Part 1 The Atmosphere

Name:

Part 1 Lesson 1 Weather vs Climate

Due:

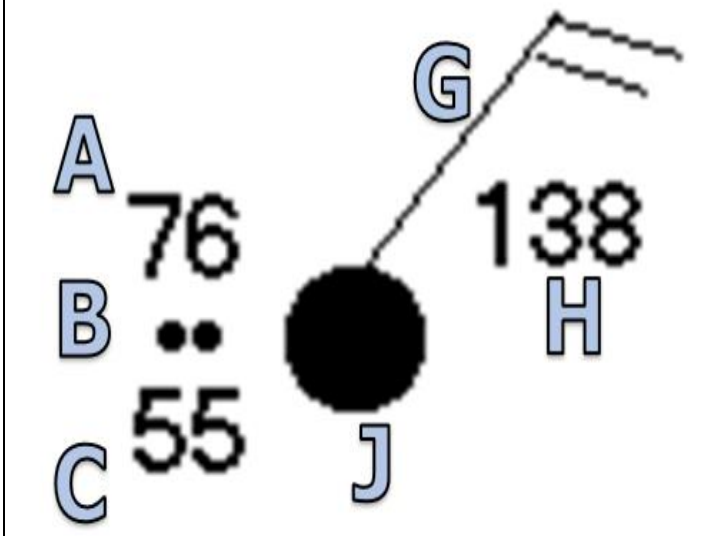
Weather: The state of the _____ at a given time and place, with respect to variables such as…

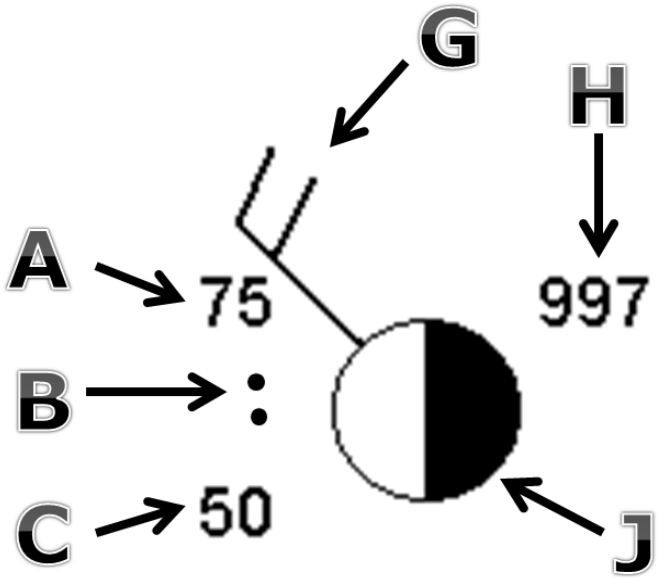
- _____
- Precipitation
- Humidity
- Wind Speed and D_____
- Air Density

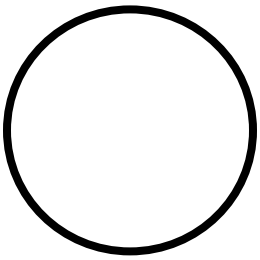
  The mass of the air per unit volume
- Air _____
  - The force exerted onto a surface by the weight of the air.

% Cloud Cover

Please look at the weather station symbols and variables on the next page to accurately describe A, B, C, G, H, J from below.

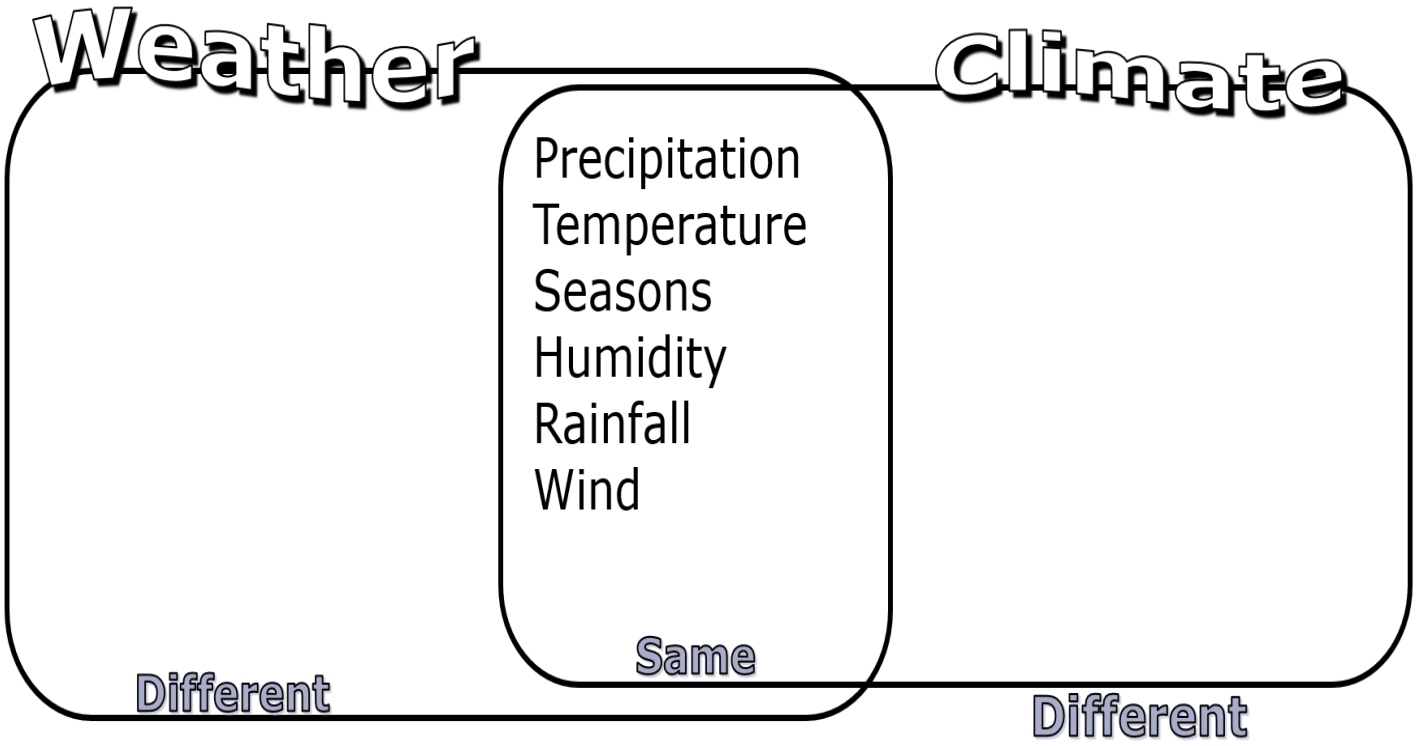




Describe the day with this forecast?	Use the information on the next page to create a weather model for your 25 day forecast. You can visit a weather website to collection additional data.
	

Climate: The _____ weather of a particular part of the world at different times of the year. (Longer periods of time)

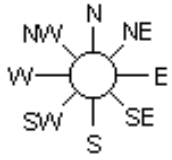
What's the difference between weather and climate?



Cloud Coverage

- No Clouds
- 1/10
- 1/4
- 1/2
- 3/4
- 9/10
- Completely Overcast
- Sky Obscured

Wind Direction



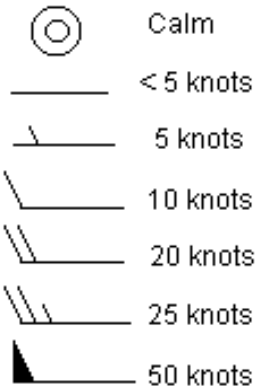
Wind comes FROM the direction of the arrow.

Air Pressure

H High

L Low

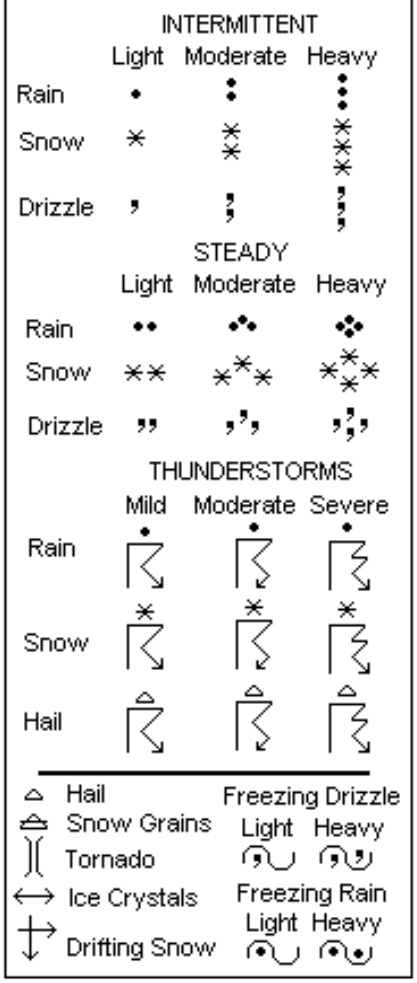
Wind Speed



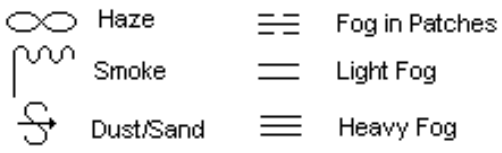
Fronts

Cloud Types

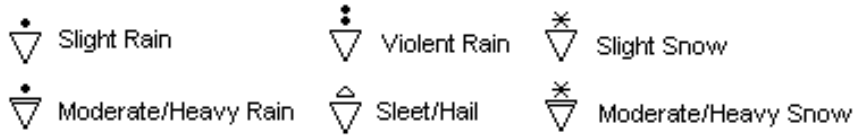
Weather Conditions



MISC. SKY COVER

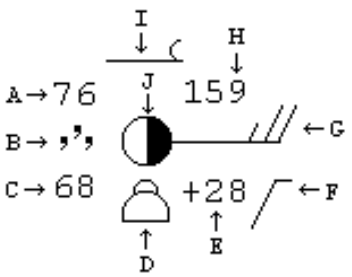


SHOWERS



Barometric Tendency

Weather Station Model Demo



A - Temperature
B - Present Weather
C - Dew Point
D - Low Cloud Type
E - Pressure Change
F - Pressure Tendency
G - Wind Speed & Direction
H - Barometric Pressure
I - High Cloud Type
J - Cloud Coverage

Part 1 Lesson 2 Atmosphere

Atmosphere: The layer of _____ surrounding Earth; composed mainly of nitrogen and oxygen. Extremely thin

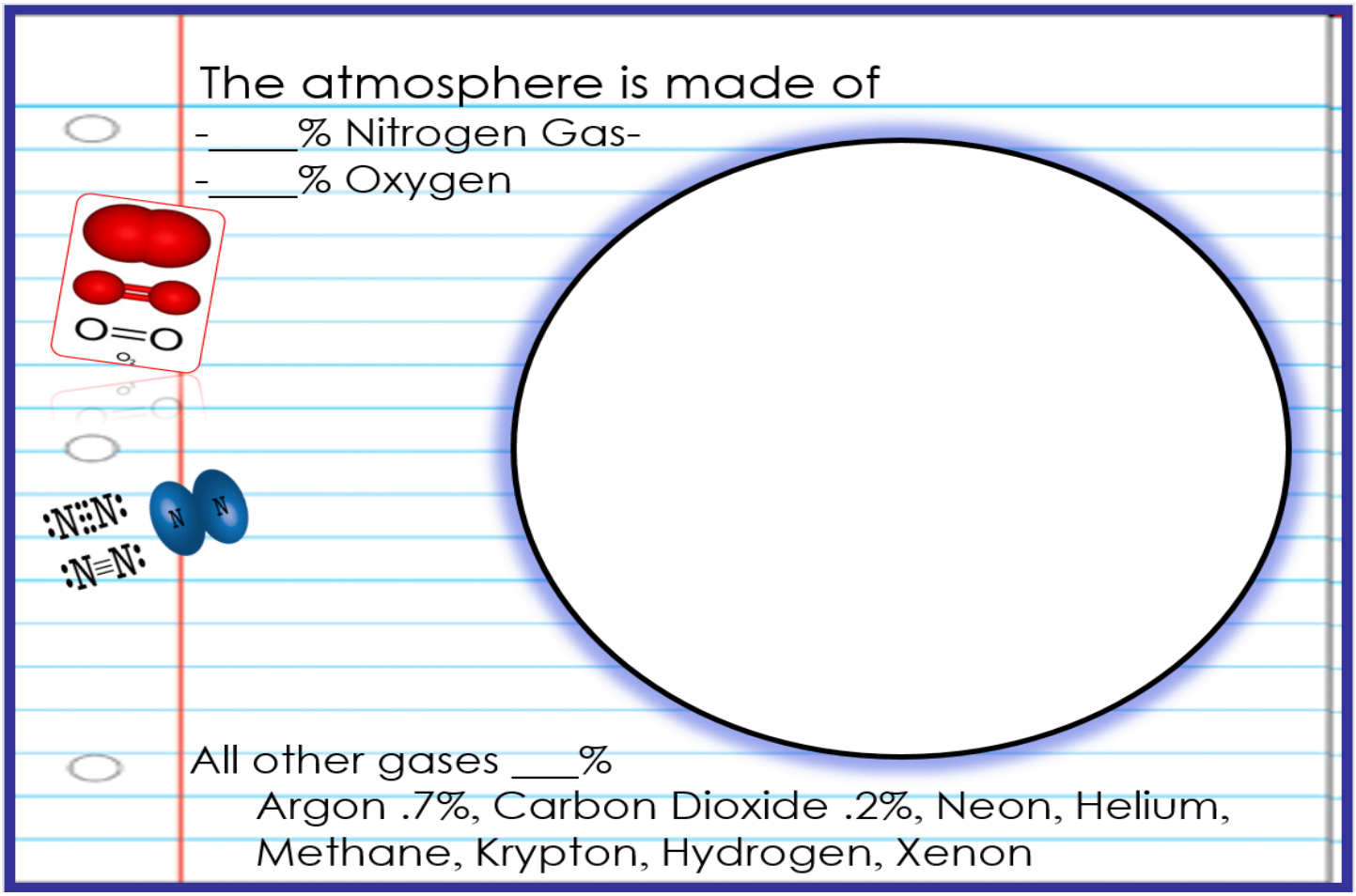
Importance of the Atmosphere

- Keeps planet _____ (Greenhouse effect)
- Provides _____ to breathe (makes respiration possible)
- Protects us from small _____
- Has _____ layer that protects us from radiation (UV)

Combustion: A process in which a substance reacts with oxygen to give heat and light.

