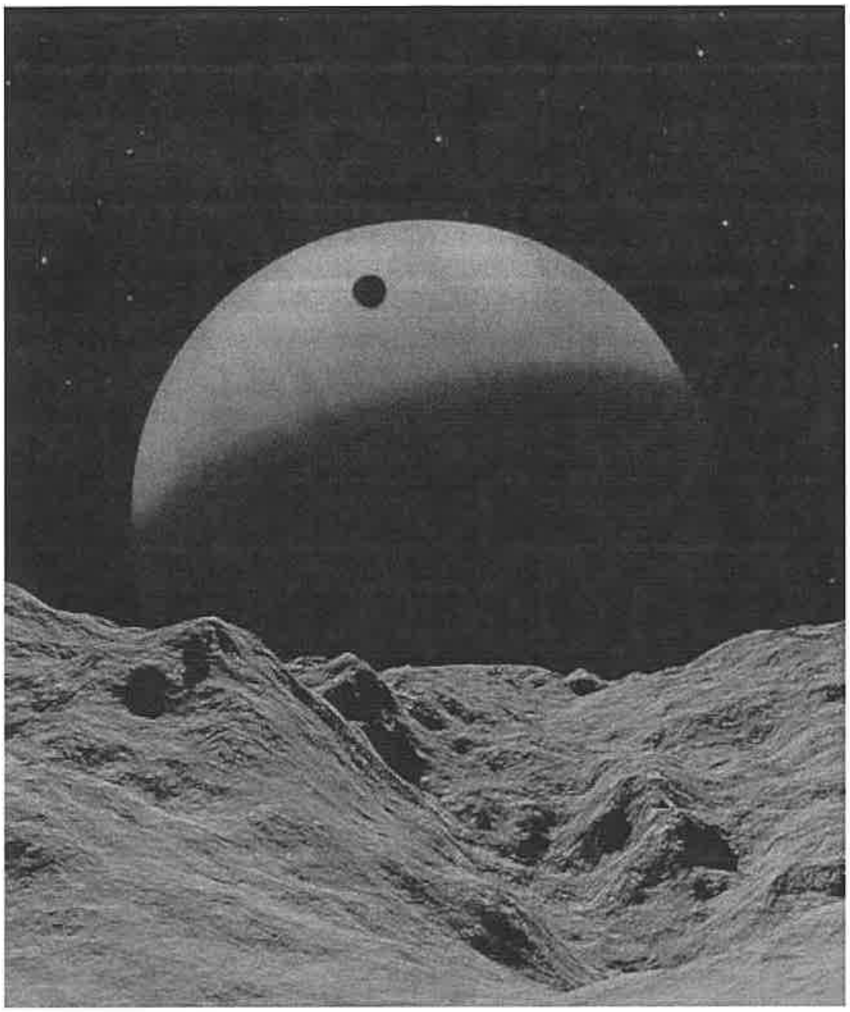


This is Neptune as it might look if seen from one of its moons. The shadow of another moon makes a dark spot on the planet's surface.

lame: ____________________ Date:__________ Planets Act: 3

Use the word bank to help you choose the correct word to complete each sentence.

moons	coldest	Red Planet	second
Galileo	eighth	third	largest

1. Earth is the ________________________ planet from the sun.
2. Jupiter is the ____________________ planet in the Solar System.
3. Neptune is the ___________________ planet from the sun.
4. Uranus is the _____________________ planet in our Solar System.
5. Venus is the _________________________ planet from the sun.
6. Mars is also known as the ______________________________.
7. Mercury has no ______________________.
8. The rings of Saturn were first seen by _____________________.

Discovery EDUCATION

Getting to Know: Forms of Energy

It's a lazy Saturday afternoon. Outside, the wind is blowing the tree branches back and forth. You turn on a computer. You check your e-mail. You charge up your mp3 player so you can listen to some music. You decide to walk to the park. Maybe some of your friends are there. You could play a game of soccer. "I'm going to head over to the park," you tell your dad. "Don't forget you still have to practice piano," your dad says. "I won't forget," you say.

These are the kinds of things you see and do every day. What do they have in common? Wind, turning on a computer, charging a battery, talking, and playing music seem very different. But they all use forms of energy.

