Chapter 12 DRW

Lesson 1 Describing Earth's Atmosphere Name _____

Scan *Lesson 1. Read the lesson titles and bold words. Look at the pictures. Identify three facts that you discover about Earth's atmosphere. Record these facts in your Science Journal.*

Main Idea

Importance of Earth's Atmosphere

I found this on page _____.

Details

Define atmosphere, *and identify four things the* atmosphere *does for Earth.*

Atmosphere: _____

_____

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

Origins of Earth's Atmosphere

I found this on page _____.

Write *the number of each event on the time line to describe how Earth's* atmosphere *changed over time.*

1. Photosynthetic organisms remove carbon dioxide from the air and release oxygen.
2. Water vapor cools and condenses. Rain falls, evaporates, and eventually accumulates in oceans.
3. Atmosphere contains present levels of carbon dioxide, oxygen, nitrogen, and other gases.
4. Atmosphere is mainly water vapor with a little carbon dioxide and nitrogen.

Early atmosphere **Present time**

Main Idea

Composition of the Atmosphere

I found this on page _____.

Details

Assess *information about the* atmosphere. *Read each statement below. If the statement is true, write* true *on the line. If the statement is false, write* false *on the line and rewrite the underlined portion so that it is true.*

Earth's atmosphere is mostly made of <u>visible</u> gases, including nitrogen, oxygen, and carbon dioxide.

_____

<u>Solid</u> and liquid particles are also present in the atmosphere.

_____

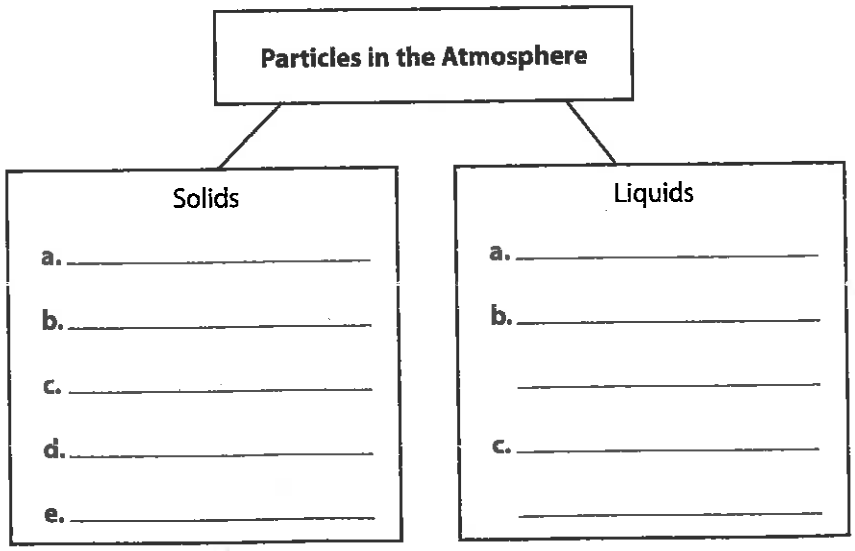
I found this on page _____.

Identify *the gases that make up Earth's* atmosphere.

Gases in the Atmosphere	
Percent	**Gas**
78	
21	
1	**a.** **b.** **c.** **d.**

I found this on page _____.

Identify *solid and liquid particles in the* atmosphere.



Main Idea

Layers of the Atmosphere

I found this on page _____.

I found this on page _____.

I found this on page _____.

I found this on page _____.

I found this on page _____.

I found this on page _____.

Details

Describe *the layers of the* atmosphere. *First, list the layers in order from the surface to space. Identify the height of each layer. Then describe each layer.*

Layers of the Atmosphere	
Layer and Height above Earth's Surface	**Description**
_____ above 500 km	
Thermosphere	
_____ extends from about 50 km to about 85 km	
Stratosphere	
_____ from the surface to a height of 8–15 km	

Distinguish ozone *from oxygen.*

Ozone	Oxygen

Main Idea

I found this on page _____.

Identify *the 2 layers of the* atmosphere *that contain the* ionosphere.

1. _____ 2. _____

I found this on page _____.

Explain, *in your own words, how auroras form in the* ionosphere.

_____

_____

_____

_____

Air Pressure and Altitude

I found this on page _____.

Describe *the relationship between altitude and air pressure.*

As altitude _____, air pressure _____.

Temperature and Altitude

I found this on page _____.

Identify *the changes in temperature and altitude in the different layers of the* atmosphere.

Layer of the Atmosphere	Altitude	Temperature
Troposphere	↑ increases	
Stratosphere	↑ increases	
Mesosphere	↑ increases	
Thermosphere	↑ increases	
Exosphere	↑ increases	

Connect It Suppose that you move from a town near the ocean to a town in the mountains. To what atmospheric changes would your body need to adjust?

