

# My NASA Data – Data Literacy Cubes



The tools in this guide are resources to support data literacy in your instructional setting with My NASA Data Earth science materials. These flexible resources may be used with graphs, data tables, and mapped images of NASA Earth science data. To access NASA data, visit the My NASA Data visualization tool, Earth System Data Explorer (<https://mynasadata.larc.nasa.gov>).

## The Data Literacy Cube set includes:

- Cube templates (*Gaming dice may be substituted for the cubes.*) Each cube type has an icon associated with it. Icons are displayed on the right side of My NASA Data pages to indicate which cubes could be used with the content on the page. It is also possible to search content by cube type.



- Leveled question sheets to help you differentiate your instruction  
*Note: This guide provides a labeled version identifying the different question sheets, as well as an unlabeled version for you to use at your discretion. See the bottom left for this designation on each labeled question sheet.*

Beginner

Intermediate

Advanced

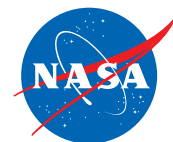
English Language Learners

**A****B****C****D**

## How to use the Data Literacy Cubes and leveled questions:

1. Access Earth science data from the My NASA Data website and the Earth System Data Explorer visualization tool (<https://mynasadata.larc.nasa.gov/EarthSystemLAS/UI.vm>).
2. Differentiate your lesson based on your students' needs and abilities. See versions A-D to select the leveled question sheets and distribute to students.
3. Instruct students to roll cube (or numbered die) to answer appropriate question/s.
4. Visit the *Maps*, *Graphs*, and *Data* sections on My NASA Data to access mini lessons and resources from each of the following spheres:
  - Atmosphere <https://mynasadata.larc.nasa.gov/atmosphere>
  - Biosphere <https://mynasadata.larc.nasa.gov/biosphere>
  - Cryosphere <https://mynasadata.larc.nasa.gov/cryosphere>
  - Geosphere <https://mynasadata.larc.nasa.gov/geosphere>
  - Hydrosphere <https://mynasadata.larc.nasa.gov/hydrosphere>
  - Earth as a System <https://mynasadata.larc.nasa.gov/earthsystem>





# Map Cube



1. Examine the map.



Map Cube

2. Where on Earth is this map?



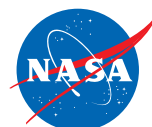
Map Cube

5. When were the data on this map collected?



Map Cube

3. Summarize the map.



Map Cube

6. Ask a question about the map.

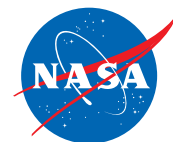


Map Cube

4. Analyze the map.



Map Cube



# **Map Cube Questions**

## 1. Examine the map.

- A. The color that shows the most is \_\_\_\_\_. It means \_\_\_\_\_.
- B. The color that you do not see much is \_\_\_\_\_. It means \_\_\_\_\_.

## 2. Where on Earth is this map?

- A. A place I know on the map is \_\_\_\_\_.
- B. Another place I know on the map is \_\_\_\_\_.

## 3. Summarize the map.

- A. The different colors stand for the variable \_\_\_\_\_. It is measured in \_\_\_\_\_.  
(unit)
- B. The color with the biggest value/number is \_\_\_\_\_.
- C. The color with the smallest value/number is \_\_\_\_\_.
- D. The color in the middle is \_\_\_\_\_. Its value is \_\_\_\_\_.

## 4. Analyze the map.

- A. The area/s with the highest values is/are \_\_\_\_\_. This means \_\_\_\_\_.
- B. The area/s with the lowest values is/are \_\_\_\_\_. This means \_\_\_\_\_.

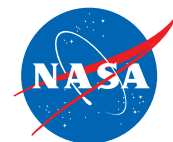
## 5. When were the data on this map collected?

- A. The date/s shown on the map is/are \_\_\_\_\_.
- B. A key word in the title that tells me the time frame of this map is \_\_\_\_\_.

## 6. Ask a question about the map.

- A. How does...?
- B. I wonder if...
- C. How is \_\_\_\_\_ the same as? Different than?
- D. How many...? How long...? How often...?





# *Map Cube Questions*

## 1. Examine the map.

- A. The color that shows the most is \_\_\_\_\_. It means \_\_\_\_\_.
- B. The color that you do not see much is \_\_\_\_\_. It means \_\_\_\_\_.

