Part 2 Air Pressure

Name:
Due:

Part 2 Lesson 1 Air

Does air have weight? _____

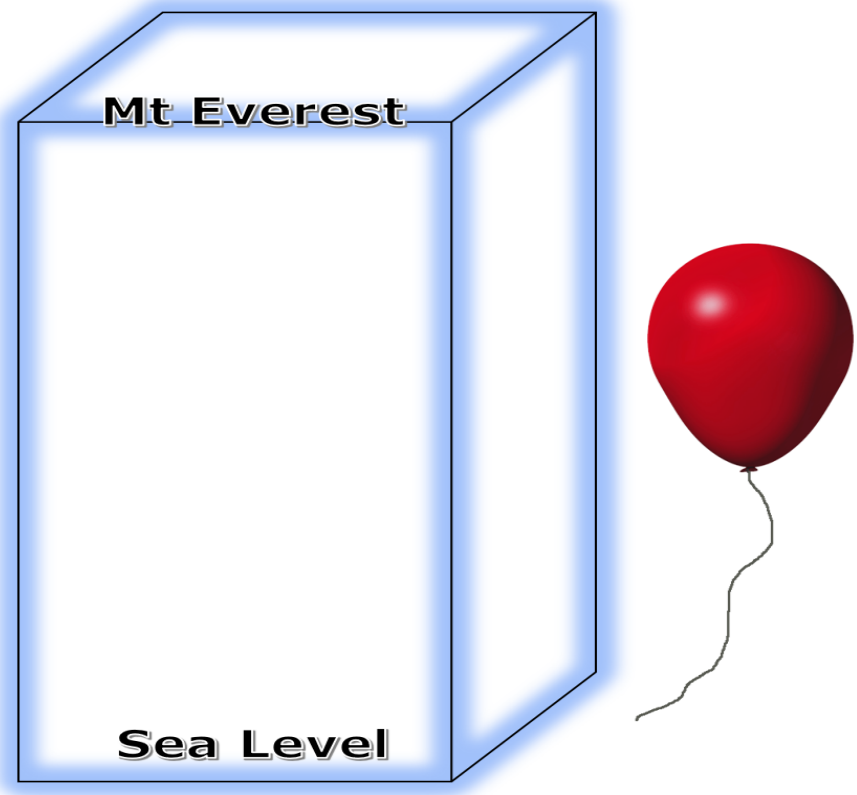
_____

Air Pressure: The pressure caused by the weight of the _____?

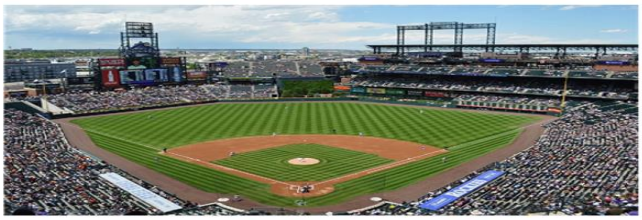
Air pressure applies a force _____ in all directions.

As elevation increases, air pressure _____.

Please add in some dots (hundreds?) to show how air pressure changes with elevation. How does air pressure act on a balloon?



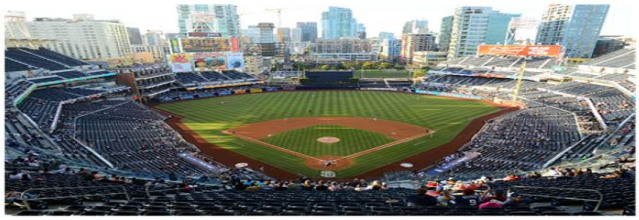
Why is it easier to hit a homerun in Colorado than it is in San Diego?



Coors Field, Denver CO

Air Density Index

41.98



Petco Park, San Diego CA

Air Density Index

64.07

Use the graph below to answer the questions.

What is the atmospheric pressure at sea level?_____

At what elevation do you find air pressure at 60 (kPa)?_____

Would the air pressure be high in Denver, Colorado, or Boston Massachusetts?_____

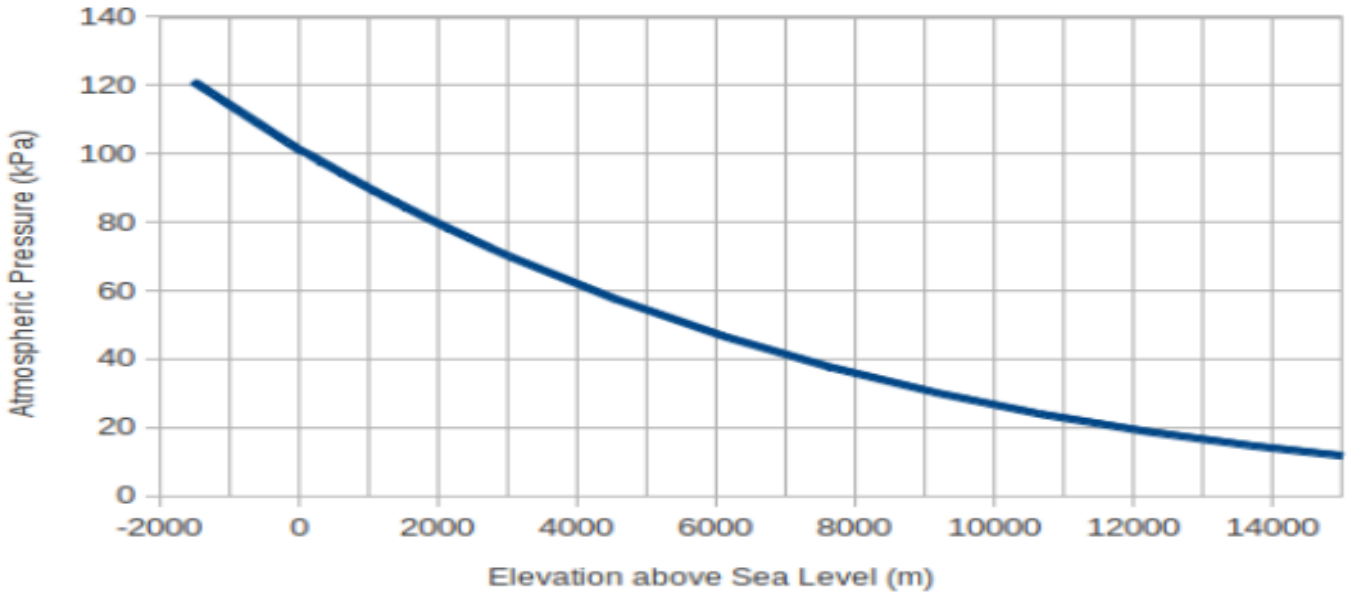
_____

_____

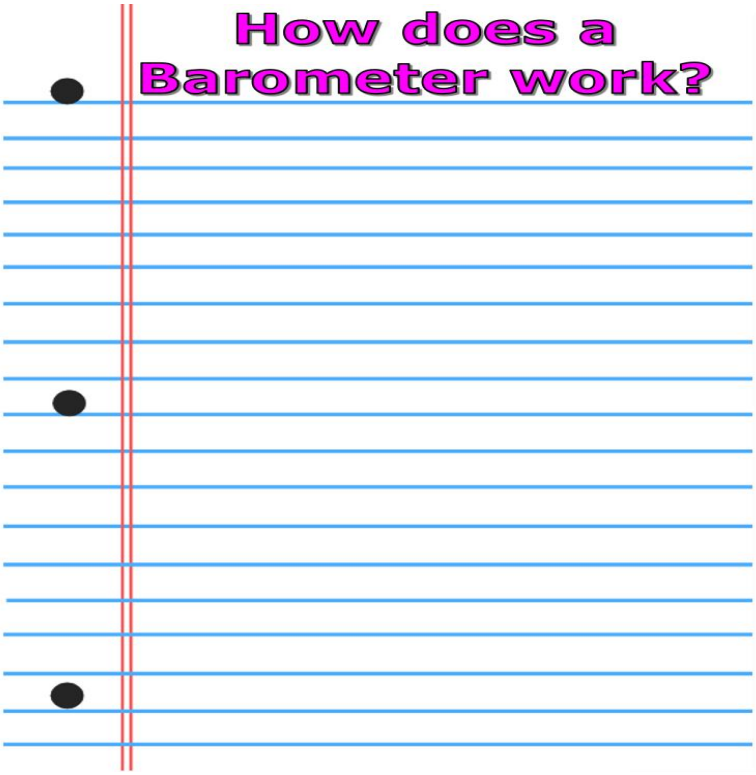
What is the atm at 14,000 feet above sea level?_____

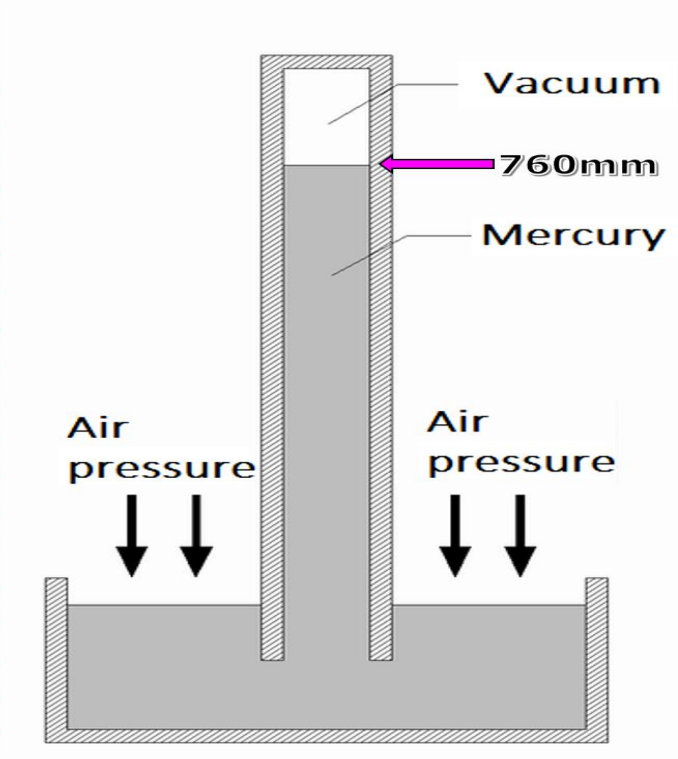
Why is there less atm at 14,000 above sea level? Answer is below…

As you increase in elevation air pressure _____. As you decrease in elevation pressure _____.



Barometer: Instrument that _____ air pressure.



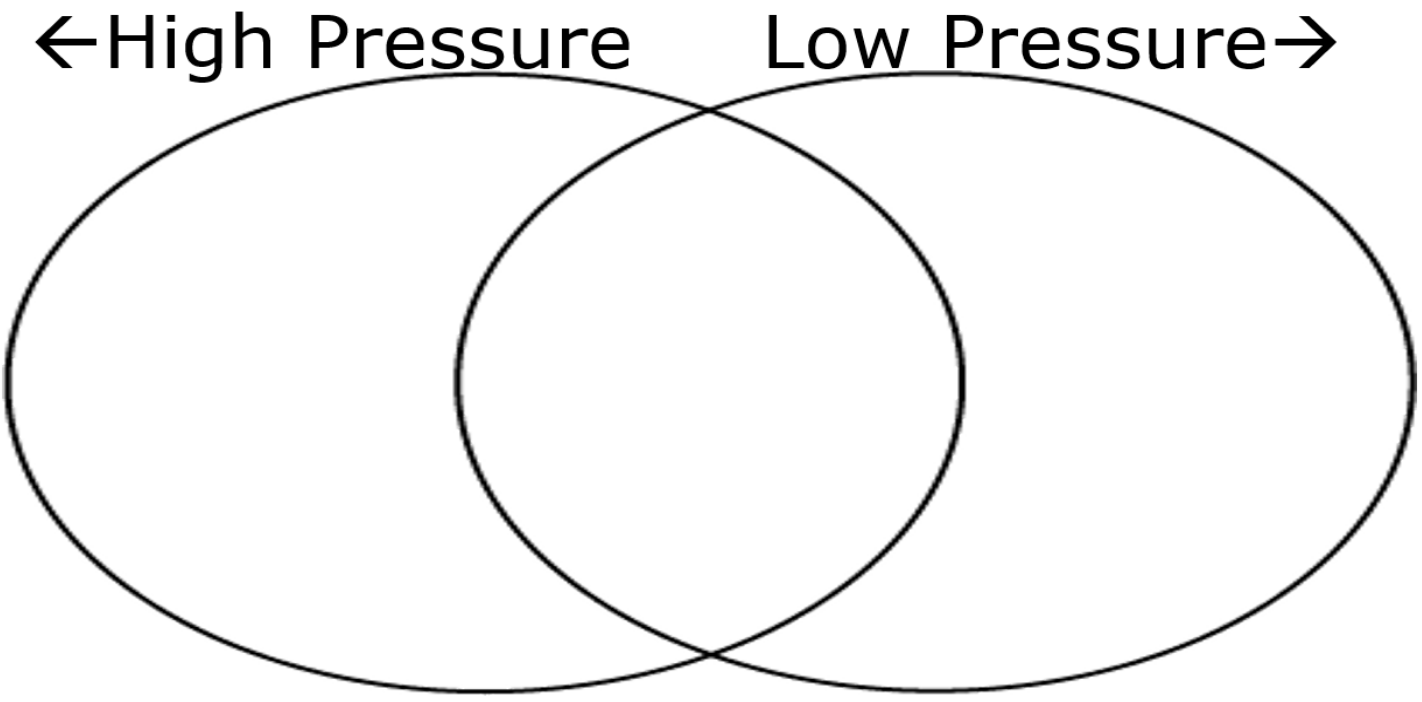


In normal atmospheric pressure (1 _____), the boiling point of water is _____degrees Celsius.

