

Part 5 Weather Tools

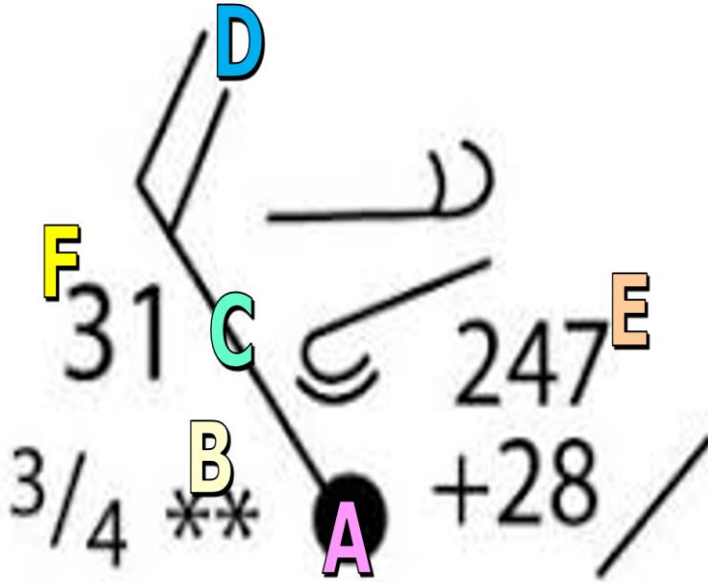
Name: _____

Due: _____

Part 5 Lesson 1

Meteorology: The study of the _____ that focuses on weather processes and _____.

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



A _____

B _____

C _____

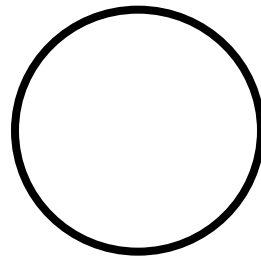
D _____

E _____

F _____

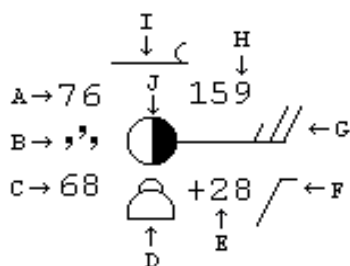
Please provide at least a 25 word weather forecast for today? You must include some variables from page 2 in your forecast?
 Date: _____

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



<p>Cloud Coverage</p> <p>○ No Clouds</p> <p>◐ 1/10</p> <p>◑ 1/4</p> <p>◒ 1/2</p> <p>◓ 3/4</p> <p>◔ 9/10</p> <p>● Completely Overcast</p> <p>⊗ Sky Obscured</p>	<p>Wind Speed</p> <p>☉ Calm</p> <p>— < 5 knots</p> <p>— 5 knots</p> <p>— 10 knots</p> <p>— 20 knots</p> <p>— 25 knots</p> <p>— 50 knots</p>	<p>Cloud Types</p> <p><i>High Elevation</i></p> <p>— Scattered Cirrus</p> <p>— Dense Cirrus</p> <p>— Cirrostratus</p> <p>— Heavy Cirrostratus</p> <p>— Cirrus & Cirrostratus</p> <p><i>Middle Elevation</i></p> <p>— Thin Altostratus</p> <p>— Thick Altostratus</p> <p>— Thin Altocumulus</p> <p>— Heavy Altocumulus</p> <p><i>Low Elevation</i></p> <p>— Stratocumulus</p> <p>— Fair Weather Cumulus</p> <p>— Developing Cumulus</p> <p>— Cumulonimbus</p> <p>— Cirrocumulus</p> <p>— Nimbostratus</p> <p>— Stratus</p> <p>— Fractostratus</p>	<p>Weather Conditions</p> <p style="text-align: center;">INTERMITTENT</p> <table style="width:100%; text-align: center;"> <tr> <td></td> <td>Light</td> <td>Moderate</td> <td>Heavy</td> </tr> <tr> <td>Rain</td> <td>•</td> <td>••</td> <td>•••</td> </tr> <tr> <td>Snow</td> <td>*</td> <td>**</td> <td>***</td> </tr> <tr> <td>Drizzle</td> <td>,</td> <td>;</td> <td>;</td> </tr> </table> <p style="text-align: center;">STEADY</p> <table style="width:100%; text-align: center;"> <tr> <td></td> <td>Light</td> <td>Moderate</td> <td>Heavy</td> </tr> <tr> <td>Rain</td> <td>••</td> <td>•••</td> <td>••••</td> </tr> <tr> <td>Snow</td> <td>**</td> <td>*•*</td> <td>*•*•*</td> </tr> <tr> <td>Drizzle</td> <td>”</td> <td>”;</td> <td>”;</td> </tr> </table> <p style="text-align: center;">THUNDERSTORMS</p> <table style="width:100%; text-align: center;"> <tr> <td></td> <td>Mild</td> <td>Moderate</td> <td>Severe</td> </tr> <tr> <td>Rain</td> <td>⚡</td> <td>⚡</td> <td>⚡</td> </tr> <tr> <td>Snow</td> <td>*⚡</td> <td>*⚡</td> <td>*⚡</td> </tr> <tr> <td>Hail</td> <td>⚡</td> <td>⚡</td> <td>⚡</td> </tr> </table> <p>△ Hail Freezing Drizzle</p> <p>⊖ Snow Grains Light Heavy</p> <p>⚡ Tornado ⚡ ⚡</p> <p>↔ Ice Crystals Freezing Rain</p> <p>⚡ Drifting Snow Light Heavy</p>		Light	Moderate	Heavy	Rain	•	••	•••	Snow	*	**	***	Drizzle	,	;	;		Light	Moderate	Heavy	Rain	••	•••	••••	Snow	**	*•*	*•*•*	Drizzle	”	”;	”;		Mild	Moderate	Severe	Rain	⚡	⚡	⚡	Snow	*⚡	*⚡	*⚡	Hail	⚡	⚡	⚡
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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

Visiting a weather internet site.

- <http://www.findlocalweather.com/>
 - Everyone take a guess about the following and we will see who gets the closest.
 - Current Temperature _____
 - Humidity 1-100% _____
 - Wind Speed _____
 - Wind Direction _____
 - Barometric Pressure _____
 - Dew Point (Temp) _____
 - Heat Index _____
 - Wind Chill _____

What is the 5-Day forecast? Which day would be the best to plan a hike if any?

--	--	--	--	--

Most common Weather Tools

Thermometer

A thermometer is usually a glass tube _____ at both ends. It is partly filled with a liquid like mercury or alcohol that doesn't _____ easily. As the temperature around the thermometer's bulb heats up, the molecules of the liquid inside _____ around more. This causes the liquid to rise up the glass tube. Numbers are placed along the tube to indicate the correct temperatures.

Wind Vane – Wind direction

A wind vane spins and points in the _____ from which the wind is coming. One end is usually shaped like an arrow and turns into the wind and one end that is wider so that it catches the breeze.

The arrow will point to the direction the _____ is blowing.