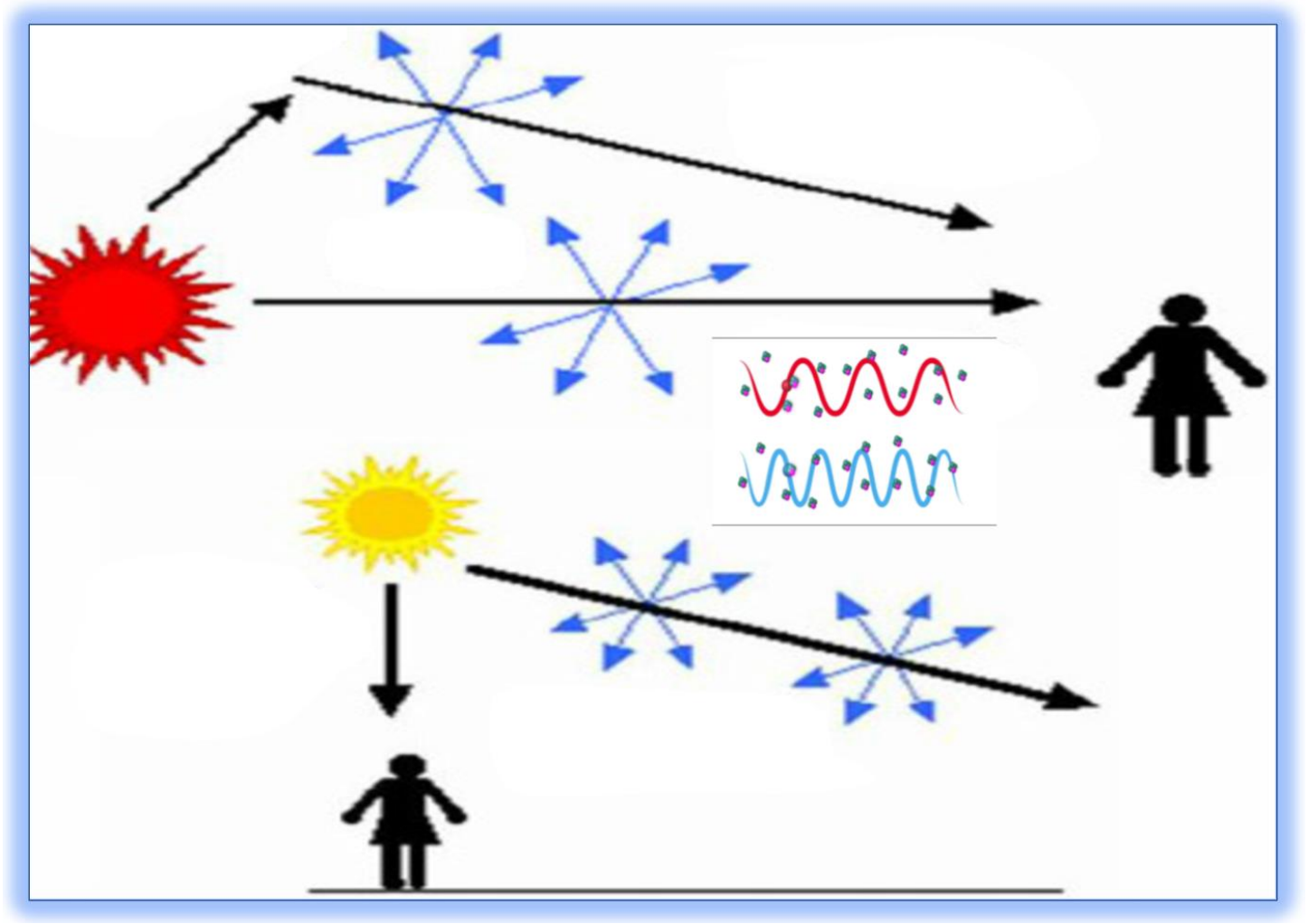
Without atmosphere, smell, taste, sound, and combustion are not possible.

	Large	Medium	Small
Volume of the container / Size			
Seconds for the flame to go out			



Why is the sky blue? Why do sunsets look the way they do? The diagram below can assist you when you complete it later in the lesson.

Please add information to describe why sunsets are colored / red, and the sky is blue when the sun is directly overhead.



Part 1 Lesson 3 layers of the Atmosphere

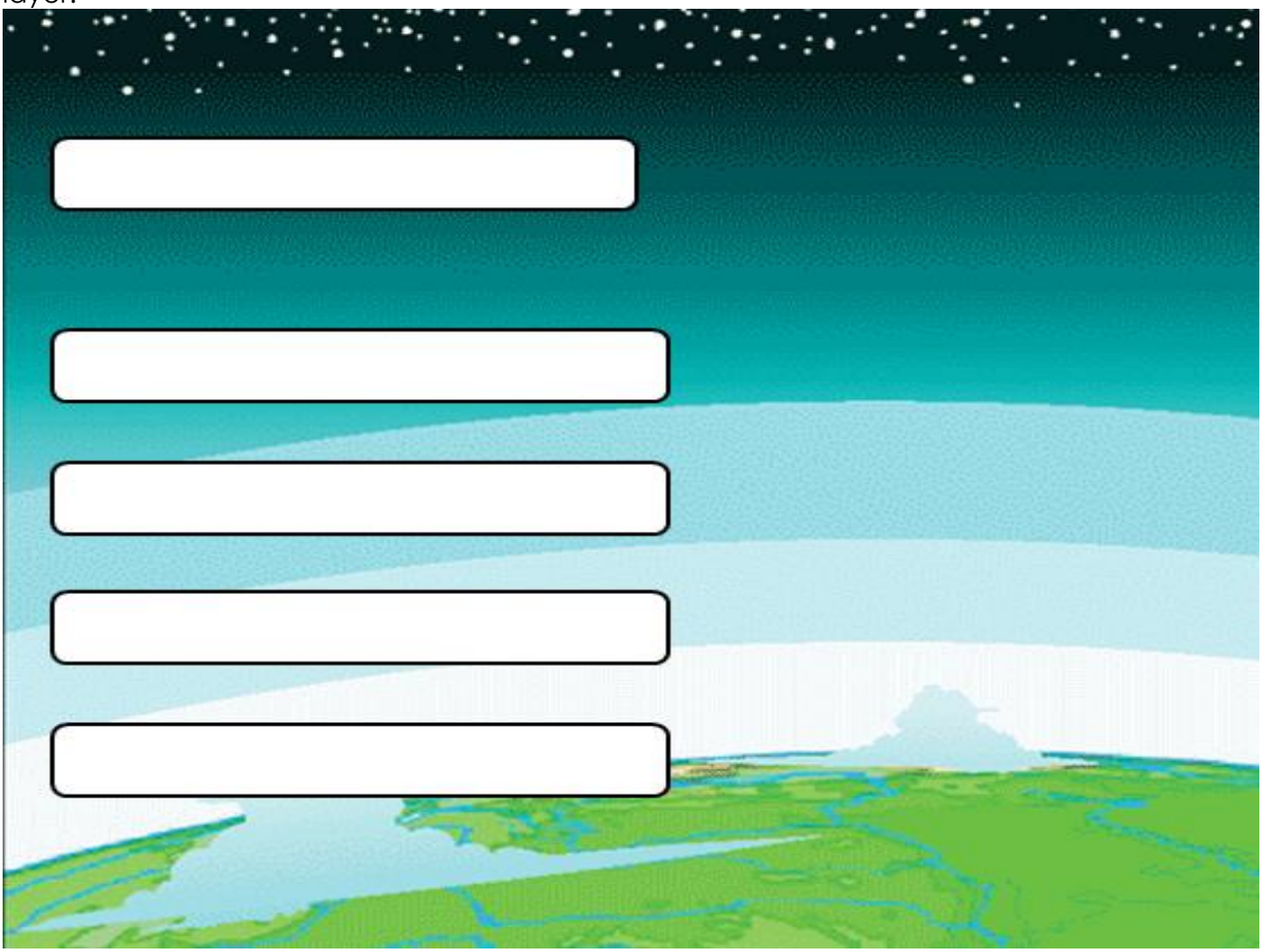
Layers of the Atmosphere

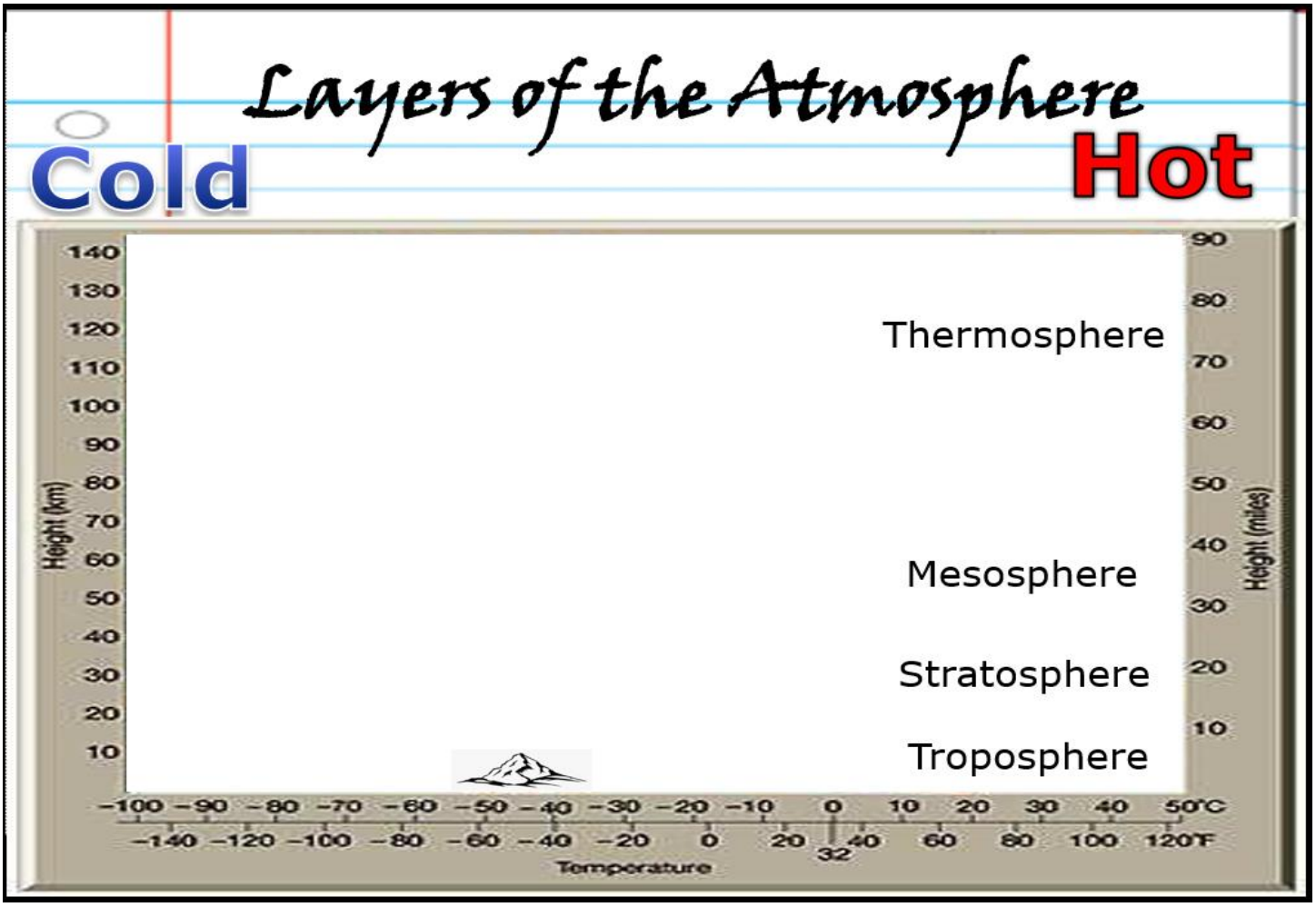
- Exosphere – Merges with _____, some satellites here.
----------Kármán Line (100km) ----------
- Thermosphere –The ISS orbits here, Aurora _____
- Mesosphere – _____ burn up here
- _____- Ozone found here.
- Troposphere – _____ occurs here, life, air travel.
--------Earth's Surface--------

Quiz in the Slideshow: Name the layer in the atmosphere?

1)	2)	3)
4)	5)	Bonus

Name the layers of the atmosphere and draw some "things" that you might find in each layer.