_____: An instrument for determining altitude attained, especially a barometric or radar device used in an aircraft.

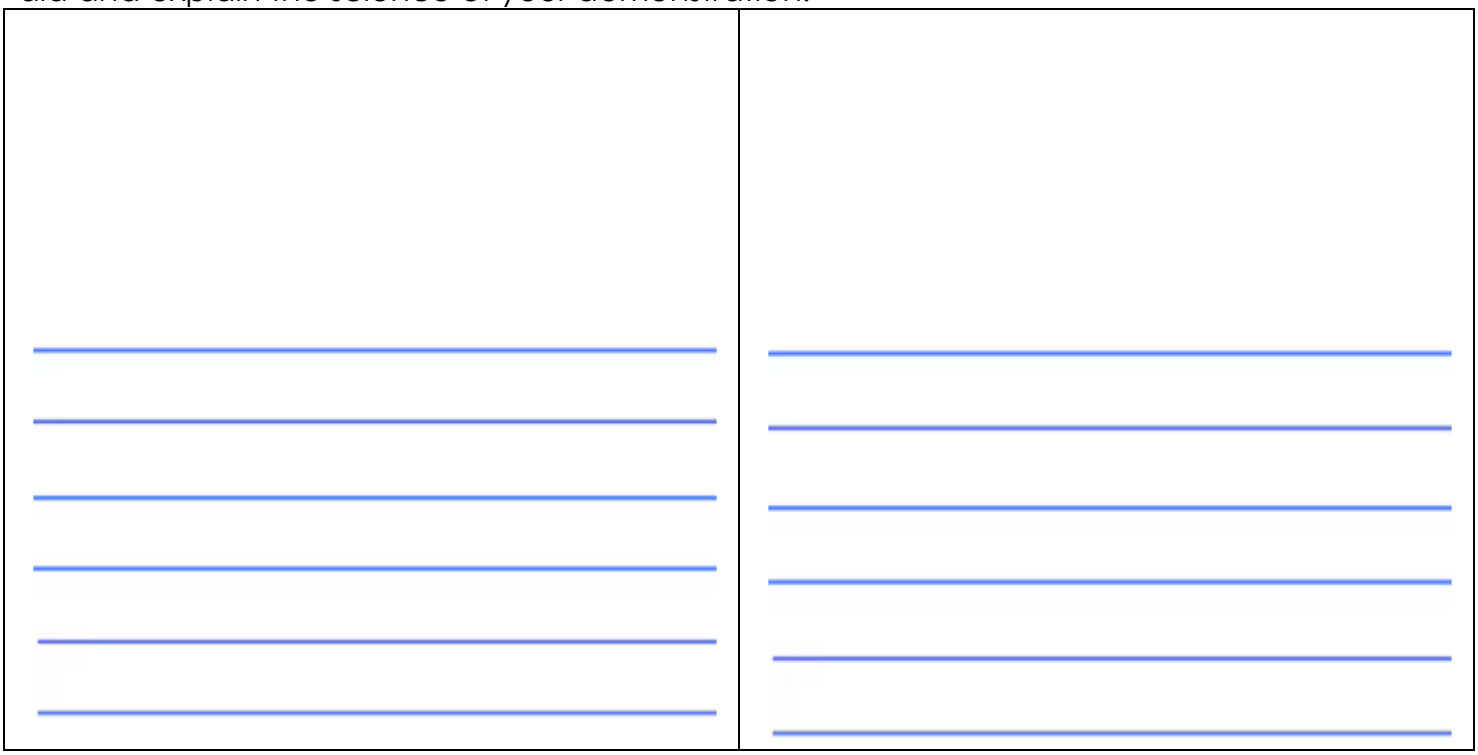
Part 2 Lesson 2 Air Pressure

Titanic wreck, Top of Mt. Everest, sea-level, jet plane, bottom of your pool, hot air balloon.



-What two air pressure experiments is your group doing? Explain them below with explanations, the materials needed, and provide visuals.

-Which one is the big one, and which one is the smaller one? Remember to include a visual aid and explain the science of your demonstration.



Did the teacher approve the experiment / demonstration? Yes/No?

Who is doing what in the experiments?_____

What materials do you need from the teacher?_____

_____

Create a Checklist below so that you're organized for your experiment tomorrow.

Check	Things to do…	Notes…
	All materials are ready for the big experiment	
	All materials are ready for the smaller experiment	
	Everyone in group understands the experiments	
	Visual Aids for the presentation day are complete	
	Who is doing what in the demonstration has been practiced and discussed?	
	Have you practiced the experiment? Does it work?	

Air Pressure Demo – Mini Rubric. Please hand your work bundle / this page to teacher before presentation.

Preparedness and Materials 25%	Understanding of Demonstration 25%	Visual Aid 25%	Professionalism 25%
Completed demonstration	Strong understanding of air pressure and what was happening in demonstration	A strong original visual aid that explained the air pressure demonstration	The group cooperated, conducted themselves accordingly, and engaged their audience.
Demonstration was missing some pieces / Materials but were able to get assistance to complete	Group presented an understanding of most of the air pressure in demonstration but missed some pieces	Group had a visual aid, but it did not accurately describe their air pressure demo or presented in way that was confusing	The group had some cooperation issues or / was unable to engage audience and delegate responsibilities.
Group was not prepared and could not complete a demonstration	Group did not understand the science of air pressure in their demonstration / could not explain what was happening	No visual aid or the visual aid did not provide information about air pressure in their project.	Group could not cooperate and or was inappropriate during their demonstration or other demonstrations.

Describe two experiments that could show air pressure in the boxes below. Provide a procedure and an explanation as to how this experiment shows air pressure. You'll need to bring in the materials. Make fun and safe! Please label the materials in your drawing.

Visual of experiment and procedure /materials	Explanation of experiment

Please record at least two demonstrations of air pressure? Draw the experiment and describe how it showed air pressure? Please label the materials in your drawing.

Visual of experiment and procedure/materials	Explanation of experiment / Peer Name:

Part 2 Lesson 3 Isobars

Air Pressure drives the _____ and creates the weather.
Caused by the uneven heating on the planet from the _____.

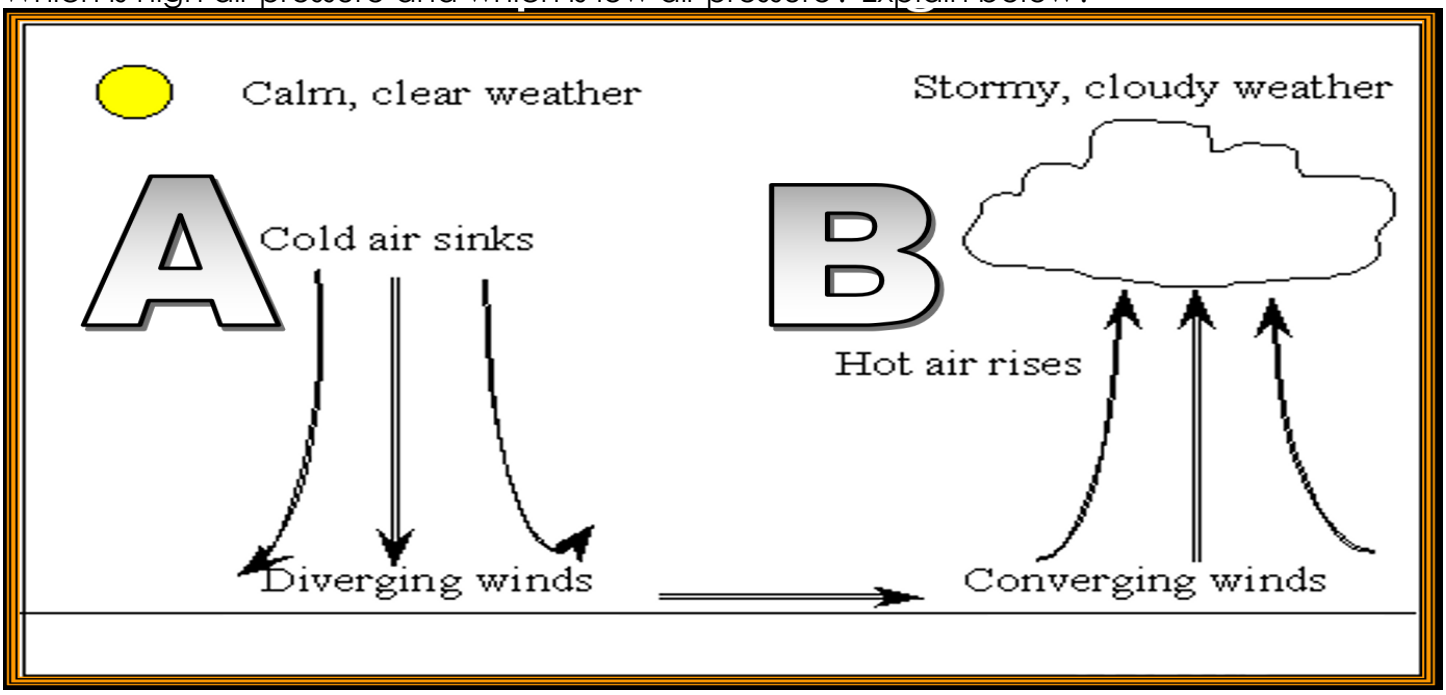
A rising barometer = _____ air pressure.

High pressure = _____Weather
Low Pressure = _____ weather coming

Warm air _____ (_____Pressure), cool air _____ (_____ Pressure).

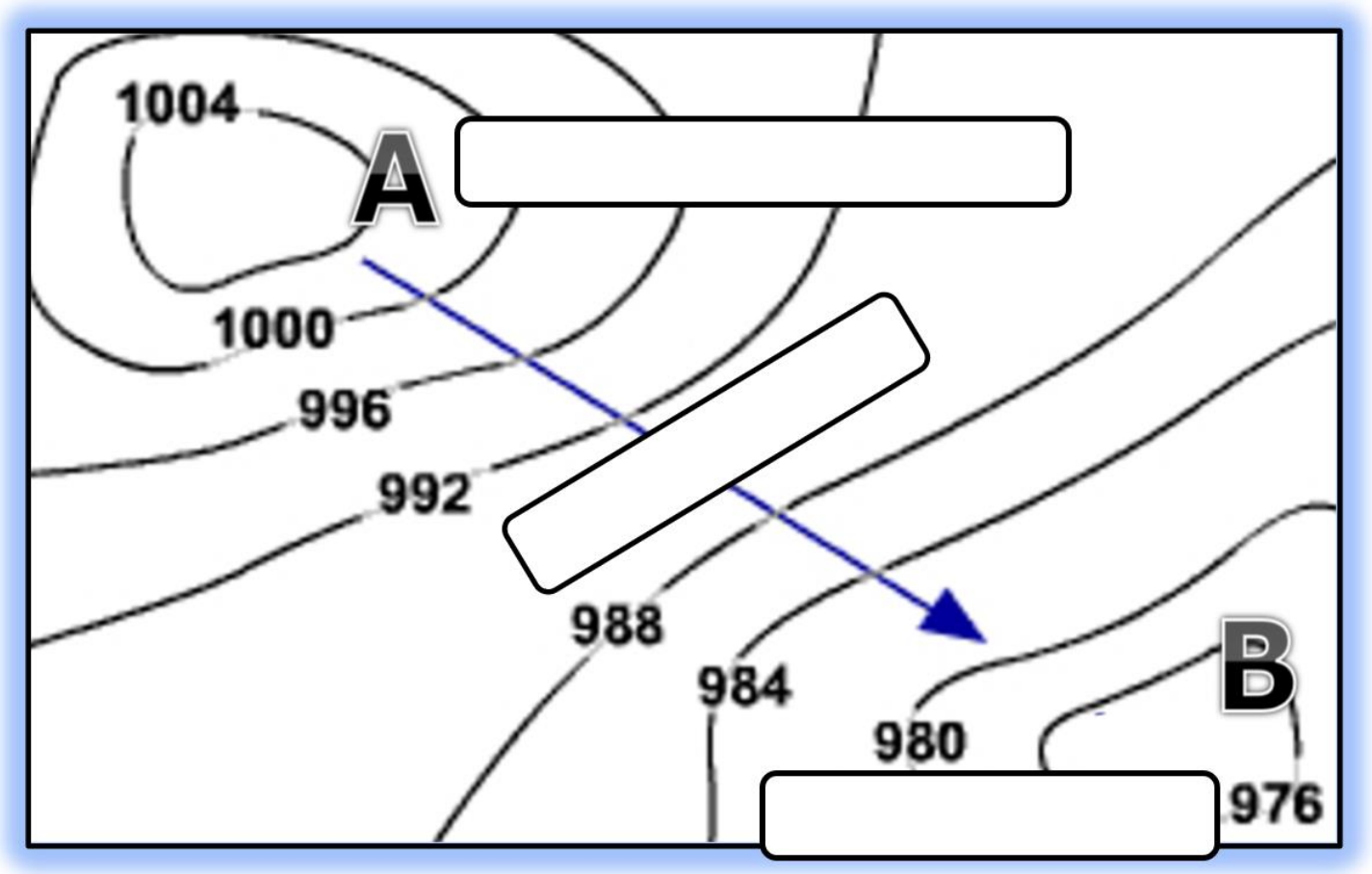
- Wind flows from areas of _____ pressure to areas of _____ Pressure.