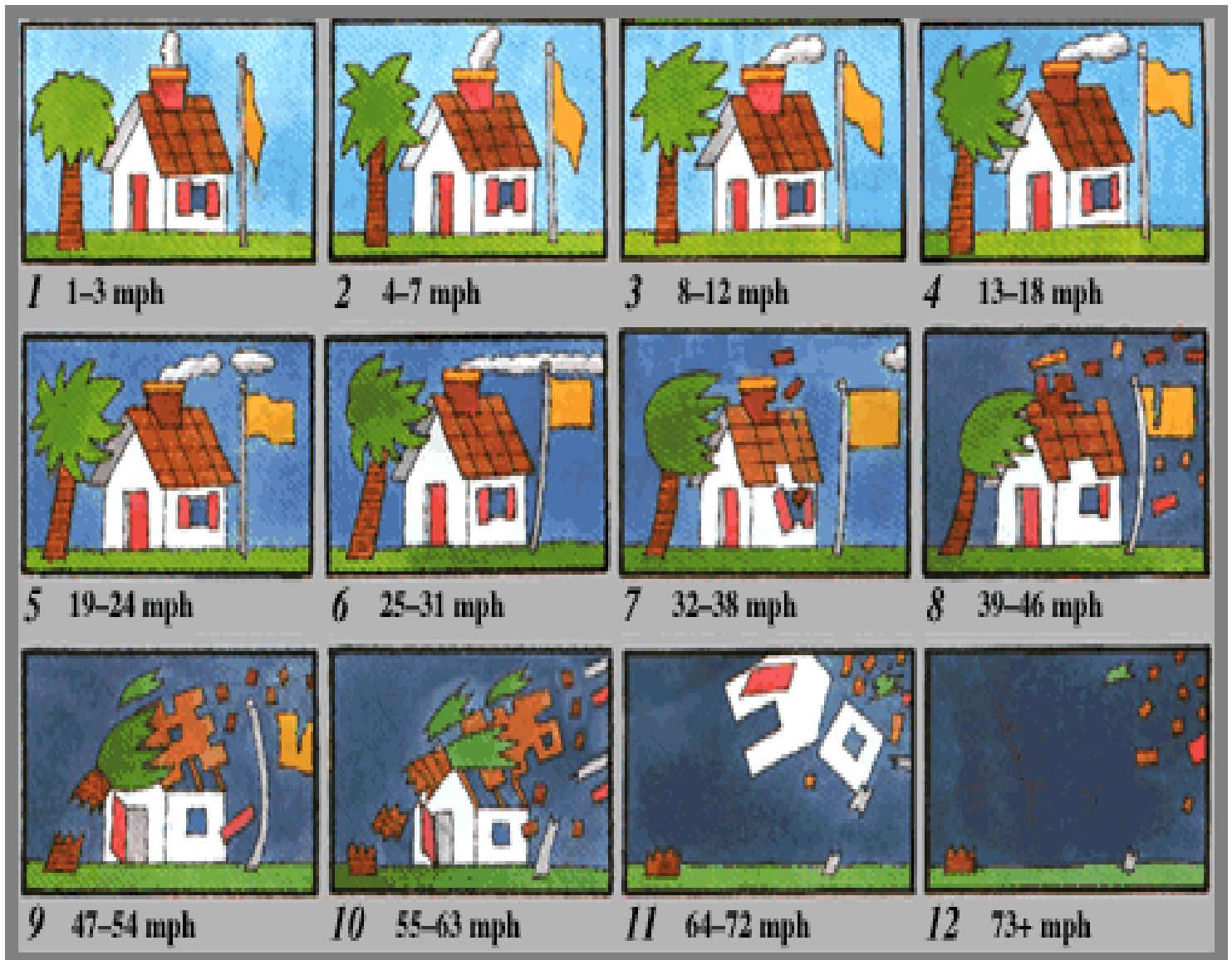
Part 5 Lesson 2

Anemometer – Wind speed

An anemometer works by having arms that are attached to a vertical rod. As the wind blows, the cups rotate, making the rod _____.

The stronger the wind blows, the faster the rod spins. The anemometer counts the number of _____, or turns, which then calculate wind speed.

The _____ Scale measures wind speed based on local observations.



How fast is the wind traveling in the following pictures? Use the Beaufort Scale





Barometer – Measures air _____

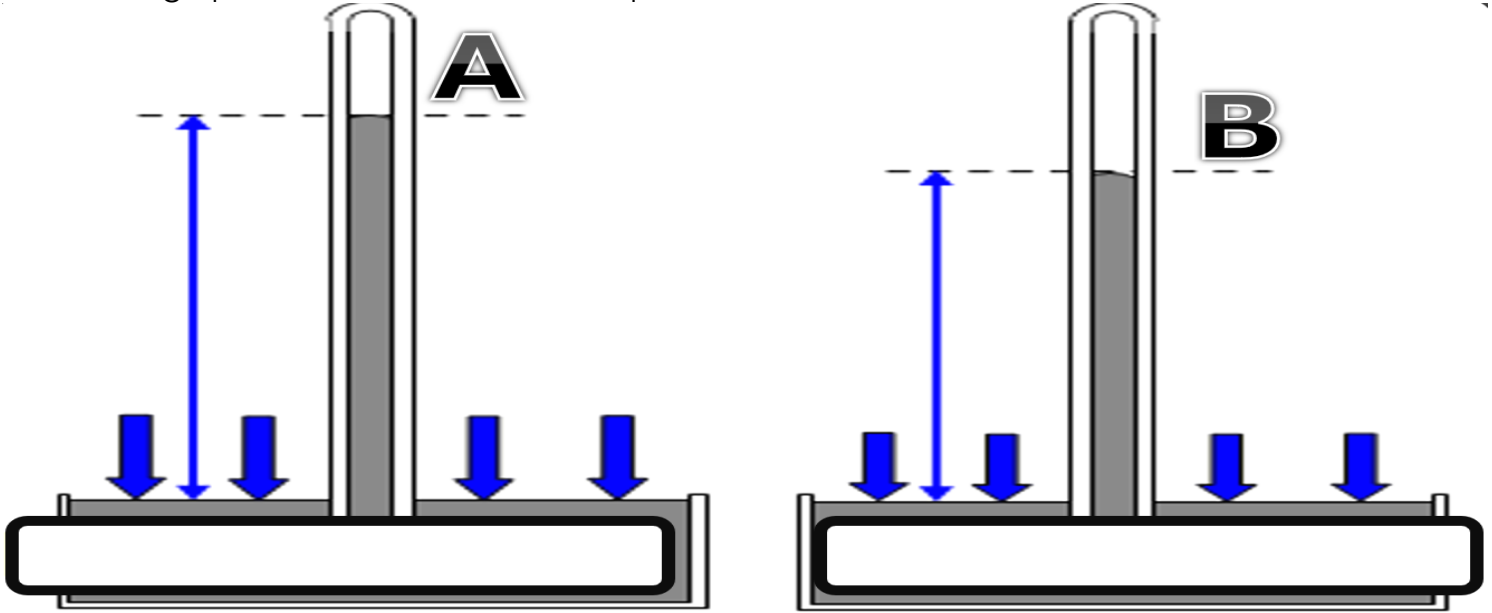
A barometer: An upside-down glass tube stands in a bath of mercury. Air pressure pushes _____ on the surface of the mercury, making some

rise up the tube. The greater the air pressure, the higher the mercury

_____.

Aneroid barometers don't use liquid of any kind, instead use a flexible-walled _____ capsule.

Which is high pressure? and which is low pressure?



Part 5 Lesson 3

Hygrometer: Measures the water _____ content of air (humidity).

Sling _____: Device used to measure humidity.

Rain Gauge: Measures rainfall.

Hygrometer: Measures the water _____ content of air (humidity).

Snow / rain equivalent = One inch of rain is about _____ inches of snow and vice versa.

Heat Index / Apparent Temperature

- It feels hotter than the actual temperature when there's high _____.

Dew: Moisture _____ from the atmosphere, esp. at night, and deposited in the form of small drops upon any cool surface.

Dew Point: The temperature to which air must be _____ for saturation to occur.

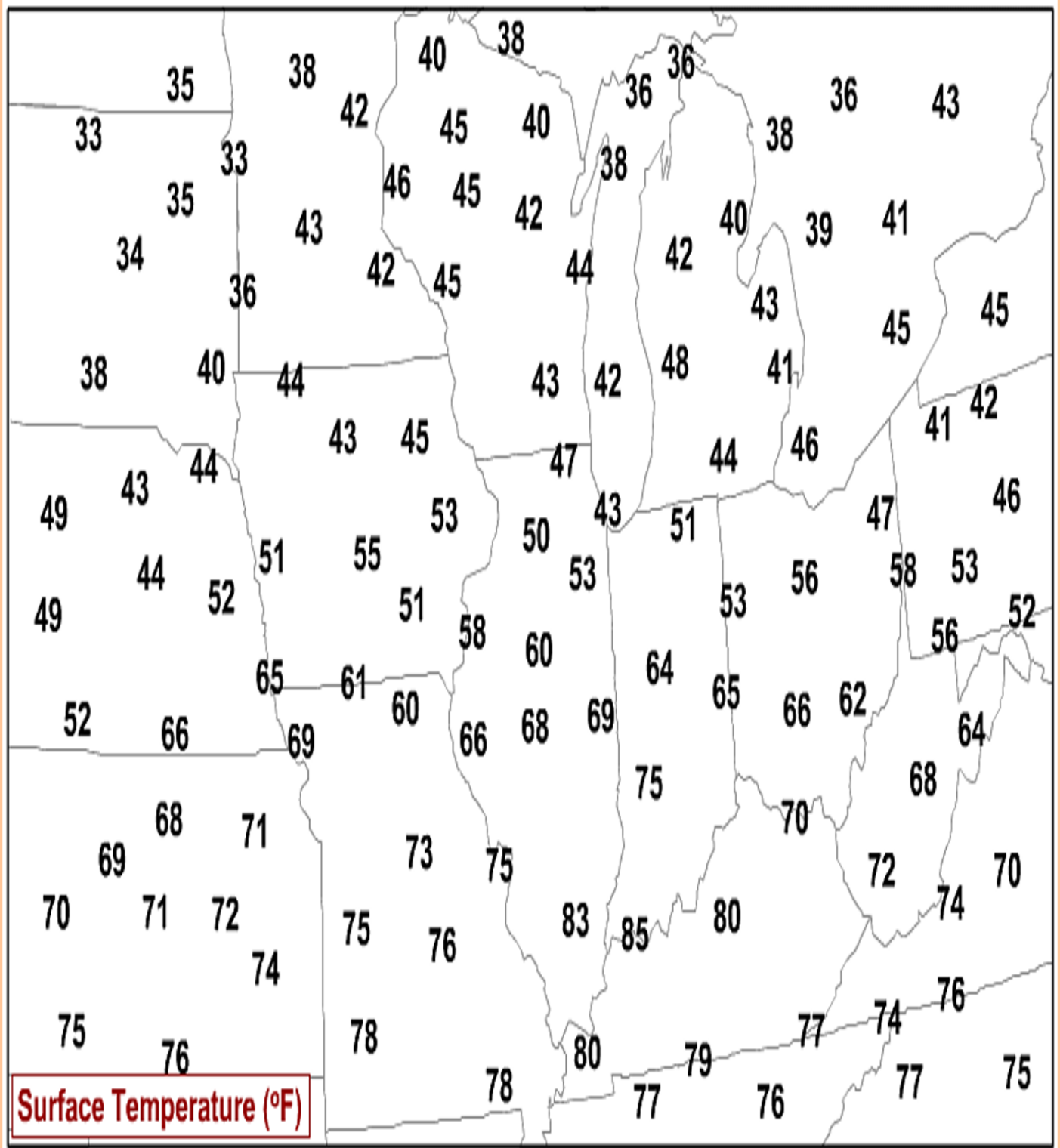
Sling psychrometer: Device used to measure _____.

