Earth Science

Quarter 3

Name: _____

Number: _____

Notes: What is Air pg. 81-84

What is Air pg. 81-84

- _____
- _____
- _____

What is Air? pg. 81-84 (19 Points)

1. All planets and stars have an_____ around them? (1 pt.)

2. Our air is what percent of each element? Highlight the most abundant gas in our atmosphere. Put a star next to the gas necessary for life on Earth. (6 pt.)

___% Nitrogen / ___% Oxygen / __% Carbon Dioxide / ___ % Other gases

3. What three words are used to describe Oxygen? (3 pt.)

1.	2.	3.

4. What two gases remain constant in our atmosphere? (2 pt.)

1.	2.

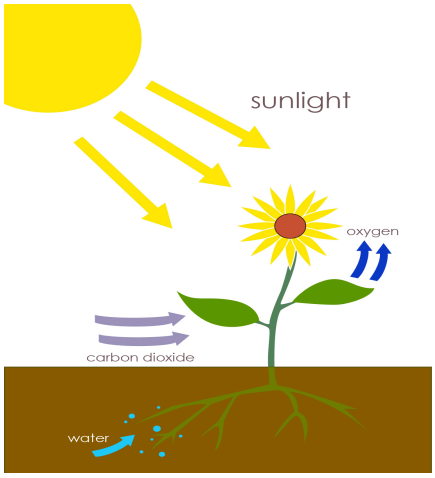
5. What three ways does water move through our atmosphere? (3 pt.)

1.	2.	3.

6. What is the formula for photosynthesis? What gas is released during this process? (5 pt.)

_____ + _____ + _____ = _____

Gas Released:



Notes: Earth's Atmosphere pg. 85-91

Earth's Atmosphere pg. 85-86

- _____
- _____
- _____

Troposphere pg. 87-88

- _____
- _____
- _____

Stratosphere pg. 89

- _____
- _____

Mesosphere pg. 90

- _____

Thermosphere pg. 90

- _____
- _____

Exosphere pg. 91

- _____
- _____

Earth's Atmosphere pg. 85-91 (16 points)

1. What is the layer of the earth we live in? (1 pt.)

2. When the air is colder/warmer what happens to the atmosphere? (2 pt.)
The air is _____ when it's cold.
The air is _____ when it's warm.

3. What are important weather variables that occur in the troposphere? (4 pt.)			

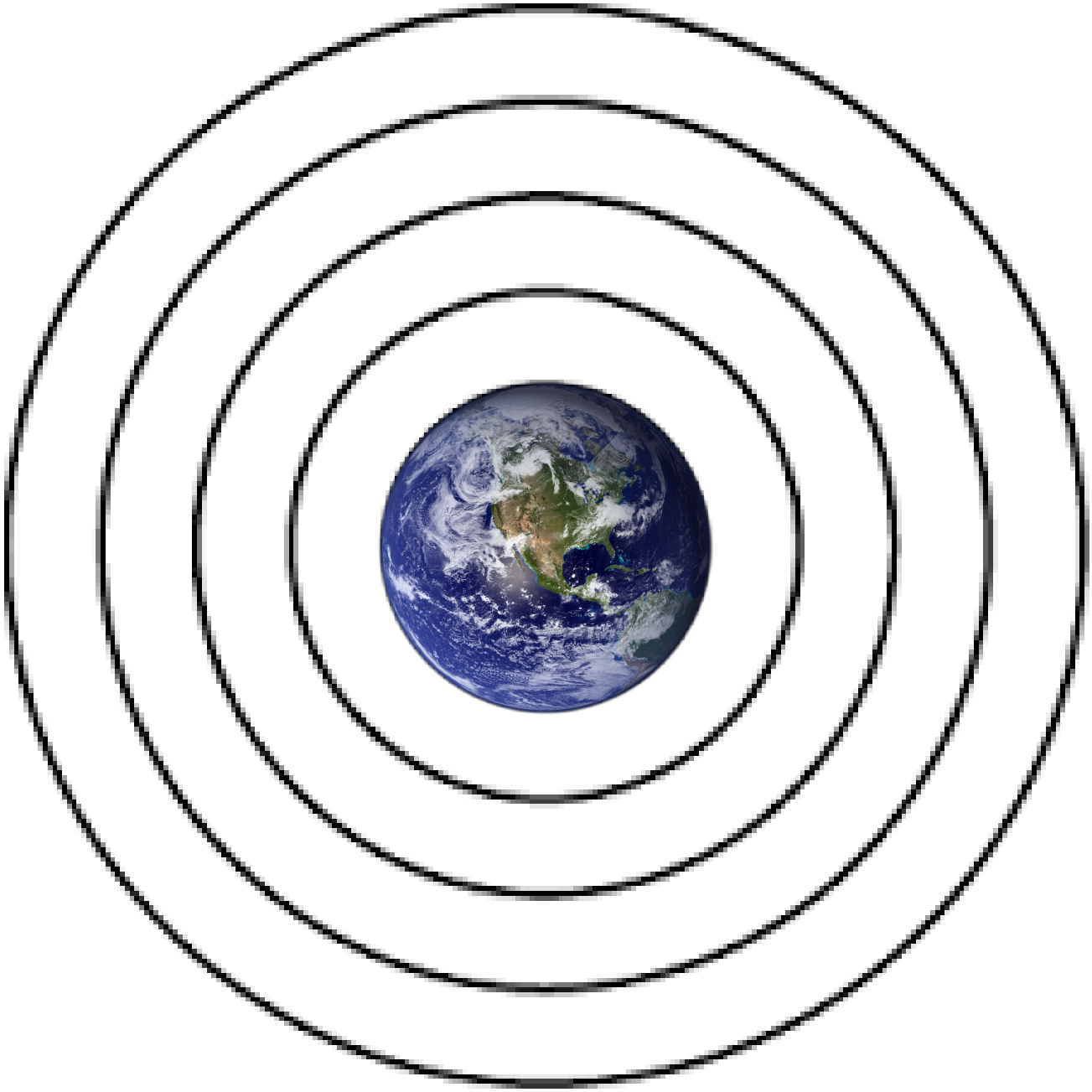
4. In what layer do meteors burn up? What do we usually refer to meteors as? (2 pt.)	

