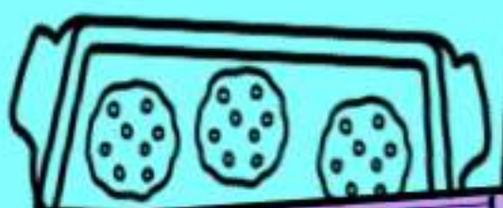
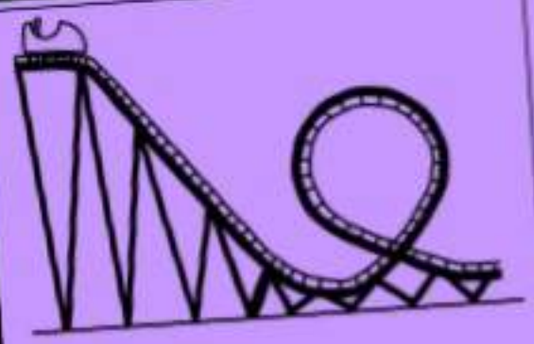
FORMS OF ENERGY

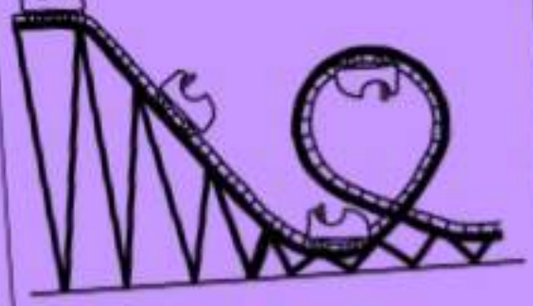
Chloe Campbell EDUCATION

Radiation

Conduction







Potential + Kinetic = Mechanical

Light

Heat

Sound

Electrical

Chemical

Mechanical

Refraction

Reflection

Absorption

Struggling to find a hands-on way to teach the different forms of energy?

Don't spend any more time planning, searching, or brainstorming. Everything you need is in this easy to use download!

Forms of Energy

Includes:

- Light Energy
- Heat Energy
- Sound Energy
- Mechanical Energy
- Electrical Energy
- Chemical Energy
- Electrical Conductors/Insulators
- Static Electricity
- Potential and Kinetic Energy
- Energy Transfers

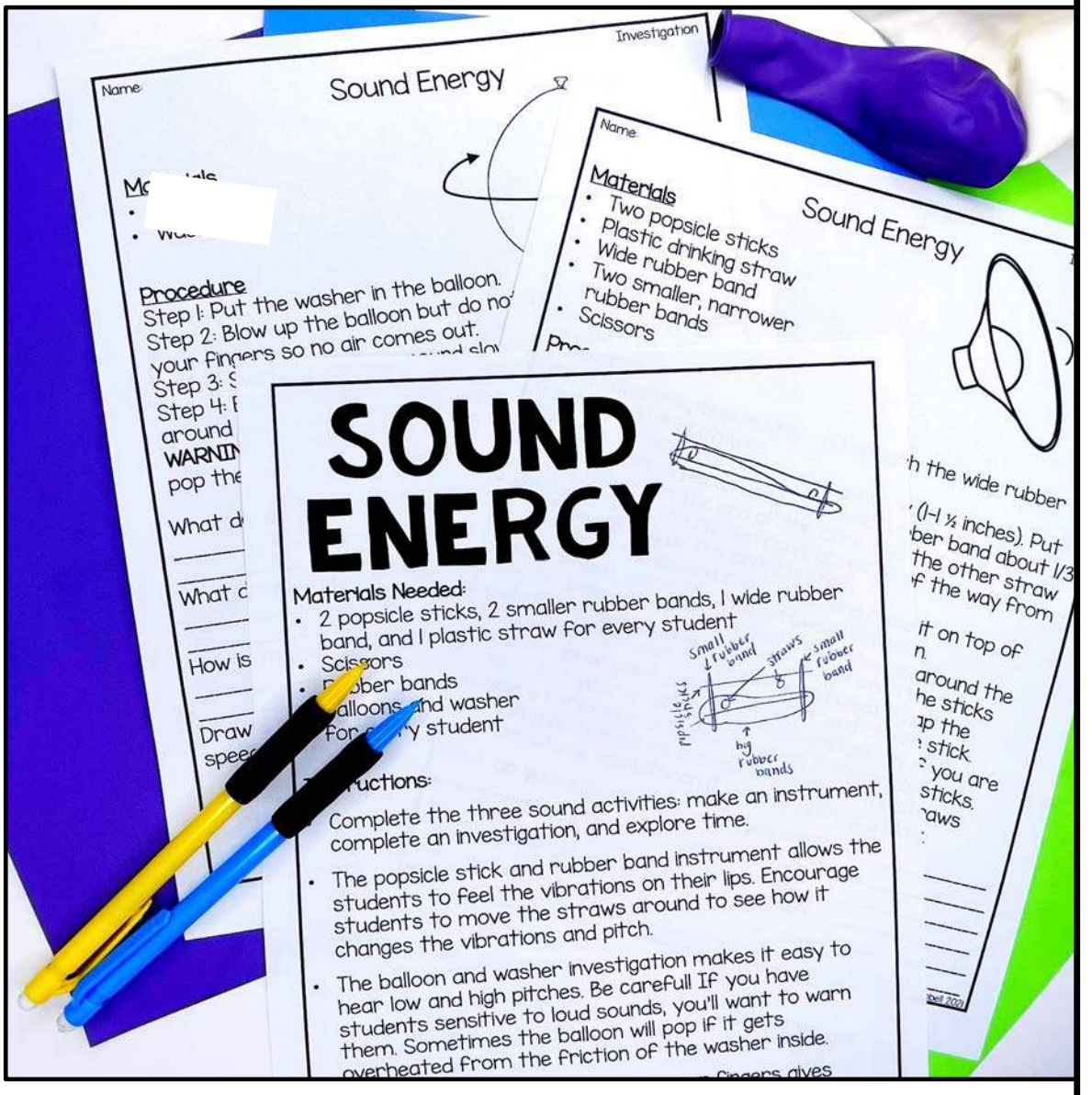
Forms of Energy

Includes:

- Teacher Directions
- Foldable Notes
- Investigations
- Sorts
- Real Life Applications
- Scavenger Hunt
- Graphic Organizer
- Review Games
- Discussion Questions
- Vocabulary Cards
- Unit Project
- Exit Slips
- Unit Assessment
- Mastery Checklist

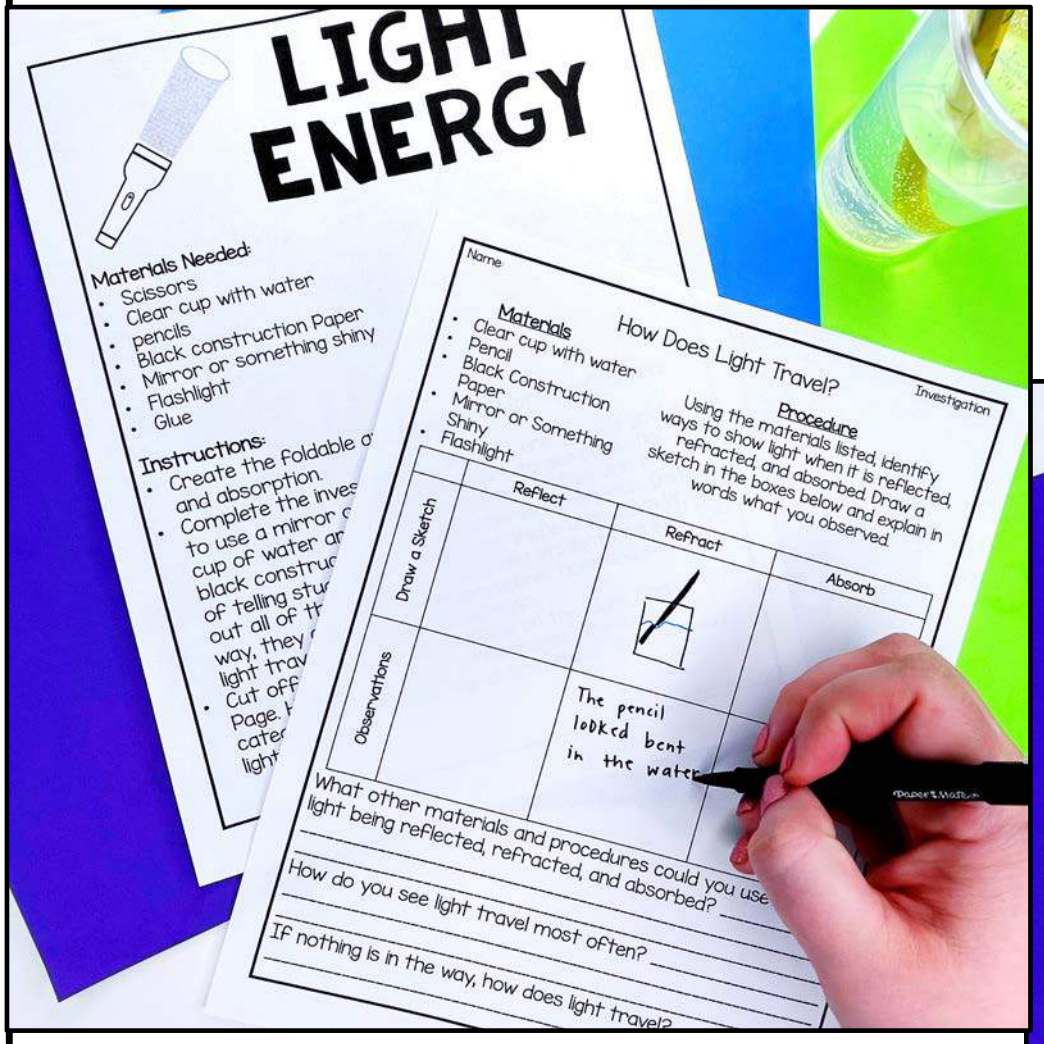
Teacher Directions Pages

- Learning Goals
- Materials Needed
- Specific Directions for All Parts of Lesson