## 2. Where on Earth is this map?

- A. A place I know on the map is \_\_\_\_\_.
- B. Another place I know on the map is \_\_\_\_\_.

## 3. Summarize the map.

- A. The different colors stand for the variable \_\_\_\_\_. It is measured in \_\_\_\_\_.  
(unit)
- B. The color with the biggest value/number is \_\_\_\_\_.
- C. The color with the smallest value/number is \_\_\_\_\_.
- D. The color in the middle is \_\_\_\_\_. Its value is \_\_\_\_\_.

## 4. Analyze the map.

- A. The area/s with the highest values is/are \_\_\_\_\_. This means \_\_\_\_\_.
- B. The area/s with the lowest values is/are \_\_\_\_\_. This means \_\_\_\_\_.

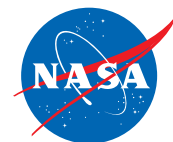
## 5. When were the data on this map collected?

- A. The date/s shown on the map is/are \_\_\_\_\_.
- B. A key word in the title that tells me the time frame of this map is \_\_\_\_\_.

## 6. Ask a question about the map.

- A. How does...?
- B. I wonder if...
- C. How is \_\_\_\_\_ the same as? Different than?
- D. How many...? How long...? How often...?





# **Map Cube Questions**

## 1. Examine the map.

- A. The colors that show the most represent \_\_\_\_\_.
- B. The colors that show the least represent \_\_\_\_\_.
- C. I observe a pattern which shows \_\_\_\_\_.

## 2. Where on Earth is this map?

- A. A place I recognize on the map is \_\_\_\_\_. The longitude is \_\_\_\_\_.
- B. Another place I know on the map is \_\_\_\_\_. The latitude is \_\_\_\_\_.
- C. A region I recognize is \_\_\_\_\_.

## 3. Summarize the map.

- A. The scale of the colors represents the variable \_\_\_\_\_.
- B. The unit for the variable is \_\_\_\_\_.
- C. This variable explains \_\_\_\_\_.

## 4. Analyze the map.

- A. The area/s with the highest values is/are \_\_\_\_\_. This represents \_\_\_\_\_.
- B. The area/s with the lowest values is/are \_\_\_\_\_. This represents \_\_\_\_\_.
- C. The values change from \_\_\_\_\_ to \_\_\_\_\_ in the \_\_\_\_\_ hemisphere.

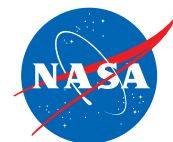
## 5. When were the data on this map collected?

- A. The time frame for the map is \_\_\_\_\_.
- B. If the time frame/area etc. changes to \_\_\_\_\_, then the variable will \_\_\_\_\_.

## 6. Ask a question about the map.

- A. I wonder if...
- B. How many...? How long...? How often...?





# *Map Cube Questions*

## 1. Examine the map.

- A. The colors that show the most represent \_\_\_\_\_.
- B. The colors that show the least represent \_\_\_\_\_.
- C. I observe a pattern which shows \_\_\_\_\_.

## 2. Where on Earth is this map?

- A. A place I recognize on the map is \_\_\_\_\_. The longitude is \_\_\_\_\_.
- B. Another place I know on the map is \_\_\_\_\_. The latitude is \_\_\_\_\_.
- C. A region I recognize is \_\_\_\_\_.

## 3. Summarize the map.

- A. The scale of the colors represents the variable \_\_\_\_\_.
- B. The unit for the variable is \_\_\_\_\_.
- C. This variable explains \_\_\_\_\_.

## 4. Analyze the map.

- A. The area/s with the highest values is/are \_\_\_\_\_. This represents \_\_\_\_\_.
- B. The area/s with the lowest values is/are \_\_\_\_\_. This represents \_\_\_\_\_.
- C. The values change from \_\_\_\_\_ to \_\_\_\_\_ in the \_\_\_\_\_ hemisphere.

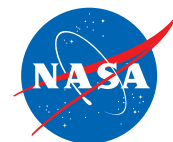
## 5. When were the data on this map collected?