Part 5 Lesson 4

Satellites: Provide _____ view of weather.

Isotherm- A _____ drawn on a weather map or chart linking all points of equal or constant _____.

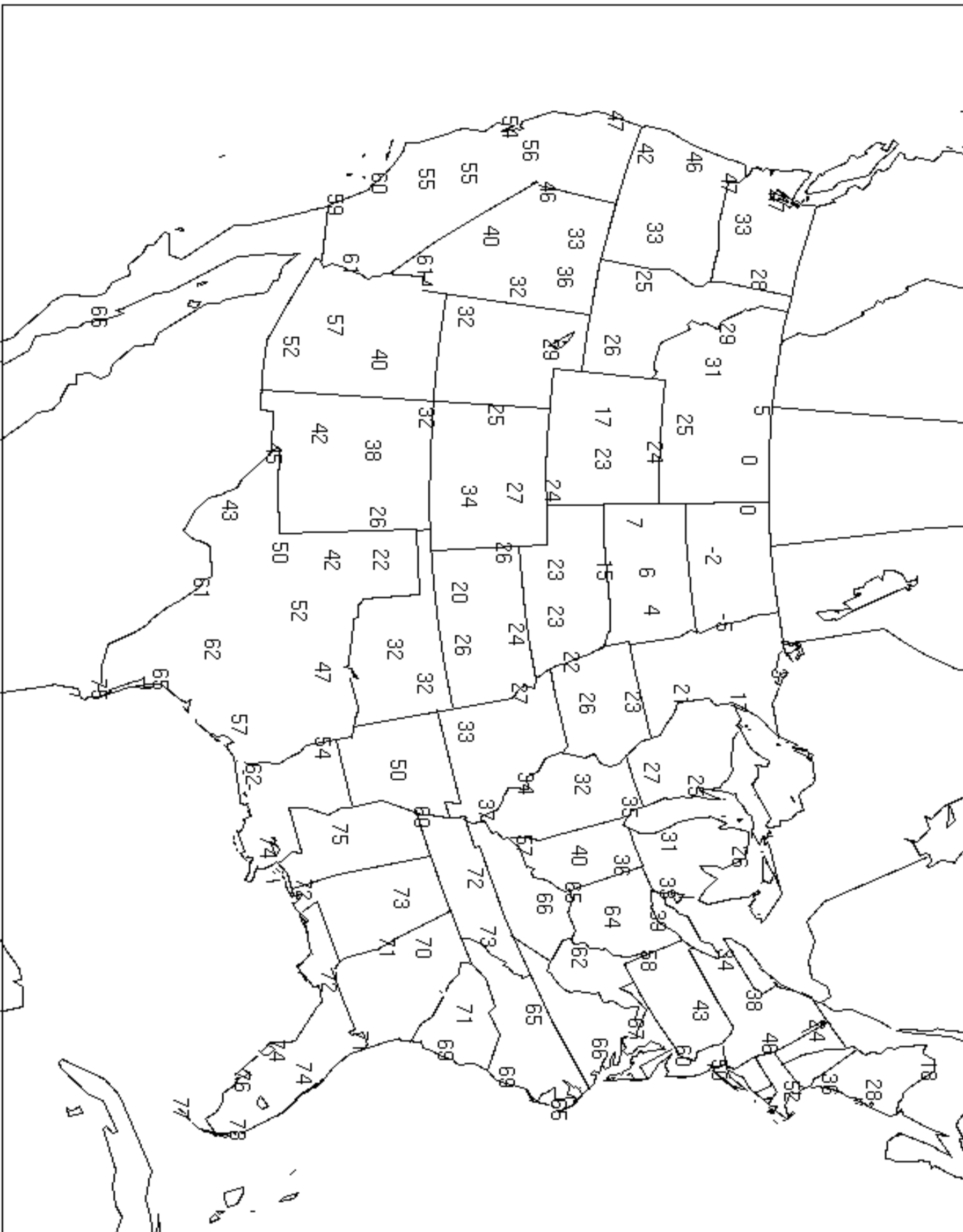
Please create and isotherm in the map below. Please color code a key at the bottom of the page. Makes your Isotherm for every 10 degrees. 30's, 40's, 50's, 60's, 70's, 80's



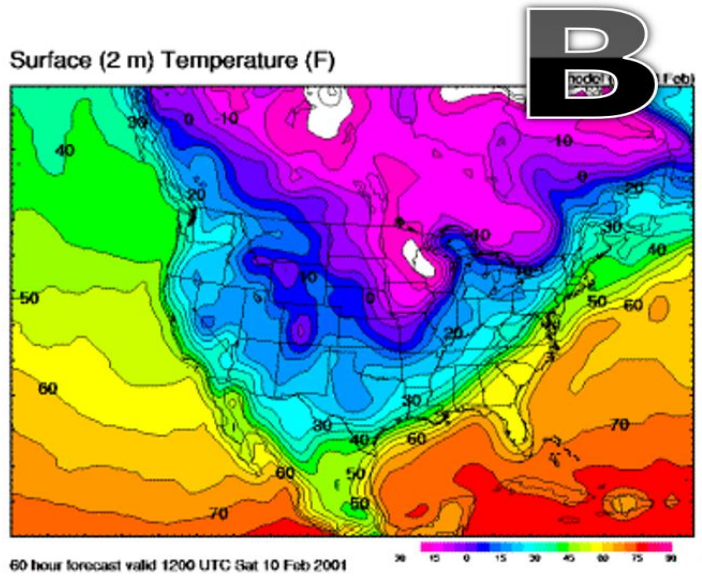
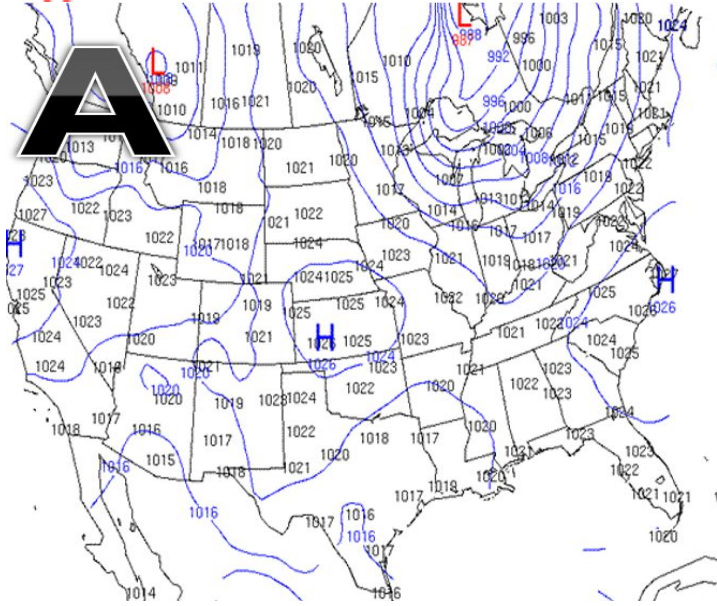
◇30's ◇40's ◇50's ◇60's ◇70's ◇80's