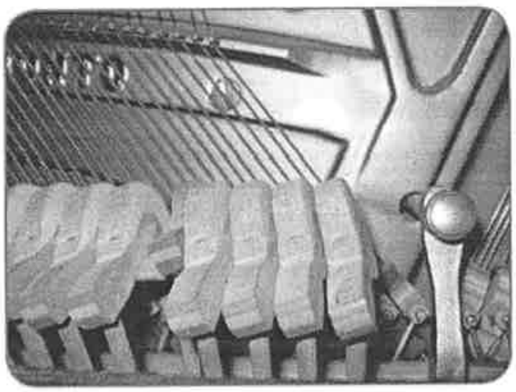
I know we use energy. But what are the different forms of energy?

Energy comes in different forms. You sense *light* energy when you see things. You sense *sound* energy when you hear someone talking. You sense *thermal* energy when you feel heat coming from the stove. Any time something moves, it has *motion* energy.

Some forms of energy aren't as easy to sense. *Electrical* energy is what makes your computer turn on when you press a button. The bonds between atoms store *chemical* energy. And the bonds between particles in the nucleus of an atom have a special type of energy. You guessed it! It's called *nuclear* energy.

So, when I play the piano, am I making sound energy?

Well, you are causing sound energy to come out of the piano. When you play a piano, small hammers strike the strings inside. The strings vibrate. This causes the air molecules near the strings to vibrate, too. The vibrations travel through the air to your ear. That's sound energy. But think about what you did to cause that sound energy. You used another kind of energy: motion energy. Think about what type of energy helped you move your fingers. Suppose you ate an apple before playing the piano. Your body burned food, which is stored chemical energy!



The hammers inside a piano strike the strings, changing motion energy to sound energy.

It doesn't stop there. The apple has stored chemical energy made by an apple tree. Where did the tree get the energy needed to make the chemical energy? It came from the Sun! Plants use sunlight to make chemical energy during photosynthesis. You can trace the sound energy from a piano all the way back to energy from the Sun.

You can see that energy isn't created from nothing. Energy is changed from one form to another.

We talk about "using" energy all the time. I always thought we were using it up.

When we "use" energy, we're changing it from one form to another form. We do this so we can use the energy. Energy can't be made from nothing. It can't be destroyed. It can only be changed.

Misconception 1: *We are running out of energy.*

Energy can't be created or destroyed. It can only change forms. Therefore, we can't "run out" of energy. However, we can run out of fossil fuels. These supply much of the energy we use to make electricity and power cars. The good news is that renewable energy such as solar power and wind power is becoming cheaper and easier to use.

Sometimes we talk about using an energy source like oil, gasoline, or other fuels. A fuel is a substance that contains chemical energy. We burn the fuel to release the chemical energy. For example, we burn coal to heat a liquid. This changes the liquid to a gas. The hot gas moves a turbine. When a turbine moves, it makes electricity. We can use the electricity to power a lamp. The *energy* is not used up. It is changed from chemical energy to motion energy. The motion energy is changed into electrical energy. The electrical energy is changed into light energy. But the *fuel* we burned is used up. That's an important difference.

In this lesson, you will learn more about energy in all its forms.

Gasoline is a fossil fuel. In an engine, the chemical energy of the gasoline changes to motion energy and thermal energy.

Activity: Draw a picture, in the space below, of something you have done since you have been home that represents at least **three** forms of energy. **Label each type of energy.**