5. What is the layer of the atmosphere where particles escape into space? (1 pt.)

6. How much atmospheric air pressure do we carry on us constantly? (1 pt.)
_____ kg

7. Create an *acronym* to help you remember the layers of the atmosphere. (5 pt.)	
Troposphere	T
Stratosphere	S
Mesosphere	M
Thermosphere	Th
Exosphere	E

Label the layers of the atmosphere.
Include its temperature ranges and one characteristic associated with the layer.
Name and draw something you might find in that layer (Satellites, Aircraft, Meteorites ex.).



Notes: Uneven Heating pg. 95-98

Uneven Heating pg. 95

- _____
- _____
- _____

Heating it Up pg. 96

- _____
- _____
- _____

Solar Energy in Action pg. 97

- _____
- _____
- _____

Uneven Heating Worldwide pg. 98

- _____
- _____

Uneven Heating pg. 95-98 (Points 10)

1. Heat and light from the sun are what type of energy? (1 pt.)

2. When light from the sun hits matter, what two important things happen? (2 pt.)	

3. When matter gains energy, what happens to the temperature? (1 pt.)

4. Explain the effects each variable has on the earth's temperature. (5 pt.)	
1. Length of exposure	
2. Intensity of solar energy	
3. Angle of exposure	
4. Color of material	
5. Properties of material	

5. Which material heats up and cools down faster? (WATER / SOIL) (1 pt.)

6. Which material heats up and cools down faster? (Asphalt / Sand) (1 pt.)

Notes: Heating the Air pg. 99-104

Radiation and Conduction pg. 99

- _____

Heat = Movement pg. 100

- _____
- _____
- _____

Energy Transfer pg. 101

- _____
- _____

Energy Transfer by **Radiation** pg. 102

- _____
- _____
- _____

Energy Transfer by **Conduction** pg. 103

- _____
- _____
- _____

Energy Transfer to the Air pg. 104

- _____
- _____
- _____

Heating the Air pg. 99-104 (14 points)

1. Energy in motion is called what? (1 pt.)

2. True or False: The less molecules vibrate, the MORE energy they have. (1 pt.)

3. Heat moves from a _____ location to a _____ location. (2 pt.)	

4. Radiant energy travels in_____. (1 pt.)

5. What type of energy is created when radiation from the sun passes through the atmosphere? (1 pt.)

6. When energy transfers from one place to another by contact this is called... (1 pt.)

7. Write either RADIANT or CONDUCTION for each example of energy transfer. (7 pt.)	
An ice cube melting in hot chocolate	
The warmth from a lightbulb	
Your feet burning on hot sand	
Opening an oven and feeling the heat	
Touching a hot pan with your hand	
The warmth of the sun on a summer's day	
Water in a pot heating up	