Which is high air pressure and which is low air pressure? Explain below?

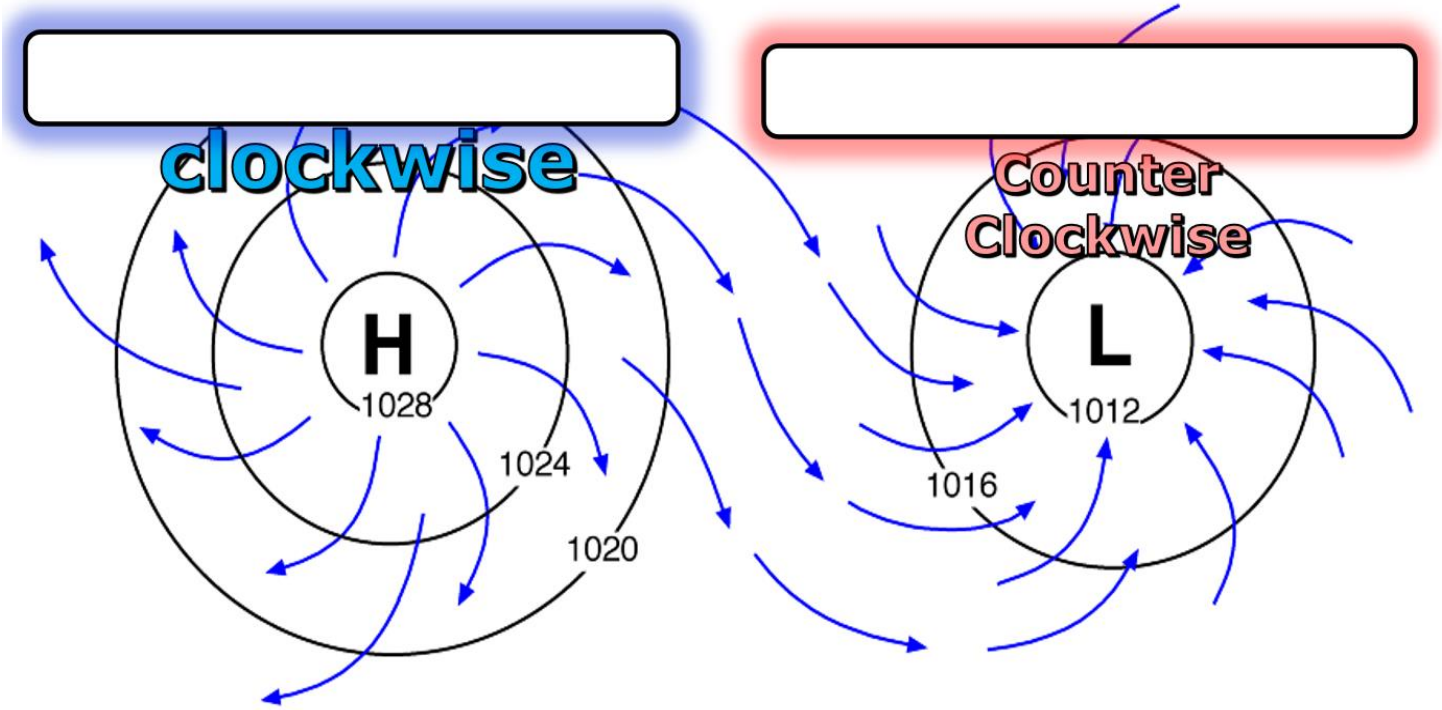


Isobar: A line connecting points of _____ atmospheric pressure.

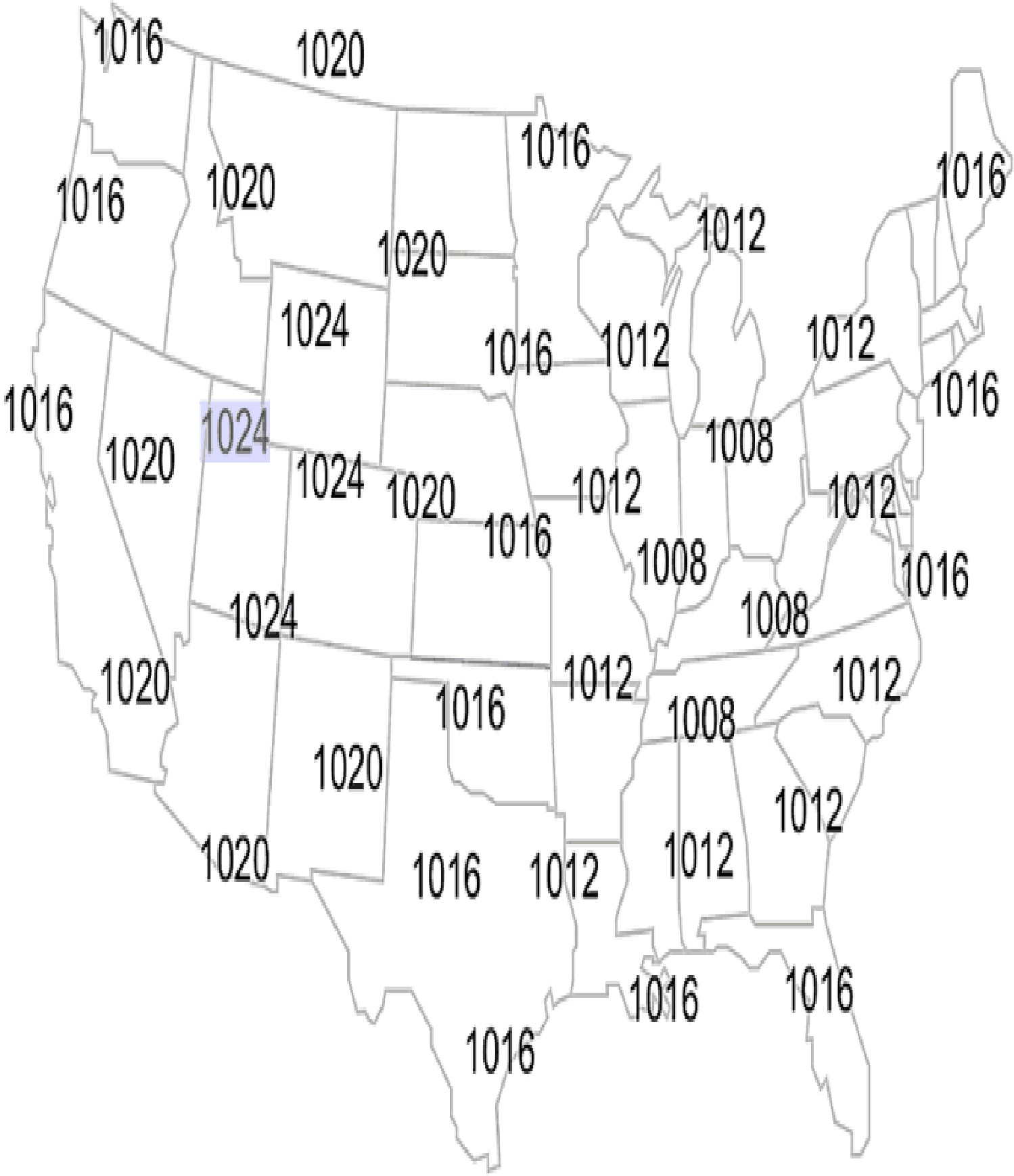
Which is high air pressure? low air pressure? And higher winds? Explain below?



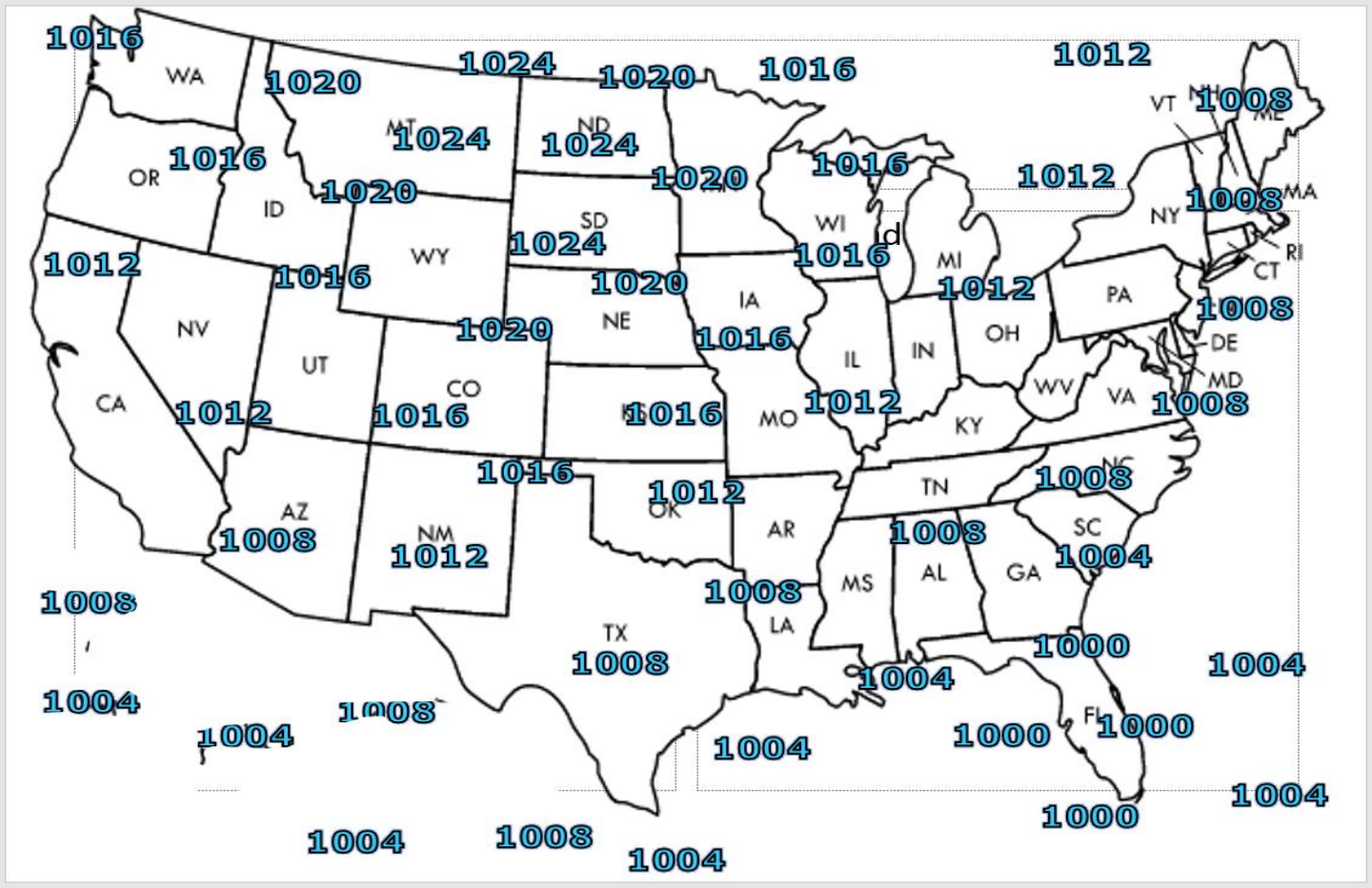
Which is cyclonic, and which is anticyclonic?



Please use the atmospheric Pressure data to create an accurate Isobar of the US.
Make a large H with an area of **<u>High Pressure</u>** and **L** for an area of **<u>Low Pressure.</u>**

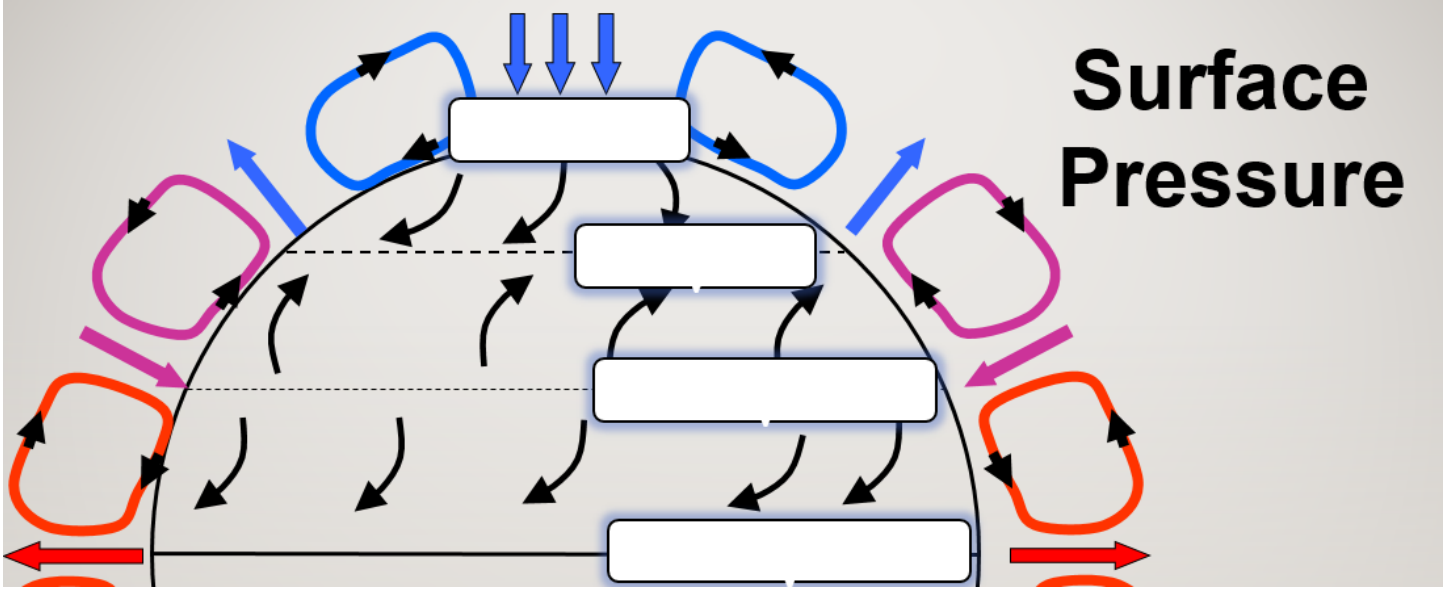


Please complete the more challenging Isobar below?
Make a large H with an area of **High Pressure** and **L** for an area of **Low Pressure.**



Primary High-Pressure and Low-Pressure Areas

- Equatorial _____ -pressure trough.
- Polar _____-pressure cells.
- Subtropical _____-pressure cells.
- Subpolar _____-pressure cells.