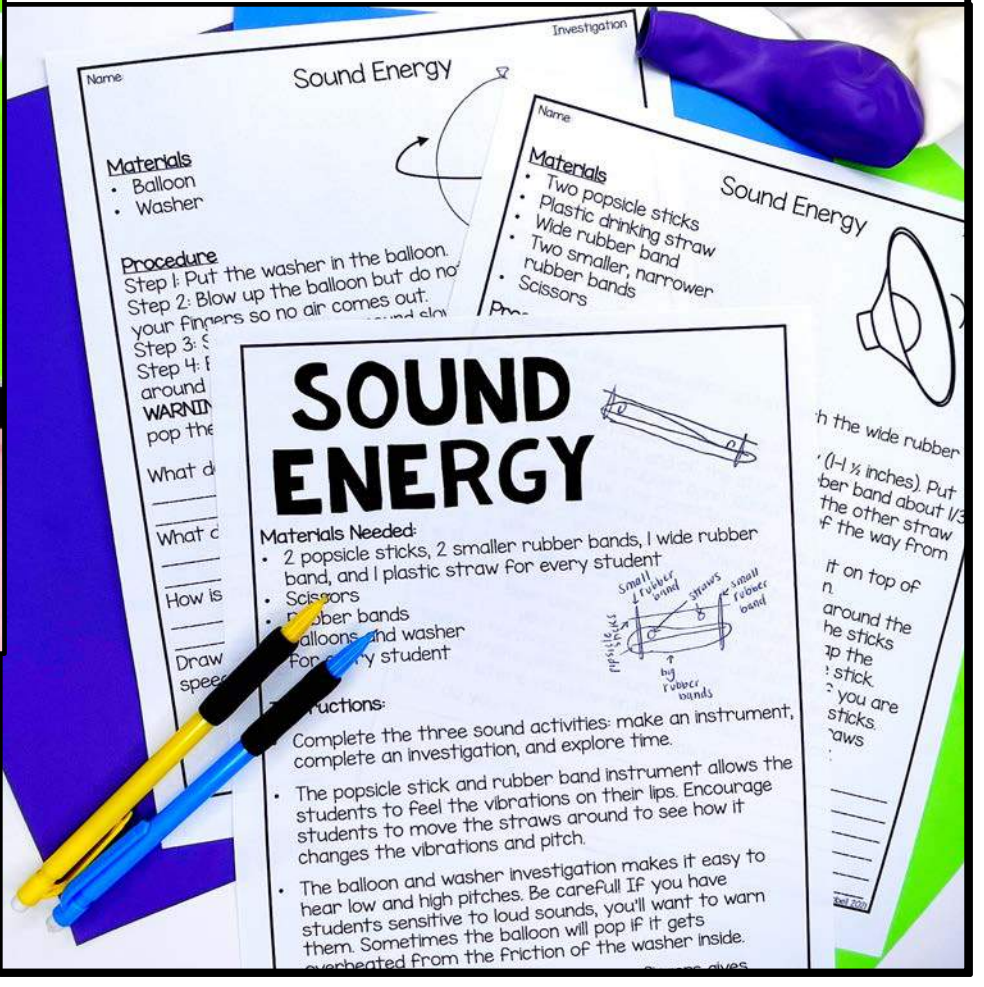


Foldable Notes

Hands-On Investigations



Light Energy

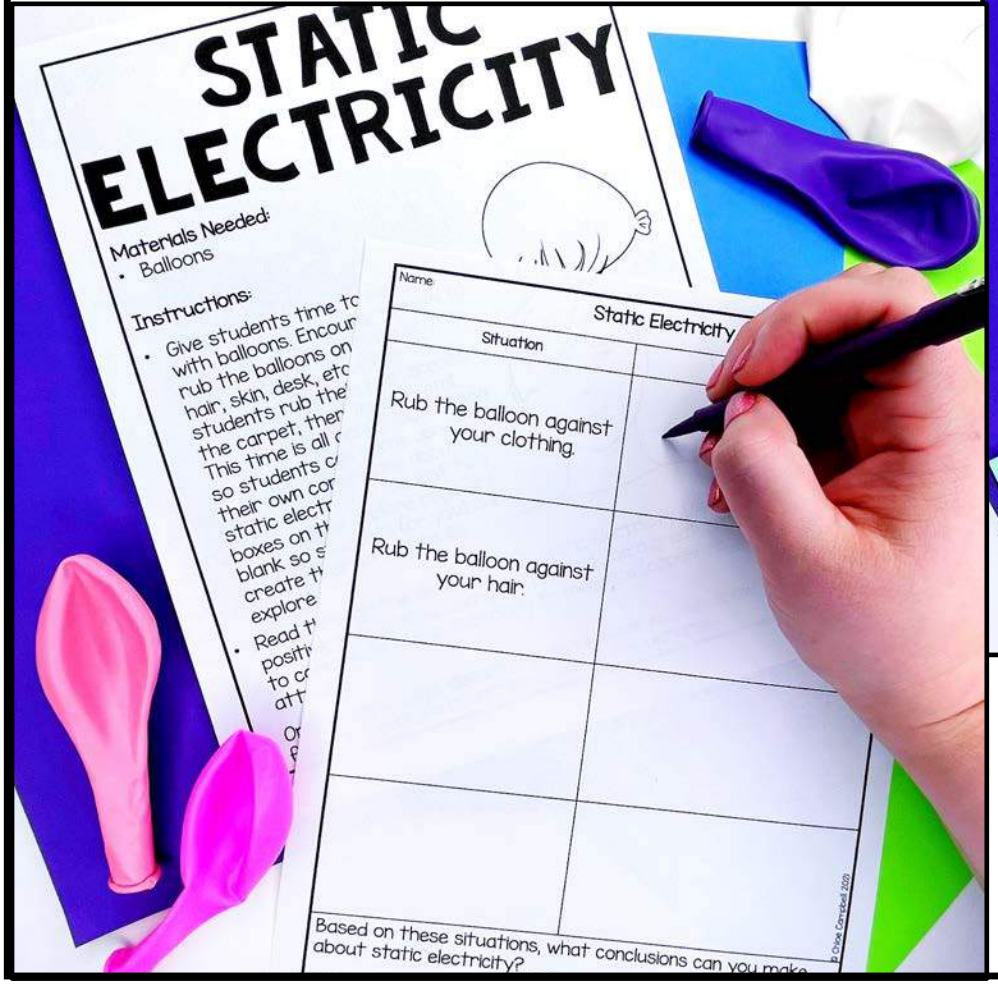


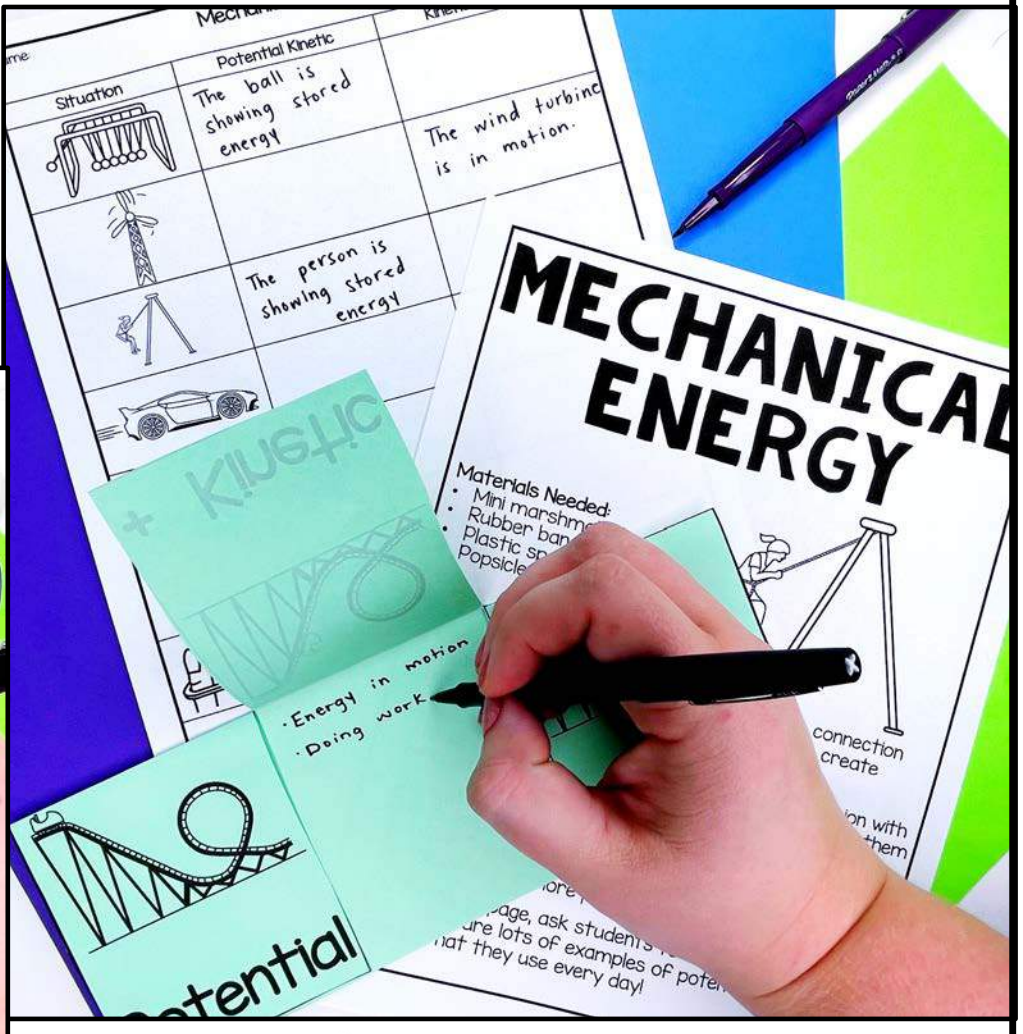
Sound Energy

Hands-On Investigations

Static Electricity

Energy



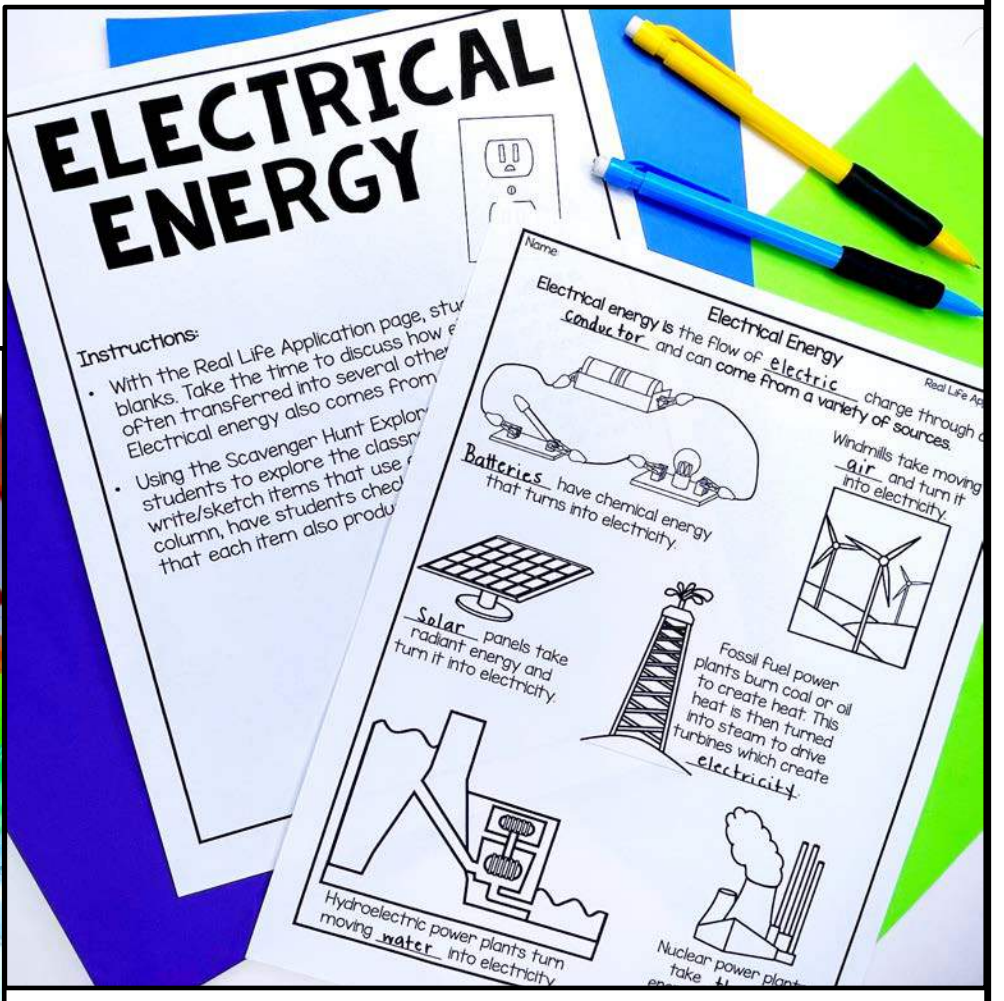


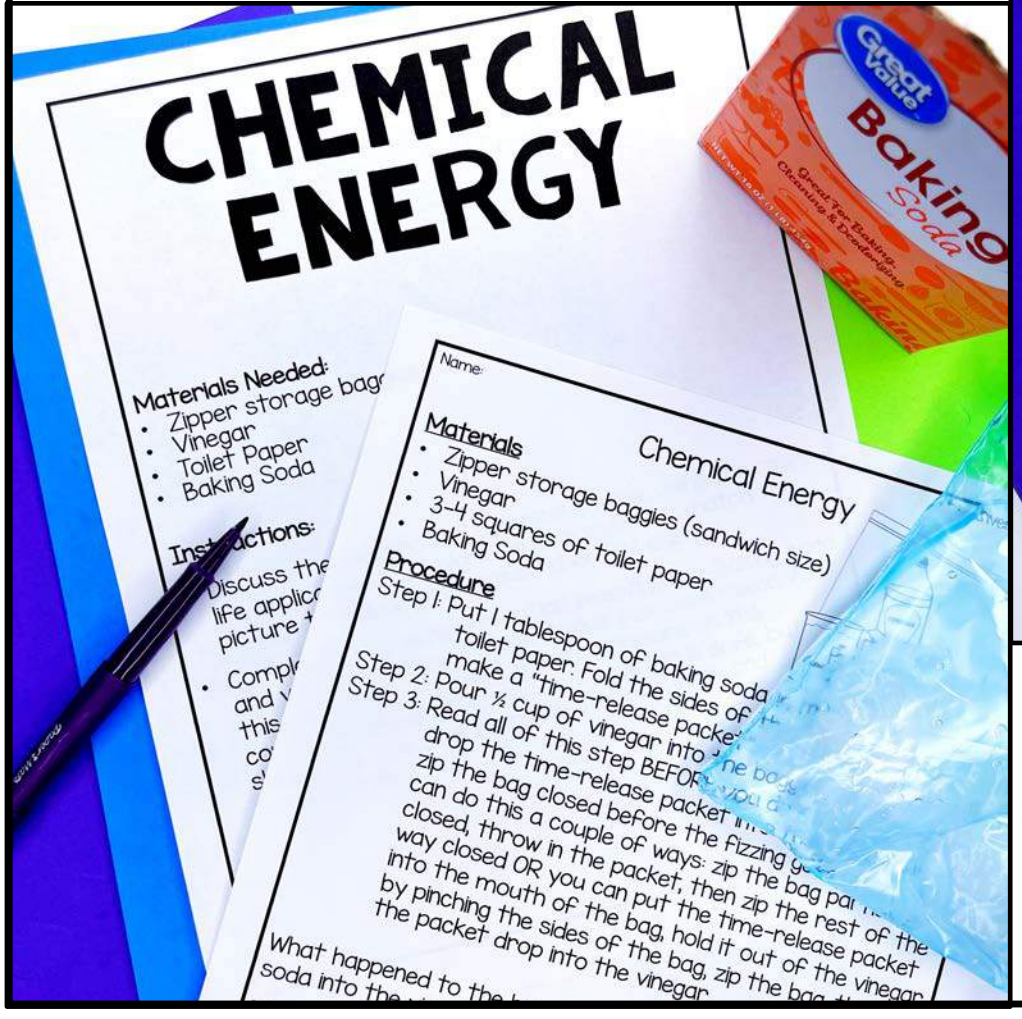
Mechanical

Energy

Hands-On Investigations

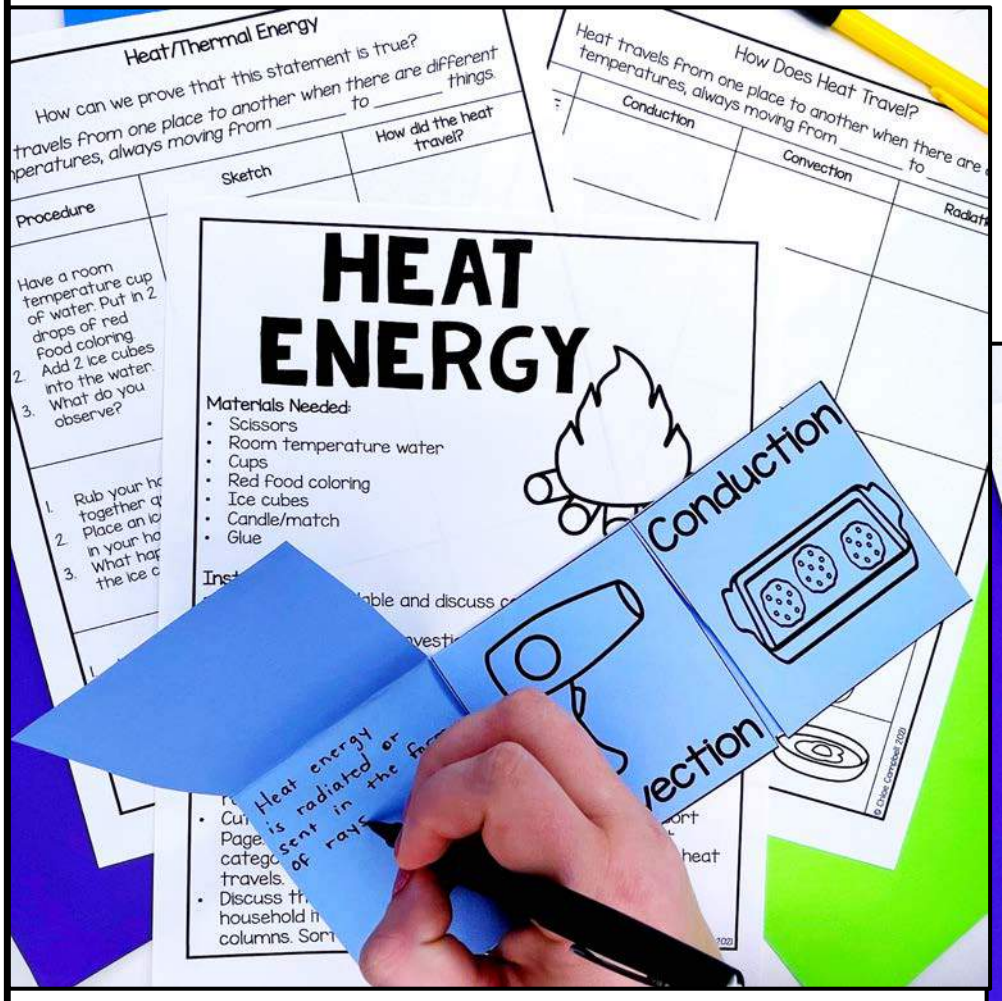
Electrical Energy





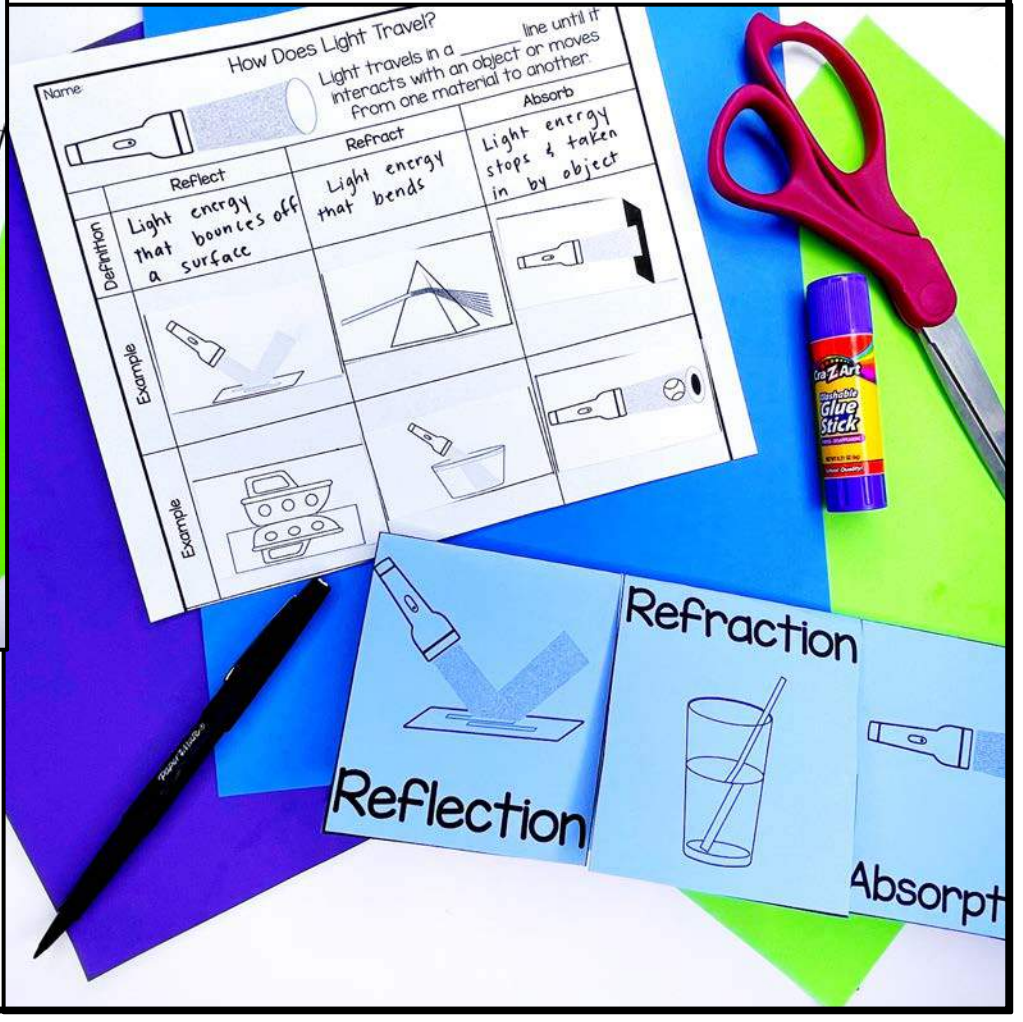
Chemical Energy

Hands-On Investigations

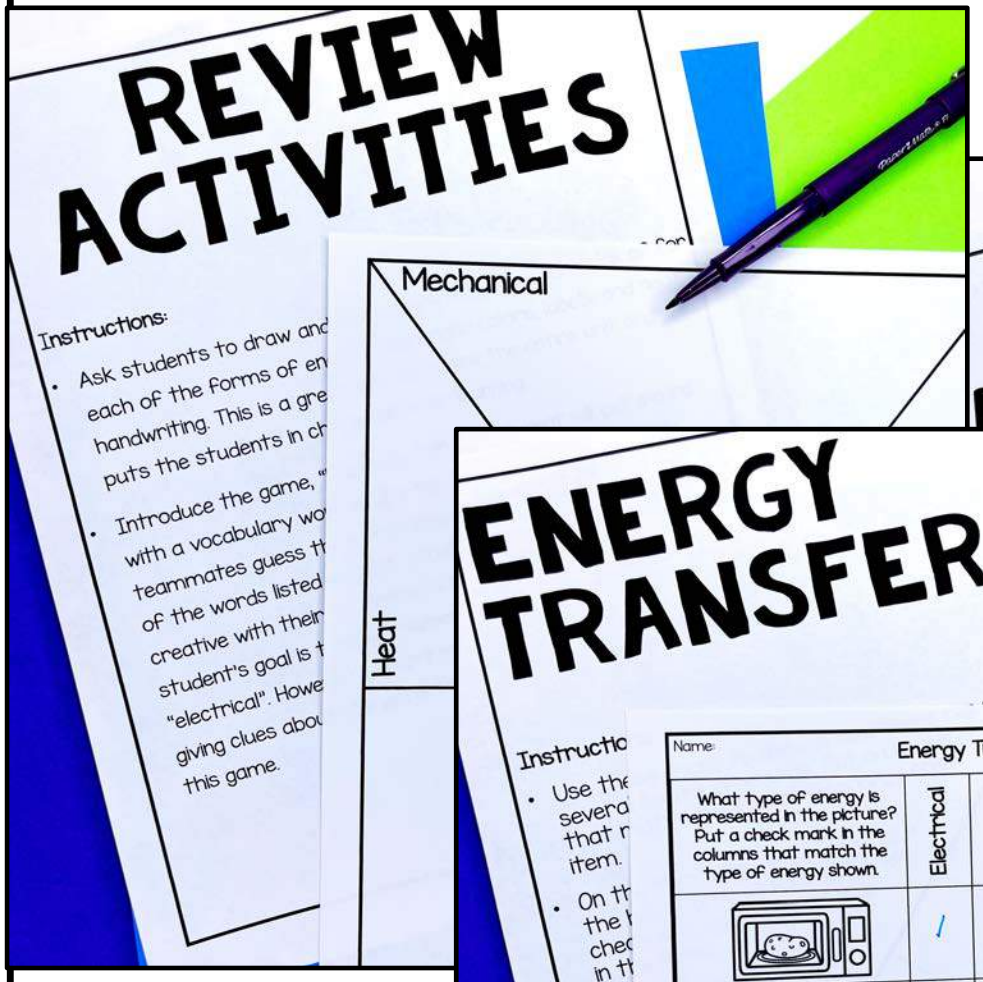


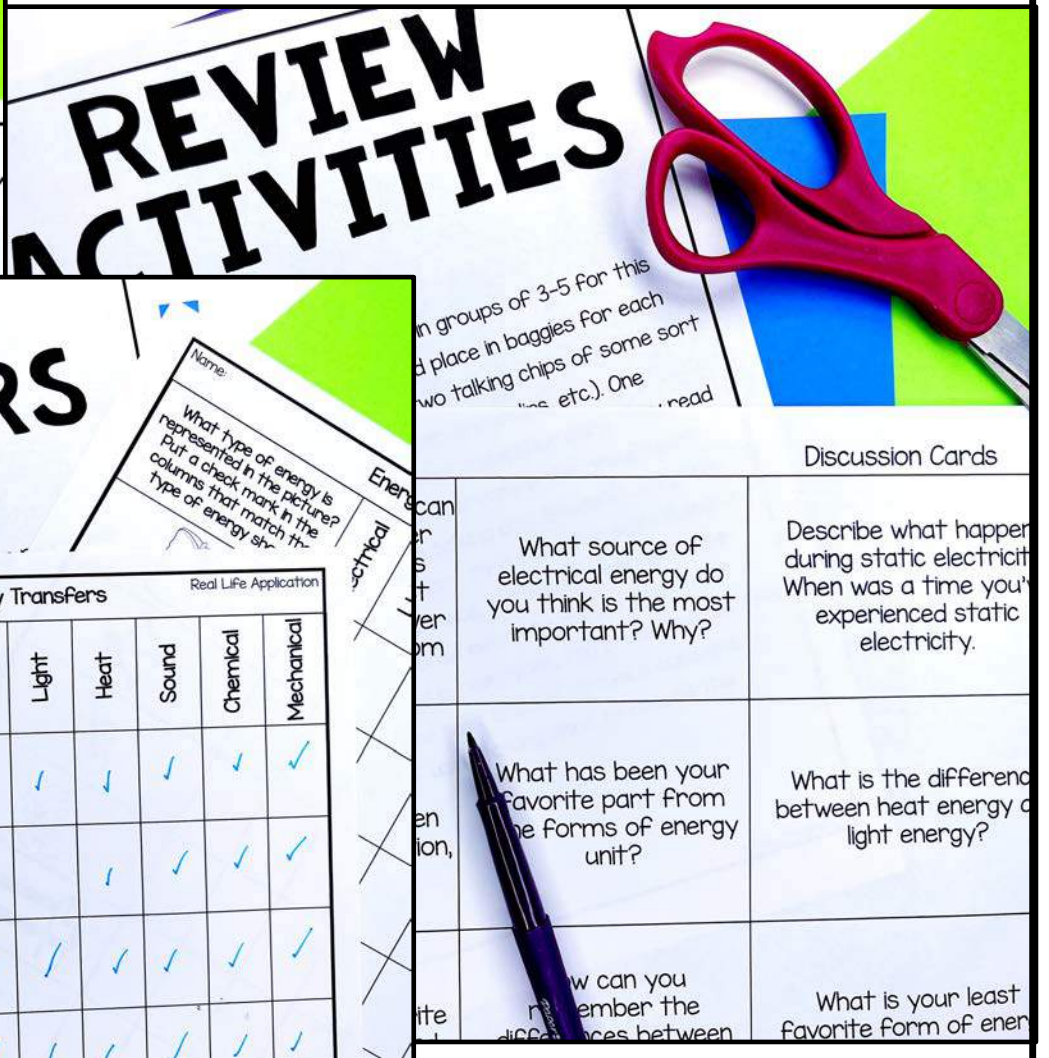
Heat Energy

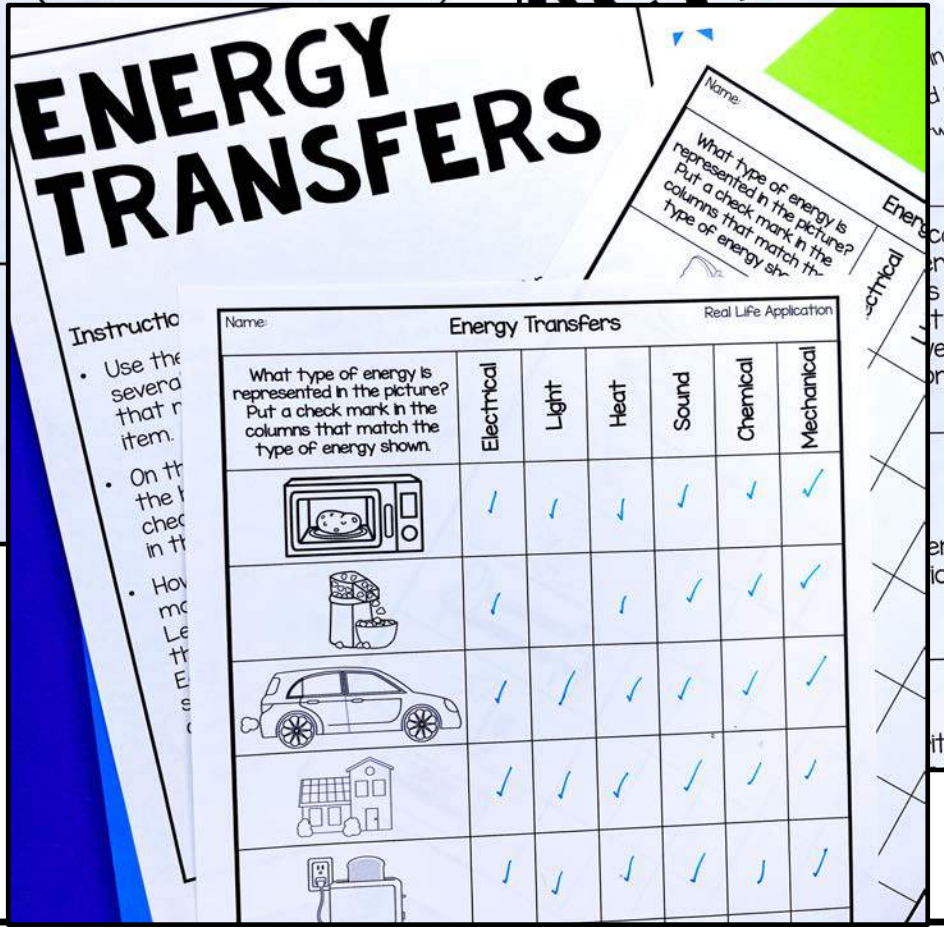
Light Energy



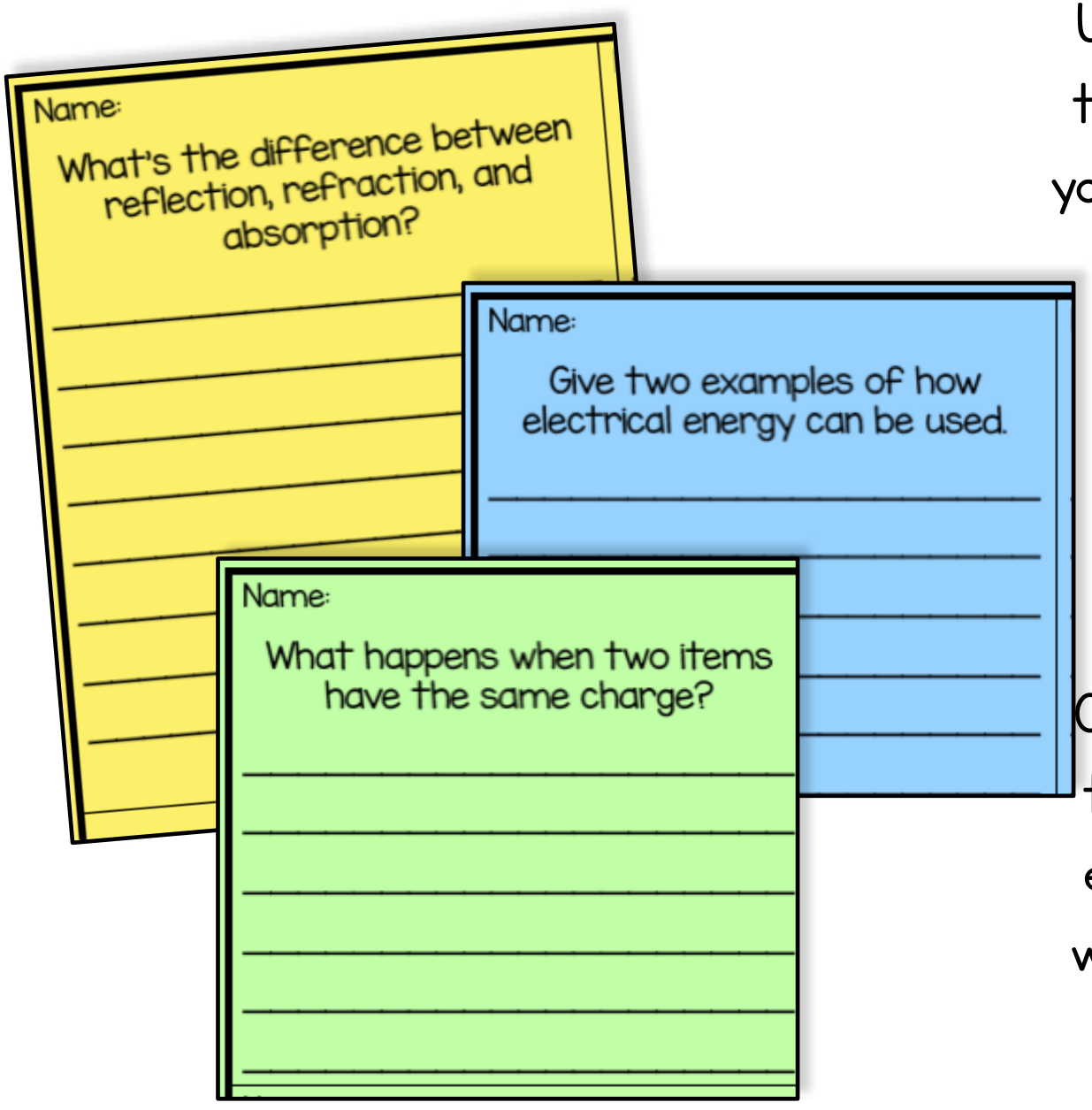
Review Activities







Quick Assessments



Use the included simple exit ticket questions to measure your students' learning at the end of the lesson.