Notes: Wind and Convection pg. 105-109

Wind and Convection pg. 105-106

- _____
- _____
- _____

The Wind Starts pg. 107

- _____
- _____
- _____

The Wind Changes Direction pg. 108

- _____
- _____

Convection Summary pg. 109

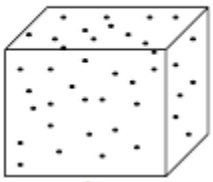
- _____
- _____

Wind and Convection pg. 105-109 (11 points)

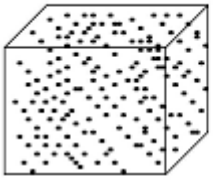
1. What causes air to blow, creating wind? What source does it come from? (2 points)

2. Which box represents a cubic meter of cold air and which is a cubic meter of hot air? Explain how you know. (4 points)

- Hot or Cold Air? _____
- How do you know?



- Hot or Cold Air? _____
- How do you know?



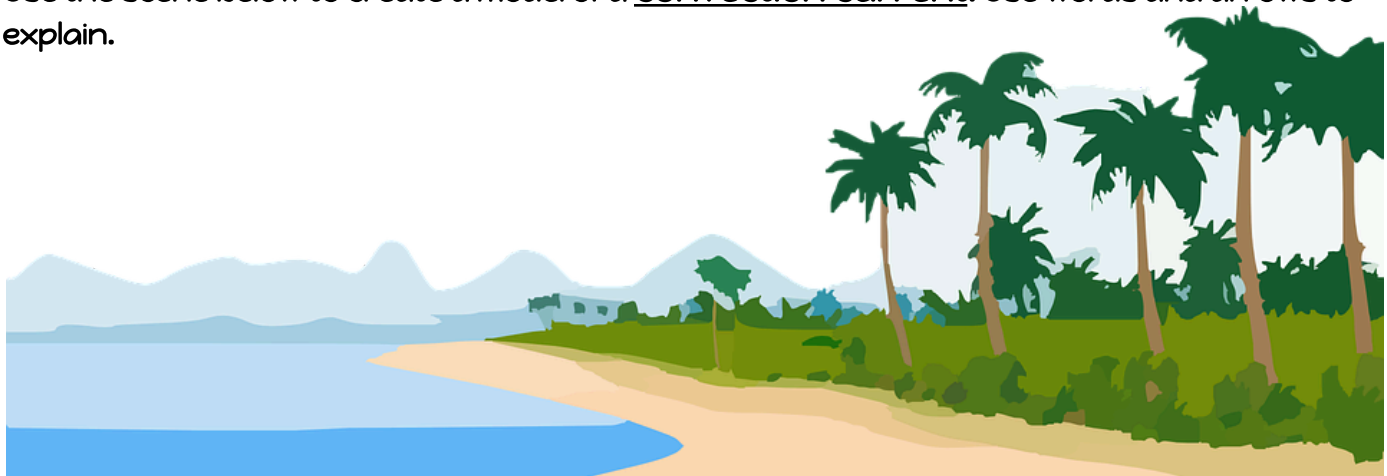
3. It is a warm sunny day at the local beach. You feel a sea breeze coming from the ocean. Explain how both cold and warm air is moving through the atmosphere in order to create this sea breeze. Start with the cool air over the ocean. (3 points)

_____

_____

_____

Use the scene below to create a model of a convection current. Use words and arrows to explain.



Notes: Wind and Solar Power pg. 110-119

Wind Power pg. 110-111

- _____
- _____
- _____

Solar Heaters pg. 112-113

- _____
- _____
- _____

Solar Cookers pg. 114-115

- _____
- _____
- _____

Solar Electricity pg. 116

- _____
- _____
- _____

Solar Buildings pg. 118-119

- _____
- _____
- _____

Wind and Solar Technology pg. 110-119 (6 pts.)

Type of Energy	How does it work?	Advantages	Disadvantages
Wind Energy			
Solar Energy			

Build A Solar Oven

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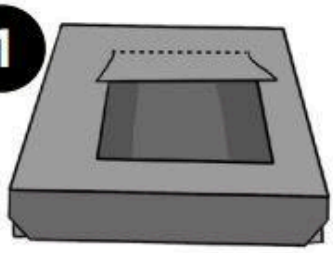
1

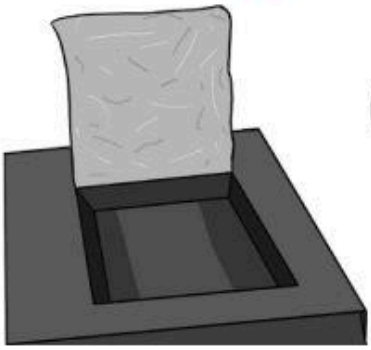


Have an adult help you cut a flap in the top of a pizza box, leaving one side attached. Fold flap open.

