

Name:

Class Period:



Date: Lab #: _

Lab Title: Air Pressure & Wind speeds

READ THIS:

In this lab we will explore the relationship between air pressure and wind speeds in tropical storm systems.

- We will use real observed data from storms like a hurricane or tropical storm.
- Using the data in the table below, you will create a line graph with **2 Y axis values**.
 - The Y axis value on the **left side will be Air Pressure** (in millibars).
 - The Y axis value on the **right side will be Wind Speed** (in mph).
 - The X axis will be Date (month/day) and Time (GMT).
- This graph will help you understand the air pressure and wind speed relationship in a tropical storm.
- Please note that, in a tropical storm, low air pressure indicates the strength of the storm. The lowest air pressure indicates the worst part of the storm. Wind is caused by air pressure differences.

Data Table - Hurricane Ike - September 2008 (data source – weatherunderground.com)

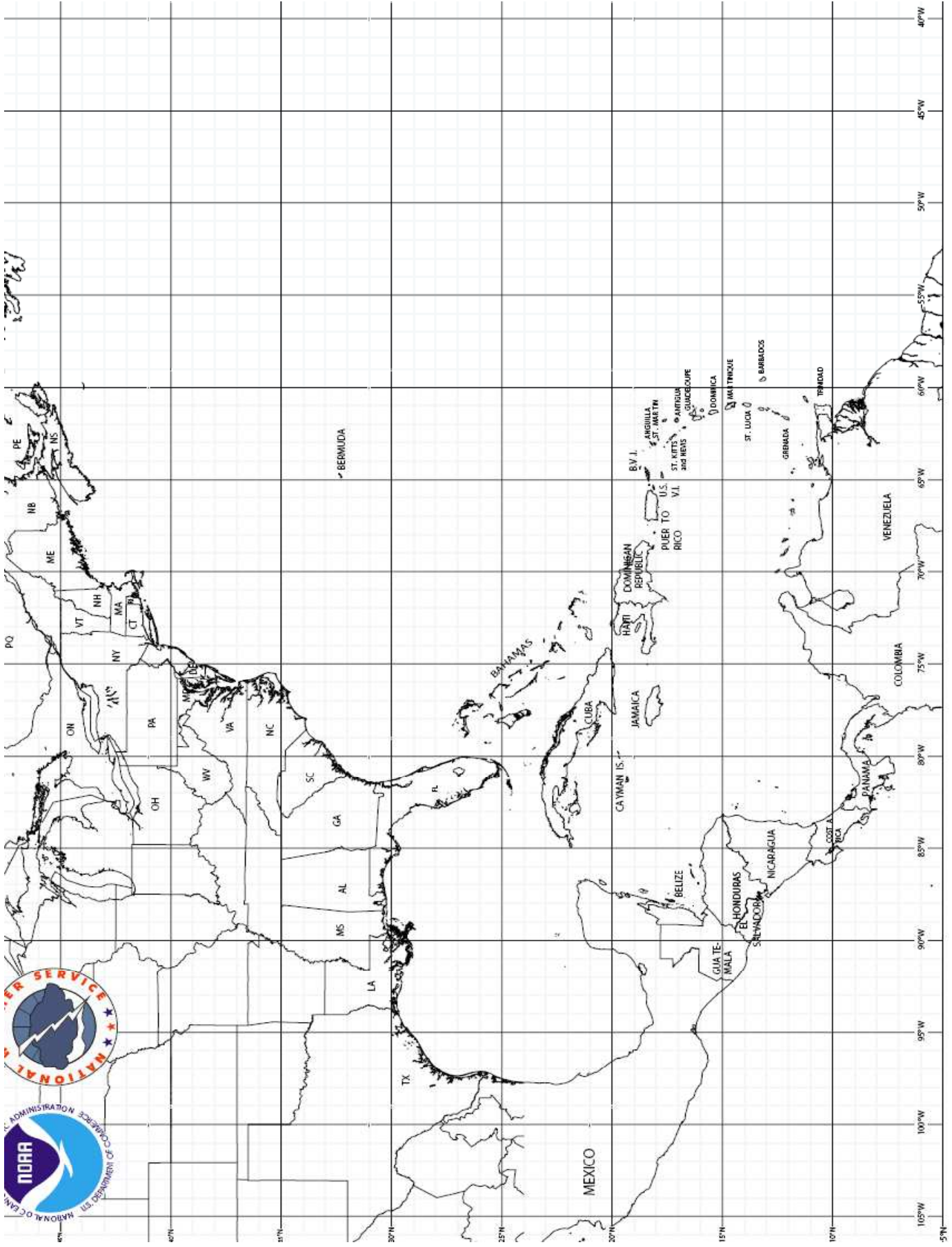
Date:	Time:	Lat:	Lon:	Wind (mph):	Pressure (mb):	Storm Type:
09/01	15 GMT	17.60	-39.50	35	1005	Tropical Depression
09/01	21 GMT	17.70	-40.60	50	1000	Tropical Storm
09/02	3 GMT	18.00	-41.60	50	1000	Tropical Storm
09/02	9 GMT	18.60	-43.10	50	1005	Tropical Storm
09/02	15 GMT	18.90	-45.00	60	1002	Tropical Storm
09/02	21 GMT	19.20	-46.30	65	996	Tropical Storm
09/03	3 GMT	19.90	-47.90	65	996	Tropical Storm
09/03	9 GMT	20.60	-49.60	65	996	Tropical Storm
09/03	15 GMT	20.80	-51.20	70	991	Tropical Storm
09/03	21 GMT	21.60	-52.70	80	984	Category 1 Hurricane
09/04	0 GMT	21.70	-53.20	115	960	Category 3 Hurricane
09/04	3 GMT	22.10	-54.10	135	948	Category 4 Hurricane
09/04	9 GMT	22.70	-55.80	145	935	Category 4 Hurricane
09/04	15 GMT	23.20	-57.00	140	938	Category 4 Hurricane
09/04	21 GMT	23.60	-58.20	135	945	Category 4 Hurricane
09/05	3 GMT	23.60	-59.50	135	945	Category 4 Hurricane
09/05	9 GMT	23.70	-61.00	125	945	Category 3 Hurricane
09/05	15 GMT	23.20	-62.70	120	954	Category 3 Hurricane
09/05	21 GMT	22.90	-64.10	115	958	Category 3 Hurricane
09/06	3 GMT	22.60	-65.60	115	958	Category 3 Hurricane
09/06	9 GMT	22.40	-67.10	115	962	Category 3 Hurricane
09/06	15 GMT	21.90	-68.80	110	960	Category 2 Hurricane
09/06	21 GMT	21.40	-69.70	135	949	Category 4 Hurricane
09/07	3 GMT	21.20	-70.90	135	947	Category 4 Hurricane