BONUS: Includes a Mastery Checklist. You can easily keep track of students who need extra practice and students who are ready to move on to the next lesson in one easy place!

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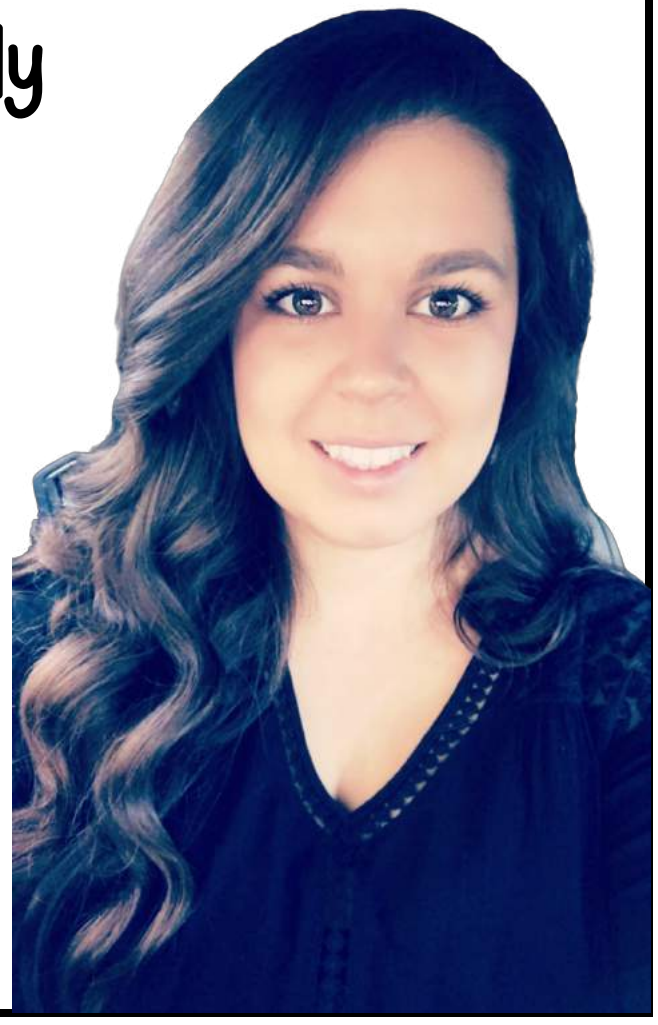

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FORMS OF ENERGY

Includes:

- Materials
- Forms of Energy Foldable
- Light: Reflection, Refraction, Absorption Foldable
- How Does Light Travel? Investigation
- How Does Light Travel? Sort
- Heat: Conduction, Convection, and Radiation Foldable
- Heat/Thermal Energy Investigation
- How Does Heat Travel? Sort
- Conductors/Insulators Sort
- Sound Energy Instrument
- Sound Energy Investigation
- Sound Energy Explore
- Static Electricity Explore
- Static Electricity Investigation
- Static Electricity Real Life Application
- Potential, Kinetic, and Mechanical Energy Foldable
- Mechanical Energy Real Life Application
- Marshmallow Catapults Experiment
- Mechanical Energy Apply
- Electrical Energy Real Life Application
- Electrical Energy Scavenger Hunt Explore
- Electrical Energy Investigation
- Chemical Energy Real Life Application
- Chemical Energy Investigation
- Energy Transfers Real Life Application
- How does energy cause motion or create change? Graphic Organizer
- Forms of Energy Review
- Game: Don't Say It!
- Discussion Cards
- Game: What Am I?
- Matching Vocabulary Cards
- Forms of Energy Project
- Forms of Energy Assessment

FORMS OF ENERGY

Activity	Materials Needed Per Group/Person
Light Energy Investigations	• Clear Cup With Water • Black Construction Paper • Pencil • Mirror Or Something Shiny • Flashlight • Scissors • Glue
Heat/Thermal Energy Investigations	• Room Temperature Water • Cup • Red Food Coloring • Ice Cubes • Candle/Math (Teacher Demonstration) • Scissors • Glue
Sound Energy Investigations	• Popsicle Sticks • Plastic Drinking Straws • Wide Rubber Band • Two Smaller, Narrower Rubber Bands • Scissors • Balloon • Washer • Rubber Bands
Static Electricity Investigations	• Balloons
Electrical Energy Investigations	• Small Lightbulbs • Batteries • Wire • Wire Cutters
Mechanical Energy Investigations	• Mini Marshmallows • Rubber Bands • Plastic Spoons • Popsicle Sticks
Chemical Energy	• Vinegar • Zipper Storage Baggies • Toilet Paper • Baking Soda

STANDARDS

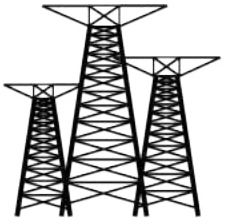
Florida Standards

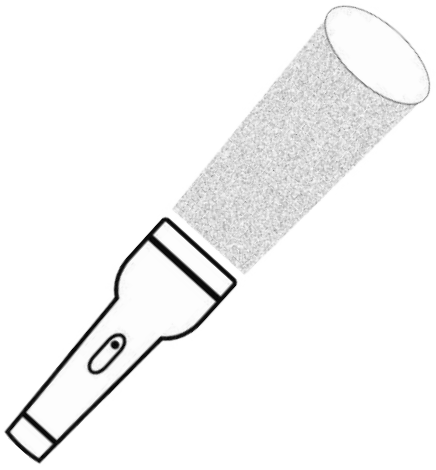
SC.5.P.10.1 Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical.

SC.5.P.10.2 Investigate and explain that energy has the ability to cause motion or create change.

SC.5.P.10.3 Investigate and explain that an electrically-charged object can attract an uncharged object and can either attract or repel another charged object without any contact between the objects

SC.5.P.10.34 Investigate and explain that electrical energy can be transformed into heat, light, and sound energy, as well as the energy of motion.

	Light 
	Heat 
	 Sound
	Electrical 
	 Chemical
	 Mechanical



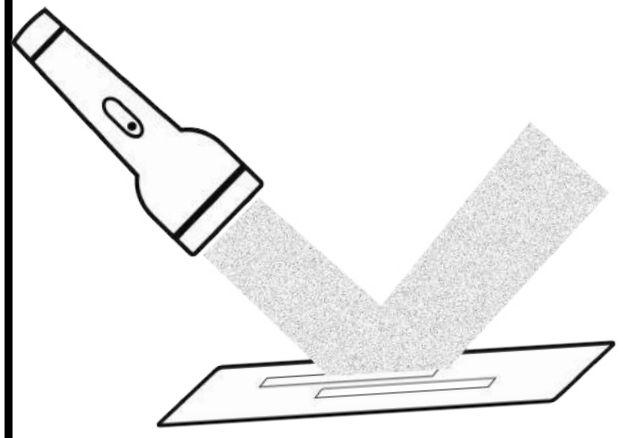
LIGHT ENERGY

Materials Needed:

- Scissors
- Clear cup with water
- pencils
- Black construction Paper
- Mirror or something shiny
- Flashlight
- Glue

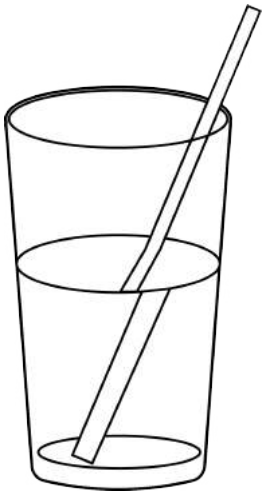
Instructions:

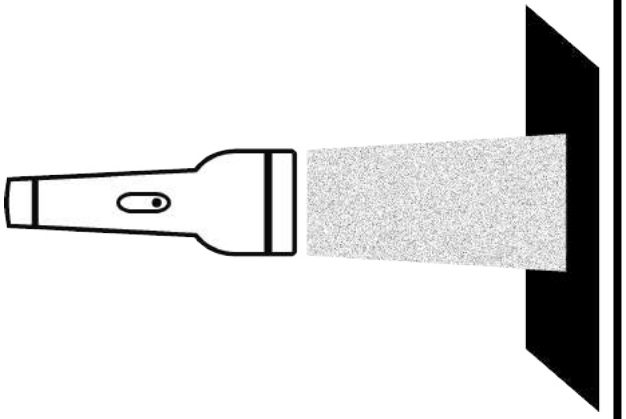
- Create the foldable and discuss reflection, refraction, and absorption.
- Complete the investigation with light energy. The goal is to use a mirror or something shiny to see reflection, the cup of water and a pencil to see refraction, and the black construction paper to observe absorption. Instead of telling students the outcome, there is power in laying out all of the materials and letting students explore. This way, they can make their own connections and see how light travels in each of these ways.
- Cut off the bottom rectangles on the Light Energy Sort Page. Have students sort the images into the correct categories and discuss the definitions of the each way light travels.



Reflection

Refraction





Absorption

Name: Investigation

How Does Light Travel?

Materials

- Clear cup with water
- Pencil
- Black Construction Paper
- Mirror or Something Shiny
- Flashlight

Procedure

Using the materials listed, identify ways to show light when it is reflected, refracted, and absorbed. Draw a sketch in the boxes below and explain in words what you observed.

	Reflect	Refract	Absorb
Draw a Sketch			
Observations			

What other materials and procedures could you use to show light being reflected, refracted, and absorbed? _____

_____

_____

How do you see light travel most often? _____

_____

_____

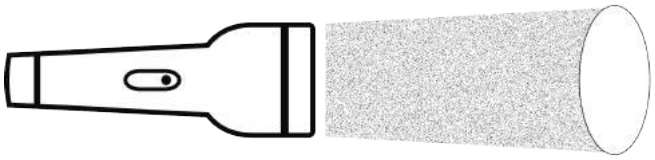
If nothing is in the way, how does light travel? _____

_____

Name:

Sort

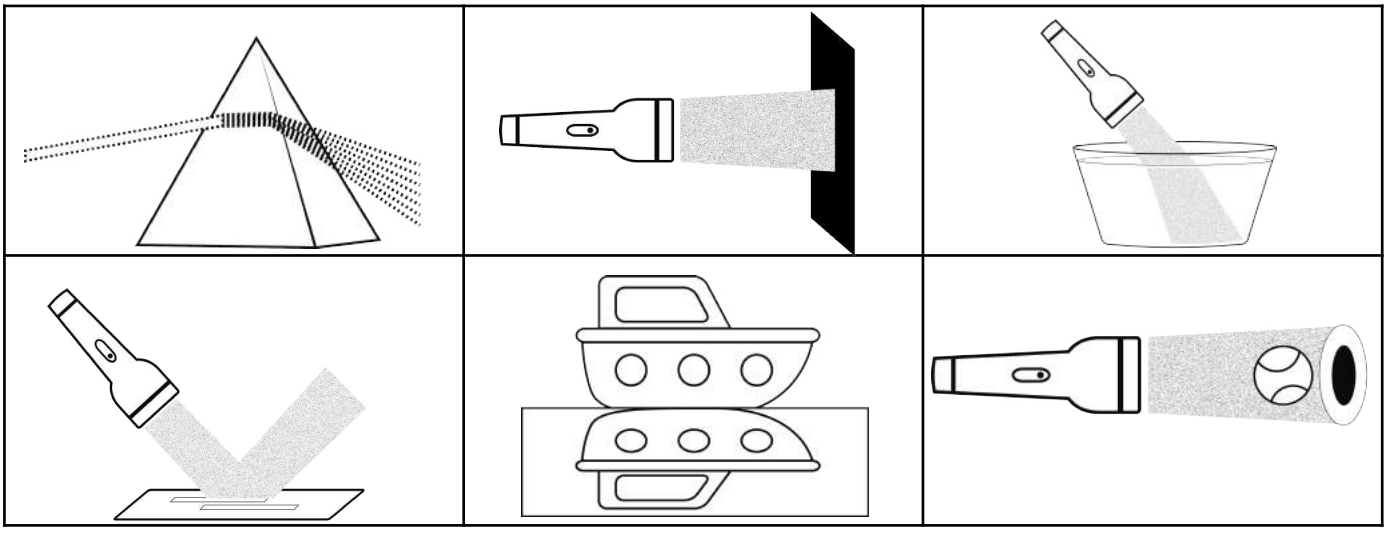
How Does Light Travel?



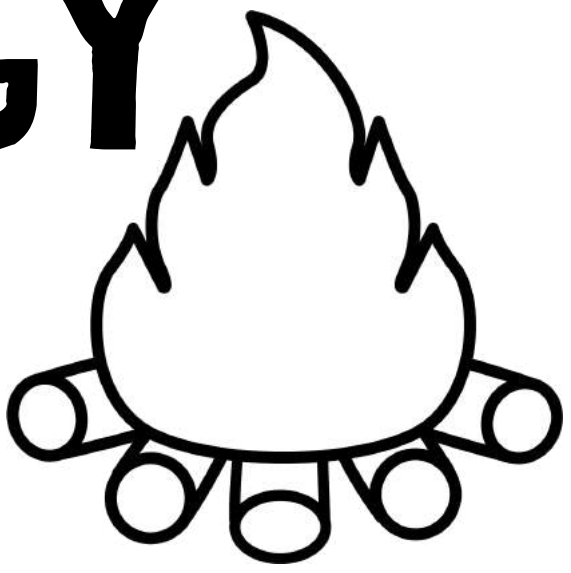
Light travels in a _____ line until it interacts with an object or moves from one material to another.

	Reflect	Refract	Absorb
Definition			
Example			
Example			

Cut out the examples below and sort them to the matching categories above.



HEAT ENERGY



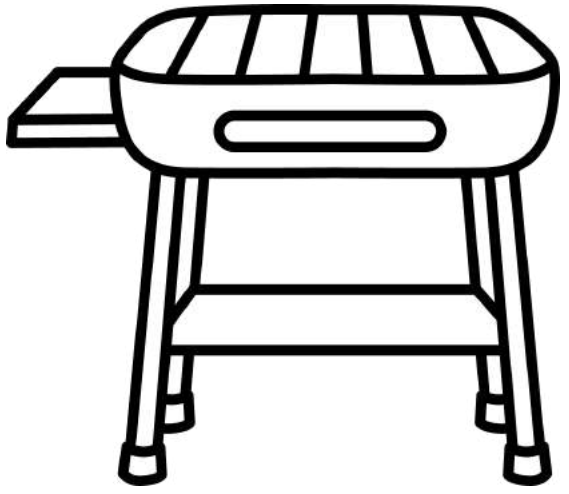
Materials Needed:

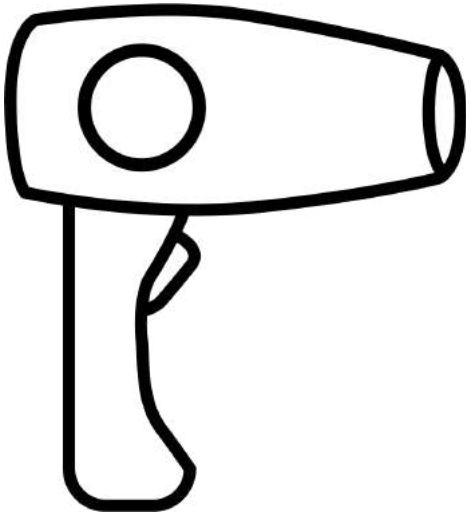
- Scissors
- Room temperature water
- Cups
- Red food coloring
- Ice cubes
- Candle/match
- Glue

Instructions:

- Create the foldable and discuss conduction, convection, and radiation.
- Complete the three investigations. Encourage students to make the connection that heat travels from warmer to cooler things. Please conduct the third investigation as a teacher demonstration (lighting a candle). In th last column of how the heat traveled, students should connect that in all three investigations, heat traveled from the warmer object to the cooler object. They can also write if each investigation was showing conduction, convection, or radiation.
- Cut off the bottom rectangles on the Heat Energy Sort Page. Have students sort the images into the correct categories and discuss the definitions of the each way heat travels.
- Discuss thermal conductors and insulators. Cut the household items out to glue them on the page with 2 columns. Sort them in the correct category.

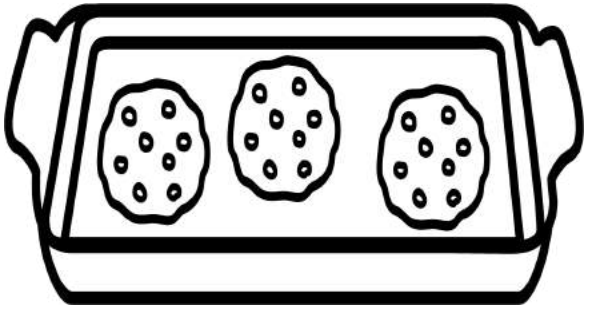
Radiation





Convection

Conduction



Name:

Heat/Thermal Energy

Investigation

How can we prove that this statement is true?

Heat travels from one place to another when there are different temperatures, always moving from _____ to _____ things.

Procedure	Sketch	How did the heat travel?
1. Have a room temperature cup of water. Put in 2 drops of red food coloring. 2. Add 2 ice cubes into the water. 3. What do you observe?		
1. Rub your hands together quickly. 2. Place an ice cube in your hands. 3. What happens to the ice cube?		
1. Light a candle with adult supervision. 2. What happens to the temperature of the air near the candle?		

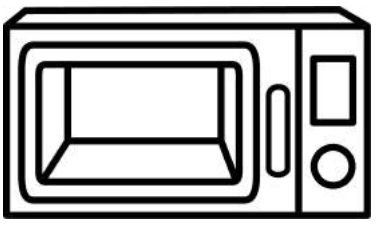
Name: Sort

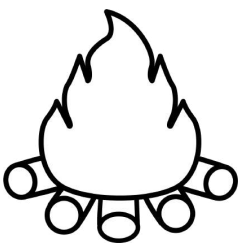
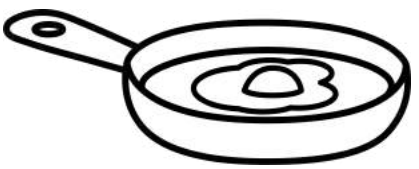
How Does Heat Travel?

Heat travels from one place to another when there are different temperatures, always moving from _____ to _____ things.

	Conduction	Convection	Radiation
Definition			
Example			
Example			

Cut out the examples below and sort them to the matching categories above.

Name:

Sort

Conductors/Insulators

_____ allow heat energy to pass through while _____ stop or slow down heat energy.

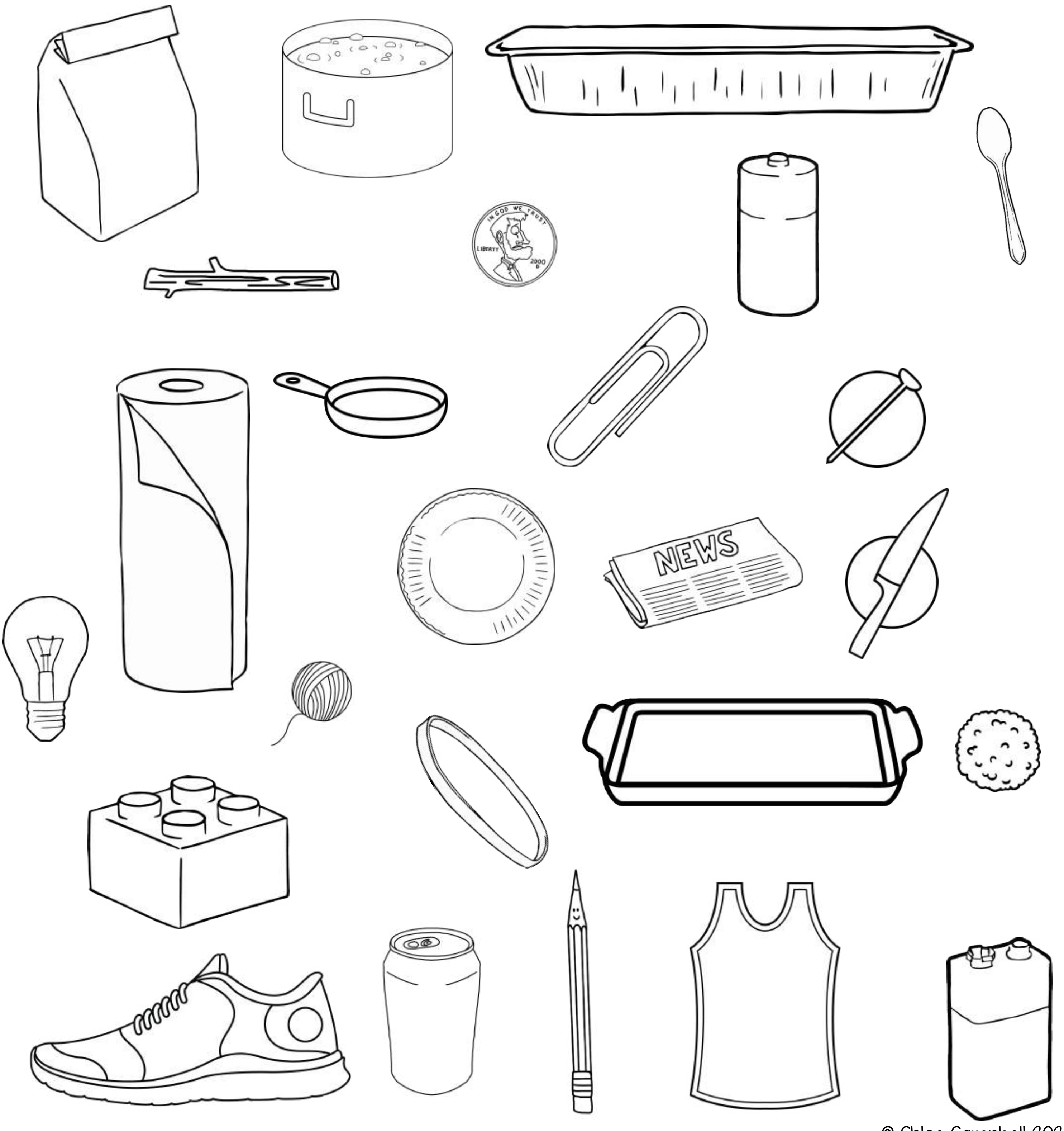
Thermal Conductors	Thermal Insulators

Name:

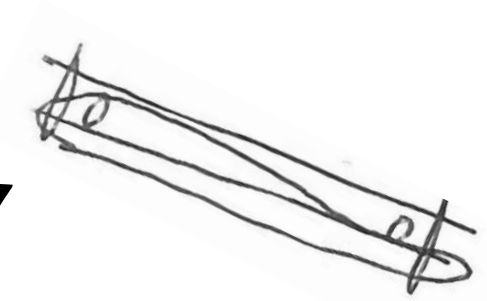
Sort

Conductors/Insulators Items

Cut out the items on this page. Decide if the material would allow heat energy to pass through them or if it would stop/slow down heat heat energy. Glue them into the matching column on the Conductors/Insulators sorting page.