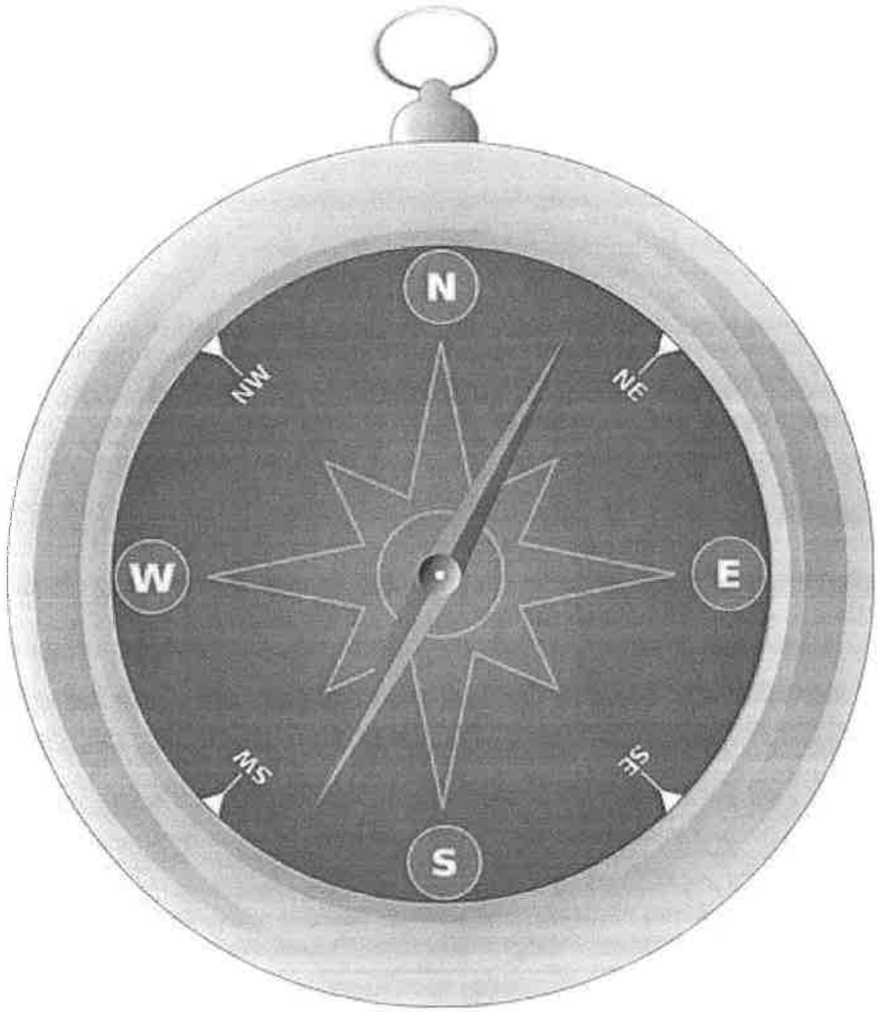
3rd Science Distance Learning Checklist

Directions: Work through the assignments within the packet. You should spend about 30 minutes a day on Science content. The checklist is provided as a guide, but feel free to work at your own pace and to skip around if you like. If you have questions, please contact your child's teacher.

Week 3	Print Resources	Optional Digital Resources
Day 1	☐ ReadWorks article: *Magnetic Fields and the Magnetic Compass* ☐ Answer the questions at the end of the article	☐ BrainPop Jr. - Magnets o Available through Classlink – search Magnets
Day 2	☐ Read the RocketLit article: *Criteria vs. Constraints* ☐ Answer the questions at the end of the article	☐ BrainPop – Engineering and Design Process o Available through Classlink – search Engineering and Design Process
Day 3	☐ ReadWorks article: *Electricity & Energy: Circuits* ☐ Answer the questions at the end of the article	☐ Brain Pop o Circuit Game
Day 4	☐ Read the article from Discovery Education: *Solids, Liquids, and Gases* ☐ Complete the House drawing activity	☐ BrainPop Jr. – Matter o Available through Classlink – search Matter ☐ States of Matter Simulation ☐ https://tinyurl.com/lsodv25
Day 5	☐ Read the article: *Physical Properties of Matter* ☐ Complete the Physical Properties Task	☐ Study Jams Property of Matter ☐ https://tinyurl.com/7f5t8l3

Magnetic Fields and the Magnetic Compass

by ReadWorks



If you were in a forest, chances are there wouldn't be any street signs to help direct you! That's why you need a compass to help you find your way using the power of a magnetic field.

What Is a Magnetic Field?

Magnets are objects that produce an area of magnetic force called a magnetic field. Magnetic fields by themselves are invisible to the human eye. Magnets attract, or pull, objects made of materials that are very attracted to magnets. These materials include iron and nickel. A magnet also reacts to another magnet when they are close enough to each other.

What Are Magnetic Poles?

Magnets come in different shapes, strengths, and sizes. However, they all have a north pole and a south pole. The south pole of one magnet is attracted to another magnet's north pole. However, the north poles of both magnets would repel, or push, each other away.