Part 2 Lesson 4 Weather Fronts

Warm Fronts and Cold Fronts are caused by _____

Draw a middle and after to the demonstration in the slideshow / video.

Start	Middle	End

Cold Front: Form where cold air moves _____ warm air.

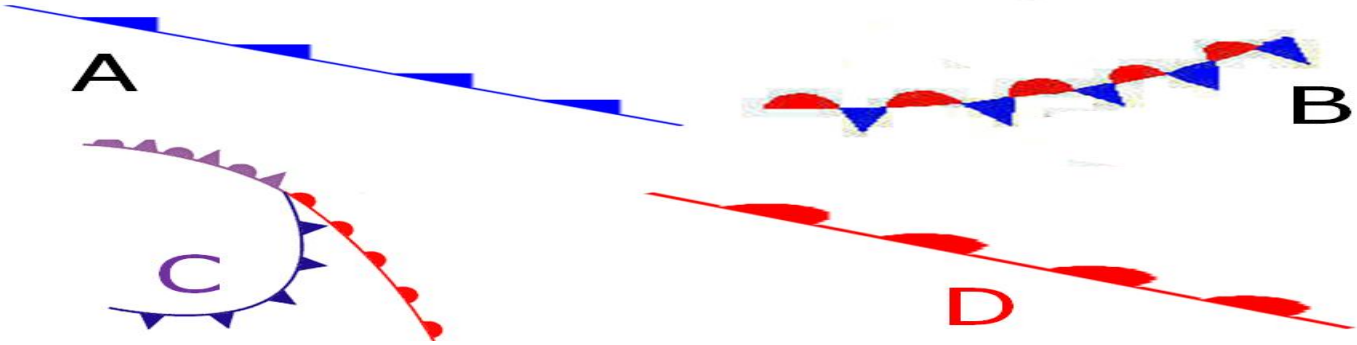
- Creates rainstorms.

Warm Front: Form where warm air moves towards _____ air.

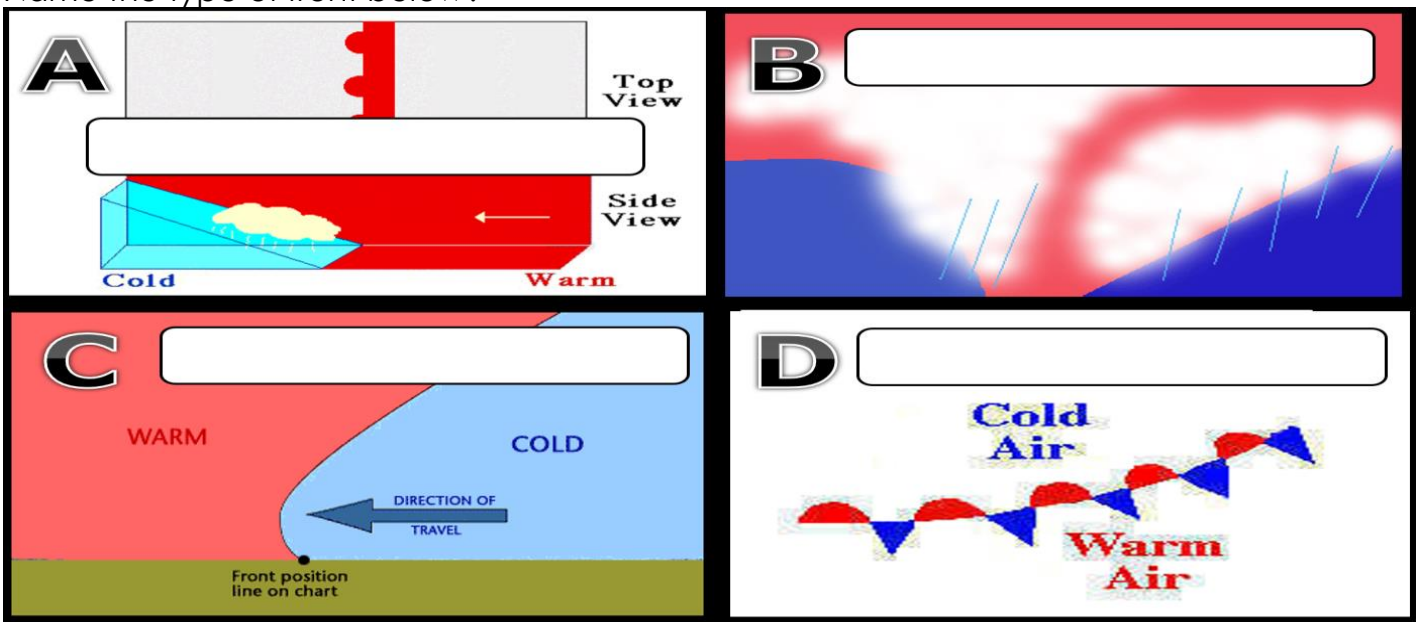
Occluded front: When a cold front overtakes a warm front and forces it _____ (Mix)

Stationary Front: When a cold front and warm front _____ overtake each other.

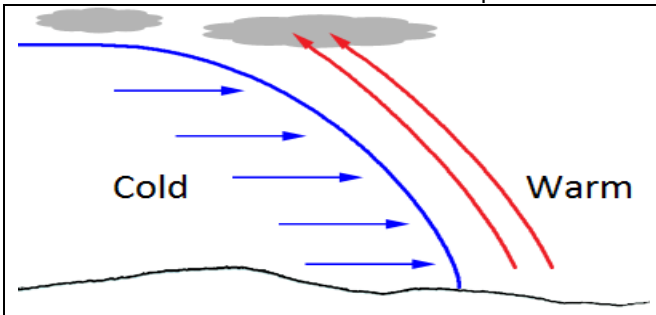
Please name the four types of fronts we have studied based on their weather symbols.

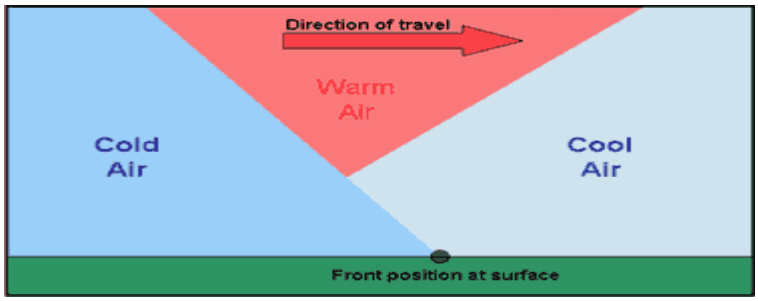


Name the type of front below?

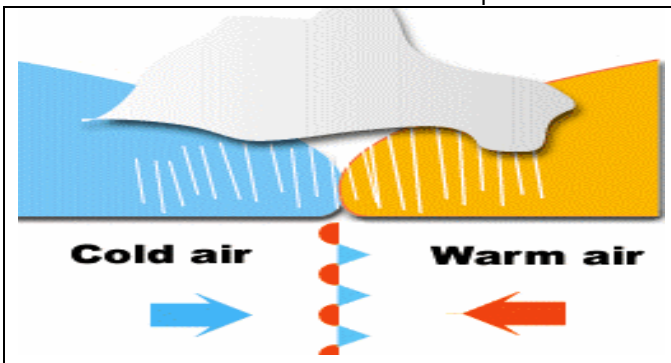


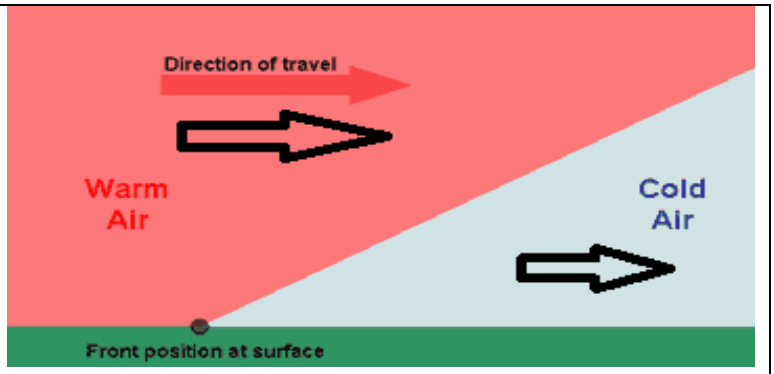
Name the front based on the picture.





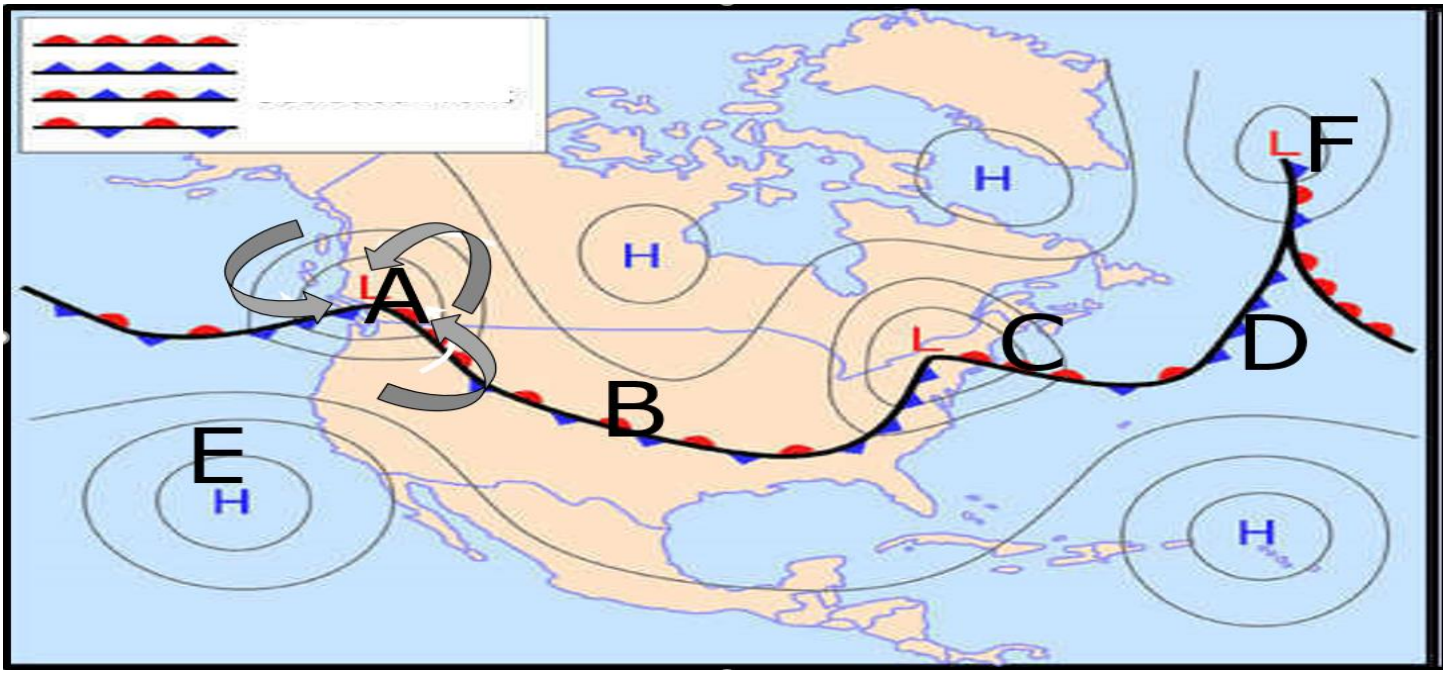
Name the front based on the picture.





Which is a warm front, cold front, stationary front, occluded front, area of high pressure, area of low pressure, cyclone?

A=	B=	C=
D=	E=	F=



Quiz 1-10 Name the Front. Warm, Cold, Occluded, Stationary, Other.