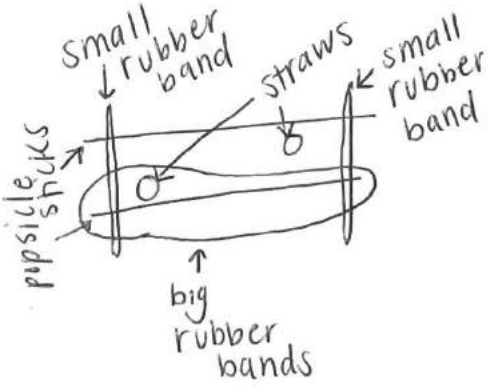


SOUND ENERGY



Materials Needed:

- 2 popsicle sticks, 2 smaller rubber bands, 1 wide rubber band, and 1 plastic straw for every student
- Scissors
- Rubber bands
- Balloons and washer for every student



Instructions:

- Complete the three sound activities: make an instrument, complete an investigation, and explore time.
- The popsicle stick and rubber band instrument allows the students to feel the vibrations on their lips. Encourage students to move the straws around to see how it changes the vibrations and pitch.
- The balloon and washer investigation makes it easy to hear low and high pitches. Be careful! If you have students sensitive to loud sounds, you'll want to warn them. Sometimes the balloon will pop if it gets overheated from the friction of the washer inside.
- Stretching the rubber band over your fingers gives students a simple visual to connect the vibration speed to the pitch.

Name: Instrument

Sound Energy

Materials

- Two popsicle sticks
- Plastic drinking straw
- Wide rubber band
- Two smaller, narrower rubber bands
- Scissors

Procedure

Step 1: Take one popsicle stick and stretch the wide rubber band around it lengthwise.
Step 2: Cut two small pieces of the straw (1-1 ½ inches). Put one of the small pieces under the wide rubber band about 1/3 of the way from the end of the stick. Put the other straw piece on top of the rubber band, about 1/3 of the way from the opposite end of the popsicle stick.
Step 3: Take the second craft stick and place it on top of the first one - with the two straws in between.
Step 4: Wrap one of the smaller rubber bands around the end of the two popsicle sticks. It should pinch the sticks tightly together with the straws in between. Wrap the second rubber band around the other end of the stick.
Step 5: Put your mouth in the middle and act as if you are playing a harmonica and blow through the popsicle sticks. You can make different sounds if you move the straws location, where you blow on it, or how hard you blow.

What do you hear and feel when you use this?_____

_____

_____

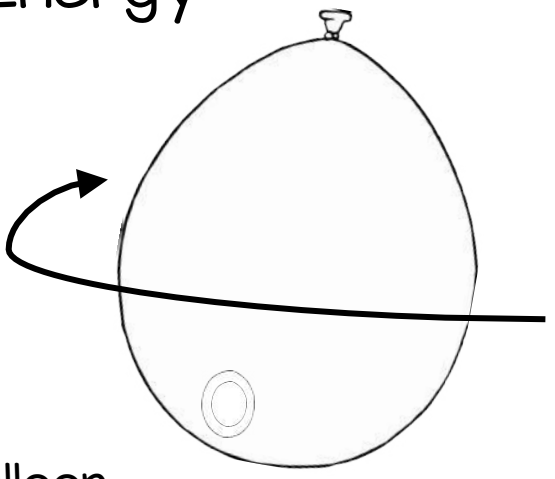
What makes the sound in this instrument?_____

_____

_____

Name: Investigation

Sound Energy



Materials

- Balloon
- Washer

Procedure

Step 1: Put the washer in the balloon.
Step 2: Blow up the balloon but do not tie it. Hold it tight with your fingers so no air comes out.
Step 3: Swirl the balloon around slowly until you hear a sound.
Step 4: Explore what happens when you swirl the balloon around quickly with the washer in it.
WARNING: Be careful! The friction and heat can sometimes pop the balloon if the washer moves too fast.

What do you feel and hear when you swirl the balloon slowly?

_____

_____

What do you feel and hear when you swirl the balloon quickly?

_____

_____

How is the vibration connected to the pitch? _____

_____

_____

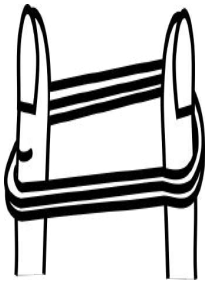
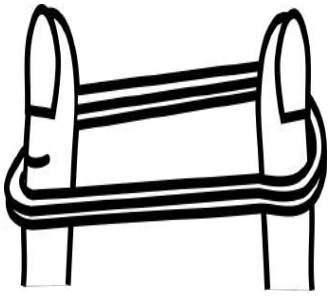
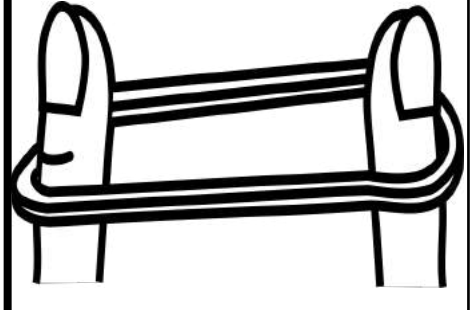
Draw a picture to represent how the pitch is related to the speed of vibration?

Name:

Sound Energy

Explore

What happens when pluck a rubber band?

Investigation	Observations	Sound Waves & Pitch
		
		
		

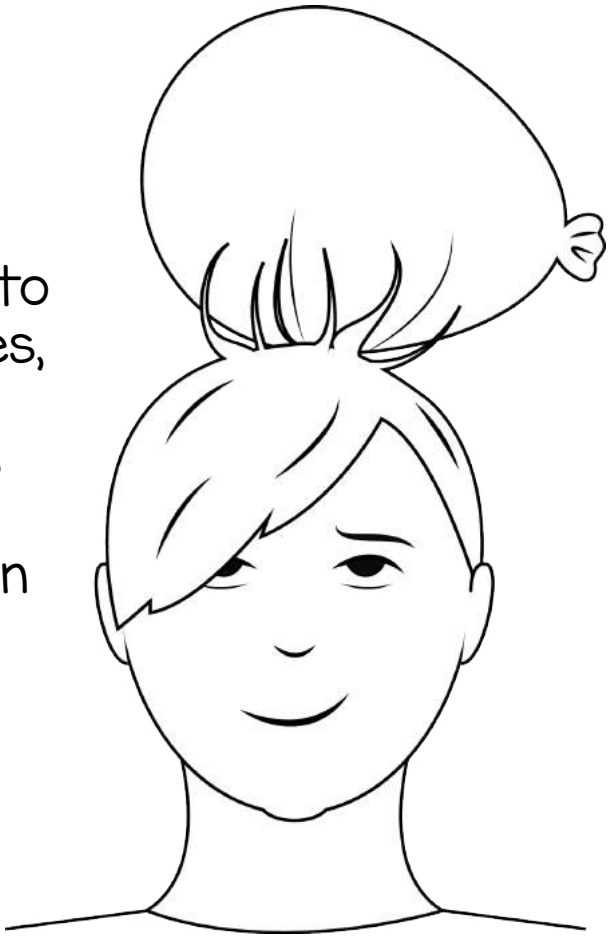
Based on this investigation, what conclusions about pitch and vibrations can you make? _____

_____

STATIC ELECTRICITY

Materials Needed:

- Balloons



Instructions:

- Give students time to explore with balloons. Encourage them to rub the balloons on their clothes, hair, skin, desk, etc. Have students rub their feet across the carpet, then touch metal. This time is all about exploration so students can come up with their own conclusions about static electricity. The last two boxes on the Explore page are blank so students (or you) can create their situations to explore.
- Read through the description of static electricity. Discuss positive and negative charges. This would be a great time to connect to static electricity to magnets (opposites attract).
- On the Apply page, discuss the conclusions you can draw from the real life situations shown in the pictures.

Name:

Static Electricity

Explore

Situation	Observations
Rub the balloon against your clothing.	
Rub the balloon against your hair.	

Based on these situations, what conclusions can you make about static electricity? _____

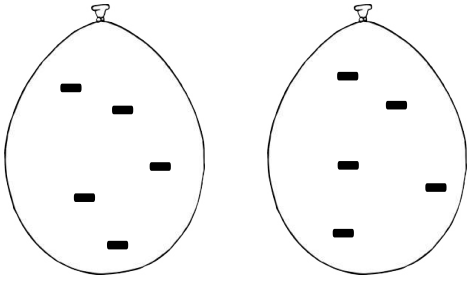
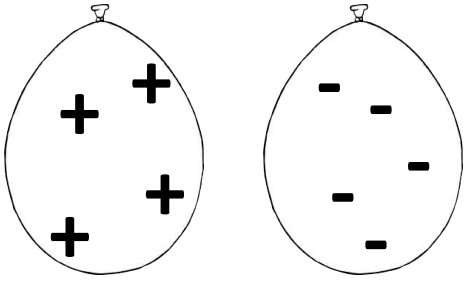
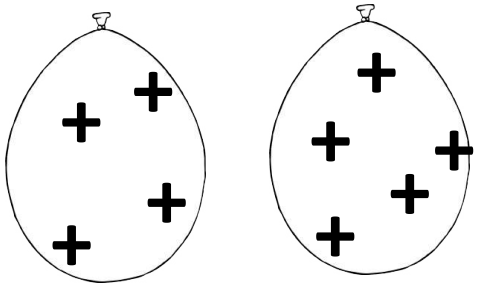
_____

Name:

Investigation

Static Electricity

All things are made of matter, which are also made up atoms. Inside of atoms, you will find neutrons (positive charges+), protons (negative charges-), and electrons (no charge). Static electricity is created when positive and negative charges aren't balanced. Positive and negative charges don't move around too much, but electrons love to jump all over. When an object or person has extra electrons, it ends up having a negative charge. Positive charges look for negative charges and negative charges search for positive charges.

Investigation	Observations
	
	
	

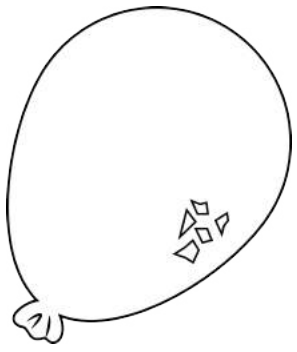
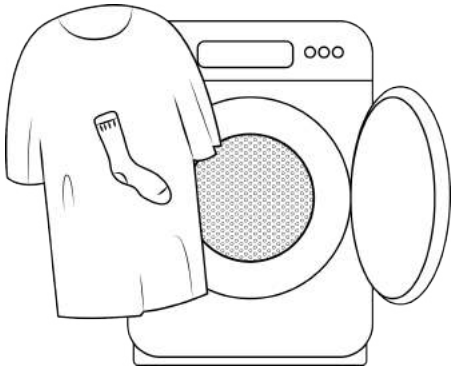
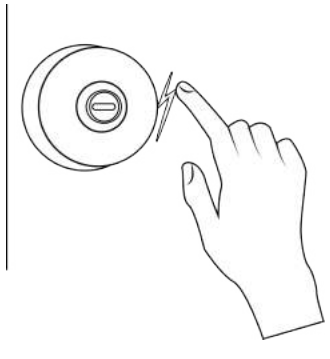
Based on this investigation, what conclusions can you make about static electricity? _____

_____

Name:

Static Electricity

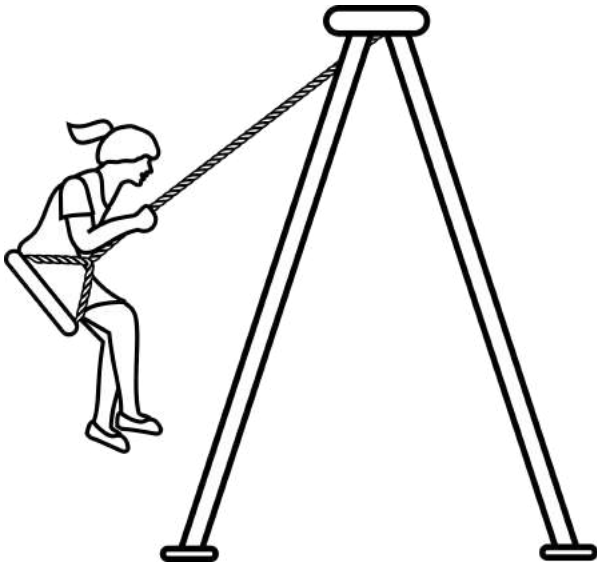
Real Life Application

Situation	Conclusions
	
	
	
	

Based on these situations, what conclusions can you make about static electricity? _____

_____

MECHANICAL ENERGY

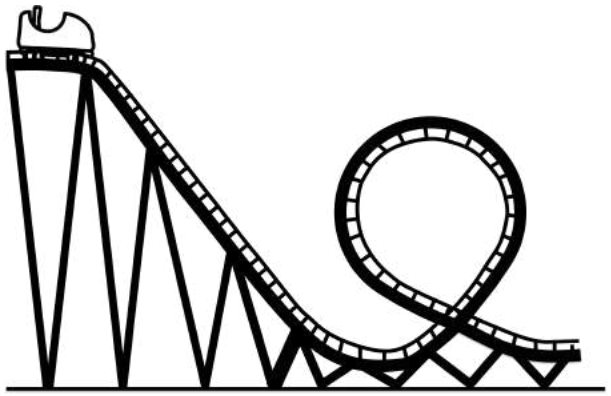


Materials Needed:

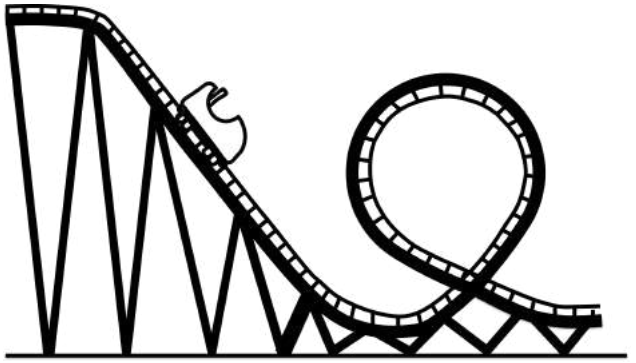
- Mini marshmallows
- Rubber bands
- Plastic spoons
- Popsicle sticks

Instructions:

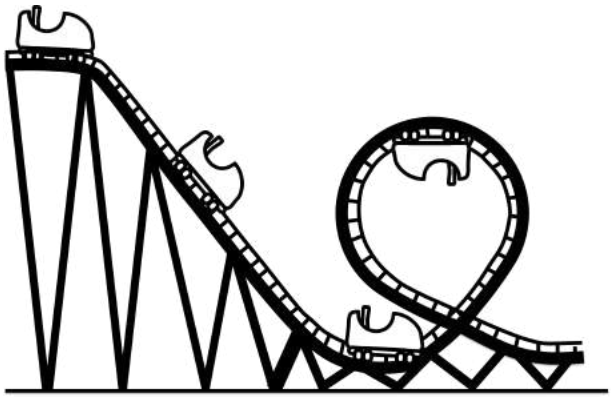
- Complete foldable with students. Make the connection that potential and kinetic energy combine to create mechanical energy.
- Using the Real Life Application chart, have discussion with students about each of the situations. This will help them be creative when it comes to the next Apply page.
- During the experiment, remind students to label potential and kinetic energy in their sketches. Encourage students to make the connection that the marshmallow will travel farther if it has more potential or stored energy.
- On the Apply page, ask students to think outside of the box. There are lots of examples of potential and kinetic energy that they use every day!



Potential



+ Kinetic

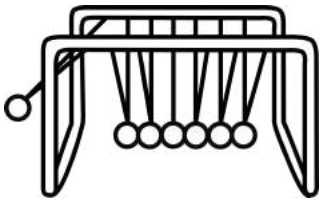
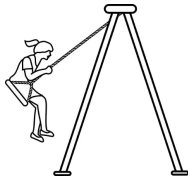
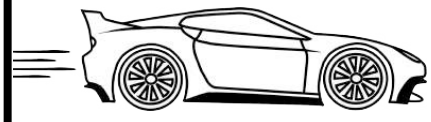
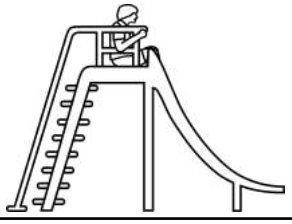
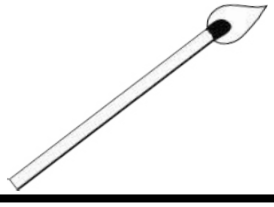


= Mechanical

Name:

Mechanical Energy

Real Life Application

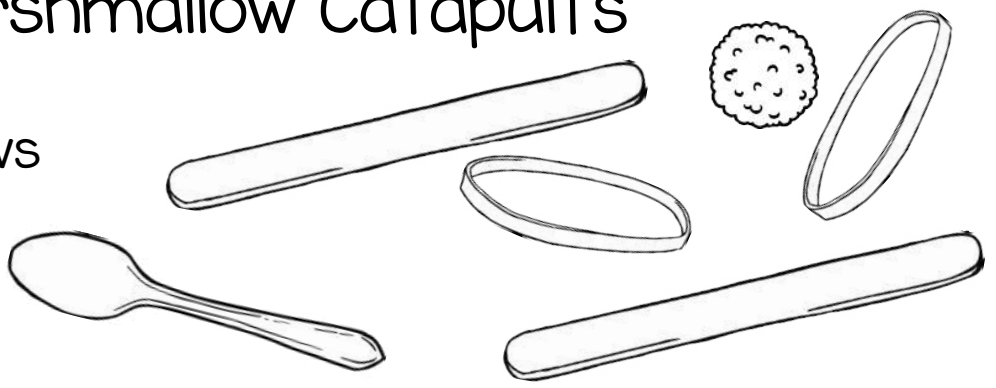
Situation	Potential Kinetic	Kinetic Energy
		
		
		
		
		
		
		
		

Name: Experiment

Marshmallow Catapults

Materials Needed:

- Mini marshmallows
- Rubber bands
- Plastic spoons
- Popsicle sticks



	Design #1	Design #2
Sketch		
Distance marshmallow traveled	Trial 1: Trial 2: Trial 3:	Trial 1: Trial 2: Trial 3:

What about your design made the marshmallow travel successfully?_____

_____

How does this experiment connect to mechanical energy?

_____

_____

_____

Name:

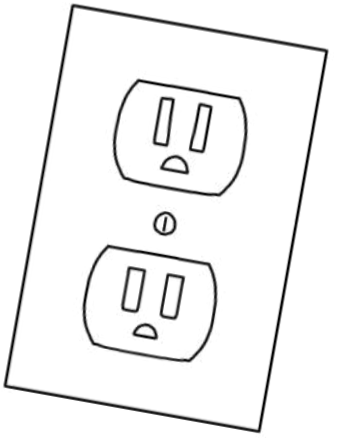
Mechanical Energy

Apply

Design your own rollercoaster. Label the parts that have potential energy (PE) and the parts that have kinetic energy (KE).

Think about something else in the real world that would show potential and kinetic energy. Label the parts that demonstrate potential energy (PE) and the parts that show kinetic energy (KE).

ELECTRICAL ENERGY



Instructions:

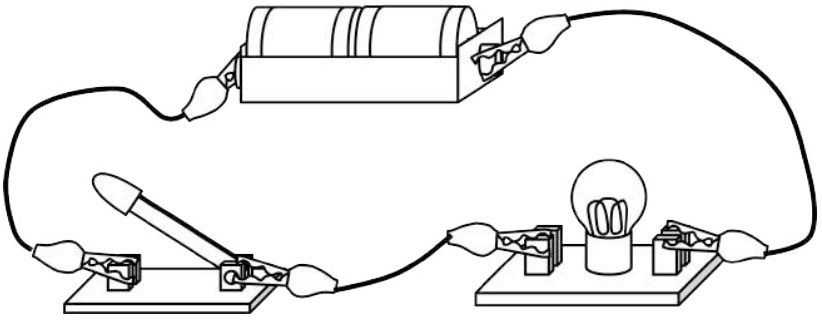
- With the Real Life Application page, students will fill in the blanks. Take the time to discuss how electrical energy is often transferred into several other forms of energy. Electrical energy also comes from a variety of sources.
- Using the Scavenger Hunt Explore chart, encourage students to explore the classroom (or school) and write/sketch items that use electrical energy. In the last column, have students check off other forms of energy that each item also produces.
- Using a battery, small light bulbs, and 2 wires, give students time to investigate electrical energy. Can they find a way to make the light bulb light up? Just warn the students not to hold their finger on the metal piece of the wire - it will get quite warm.

