Name: _____
Period: _____

Meteorology 2: Our Atmosphere

I. Unit Pretest
- _____ A. *Quarter 4 Pre-Assessment*

II. Layers of the Atmosphere
- _____ A. *Chapter 15 Starter Transparency*
- _____ B. **Layers of the Atmosphere Vodcast**
- _____ C. **Layers of the Atmosphere Guided Reading (Chapter 15-1)**
- _____ D. *Chapter 15 - Start-up Activity - p. 447*
- _____ E. *Bill Nye "Atmosphere"*
- _____ F. **"Thanks Atmosphere" RAFT Assignment**
- _____ G. *Oxygen Concentration Lab*
- _____ H. **"Layers of the Atmosphere" Ediscio Flash Cards**
- _____ I. **Layers of the Atmosphere Standard Check**

III. Heat Transfer in the Atmosphere
- _____ A. *Eyewitness Weather Video and Questions*
- _____ B. **Radiation, Conduction, and Convection Vodcast**
- _____ C. **Radiation, Conduction, and Convection Graphic Organizer**
- _____ D. 15-2 Guided Reading
- _____ E. *15-2 Bellringer*
- _____ F. Radiation/Conduction/Convection examples Senteo Quiz

IV. The Greenhouse Effect and Global Warming
- _____ A. **Greenhouse and Global Warming Document**
- _____ B. *"Greenhouse Effect" Senteo Practice Quiz*
- _____ C. **Greenhouse Effect Calculator Lab**
- _____ D. *Socratic Seminar on Climate Change*
  - _____ 1. Research with links provided on blog
  - _____ 2. List of Questions that will prompt discussion (on blog)
  - _____ 3. Evaluation Sheet
- _____ E. What do you want to say that (for some reason) you didn't get to? Blog Response
- _____ F. **Greenhouse Effect Ediscio Flash Cards**
- _____ G. **Greenhouse and Climate Change Standard Check**

I - A. *Quarter 4 Pre-Assessment* **Percent Score** _____

This is a pretest covering the topics you will learn about during fourth quarter. The score will not affect your grade since it is a pretest. Pay attention to the topics and types of questions while you take this pretest.

What topics seemed easy and/or familiar to you? ___

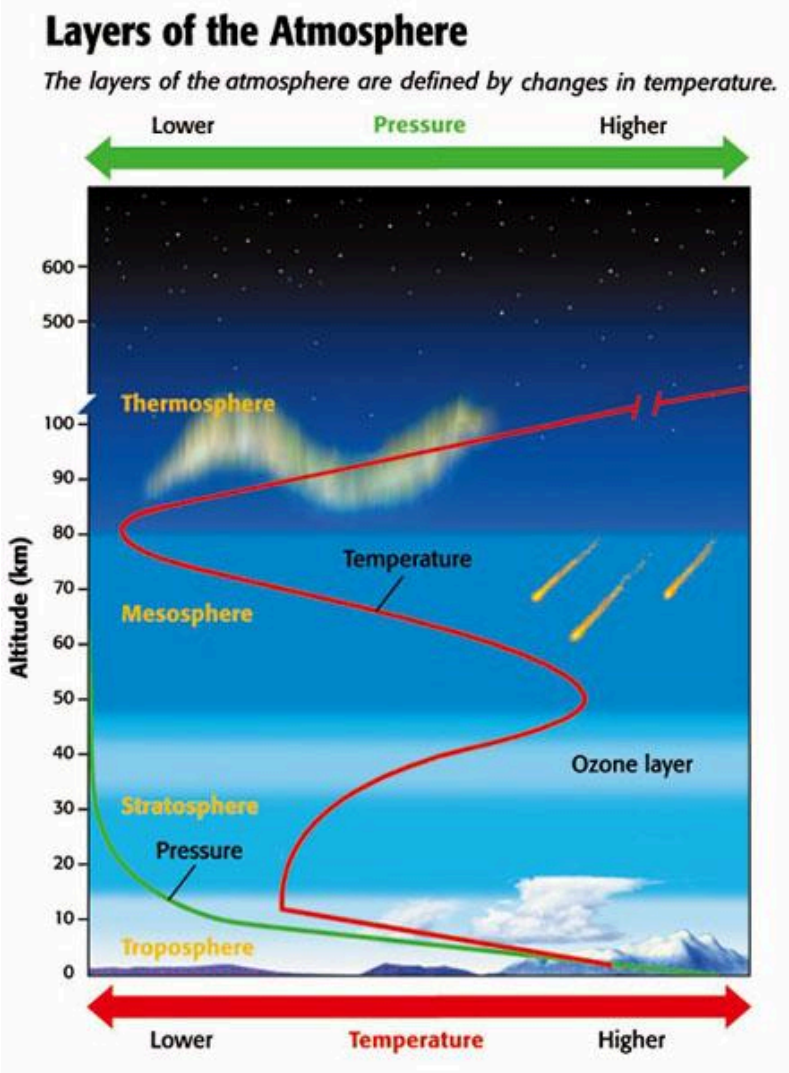
What topics seemed difficult and/or confusing? ___