1)	2)	3)	4)
5)	6)	7)	8)
9)	10)	Bonus	Bonus

Across

3. Air Pressure: The pressure caused by the weight of the _____.
5. Wind travels from areas of high pressure to areas of ____ pressure!
8. 760 mm Hg is the standard barometric (atmospheric) pressure. It is the pressure giving a pillar of _____ (the elemental abbreviation of mercury is Hg) that is 760 millimeters (mm) high.
11. This is a weather phenomenon defined as a large-scale circulation of winds around a central region of high atmospheric pressure, clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere as viewed from above (opposite to a cyclone).
14. As you increase in elevation air pressure decreases. As you decrease in elevation pressure _____.
16. As elevation increases, air pressure _____
19. _____Pressure = Stormy Weather

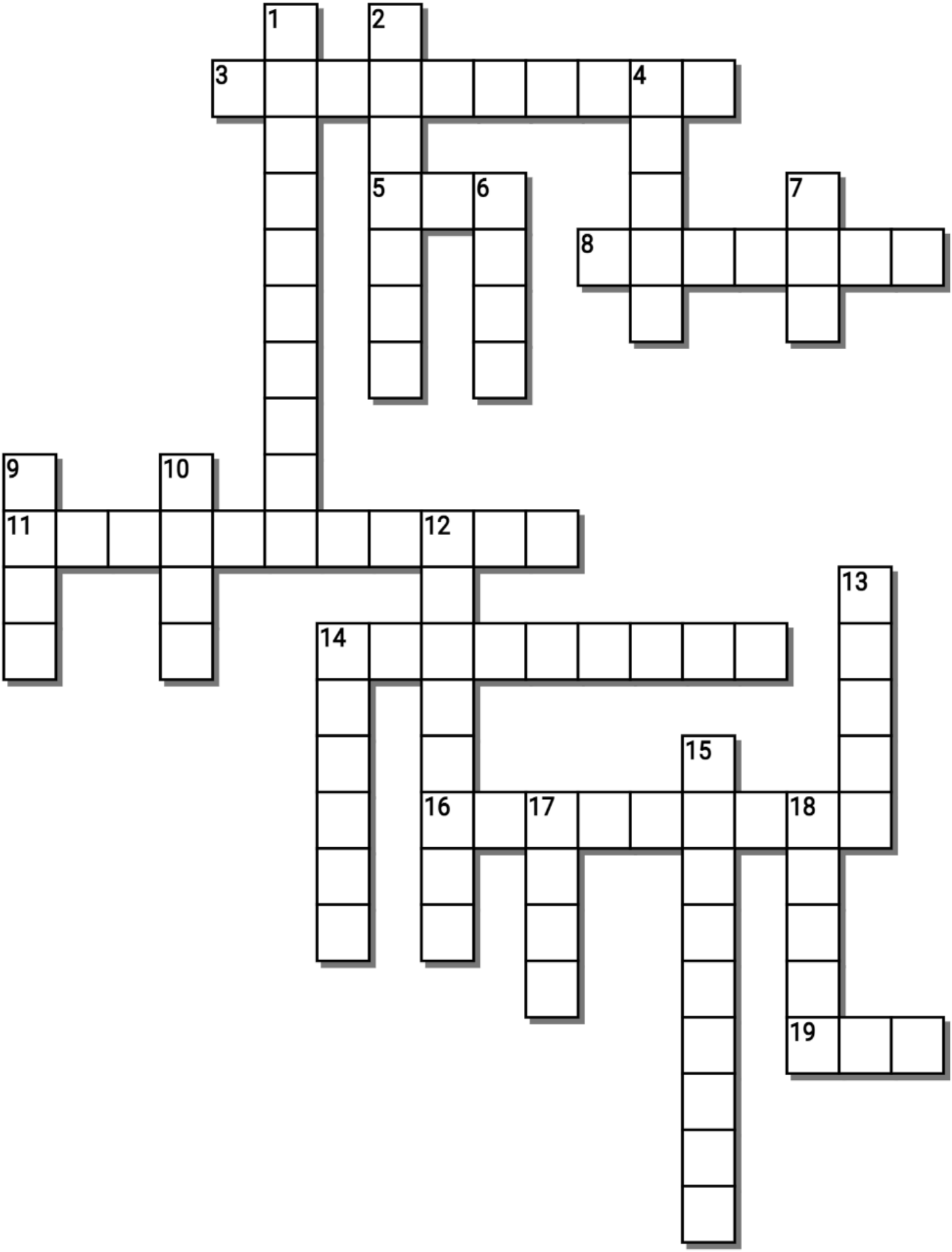
Down

1. _____Front: Type of front when cold and warm cannot overtake each other (tie
2. In normal atmospheric pressure (1 atm), the _____ point of water is 100 degrees Celsius.
4. Warm Air _____, Cool air Sinks
6. Air Pressure drives the _____ and creates the weather.
7. The _____ keeps cold and warm air moving and makes changes in air pressure.
9. _____Front: Type of front where warm air moves towards cold air.
10. _____ Pressure = Nice weather
12. _____Front: Type of front when a cold overtakes a warm and forces it up (Mix)
13. Warm air rises, cool air _____
14. A line connecting points of equal atmospheric pressure.
15. Instrument that measures air pressure.
17. _____Front: Type of front where cold air moves towards warm air. Creates rain storms.
18. Air pressure applies a force _____ in all directions.

Teacher can remove word bank to make more challenging.

Possible Answers

ANTICYCLONE, BAROMETER, COLD, EQUAL, HIGH, INCREASES, ISOBAR, LOW, LOW, MERCURY, OCCLUDED, RISES, SINKS, STATIONARY, SUN, WARM, WIND, ATMOSPHERE, BOILING, DECREASES.


1
2
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Part 2 Review Game

Name:

1-20 = 5 pts Lesson 5

Due: Today

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

(Secretly write owl in correct space +1 pt)

Score ____ / 100

Final Question = 5 pt wager

PRESSURES ON	HIGHS AND LOWS	WHICH WAY	FACE FRONT	UP UP AND AWAY 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: _____

Part 2 Air Pressure

Name:
Due:

Part 2 Lesson 1 Air

There's no such thing as an empty bottle. It's already full of air.

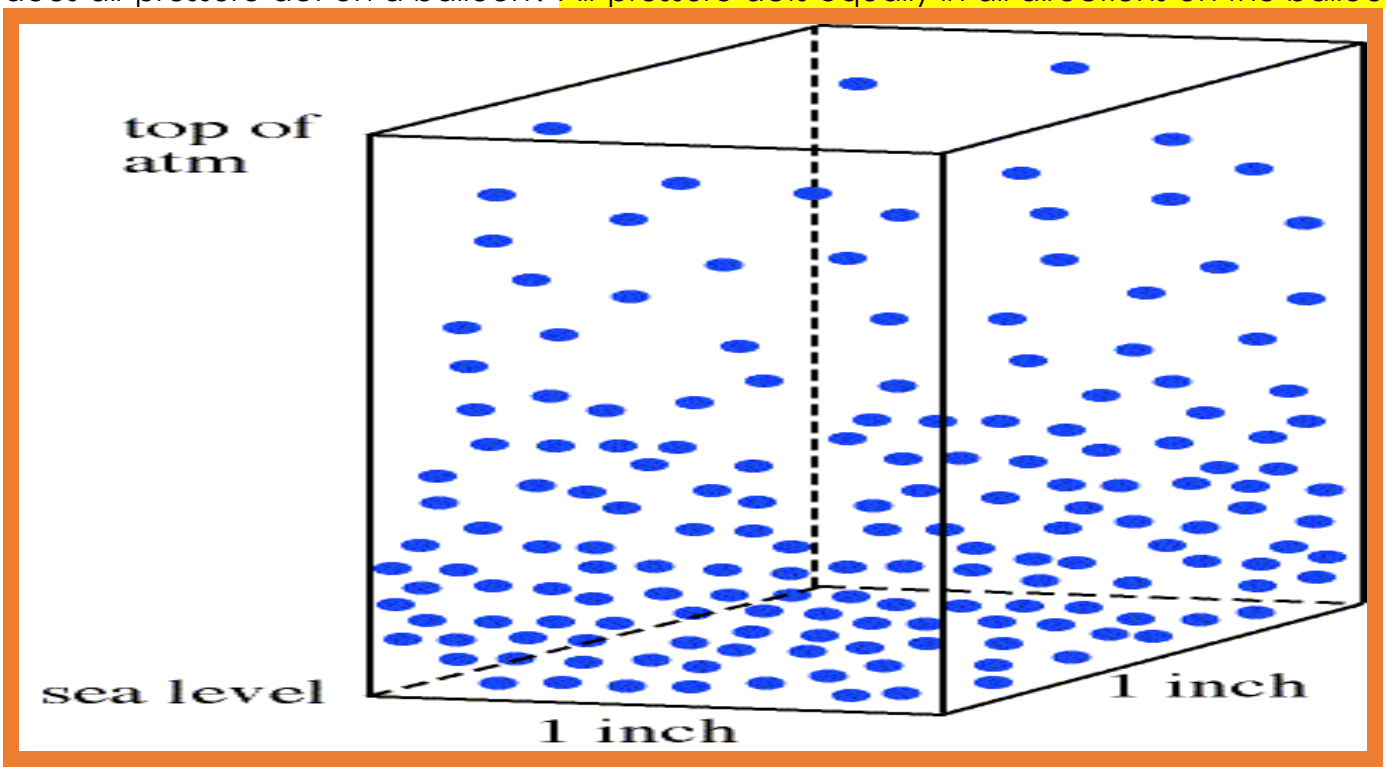
Does air have weight? It might not seem like it, but **air has weight**. Anything with mass has weight, and we know air has mass because we can feel it when the wind blows. The total weight of the atmosphere exerts a pressure of about 14.7 pounds per square inch at sea level.

Air Pressure: The pressure caused by the weight of the atmosphere?

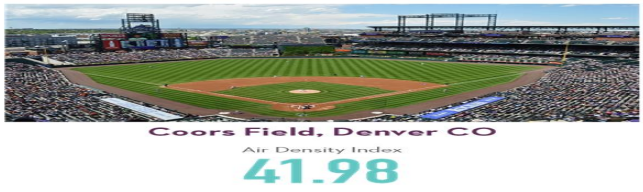
Air pressure applies a force equal in all directions.

As elevation increases, air pressure decreases.

Please add in some dots (hundreds?) to show how air pressure changes with elevation. How does air pressure act on a balloon? Air pressure acts equally in all directions on the balloon



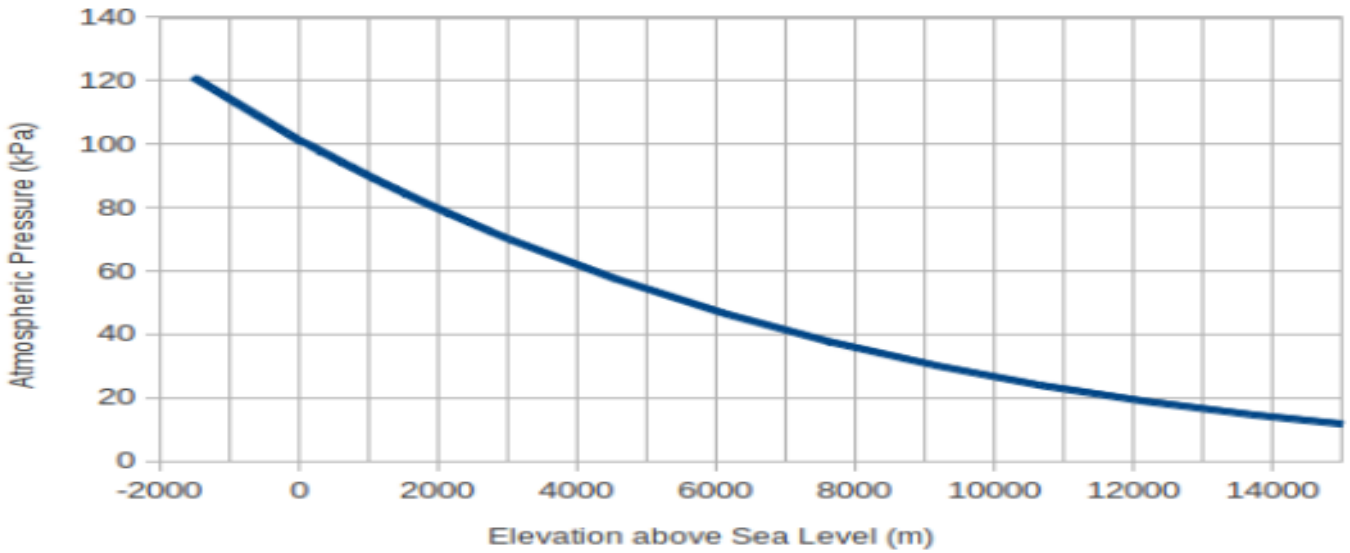
Why is it easier to hit a homerun in Colorado than it is in San Diego?



It's easier to hit a homerun in Colorado than it is to hit a homerun in San Diego. It's easier because in Colorado, the ball park is at a higher altitude, and the air is less dense. The ball will then travel through the air with less resistance and go further.