Name:

Real Life Application

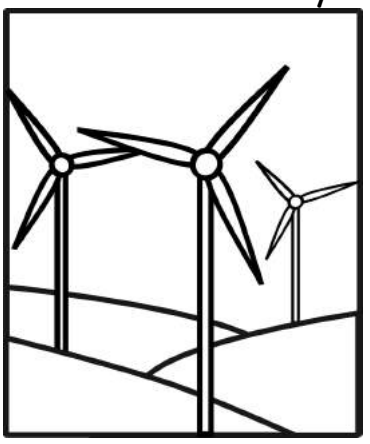
Electrical Energy

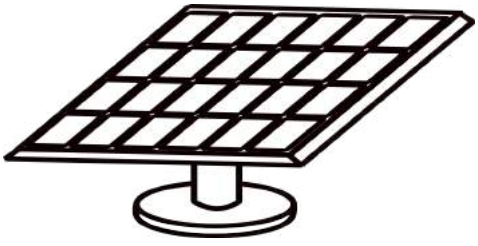
Electrical energy is the flow of _____ charge through a _____ and can **come from a variety of sources.**



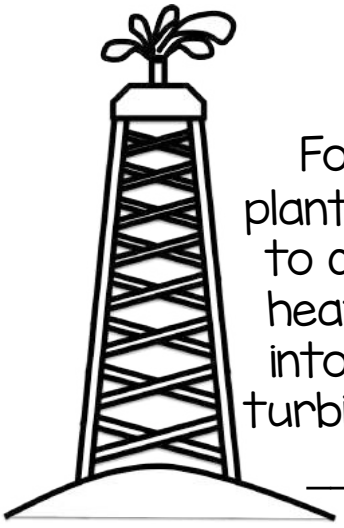
_____ have chemical energy that turns into electricity.

Windmills take moving _____ and turn it into electricity.

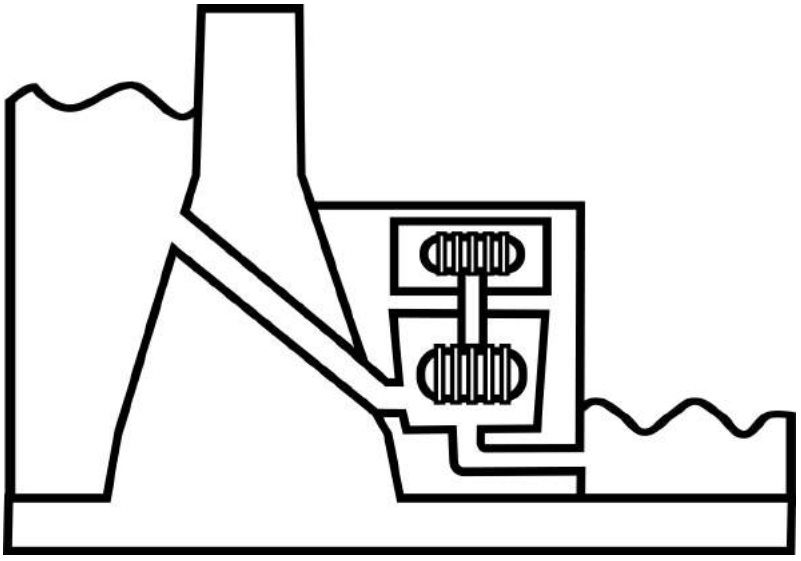




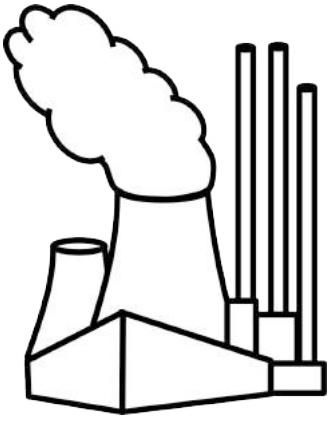
_____ panels take radiant energy and turn it into electricity.



Fossil fuel power plants burn coal or oil to create heat. This heat is then turned into steam to drive turbines which create _____.



Hydroelectric power plants turn moving _____ into electricity.



Nuclear power plants take _____ energy and transfer it to electricity.

Name:

Scavenger Hunt

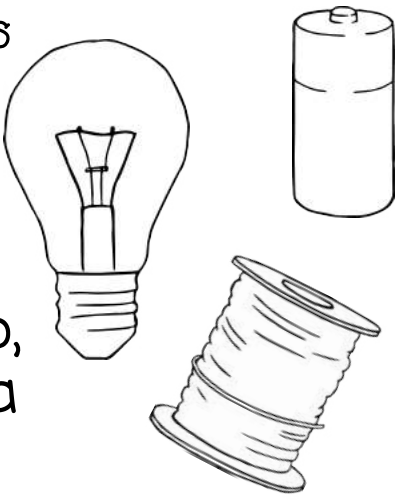
Explore

As you walk around your classroom, write/sketch items that use electrical energy.

Item	Sketch	Other Forms of Energy
		❑ Light ❑ Heat ❑ Chemical ❑ Mechanical ❑ Sound
		❑ Light ❑ Heat ❑ Chemical ❑ Mechanical ❑ Sound
		❑ Light ❑ Heat ❑ Chemical ❑ Mechanical ❑ Sound
		❑ Light ❑ Heat ❑ Chemical ❑ Mechanical ❑ Sound
		❑ Light ❑ Heat ❑ Chemical ❑ Mechanical ❑ Sound
		❑ Light ❑ Heat ❑ Chemical ❑ Mechanical ❑ Sound
		❑ Light ❑ Heat ❑ Chemical ❑ Mechanical ❑ Sound

Name:

Electrical Energy: Circuits



Materials

- Small lightbulb
- Wires
- Batteries

Challenge

Using just two wires, a lightbulb, and a battery, can you make a lightbulb shine?

Draw a sketch of the circuit each time the lightbulb works. --→			
Draw a sketch of the circuit each time the lightbulb doesn't work. --→			

How must the materials be connected in order for the electrical energy to light up the bulb? _____

_____

_____

What causes the lightbulb to not light up? _____

_____

_____

CHEMICAL ENERGY

Materials Needed:

- Zipper storage baggies
- Vinegar
- Toilet Paper
- Baking Soda

Instructions:

- Discuss the definition of chemical energy, using the real life application page. Work with students to match the picture to the descriptions of chemical energy.
- Complete the chemical reaction investigation. Baking soda and vinegar produce carbon dioxide gas when mixed. As this gas grows in volume, it puts pressure on the container (baggie). The bubbles of gas will form and cause the foaming inside the bag. A temperature change and the appearance of a new gas shows that a chemical reaction has occurred. The thermal energy has changed into energy stored in the chemical bonds of the new substances formed, called chemical energy.

Name:

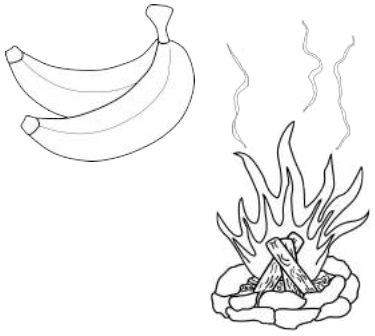
Real Life Application

Chemical Energy

Chemical energy is a form of _____ (or stored) energy that will only be observed when it is released in a chemical reaction. Chemical energy is stored in the bonds between atoms and molecules. Chemical _____ is what holds the atoms in a molecule together and what holds the molecules in a substance together. When bonds between atoms are formed or broken, a chemical _____ occurs. This is when there is a new substance formed with different properties.

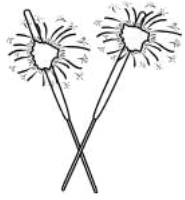
Draw a line to match the picture to the description.

When coal is burned, it converts chemical energy into light and heat.

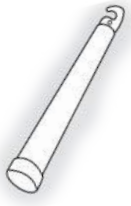


Wood, when dry, stores chemical energy. This energy is released when the wood burns and is converted into heat and light energy.

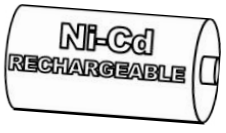
The chemical energy of food is stored energy. When combined with the acids in our stomachs, our bodies change the stored chemical energy into heat or mechanical energy.



When you crack a glow stick, the ingredients are mixed. This releases carbon dioxide and chemical energy, which is converted to light energy.



Fireworks contain potential chemical energy, which is changed into kinetic energy to send the firework in the air. It then produces sound and light energy.



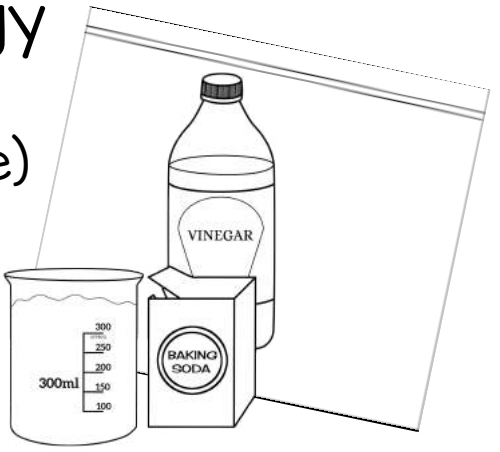
Sunlight creates a chemical reaction that gives plants energy to grow.

The chemical ingredients in the hand warmer package react with oxygen in a chemical reaction. The chemical energy is converted to heat energy.

When something is connected to a battery, chemical reactions take place to produce electricity.

Name: Investigation

Chemical Energy



Materials

- Zipper storage baggies (sandwich size)
- Vinegar
- 3-4 squares of toilet paper
- Baking Soda

Procedure

Step 1: Put 1 tablespoon of baking soda in the center of the toilet paper. Fold the sides of the toilet paper in to make a "time-release packet".

Step 2: Pour ½ cup of vinegar into the baggie and set it aside.

Step 3: Read all of this step BEFORE you do it. You'll need to drop the time-release packet into the vinegar and zip the bag closed before the fizzing gets crazy. You can do this a couple of ways: zip the bag partially closed, throw in the packet, then zip the rest of the way closed OR you can put the time-release packet into the mouth of the bag, hold it out of the vinegar by pinching the sides of the bag, zip the bag, then let the packet drop into the vinegar.

What happened to the baggie when you dropped the baking soda into the vinegar? _____

_____

_____

What would happen if you put more baking soda in the baggie?_____

_____

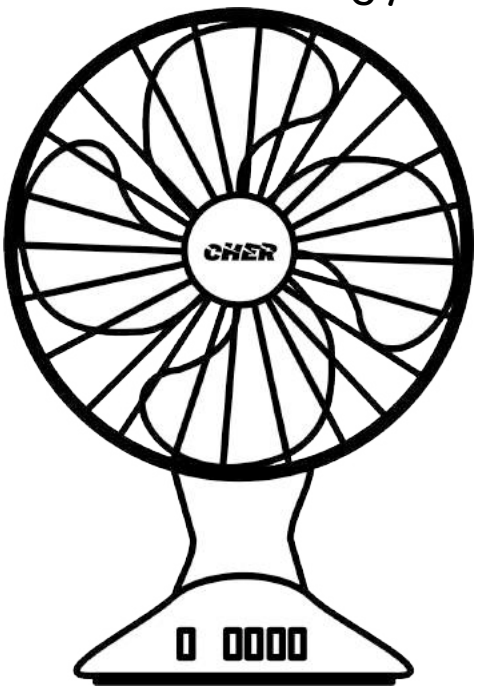
_____

What was created when you put the baking soda into the vinegar? _____

ENERGY TRANSFERS

Instructions:

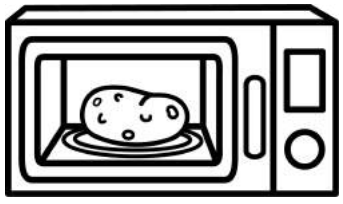
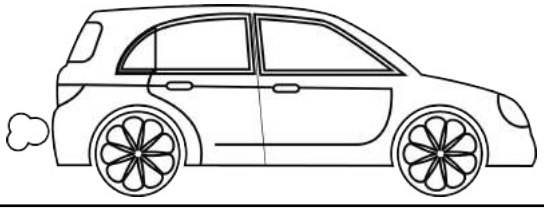
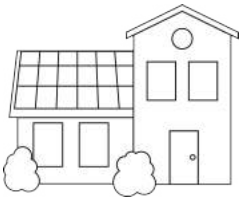
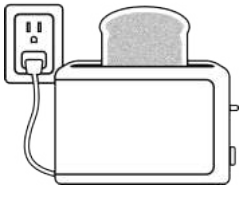
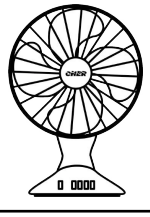
- Use these pages to discuss how items can represent several forms of energy. Put a checkmark in the boxes that match the forms of energy represented in each item.
- On the third page, encourage students to think outside of the box and draw four different items. They can label and check the boxes that match the forms of energy shown in the items.
- How does energy cause motion or create change? Lead students through all of the activities from this unit. Each of the activities have somehow caused motion or create change. Discuss as a class and add pictures and descriptions to each of the boxes in the graphic organizer.



Name:

Energy Transfers

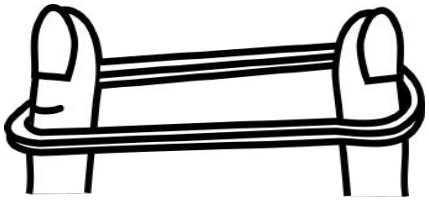
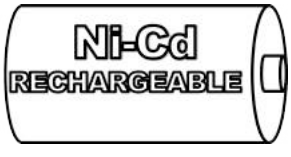
Real Life Application

What type of energy is represented in the picture? Put a check mark in the columns that match the type of energy shown.	Electrical	Light	Heat	Sound	Chemical	Mechanical
						
						
						
						
						
						
						

Name:

Energy Transfers

Real Life Application

What type of energy is represented in the picture? Put a check mark in the columns that match the type of energy shown.	Electrical	Light	Heat	Sound	Chemical	Mechanical
						
						
						
						
						
						
						

Name:

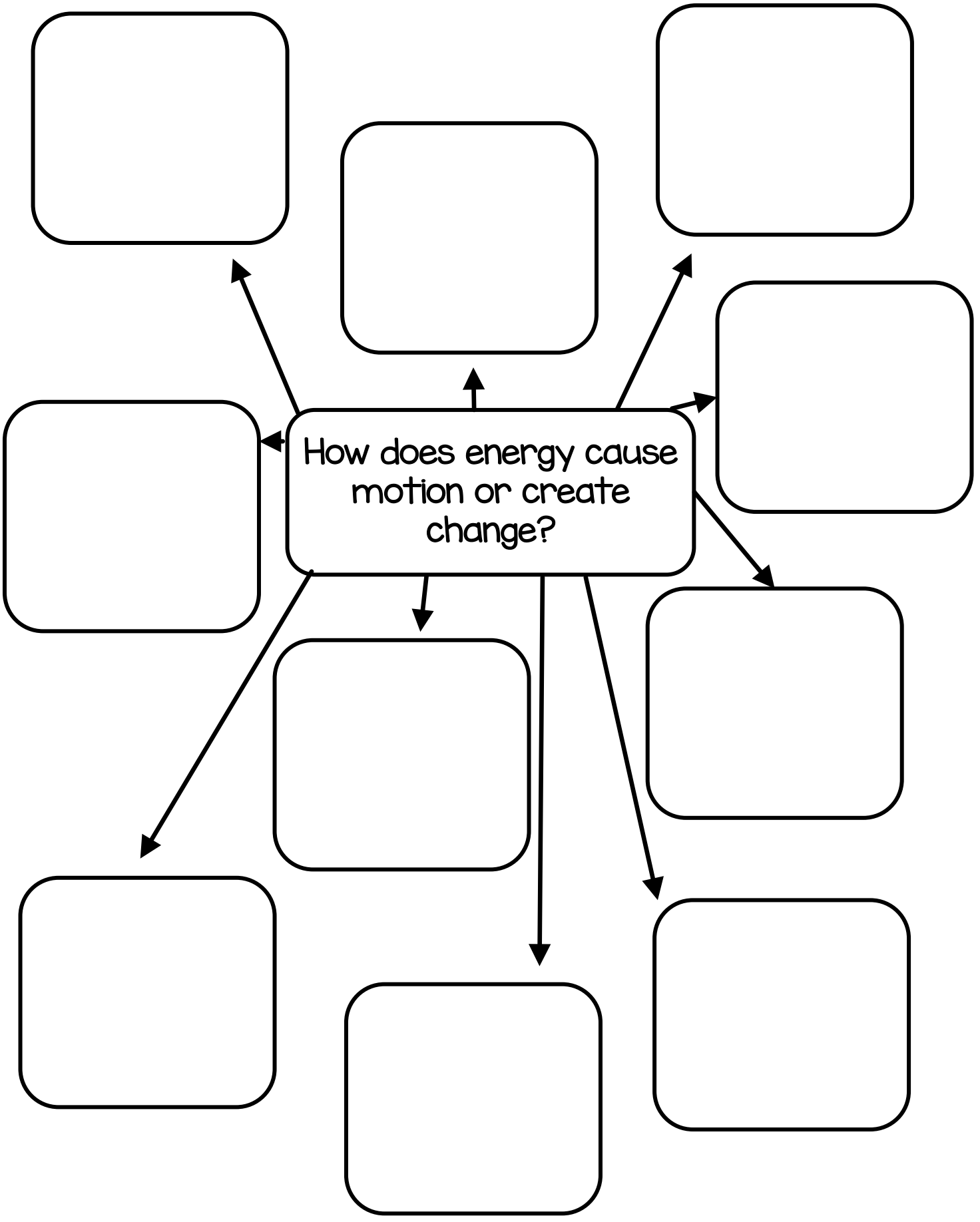
Energy Transfers

Real Life Application

Draw your own items. Check off the columns that match the type of energy shown.	Electrical	Light	Heat	Sound	Chemical	Mechanical

Name:

Review



REVIEW ACTIVITIES

Instructions:

- Ask students to draw and write everything they can think of for each of the forms of energy. Use bright colors, labels, and neat handwriting. This is a great way to review the entire unit and puts the students in charge of their learning.
- Introduce the game, "Don't Say It!". The student will get a card with a vocabulary word at the top. Their job is to make their teammates guess the word. Here's the catch: they can't say any of the words listed below it. This requires students to get creative with their explanations. Look at the example card, the student's goal is to make his/her classmates guess the word "electrical". However, he can't say outlet, plug, or battery when giving clues about the word. They can use words or motions for this game.

REVIEW ACTIVITIES

Instructions:

- Discussion Cards: Students can work in groups of 3-5 for this activity. Have a set of cards cut and place in baggies for each group. Each student will also need two talking chips of some sort (math manipulatives, pieces of paper, paperclips, etc.). One student reaches in the bag and picks a question card. They read the question to the whole group. Everyone in the group must respond to the question using a talking chip. Students only have two chips, so they can't talk more than twice for each question. Students do not have to talk twice, but must respond to the question at least one time. Once everyone agrees that the question has been answered by everyone, the students take their talking chips back. Then, the next student draws a card and continues the process of using talking chips to discuss the questions.

REVIEW ACTIVITIES

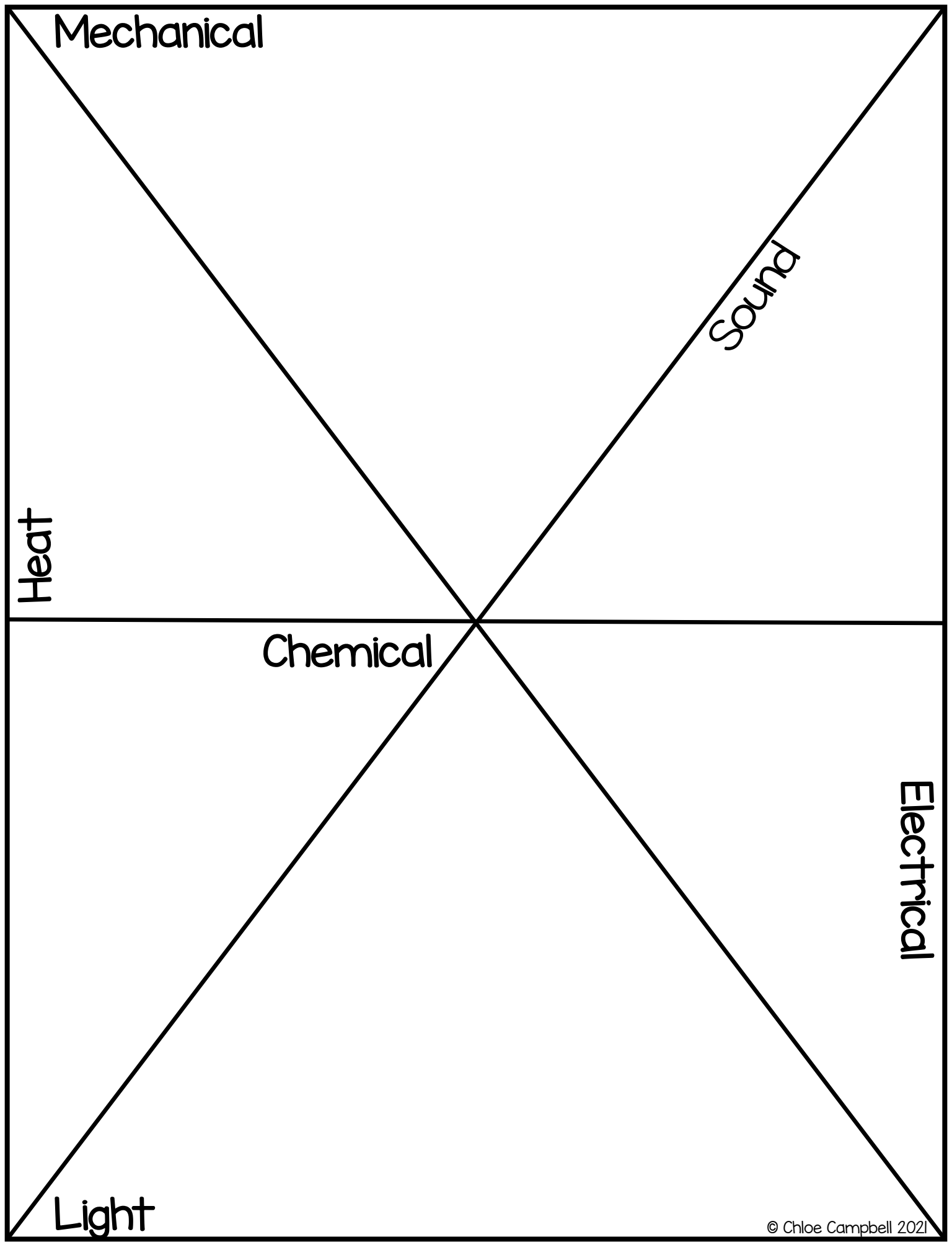
Instructions:

- Whenever we have new vocabulary words, I love playing the game "What Am I?". Students have cards taped to their back - As you tape the cards, don't let students see what's on their back! Students stand up and walk to different classmates to ask questions about the card on their back. Example question: "Do I flow from hot to cold??". The key here is that once the students ask the question and the classmate says yes, the student has to guess the energy name *that relates to the question they asked*. If the student gets it correct, they can see the teacher for a new card on their back. If they don't guess correctly, they have to find a different classmate to ask another question. Sometimes, I let the students use their resources and carry around their foldable during this game. If I play the game again later during the unit, I don't let them use their resources. I'll also encourage them to use the resources in our classroom to help remind them of each form of energy.