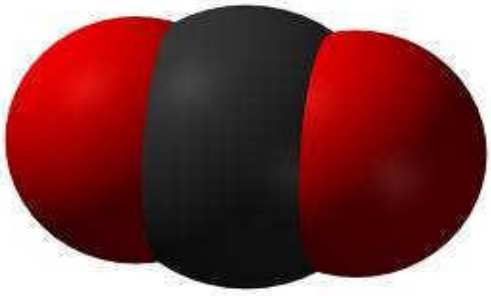
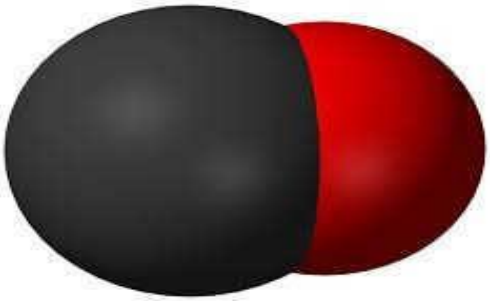


Part 1 Lesson 4 Air Quality

Air Pollution can be

- _____(Global Warming)
- _____ (Acid Rain)
- _____ (Smog)

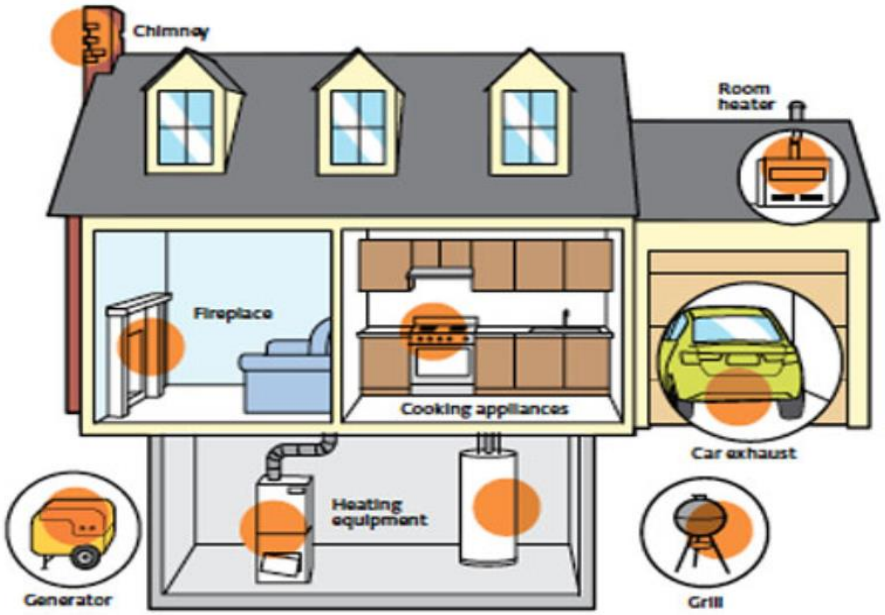
Which one is carbon monoxide? And which is carbon dioxide?

 Answer=	 Answer=

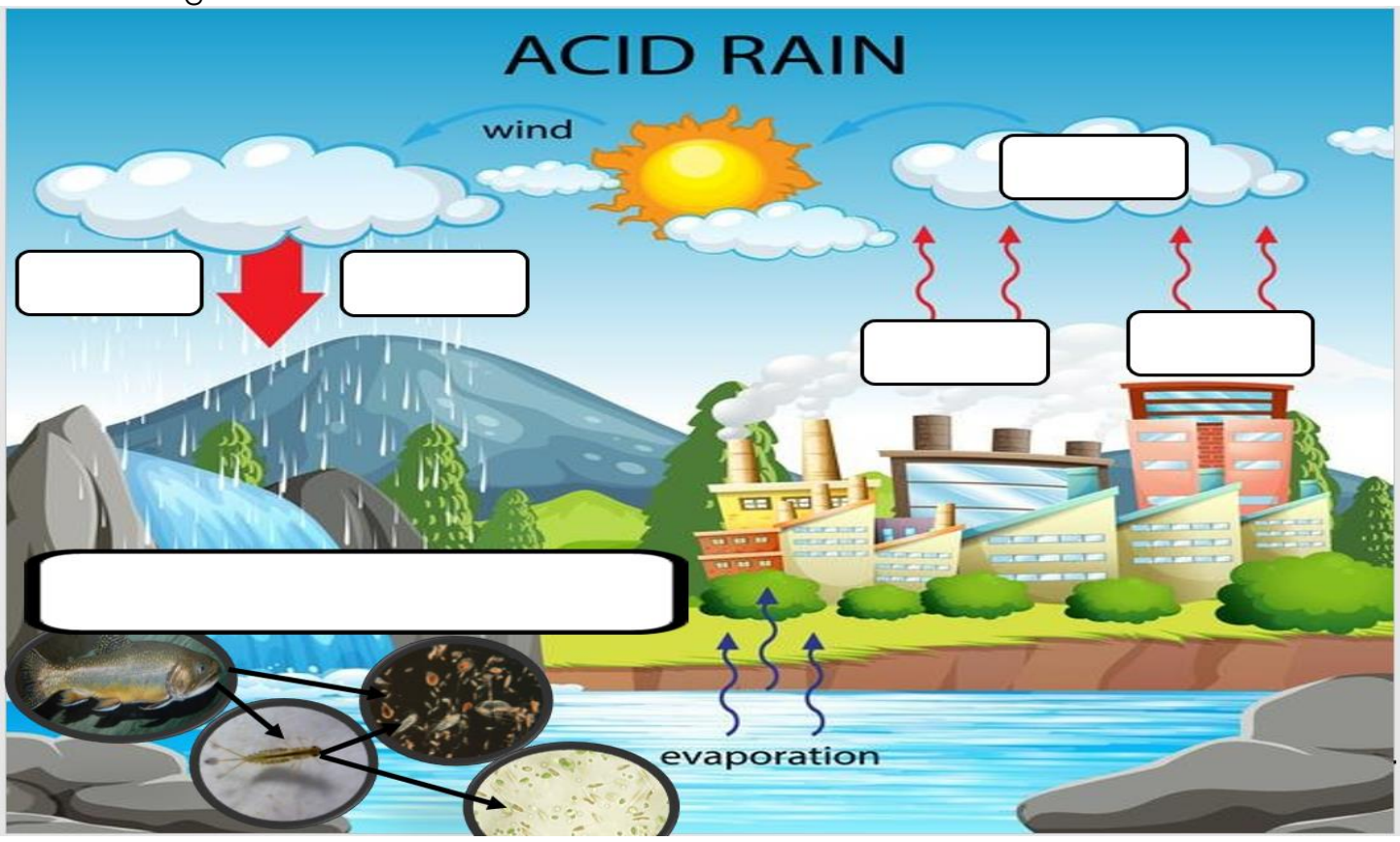
To avoid carbon monoxide poisoning, **Do not…**

Run a car in a _____garage
Burn charcoal _____or in a tent
Run a _____indoors
Burn anything without _____

What is so dangerous about carbon monoxide? Use the picture below to elaborate on some of the precautions you should take to avoid this type of poisoning?



Acid Rain is caused by _____ and _____ dioxides. aka – Air pollution (smog) causing the rain to become slightly more acidic. This has a negative impact on plants and small organisms.



Volatile organic compounds are compounds that have a high vapor pressure and low water solubility.

Many VOCs are human-made chemicals that are used and produced in the manufacture of paints, pharmaceuticals, and refrigerants.

They contain carbon but are not carbon dioxide, carbon monoxide and some others.

Radioactive pollutants can be produced by nuclear explosions, war explosives, and natural processes such as the radioactive decay of radon.

Part 1 Lesson 5 Particulates

Particulate matter (PM), measured as smoke and dust.

PM 10 is the fraction of suspended particles 10 micrometers in diameter and smaller that will enter the nasal cavity.

PM 2.5 has a maximum particle size of 2.5 μm and will enter the bronchus and lungs.

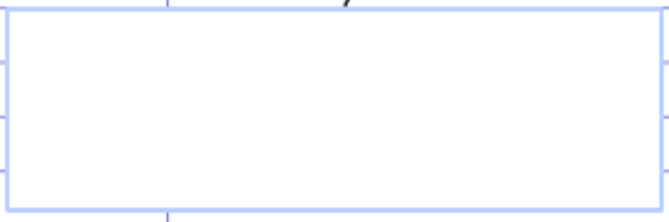
The _____ (1970) created federal and state regulations to limit emissions from both stationary (industrial) sources and mobile sources.

Particulate Matter around the school

Control Tape

Pollen / Dandelion

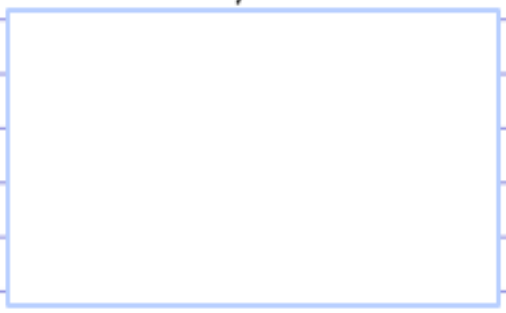
Dusty Closet



Smoke / Blown out candle

Curtain Fibers

Sweep Walk / Dusty Outside



Car Exhaust

Other?

Questions

1) How do the samples compare to the control?

2) Which sample had the largest particles and which had the smallest particles?

3) Which ones do you suspect would be the most dangerous to breath in? Why?

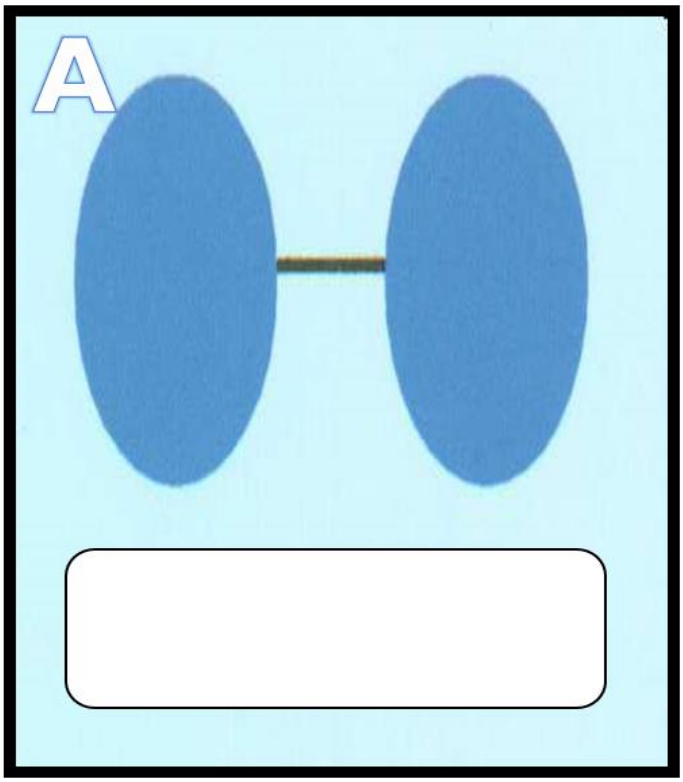
4) Are there other places we should collect from? Or… Name some situations / types of work where you may want to wear a mask to avoid breathing in particulate matter?

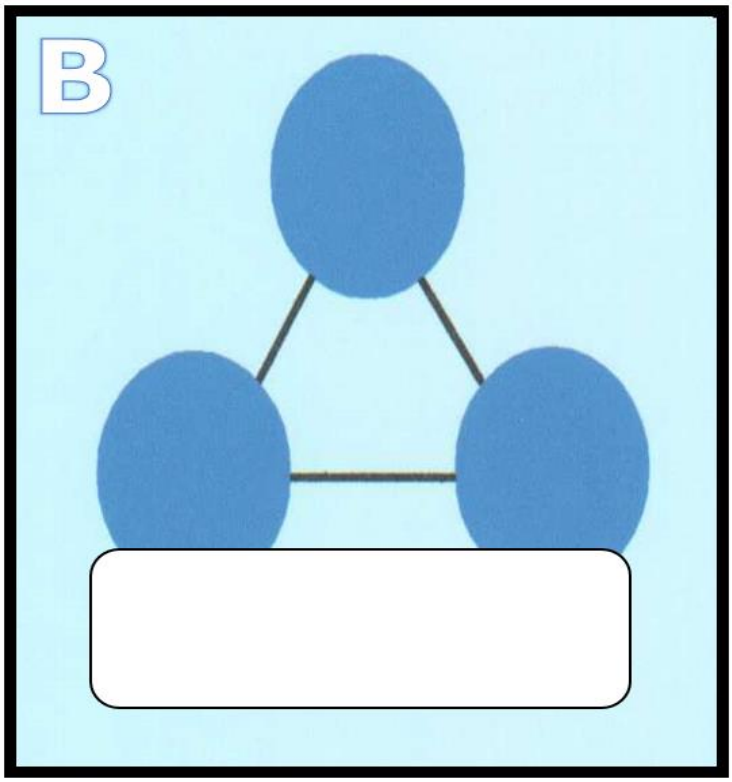
Clean Air Act (1970) created federal and state regulations to limit emissions from both stationary (industrial) sources and mobile sources.