II - A. *Chapter 15 Starter Transparency*

-How is our atmosphere different from outer space?

II - B. Layers of the Atmosphere Vodcast

DIRECTIONS: Each layer of the atmosphere is shown below. On the right side, record facts about each layer.



Thermosphere: __

Mesosphere: __

Stratosphere: __

Troposphere: __

Figure Questions

In all of the layers, what happens to pressure as altitude increases? ___

In the troposphere, what happens to the temperature as the altitude increases? ___

How about in the stratosphere? ___

II - C. Layers of the Atmosphere Guided Reading (Chapter 15-1)

Section: Characteristics of the Atmosphere (pages 448-453)

Using the book as a resource, try to highlight/type in the correct answers. Then check them using the key from the file cabinet.

___ 1. A mixture of gases surrounding a planet is the
a. oxygen. b. atmosphere.
c. breathable air. d. hemisphere.

THE COMPOSITION OF THE ATMOSPHERE

___ 2. The most common atmospheric gas is
a. oxygen. b. argon
c. nitrogen. d. carbon dioxide.

___ 3. Phytoplankton and plants produce the atmosphere's
a. oxygen. b. argon.
c. nitrogen. d. carbon dioxide.

___4. Most water in the atmosphere is in
a. rain. b. ice.
c. water vapor. d. carbon dioxide.

ATMOSPHERIC PRESSURE AND TEMPERATURE

___ 5. At sea level, a square inch of surface area is under almost how many pounds of pressure?
a. 150 b. 15
c. 30 d. 1500

___ 6. Gas molecules in the atmosphere are pulled toward the Earth by
a. air pressure. b. the moon.
c. gravity. d. surface area.

7. The measure of the force with which air molecules push on a surface is called _____.

8. Explain what happens to air pressure as you move away from the Earth's surface. _____
_____

9. Explain why parts of the atmosphere are warmer than others.
_____
_____

LAYERS OF THE ATMOSPHERE
Match the correct definition with the correct term. Write the letter in the space provided.

___ 10. coldest layer of the atmosphere — a. troposphere

___ 11. atmosphere layer including the ozone layer — b. mesosphere

___ 12. layer of atmosphere closest to Earth — c. stratosphere

___ 13. uppermost layer of the atmosphere — d. thermosphere

14. How are the layers of the atmosphere defined?
_____

15. In the stratosphere, what happens to the temperature as altitude increases?
_____

16. Electrically charged particles are called _____.

17. In polar regions, ions radiate energy as shimmering lights called _____.

Remember to check your answers with the key in the file cabinet!