What Are the Earth's Poles?

The earth is like a huge magnet. It has a magnetic field, and it has magnetic North and South Poles. The earth's magnetic poles are not to be confused with its geographic poles, though.

The earth is tilted on an axis. The geographic North Pole is located at the most northern end of the axis. This place is in the middle of the Arctic Ocean. The geographic South Pole is located at the most southern end of the axis, and this can be found in Antarctica.

The earth's magnetic poles are in the general direction of the planet's geographic poles. However, unlike the geographic poles, the magnetic poles are not always in the same place. They are moving slowly.

How Does a Compass Work?

A compass is used to show direction. There are different types of compasses. They include the magnetic compass, the solar compass, and the gyro compass. When people talk about a compass, they often think of the magnetic compass.

A magnetic compass is usually comprised of a magnetized needle and a card with north, south, east, and west printed on it. One end of the needle is attracted to the earth's magnetic north pole. This end is often painted red. With one end showing you the direction of north, you can use the compass to figure out the other directions, too.

Name: ______________________________ **Date:** _______________

1. What is a magnetic field?

A. the geographic poles of the earth

B. the shape, strength, and size of a magnet

C. an area of magnetic force around a magnet

D. a street sign to help direct you

2. What does the author describe?

A. the characteristics of magnets and magnetic fields

B. the reasons why some materials are attracted to magnets

C. the different shapes, strengths, and sizes of magnets

D. the ways different compasses work to tell direction

3. Read these sentences from the text.

> Magnets are objects that produce an area of magnetic force called a magnetic field. Magnetic fields by themselves are invisible to the human eye. Magnets attract, or pull, objects made of materials that are very attracted to magnets. These materials include iron and nickel. A magnet also reacts to another magnet when they are close enough to each other.

Based on these sentences, what can you conclude about the attraction of iron to a magnet?

A. When the iron is farther from the magnet, the attraction is stronger.

B. When the iron is closer to the magnet, the attraction is stronger.

C. When the iron is closer to the magnet, the attraction is weaker.

D. When the iron is close to the magnet, there is no attraction.

4. Read these sentences from the text.

> The earth's magnetic poles are in the general direction of the planet's geographic poles. However, unlike the geographic poles, the magnetic poles are not always in the same place. They are moving slowly.
>
> [. . .]
>
> A magnetic compass is usually comprised of a magnetized needle and a card with north, south, east, and west printed on it. One end of the needle is attracted to the earth's magnetic north pole. This end is often painted red. With one end showing you the direction of north, you can use the compass to figure out the other directions, too.

Based on these sentences, what does a magnetic compass show someone?

A. the exact direction of the earth's geographic South Pole

B. the general direction of the earth's geographic South Pole

C. the exact direction of the earth's geographic North Pole

D. the general direction of the earth's geographic North Pole

5. What is the main idea of the text?

A. There are different shapes and sizes of magnets. Iron and nickel are some of the materials that are very attracted to magnets, so they can get pulled toward magnets.

B. The earth is like a big magnet. People can figure out directions by using a magnetic compass, which has a needle that is attracted to the earth's magnetic North Pole.

C. The earth has a geographic North Pole, which is located in the middle of the Arctic Ocean. The planet also has a magnetic North Pole, but it is always moving slowly.

D. There are different types of compasses. One type of compass is the magnetic compass, and it is made up of a magnetized needle and a card with directions printed on it.

6. Read these sentences from the text.

> The earth's magnetic poles are in the **general direction** of the planet's geographic poles. However, unlike the geographic poles, the magnetic poles are not always in the same place.

As used in the text, what does the phrase "**general direction**" mean?

A. different but the same exact way

B. similar but complete opposite way

C. similar but not the same exact way

D. different and complete opposite way

7. Choose the answer that best completes the sentence below.

The earth has a magnetic field and magnetic North and South Poles, ________ it's like a magnet.

A. but

B. so

C. if

D. although

8. What is one end of a magnetized compass's needle attracted to?

____

____

____

9. Based on the text, what other direction or directions can someone figure out if the person knows the direction of north?