Ozone Layer

- Layer of atmosphere
- Gas made of 3 _____ atoms (O_3)
- Absorbs 99% of suns harmful _____ rays
- Chloroflurocarbons, (_____s) made by humans in aerosols destroy Ozone
- Humans have created a hole in the ozone layer. -Not getting worse 😊

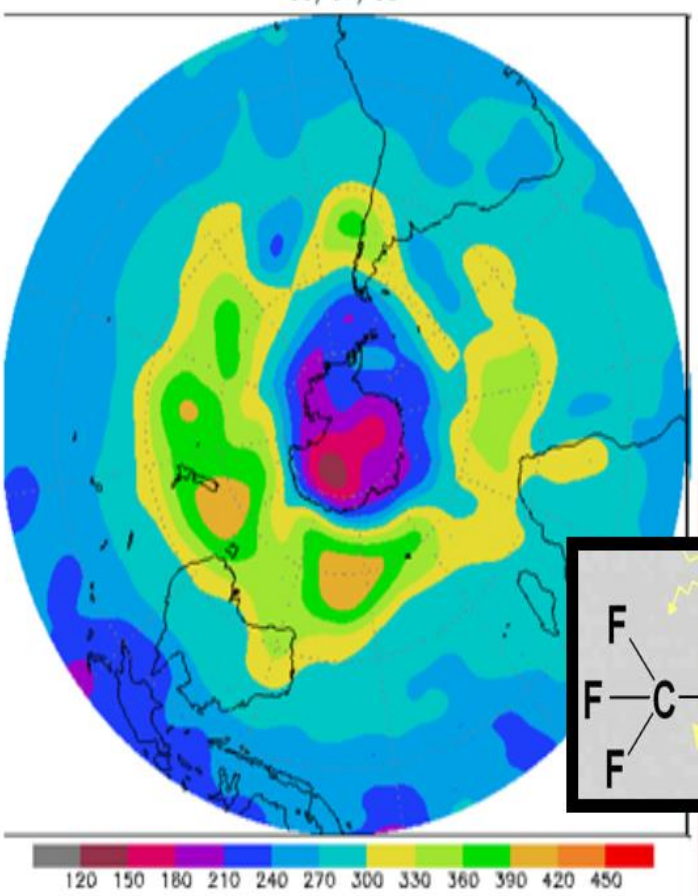
Which one is diatomic Oxygen Gas? And which one is ground level Ozone?



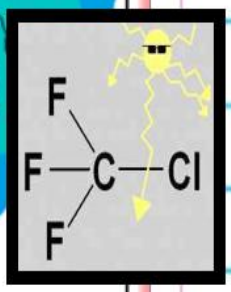


Asthma: A condition in which your airways narrow and swell and produce extra mucus. This can make breathing difficult and trigger coughing, wheezing and shortness of breath.

Please analyze the photo below. Do you recognize the environmental issue? What do you know about it?



What are these?

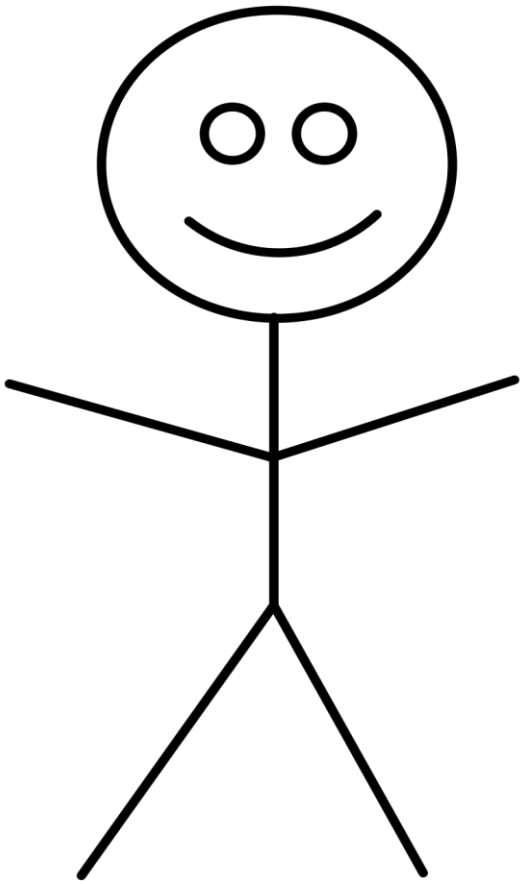


Part 1 Lesson 6 Skin Cancer

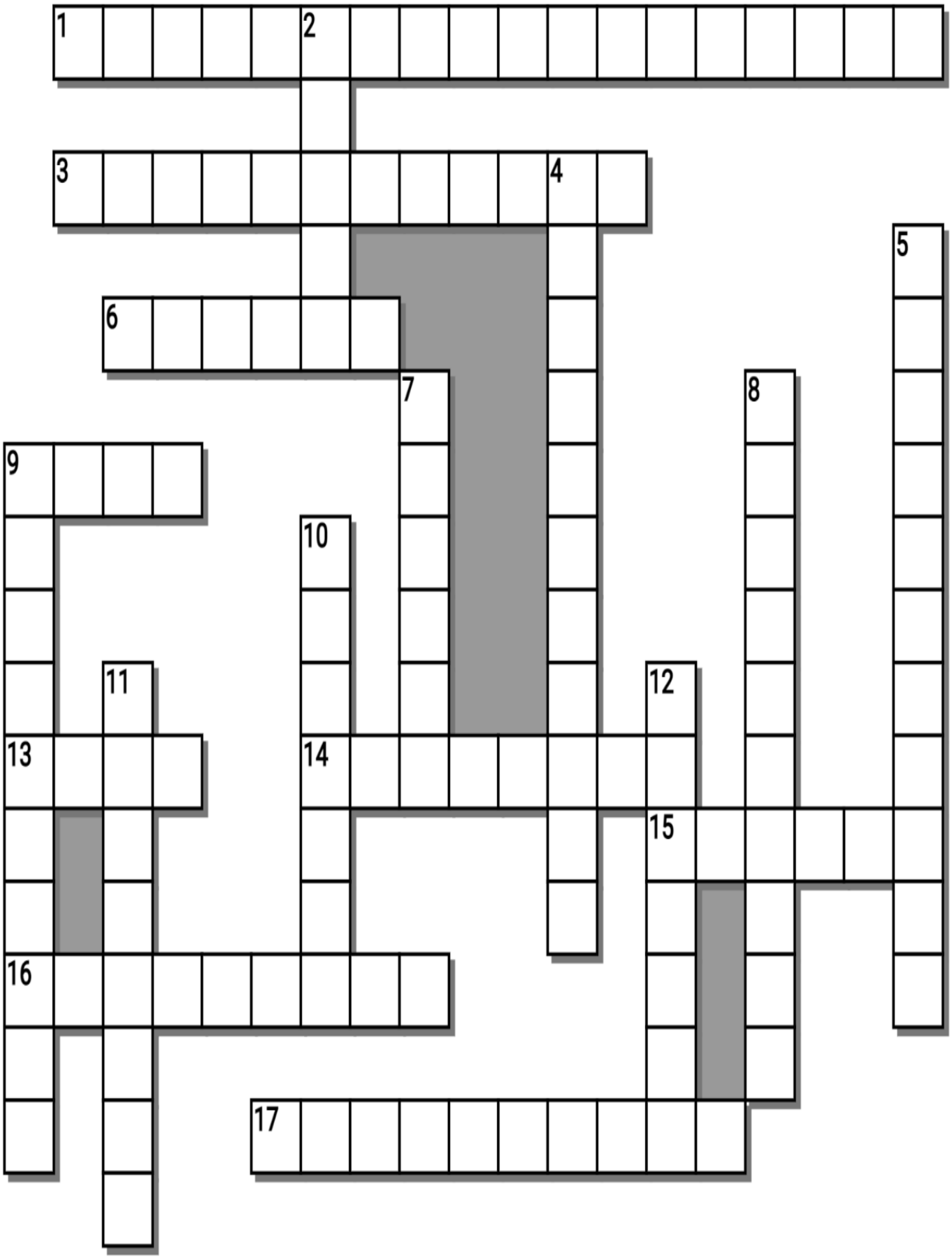
Ways to avoid skin cancer

- Don't_____. The sun is radiation
- Tanning also increases your risk
- Avoid the sun, especially between _____
- Seek _____
- Wear a shirt (thicker and darker)
- Wear _____
- Be especially wary fair skinned people

Please decorate this stick figure so that's its more UV protected. Describe in the margin ways to protect yourself from Ultraviolet Radiation known as UV ray's which can cause skin cancer.



Do you know you're A,B,C,D's of skin moles below?


1
2
3
4
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6
7
8
9
10
11
12
13
14
15
16
17

Across

1. C_____ (CFC's) made by humans in aerosols destroy Ozone
3. The ozone layer is found in this layer of the atmosphere
6. The atmosphere is made of 21%_____ gas
9. _____ Rain: is caused by Nitrogen and Sulfur dioxides. aka – Air pollution (smog) causing the rain to become slightly more acidic. This has a negative impact on plants and small organisms.
13. _____ cancer is an abnormal growth of skin cells. It generally develops in areas that are exposed to the sun
14. Carbon _____ is a poisonous gas that has no smell or taste. Breathing it in can make you unwell, and it can kill if you're exposed to high levels.
15. A condition in which your airways narrow and swell and produce extra mucus. This can make breathing difficult and trigger coughing, wheezing and shortness of breath.
16. Layer of the atmosphere that merges with space, some satellites orbit here.
17. Meteors burn up in this layer of the atmosphere

Down

2. _____ Layer: A layer in the earth's stratosphere at an altitude of about 6.2 miles (10 km) containing a high concentration of O3, which absorbs most of the ultraviolet radiation reaching the earth from the sun.
4. _____ pollutants can be produced by nuclear explosions, war explosives, and natural processes such as the radioactive decay of radon.
5. _____ Matter is the sum of all solid and liquid particles suspended in air many of which are hazardous. This complex mixture includes both organic and inorganic particles, such as dust, pollen, soot, smoke, and liquid droplets.
7. The _____ line is an imaginary boundary about that's 62 miles / 100 km above sea level.
8. A process in which a substance reacts with oxygen to give heat and light.
9. The layer of gases surrounding Earth; composed mainly of nitrogen and oxygen.
10. The average weather of a particular part of the world at different times of the year. (longer periods of time
11. The atmosphere is made of 78%_____ gas
12. The state of the atmosphere at a given time and place, with respect to variables

----------Remove this word bank before printing to make more difficult----------

Possible Answers

ACID, ASTHMA:, ATMOSPHERE, CHLOROFLUROCARBONS, CLIMATE, COMBUSTION, EXOSPHERE, KÁRMÁN, MONOXIDE, NITROGEN, OXYGEN, OZONE, PARTICULATE, RADIOACTIVE, SKIN, STRATOSPHERE, WEATHER, MESOSPHERE

Part 1 Review Game

Name:

1-20 = 5 pts Lesson 7 Due: Today

*20-*25 * = Bonus + 1 pt,

(Secretly write owl in correct space +1 pt) Score ____ / 100

Final Question = 5 pt wager

AT MOST	LOTSA LAYERS	SMOGGY SMOG	MY WEATHER TOOLBOX	WEATHER MOVIES Bonus round 1pt each
1)	6)	11)	16)	*21)
2)	7)	12)	17)	*22)
3)	8)	13)	18)	*23)
4)	9)	14)	19)	*24)
5)	10)	15)	20)	*25)

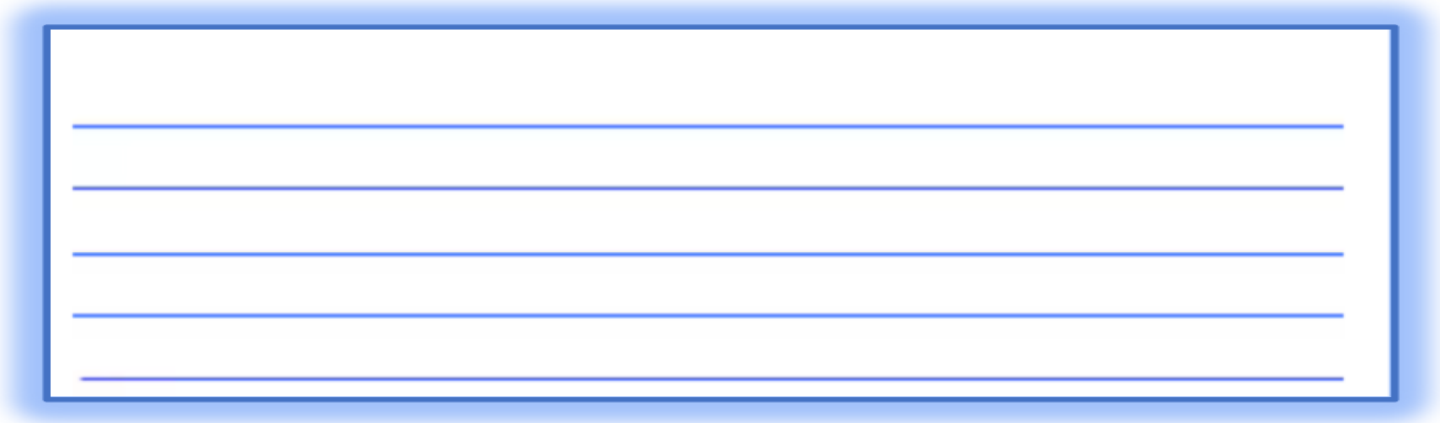
Final Question Wager ___ /5 Answer: _____

Self-Assessment Atmosphere

Name:

SELF-ASSESSMENT AREAS	Absolutely 100% / Agree	Mostly	It wasn't my best this time / Disagree	NOTES / Explain
The entire work bundle was completed and passed in on time. Explain in notes if needed.				
What was my score on the review game? _____ Did this score accurately reflect my understanding?				
This work bundle demonstrates my best work in science. Explain if needed.				

Which lesson in the unit / question in work bundle did you enjoy the most and least? Explain



What word/words did you misspell most frequently in this work bundle? Please write them down with the correct spelling below?