01Z 22 DEC 2013

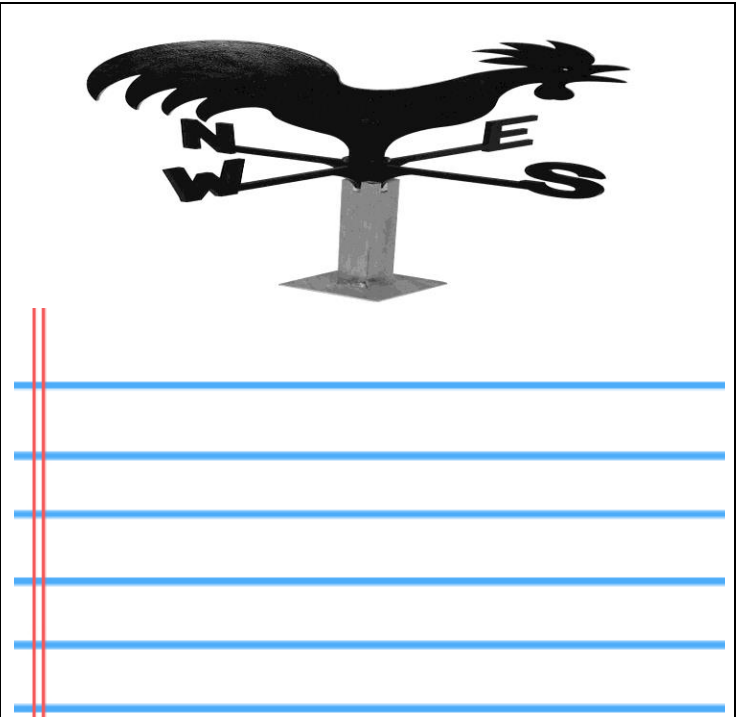
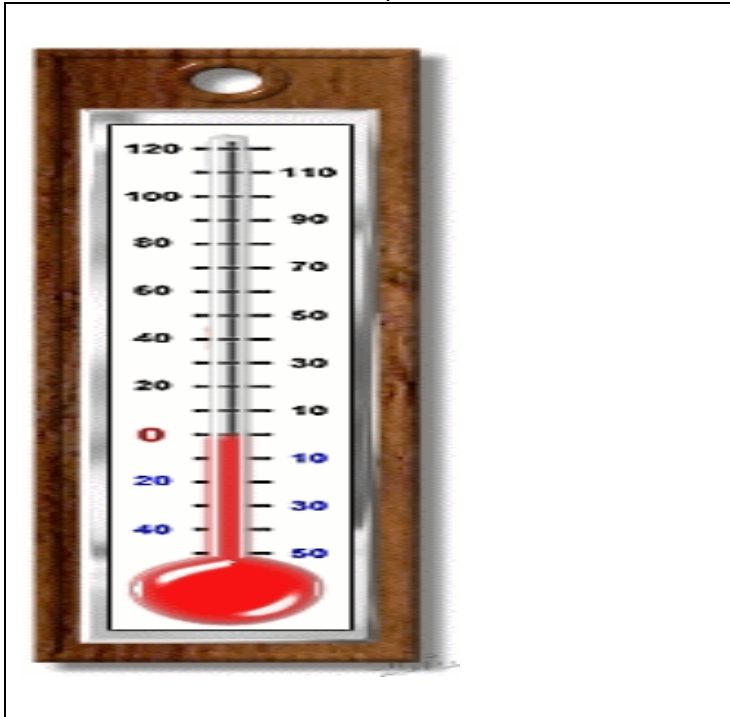
Temperatures



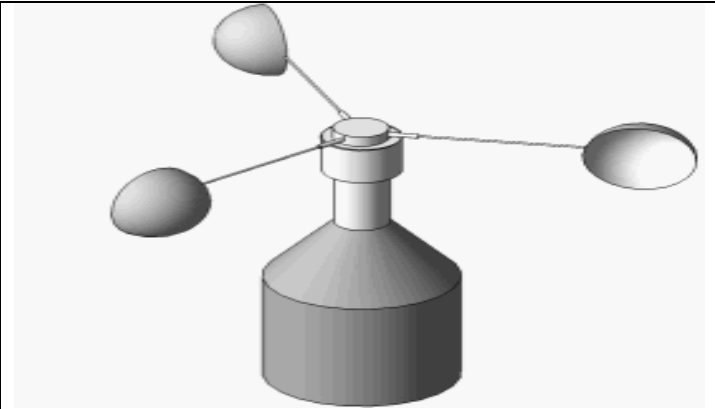
Which is an Isotherm? And which is an Isobar? What's the difference?



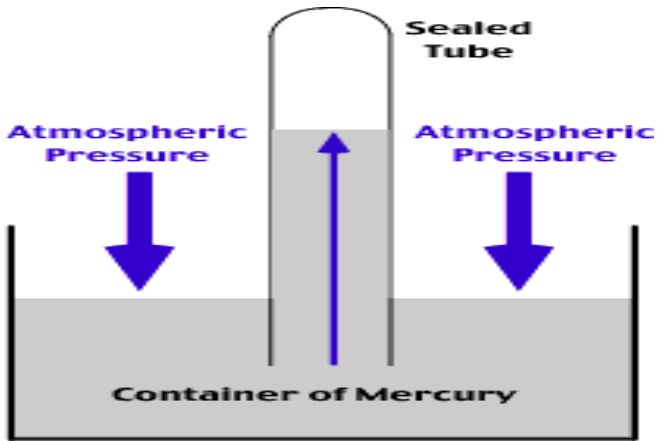
* Warning! Multi-part Question - Name these four common weather tools. What do they record and how do they do it?



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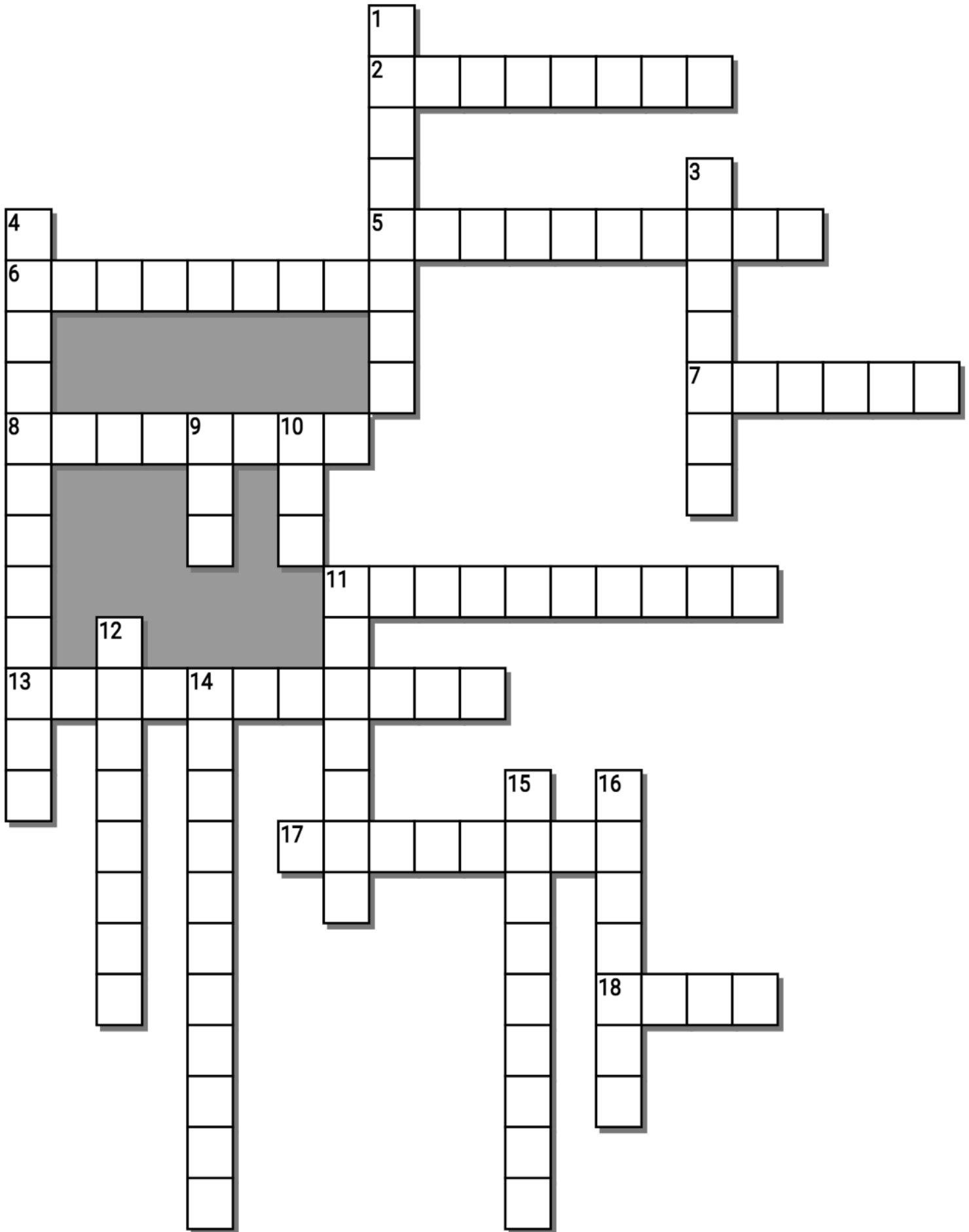
Blank lines for writing answers, with a red margin line on the left.



Review Quiz 1-10

Score=

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



Across

2. Campbell Stokes Recorder measures _____

5. Measures the water vapor content of air (humidity).

6. A weather _____ is a type of satellite that is primarily used to monitor the weather and climate of the Earth.

7. An imaginary line or a line on a map or chart connecting or marking places of equal barometric pressure

8. Wetness in the atmosphere

11. An _____ works by having arms that are attached to a vertical rod. As the wind blows, the cups rotate, making the rod spin.

13. An instrument for measuring and indicating temperature, typically one consisting of a narrow, hermetically sealed glass tube marked with graduations and having at one end a bulb containing mercury or alcohol that expands and contracts in the tube with heating and cooling.

17. A _____ spins and points in the direction from which the wind is coming. One end is usually shaped like an arrow and turns into the wind and one end that is wider so that it catches the breeze.

18. _____ Index / Apparent Temperature It feels hotter than the actual temperature when there's high humidity.

Down

1. A line drawn on a weather map or chart linking all points of equal or constant temperature.

3. A weather _____ makes continuous measurements of different aspects of the weather.

4. Sling _____ : Device used to measure humidity.

9. Moisture condensed from the atmosphere, esp. at night, and deposited in the form of small drops upon any cool surface.

10. Snow / rain equivalent = One inch of rain is about ____ inches of snow and vice versa.

11. _____ barometers don't use liquid of any kind, instead use a flexible-walled empty capsule.