_____

_____

_____

_____

_____

_____

Lesson 2 Energy Transfer in the Atmosphere

Predict *three facts that will be discussed in Lesson 2 after reading the headings. Record these facts in your Science Journal.*

Main Idea

Energy from the Sun

I found this on page _____.

I found this on page _____.

I found this on page _____.

Energy on Earth

I found this on page _____.

Details

Define radiation.

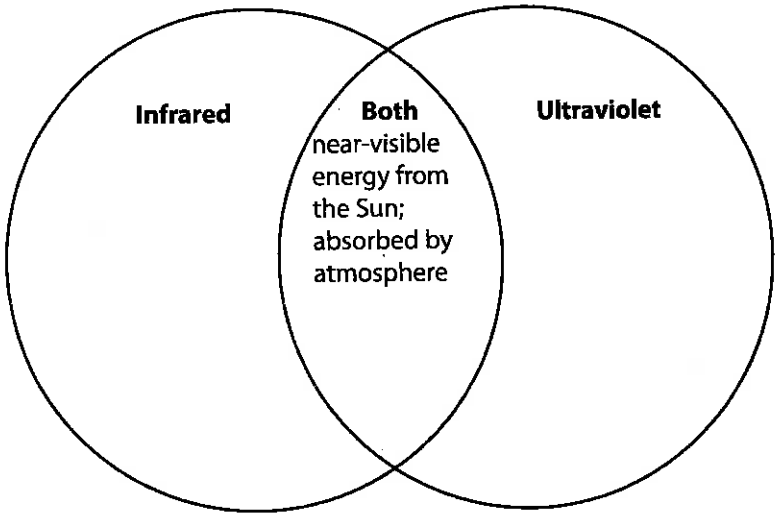
Radiation: _____

_____

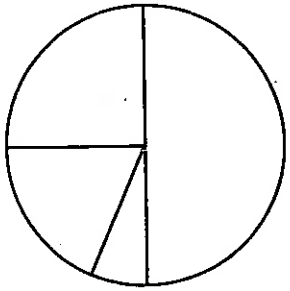
Identify *the 3 forms of* radiation *that make up most of the Sun's energy.*

1. _____
2. _____
3. _____

Compare and contrast *infrared and ultraviolet light.*



Color *the circle graph to represent the portion of* radiation *reflected and absorbed by Earth's surface and atmosphere. Complete the key to show what each color indicates.*



KEY

- ☐ 25% reflected back to space by particles in the atmosphere
- ☐ 20% absorbed by particles in the atmosphere
- ☐ 50% absorbed by Earth's surface
- ☐ 5% reflected back by land and sea surfaces

Main Idea

Details

Radiation Balance

I found this on page _____.

Explain *how* radiation *levels are kept in balance.*

Incoming
Solar radiation that reaches Earth's surface is

_____

_____

_____

Outgoing
Earth emits

_____

back toward the Sun in the form of

_____

The Greenhouse Effect

I found this on page _____.

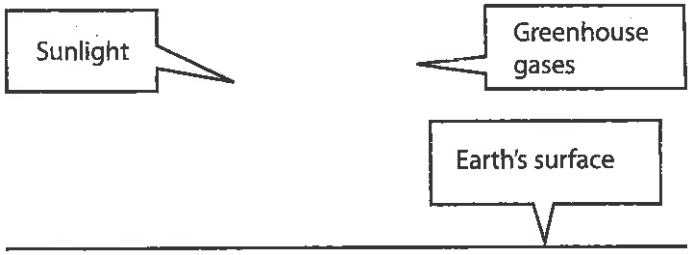
Identify *three greenhouse gases, and include their chemical formulas.*

1. _____
2. _____
3. _____

I found this on page _____.

Draw *a yellow arrow to indicate the incoming visible light. Draw red arrows to indicate the paths of infrared energy.*

Greenhouse Effect



Thermal Energy Transfer

I found this on page _____.

Identify *and define 3 ways that thermal energy is transferred.*

1. _____

_____

2. _____

_____

3. _____

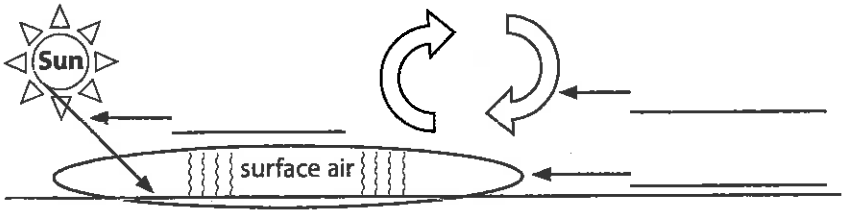
_____

Main Idea

I found this on page _____.

Details

Identify *each type of energy transfer.*



I found this on page _____.