MATERIALS

- pizza box (or similar shape box)
- clear tape (packing tape works well)
- plastic wrap (or a large ziplock bag)
- aluminum foil
- black paper
- newspaper
- 12" ruler

2 Wrap the flap with aluminum foil so that it can reflect the sun.



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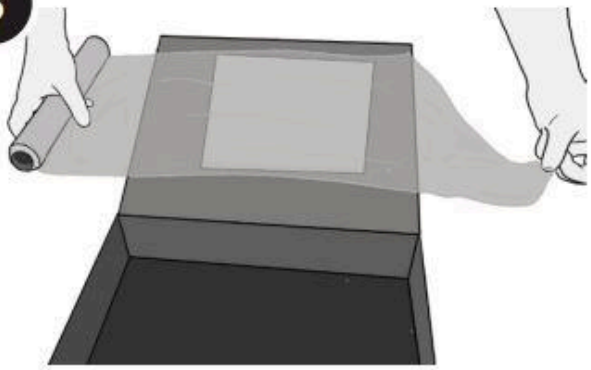
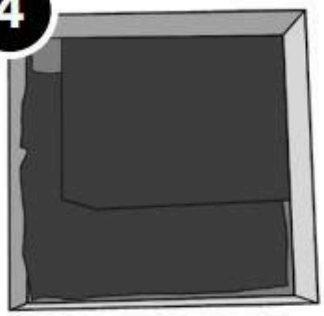


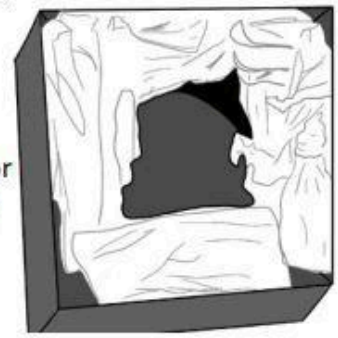
Use clear plastic to create an airtight window for solar energy to enter the box. Plastic wrap or a piece of a Ziplock bag can work as a cover. Packing tape can help secure the "window" in place and seal the opening.

4



Line the bottom of the box with black construction paper - the color black absorbs heat. The black surface is where your food will be set to cook.

5 Roll up newspaper and create a border around your box - with space in the middle enough for what you want to cook. Tape the newspaper in place.



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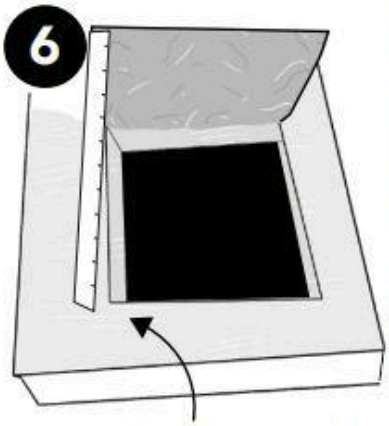


use a ruler to prop open

Put your oven in a sunny spot in the middle of a nice hot day. Temperatures inside can get to 200 degrees or more!

Make a quesadilla by melting cheese on a tortilla!

BAKING TIPS

Use potholders or gloves when removing items from the oven!

Protect your oven by baking items on a dish.

Notes: The Water Cycle pg. 125-129

The Water Cycle pg. 125-126

- _____
- _____
- _____

Water Evaporates from Earth's Surface pg. 127

- _____
- _____

Water Falls Back Down to Earth’s Surface pg. 128-129

- _____
- _____
- _____

Water Cycle 124-129 (9 points)

1. Put the following example of a water cycle in order starting with evaporation. (5 points)	
	Water vapor cools and **condenses** into the form of clouds
	Water may go back into a lake, go into the ground, or become run-off.
	Water **evaporates** from a lake on the earth's surface turning into water vapor.
	Clouds become full and the water falls back to the earth as rain (**precipitation**).
	The cycle begins again.