12. The _____ Scale measures wind speed based on local observations.

14. The study of the atmosphere that focuses on weather processes and forecasting.

15. An 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.

16. The state of the atmosphere at a given time and place, with respect to variables

-----Teacher can remove this word bank to make puzzle more difficult-----

Possible Answers

STATION, ANEROID , BAROMETER, BEAUFORT , DEW, HEAT, HUMIDITY, HYGROMETER, ISOBAR ISOTHERM, METEOROLOGY, SUNSHINE, TEN, THERMOMETER, WEATHER, WINDVANE, ANEMOMETER , PSYCHROMETER, SATELLITE

Part 5 Weather Tools

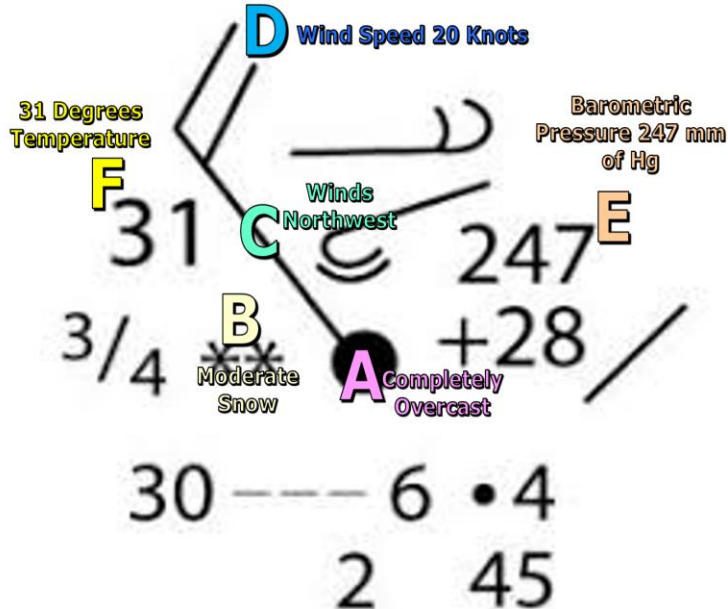
Name: _____

Due: _____

Part 5 Lesson 1

Meteorology: The study of the **atmosphere** that focuses on weather processes and **forecasting**.

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



A Completely Overcast

B Moderate Snow

C Winds Northwest

D Wind Speed 20 Knots

E Barometric Pressure 247 mm Hg

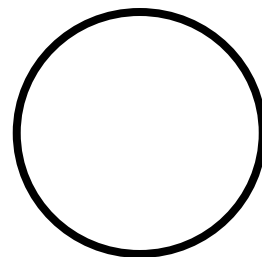
F 31 Degrees F

Please provide at least a 25 word weather forecast for today? You must include some variables from page 2 in your forecast?

Date: _____

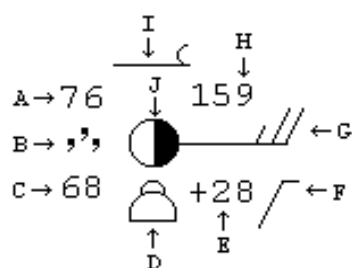
The paragraph should match the symbols to the right.

Use the information on the next page to create a weather model for your forecast. You can visit a weather website to collection additional data. **Answers will vary based on the weather of the day. But include the above if possible**



<p>Cloud Coverage</p> <p>○ No Clouds</p> <p>◐ 1/10</p> <p>◑ 1/4</p> <p>◒ 1/2</p> <p>◓ 3/4</p> <p>◔ 9/10</p> <p>● Completely Overcast</p> <p>⊗ Sky Obscured</p>	<p>Wind Speed</p> <p>☉ Calm</p> <p>— < 5 knots</p> <p>— 5 knots</p> <p>— 10 knots</p> <p>— 20 knots</p> <p>— 25 knots</p> <p>— 50 knots</p>	<p>Cloud Types</p> <p><i>High Elevation</i></p> <p>— Scattered Cirrus</p> <p>— Dense Cirrus</p> <p>— Cirrostratus</p> <p>— Heavy Cirrostratus</p> <p>— Cirrus & Cirrostratus</p> <p><i>Middle Elevation</i></p> <p>— Thin Altostratus</p> <p>— Thick Altostratus</p> <p>— Thin Altocumulus</p> <p>— Heavy Altocumulus</p> <p><i>Low Elevation</i></p> <p>— Stratocumulus</p> <p>— Fair Weather Cumulus</p> <p>— Developing Cumulus</p> <p>— Cumulonimbus</p> <p>— Cirrocumulus</p> <p>— Nimbostratus</p> <p>— Stratus</p> <p>— Fractostratus</p>	<p>Weather Conditions</p> <p style="text-align: center;">INTERMITTENT</p> <table style="width: 100%; text-align: center;"> <tr> <td></td> <td>Light</td> <td>Moderate</td> <td>Heavy</td> </tr> <tr> <td>Rain</td> <td>•</td> <td>••</td> <td>•••</td> </tr> <tr> <td>Snow</td> <td>*</td> <td>**</td> <td>***</td> </tr> <tr> <td>Drizzle</td> <td>,</td> <td>;</td> <td>;</td> </tr> </table> <p style="text-align: center;">STEADY</p> <table style="width: 100%; text-align: center;"> <tr> <td></td> <td>Light</td> <td>Moderate</td> <td>Heavy</td> </tr> <tr> <td>Rain</td> <td>••</td> <td>•••</td> <td>••••</td> </tr> <tr> <td>Snow</td> <td>**</td> <td>*•*</td> <td>*•*•*</td> </tr> <tr> <td>Drizzle</td> <td>”</td> <td>”;</td> <td>”;</td> </tr> </table> <p style="text-align: center;">THUNDERSTORMS</p> <table style="width: 100%; text-align: center;"> <tr> <td></td> <td>Mild</td> <td>Moderate</td> <td>Severe</td> </tr> <tr> <td>Rain</td> <td>⚡</td> <td>⚡</td> <td>⚡</td> </tr> <tr> <td>Snow</td> <td>*⚡</td> <td>*⚡</td> <td>*⚡</td> </tr> <tr> <td>Hail</td> <td>⚡</td> <td>⚡</td> <td>⚡</td> </tr> </table> <p>△ Hail Freezing Drizzle</p> <p>⊖ Snow Grains Light Heavy</p> <p>⚡ Tornado ⚡ ⚡</p> <p>↔ Ice Crystals Freezing Rain</p> <p>⚡ Drifting Snow Light Heavy</p>		Light	Moderate	Heavy	Rain	•	••	•••	Snow	*	**	***	Drizzle	,	;	;		Light	Moderate	Heavy	Rain	••	•••	••••	Snow	**	*•*	*•*•*	Drizzle	”	”;	”;		Mild	Moderate	Severe	Rain	⚡	⚡	⚡	Snow	*⚡	*⚡	*⚡	Hail	⚡	⚡	⚡
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Weather Station Model Demo



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- D - Low Cloud Type
- E - Pressure Change

- F - Pressure Tendency
- G - Wind Speed & Direction
- H - Barometric Pressure
- I - High Cloud Type
- J - Cloud Coverage

Visiting a weather internet site.

- <http://www.findlocalweather.com/>
 - Everyone take a guess about the following and we will see who gets the closest.
 - Current Temperature _____
 - Humidity 1-100% _____
 - Wind Speed _____
 - Wind Direction _____
 - Barometric Pressure _____
 - Dew Point (Temp) _____
 - Heat Index _____
 - Wind Chill _____

What is the 5-Day forecast? Which day would be the best to plan a hike if any?

Example



Most common Weather Tools

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A thermometer is usually a glass tube **sealed** at both ends. It is partly filled with a liquid like mercury or alcohol that doesn't **freeze** easily. As the temperature around the thermometer's bulb heats up, the molecules of the liquid inside **move** around more. This causes the liquid to rise up the glass tube. Numbers are placed along the tube to indicate the correct temperatures.

Wind Vane – Wind direction

A wind vane spins and points in the **direction** from which the wind is coming. One end is usually shaped like an arrow and turns into the wind and one end that is wider so that it catches the breeze. The arrow will point to the direction the **wind** is blowing.