____

____

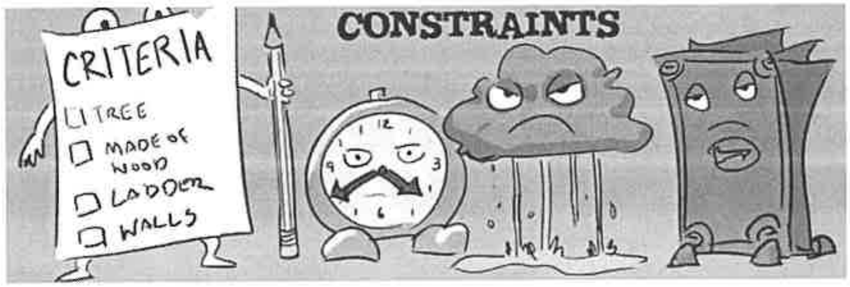
____

10. A person is lost and needs to go south. How might a magnetic compass help the person? Use evidence from the text to support your answer.

____

____

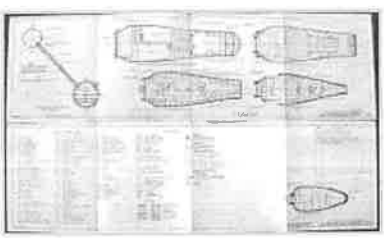
____



Criteria vs. Constraints

Think about the perfect tree house. It sits high up in the branches of a redwood tree, the tallest tree in the world. Don't worry - you don't have to climb all the way up there. There is an elevator system with a pulley that makes it very easy for you to hoist yourself to the top. Up in the tree house, you have all the nice things that people have in their homes: a refrigerator, a television, and a secret trap door for tossing out bad guys and banana peels. When you're all done enjoying your home in a tree, you get to ride a twisty slide all the way to the bottom! Wheeeeeeee. Doesn't that sound fun? First, let's see if we can really build it. To do this, we'll have to try thinking like an engineer. Being an engineer is all about bringing the ideas in your head out into the real world.

In the make believe world of ideas, there are no rules. You can do anything you want! (See our tree house example above.) To be an engineer, however, you have to follow a set of rules. This is why it's always good to lay things out with a clear head before you start building. A **design** is a plan for how to build something. If we think with our real world brains, we might have to abandon some of our ideas for the ideal tree house, like the elevator, the slide, and the redwood tree, which itself would be too tall to really be able to use as a place for our project. Sigh.



Before we build, we need to design!

Let's go back to the beginning, shall we? Before any engineer moves farther than the brainstorm and idea stages, she needs to ask some important questions. What is she going to build, why is she going to build it, and for whom is she building it? Having a clear answer to these three questions will help her figure out what to do as she moves through this from start to finish. In engineering, a **need** is a reason why you are building something. Engineers work hard to make sure they understand the problem so that they can build something that works best for what people need. This is true with people who build websites as much as it's true for people who build bridges, even though it takes two extremely different kinds of engineers to do those jobs. Does anyone really need a tree house? Likely not. But let's say that there is a need, for the sake of this example. Perhaps you have been called on by the government of a place where a tree house would give a safe place for people to go because there are dangerous wild animals around that can't climb trees or fly! Now we have a beginning and a place to start.

Let's gather more information. We want people to be safe while up in this tree house; falling from high places can be very dangerous! **Criteria** are principles to follow as you build something to make sure it is going to work the way you want it to. In other words, what will it look like and how will it work? You have to think about things like shape, size, weight, speed, and how easy it might be to make.

Before you get carried away with your design, remember that you are building this tree house for someone with a need. We want the people who depend on this tree house to be a safe place to get away from harm, so we have some things we need to think of as we design and build the house. **Constraints** are limits to what you can do as you build something. Some common ones are cost, time, place, and how much you know.

Does anyone really NEED a tree house? Probably not. Are they pretty cool? Definitely.

All right, now you can start designing. It's fun to think about wacky ideas, like a tree house in a redwood, but when it comes to real engineering, you have to take some steps. First, you have to make sure there is a need for your plan. Then you must make yourself aware of your criteria, or what specific needs have to be met once it's built. Finally, you need to know your constraints! What are you up against? What materials will you need? How much will it cost? Where is this tree? If you do these things, you just might bring a tree house--a real tree house--into the real world.