REVIEW ACTIVITIES

Instructions:

- Matching Game: These cards can be cut out to play memory. You'll match the definition to the vocabulary word. This is great practice before the assessment at the end of the unit.
- Forms of Energy Project: There are two versions available. The options are the same, one just lists the learning style and one does not. Students are encouraged to select one box and create the project. I have either given my students time in class to work on the projects or I've sent it home as an assignment. Use your discretion to determine what works best for your students. I have them circle their choice on the paper and turn it in when they turn in their project. I like to give students time, once the projects have been turned in, to do a gallery walk. They'll walk around the classroom and observe the types of projects. I love giving each student sticky notes to write positive feedback on each project!



Game: Don't Say It

Electrical	Light	Heat	Sound
outlet	reflect	flows	vibration
plug	refract	friction	pitch
battery	straight	thermal	waves

Chemical	Mechanical	Energy	Conductor
stored	motion	motion	heat
reaction	kinetic	change	travels
potential	potential	transfer	metal

Insulator	Static	Kinetic	Potential
heat	electricity	motion	stored
blocks	shock	mechanical	mechanical
slows	charge	movement	energy

Discussion Cards

What hand motions can help you remember that a high pitch is created from fast vibrations and a lower pitch is created from slow vibrations?	What source of electrical energy do you think is the most important? Why?	Describe what happens during static electricity. When was a time you've experienced static electricity.
How can you remember the differences between refraction, absorption, and reflection?	What has been your favorite part from the forms of energy unit?	What is the difference between heat energy and light energy?
What is your favorite form of energy and why?	How can you remember the differences between radiation, convection, and conduction?	What is your least favorite form of energy and why?

Game: "What Am I?"

Light Energy	Heat Energy
Sound Energy	Electrical Energy
Chemical Energy	Mechanical Energy

Game: "What Am I?"

Reflection	Refraction
Absorption	Convection
Conduction	Radiation

Game: "What Am I?"

Conductors	Insulators
Static Electricity	Kinetic Energy
Potential Energy	Pitch

Matching Cards

Light Energy	Mechanical Energy	Chemical Energy
Heat Energy	Electrical Energy	Sound Energy
Energy of movement; potential and kinetic energy combined	Travels in a straight line until it interacts with an object or moves from one material to another	Travels from one place to another when there are different temperatures; moves from warmer to cooler things
Travels in waves; caused by vibrations	The flow of electric charge through a conductor	Energy stored in chemicals and released when broken apart or rearranged

Matching Cards

Conductors	Conduction	Convection
Pitch	Insulators	Radiation
When heat energy is sent in the form of rays, waves, or particles	The transfer of heat from one substance to another by direct contact	Material that lets heat travel through it
Material that does not let heat flow through it	The transfer of heat by the circulation or movement of a liquid or gas	The speed of vibrations determines this

Matching Cards

Static Electricity	Reflect	Refract
Absorb	Kinetic Energy	Potential Energy
Light energy that bends when it hits a surface	When light energy stops and is taken in by an object	When positive and negative charges aren't balanced
Energy in motion	Light energy that bounces off a surface	Stored energy

Name: Forms of Energy Project

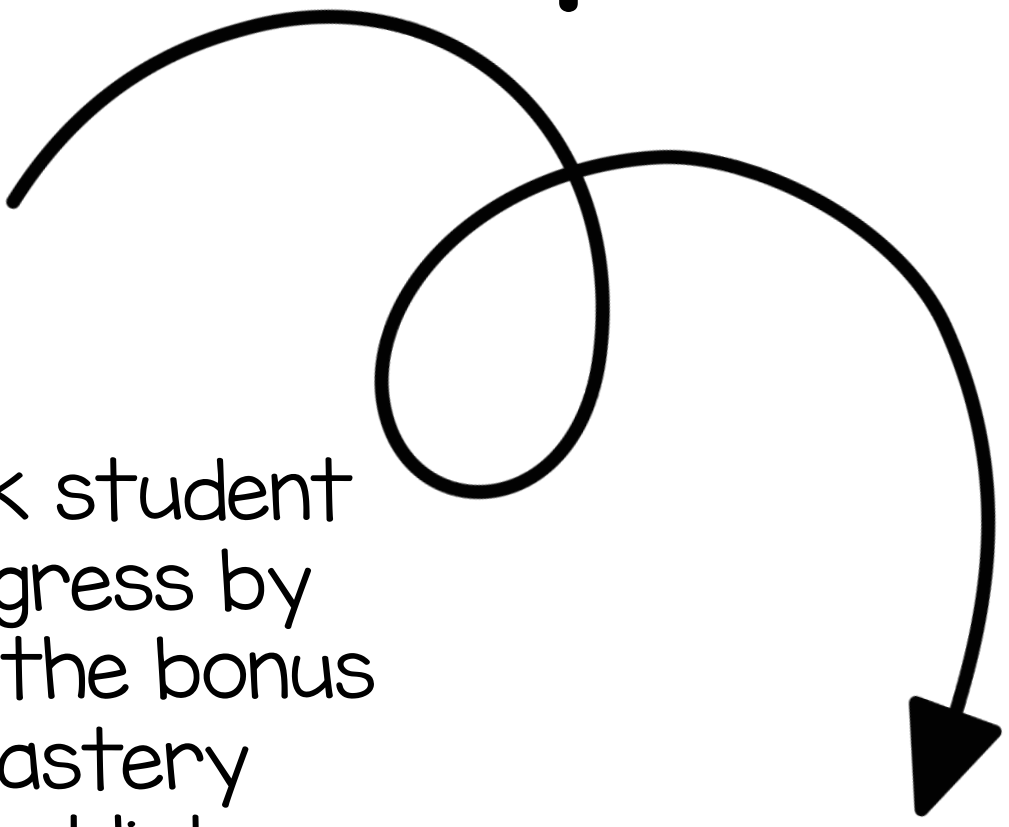
Auditory Write a song that describes and explains the different forms of energy.	**Visual** Design a bookmark or book cover that shows and explains the different forms of energy.	**Naturalist** Explain how we can use forms of energy in our daily lives.
Kinesthetic Create a short skit or dance that describes and explains the different forms of energy.	**Technological** Create a PowerPoint to show and explain the different forms of energy.	**Interpersonal** Create a board game that shows and explains the different forms of energy.
Verbal Compose a letter or write a speech to absent classmate and explain the different forms of energy.	**Intrapersonal** Create a journal of different weather that explains the different forms of energy.	**Math/Logical** Create a puzzle that shows and explains the different forms of energy.

Name: Forms of Energy Project

Write a song that describes and explains the different forms of energy.	Design a bookmark or book cover that shows and explains the different forms of energy.	Explain how we can use forms of energy in our daily lives.
Create a short skit or dance that describes and explains the different forms of energy.	Create a PowerPoint to show and explain the different forms of energy.	Create a board game that shows and explains the different forms of energy.
Compose a letter or write a speech to absent classmate and explain the different forms of energy.	Create a journal of different weather that explains the different forms of energy.	Create a puzzle that shows and explains the different forms of energy.

Exit Slips: Multiple Options Available

Assess what you think is important!



Track student progress by using the bonus mastery checklists.

Name:

How does light travel?

Name:

How does light travel?

Name:

How does light travel?

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How does light travel?

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How does light travel?

Name:

How does light travel?

Name:

What's the difference between reflection, refraction, and absorption?

Name:

What's the difference between reflection, refraction, and absorption?

Name:

What's the difference between reflection, refraction, and absorption?

Name:

What's the difference between reflection, refraction, and absorption?

Name:

How does heat travel?

Name:

How does heat travel?

Name:

How does heat travel?

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How does heat travel?

Name:

How does heat travel?

Name:

How does heat travel?

Name:

How does sound travel?

Name:

How does sound travel?

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How does sound travel?

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How does sound travel?

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How does sound travel?

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How does sound travel?

Name:

How does the pitch relate to the speed of vibration?

Name:

How does the pitch relate to the speed of vibration?

Name:

How does the pitch relate to the speed of vibration?

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How does the pitch relate to the speed of vibration?

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How does the pitch relate to the speed of vibration?

Name:

How does the pitch relate to the speed of vibration?

Name:

What is static electricity?

Name:

What is static electricity?

Name:

What is static electricity?

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What is static electricity?

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What is static electricity?

Name:

What is static electricity?

Name:

What happens when two items have the same charge?

Name:

What happens when two items have the same charge?

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What happens when two items have the same charge?

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What happens when two items have the same charge?

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What happens when two items have the same charge?

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What happens when two items have the same charge?

Name:

What is mechanical electricity?

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What is mechanical electricity?

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What is mechanical electricity?

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What is mechanical electricity?

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What is mechanical electricity?

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What's the difference between potential and kinetic energy?

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What's the difference between potential and kinetic energy?

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What's the difference between potential and kinetic energy?

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What's the difference between potential and kinetic energy?

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What's the difference between potential and kinetic energy?

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What's the difference between potential and kinetic energy?

Name:

What is electrical energy?

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What is electrical energy?

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What is electrical energy?

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What is electrical energy?

Name:

Give two examples of how electrical energy can be used.

Name:

Give two examples of how electrical energy can be used.

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Give two examples of how electrical energy can be used.

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Give two examples of how electrical energy can be used.

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Give two examples of how electrical energy can be used.

Name:

Give two examples of how electrical energy can be used.

Name:

What is chemical energy?

Name:

What is chemical energy?

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What is chemical energy?

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What is chemical energy?

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What is chemical energy?

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What is chemical energy?

Name:

Give two examples of chemical energy.

Name:

Give two examples of chemical energy.

Name:

Give two examples of chemical energy.

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Give two examples of chemical energy.

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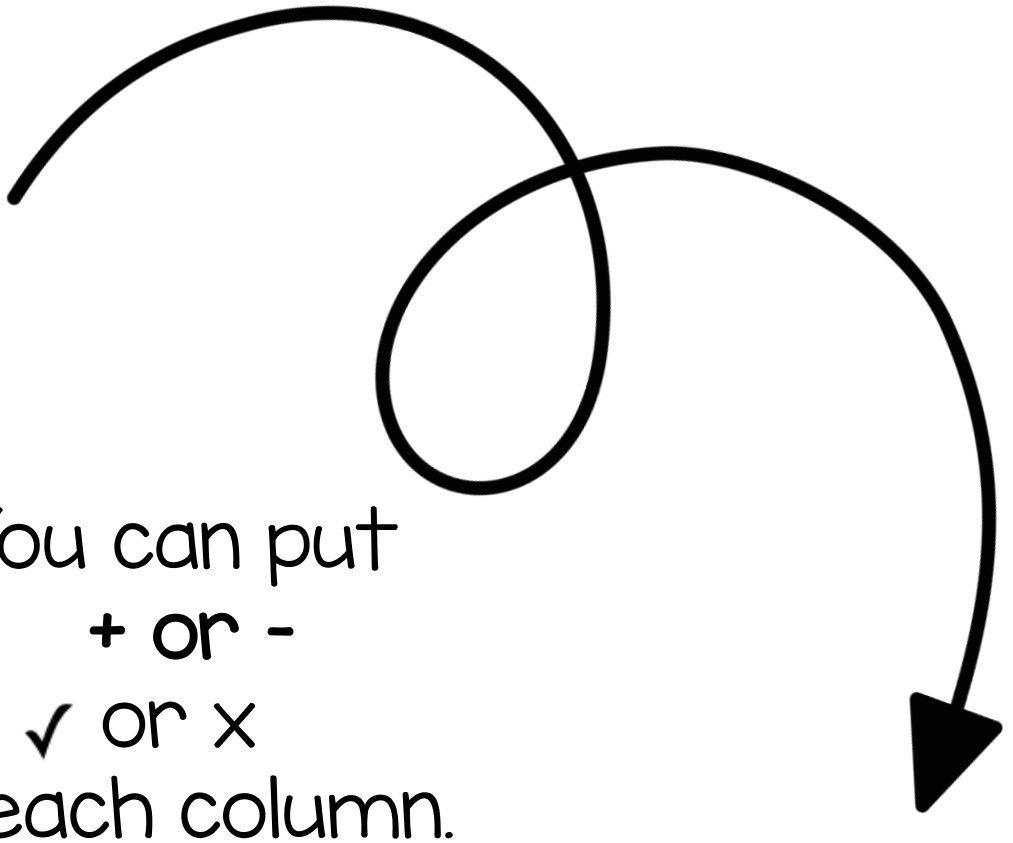
Give two examples of chemical energy.

Name:

Give two examples of chemical energy.

Use the following pages to track student understanding on Exit Slips.



You can put
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Exit Slip Tracking

Date	Exit Slip Topic	Students Who Have Shown Mastery	Students Who Need Additional Review/Practice

Name: _____ Forms of Energy Unit Assessment

1. Match the form of energy with it's definition .

_____ Light
_____ Heat
_____ Mechanical
_____ Chemical
_____ Sound
_____ Electrical

a. Travels in a straight line until it interacts with an object or moves from one material to another
b. Energy of movement; potential and kinetic energy combined
c. Travels from one place to another when there are different temperatures; moves from warmer to cooler things
d. The flow of electric charge through a conductor
e. Travels in waves; caused by vibrations
f. Energy stored in chemicals and released when broken apart or rearranged

2. Match the light energy vocabulary word with the definition .

_____ Static Electricity
_____ Reflect
_____ Refract
_____ Absorb
_____ Kinetic
_____ Potential
_____ Conductors
_____ Insulators
_____ Pitch
_____ Conduction
_____ Convection
_____ Radiation

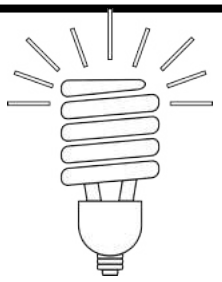
a. The transfer of heat by the circulation or movement of a liquid or gas
b. Stored energy
c. Material that does not let heat flow through it
d. Energy in motion
e. When light energy stops and is taken in by an object
f. The transfer of heat from one substance to another by direct contact
g. The speed of vibrations determine this
h. Light energy that bounces off a surface
i. When heat energy is sent in the form of rays, waves, or particles
j. Light energy that bends when it hits a surface
k. When positive and negative charges aren't balanced
l. Material that lets heat flow through it

3. Give two examples of how energy can cause motion or create change.

ANSWER KEYS

- Light travels in a straight line
- Absorption
- Reflection
- Refraction

Light



- Heat travels from warmer to colder objects
- Radiation
- Convection
- Conduction

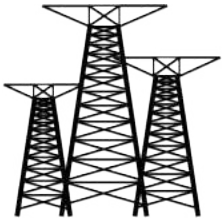
Heat

- Travels in sound waves
- Higher pitches have faster vibrations
- Lower pitches have slower vibrations

Sound

- Energy made available by the flow of electric charge through a conductor
- Electrically charged objects can attract an uncharged object
- We can get electrical energy from batteries, outlets, fossil fuel power plants, windmills, solar panels, hydroelectric power plants, and nuclear power plants.

Electrical



- Energy stored in chemicals and released when broken apart or rearranged
- Glow sticks, batteries, food, fuel
- Chemical energy is a form of potential (or stored) energy that will only be observed when it is released in a chemical reaction.

Chemical

- Potential + kinetic energy = mechanical energy
- Movement

Mechanical

Name:

Heat/Thermal Energy

Investigations

How can we prove that this statement is true?

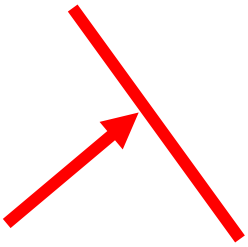
Heat travels from one place to another when there are different temperatures, always moving from hotter to colder things.

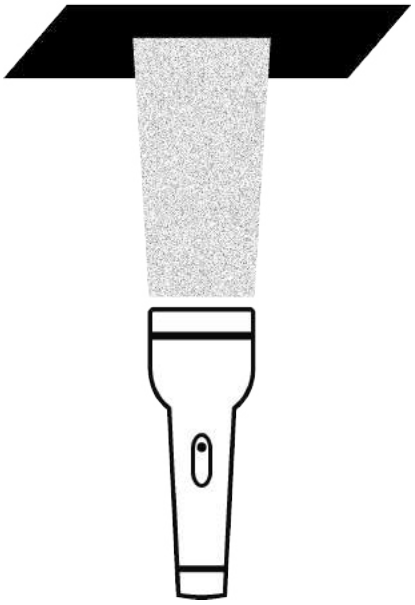
Procedure	Sketch	How did the heat travel?
1. Have a room temperature cup of water. Put in 2 drops of red food coloring. 2. Add 2 ice cubes into the water. 3. What do you observe?		The heat traveled from the hotter item (the room temperature water) to the colder item (the ice cubes). This is an example of convection because of the circulation/movement of a liquid or gas.
1. Rub your hands together quickly. 2. Place an ice cube in your hands. 3. What happens to the ice cube?		The heat traveled from the hotter item (your hands) to the cooler item (the ice cube). This is an example of conduction because there was direct contact.
1. Light a candle with adult supervision. 2. What happens to the temperature of the air near the candle?		The heat traveled from the hotter item (the candle flame) to the cooler item (the air). This is an example of radiation because you didn't have to touch the candle to experience the heat.

Definition: When light energy stops and is taken in by an object

Examples: Plant, tent, strawberry, desk

Sketch:

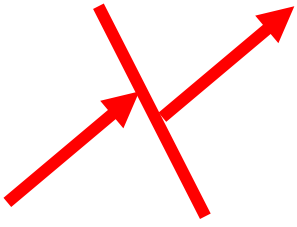




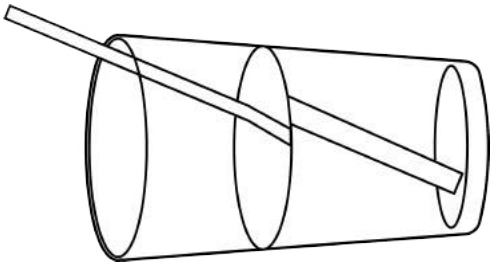
Absorption

Definition: Light energy that bends when it hits a surface

Examples: straw in water, magnifying glass, telescope, prism

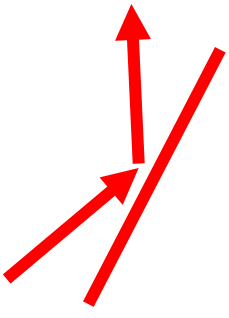


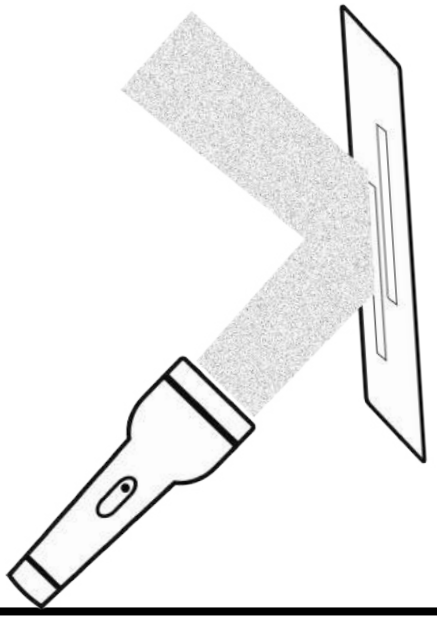
Refraction



Definition: Light energy that bounces off a surface

Examples: mirror, quarter, moon, spoon



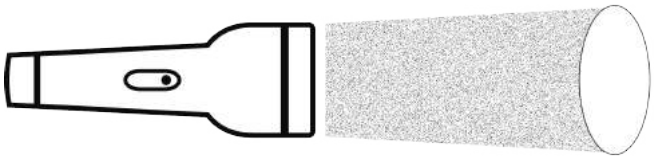


Reflection

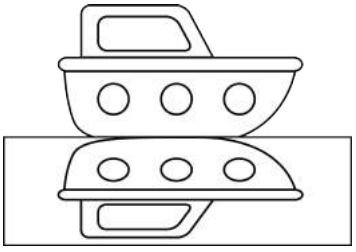
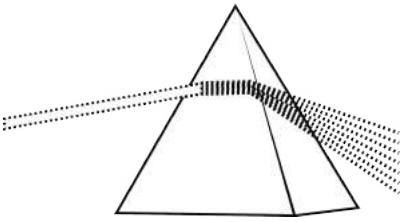
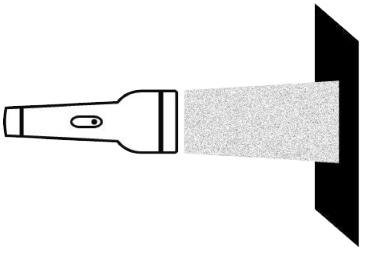
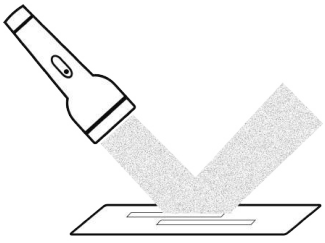
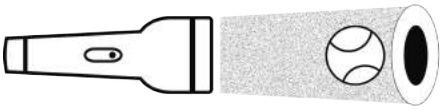
Name:

How Does Light Travel? KEY

Sort



Light travels in a straight line until it interacts with an object or moves from one material to another.