_____

What questions do you still have? Or what are some takeaways that you will remember about this unit? Explain below

What do you feel you should get for a score out of 100 points? _____

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Name:

Part 1 Lesson 1 Weather vs Climate

Due:

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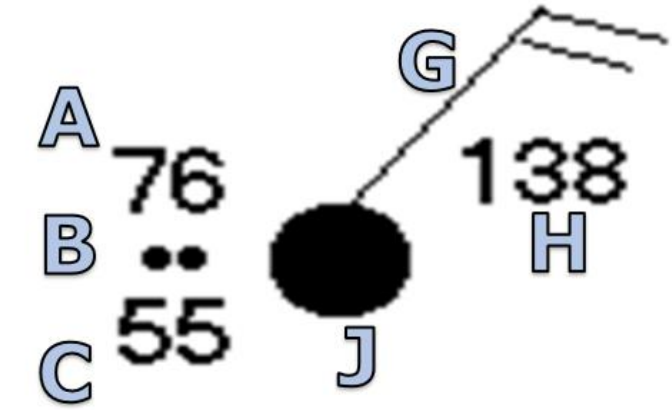
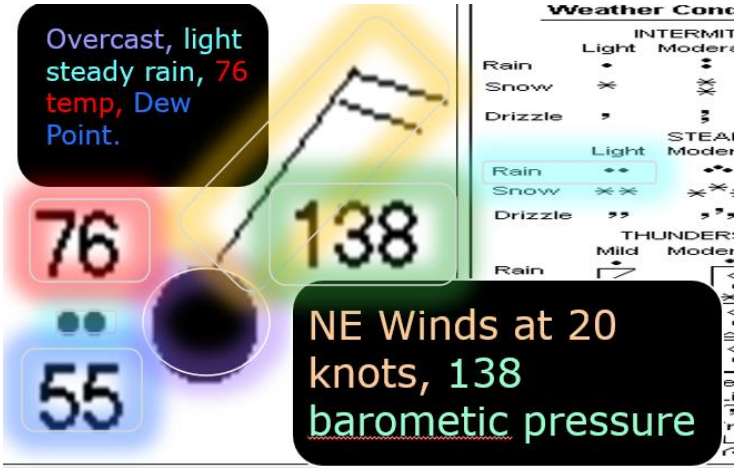
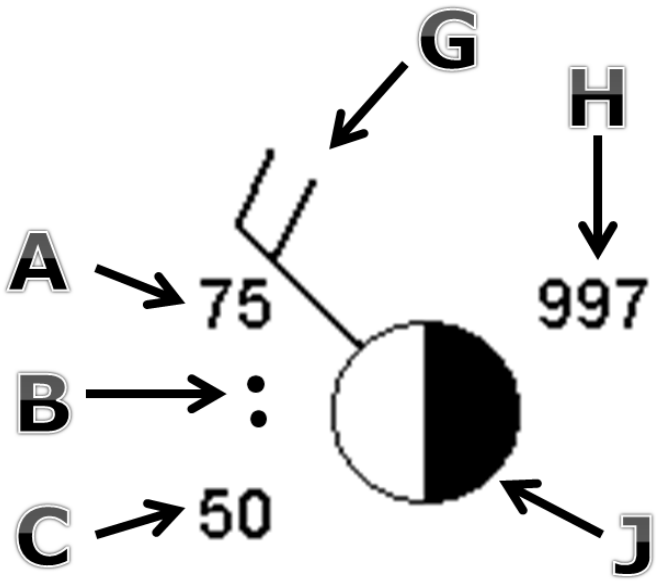
- Temperature
- Precipitation
- Humidity
- Wind Speed and Direction
- Air Density
  - The mass of the air per unit volume
- Air pressure
  - The force exerted onto a surface by the weight of the air.
- % Cloud Cover

Please look at the weather station symbols and variables on the next page to accurately describe A, B, C, G, H, J from below.

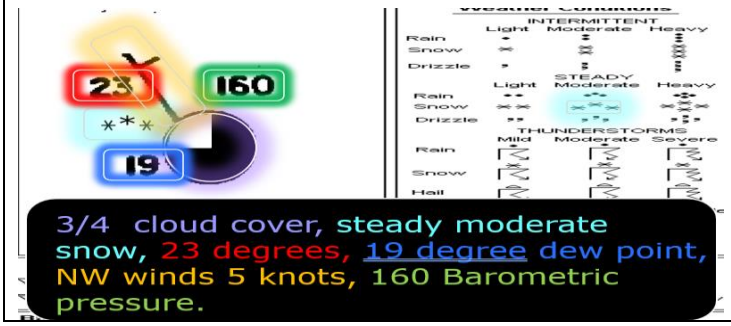






Wind to the NW at 20 Knots, Skies ½ overcast/ cloud coverage, Intermittent Moderate Rain, 75 degrees, Dew Point at 68 and Barometric Pressure is 997

Describe the day with this forecast?



Use the information on the next page to create a weather model for your 25 day forecast. You can visit a weather website to collection additional data.

Answers will vary but wind speed, temperature, cloud coverage, barometric pressure, and weather conditions would be expected as part of the daily forecast

Climate: The average weather of a particular part of the world at different times of the year. (Longer periods of time)

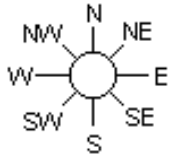
What's the difference between weather and climate?

S/No	Weather	Climate
1.	Weather is the condition of the atmosphere in a specific place at a given point in time; these atmospheric conditions may take place day by day, minute by minute or seasonally.	While climate is the average weather conditions over a place and it mostly take place after 30 year of time.
2.	Weather may involve just one condition of the atmosphere.	While climate includes all the conditions of the atmosphere such temperature, precipitation, wind, humidity, cloud and pressure.
3.	Weather occurs in a place within a short period.	Climate takes place over long period of time.
4.	Weather is what you get on a daily basis;	Climate is what you expect over a long time
5.	Weather changes within a short time.	The overall changes and variations of a climate are very stable and may take decades or centuries to occur.
6.	The scientific study of weather is called meteorology and meteorologist studies weather.	The scientific study of climate is called climatology; a climatologist studies climate.

Cloud Coverage

- No Clouds
- 1/10
- 1/4
- 1/2
- 3/4
- 9/10
- Completely Overcast
- Sky Obscured

Wind Direction



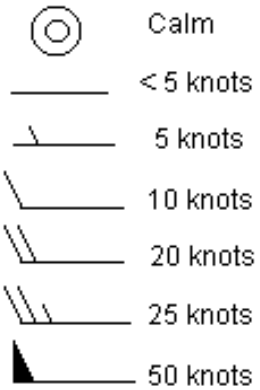
Wind comes FROM the direction of the arrow.

Air Pressure

H High

L Low

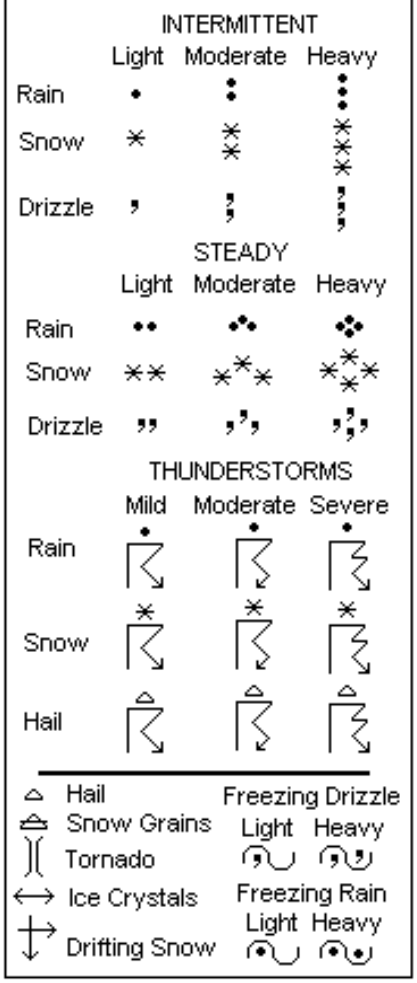
Wind Speed



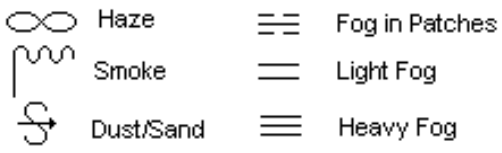
Fronts

Cloud Types

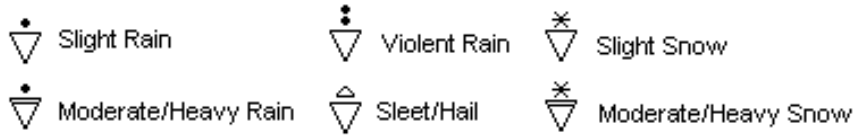
Weather Conditions



MISC. SKY COVER

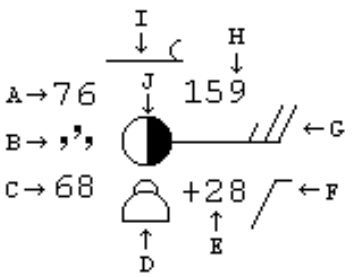


SHOWERS



Barometric Tendency

Weather Station Model Demo



A - Temperature
B - Present Weather
C - Dew Point
D - Low Cloud Type
E - Pressure Change
F - Pressure Tendency
G - Wind Speed & Direction
H - Barometric Pressure
I - High Cloud Type
J - Cloud Coverage

Part 1 Lesson 2 Atmosphere

Atmosphere: The layer of gases surrounding Earth; composed mainly of nitrogen and oxygen. Extremely thin

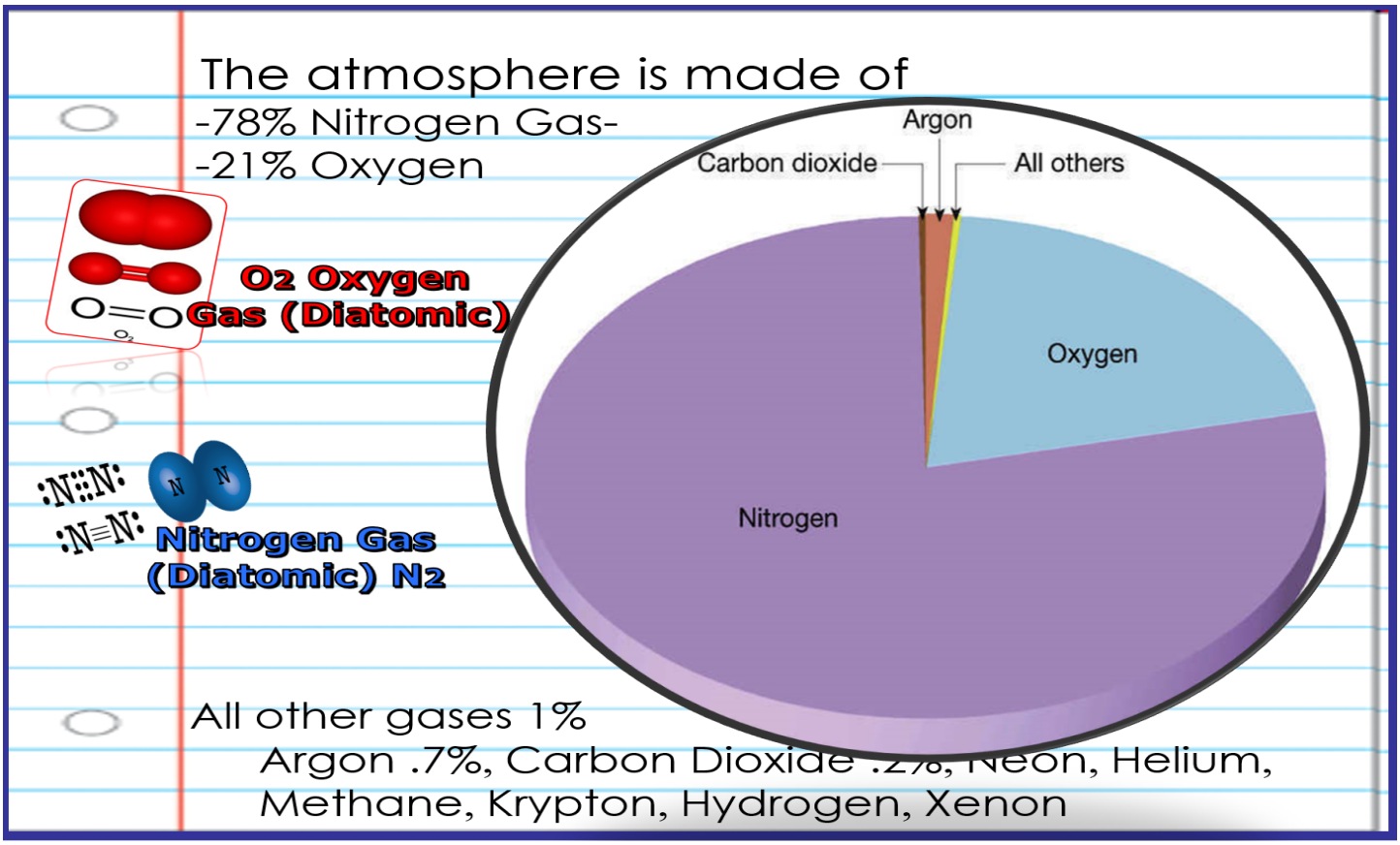
Importance of the Atmosphere

- Keeps planet warm (Greenhouse effect)
- Provides oxygen to breathe (makes respiration possible)
- Protects us from small meteorites
- Has ozone layer that protects us from radiation (UV)

Combustion: A process in which a substance reacts with oxygen to give heat and light.