- A. The time frame for the map is \_\_\_\_\_.
- B. If the time frame/area etc. changes to \_\_\_\_\_, then the variable will \_\_\_\_\_.

## 6. Ask a question about the map.

- A. I wonder if...
- B. How many...? How long...? How often...?





# **Map Cube Questions**

## **1. Examine the map.**

- A. What do the colors that show the most represent?
- B. What do the colors that show the least represent?
- C. What pattern do you observe?

## **2. Where on Earth is this map?**

- A. What is the latitude and longitude range?
- B. Identify a place you recognize and its approximate latitude and longitude.
- C. What type of map projection is this?

## **3. Summarize the map.**

- A. What is the scale on the map?
- B. What variable is represented?
- C. What is the range and unit for the scale?

## **4. Analyze the map.**

- A. What patterns are there for the high values?
- B. What patterns are there for the low values?
- C. How do the values change by area?

## **5. When were the data on this map collected?**

- A. What time frame is represented?
- B. Compare this map to a map for a different time frame for the same variable.
- C. What are the similarities and differences?

## **6. Ask a question about the map.**

- A. Form a hypothesis about the data displayed on the map.
- B. What inference can you make about the cause of the data displayed?
- C. Compare this map to another map for a different variable for the same area.  
What are the similarities and differences?





# **Map Cube Questions**

## **1. Examine the map.**

- A. What do the colors that show the most represent?
- B. What do the colors that show the least represent?
- C. What pattern do you observe?

## **2. Where on Earth is this map?**

- A. What is the latitude and longitude range?
- B. Identify a place you recognize and its approximate latitude and longitude.
- C. What type of map projection is this?

## **3. Summarize the map.**

- A. What is the scale on the map?
- B. What variable is represented?
- C. What is the range and unit for the scale?

## **4. Analyze the map.**

- A. What patterns are there for the high values?
- B. What patterns are there for the low values?
- C. How do the values change by area?

## **5. When were the data on this map collected?**

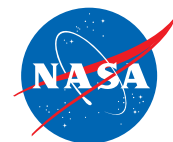
- A. What time frame is represented?
- B. Compare this map to a map for a different time frame for the same variable.
- C. What are the similarities and differences?

## **6. Ask a question about the map.**

- A. Form a hypothesis about the data displayed on the map.
- B. What inference can you make about the cause of the data displayed?
- C. Compare this map to another map for a different variable for the same area.  
What are the similarities and differences?







# Map Cube Questions



## 1. Examine the map.

- A. The color \_\_\_\_\_ shows the most. It means \_\_\_\_\_.
- B. The color \_\_\_\_\_ shows the least. It means \_\_\_\_\_.
- C. A pattern shows the color \_\_\_\_\_ in the areas that are \_\_\_\_\_.

## 2. Where on Earth is this map?

- A. The latitude goes from \_\_\_\_ to \_\_\_\_\_. The longitude goes from \_\_\_\_ to \_\_\_\_\_.
- B. This is a \_\_\_\_\_ map.

## 3. Summarize the map.

- A. The colors stand for the variable \_\_\_\_\_.
- B. The unit used for the variable is \_\_\_\_\_.

## 4. Analyze the map.

- A. The highest values show up in \_\_\_\_\_ areas.
- B. The lowest values show up in \_\_\_\_\_ areas.
- C. The values change from \_\_\_\_\_ in \_\_\_\_\_ to \_\_\_\_\_ in \_\_\_\_\_.  
(value) (area) (value) (area)

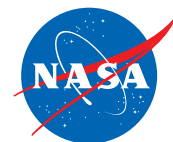
## 5. When were the data on this map collected?

- A. The word in the title that tells me the time frame is \_\_\_\_\_.
- B. The time frame shows the data for a day/week/month/quarter/year, etc.?

## 6. Ask a question about the map.

- A. How will \_\_\_\_\_ change when \_\_\_\_\_ changes?
- B. I wonder....
- C. Ask a question that starts with why, when, or where.





# Map Cube Questions



## 1. Examine the map.

- A. The color \_\_\_\_\_ shows the most. It means \_\_\_\_\_.
- B. The color \_\_\_\_\_ shows the least. It means \_\_\_\_\_.
- C. A pattern shows the color \_\_\_\_\_ in the areas that are \_\_\_\_\_.