Use the graph below to answer the questions.
What is the atmospheric pressure at sea level? 100 kPa
At what elevation do you find air pressure at 60 (kPa)? 4000 meters above sea level
Would the air pressure be high in Denver, Colorado, or Boston Massachusetts?_____

Air pressure will be higher in Boston Massachusetts because it is a city located at sea-level. Because it's at sea level, the air is more dense than it would be high up in the mtns.
What is the atm at 14,000 feet above sea level? 20 kPa
Why is there less atm at 14,000 above sea level? Less air = less atmospheric pressure



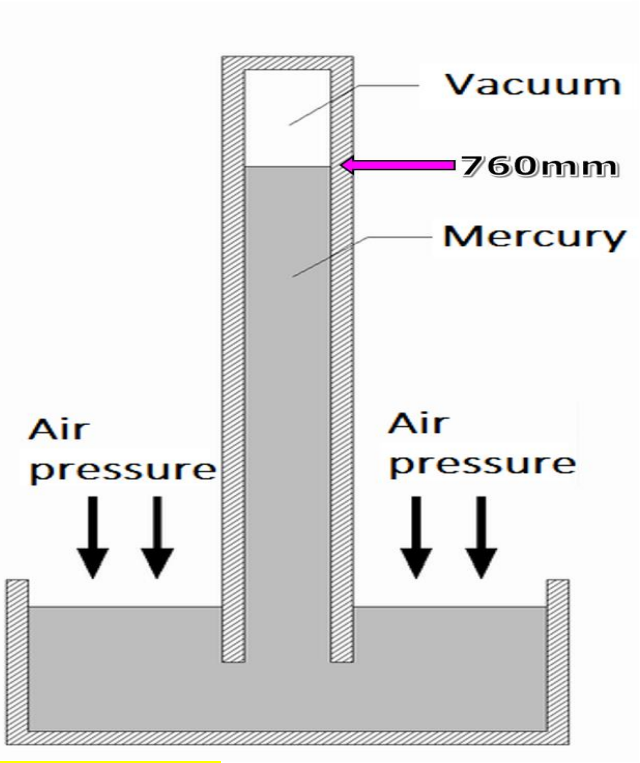
As you increase in elevation air pressure decreases. As you decrease in elevation air pressure increases.

The sun is the engine of air pressure.

The sun keeps cold and warm air moving and makes changes in air pressure. Those air pressure changes cause wind. The heat of the sun also helps moisture to rise and form clouds, bringing rain, snow, or thunderstorms.

Barometer: Instrument that measures air pressure.

How does a Barometer work?

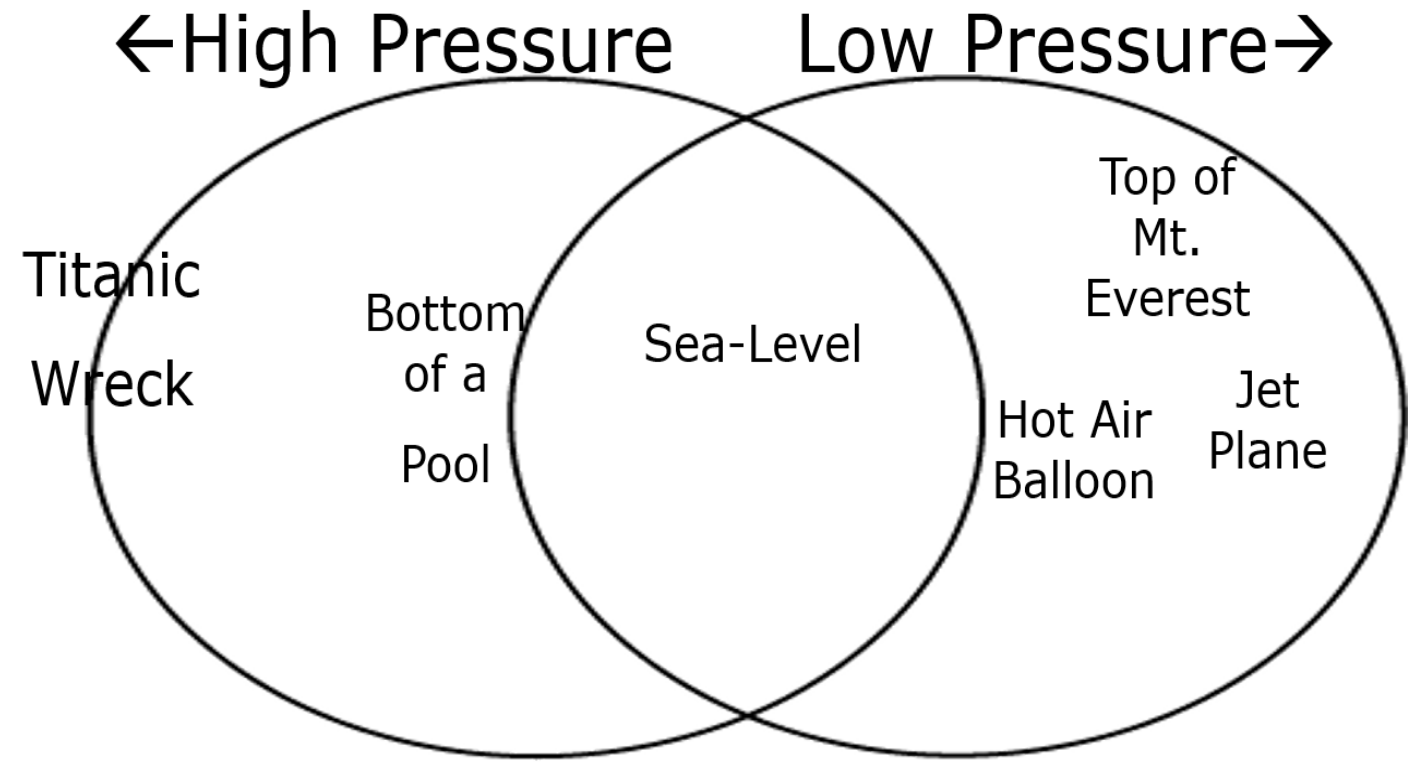


An inverted (upside-down) glass tube stands in a bath of mercury.
Air pressure pushes down on the surface of the mercury, making some rise up the tube.
The greater the air pressure, the higher the mercury rises.

In normal atmospheric pressure (1 atm), the boiling point of water is 100 degrees Celsius.

Part 2 Lesson 2 Air Pressure

Titanic wreck, Top of Mt. Everest, sea-level, jet plane, bottom of your pool, hot air balloon.



Describe two experiments that could show air pressure in the boxes below. Provide a procedure and an explanation as to how this experiment shows air pressure. You'll need to bring in the materials. Make fun and safe! Answers will vary. Descriptions of experiments should be well written.

Part 2 Lesson 3 Isobars

Air Pressure drives the wind and creates the weather.
Caused by the uneven heating on the planet from the Sun.

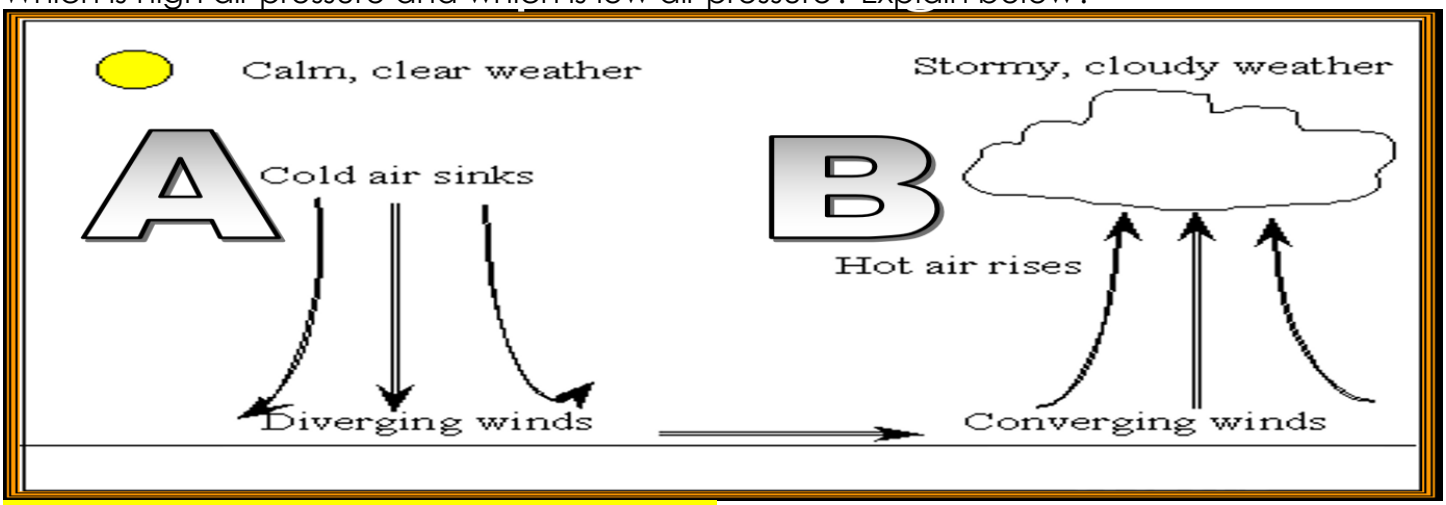
A rising barometer = increasing air pressure.

High pressure = Good Weather
Low Pressure = Poor weather coming

Warm air rises (Low Pressure), cool air sinks (High Pressure).

- Wind flows from areas of high pressure to areas of low Pressure.

Which is high air pressure and which is low air pressure? Explain below?



A= High Pressure B=Low Pressure

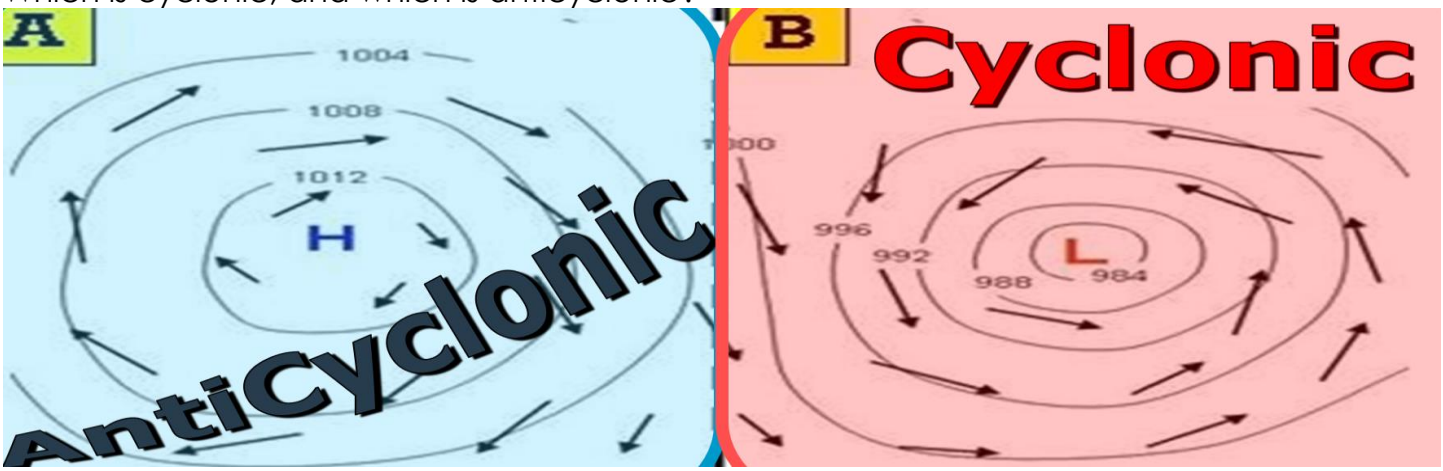
The gases that make up our atmosphere do interesting things as the temperatures change. When gases warm up, the atoms and molecules move faster, spread out, and rise. That's why steam coming off a pot of boiling water always goes upward. When air is colder, the gases get slower and closer together. Colder air sinks.

The sun warms up the air, but it does so unevenly. Because the sun hits different parts of the Earth at different angles, and because Earth has oceans, mountains, and other features, some places are warmer than others. Because of this, we get pockets of warm air and cold air.