Describe *latent heat's relationship to water, and give an example.*

_____

_____

Example: _____

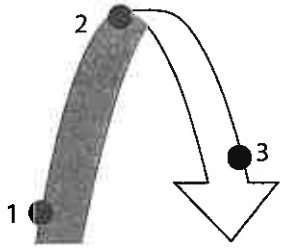
_____

_____

Circulating Air

I found this on page _____.

Describe *how air moves as it is heated and cooled. Indicate what happens at each position.*



Position 1: As air warms, it becomes _____ and _____.

Position 2: As air moves away from the warm surface, it loses _____ and _____. Cool air is _____ than warm air, so it begins to _____.

Position 3: Cool air _____ and pushes the _____ air out of the way.

I found this on page _____.

Define stability.

Stability: _____

_____

Main Idea

I found this on page _____.

Details

Distinguish *the motion of stable and unstable air.*

Motion of Stable Air	Motion of Unstable Air

I found this on page _____.

Explain *air movement during a thunderstorm.*

During unstable conditions, ground level air is much warmer than _____. Air rises _____, cools, and produces large, tall clouds. _____, released as water vapor, changes from a _____ to a _____, adds to the instability, and produces a violent storm.

I found this on page _____.

Sequence *a* temperature inversion.

Ground-level air is nearly the same temperature as _____.

↓

A layer of _____ is trapped by a layer of _____ above it.

↓

A _____ prevents air from mixing and can trap _____ in the air close to Earth's surface.

Analyze it While on a picnic in the Rocky Mountains, you notice that clouds form and disappear at the top of the peaks. How can you explain this phenomenon?

_____

_____

_____

_____

Lesson 3 Air Currents

Skim *Lesson 3 in your book. Read the headings and look at the photos and illustrations. Identify three things you want to learn more about as you read the lesson. Write your ideas in your Science Journal.*

Main Idea

Global Winds

I found this on page _____.

Details

Explain *the formation of Earth's global* winds.

The Sun heats Earth's surface unevenly because of the _____ _____. This uneven heating causes differences in _____.

⇩

_____ pressure develops over the tropics. _____ pressure develops over the poles. The movement of air from areas of high pressure to areas of low pressure is called _____.

⇩

Global wind belts influence

a. _____ **b.** _____

Global Winds Belts

I found this on page _____.

Assess *information about circulation in Earth's atmosphere. Read each statement below. If the statement is true, write* true *on the line. If the statement is false, write false on the line and rewrite the underlined portion so that it is true.*

Two of the three cells that scientists use to describe circulation of Earth's atmosphere are <u>conduction</u> cells.

_____

The first belt begins with warm air rising at the equator and dropping back to Earth near <u>30° latitude</u>.

_____

The third cell, at the <u>lowest</u> latitude, is also a convection cell.

_____

I found this on page _____.

Explain *the Coriolis effect.*

Coriolis effect: _____

_____

_____

Main Idea

I found this on page _____.

I found this on page _____.

I found this on page _____.

I found this on page _____.

I found this on page _____.

Local Winds

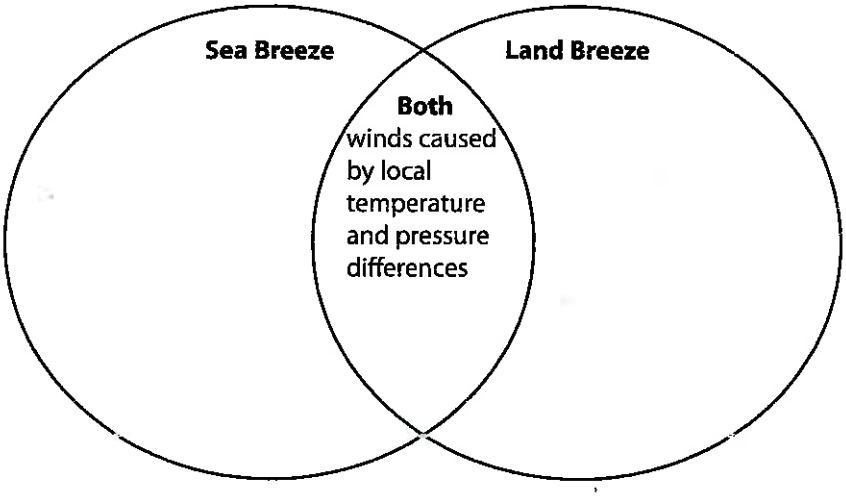
I found this on page _____.

Details

Analyze *prevailing* winds.

Winds	Description
Trade	
Doldrums	
Westerlies	
Polar easterlies	
Jet stream	

Compare and contrast *a* sea breeze *and a* land breeze.



Synthesize It An airplane pilot flying from California to New York would like to make the flight in the shortest amount of time possible. What could the pilot do to decrease his travel time?

_____

_____