1. Describe Evaporation and Transpiration. (2 point)

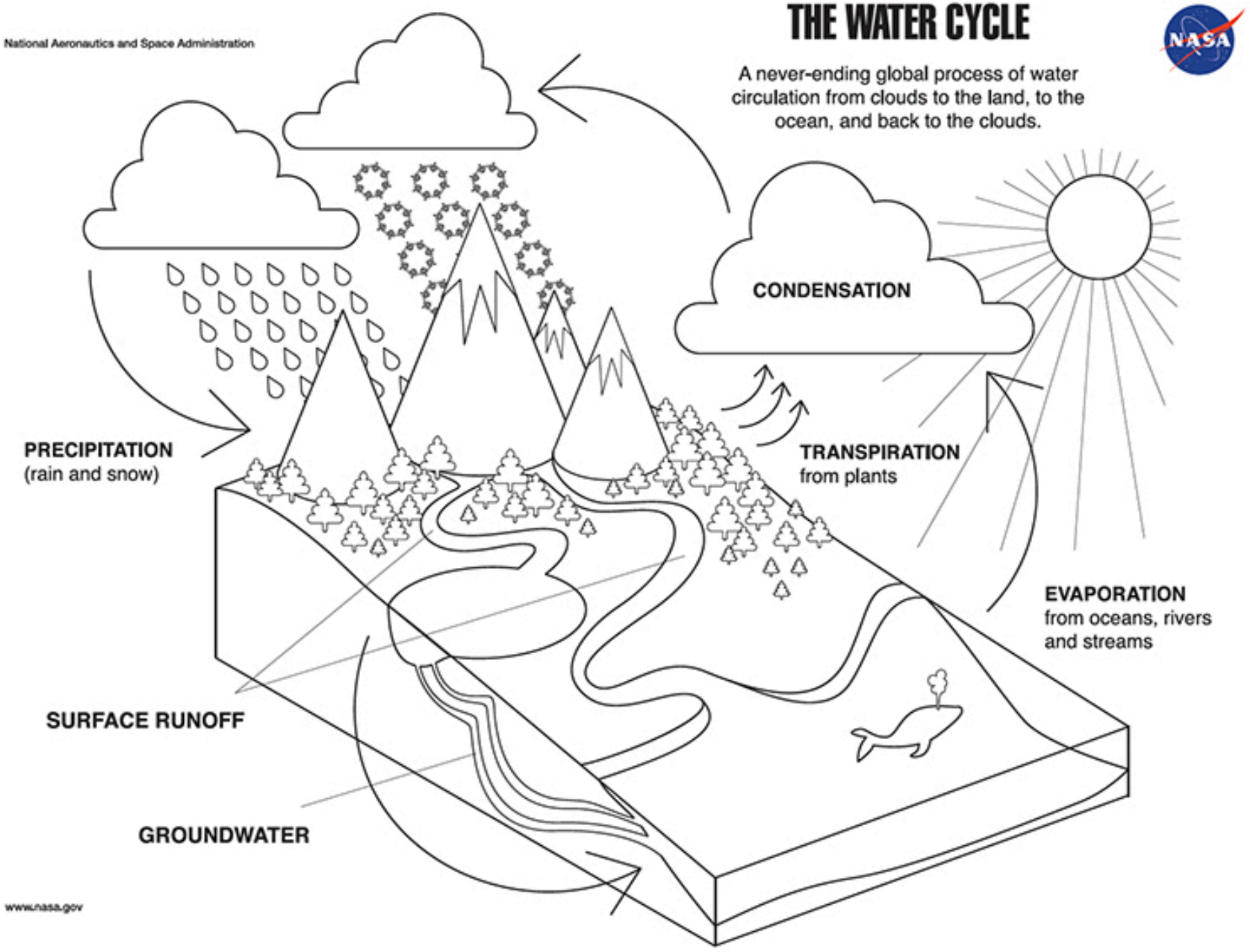
2. Describe Condensation. (1 point)

3. Describe Precipitation. (1 point)

National Aeronautics and Space Administration

THE WATER CYCLE

A never-ending global process of water circulation from clouds to the land, to the ocean, and back to the clouds.



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Notes: Severe Weather pg. 130-138

Severe Weather pg. 130

- _____
- _____
- _____

What is Weather? Pg. 131

- _____
- _____

What Causes Weather to Change? Pg. 131

- _____
- _____
- _____

Hurricanes and Tropical Storms pg. 132

- _____
- _____
- _____

Thunderstorms pg. 133

- _____
- _____

Tornadoes pg. 134

- _____
- _____

Hot and Cold pg. 135

- _____
- _____

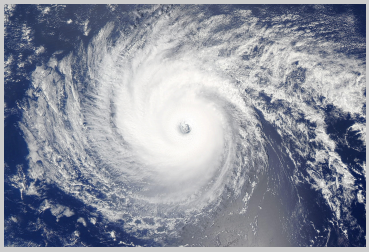
Weather Extremes pg. 135 -137

- _____
- _____
- _____

The Role of the Ocean in Weather pg. 138

- _____
- _____
- _____

Severe Weather 130-138 (12 Points)