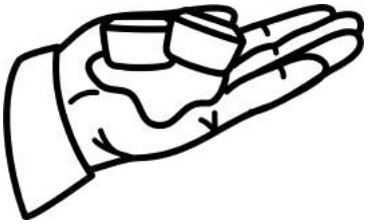
	Reflect	Refract	Absorb
Definition	Light energy that bounces off a surface	Light energy that bends when it hits a surface	When light energy is stops and is taken in by an object
Example			
Example			

Cut out the examples below and sort them to the matching categories above.

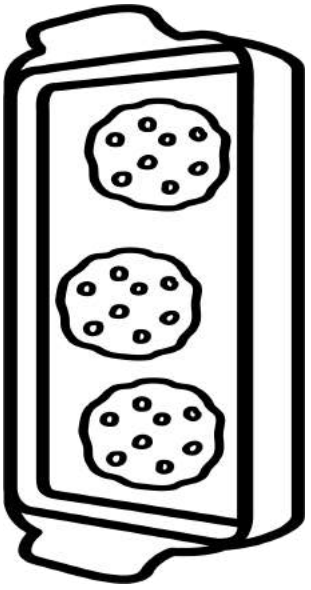
Definition: The transfer of heat from one substance to another by direct contact

Examples: The fire heating a pan and cooking an egg, ice melting in your hand, a fire touching a pot, hot cocoa heating the mug

Sketch:



Conduction

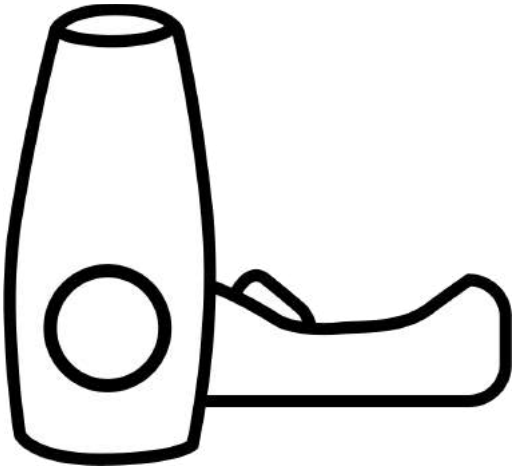


Definition: The transfer of heat by the circulation or movement of a liquid or gas

Examples: A rising hot air balloon, water boiling in a pot, roasting marshmallows, heat being blown out of a blow dryer

Sketch:

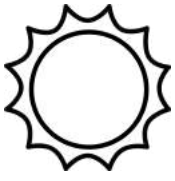
Convection



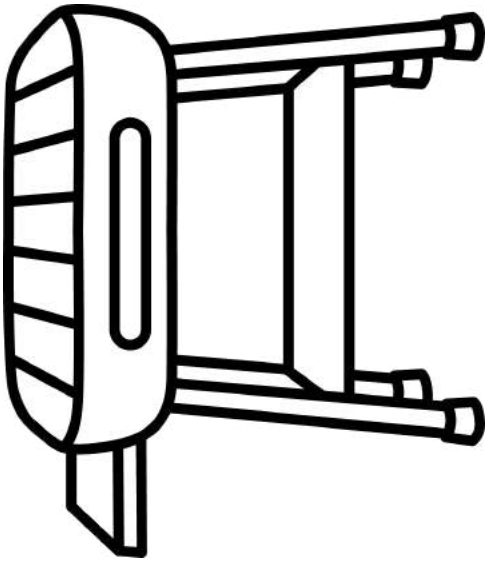
Definition: When heat energy is radiated or sent in the form of rays, waves, or particles

Examples: Cooking food in a microwave, heat coming from a hot pot, the Sun's rays warming the earth, heat from a fire

Sketch:



Radiation

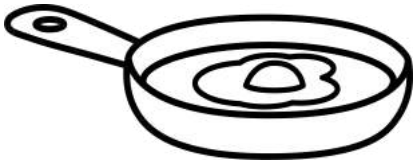
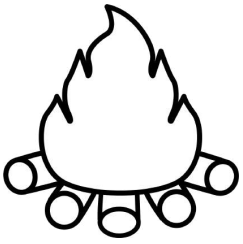
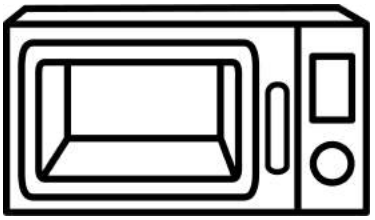


Name:

How Does Heat Travel? KEY

Sort

Heat travels from one place to another when there are different temperatures, always moving from hotter to colder things.

	Conduction	Convection	Radiation
Definition	the transfer of heat from one substance to another by direct contact	the transfer of heat by the circulation or movement of a liquid or gas	When heat energy is radiated or sent in the form of rays, waves, or particles
Example			
Example			

Cut out the examples below and sort them to the matching categories above.

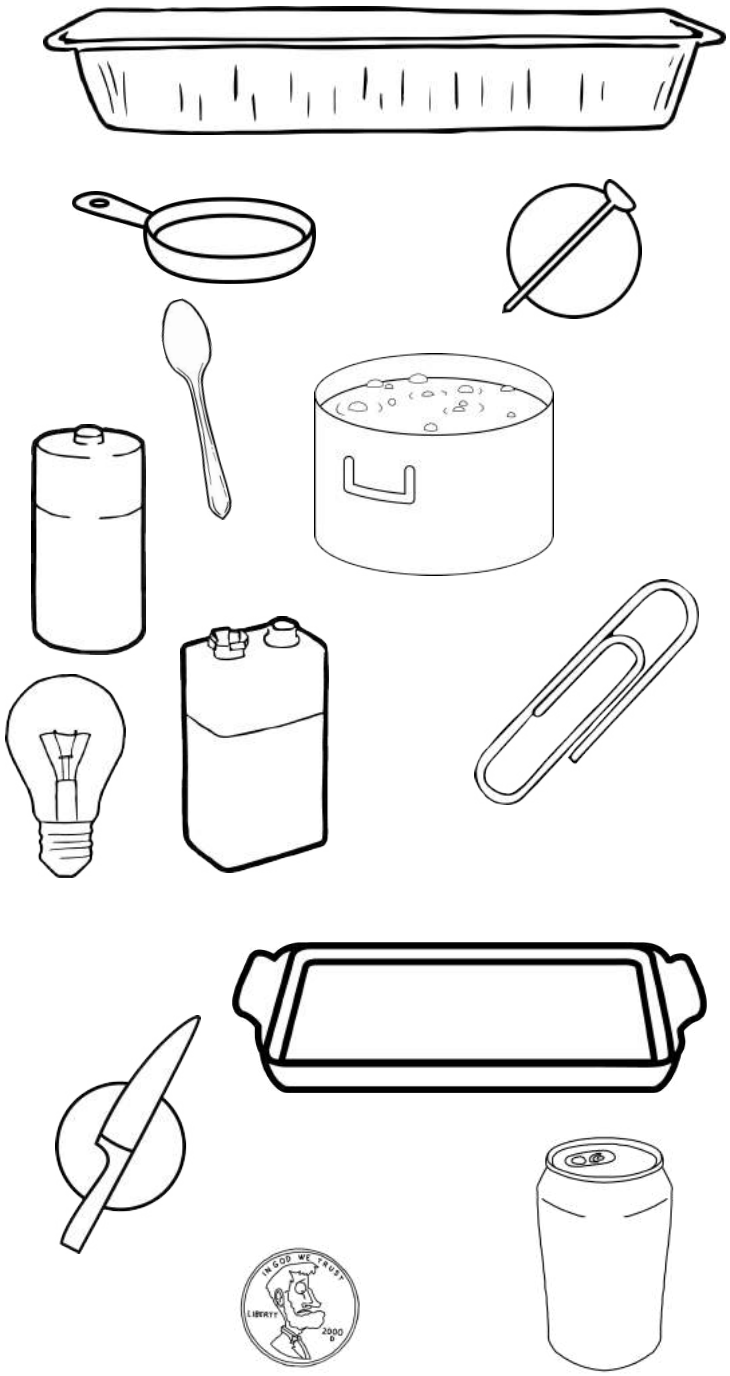
Name:

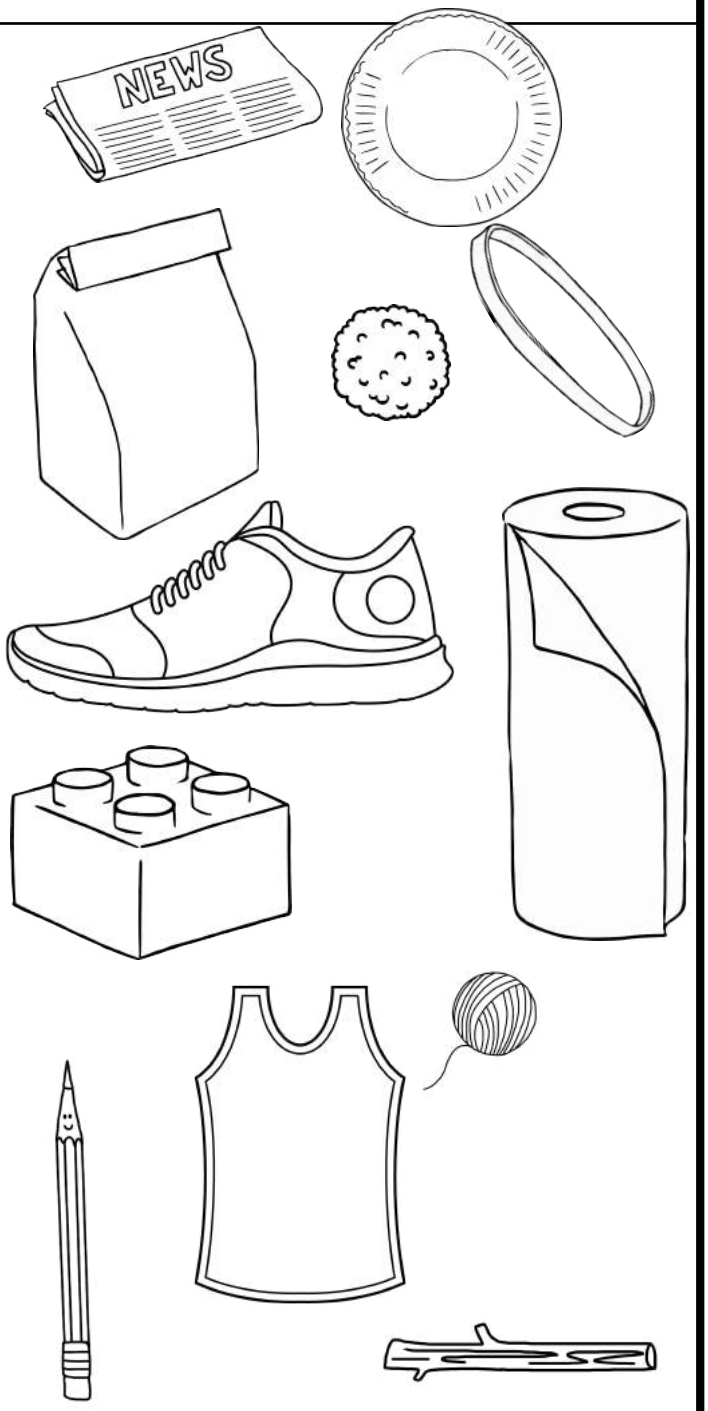
Conductors/Insulators KEY

Sort

Conductors allow heat energy to pass through while insulators stop or slow down heat energy.

Thermal Conductors	Thermal Insulators
Any material that lets heat flow through it	Any material that does NOT let heat flow through it



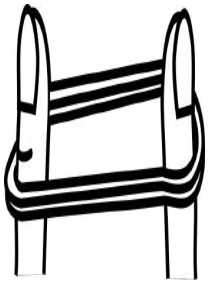
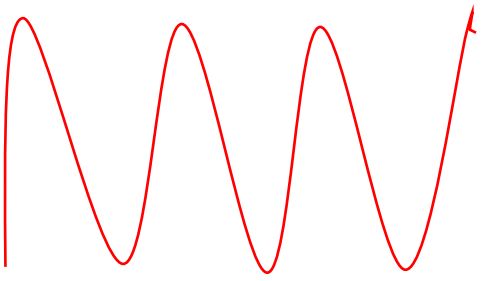
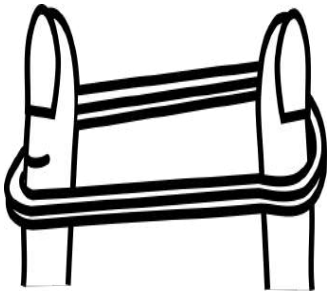
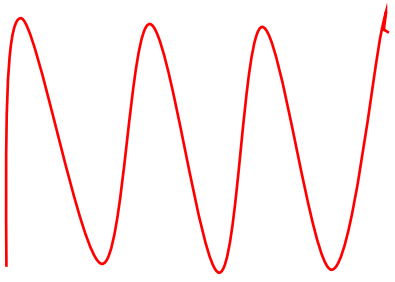
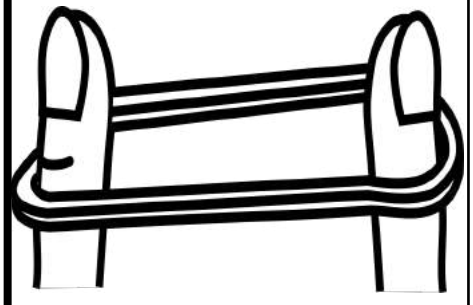
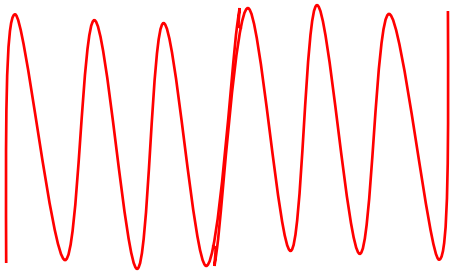


Name:

Investigation

Sound Energy

What happens when pluck a rubber band?

Investigation	Observations	Sound Waves & Pitch
	When you barely stretch rubber band, it vibrates slower and creates a lower-pitched sound.	Low Pitch Slow Vibrations 
	When you stretch rubber band a little bit, it vibrates some and creates an in between sound.	In Betewen Pitch Moderate Vibrations 
	When the rubber band is stretched tight, it vibrates faster and creates a higher-pitched sound.	High Pitch Fast Vibrations 

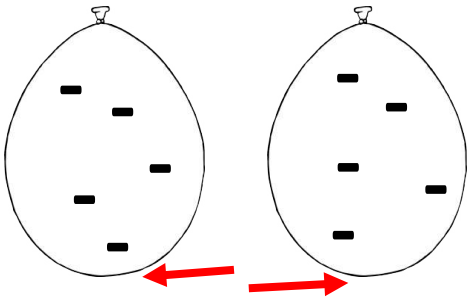
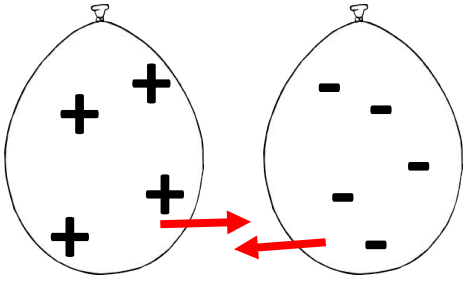
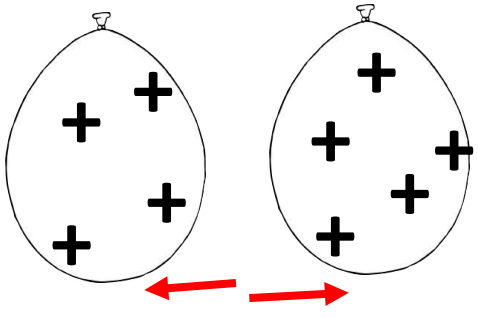
Based on this investigation, what conclusions about pitch and vibrations can you make? The slower the vibrations, the lower the pitch. The faster the vibrations, the higher the pitch.

Name:

Static Electricity KEY

Investigation

All things are made of matter, which are also made up atoms. Inside of atoms, you will find neutrons (positive charges+), protons (negative charges-), and electrons (no charge). Static electricity is created when positive and negative charges aren't balanced. Positive and negative charges don't move around too much, but electrons love to jump all over. When an object or person has extra electrons, it ends up having a negative charge. Positive charges look for negative charges and negative charges search for positive charges.

Investigation	Observations
	The balloons will repel or move away from each other.
	The balloons will attract each other or move closer together.
	The balloons will repel or move away from each other.

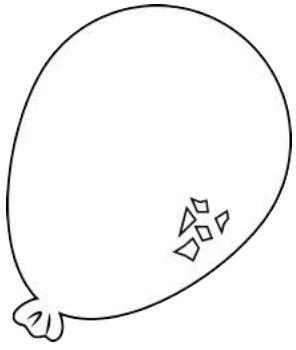
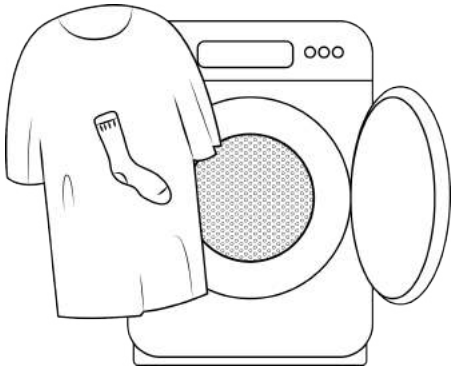
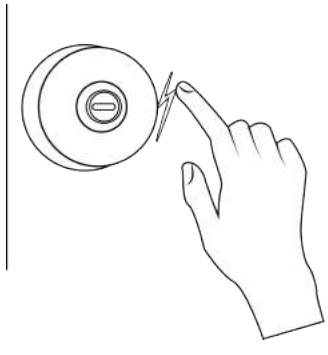
Based on this investigation, what conclusions can you make about static electricity? _____

_____

Name:

Static Electricity KEY

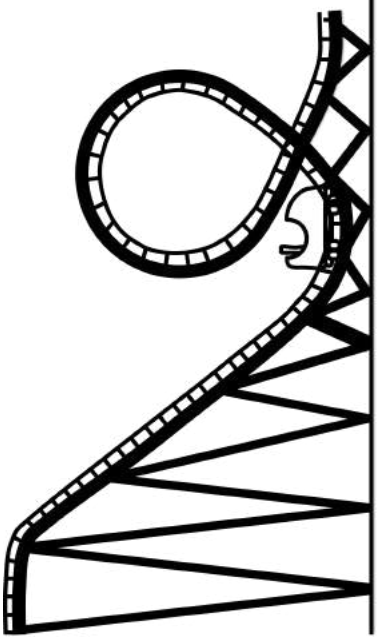
Apply

Situation	Conclusions
	The balloon and the small pieces of paper must have the opposite charge. They are being attracted to each other.
	The sock and shirt have just come out of a dryer. They are attracted to each other, so they must have opposite charges. Static electricity happens often after clothes have been in a dryer because it's dry air. This causes extra electrons to build up.
	When you rub a balloon on your head, your hair will stand up. The balloon and your hair are attracted to each other, so they must have opposite charges.
	You get shocked touching a doorknob because it's made of metal and has a positive charge and few electrons. The electrons from your body want to jump from you to the doorknob, which creates a shock!