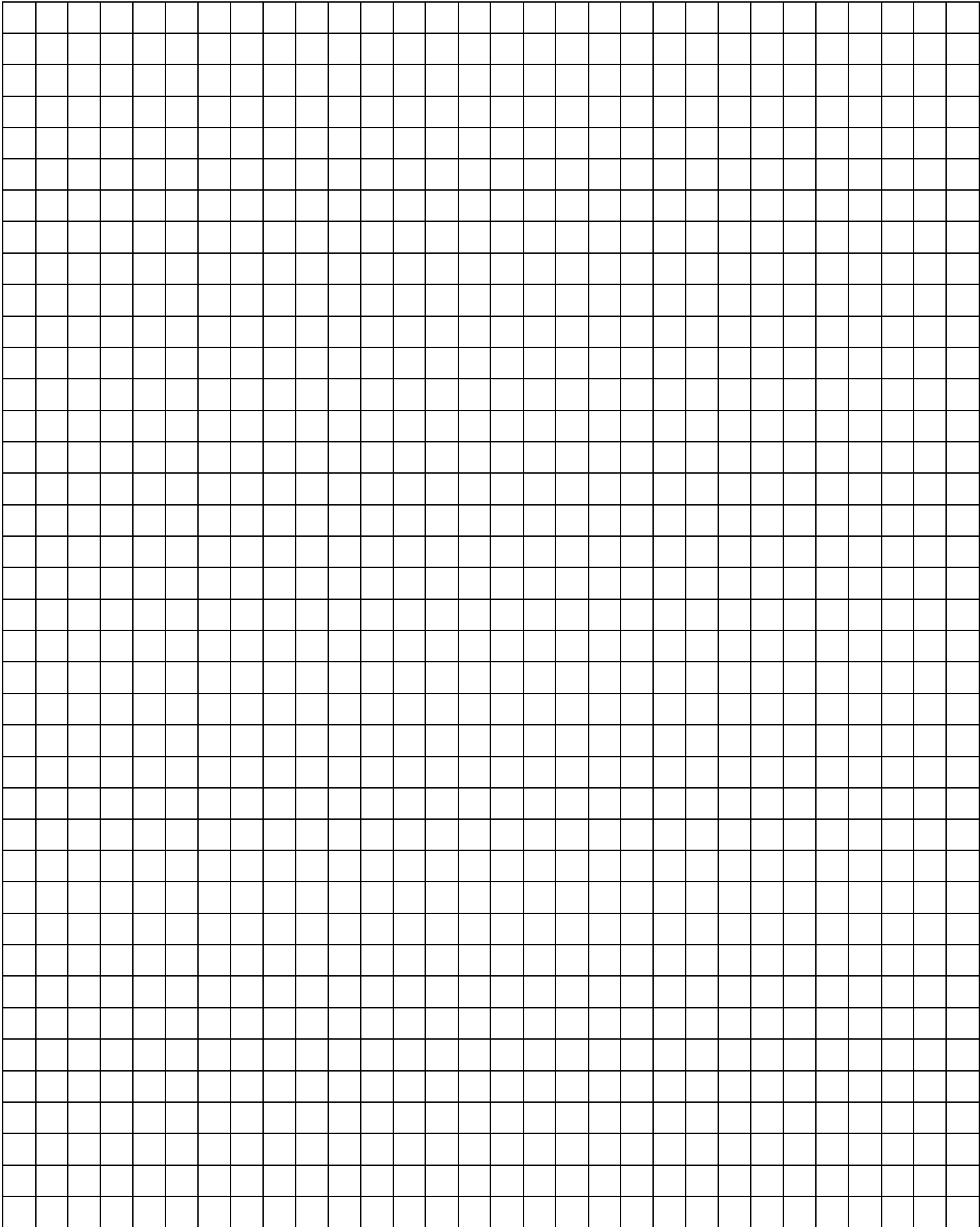
Date:	Time:	Lat:	Lon:	Wind (mph):	Pressure (mb):	Storm Type:
09/07	9 GMT	21.10	-72.20	135	948	Category 4 Hurricane
09/07	15 GMT	21.00	-73.40	135	949	Category 4 Hurricane