Extreme Weather Type	Describe what they are. (4 pt.)	How are they formed? (4 pt.)	Location(and or) Time (4 pt.)
Hurricanes/ Tropical Storms 	Wind systems that rotate around an eye, or center of low air pressure.	Starts as a tropical storm and draws energy from the warm ocean. Spinning air draws up a lot of warm water vapor that condenses into clouds and spins even faster. When it reaches land it blows at deadly speeds. The rain and wind cause a lot of destruction.	Start in the Atlantic Ocean and start in the late summer or early fall when the weather is at its warmest.
Thunderstorms 			
Tornadoes 			
Blizzards 			
Droughts 			

Cast Practice

26. Engineers use a device called a shake table to test buildings to see if they can hold up in an earthquake. This helps them learn how to make safer buildings for areas where earthquakes are common.

A group of students is asked to make a model of a building. They can use no more than 100 toothpicks and 50 mini marshmallows. They must make a four-story building that can remain standing after 30 seconds on a small shake table in their classroom.

When the students test their building, it collapses after 17 seconds on the shake table. The students want to improve their design. For each item in the table, check a box to show whether they should keep the item the same or change it.

	Change	Keep the same
The way the materials are connected	☐	☐
The materials the building is made from	☐	☐
The number of floors in the building	☐	☐
The shape of the building's walls	☐	☐

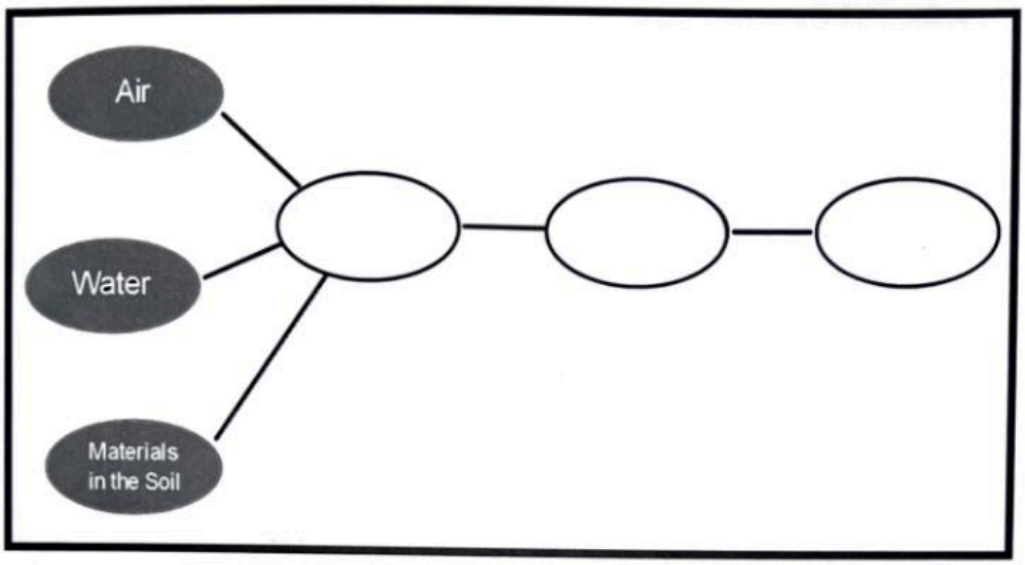
27. Two small hills in a state park are right next to each other. The hills are the same height. Soil is eroding from Hill A but not from Hill B.

Select the **two** items from the table that would be the **best** for comparing the two hills and providing evidence of what is causing erosion on Hill A.

	Helps to provide evidence of erosion
How steep the hills are	☐
How much rain each hill gets	☐
How many plants are on the hills	☐
How windy it is on each hill	☐

30. Two students are eating hamburgers. Student A wants to show Student B that all of the food we eat can be traced back to things that are not food, such as water, air, and materials in the soil.

To illustrate this, Student A creates a model. Complete the model by writing the words into the correct places.



Humans

Cows

Grass

28. A hot plate is a small electrical device with a flat metal surface that heats up and is usually used for cooking food. Some students use a hot plate to warm up water in a cup, as shown in Figure 2.

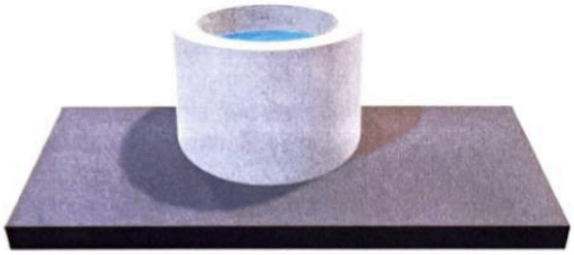


Figure 2: A cup of water on a hot plate

Part A

Which observation provides the **best** evidence that heat energy is being transferred from the hot plate to the water?