## 2. Where on Earth is this map?

- A. The latitude goes from \_\_\_\_ to \_\_\_\_\_. The longitude goes from \_\_\_\_ to \_\_\_\_\_.
- B. This is a \_\_\_\_\_ map.

## 3. Summarize the map.

- A. The colors stand for the variable \_\_\_\_\_.
- B. The unit used for the variable is \_\_\_\_\_.

## 4. Analyze the map.

- A. The highest values show up in \_\_\_\_\_ areas.
- B. The lowest values show up in \_\_\_\_\_ areas.
- C. The values change from \_\_\_\_\_ in \_\_\_\_\_ to \_\_\_\_\_ in \_\_\_\_\_.  
(value) (area) (value) (area)

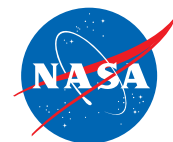
## 5. When were the data on this map collected?

- A. The word in the title that tells me the time frame is \_\_\_\_\_.
- B. The time frame shows the data for a day/week/month/quarter/year, etc.?

## 6. Ask a question about the map.

- A. How will \_\_\_\_\_ change when \_\_\_\_\_ changes?
- B. I wonder....
- C. Ask a question that starts with why, when, or where.





# Graph Cube



5. Who would be interested in this graph?



Graph Cube

1. Examine the graph.



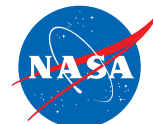
Graph Cube

4. Brainstorm a question that you can answer using these data.



Graph Cube

6. Assess the data values.



Graph Cube

2. Summarize the graph.

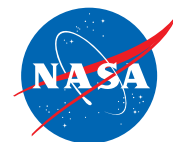


Graph Cube

3. Analyze the graph.



Graph Cube



# **Graph Cube Questions**

## 1. Examine the graph.

- A. The title tells me \_\_\_\_\_.
- B. The bottom of the graph is the \_\_\_\_ axis. The variable is \_\_\_\_\_.
- C. The left side of the graph is the \_\_\_\_ axis. The variable is \_\_\_\_\_.
- D. The time frame for the data is \_\_\_\_\_ to \_\_\_\_\_.

## 2. Summarize the graph.

- A. The x axis shows the (*independent/dependent*) variable.
- B. The y axis shows the (*independent/dependent*) variable.
- C. The data \_\_\_\_\_ (increase/decrease/follow a pattern). Explain.

## 3. Analyze the graph.

- A. \_\_\_\_\_ caused the change.
- B. The variable that changed as a result of something else changing is \_\_\_\_\_.
- C. If \_\_\_\_ (*increases/decreases/stays the same*), then \_\_\_\_ (*increases/decreases/stays the same*).
- D. The numbers on the graph show \_\_\_\_\_.

## 4. Brainstorm a question that you can answer using these data.

- A. How does...?
- B. I wonder...
- C. How is \_\_\_\_\_ the same as \_\_\_\_\_? Different from \_\_\_\_\_?
- D. How many \_\_\_\_\_?

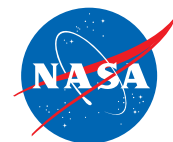
## 5. Who would be interested in this graph?

- A. I think \_\_\_\_ (i.e. farmers, snow skiers, etc.) would be interested in this graph.
- B. These data are important to the \_\_\_\_\_ community because \_\_\_\_\_.

## 6. Assess the data values.

- A. The label on the x axis is \_\_\_\_\_. The label on the y axis is \_\_\_\_\_.
- B. The unit for the x axis is \_\_\_\_\_. The unit for the y axis is \_\_\_\_\_.
- C. The scale for the x axis is \_\_\_\_\_. The scale for the y axis is \_\_\_\_\_.





# **Graph Cube Questions**

## 1. Examine the graph.

- A. The title tells me \_\_\_\_\_.
- B. The bottom of the graph is the \_\_\_\_ axis. The variable is \_\_\_\_\_.
- C. The left side of the graph is the \_\_\_\_ axis. The variable is \_\_\_\_\_.
- D. The time frame for the data is \_\_\_\_\_ to \_\_\_\_\_.