II - D. *Chapter 15 Start-up Activity – p. 447 Does air have mass***?**
BEFORE the demonstration, write your hypothesis here: _____
_____

Watch the demonstration. Describe what happened after one balloon was popped. _____
_____

Based on the results, does air have mass?
_____
_____

If air has mass, is the atmosphere affected by Earth's gravity?
_____
_____

II - E. *Bill Nye "Atmosphere"*
1. How thick is our atmosphere?
_____

2. What is air?
_____

3. Why is it cooler in the mountains and warmer in the city?
_____

4. What keeps Earth warm and wet?
_____

II - F. "Thanks, Atmosphere" RAFT Assignment

Atmosphere RAFT

***Choose one from each of the lists given**

Choose a role, audience, and format for your assignment. Then read the rest of the directions on this page. When you are ready to start writing, begin in Google docs (there is space below). When you are finished, copy your assignment and paste it into your science blog. Have fun being creative!

Role (who you will write this as)	**Audience** (who you are writing this to)	**Format** (what you're writing)
United Nations Representative	Atmosphere	Thank you letter
President of US	Atmosphere of another planet	Love letter
The Earth	Self	Series of text messages (key included if needed)
Our atmosphere		Journal entry
		Dear Abby (advice column)

Topic (what you're writing about)

In your writing, include *at least* 4 reasons/examples of how the atmosphere supports life here on Earth.

GUIDELINES:

*Use at least 8 sentences.

*Be creative – use your own "voice."

****If you're willing to, copy what you write to a comment on your science blog. Share how/why the atmosphere is so important for us. If you don't want the comment to be published, just say so. Thanks. **** Crazy 8 Science Gator 8 Science V8 Science

II - G. *Oxygen Concentration Lab*

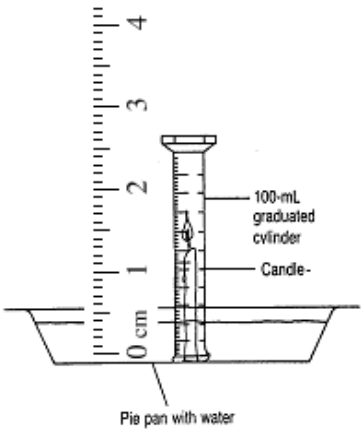
Oxygen Calculation

1. With some melted wax, attach a small candle to the center of a small pie pan.

2. Fill the pan with 2 cm of water. Use the ruler to measure the depth of the water. Make sure this is accurate.

3. Light the candle and cover it quickly with the graduated cylinder, but carefully as to not put out the flame by hitting it with the 50-ml graduated cylinder.(see diagram)

4. After the candle has burned out, measure the height to which the water rose in the graduated cylinder. (ending height- starting height = height at which water rose). **Remember that the starting height would be 2cm and also use your ruler to make measurements, not the graduated cylinder.**



5. Calculate the percentage of oxygen in the air by dividing the height of the water in the graduated cylinder by the height of the graduated cylinder and multiplying by 100.
Remember: You need to make measurements with the ruler!!!!

	A	B	C	D	E
Trial	**Start Ht (cm)**	**Cylinder Ht -2cm**	**End Ht (cm) Water Level inside Cylinder**	**Change C-A (cm)**	**Oxygen % D÷B X 100**
1	**2 cm**				
2	**2 cm**				
3	**2 cm**				
Avg→					

*** Show your work on these problems.*

1. How does your answer compare to the actual percentage of oxygen in the air? Is it really close? Way off? Explain why. **Use complete sentences.**

2. Why is this a way of calculating the amount of oxygen in the cylinder? **Use complete sentences.**

3. What causes the water to rise in the cylinder? **Use complete sentences.**

4. Why aren't trials 1,2, and 3 exactly the same? Why so many trials? **Use complete sentences.**

II - H. "Layers of the Atmosphere" Ediscio Flash Cards

Statistics:

# of flashcards known: _____ # of flashcards unknown: _____

II - I. Layers of the Atmosphere Standard Check

What was your score on this standard check? _____

Which questions did you answer incorrectly? _____

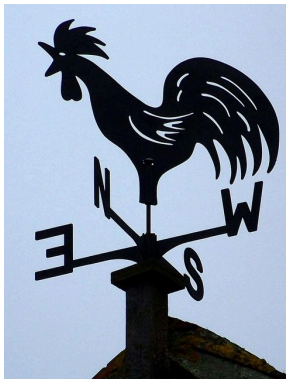
Will you be retaking this standard check? _____

How did/can you master the concepts in this standard check? _____

_____

III - A. *Eyewitness Weather Video and Questions*

Weather Eyewitness Video



1. The _____ is what happens on a particular day.
2. In _____ regions it is far more variable.
3. _____ brings the first clues to the weather of the day.
4. 20 years ago _____ _____ was frozen solid.
5. As the sun rises in the sky its rays become more _____.
6. What are the layers of gases called that surround the earth? _____
7. The first layer is called the _____ and is 8 miles thick.
8. Most all of our weather occurs in the _____.
9. Pine cones only open when it is _____.
10. _____ first showed that air has weight. He also invented the barometer.
11. How many months did the Tacoma Bridge last? _____
12. What occurs more frequently when the wind speed increases? _____
13. Tornadoes have been known to _____ a chickens feathers.
14. Parts of the South American desert haven't seen rain for over _____ years.
15. Is there new water on our planet daily? _____
16. Floods cost more _____ than any other weather disaster.
17. What does water vapor condense on in the air? _____
18. How much snow fell in Colorado in one day? _____
19. How many times was a ranger in Yosemite National Park struck by lightning? _____
20. True or False. Weather is the greatest natural force we know. _____

III - B. Radiation, Conduction, and Convection (Heat Transfer) Vodcast

	Description	Examples
Radiation	_____	_____
Conduction	_____	_____
Convection	_____	_____

*List 2 ways that these three vocab words differ from each other.

1. _____

2. _____

III - C. Radiation, Conduction, and Convection Graphic Organizer

Complete the graphic organizer on the next page, using Chapter 15.2 to help you.

Convection

What is it?

_____

Insert a picture that represents ***convection***:

Insert picture here

Explain why this is convection here:

_____

Examples:

1. ___

2. ___

Conduction

What is it?

_____

Insert a picture that represents ***conduction***:

Insert picture here

Explain why this is convection here:

_____

Examples:

1. ___

2. ___

Radiation

What is it?

_____

Insert a picture that represents ***radiation***:

Insert picture here

Explain why this is convection here:

_____

Examples:

1. ___

2. ___

What do all of them have in common?

_____

Chapter 15-2 pp.454-457

___ 1. How long does it take the sun's energy to reach the Earth?

a. about 8 hours c. about 8 minutes
b. about 80 hours d. about 8 days

ENERGY IN THE ATMOSPHERE

___ 2. What percentae of the energy radiated by the sun reaches the Earth's surface?

a. two-fiftieths c. two-millionths
b. two-thousandths d. two-billionths

___ 3. What percentage of the sun's energy that reaches the Earth is absorbed by the Earth's surface?

a. 25% c. 20%
b. 50% d. 5%

___ 4. What percentage of the sun's energy that reaches the Earth is absorbed by ozone, clouds, and atmospheric gases?

a. 25% c. 20%
b. 50% d. 5%

Match the correct description with the correct term. Write the letter in the space provided.

___ 5. transfer of energy as heat through a material

___ 6. transfer of energy by circulation or movement of a gas

___ 7. circular movement of warm air rising and cool air sinking

___ 8. transfer of energy as electromagnetic waves

a. thermal conduction

b. radiation

c. convection current

d. convection

9. Explain what process produces the greenhouse effect.

_____

_____

10. The balance between incoming solar energy and outgoing energy radiated into space is called _____.

11. A gradual increase in average global temperature is called _____.

12. What are greenhouse gases?

_____

13. What human activities may increase the level of greenhouse gases in the atmosphere?

_____

Now answer questions #2-7 from pg. 457. Write your answers below.