Think this would be strong enough to hold out house?

1. Design ______________________

a. is the reason why you are building something.

b. is the limit as to what you can do as you build something

c. is a plan for how to build something.

d. is the rules to follow as you build something to make sure it is going to work the way you want it to.

2. A need ______________________

a. is a plan for how to build something.

b. is the limit to what you can do as you build something.

c. is the reason why you are building something.

d. is the rules to follow as you build something to make sure it is going to work the way you want it to.

3. Criteria ______________________

a. is the reason why you are building something.

b. is the limit as to what you can do as you build something.

c. is a plan for how to build something.

d. is the rules to follow as you build something to make sure it is going to work the way you want it to.

4. Constraints __________________

a. are a plan for how to build something.

b. are limits to what you can do as you build something.

c. are the reason why you are building something.

d. are the rules to follow as you build something to make sure it is going to work the way you want it to.

5. Which of the following would not be a constraint when building a bridge?

a. The color of the bridge.

b. How long you have to build it.

c. How much it costs.

d. The size of the water it is going over.

6. Which of the following would be criteria for building a table?

a. It shouldn't be made from plastic.

b. It can't cost more than $25.

c. It needs to fit 8-10 people.

d. It needs to be built by the end of the month.

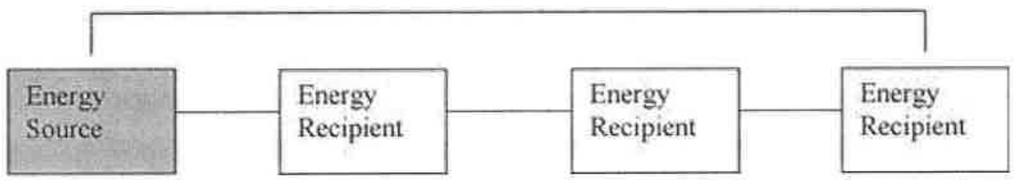
Electricity & Energy: Circuits

by ReadWorks

An electric circuit is the complete path of an electric current. The simplest electric circuit is made up of two components, or parts. The first component is an energy source, such as a battery or generator. The second component is a wire or cable that carries energy from one end of the source. Then it connects back to the source at the other end.

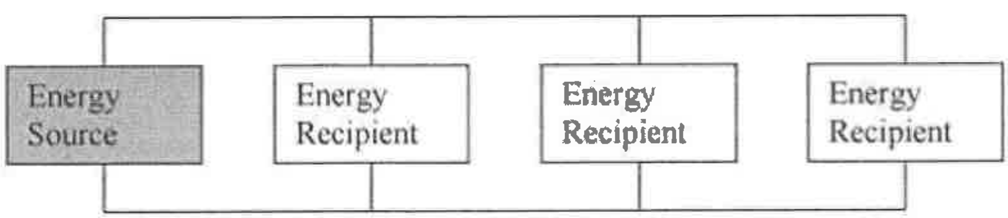
Usually a simple circuit has an energy recipient, such as a motor or lamp. An energy recipient is connected to the electric circuit by the wire or cable. There are two basic types of electric circuits: series circuits and parallel circuits.

Series Circuit



Series circuits are easy to understand if you think about certain strands of light bulbs linked to each other. One example is Christmas lights. With some Christmas lights, all of the lights don't work when one bulb goes out. Why does this happen? This is because in a series circuit the energy has to go through one energy recipient to get to the next. If a bulb blows out, the energy stops at that bulb. It never makes it to the next bulb.

Parallel Circuit



In a parallel circuit, energy is passed through the energy recipients and through a second connection. As long as there's an energy source, electricity will always be able to reach each recipient. If there is a problem with one recipient, the other recipients are not affected.

In practice, most electrical devices have combination circuits. Combination circuits do not use just one type of circuit. Instead, combination circuits utilize both series and parallel types. Devices that use combination circuits include computers and television sets. More complex circuits often have more electric components like switches and resistors, which limit the electric current flow.