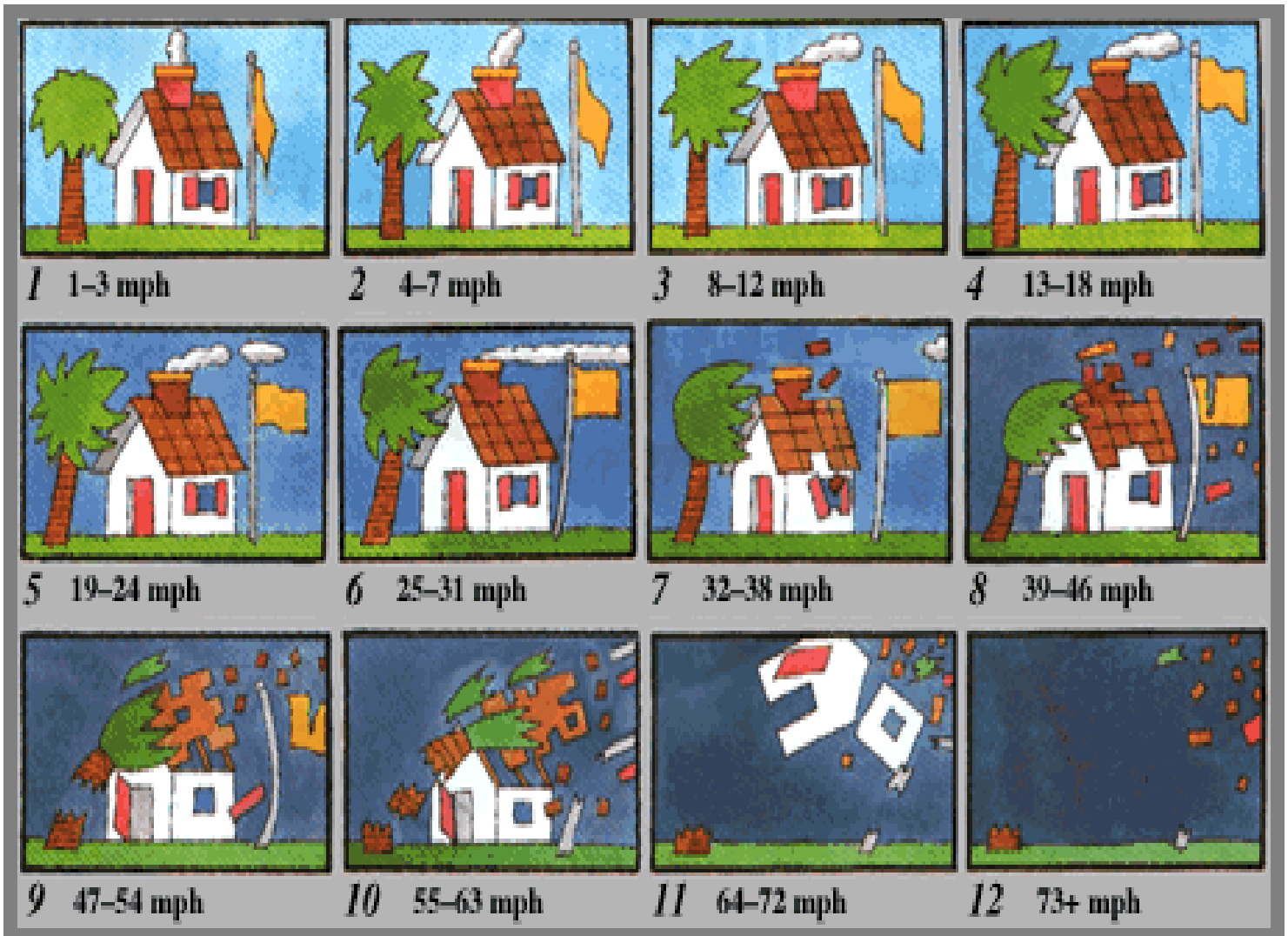
Part 5 Lesson 2

Anemometer – Wind speed

An anemometer works by having arms that are attached to a vertical rod. As the wind blows, the cups rotate, making the rod **spin**.

The stronger the wind blows, the faster the rod spins. The anemometer counts the number of **rotations**, or turns, which then calculate wind speed.

The **Beaufort** Scale measures wind speed based on local observations.



How fast is the wind traveling in the following pictures? Use the Beaufort Scale



25-31 mph smoke is horizontal



19-24 mph



32-38 mph Shingles removed



55-63 mph



1-3 mph Smoke rises vertically



32-38 mph, 39-46 mph



47-54 mph



73+ mph

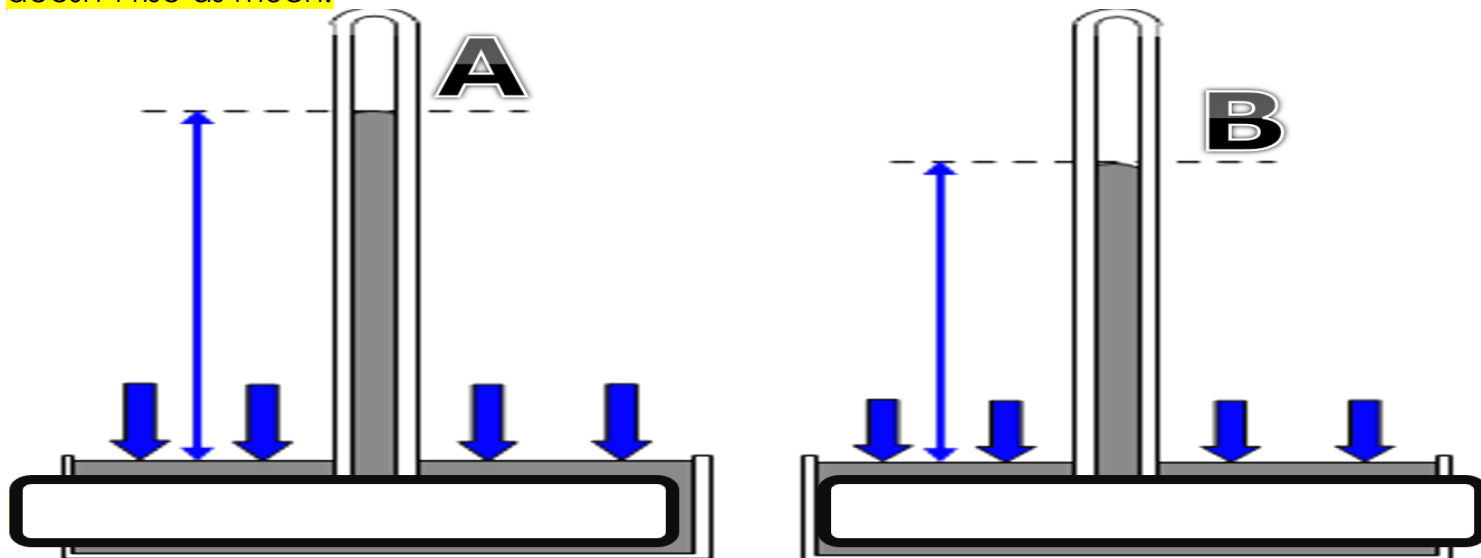
Barometer – Measures air **pressure**

A barometer: An 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**.

Aneroid barometers don't use liquid of any kind, instead use a flexible-walled **empty** capsule.

Which is high pressure? and which is low pressure?

A is high pressure, it pushes the mercury up higher, B = lower pressure, pushes less so mercury doesn't rise as much.



Part 5 Lesson 3

Hygrometer: Measures the water **vapor** content of air (humidity).

Sling **psychrometer**: Device used to measure humidity.

Rain Gauge: Measures rainfall.

Hygrometer: Measures the water **humidity** content of air (humidity).

Snow / rain equivalent = One inch of rain is about **10 inches** of snow and vice versa.

Heat Index / Apparent Temperature

- It feels hotter than the actual temperature when there's high **humidity**.

Dew: Moisture **condensed** from the atmosphere, esp. at night, and deposited in the form of small drops upon any cool surface.

Dew Point: The temperature to which air must be **cooled** for saturation to occur.

Sling psychrometer: Device used to measure **humidity**.