A. The electric hot plate changes electrical energy into heat energy.

B. Small bubbles begin to form on the bottom of the cup of water.

C. A thermometer shows that the temperature of the water is increasing.

D. The surface of the electric hot plate becomes too hot to touch.

Part B

The hot plate has three heat levels. A student plans an investigation to compare how much heat energy each level transfers to the water. Write the **letter** of each step into the order in which they should be completed.

Step 1:	
Step 2:	
Step 3:	
Step 4:	

A. Repeat until each of the three levels have been tested.
B. Replace the heated water with room-temperature water.
C. Heat room-temperature water for 5 minutes on one of the levels.
D. Record the temperature of the water.

11. A group of students plans to watch a television show together, but thunderstorms are expected during the program. The thunderstorms could cause the power to go out.

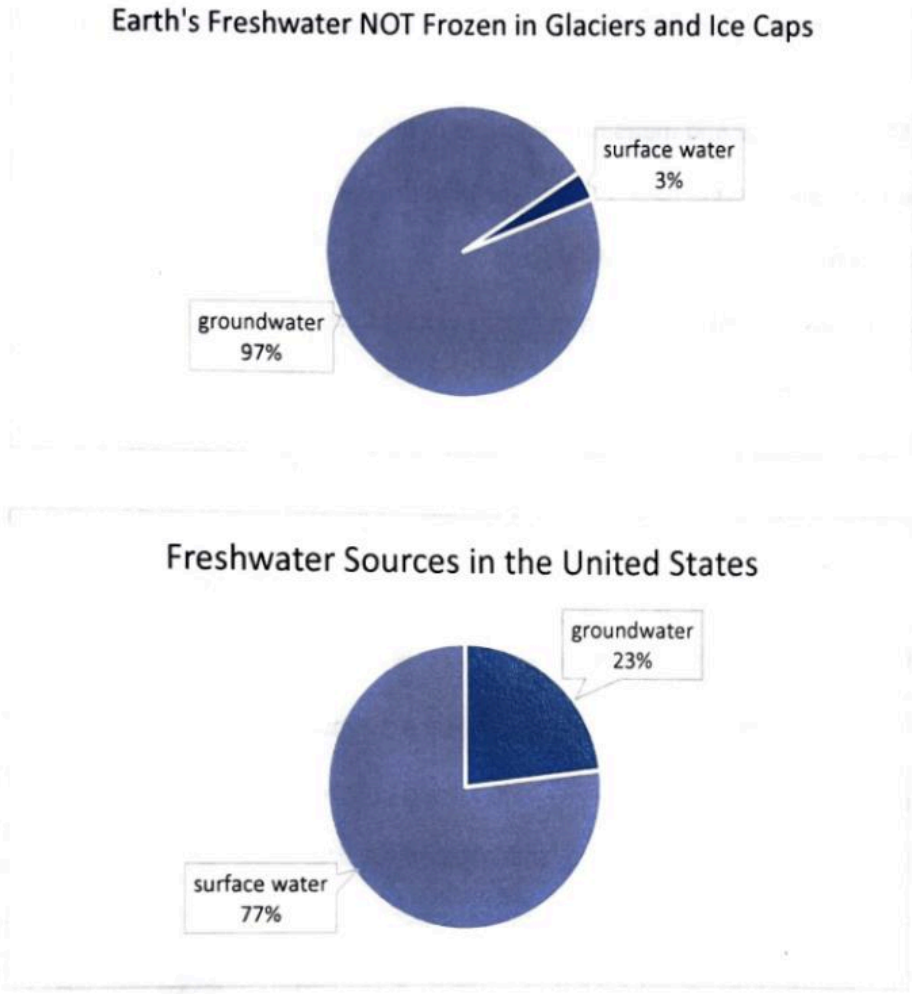
The students find three ways to keep using the television if the power goes out.

Solution	This solution can produce electricity...
A battery pack that uses energy from the sun to produce electricity	...as long as there is sunny weather.
An engine that burns gas to produce electricity	...as long as more gas is added.
A bicycle that uses the motion of the bicycle's gears to produce electricity	...as long as someone pedals the bicycle.

The students have three requirements to help them decide which solution to use. Check the boxes to show which requirements each solution meets.