Name: ___________________________________ **Date:** _______________

1. According to this passage, what is the second component of a circuit?

A. electric current

B. energy source

C. energy recipient

D. wire or cable

2. What role do the two diagrams play in the passage?

A. They illustrate two types of circuits that are described in the text.

B. They contradict the information described in the text about series and parallel circuits.

C. They illustrate how series and parallel circuits combine to form a combination circuit.

D. They illustrate information about circuits not discussed in the text of passage.

3. What would happen if one light went out in a parallel circuit?

A. All of the lights would go out.

B. The circuit would become a simple circuit

C. All the lights except for that one would stay lit.

D. The energy source would stop working.

4. Read these sentences: "Combination circuits do not use just one type of circuit. Instead, combination circuits **utilize** both series and parallel types."

The word **utilize** means

A. to make use of

B. to burn out

C. to provide energy for

D. to create

5. The primary purpose of this passage is to describe

A. what combination circuits are

B. how Christmas lights work

C. the types of circuits found in computers

D. how different types of circuits work

6. How is energy passed in a parallel circuit?

____

____

____

7. What evidence from this passage could support the idea that a strand of lights might benefit from using a parallel circuit instead of a series circuit?

____

____

____

8. Choose the answer that best completes the sentence.

In a series circuit, energy is passed from one recipient to the next; __________, the flow of energy stops if one of the recipients has a problem.

A. previously

B. however

C. on the other hand

D. consequently

Solids, Liquids, and Gases

What is one thing that can be as hard as a rock, fill a glass, or float inside a cloud? The answer is water!

When water is frozen, it becomes a **solid**. It is as hard as a rock. You might put ice cubes in a drink to keep it cold. Ice can also cover the surface of a lake.

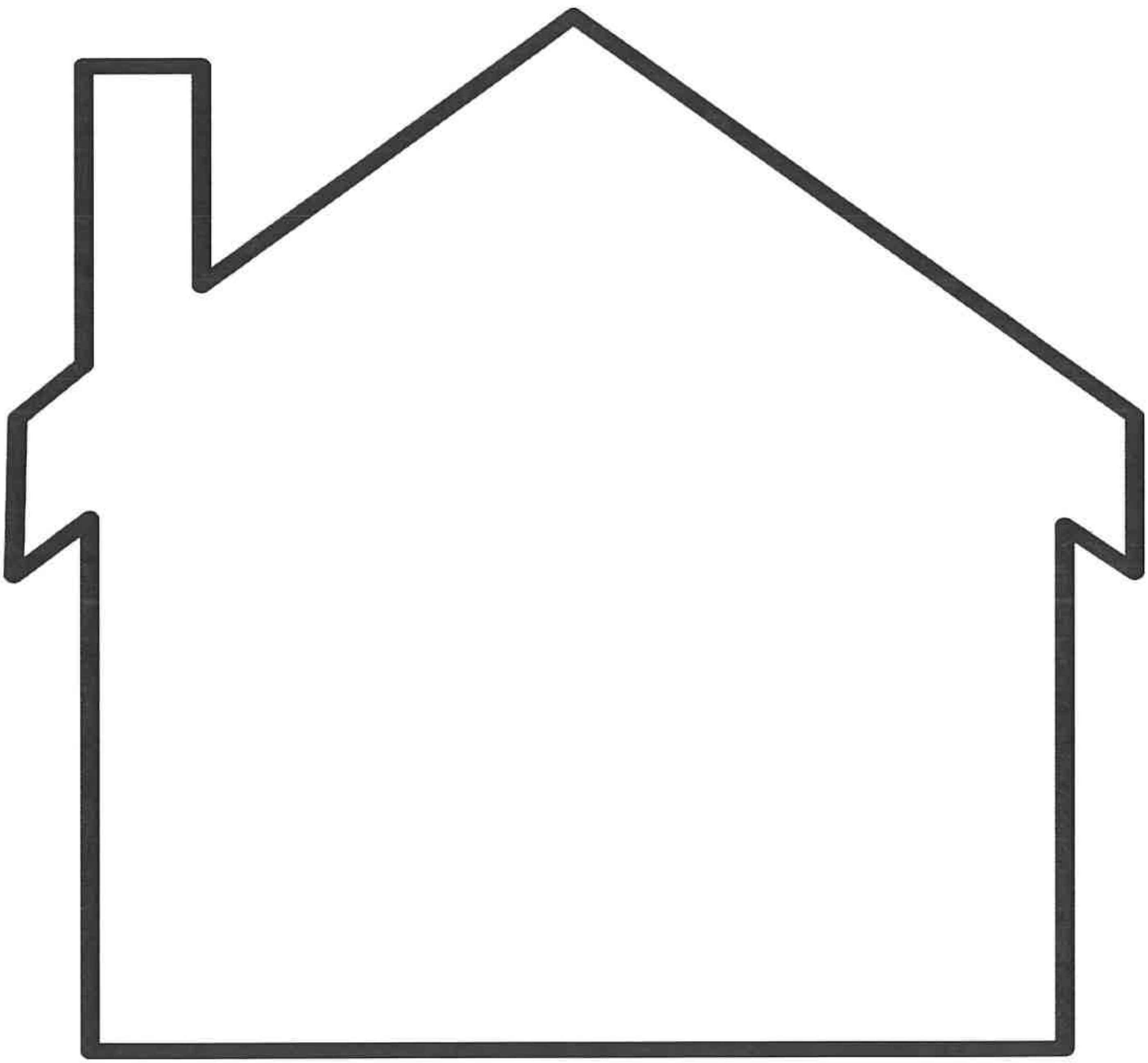
When the ice melts, it becomes a **liquid**. It can fill a glass or flow in a river.