mb = millibars; GMT = Greenwich Mean Time (time at 0° Longitude)


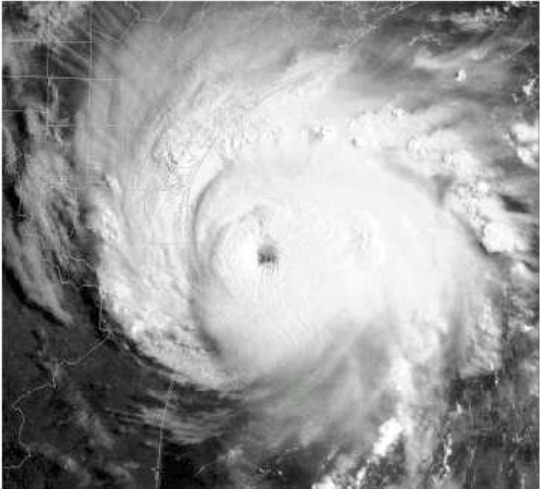
On the map below, use the latitude and longitude values from the data chart above, to plot the path of this hurricane. Connect your dots with a solid line and label it Hurricane Ike.

Staple this page to your lab cover sheet before you hand it in.

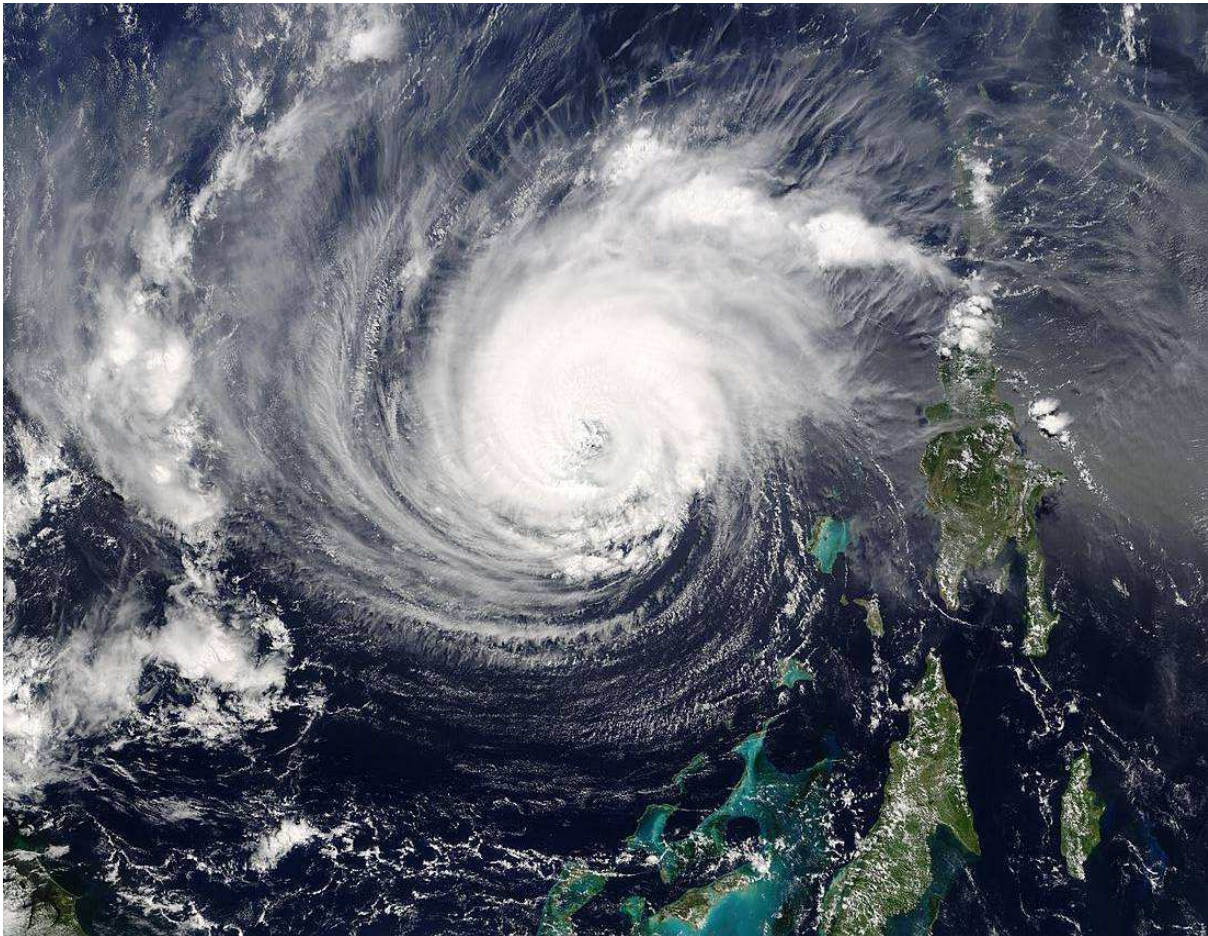




After drawing your graph, look at the pattern of the lines you drew and draw some mental conclusions. Then answer the following questions.

1.____	A hypothesis is a suggested explanation for an observation. The data table and your graph display a sequence of observations for Hurricane Ike. In a brief but complete sentence, state a reasonable hypothesis to explain these observations.
2.____	Describe the relationship between wind speed and air pressure within a tropical storm system. <ul style="list-style-type: none"> You must use the units mb and mph in your answer.
3.____	During a hurricane one of the primary dangers is called a storm surge. Describe a storm surge.
4.____	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>In this hurricane, at which ocean shore location would the highest storm surge most likely occur - Location X or Location Y? Why?</p> </div> </div>
5.____	See your ESRT for this question. Both millibars (mb) and inches of mercury are units of measure for air pressure. An air mass has air pressure of 1000 mb, using your ESRT, convert 1000 mb to inches (of mercury) and write it below to the nearest 1/100 th of an inch.