Solution	Is not too noisy	Can produce electricity during a thunderstorm
Battery pack	☐	☐
Engine	☐	☐
Bicycle	☐	☐

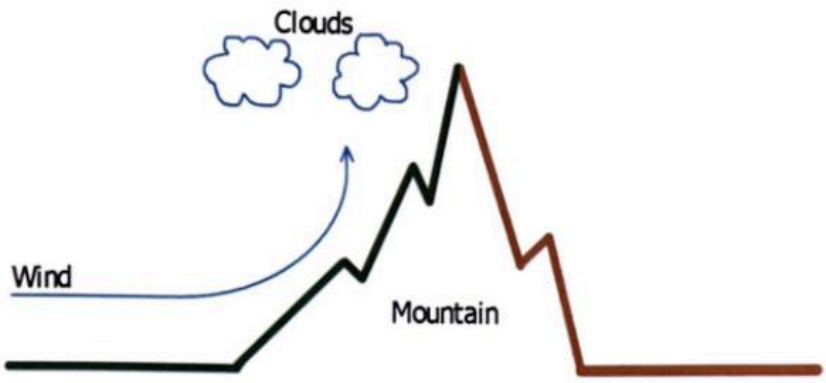
16. Most of Earth's freshwater is frozen in glaciers and in the polar ice caps (about 69%). The rest of Earth's freshwater (about 31%) is either groundwater or surface water.



Circle the words in **BOLD** that **best** complete the sentence.

Most of Earth's freshwater that is not frozen in glaciers and polar ice caps is **groundwater / surface water**, but in the United States there is more freshwater available from **groundwater / surface water** than from **groundwater / surface water**.

14. A student creates a model to show how mountains can affect the weather by changing how air moves across Earth's surface.



The model shows that the side of a mountain range that faces the wind (moving air) usually receives more rain than the side that faces away from the wind.

- The mountains force air to move upward.
- As the air moves upward, it cools down.
- As the air cools down, water vapor in the air condenses to form clouds and fall as rain.

Which two Earth systems does the model show interacting to affect the weather?

A. The atmosphere and the geosphere

B. The atmosphere and the hydrosphere

C. The geosphere and the hydrosphere

D. The geosphere and the biosphere

15. A student is making a small solar car. The car has three main parts—a frame with wheels, an electric motor that turns the wheels, and a solar cell that uses energy from the sun to provide power to the electric motor. The frame and wheels can be made from metal, wood, or plastic.

The student wants to make the car as fast as possible. Which test would be the **least** helpful in improving the design of the car?

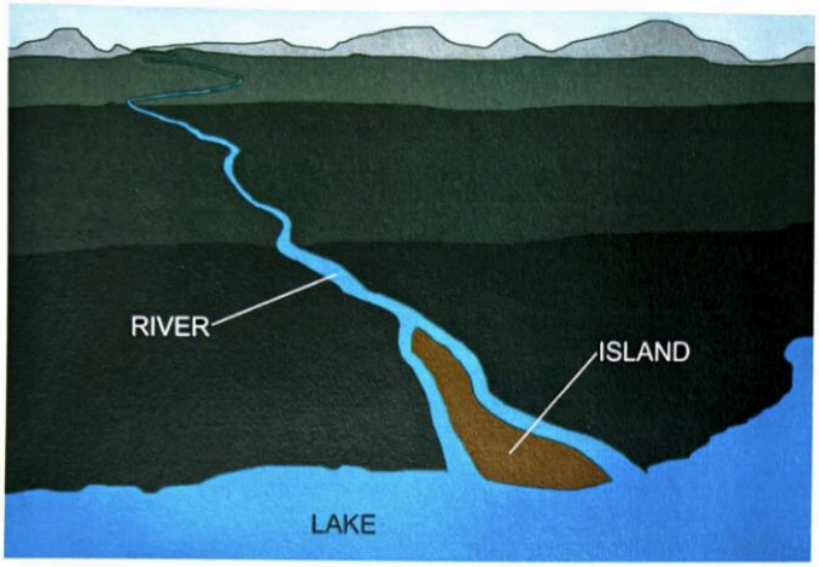
A. Test wheels made from different materials and measure the speed of the car

B. Test frames made from different materials and measure the speed of the car

C. Measure the speed of the car using solar cells of different sizes

D. Measure the speed of the car on sunny, partly cloudy, and mostly cloudy days

2. Students visit a small river that flows into a lake. A short distance before the river reaches the lake, it splits into two branches with a low, flat island in between them.



Select the option that **best** completes the sentence describing how the island was **most likely** formed.

The island was formed by:

A. the river gradually eroding the land around it over time.

B. waves from the lake piling up sand and soil over time.

C. the river gradually depositing sand and soil from upstream.

D. humans using bulldozers and dump trucks to pile up soil.