STORM-E Weather simulation

Day 2 PDF Files

- Conditions for Severe Weather

Air Pressure

- Air Pressure Team Map
- Air Pressure Team Graph Data (days 1 & 2)
- Air Pressure Team Graph (days 1 & 2)

Humidity

- Humidity Team Dew Point Temperature Map
- Humidity Team Graph Data (days 2 & 3)
- Humidity Team Graph
- Humidity Team Relative Humidity Map

Temperature

- Temperature Team Map
- Temperature Team Graph Data (days 2 & 3)
- Temperature Team Graph

Wind

- Wind Team Map
- Wind Team Graph Data (days 2 & 3)
- Wind Team Graph

Conditions for Severe Weather

For thunderstorms to develop, the air must become unstable, and the following conditions must be present:

- Abundant moisture, which means relatively high dew point readings.
- Some "trigger" that will make the air lift, which could be an approaching cold front or upper air trough.
- The right atmospheric conditions for unstable air, which means air pressure is dropping.

Team condition	Weak possibility of severe weather	Moderate possibility of severe weather	Strong possibility of severe weather
Air pressure pressure reading over threatened area	>1010 mb	1010 to 1005 mb	< 1005 mb
Humidity surface dew point readings	55° F	56° to 64° F	> 64° F
Temperature cold front	Is a cold front moving into the area? If yes, how close is it?		
Wind jet stream	Is a trough approaching the area? If yes, how close is it?		

Air Pressure Team - Day 2

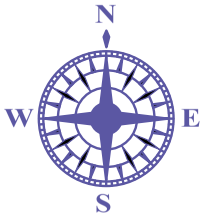
Isobars are lines connecting places of equal air pressure. They have a regular interval of four millibars. First, fill in the key with a pattern of numbers increasing or decreasing by four.

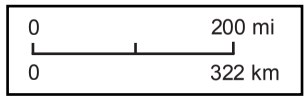
Some isobar lines might not be numbered. Next, print the correct numbers next to those lines. Then, using the color key, trace over all isobar lines.

Now, locate the closed isobar. Is it a high or low pressure area? Mark an "H" or "L" inside the closed isobar.

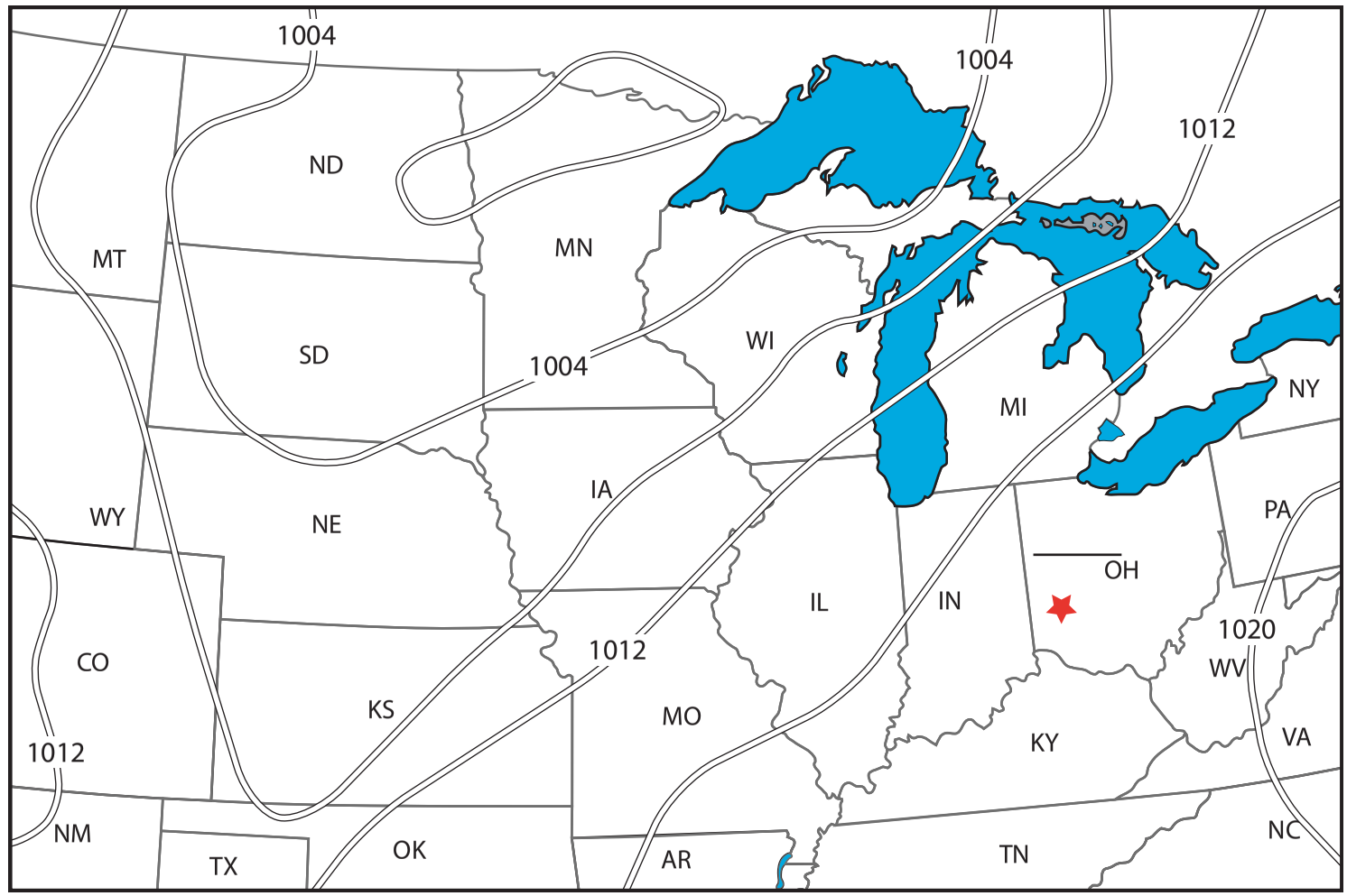
The star in Ohio marks Dayton. Estimate the air pressure reading for Dayton. Record it on the line. What do you expect Dayton's air pressure reading will be in 24 hours? In 48 hours? Be ready to report your predictions to Weather Central.

