**Name: Date: Period:**

**Weather and Climate IQuest**

Go to [http://pmm.nasa.gov/education/interactive/weather-climate-iquest a](http://pmm.nasa.gov/education/interactive/weather-climate-iquest)nd use the links to help you explore the wild and changing world of weather and climate. Record your answers on this sheet. Before we get started, take a few minutes to think about what you already know about weather and climate. Use your background knowledge to answer the questions below (to the best of your ability).

Define what you think “weather” is-

What is the weather like today? List 5 observations about today’s weather.

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What was the weather like yesterday?

What is your definition of “climate”?

How would you describe the climate of Maine?

a) the summer climate in Maine is all like…

b) the autumn climate in Maine is all like…

c) the winter climate in Maine is all like…

d) the spring climate in Maine is all like…

How are weather and climate similar?

How are weather and climate different?

*Next, go to* [*http://www.weather.gov a*](http://www.weather.gov/)*nd take a look at today’s weather in the United States.*

What are some of the different kinds of hazardous weather that are listed in the map key?

Click on the blue tab above the map that says “FORECAST”. Then look down at the orange headings that show various types of forecast maps. By looking at these categories, list four of the types of data that meteorologists collect related to weather:

1. 2.

3. 4.

Take a few minutes to explore some of these maps to see the different types of data that scientists collect in order to forecast the weather. Based on the different types of data, why do you think that it is difficult for weather forecasters to be accurate when they are making predictions about the weather for the next few days?

*To find out the difference between a “warning” and a “watch”, here is a short (2:44) video clip from NOAA that explains the differences:* [*http://youtu.be/x3V3HZBs1Y4.*](http://youtu.be/x3V3HZBs1Y4)

What is issued when weather of concern is about to strike?

What does a “watch” tell you about the potential for dangerous weather?

What should you do when a “watch” is issued?

*The video NASA Con2ect: “Plane Weather” (7:09) discusses the basics of meteorology and the impact of weather forecasting on aviation. Answer the questions below using the information from the video at* [*http://youtu.be/y0-uVQOc4oU.*](http://youtu.be/y0-uVQOc4oU)

What types of weather do we experience in the US? In Maine?

Why do you think that plane travel is more impacted by weather conditions than other forms of transportation?

What is solar radiation?

Why doesn’t the Sun warm all parts of the Earth equally?

Why don’t land and water absorb solar radiation evenly?

In which layer of the atmosphere does most weather take place?

What type of pressure system is associated with low air pressure?

What makes wind flow?

What factors determine the type of precipitation that falls during the winter?

Let’s move on and look at one of the variables that scientists collect data on when looking at the weather: temperature. Before visiting the next website, answer the next few questions to the best of your ability:

What do you think “temperature” is?

What factors cause the temperature to change during the day?

What factors cause the temperature to change throughout the year?

Where do you think the hottest place on Earth is? Why do you think that?

*You can see the dynamic motion of the oceanic and atmospheric flow patterns in the data animation here:* [*http://go.nasa.gov/1yjyI8D*](http://go.nasa.gov/1yjyI8D)

In the second animation, what direction do the clouds appear to be moving in at the equator?

Does the wind direction appear to follow a consistent pattern everywhere on the Earth?

How do you think these weather patterns may affect the climate in a location such as northern Africa?

What do you think the climate might be like in Central America, based on its geographical location and the atmospheric flow patterns?

*We’ve spent time looking at weather, now we will take a closer look at climate. Watch this video called “Melting Ice, Rising Seas” (4:31)* [*http://go.nasa.gov/1BpMF7v*](http://go.nasa.gov/1BpMF7v)

Why is the sea level rising?

What is happening to the ice sheets and glaciers in Greenland?

What types of consequences would sea level rise have for people across the globe?

Why is it hard to predict the exact amount the sea level will rise in the future?

*Read the article called “Global Warming vs. Climate Change” at* [*http://go.nasa.gov/1mZft0l*](http://go.nasa.gov/1mZft0l)

What does the term “global warming” describe to a scientist?

What is the definition of “climate change”?

Other than an increase in global surface temperature, what other weather variable changes are expected to occur with climate change?

Why is “global climate change” a more scientifically accurate term than “global warming”?

*Go to this site: “Global Climate Change: Vital Signs of the Planet”-* [*http://climate.nasa.gov*](http://climate.nasa.gov/)

What are some of the “vital signs” that a doctor might check on a patient?

What are the six “vital signs” that NASA is monitoring on Earth?

1. 2.

3. 4.

5. 6.

*Hover over each of the vital signs (just under the main cycling images) and look at the explanatory text that appears. For each of the vital signs, write that information below.*

Carbon dioxide:

Global temperature:

Arctic ice minimum:

Land ice:

Sea level:

Forest cover:

*Select* ***one*** *of these vital signs to learn more about. Click to expand and make more information visible to answer the following questions about the vital sign you select. For additional details, click on the “full vital sign” link at the lower right of the pop-up box.*

Your chosen vital sign:

Why is this a “vital sign” for Earth? How will its change impact us?

What type of data is being collected on this vital sign?

Use the data to explain, both qualitatively and quantitatively, how this vital sign is changing over time.