill the snowsuits on the left. The feathers keep birds as well as people warm!

Another example of a **thermal insulator** is pictured in the **picture**. The picture shows fluffy pink insulation inside the attic of a home. Like the down filling in a snowsuit, the insulation traps a lot of air. The insulation helps to prevent the transfer of thermal energy into the house on hot days and out of the house on cold days. Other materials that are thermal insulators include plastic and wood. That's why pot handles and cooking utensils are often made of these materials. Notice that the outside of the toaster pictured in the opening image is made of plastic. The plastic casing helps prevent the transfer of thermal energy from the heating element inside to the outer surface of the toaster where it could cause burns.



Home insulation looks a little like cotton candy. Like cotton candy, it is light and fluffy and full of tiny holes that trap air.

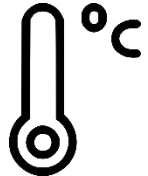
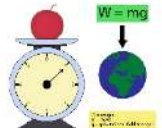
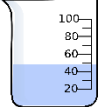
Questions

1. What is conduction?	
2. What are some materials that are good conductors?	
3. Are metals good conductors?	
4. Is air a good conductor?	
5. What is a thermal insulator?	
6. What are some examples of good insulators?	
7. Why do metals feel cool to the touch?	
8. Describe one way that thermal insulators are used	

Summary: Please write a **6 sentence** summary about what you learned in this reading.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Please draw or insert a picture of an insulator and one of a conductor.

Vocab Word	Definition	Image
Celsius	A way to measure temperature where water freezes at 0 degrees and boils at 100 degrees	
Conduction	Heat moving through an object (Touching)	
Conductor	Something that allows energy in the form of heat transfer	
Convection	Heat is circulated through a fluid, like air or water	
Heat	The quality of being hot; high temperature.	
Insulator	Material that prevents heat from being transferred	
Mass	The quantity of matter which a body contains	
Matter	Physical substance in general that occupies space and possesses mass, especially as distinct from energy.	
Radiation	Transfer of heat between objects that are not touching	
Volume	The amount of space that a substance or object occupies, or that is enclosed within a container	

Example of how to fill out the Vocab Boxes

Precipitation	
Definition: process of water falling from the sky. It can be in, hail, snow, or sleet.	Draw or use the word in a sentence Sentence: Precipitation is when some kind of water falls from the sky. Drawing: 

Now it's your turn to fill out the vocab boxes. Remember to check the definitions on the previous page.

Celsius	
Definition:	Draw or use the word in a sentence

Conduction	
Definition:	Draw or use the word in a sentence

Convection	
Definition:	Draw or use the word in a sentence

Conductor

Definition:

Draw or use the word in a sentence

Convection

Definition:

Draw or use the word in a sentence

Heat

Definition:

Draw or use the word in a sentence

Insulator

Definition:

Draw or use the word in a sentence

Mass

Definition:

Draw or use the word in a sentence

Matter

Definition:

Draw or use the word in a sentence

Radiation

Definition:

Draw or use the word in a sentence

Volume

Definition:

Draw or use the word in a sentence

Bill Nye: Heat

- [Click here to watch](#) or look up Bill Nye Heat

Take 10 notes during the video. You can take more for extra credit if you want.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Make a playlist of 6 songs that are about science or have science words in them.