KEY	
Color	**Millibars**
Red	1020
Yellow	
Orange	
Green	
Blue	
Purple	
Brown	996
Black	





Sea Level Pressure (mb) **Day 2** Analysis for 18Z 18 SEP 00



Interval 4.0

Days 1 and 2 Air Pressure Team Graph Data for Dayton

Day 1

AIR PRESSURE DATA

EDT	Air Pressure (mb)
2 a.m.	1021
5 a.m.	1021
8 a.m.	1021
11 a.m.	1022
2 p.m.	1020
5 p.m.	1017
8 p.m.	1018
11 p.m.	1018

Day 2

AIR PRESSURE DATA

EDT	Air Pressure (mb)
2 a.m.	1018
5 a.m.	1018
8 a.m.	1019
11 a.m.	1019
2 p.m.	1017
5 p.m.	1015
8 p.m.	1015
11 p.m.	1015

Air Pressure Graph Days 1 and 2

The graph below will display air pressure data plotted for days 1 and 2 for Dayton. The data is recorded every three hours.

Now you will graph day 1 data. Complete the graph by marking a dot on each hour.

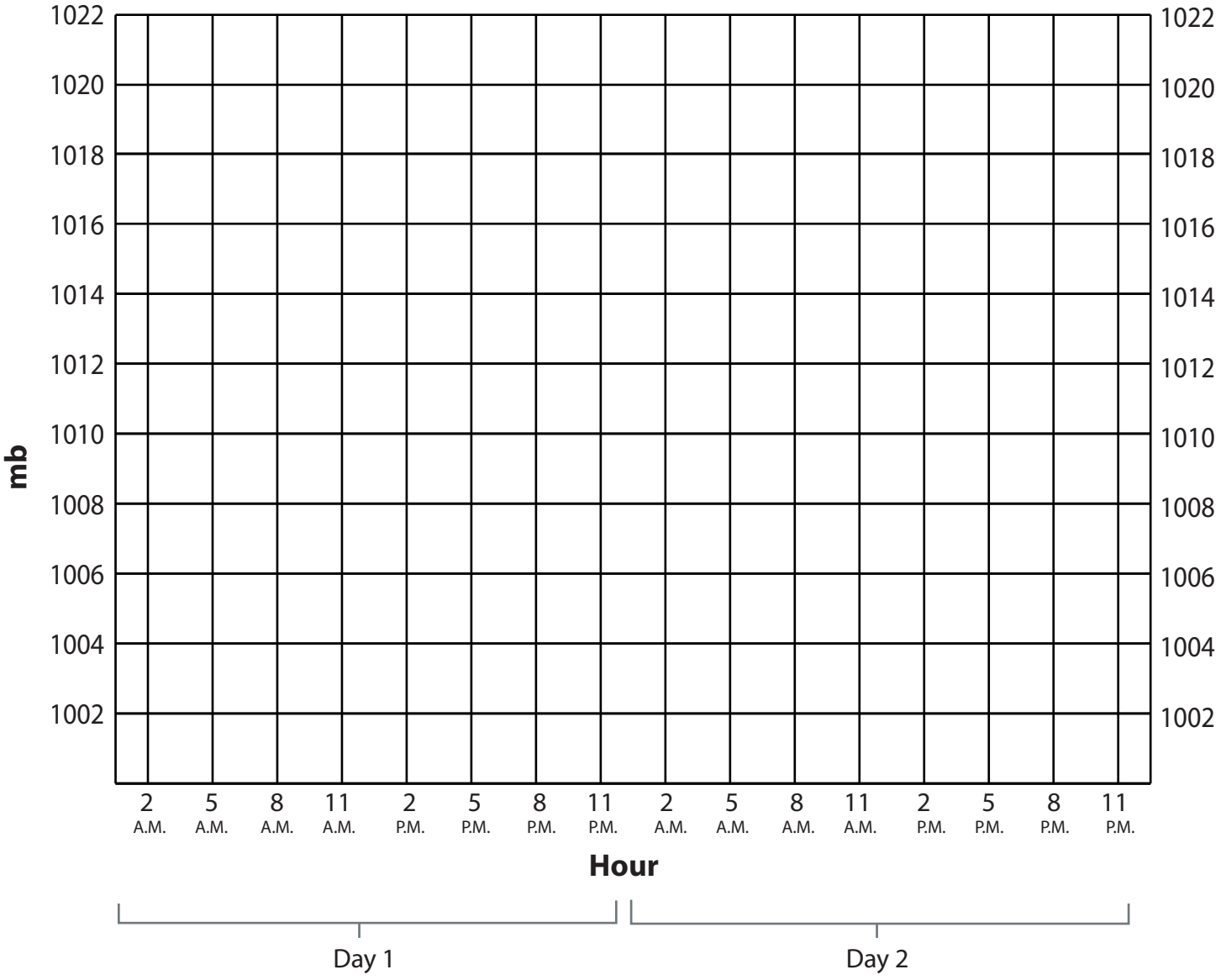
Next draw a line to connect the dots. This makes a line graph.

Repeat the procedure for day 2 when you receive that data.

Dropping air pressure shows the possibility of severe weather coming.

Over 12 hours	0 mb drop shows a weak possibility.	1 to 5 mb drop shows a moderate possibility.	More than a 5 mb drop shows a strong possibility.