Based on these situations, what conclusions can you make about static electricity? _____

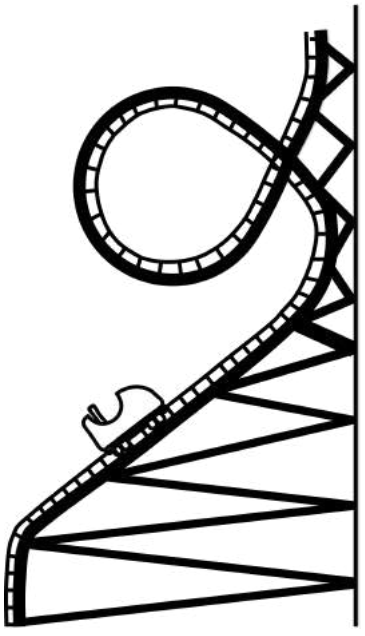
_____

- The combination of potential and kinetic energy
- Energy of motion



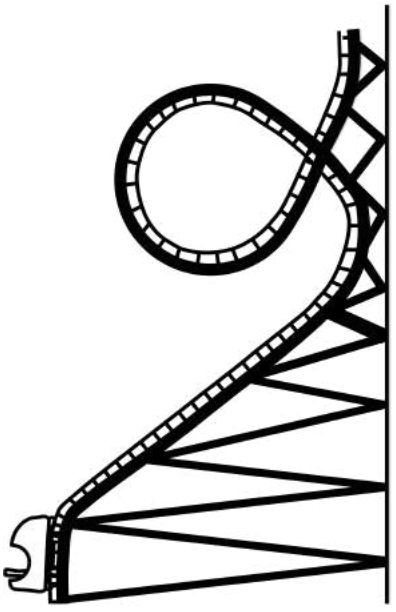
Mechanical =

- Energy in motion
- Doing work
- Relies on speed



Kinetic +

- Stored energy
- The higher the position of an object, the more potential energy it has
- Relies on position

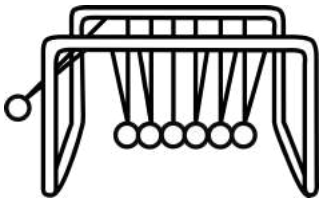
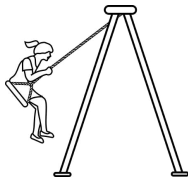
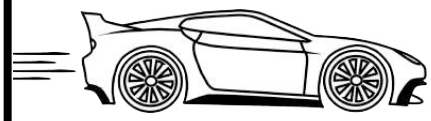
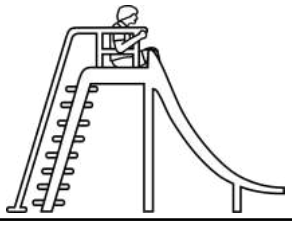
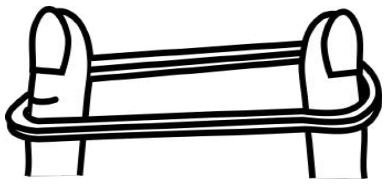
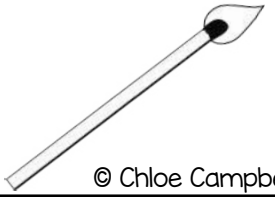


Potential +

Name:

Static Electricity

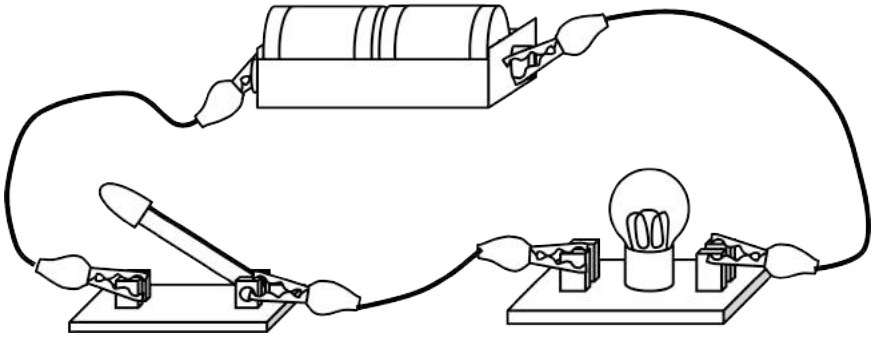
Real Life Application

Situation	Potential Kinetic	Kinetic Energy
	This ball is showing stored energy and is about to fall.	
		This wind turbine is in motion so it is showing kinetic energy.
	The person is showing stored energy.	
		The car is moving so it is showing kinetic energy.
	This arrow is drawn back and ready to be released. It has stored energy.	
	The person is showing potential energy, stored energy at the top of the slide.	
	A rubber band being stretched is showing potential energy. It has stored energy.	
		A match that is lit is using kinetic energy to create heat and light energy

Name:

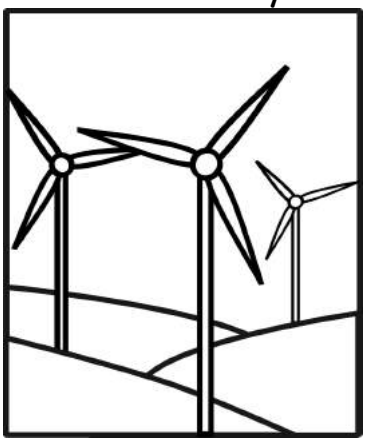
Electrical Energy KEY

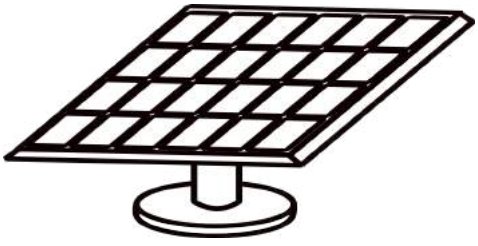
Electrical energy is the flow of electric charge through a conductor and can **come from a variety of sources.**



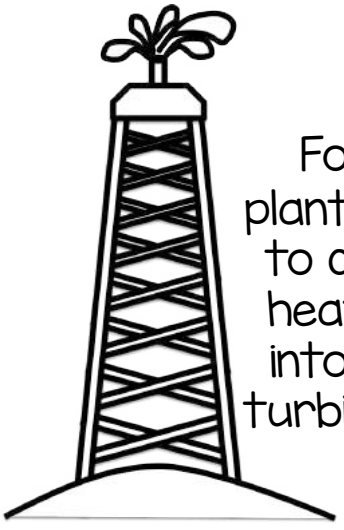
Batteries have chemical energy that turns into electricity.

Windmills take moving air and turn it into electricity.

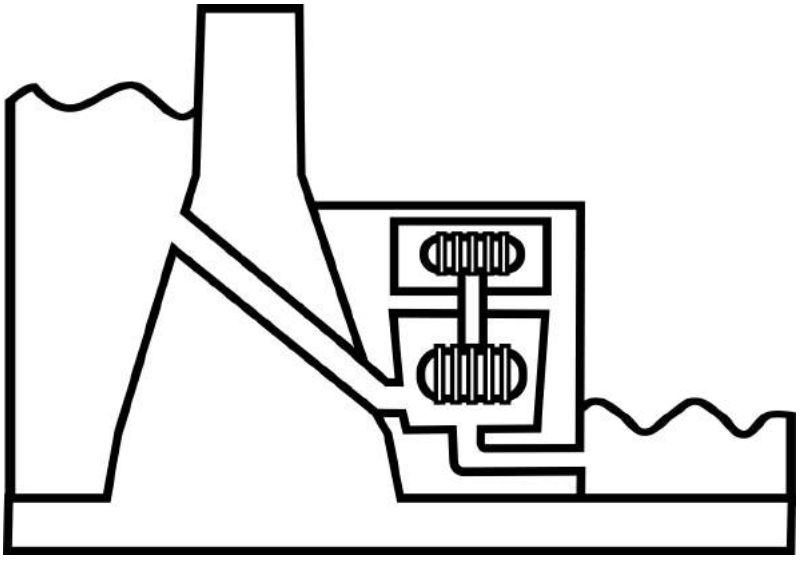




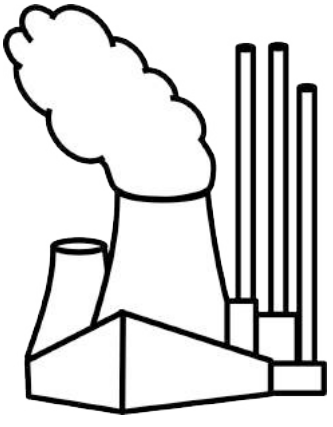
Solar panels take radiant energy and turn it into electricity.



Fossil fuel power plants burn coal or oil to create heat. This heat is then turned into steam to drive turbines which create electricity.



Hydroelectric power plants turn moving water into electricity.



Nuclear power plants take thermal energy and transfer it to electricity.

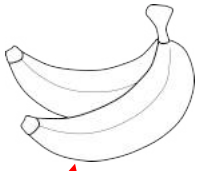
Name:

Chemical Energy

Chemical energy is a form of potential (or stored) energy that will only be observed when it is released in a chemical reaction. Chemical energy is stored in the bonds between atoms and molecules. Chemical energy is what holds the atoms in a molecule together and what holds the molecules in a substance together. When bonds between atoms are formed or broken, a chemical reaction occurs. This is when there is a new substance formed with different properties.

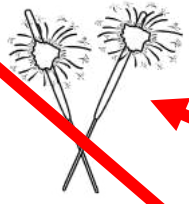
Draw a line to match the picture to the description.

When coal is burned, it converts chemical energy into light and heat.

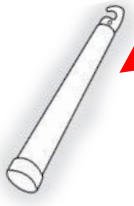


Wood, when dry, stores chemical energy. This energy is released when the wood burns and is converted into heat and light energy.

The chemical energy of food is stored energy. When combined with the acids in our stomachs, our bodies change the stored chemical energy into heat or mechanical energy.

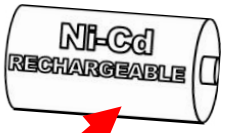


When you crack a glow stick, the ingredients are mixed. This releases carbon dioxide and chemical energy, which is converted to light energy.



Fireworks contain potential chemical energy, which is changed into kinetic energy to send the firework in the air. It then produces sound and light energy.

Sunlight creates a chemical reaction that gives plants energy to grow.

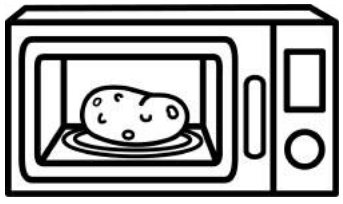
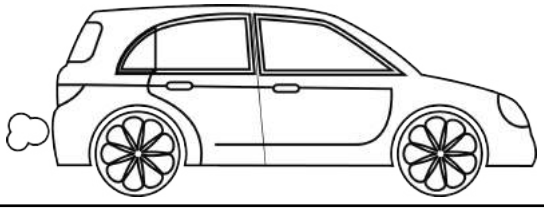
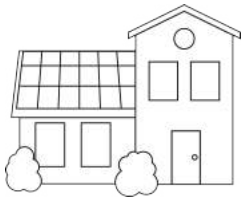
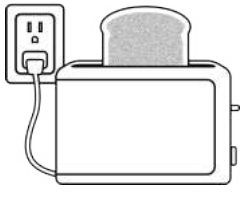
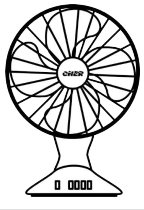


The chemical ingredients in the hand warmer package react with oxygen in a chemical reaction. The chemical energy is converted to heat energy.

When something is connected to a battery, chemical reactions take place to produce electricity.

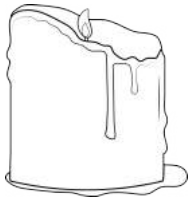
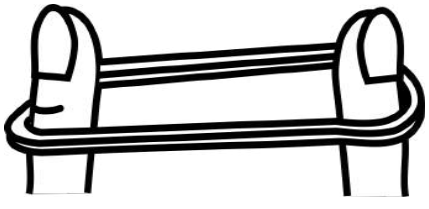
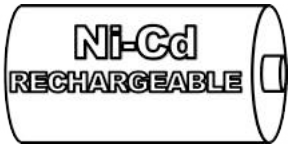
Name:

Energy Transfers KEY

What type of energy is represented in the picture? Put a check mark in the columns that match the type of energy shown.	Electrical	Light	Heat	Sound	Chemical	Mechanical
	X	X	X	X	X	X
	X		X	X	X	X
	X	X	X	X	X	X
	X	X	X	X	X	X
	X	X	X	X	X	X
	X	X		X		X
		X	X	X	X	

Name:

Energy Transfers KEY

What type of energy is represented in the picture? Put a check mark in the columns that match the type of energy shown.	Electrical	Light	Heat	Sound	Chemical	Mechanical
		×	×		×	
				×		×
				×		×
		×	×	×	×	
				×		×
	×	×	×			×
	×				×	

Name: KEY

Forms of Energy Unit Assessment

1. Match the form of energy with it's definition .

A Light	a. Travels in a straight line until it interacts with an object or moves from one material to another
C Heat	b. Energy of movement; potential and kinetic energy combined
B Mechanical	c. Travels from one place to another when there are different temperatures; moves from warmer to cooler things
F Chemical	d. The flow of electric charge through a conductor
E Sound	e. Travels in waves; caused by vibrations
D Electrical	f. Energy stored in chemicals and released when broken apart or rearranged

2. Match the light energy vocabulary word with the definition .

K Static Electricity	a. The transfer of heat by the circulation or movement of a liquid or gas
H Reflect	b. Stored energy
J Refract	c. Material that does not let heat flow through it
E Absorb	d. Energy in motion
D Kinetic	e. When light energy stops and is taken in by an object
B Potential	f. The transfer of heat from one substance to another by direct contact
L Conductors	g. The speed of vibrations determines this
C Insulators	h. Light energy that bounces off a surface
G Pitch	i. When heat energy is sent in the form of rays, waves, or particles
F Conduction	j. Light energy that bends when it hits a surface
A Convection	k. When positive and negative charges aren't balanced
I Radiation	l. Material that lets heat flow through it

3. Give two examples of how energy can cause motion or create change.

Answers will vary

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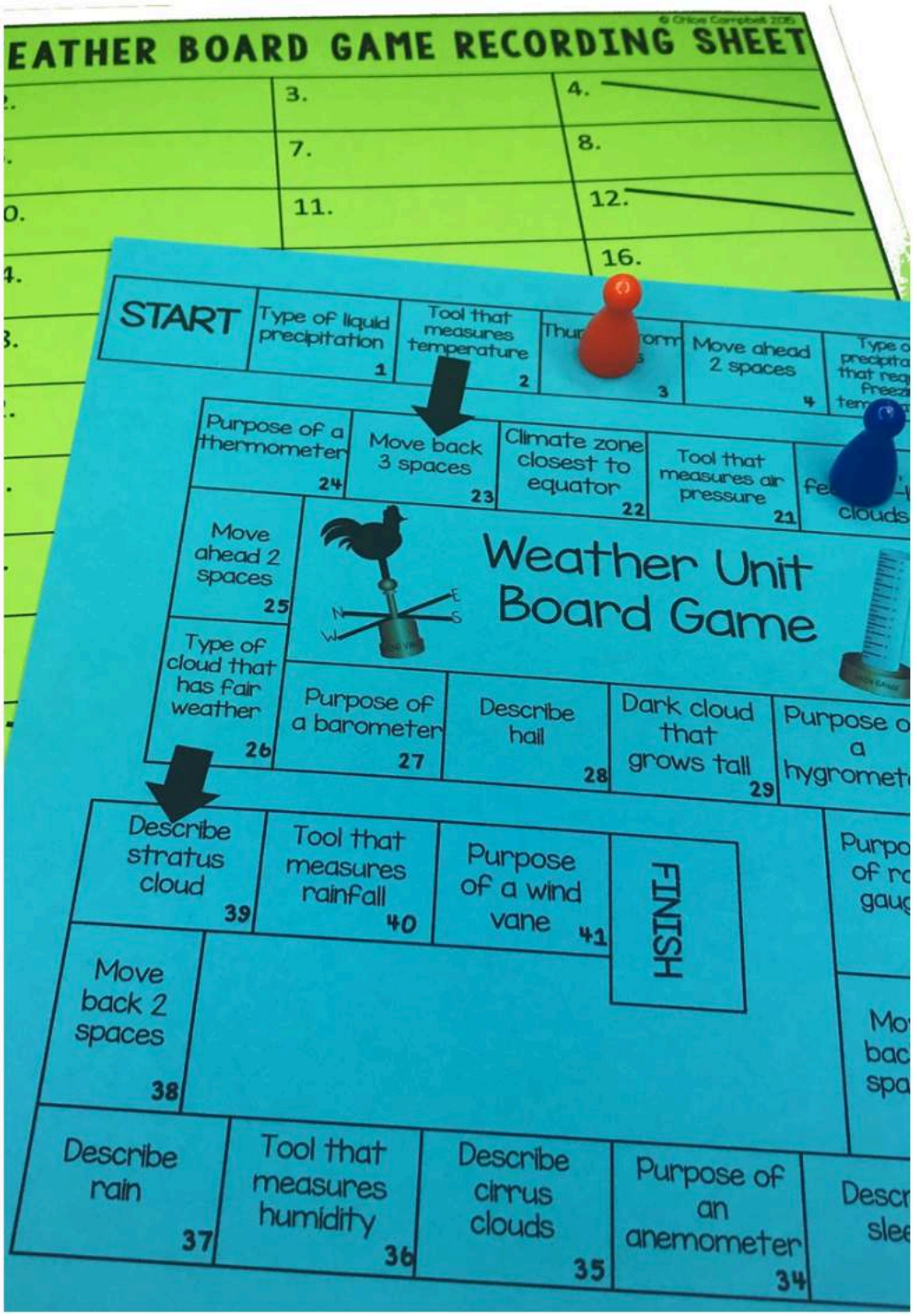
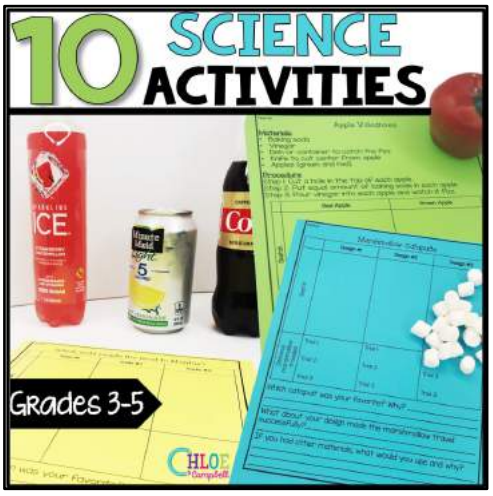
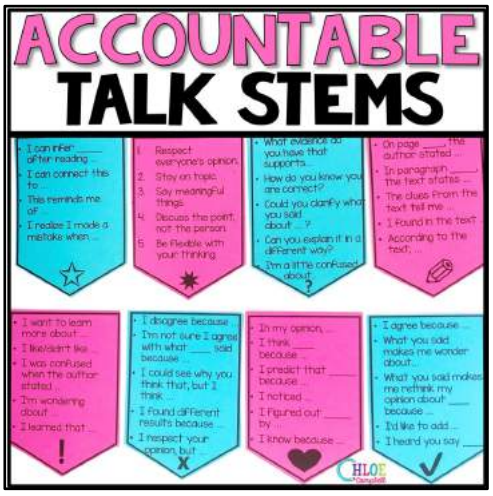
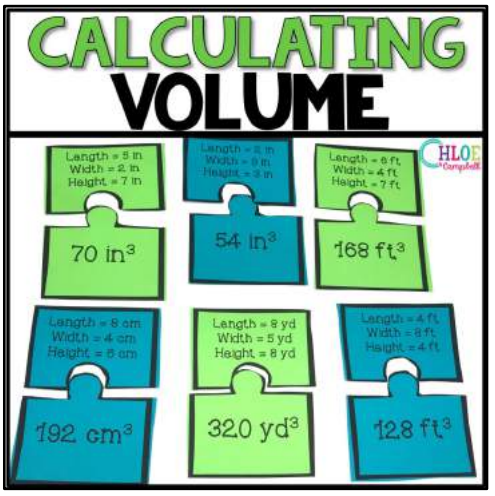
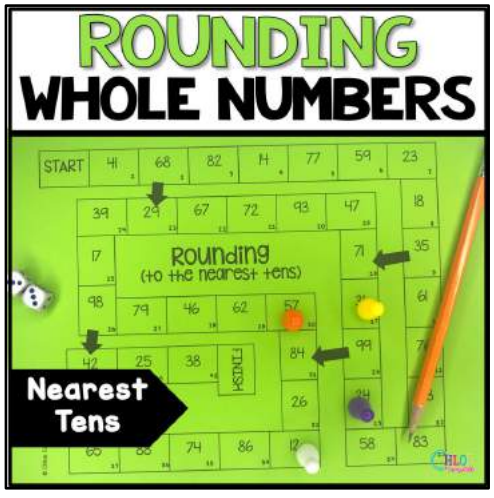


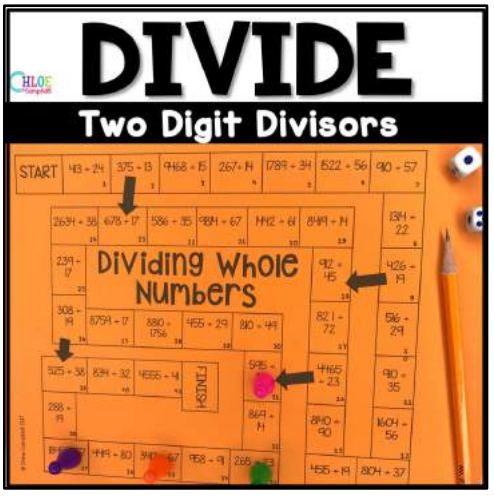
Resources You'll LOVE!

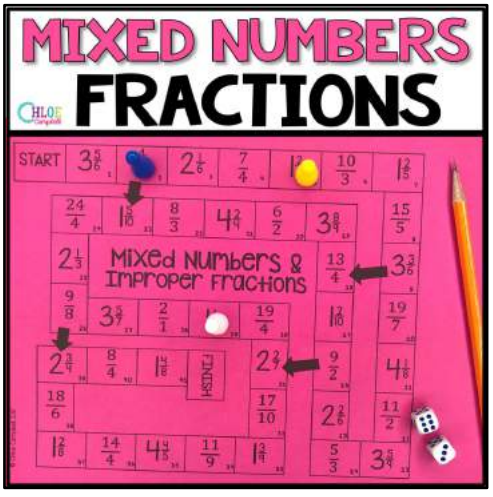


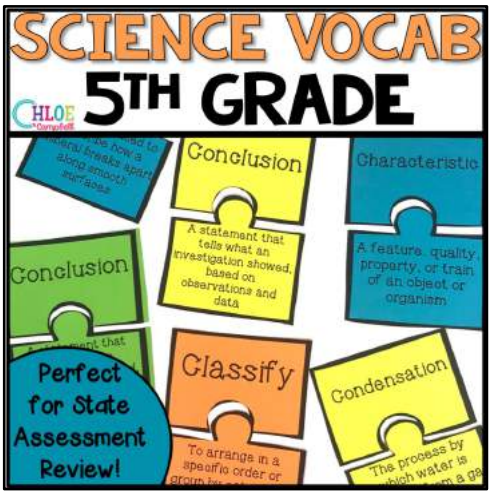


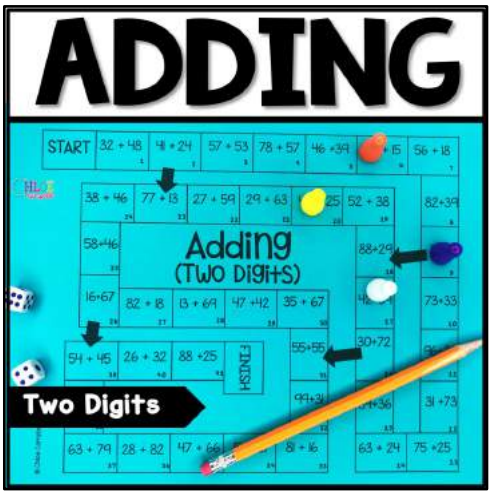












SCIENCE

ELA

MATH

Love this resource?

STEM in a BAGGIE for the WHOLE YEAR!!

1. Build a Tower: Toothpicks, marshmallows
2. Build a Catapult: rubber bands, popsicle sticks, spoons, marshmallows
3. Build a Tower: Index cards
4. Build a Pyramid: Miniature cups
5. Build a 3D Shape: Gumdrops, toothpicks
6. Build a House: Sticky notes
7. Build a Boat: Aluminum foil
8. Build a Stage and Puppet: Sock, popsicle sticks, tape
9. Build a Bridge: Straws, tape
10. Build a Park: Pipe cleaners

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CHLOE Campbell

THANK YOU!

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