When water boils, it heats and becomes a **gas**. This gas is called water **vapor**. Clouds are made up of water vapor, too.

Name: .... Grade Level: .... Date: ....

Directions:

Close your eyes and think about the things you can find in your home. Draw as many examples as you can of solids, liquids, and gases that can be found at home. Below your drawing, write S if it is a solid, L if it is a liquid and G if it is a gas.



Name ____ Date ___________________________

Physical Properties of Matter

Imagine that it's a cool fall day. The big, yellow sun is shining brightly and a few fluffy clouds are in the sky. You hear a tractor in the distance cutting hay. You smell a wood-burning fire that is keeping the chill away. Your family is carving jock-o-lanterns from pumpkins grown in your garden.

This story describes physical properties of matter. A physical property is a characteristic (feature) that can be measured or observed without changing the make-up of the matter. These properties can be observed with your five senses: sight, hearing, touch, taste, and smell. Or physical properties can be measured using tools, such as a thermometer, balance scale, or liquid measuring cups.

Common physical properties of matter that can be observed with our senses include: color, size, texture (the way a substance feels), shape, odor, and the physical state of matter. Other observable properties would include volume, mass, length, hardness, and temperature. Volume is the amount of space matter takes up. Mass is the amount of matter in an object. Mass is usually measured using a balance scale. Hardness is how hard or soft an object is.

In the story above, most of the adjectives describing the fall day are physical properties. For example, yellow describes the color of the sun, which is an observable property. Other properties of the sun are its size, shape, and temperature. According to the story, the size is "big". We know the sun is round and very hot. What about when you smell the wood-burning fire? This describes odor, which is the way something smells. What other properties of the fire can you name? Consider its temperature, color, and size. The coolness of the day can be measured with a thermometer, which measures temperature.

Suppose you have finished carving your jack-o-=lantern, but your brother hasn't started his yet. If we compared the physical properties of the jack-o-lantern and the pumpkin, using what you know about physical properties, which would be the same and which would be different?

Name ______________________________ Date ______________________

Physical Properties Task

We know that physical properties of matter are features that can be observed or measured without changing the make-up of matter. The physical properties of one substance can be compared with the physical properties of another substance. For example, your hair may be brown and your friend's hair is blonde. The observable property of color is being compared.

In this task, you will compare properties of different types of matter. Use the space below to record your findings.

Water	Vinegar	Conclusion
Describe the following properties: • Color • Temperature • Odor	Describe the following properties: • Color • Temperature • Odor	Compare the property of the odor of water and vinegar.
M&Ms	**Twizzlers**	**Conclusion**
Describe the following properties: • Size • Texture • Shape	Describe the following properties: • Size • Texture • Shape	Compare the property of the texture of M&Ms and Twizzlers.
Play Dough	**Rock**	**Conclusion**
Describe the following properties: • Hardness • Color • Mass	Describe the following properties: • Hardness • Color • Mass	Compare the property of the hardness of play dough and rock.