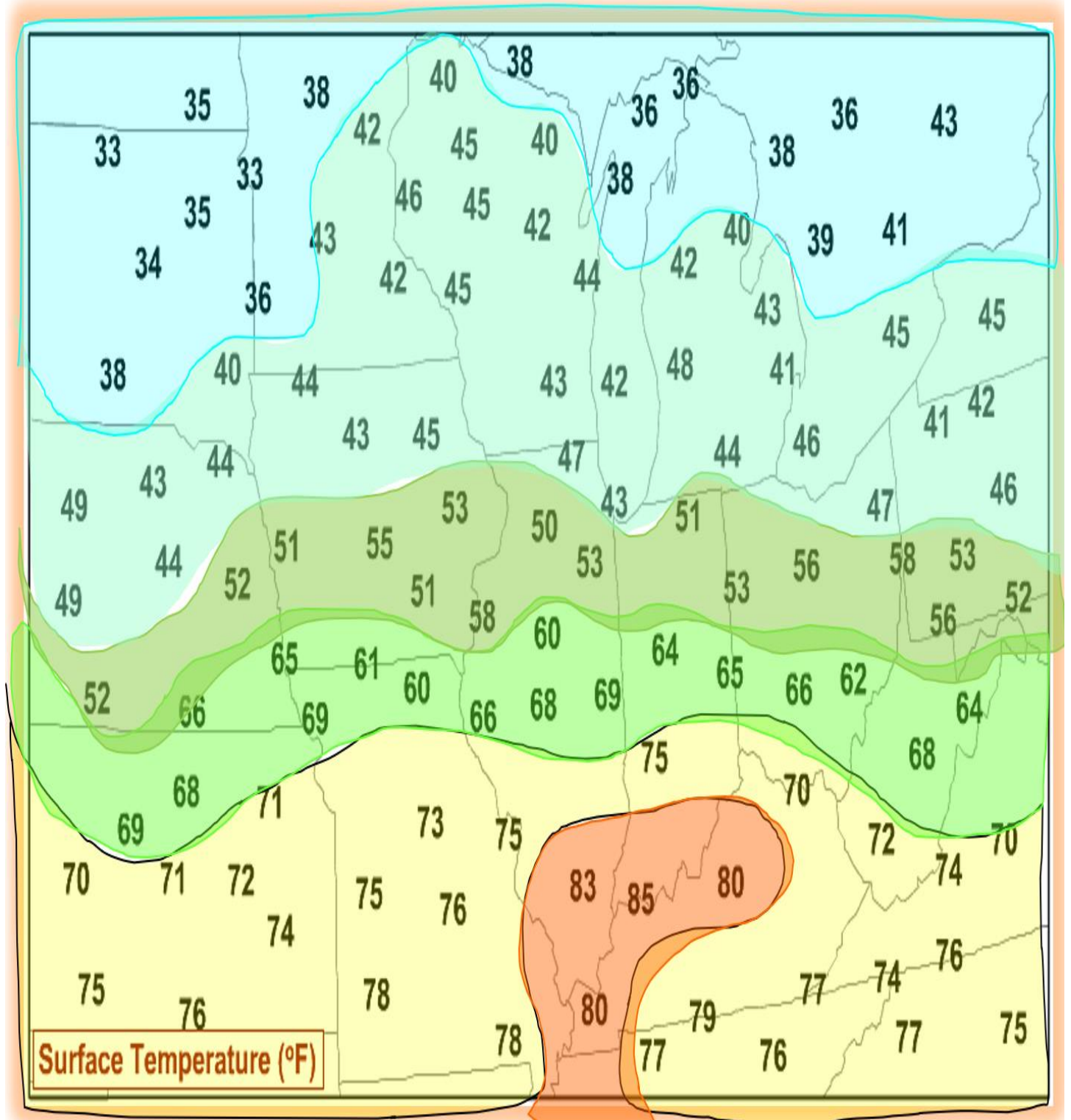
Part 5 Lesson 4 Wrap Up

Satellites: Provide **larger** view of weather.

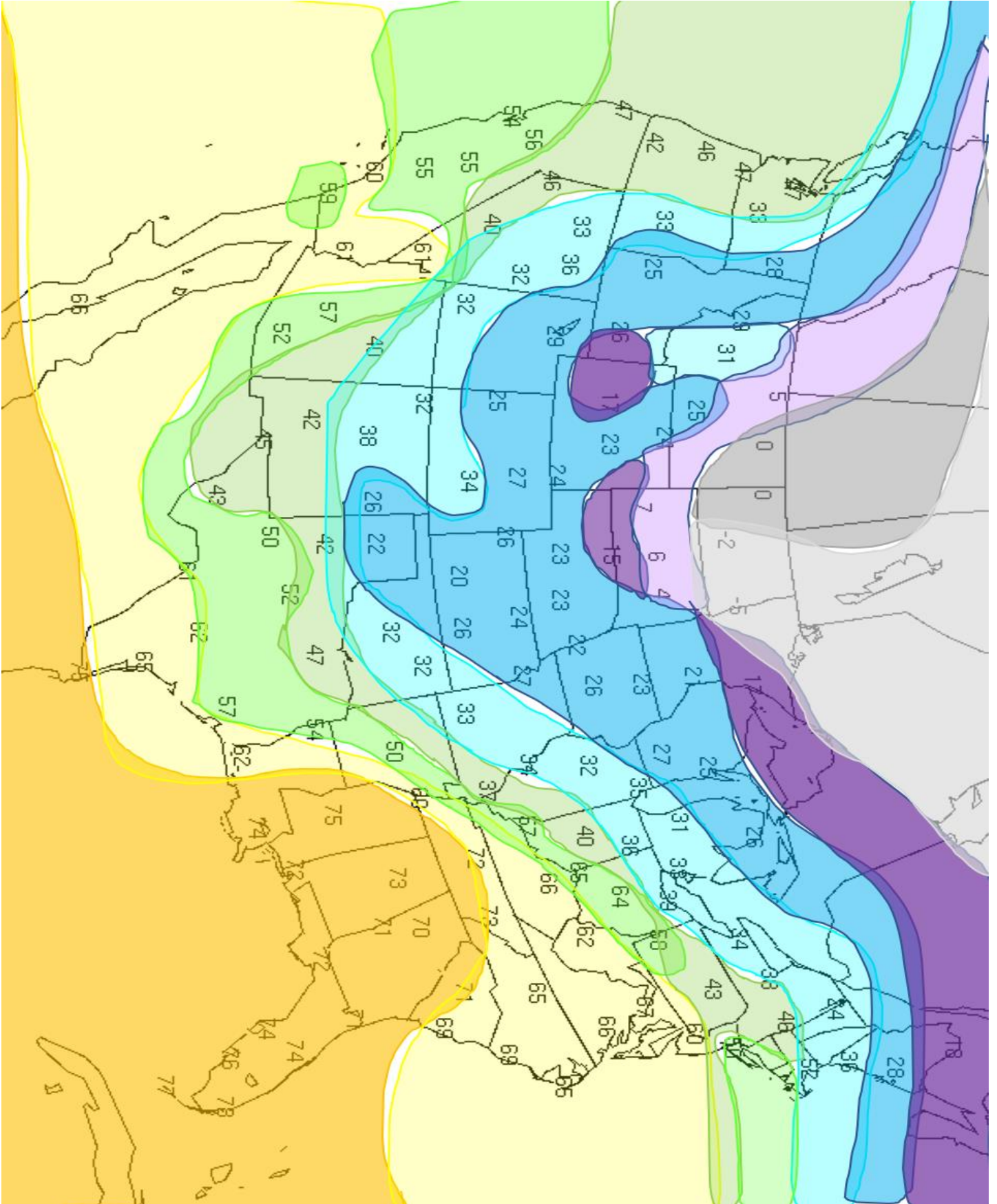
Isobar: An imaginary line or a line on a map or chart connecting or marking places of equal barometric pressure

Isotherm- A line drawn on a weather map or chart linking all points of equal or constant **temperature**.

Please create and isotherm in the map below. Please color code a key at the bottom of the page. Makes your Isotherm for every 10 degrees. 30's, 40's, 50's, 60's, 70's, 80's



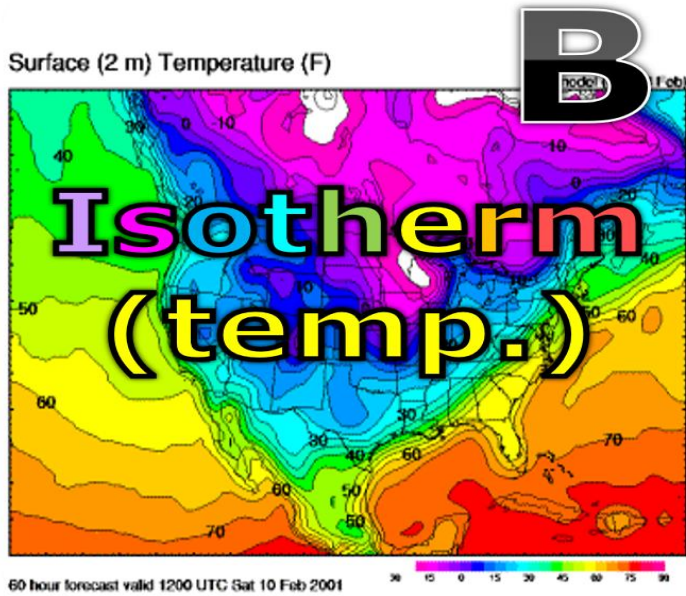
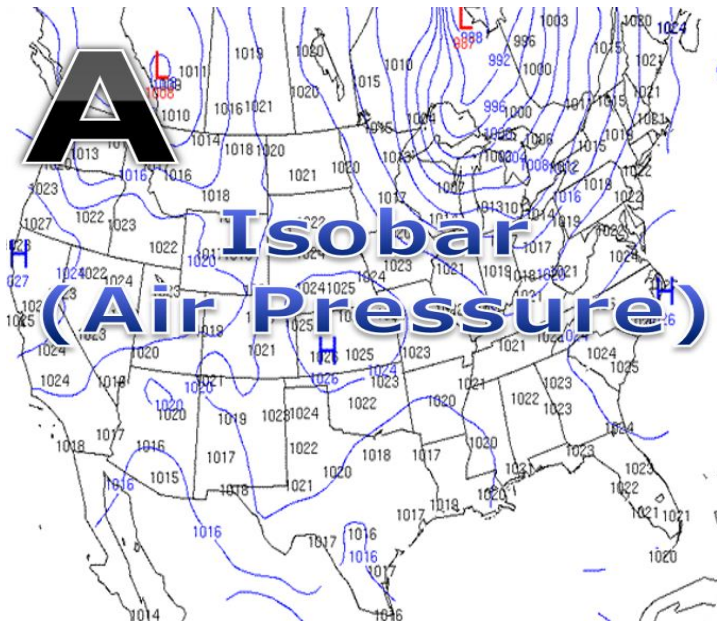
- ◆ 30's
- ◆ 40's
- ◆ 50's
- ◆ 60's
- ◆ 70's
- ◆ 80's



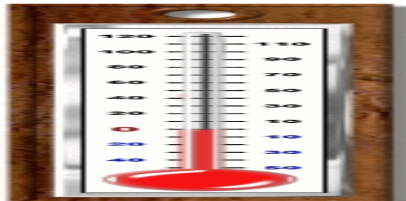
Which is an Isotherm? And which is an Isobar? What's the difference?