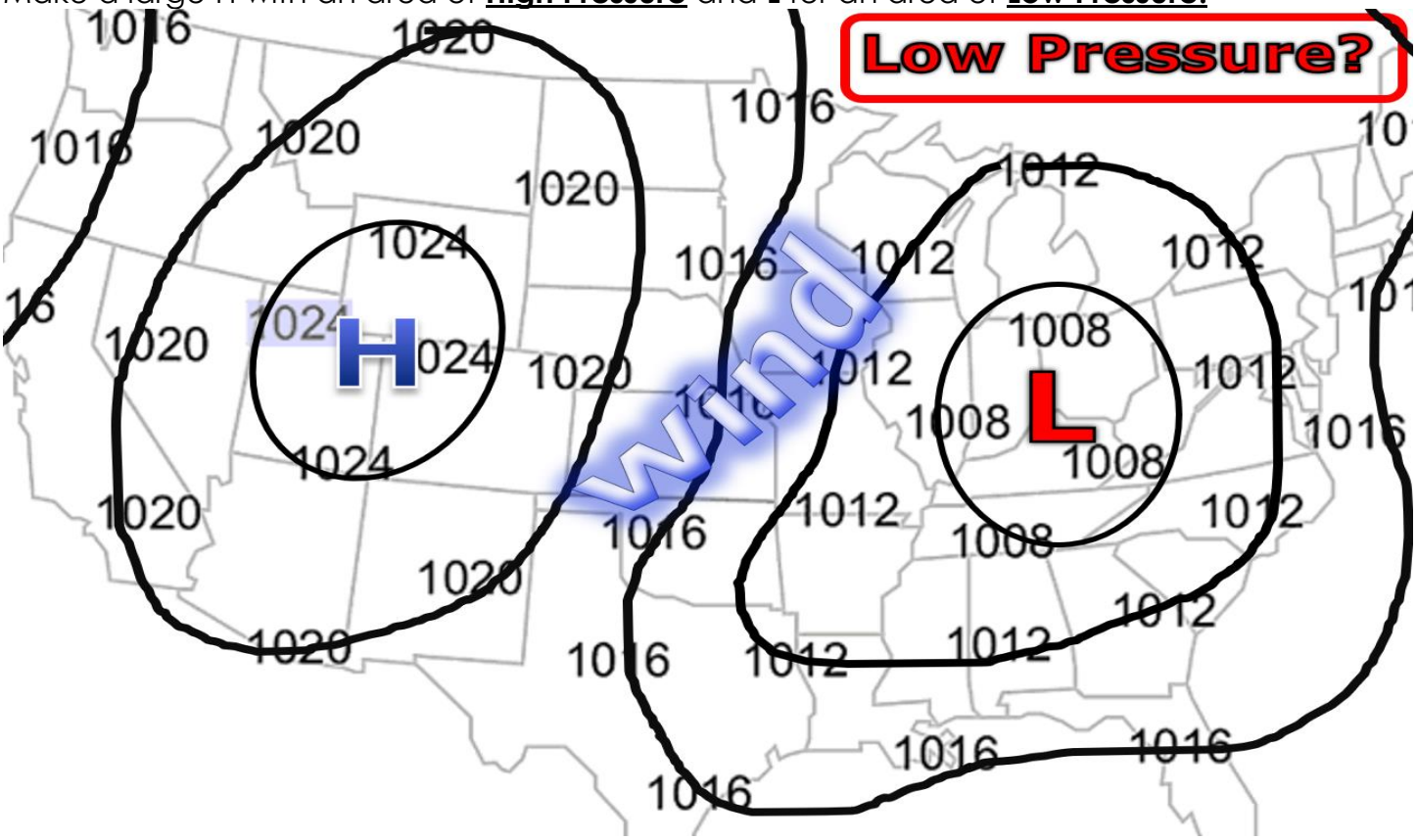
Isobar: A line connecting points of equal atmospheric pressure.

Which is high air pressure? low air pressure? And higher winds? Explain below?

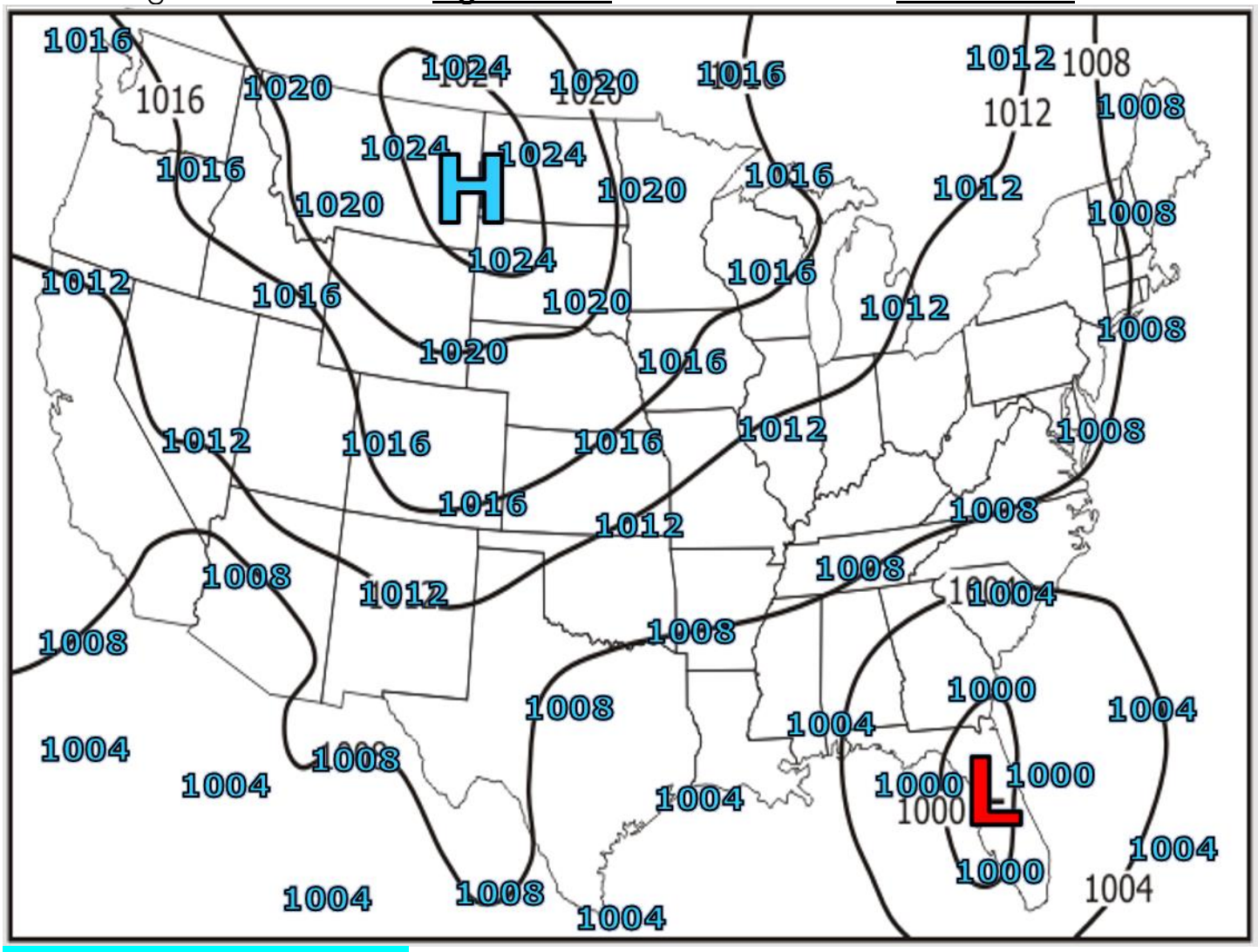
Which is cyclonic, and which is anticyclonic?



Please use the atmospheric Pressure data to create an accurate Isobar of the US.
Make a large H with an area of **High Pressure** and **L** for an area of **Low Pressure.**



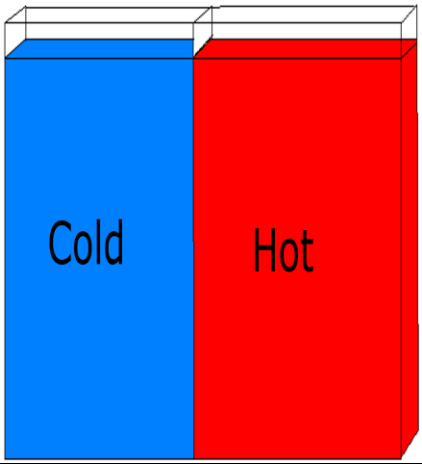
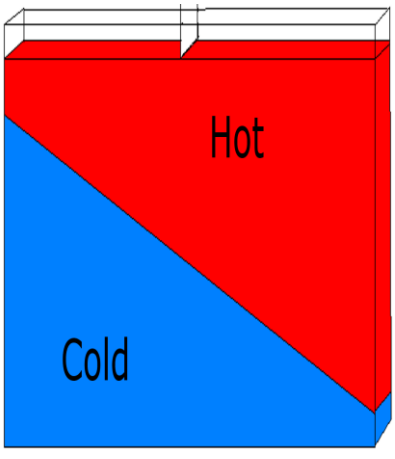
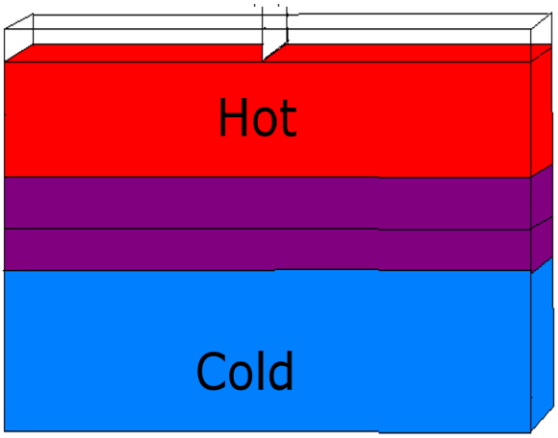
Please complete the more challenging Isobar below?
Make a large H with an area of **High Pressure** and **L** for an area of **Low Pressure.**



Part 2 Lesson 4 Weather Fronts

Warm Fronts and Cold Fronts are caused by Air Pressure

Draw a middle and after to the demonstration in the slideshow / video.

Start	Middle	End
		

Cold Front: Form where cold air moves towards warm air.

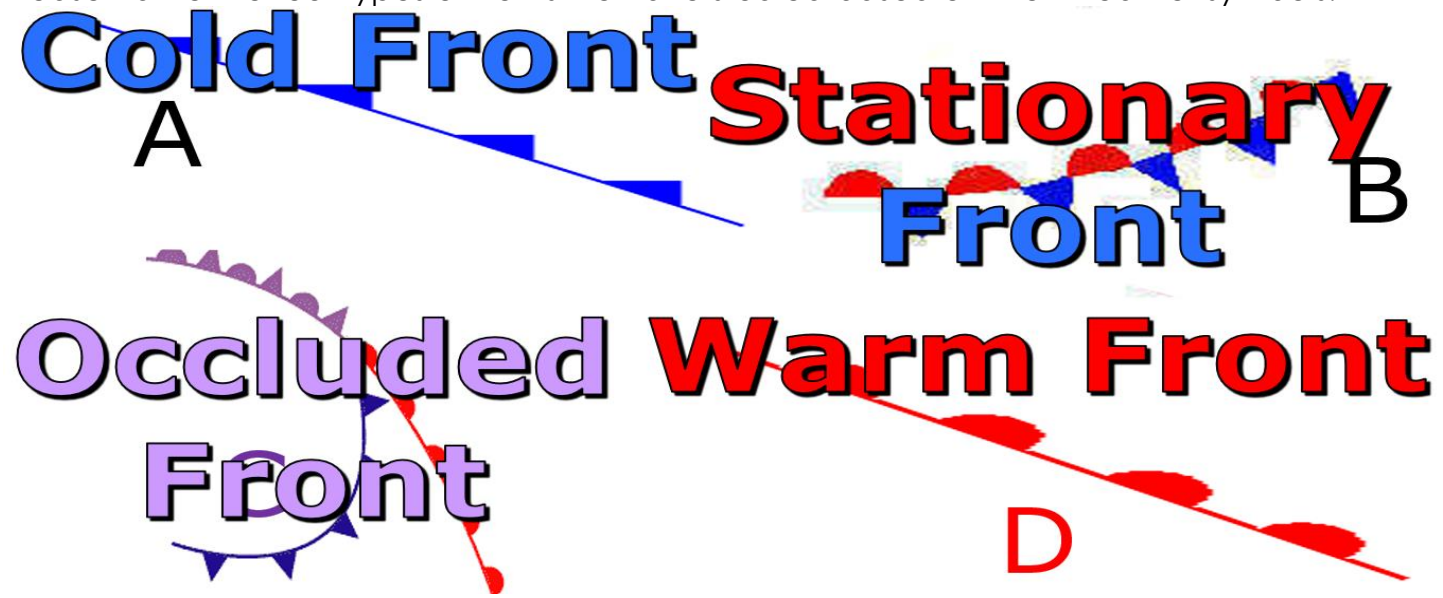
- Creates rainstorms.

Warm Front: Form where warm air moves towards cold air.