Also check the Conditions for Severe Weather chart.



Humidity Team - Day 2

Dew Point Temperature

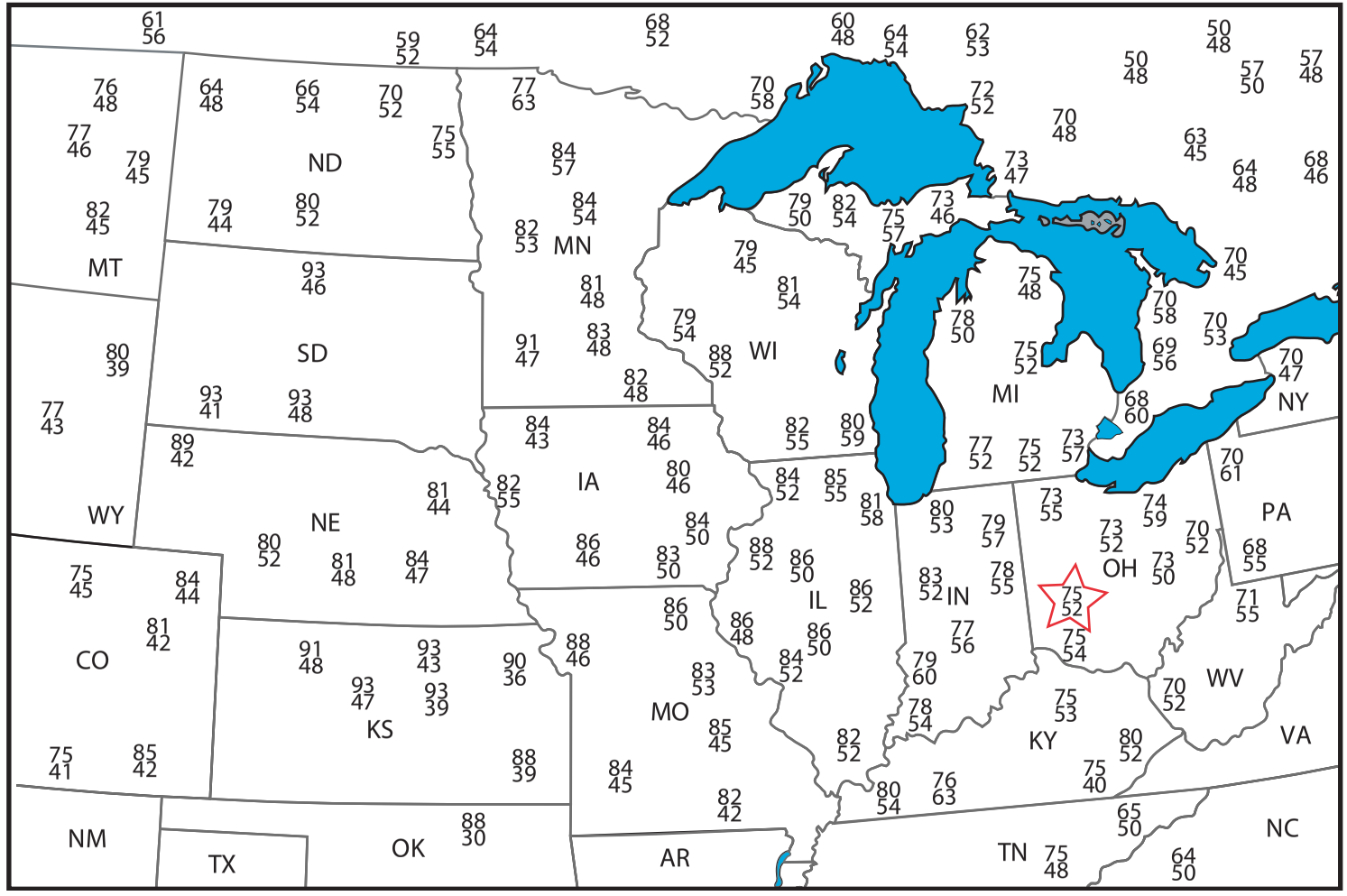
The possibility of cloud formation increases as the air temperature drops closer to its dew point.

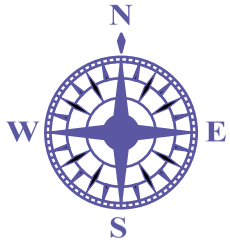
Important: Use the relative humidity map you have already completed to assist you. Find the places on that map with relatively high humidity and begin the following search in those areas.

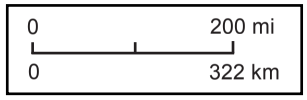
Circle the places on the dew point temperature map where the difference between the surface air temperature (top number) and the dew point temperature (bottom number) is 10 degrees or less.

What are your weather predictions for Dayton, OH, in 24 hours? In 48 hours? Be ready to report to Weather Central.

Surface and Dew Point Temperature (ºF) **Day 2** Analysis for 18Z 18 SEP 00







Days 2 and 3 Humidity Team Graph Data for Dayton

Day 2

HUMIDITY DATA

EDT	Temperature (degrees F)	Dew Point (degrees F)	Difference
2 p.m.	76	52	24
3 p.m.	78	53	
4 p.m.	79	53	
5 p.m.	80	51	
6 p.m.	78	53	
7 p.m.	77	52	
8 p.m.	74	52	
9 p.m.	71	54	
10 p.m.	67	54	
11 p.m.	66	54	

Day 3

HUMIDITY DATA

EDT	Temperature (degrees F)	Dew Point (degrees F)	Difference
2 p.m.	80	53	27
3 p.m.	81	53	
4 p.m.	83	52	
5 p.m.	83	51	
6 p.m.	82	52	
7 p.m.	79	53	
8 p.m.	75	53	
9 p.m.	74	54	
10 p.m.	73	56	
11 p.m.	72	56	