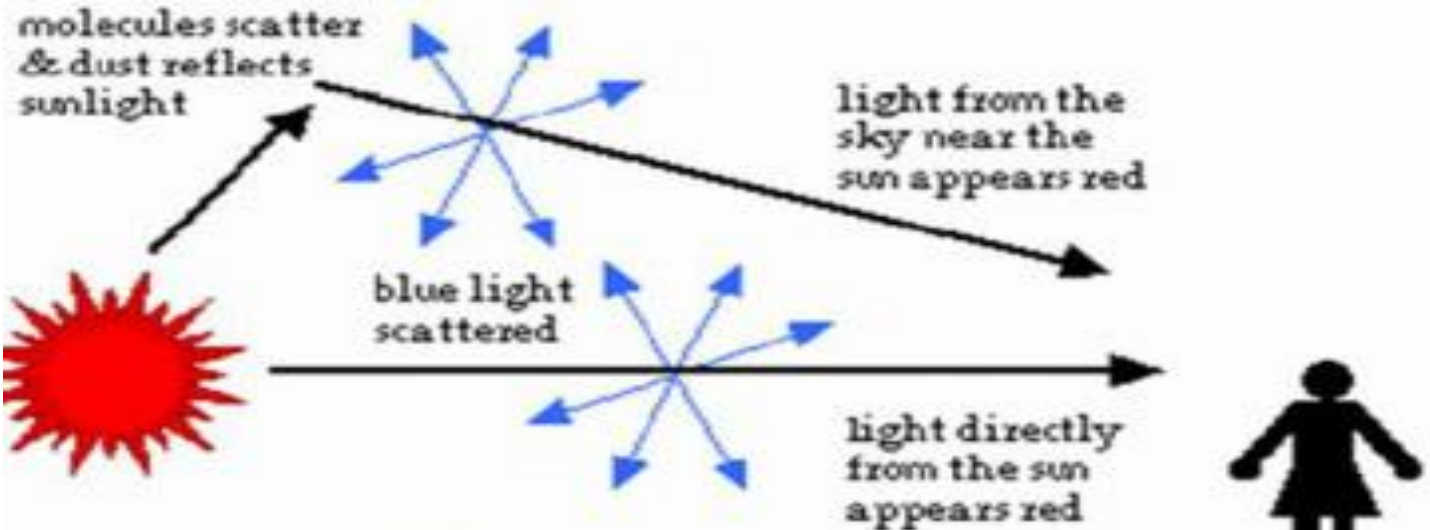
Without atmosphere, smell, taste, sound, and combustion are not possible.

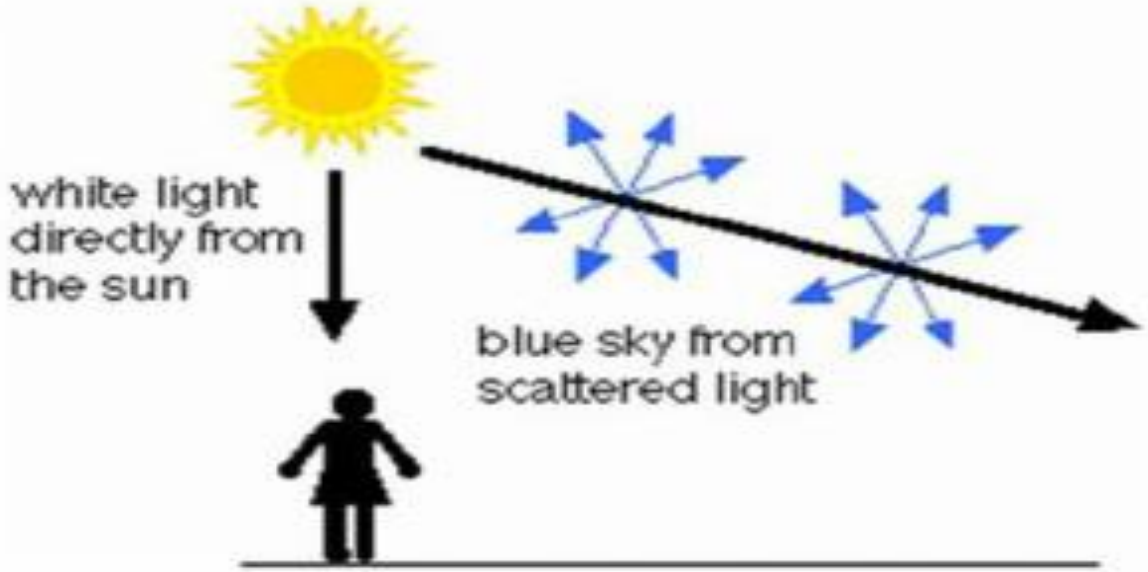
	Large	Medium	Small
Volume of the container / Size			
Seconds for the flame to go out			



Why is the sky blue? Why do sunsets look the way they do?

- The sky is blue because…
  - Nitrogen and Oxygen are small atoms.
  - Red light (long wavelength) from the sun passes by Nitrogen and Oxygen without hitting them.
  - Blue light (shorter wavelength) hits Nitrogen and Oxygen and is scattered.





Part 1 Lesson 3 layers of the Atmosphere

Layers of the Atmosphere

- Exosphere – Merges with space, some satellites here.
- Thermosphere – Space shuttle orbits here, Aurora borealis

----------Karman Line (100km)----------

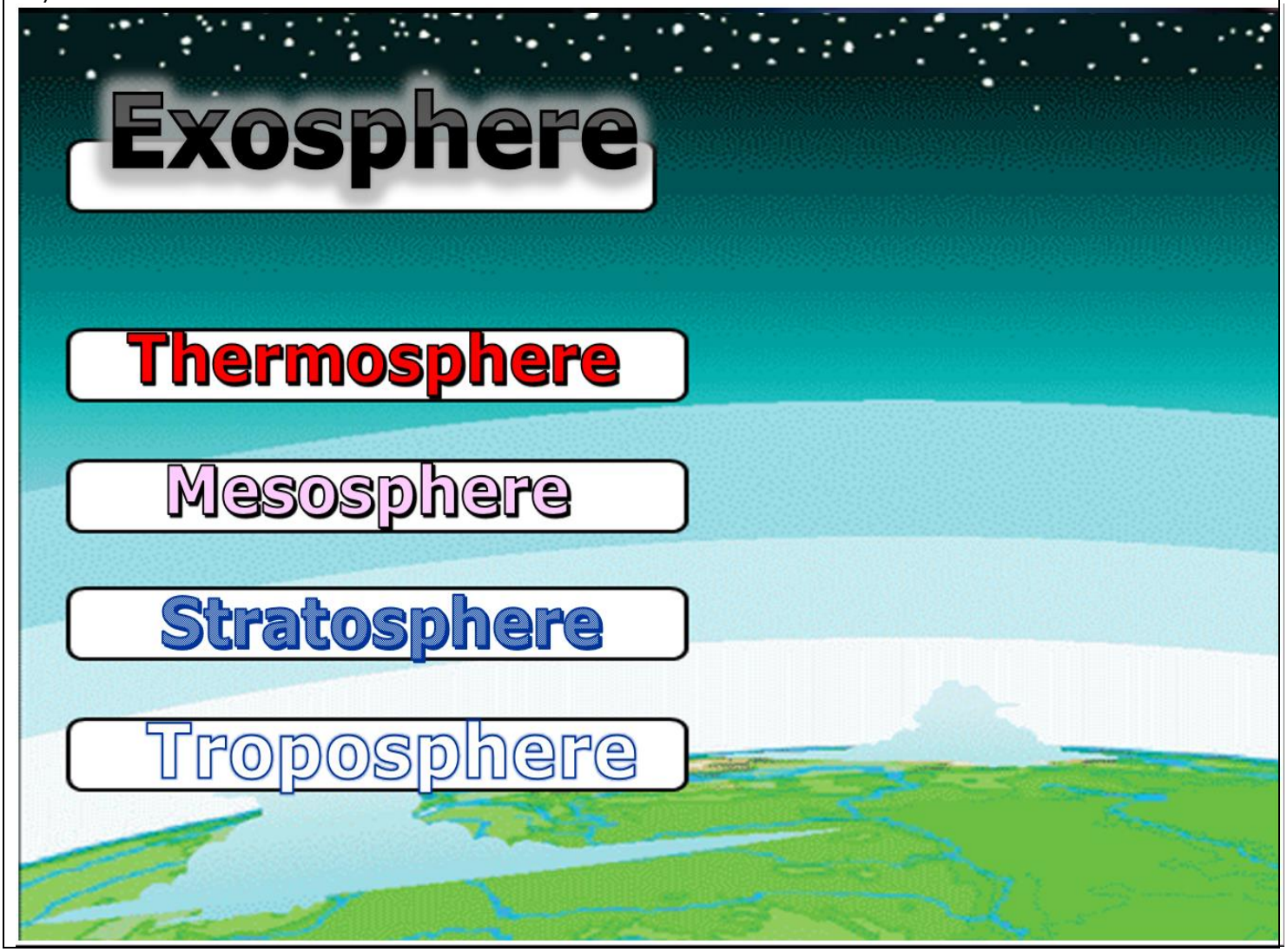
-Mesosphere – Meteors burn up here
- Stratosphere- Ozone found here.
- Troposphere – weather occurs here, life, air travel.

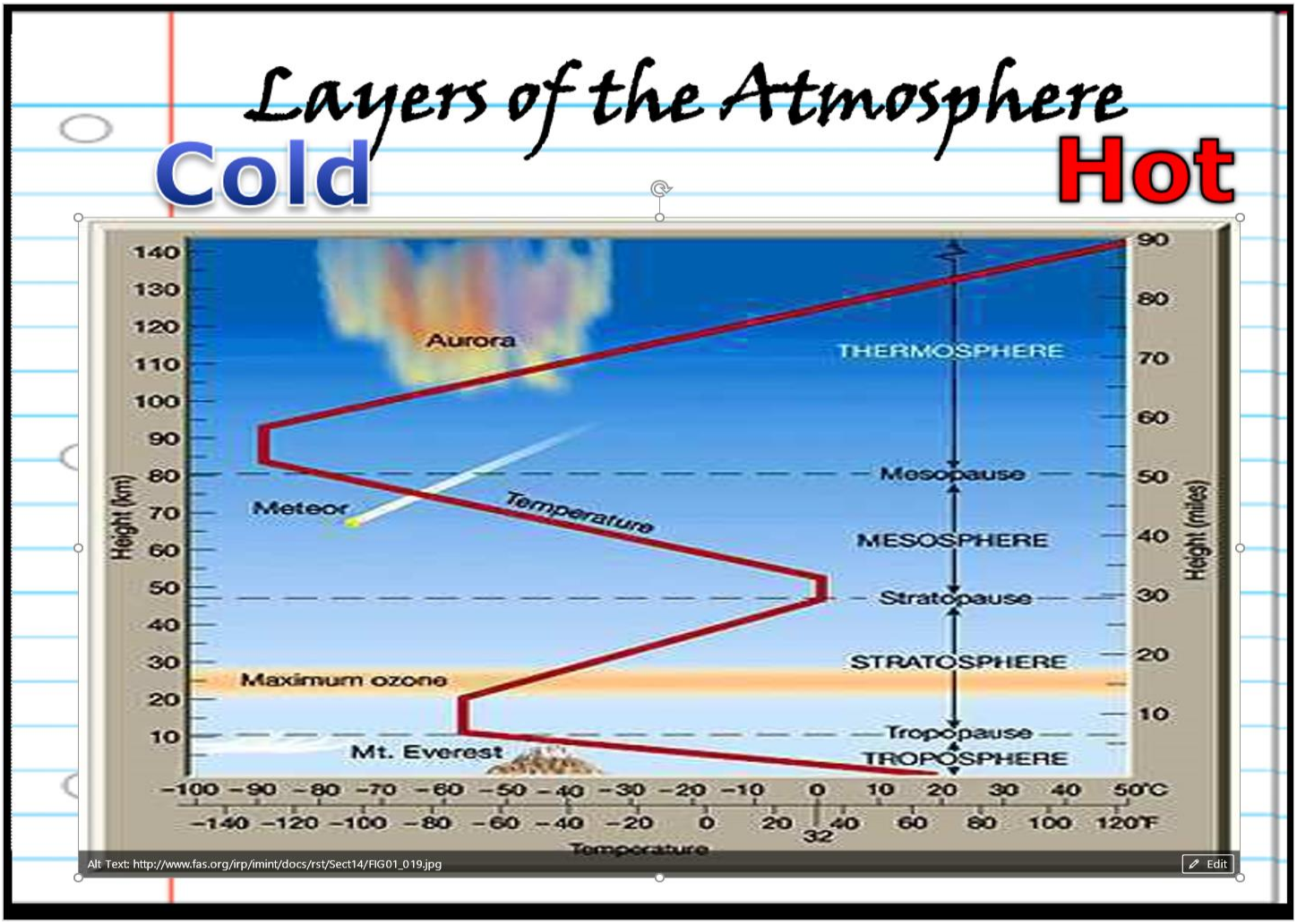
--------Earth's Surface--------

Quiz in the Slideshow: Name the layer in the atmosphere?

1) Stratosphere	2) Exosphere	3) Upper Troposphere
4) Thermosphere	5) Lower Troposphere	Bonus Underdog

Name the layers of the atmosphere and draw some "things" that you might find in each layer.



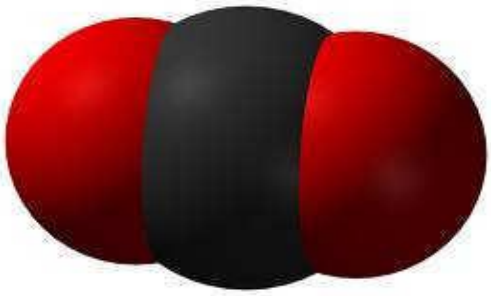


Part 1 Lesson 4 Air Quality

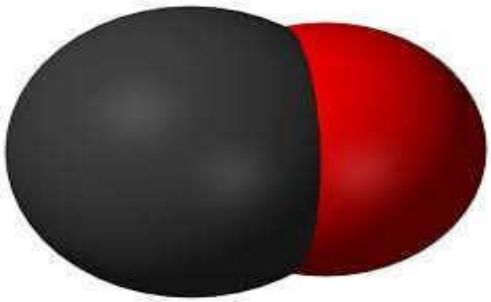
Air Pollution can be

- Global (Global Warming)
- Regional (Acid Rain)
- Local (Smog)

Which one is carbon monoxide? And which is carbon dioxide?