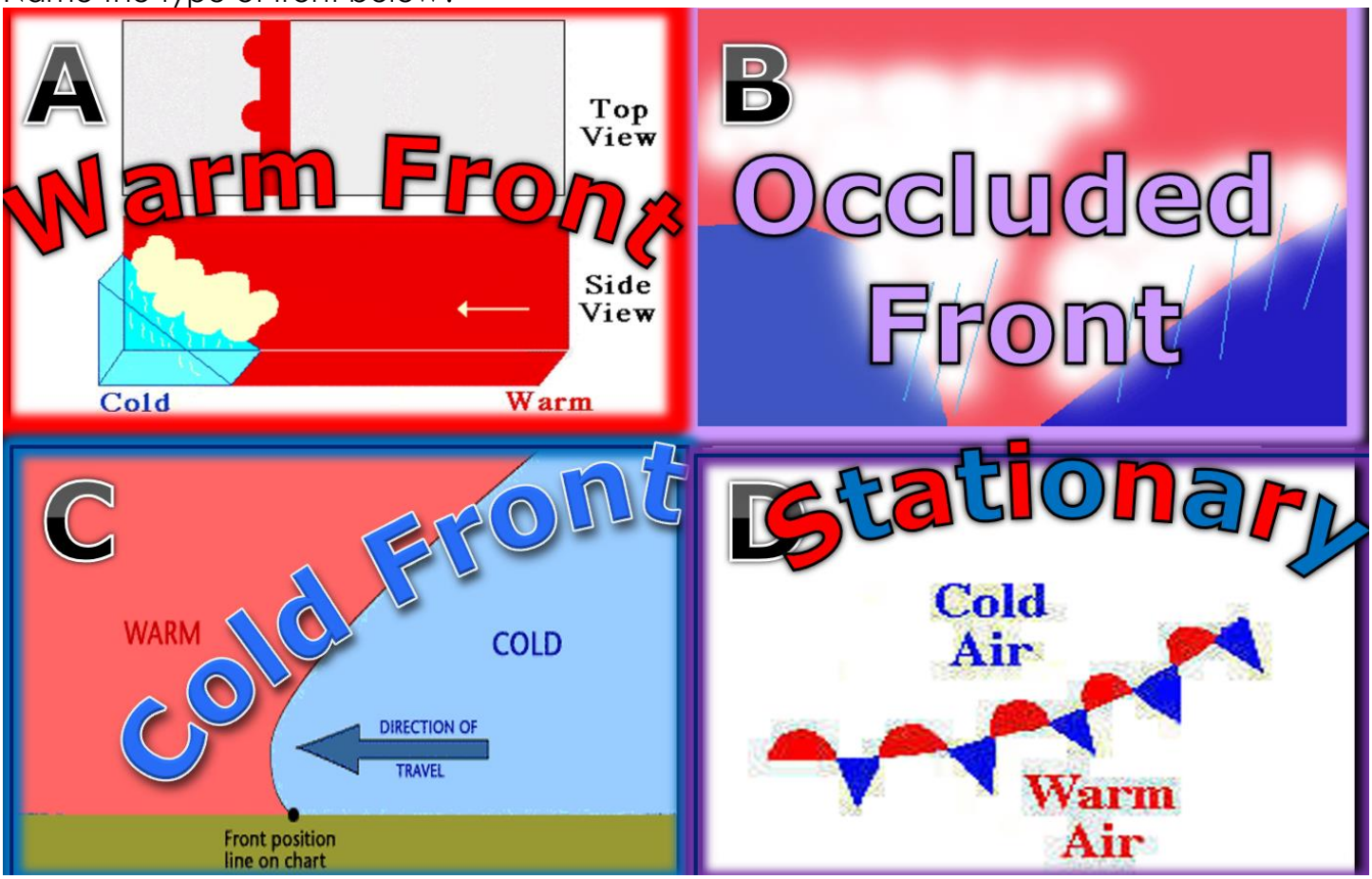
Occluded front: When a cold front overtakes a warm front and forces it up (Mix)

Stationary Front: When a cold front and warm front cannot overtake each other.

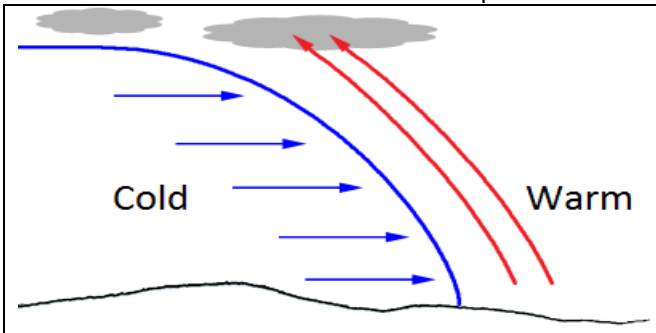
Please name the four types of fronts we have studied based on their weather symbols.



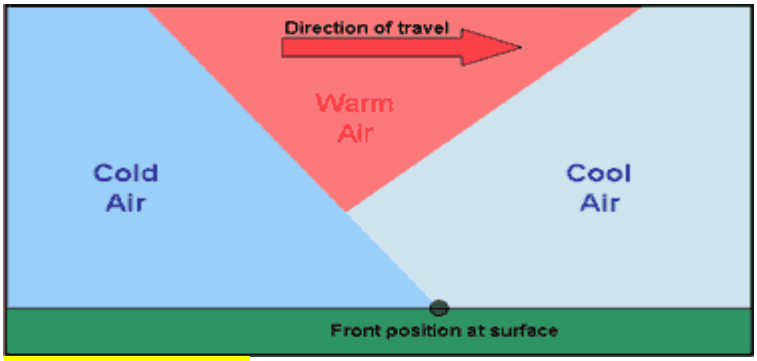
Name the type of front below?



Name the front based on the picture.

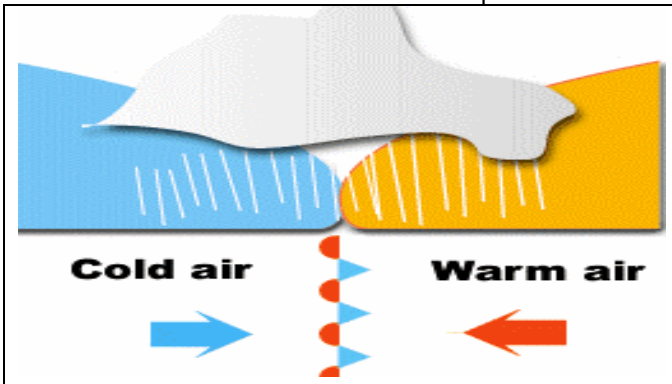


Cold Front

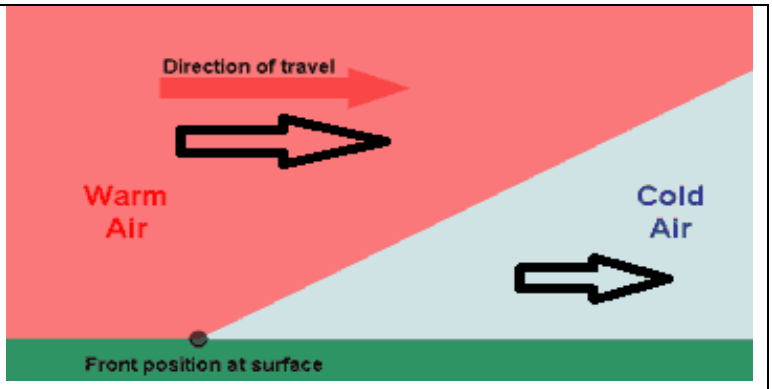


Occluded Front

Name the front based on the picture.



Stationary Front



Warm Front

Which is a warm front, cold front, stationary front, occluded front, area of high pressure, area of low pressure, cyclone?

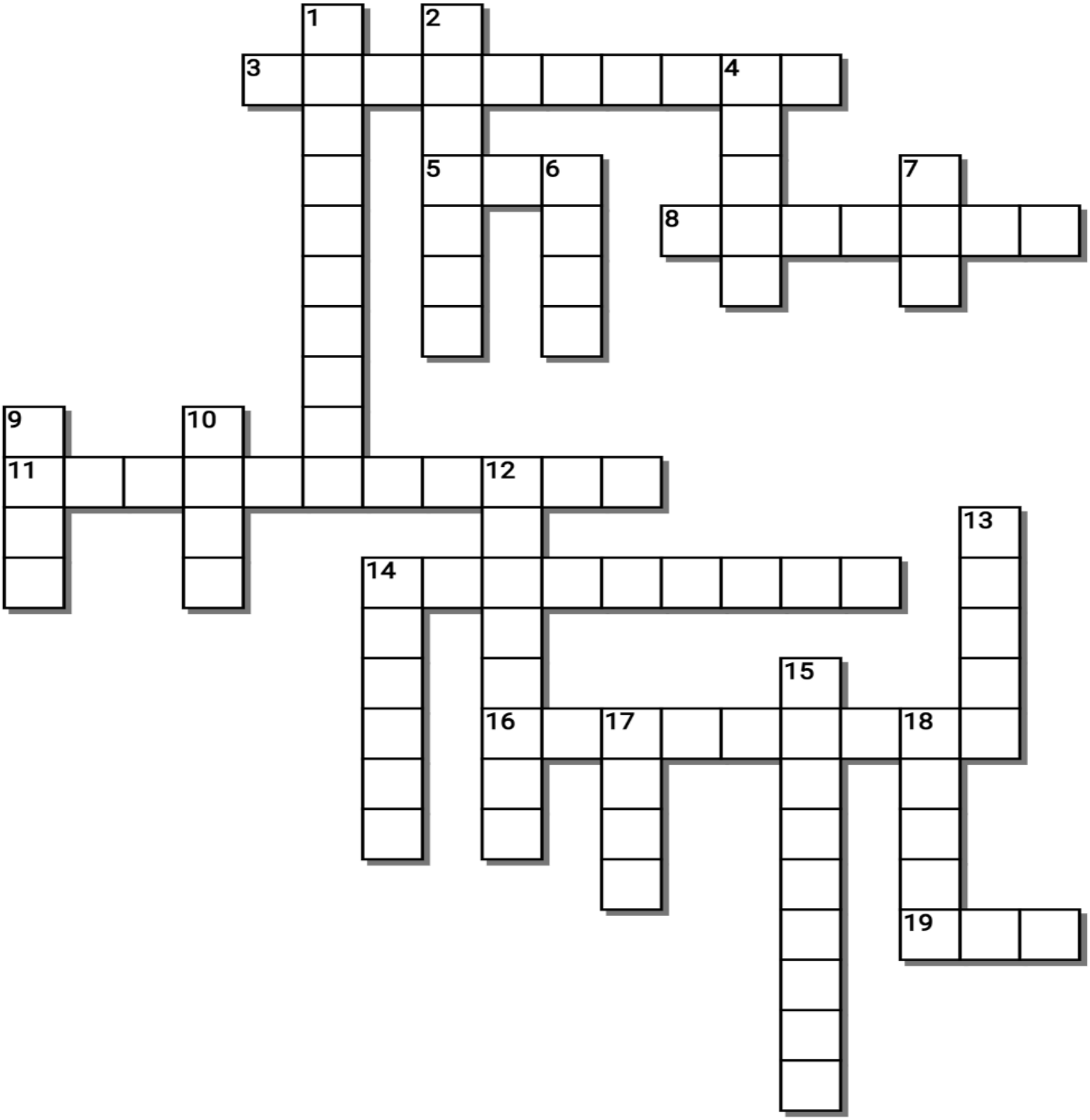
A=Low Pressure	B=Stationary Front	C=Low Pressure
D= Cold Front	E= High Pressure	F=Occluded Front

Quiz 1-10 Name the Front. Warm, Cold, Occluded, Stationary, Other.

1) Cold Front	2) Occluded Front	3)Other	4)Cold Front
5) Stationary Front	6) Warm Front	7)Cold Front	8)Warm Front
9) Other	10)Cold Front	Bonus	Bonus

Primary High-Pressure and Low-Pressure Areas

- Equatorial low-pressure trough.
- Polar high-pressure cells.
- Subtropical low-pressure cells.
- Subpolar high-pressure cells.


1
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Across

3. Air Pressure: The pressure caused by the weight of the _____.
5. Wind travels from areas of high pressure to areas of ___ pressure!
8. 760 mm Hg is the standard barometric (atmospheric) pressure. It is the pressure giving a pillar of _____ (the elemental abbreviation of mercury is Hg) that is 760 millimeters (mm) high.
11. This is a weather phenomenon defined as a large-scale circulation of winds around a central region of high atmospheric pressure, clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere as viewed from above (opposite to a cyclone).
14. As you increase in elevation air pressure decreases. As you decrease in elevation pressure _____.
16. As elevation increases, air pressure _____
19. _____Pressure = Stormy Weather

Down

1. _____Front: Type of front when cold and warm cannot overtake each other (tie
2. In normal atmospheric pressure (1 atm), the _____ point of water is 100 degrees Celsius.
4. Warm Air _____, Cool air Sinks
6. Air Pressure drives the _____ and creates the weather.
7. The _____ keeps cold and warm air moving and makes changes in air pressure.
9. _____Front: Type of front where warm air moves towards cold air.
10. _____ Pressure = Nice weather
12. _____Front: Type of front when a cold overtakes a warm and forces it up (Mix)
13. Warm air rises, cool air _____
14. A line connecting points of equal atmospheric pressure.
15. Instrument that measures air pressure.
17. _____Front: Type of front where cold air moves towards warm air. Creates rain storms.
18. Air pressure applies a force _____ in all directions.

Teacher can remove word bank to make more challenging.

Possible Answers

ANTICYCLONE, BAROMETER, COLD, EQUAL, HIGH, INCREASES, ISOBAR, LOW, LOW, MERCURY, OCCLUDED, RISES, SINKS, STATIONARY, SUN, WARM, WIND, ATMOSPHERE, BOILING, DECREASES.

Part 2 Review Game

Name:

1-20 = 5 pts Lesson 5

Due: Today

*20-*25 * = Bonus + 1 pt,
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Score ____ / 100

PRESSURES ON	HIGHS AND LOWS	WHICH WAY	FACE FRONT	UP UP AND AWAY Bonus round 1pt each
1) TRUE	6) 100 Celsius	11) Letter A=High Pressure Letter B=Low Pressure	16) C=Air Pressure	*21) UP
2) LETTER B	7) ALTIMETER	12) ISOBAR	17) A=Low Pressure, Poor Weather B=High Pressure, Good Weather	*22) AIR BUD
3) DECREASES	8) Top of Everest is switched Sea-Level	13) A=High B=Wind D=Low	18) WARM FRONT	*23) PLANES FIRE AND RESCUE
4) Letter D = 130	9) WIND	14) HIGH LOW HIGH LOW	19) Stationary COLD WARM OCCLUDED	*24) AIR FORCE
5) 760 mg of Mercury	10) Letter A	15) B=Cyclonically D=Anticyclonically	20) A=Warm B=Occluded C=Cold D=Stationary	*25) FORTNITE

Final Question Wager ____/5 Answer: LETTER D: High winds when isobar lines are close together