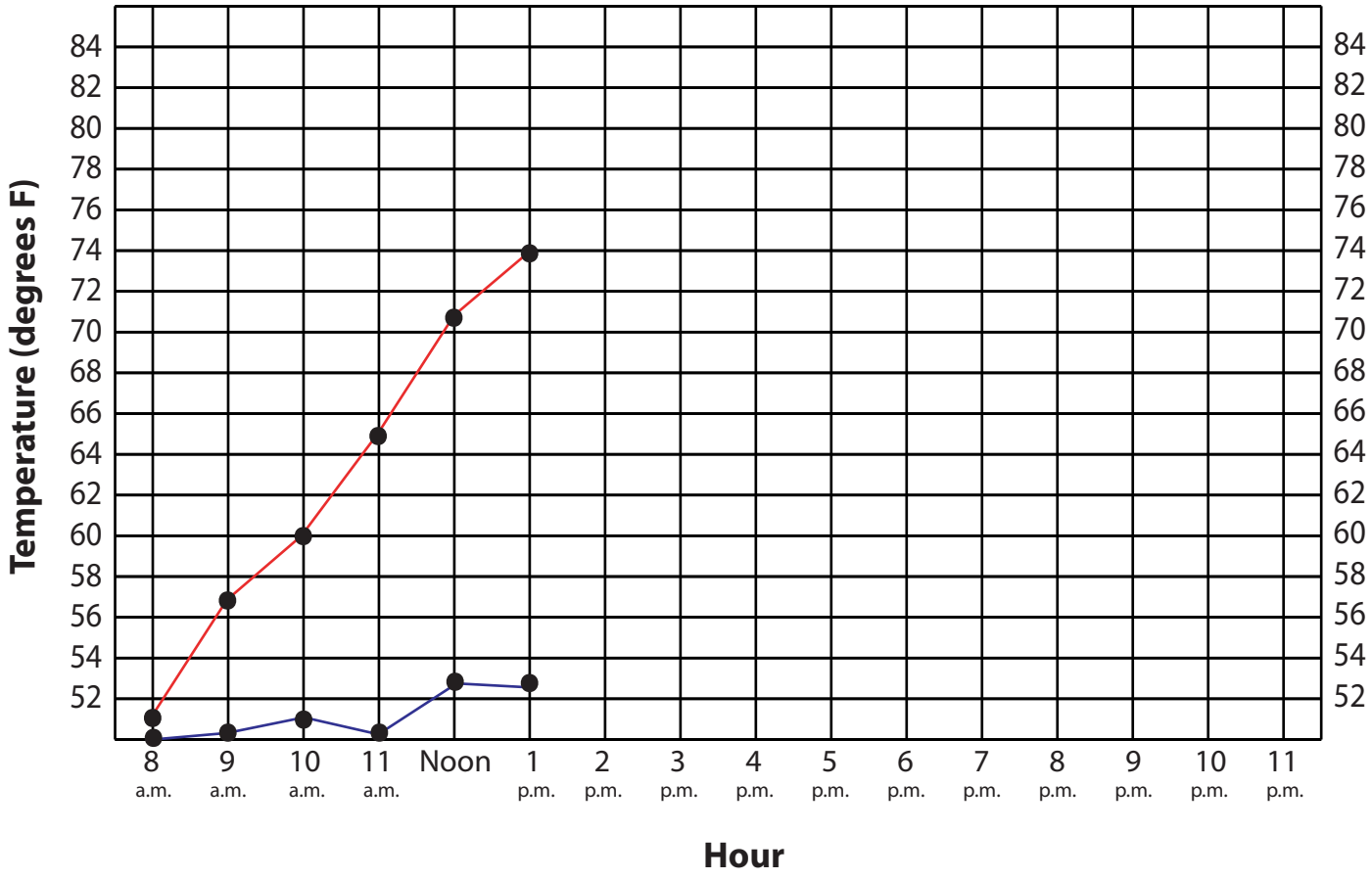
Humidity Team Graph Day 2

Finish the line graph of temperature readings for Dayton on day 2. Ask your teacher for the data.

Graph the temperature in red. Graph the dew point in blue.

Is the temperature dropping toward the dew point? Is the possibility of severe weather in Dayton increasing or decreasing?

Also check the Conditions for Severe Weather chart.