	<p>Base your answers to questions 6 through 8 on the satellite image below, which shows a Northern Hemisphere hurricane, and on your knowledge of Earth science.</p> 
6.____	<p>What is the usual surface wind pattern around the eye of Northern Hemisphere hurricanes?</p> <p>(1) clockwise and outward (3) counterclockwise and outward (2) clockwise and inward (4) counterclockwise and inward</p>

7.____	Which air mass is normally associated with the formation of hurricanes? (1) continental tropical (2) maritime tropical (3) continental polar (4) maritime polar
8.____	Clouds form in the hurricane because the air is (1) sinking, expanding, and cooling (3) rising, expanding, and cooling (2) sinking, compressing, and warming (4) rising, compressing, and warming
9.____	Use your ESRT for this one. When the eye of this hurricane reaches 43°N latitude, this hurricane will most likely be pushed by planetary winds toward the (1) northwest (2) northeast (3) southwest (4) southeast
10.____	Which weather change is most likely indicated by rapidly falling air pressure? (1) Humidity is decreasing. (3) Skies are clearing. (2) Temperature is decreasing. (4) A storm is approaching.
11A>>>	From the data table for Hurricane Ike, write below the date, time, wind speed and air pressure for the fastest wind speed. Then record the same information for the slowest wind speed. A. Fastest wind speed answer here>>>>: Date: _____ Time _____gmt Wind speed _____ mph Air pressure _____ mph
11B>>>	B. Slowest wind speed answer here>>>>: Date: _____ Time _____gmt Wind speed _____ mph Air pressure _____ mph



Hurr. Isabel 5/28/03