Answer=Carbon Dioxide

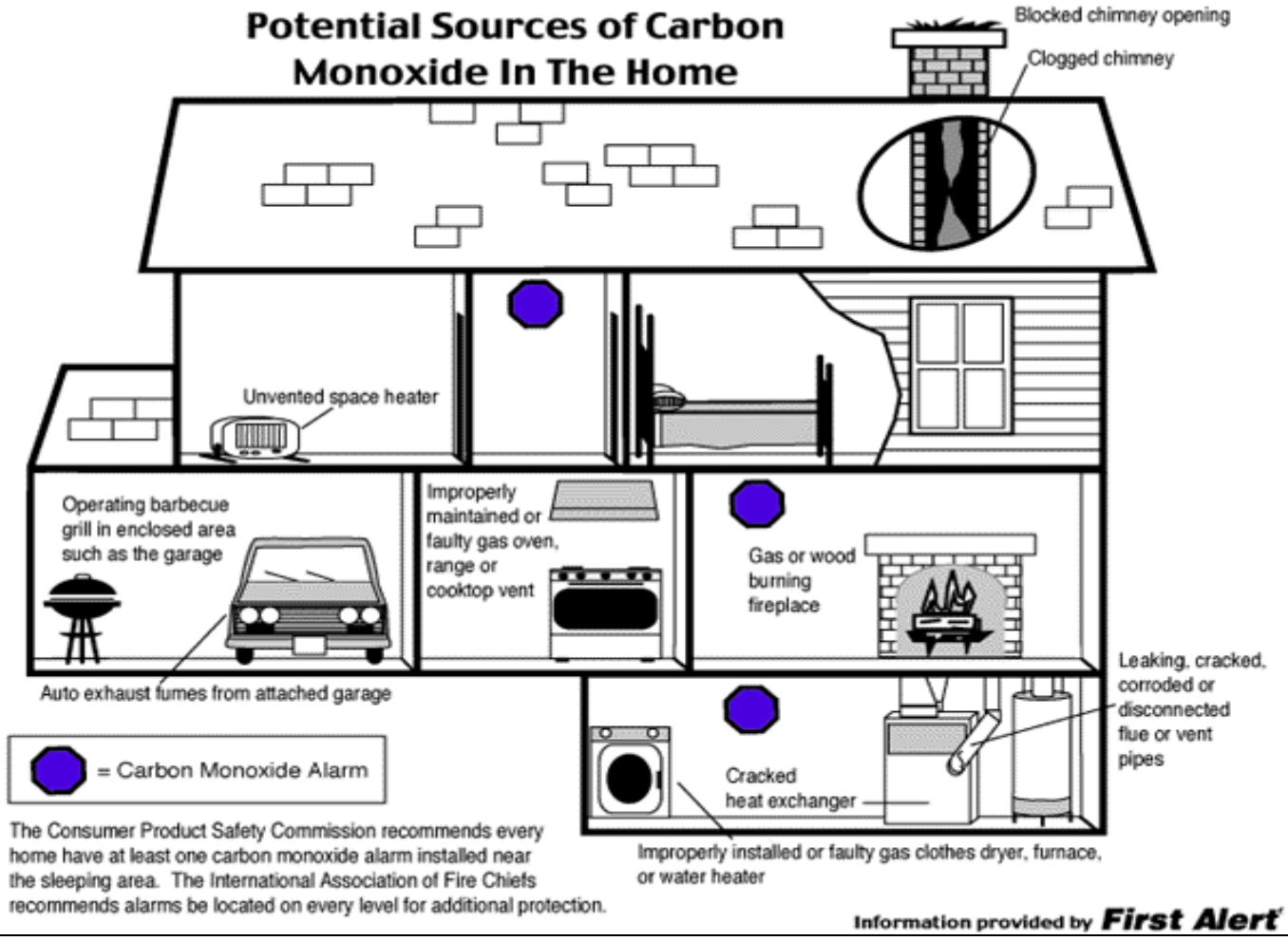


Answer=Carbon Monoxide

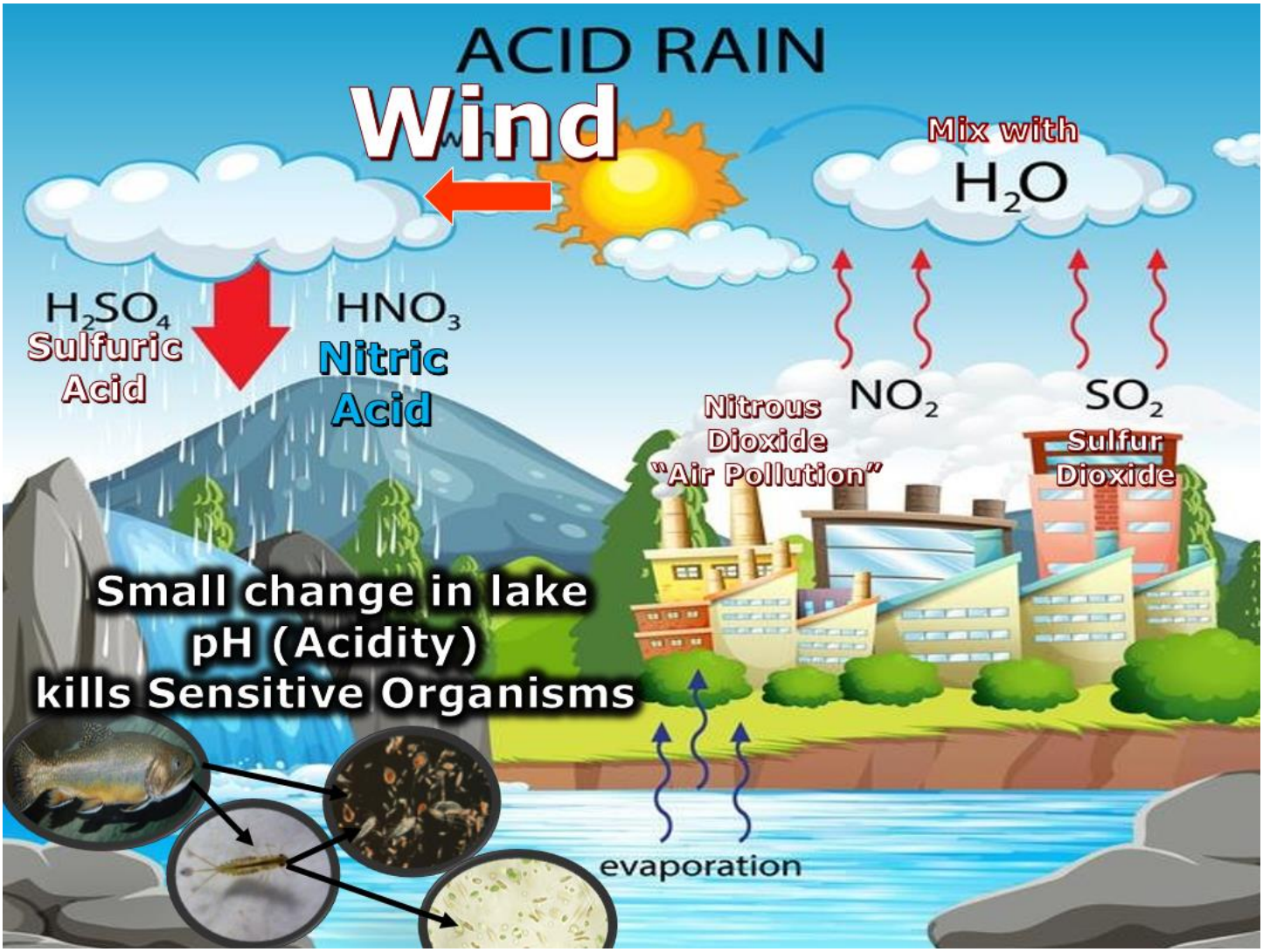
To avoid carbon monoxide poisoning, **Do not…**

Run a car in a closed garage
Burn charcoal inside or in a tent
Run a generator indoors
Burn anything without ventilation

What is so dangerous about carbon monoxide? Use the picture below to elaborate on some of the precautions you should take to avoid this type of poisoning?



Acid Rain is caused by Nitrogen and Sulfur dioxides. aka – Air pollution (smog) causing the rain to become slightly more acidic. This has a negative impact on plants and small organisms. Sketch out the diagram of acid rain below as described in the slideshow.



Radioactive pollutants can be produced by nuclear explosions, war explosives, and natural processes such as the radioactive decay of radon.

Part 1 Lesson 5 Particulates and Ozone

Particulate matter (PM), measured as smoke and dust.

PM 10 is the fraction of suspended particles 10 micrometers in diameter and smaller that will enter the nasal cavity.

PM 2.5 has a maximum particle size of 2.5 μm and will enter the bronchus and lungs.

The size of particles is directly linked to their potential for causing health problems. ... Exposure to such particles can affect both your **lungs** and your heart. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including: premature death in people with heart or lung disease.

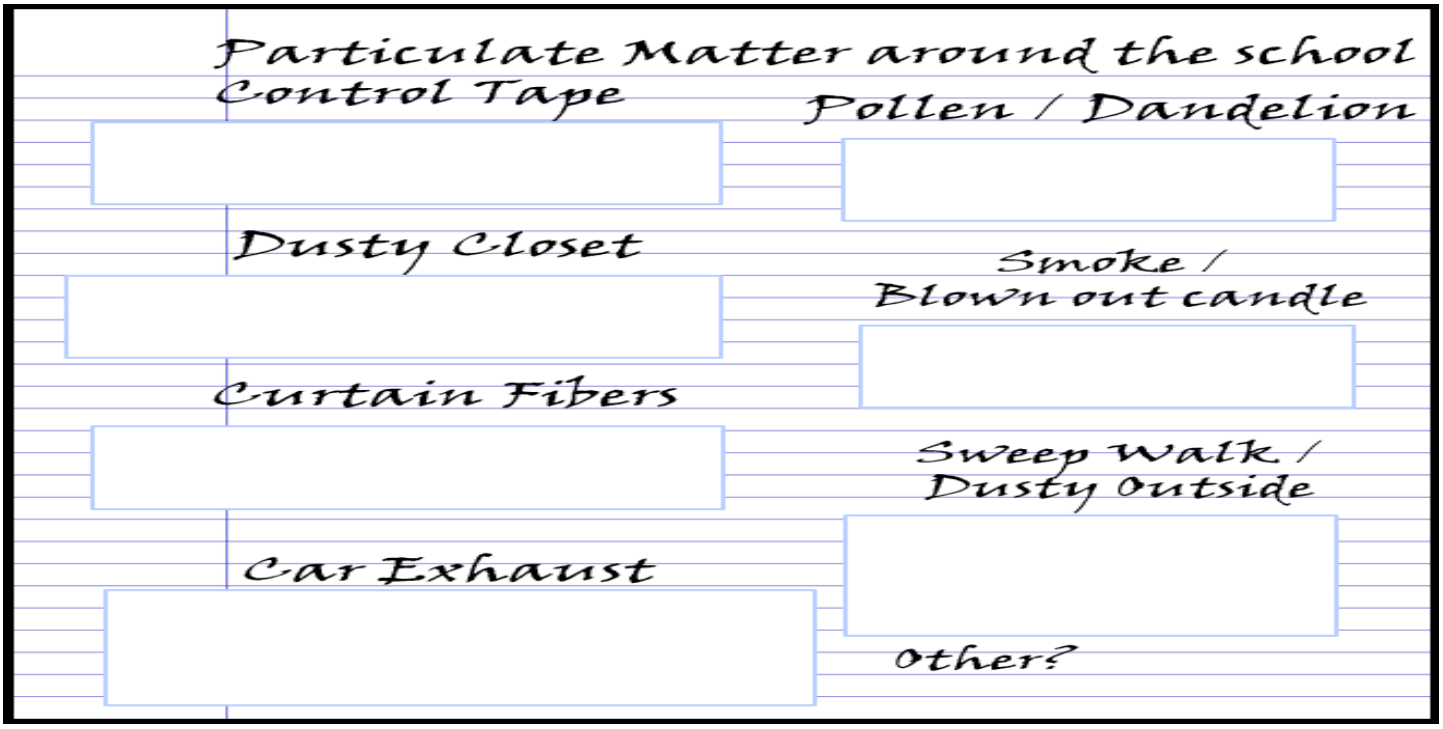
The Clean Air Act (1970) created federal and state regulations to limit emissions from both stationary (industrial) sources and mobile sources.

Name some type of air pollution?

The six common air pollutants are:

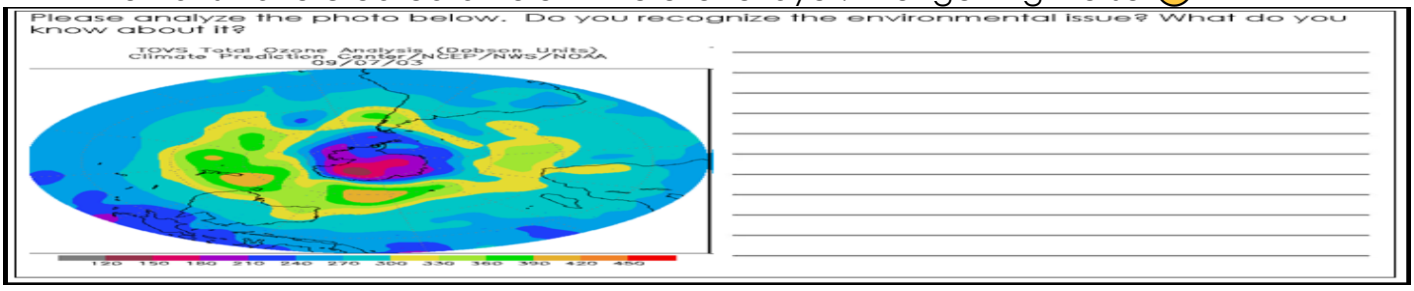
- Particle Pollution (particulate matter)
- Ground-level ozone. SMOG
- Carbon monoxide.
- Sulfur oxides.
- Nitrogen oxides.
- Lead.