Humidity Team - Day 2

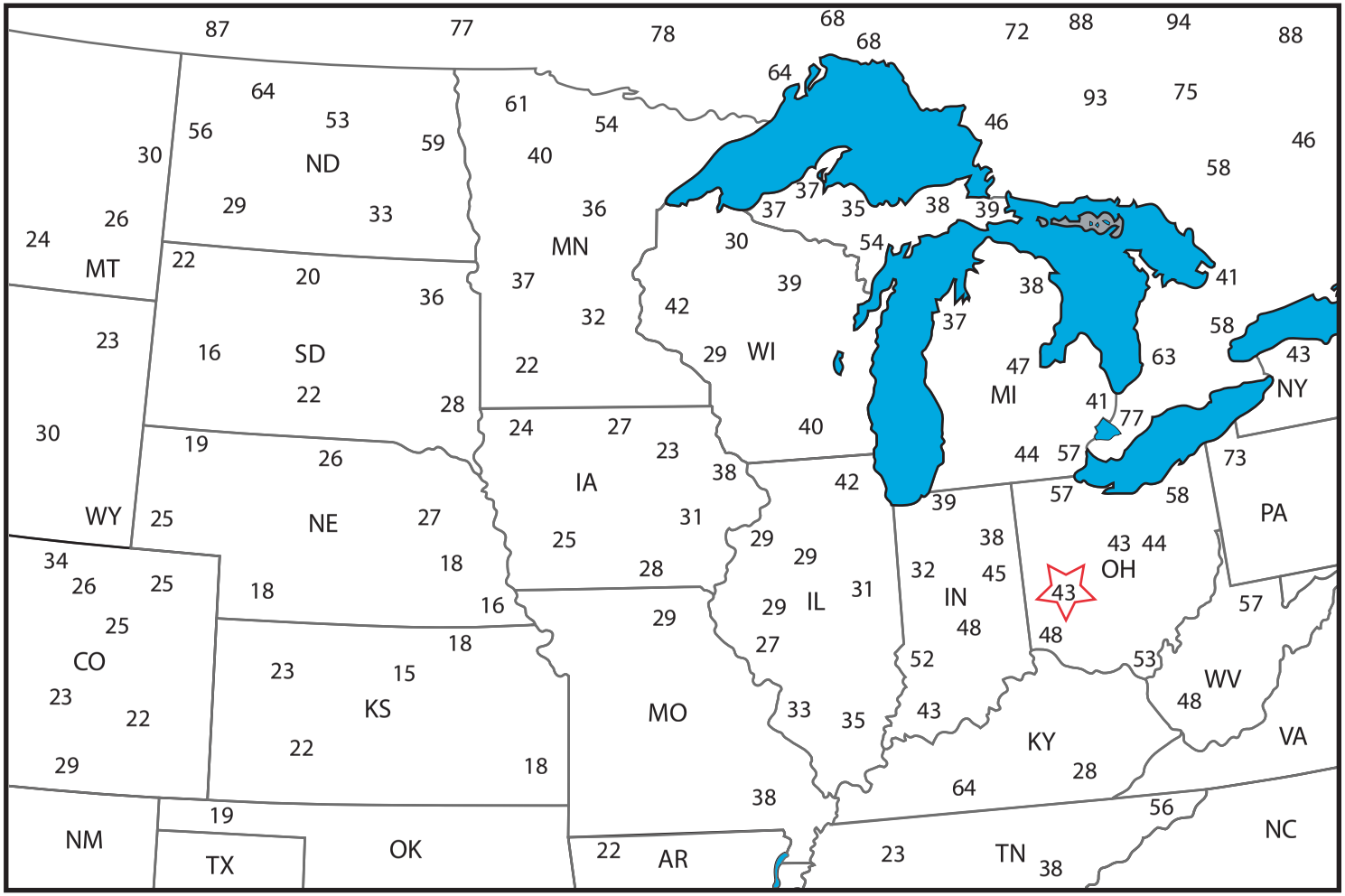
Relative Humidity

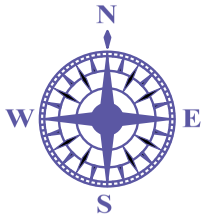
Important: Complete this map *before* starting the dew point temperature map.

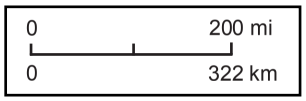
Relative humidity measures how close air is to saturation. The possibility of precipitation *increases* as the relative humidity approaches 100 percent. Circle each number with the corresponding color in the key. DO NOT shade in the circle. Where might precipitation be possible?

Compare the days 1 and 2 maps. The star in Ohio marks Dayton. Do you notice any weather patterns or trends that would affect the weather in Dayton in 24 hours? In 48 hours?

KEY	
Color	**%**
Red	≥90
Orange	80-89
Yellow	70-79
Green	60-69
Blue	50-59
Purple	40-49
Brown	30-39
Black	≤29







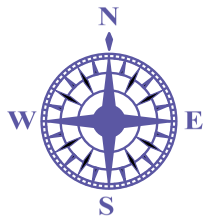
Temperature Team - Day 2

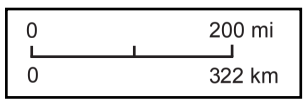
The surface temperature readings on this map are in degrees Fahrenheit. Circle each number with the corresponding color in the key. DO NOT shade in the circle.

Do you see a place on the map that might indicate a front, which is a narrow zone of air between two opposing air masses with different temperatures, humidity, or both? If so, draw a line to show its position.