Isobar: An imaginary line or a line on a map or chart connecting or marking places of equal barometric pressure

Isotherm- A line drawn on a weather map or chart linking all points of equal or constant temperature.



* Warning! Multi-part Question - Name these four common weather tools. What do they record and how do they do it?

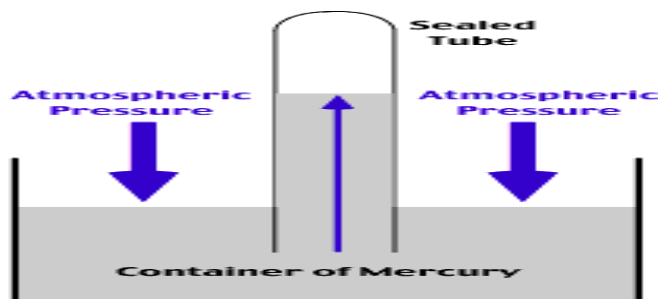


A thermometer measures temperature through a glass tube sealed with mercury that expands or contracts as the temperature rises or falls. ... As temperatures rise, the mercury-filled bulb expands into the capillary tube. Its rate of expansion is calibrated on the glass scale.

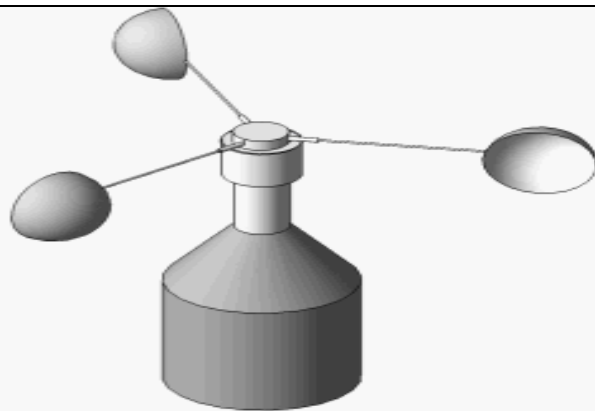


The weather vane is made up of a tail and arrow. The tail fin catches the wind and the arrow points toward the direction the wind is blowing FROM. If the arrow on the weather vane is pointing north then it means there is a north wind. In other words, the wind is blowing from north to south.

* Warning! Multi-part Question - Name these four common weather tools. What do they record and how do they do it?



Barometer – Measures air pressure
A barometer: An 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.



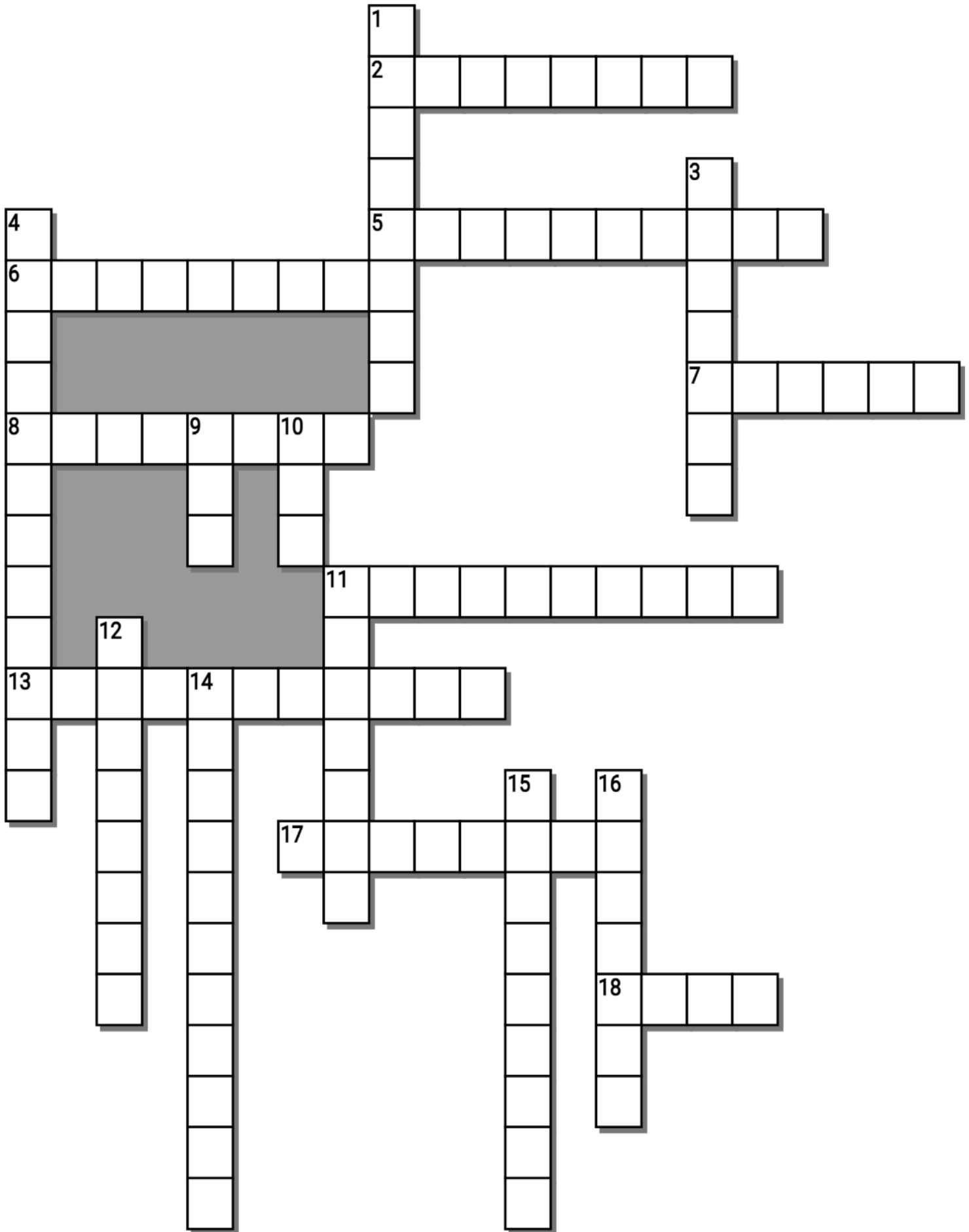
An anemometer is an instrument that measures wind speed and wind pressure. ... As the wind blows, the cups rotate, making the rod spin. The stronger the wind blows, the faster the rod spins. The anemometer counts the number of rotations, or turns, which is used to calculate wind speed.

Review Quiz 1-10

Score=

1) Meteorology	6) Barometer 1 atm = 760 mm Hg Atmospheric Pressure
2) Anemometer	7) Rain Gauge, Rainfall
3) Thermometer, 105° F	8) Satellites, Weather Balloon
4) Wind Vane, Shows wind Direction	9) Isotherm
5) Beaufort Scale, 47-54 mph	10) 10 Inches, 25.4 cm
Bonus #1 ICEE	Bonus #2 Flav-or-Ice

Final Wager Question ____/ 5 Sling Psychrometer



Across

2. Campbell Stokes Recorder measures _____

5. Measures the water vapor content of air (humidity).

6. A weather _____ is a type of satellite that is primarily used to monitor the weather and climate of the Earth.

7. An imaginary line or a line on a map or chart connecting or marking places of equal barometric pressure

8. Wetness in the atmosphere

11. An _____ works by having arms that are attached to a vertical rod. As the wind blows, the cups rotate, making the rod spin.

13. An instrument for measuring and indicating temperature, typically one consisting of a narrow, hermetically sealed glass tube marked with graduations and having at one end a bulb containing mercury or alcohol that expands and contracts in the tube with heating and cooling.

17. A _____ spins and points in the direction from which the wind is coming. One end is usually shaped like an arrow and turns into the wind and one end that is wider so that it catches the breeze.

18. _____ Index / Apparent Temperature It feels hotter than the actual temperature when there's high humidity.

Down

1. A line drawn on a weather map or chart linking all points of equal or constant temperature.

3. A weather _____ makes continuous measurements of different aspects of the weather.

4. Sling _____ : Device used to measure humidity.

9. Moisture condensed from the atmosphere, esp. at night, and deposited in the form of small drops upon any cool surface.

10. Snow / rain equivalent = One inch of rain is about ____ inches of snow and vice versa.

11. _____ barometers don't use liquid of any kind, instead use a flexible-walled empty capsule.

12. The _____ Scale measures wind speed based on local observations.

14. The study of the atmosphere that focuses on weather processes and forecasting.

15. An 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.

16. The state of the atmosphere at a given time and place, with respect to variables

-----Teacher can remove this word bank to make puzzle more difficult-----

Possible Answers

STATION, ANEROID , BAROMETER, BEAUFORT , DEW, HEAT, HUMIDITY, HYGROMETER, ISOBAR ISOTHERM, METEOROLOGY, SUNSHINE, TEN, THERMOMETER, WEATHER, WINDVANE, ANEMOMETER , PSYCHROMETER, SATELLITE