-Smells



Ozone Layer

Layer of atmosphere
Gas made of 3 oxygen atoms (O_3)
Absorbs 99% of suns harmful UV rays
Chloroflurocarbons, (CFCs) made by humans in aerosols destroy Ozone
Humans have created a hole in the ozone layer. -Not getting worse 😊



The ozone hole is not technically a "hole" where no ozone is present, but is actually a region of exceptionally depleted ozone in the stratosphere over the Antarctic that happens at the beginning of Southern Hemisphere spring (August–October). Satellite instruments provide us with daily images of ozone over the Antarctic region. Caused from human activities. Ozone depletion occurs when chlorofluorocarbons (CFCs) and halons—gases formerly found in aerosol spray cans and refrigerants—are released into the atmosphere (see details below). ... CFCs and halons cause chemical reactions that break down ozone molecules, reducing ozone's ultraviolet radiation-absorbing capacity.

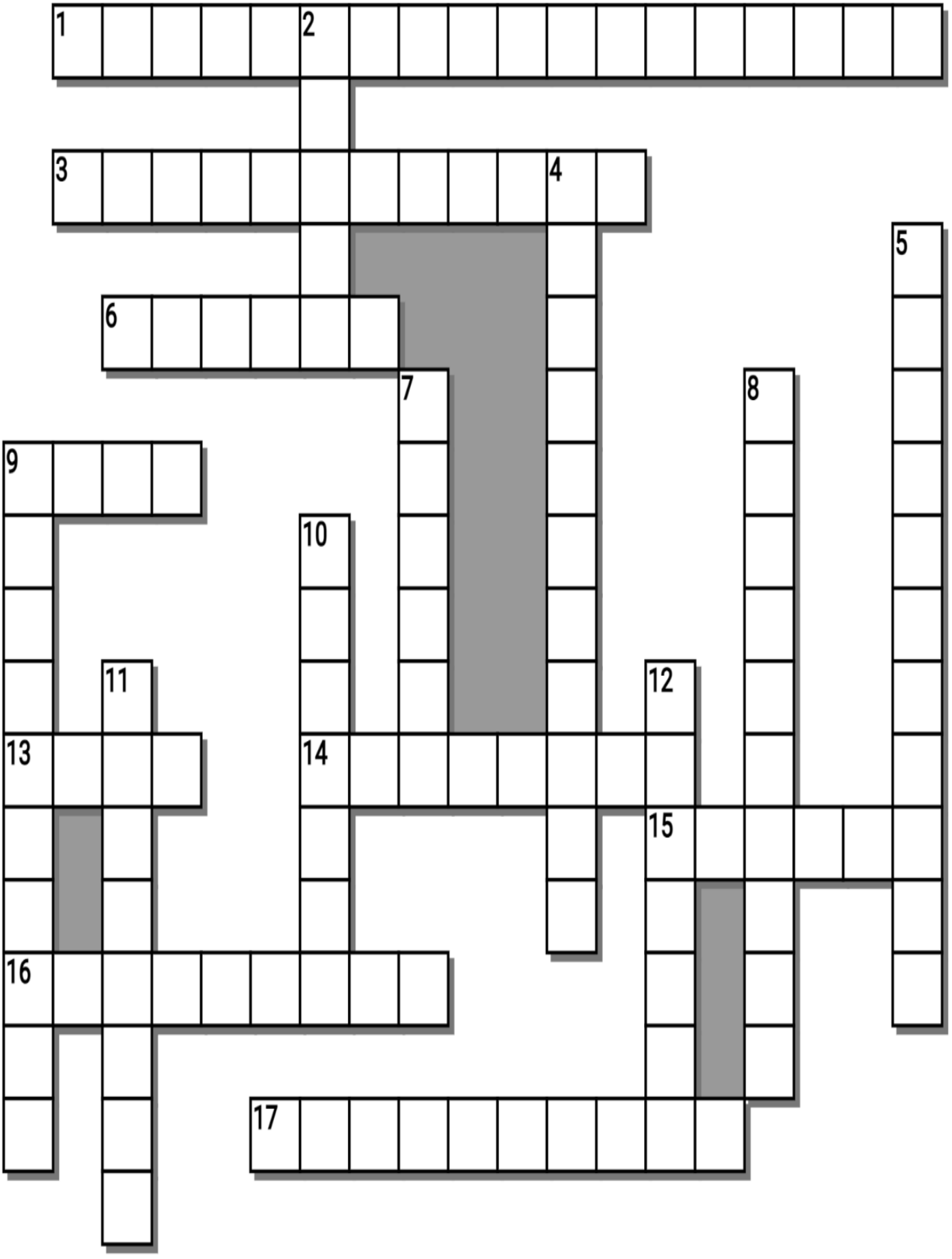
Part 1 Lesson 5 Particulates and Ozone

Ways to avoid skin cancer

- Don't use tanning beds
- Don't sun bathe. The sun is radiation
- Avoid the sun, especially between peek hours 10-4
- Seek shade
- Wear a shirt (thicker and darker)
- Wear large hats
- Be especially wary fair skinned people

Please decorate this stick figure so that's its more UV protected. Describe in the margin ways to protect yourself from Ultraviolet Radiation known as UV ray's which can cause skin cancer. Do you know you're A,B,C,D's of skin moles below.

The stick figure should seek shade/ sun umbrella, wear sunglasses, a large hat, wear sun screen, and avoid sun between 10 and 4.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Across

1. C_____ (CFC's) made by humans in aerosols destroy Ozone
3. The ozone layer is found in this layer of the atmosphere
6. The atmosphere is made of 21%_____ gas
9. _____ Rain: is caused by Nitrogen and Sulfur dioxides. aka – Air pollution (smog) causing the rain to become slightly more acidic. This has a negative impact on plants and small organisms.
13. _____ cancer is an abnormal growth of skin cells. It generally develops in areas that are exposed to the sun
14. Carbon _____ is a poisonous gas that has no smell or taste. Breathing it in can make you unwell, and it can kill if you're exposed to high levels.
15. A condition in which your airways narrow and swell and produce extra mucus. This can make breathing difficult and trigger coughing, wheezing and shortness of breath.
16. Layer of the atmosphere that merges with space, some satellites orbit here.
17. Meteors burn up in this layer of the atmosphere

Down

2. _____ Layer: A layer in the earth's stratosphere at an altitude of about 6.2 miles (10 km) containing a high concentration of O3, which absorbs most of the ultraviolet radiation reaching the earth from the sun.
4. _____ pollutants can be produced by nuclear explosions, war explosives, and natural processes such as the radioactive decay of radon.
5. _____ Matter is the sum of all solid and liquid particles suspended in air many of which are hazardous. This complex mixture includes both organic and inorganic particles, such as dust, pollen, soot, smoke, and liquid droplets.
7. The _____ line is an imaginary boundary about that's 62 miles / 100 km above sea level.
8. A process in which a substance reacts with oxygen to give heat and light.
9. The layer of gases surrounding Earth; composed mainly of nitrogen and oxygen.
10. The average weather of a particular part of the world at different times of the year. (longer periods of time
11. The atmosphere is made of 78%_____ gas
12. The state of the atmosphere at a given time and place, with respect to variables

----------Remove this word bank before printing to make more difficult----------

Possible Answers

ACID, ASTHMA:, ATMOSPHERE, CHLOROFLUROCARBONS, CLIMATE, COMBUSTION, EXOSPHERE, KÁRMÁN, MONOXIDE, NITROGEN, OXYGEN, OZONE, PARTICULATE, RADIOACTIVE, SKIN, STRATOSPHERE, WEATHER, MESOSPHERE

Part 1 Review Game

Name:

1-20 = 5 pts Lesson 7 Due: Today

*20-*25 * = Bonus + 1 pt,

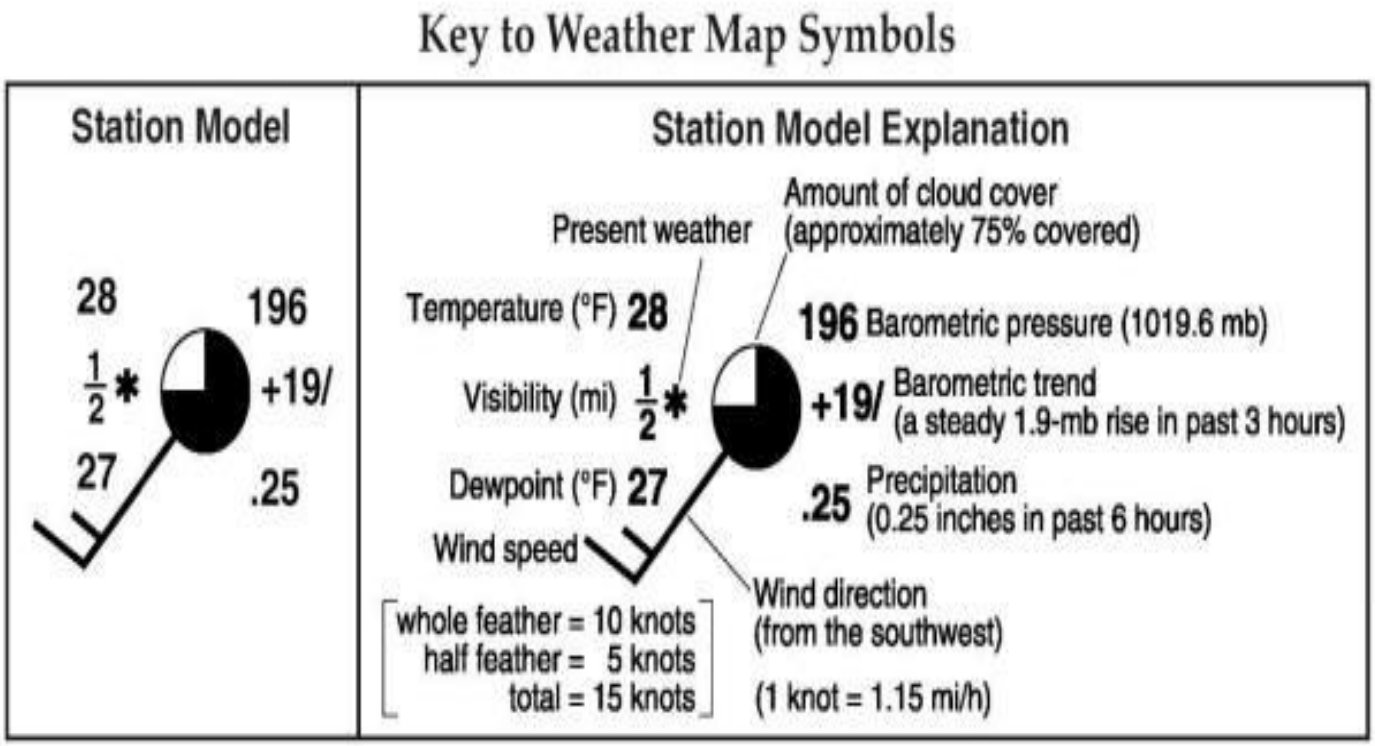
(Secretly write owl in correct space +1 pt) Score ____ / 100

Final Question = 5 pt wager

AT MOST	LOTSA LAYERS	SMOGGY SMOG	MY WEATHER TOOLBOX	WEATHER MOVIES Bonus round 1pt each
1) FALSE	6) MESOSPHERE	11) ACID RAIN	16) SUN, SUSTAINS LIFE, CYCLES, CHANGES, FUTURE	*21) WIZARD OF OZ
2) SOLID, LIQUID, GAS	7) STRATOSPHERE	12) CARBON MONOXIDE	17) SEE INSERT NEXT PAGE	*22) TWISTER
3) COMBUSTION	8) TROPOSPHERE	13) Chloro-fluorocarbons	18) TEMPERATURE AIR PRESSURE AIR DENSITY CLOUD COVER PERCIPITATION HUMIDITY WIND SPEED, WIND DIRECTION	*23) SHARKNADO
4) NITROGEN GAS	9) THERMOSPHERE	14) SKIN CANCER	19) A=WEATHER B=CLIMATE	*24) THE DAY AFTER TOMORROW
5) OXYGEN GAS	10) EXOSPHERE	15) Volatile Organic Compounds (VOC's)	20) PM=PARTICULATE MATTER	*25) FLINT LOCKWOOD SAM SPARKS

Final Question Wager ____/5 Answer: A=CARBON MONOXIDE, B= METHANE, C=OXYGEN, D=ARGON

#17 answer


Key to Weather Map Symbols
Station Model
28
196
1/2 *
+19/
27
.25
Station Model Explanation
Present weather
Amount of cloud cover
(approximately 75% covered)
Temperature (°F) 28
196 Barometric pressure (1019.6 mb)
Visibility (mi) 1/2 *
+19/ Barometric trend
(a steady 1.9-mb rise in past 3 hours)
Dewpoint (°F) 27
.25 Precipitation
(0.25 inches in past 6 hours)
Wind speed
Wind direction
(from the southwest)
whole feather = 10 knots
half feather = 5 knots
total = 15 knots
(1 knot = 1.15 mi/h)