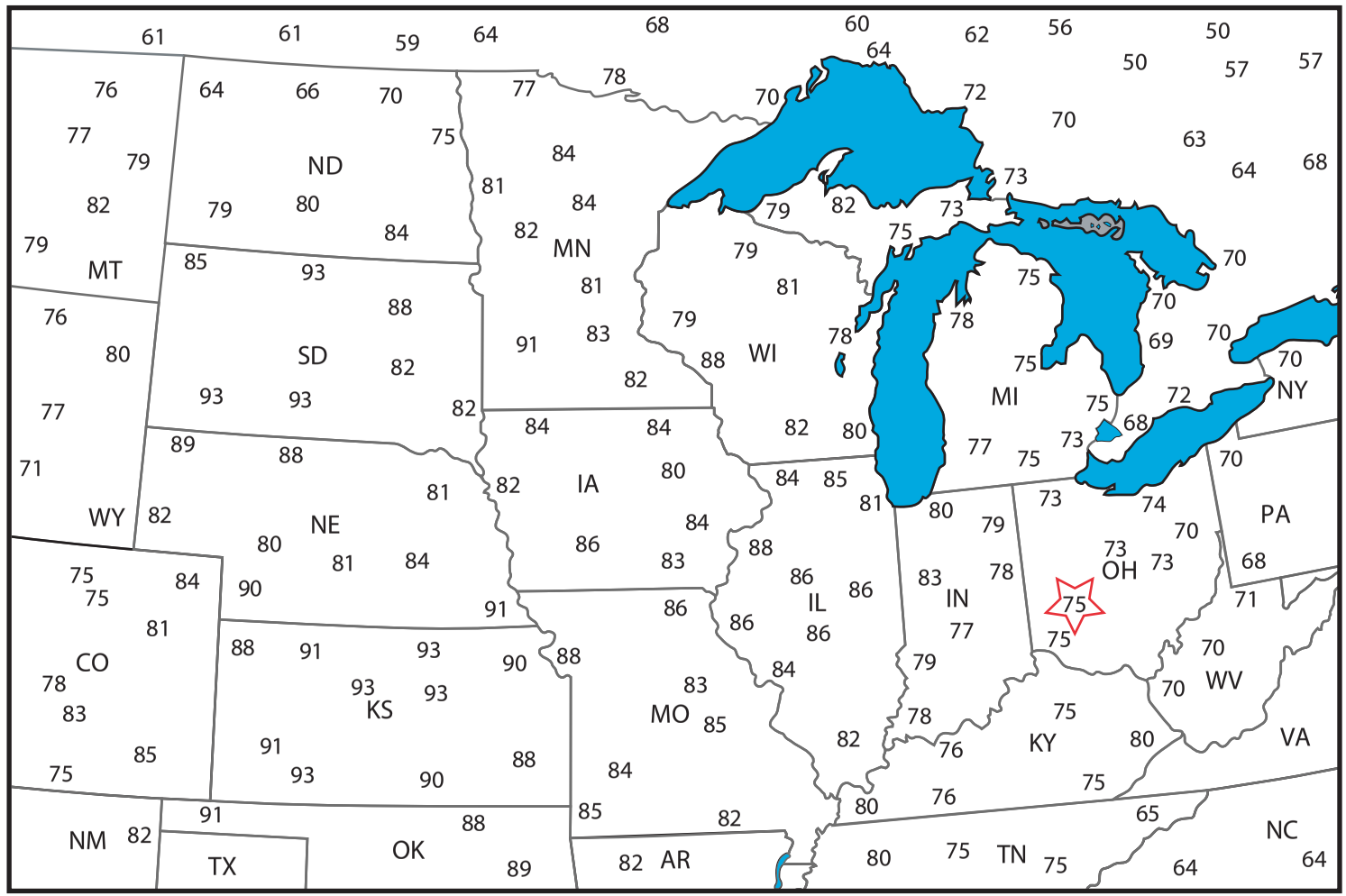
Is it a warm front or cold front? How might it affect Dayton's weather on day 4? Report predictions to Weather Central.

KEY	
Color	**ºF**
Red	90s
Orange	80s
Brown	70s
Green	60s
Blue	50s
Purple	40s





Surface Temperature (ºF) **Day 2** Analysis for 18Z 18 SEP 00



Days 2 and 3 Temperature Team Graph Data for Dayton

Day 2

TEMPERATURE DATA

EDT	Temperature (degrees F)
2 p.m.	76
3 p.m.	78
4 p.m.	79
5 p.m.	80
6 p.m.	78
7 p.m.	77
8 p.m.	74
9 p.m.	71
10 p.m.	67
11 p.m.	66

Day 3

TEMPERATURE DATA

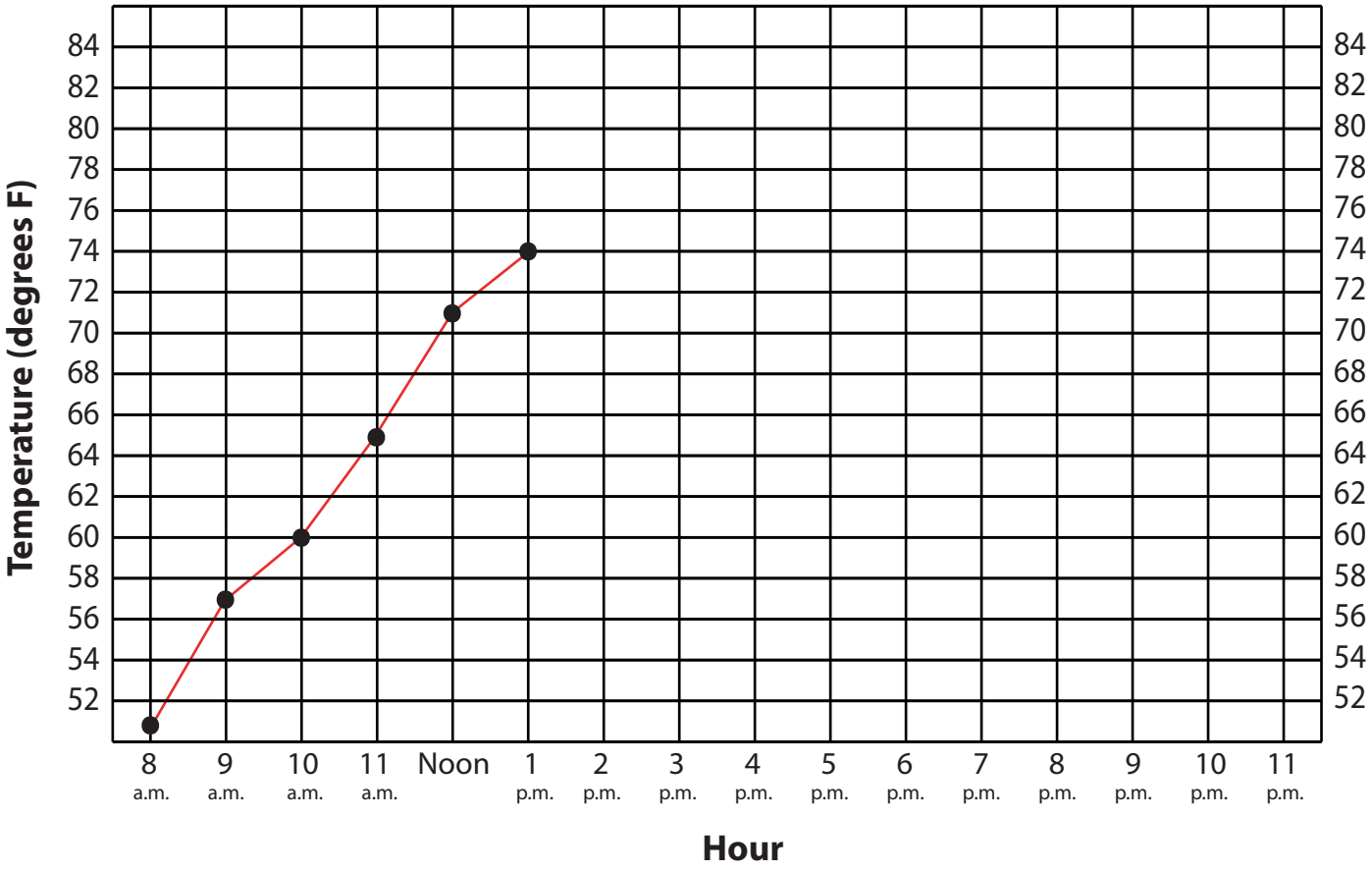
EDT	Temperature (degrees F)
2 p.m.	80
3 p.m.	81
4 p.m.	83
5 p.m.	83
6 p.m.	82
7 p.m.	79
8 p.m.	75
9 p.m.	74
10 p.m.	73
11 p.m.	72