2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

*When finished, correct your answers with an answer key.

III - E. *Ch. 15-2 Bellringer/Summary*

1. How is food heated in an oven? How is food heated on a range top? Which one is similar to thermal conduction and which is similar to convection?

_____

2. Name another example of thermal conduction. Then name another example where convection is involved.

_____

III – F. *Radiation/Conduction/Convection Examples Senteo Quiz*

What was your score on this practice standard check? _____

Which questions did you answer incorrectly? _____

How did/can you master the concepts in this standard check? _____

_____

IV - A. Greenhouse and Global Warming Document w/ ppt

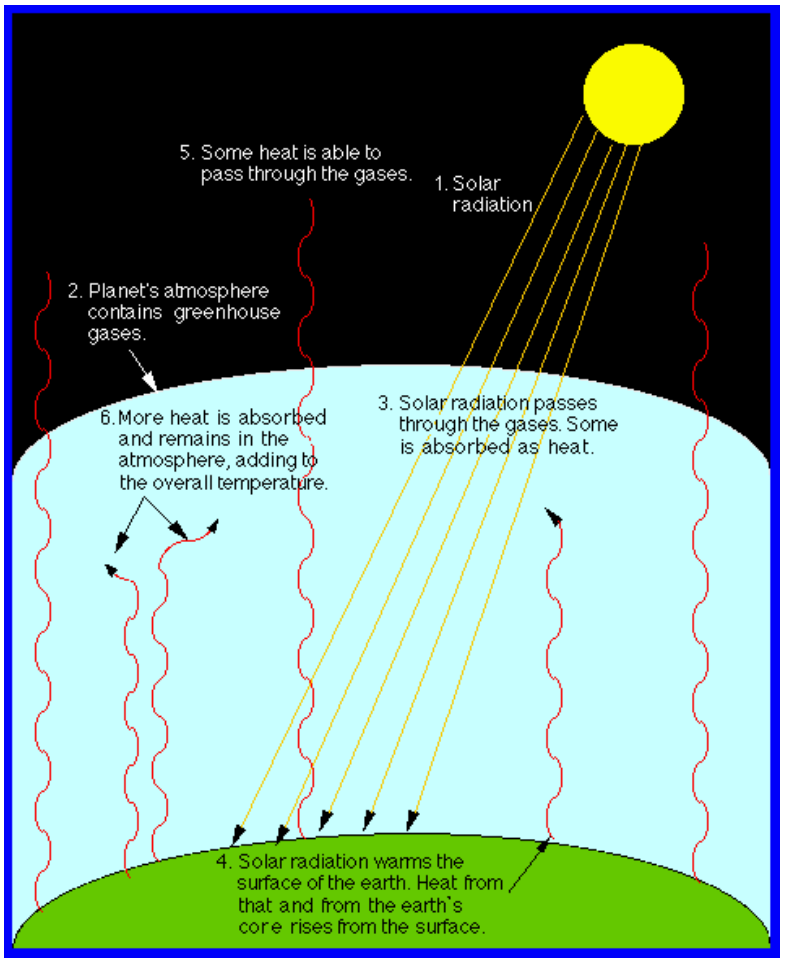
**Grab a science book and open this powerpoint from our science vodcasts web site.*

PART 1

1. In your own words, define the greenhouse effect:

2. What gases are considered the "greenhouse gases"? Why?

3. Study the figure to the right. Then rewrite each description in your own words. To help you summarize, try to use only 4-6 words for each re-written statement.