Temperature Team Graph Day 2

Finish the line graph of temperature readings for Dayton on day 2. Ask your teacher for the data.

Graph the temperature in red.

Also check the Conditions for Severe Weather chart.



Wind Team - Day 2

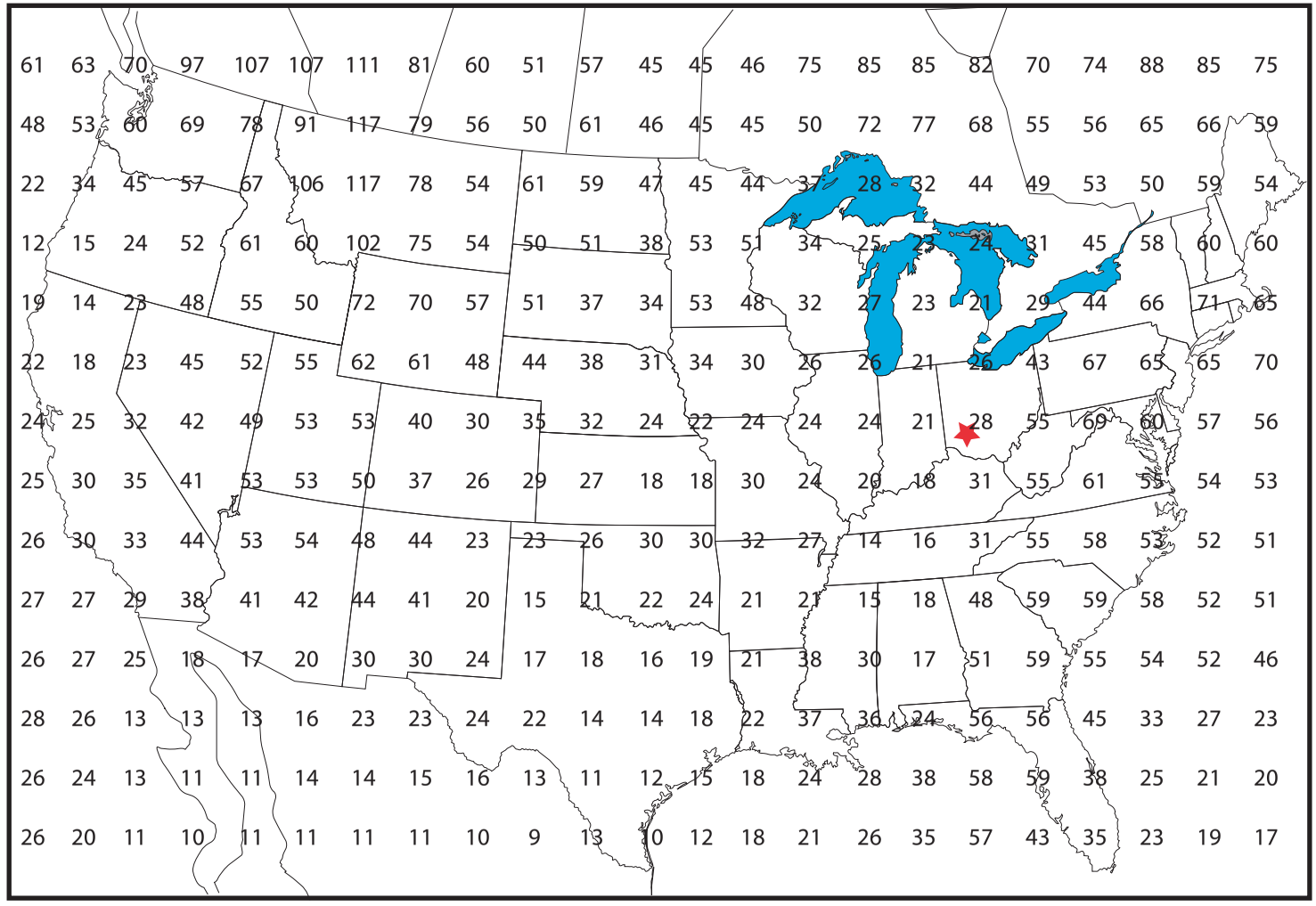
Jet streams are narrow corridors of very strong winds at altitudes from 30,000 to 50,000 feet. They blow in a wavy pattern from west to east across North America at speeds exceeding 60 knots.