*1. ___

*2. ___

*3. ___

*4. ___

*5. ___

*6. ___

4. Why is this process called the greenhouse effect?

PART 2

*Write a definition for global warming in the middle of the chart below.
*Record ideas from your sources that support each statement in the boxes on the left and the right.
*After collecting ideas for both sides, complete the opinion box at the bottom of the page.
*Use a variety of resources to collect information about global warming. List your sources here. Then write the number of your source next to each idea you record from your sources.

Source #1: textbook
Source #2:
Source #3:
Source #4:
Source #5:
Source #6:

Global Warming is -

_____

Global warming is a result of **human activity**. People need to make changes to stop global warming.	*Source #*	Global warming is a result of **natural causes**. In history, climates have risen and fallen (ex. The "Little Ice Age" from about 1645-1715 in Europe.)	*Source #*
_____	___	_____	___
_____	___	_____	___
_____	___	_____	___
_____	___	_____	___
_____	___	_____	___
_____	___	_____	___
_____	___	_____	___
_____	___	_____	___

Based on my prior knowledge and my research today, I think that global warming is the result of _____ because _____

_

IV - B. *"Greenhouse Effect" Senteo Practice Quiz (not for grade?)*

What was your score on this standard check? _____

Which questions did you answer incorrectly? _____

IV - C. Greenhouse Effect Calculator Lab

Use the separate instruction sheet to conduct the lab. Record your data here.

Greenhouse Temperature Data Chart

	Probe 1 model greenhouse	**Probe 2 control**
Final temperature		
Beginning temperature		
Temperature change		

12. Insert a drawing below. Add the graph, title, label the axes, and label your two lines.

__Insert your drawing here__

Analysis

13. a. Did the model greenhouse warm faster or slower than the control?

_____

b. What do you think caused the difference?

_____

14. Explain why a closed automobile heats up in the sun. Insert a picture if it would help illustrate your answer.

_____

15. What things were different between this experiment and the real Earth's atmosphere?

_____

16. Why might the greenhouse effect be a problem for our Earth?

_____

Going Further

Repeat the experiment using plastic containers instead of glass containers. Then discuss any differences among your results with your classmates.

IV - D. Socratic Seminar on Climate Change

Is "global warming" actually happening? If so, are humans causing it? Or, is climate change occurring because of natural fluctuations in the system? We will be discussing these questions and more in our **Socratic Seminar on Climate Change**, which will occur during class. Today, you will be preparing yourself to contribute (intelligently!) to that discussion. I will give you a list of questions that will be addressed, and you may use the links provided to research the issue of climate change. Remember to have an open mind, so that your arguments will be well-informed.
Crazy 8 Science Gator 8 Science V8 Science

_____ 1. Research with links provided on blog

EPA for Kids (click on the "Climate Change -- what it is" and "Can we change the climate?")
Icecap Facts and Myths
American Policy Roundtable
Global Warming: Natural or Manmade?
Global Warming 101 (Roy Spencer)
Larry Ferlazzo's Best Sites about Climate Change
Climate Timeline
Bias in Scientific Research
Did we cause it?
ClimateGate Article
Temperature Anomalies
AMNH's Climate Change
Global Warming Effects
USA Today Interactive
Environmental Protection Agency

_____ 2. List of Questions that will prompt discussion (on blog)

List of questions

_____ 3. Evaluation Sheet

IV - E. What do you want to say that (for some reason) you didn't get to? Blog Response Crazy 8 Science Gator 8 Science V8 Science

Is there anything you wanted to say on Friday, but for some reason did not get the chance? Well, here's your chance. What research leads you to believe that Climate Change is caused naturally, or by humans? Has anyone (peers, parents, teachers) influenced your decision? Answer these or any other questions about climate change in your response to this post.

IV - F. Greenhouse Effect Ediscio Flash Cards

Statistics:

# of flashcards known: _____ # of flashcards unknown: _____

IV - G. Greenhouse and Climate Change Standard Check

What was your score on this standard check? _____

Which questions did you answer incorrectly? _____

Will you be retaking this standard check? _____

How did/can you master the concepts in this standard check? _____
_____