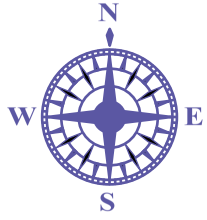
The shape of the jet stream is important in weather forecasting. Troughs (U) of low pressure air that dip south bring cool, cloudy weather. Ridges (∩) of high pressure air that rise north bring warm, clear weather.

Circle each number with the corresponding color in the key. DO NOT shade in the circle. Do you notice a trough or ridge? What is the position of the jet stream in relation to Dayton, OH (indicated by a star)? How might the shape of the jet stream affect the weather in Dayton?

KEY	
Color	**Knots**
Red	≥120
Orange	100-119
Blue	80-99
Green	60-79
Don't Color	<60

Upper Air Wind Speed (knots) **Day 2** Analysis for 00Z 19 SEP 00





Days 2 and 3 Wind Team Graph Data for Dayton

Day 2

WIND DATA

EDT	Wind Speed (knots)
2 p.m.	5
3 p.m.	8
4 p.m.	6
5 p.m.	5
6 p.m.	5
7 p.m.	7
8 p.m.	8
9 p.m.	8
10 p.m.	8
11 p.m.	6

Day 3

WIND DATA

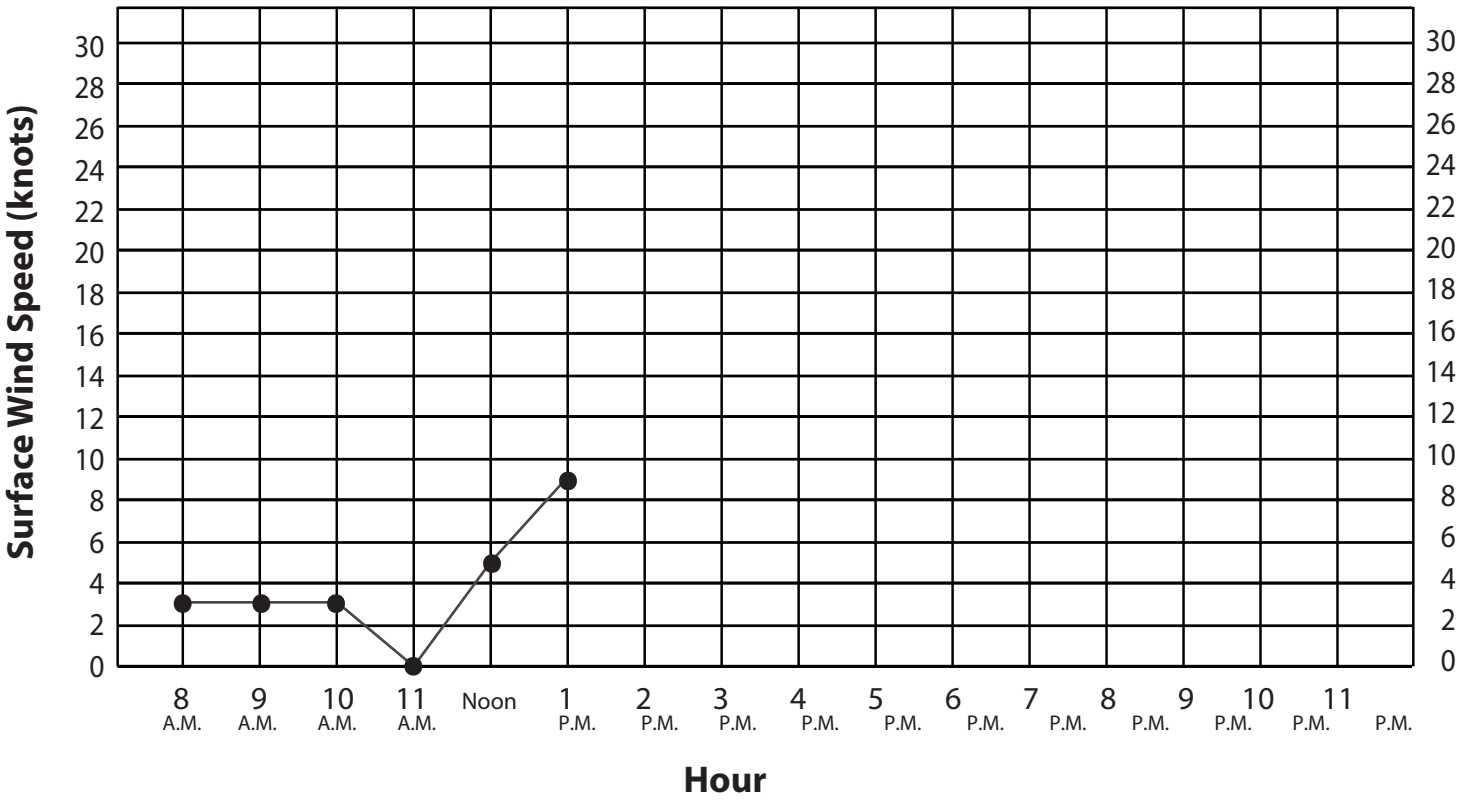
EDT	Wind Speed (knots)
2 p.m.	12
3 p.m.	14
4 p.m.	12
5 p.m.	12
6 p.m.	12
7 p.m.	12
8 p.m.	10
9 p.m.	11
10 p.m.	12
11 p.m.	13

Wind Team Graph Day 2

Surface winds blow across the Earth at altitudes from 0 to approximately 3,000 feet. The strength of surface winds or a sudden change in wind speed or direction can adversely affect the takeoff and landing of small planes and the safety of a fireworks display.

Finish the line graph of surface wind speeds for Dayton on day 2. Ask your teacher for the data. Is the wind speed increasing or decreasing? What is the possibility of severe weather?

0-6 knots Weak possibility of severe weather	7-21 knots Moderate possibility of severe weather	22-40 knots Strong possibility of severe weather



Key

G = Gust
1 Knot = 1.151 miles/hr.