## 2. Summarize the graph.

- A. The x axis shows the (*independent/dependent*) variable.
- B. The y axis shows the (*independent/dependent*) variable.
- C. The data \_\_\_\_\_ (increase/decrease/follow a pattern). Explain.

## 3. Analyze the graph.

- A. \_\_\_\_\_ caused the change.
- B. The variable that changed as a result of something else changing is \_\_\_\_\_.
- C. If \_\_\_\_ (*increases/decreases/stays the same*), then \_\_\_\_ (*increases/decreases/stays the same*).
- D. The numbers on the graph show \_\_\_\_\_.

## 4. Brainstorm a question that you can answer using these data.

- A. How does...?
- B. I wonder...
- C. How is \_\_\_\_\_ the same as \_\_\_\_\_? Different from \_\_\_\_\_?
- D. How many \_\_\_\_\_?

## 5. Who would be interested in this graph?

- A. I think \_\_\_\_ (i.e. farmers, snow skiers, etc.) would be interested in this graph.
- B. These data are important to the \_\_\_\_\_ community because \_\_\_\_\_.

## 6. Assess the data values.

- A. The label on the x axis is \_\_\_\_\_. The label on the y axis is \_\_\_\_\_.
- B. The unit for the x axis is \_\_\_\_\_. The unit for the y axis is \_\_\_\_\_.
- C. The scale for the x axis is \_\_\_\_\_. The scale for the y axis is \_\_\_\_\_.





# **Graph Cube Questions**

## 1. Examine the graph.

- A. The variable on the x axis is \_\_\_\_\_. It is the (*independent/dependent*) variable.
- B. The variable on the y axis is \_\_\_\_\_. It is the (*independent/dependent*) variable.
- C. The value of the independent variable affects the dependent variable by \_\_\_\_\_.

## 2. Summarize the graph.

- A. The variable that changes as a result of another variable changing is \_\_\_\_\_.
- B. The variable that causes the change is \_\_\_\_\_.
- C. As the independent variable \_\_\_\_ (*increases/decreases*), the dependent variable \_\_\_\_ (*increases/decreases/stays the same*).
- D. The time frame represented in the graph is from \_\_\_\_\_ to \_\_\_\_\_.
- E. The data \_\_\_\_\_ (*increase/decrease/follow a pattern*). Explain.

## 3. Analyze the graph.

- A. Write a hypothesis about the two variables to explain the graph. If \_\_, then \_\_.
- B. The quantitative evidence that supports my testable statement is \_\_\_\_\_.

## 4. Brainstorm a question that you can answer using these data.

- A. How does...? How many...?
- B. I wonder...
- C. How is \_\_\_\_\_ the same as \_\_\_\_\_? Different from \_\_\_\_\_?

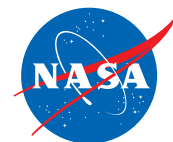
## 5. Who would be interested in this graph?

- A. I think \_\_\_\_\_ (i.e. farmers, snow skiers, etc.) would be interested in this graph.
- B. These data are important to the \_\_\_\_\_ community because \_\_\_\_\_.

## 6. Assess the data values.

- A. The label on the x axis is \_\_\_\_\_. The label on the y axis is \_\_\_\_\_.
- B. The unit for the x axis is \_\_\_\_\_. The unit for the y axis is \_\_\_\_\_.
- C. The scale for the x axis is \_\_\_\_\_. The scale for the y axis is \_\_\_\_\_.





# **Graph Cube Questions**

## 1. Examine the graph.

- A. The variable on the x axis is \_\_\_\_\_. It is the *(independent/dependent)* variable.
- B. The variable on the y axis is \_\_\_\_\_. It is the *(independent/dependent)* variable.
- C. The value of the independent variable affects the dependent variable by \_\_\_\_\_.

## 2. Summarize the graph.

- A. The variable that changes as a result of another variable changing is \_\_\_\_\_.
- B. The variable that causes the change is \_\_\_\_\_.
- C. As the independent variable \_\_\_\_ *(increases/decreases)*, the dependent variable \_\_\_\_ *(increases/decreases/stays the same)*.
- D. The time frame represented in the graph is from \_\_\_\_\_ to \_\_\_\_\_.
- E. The data \_\_\_\_\_ *(increase/decrease/follow a pattern)*. Explain.

## 3. Analyze the graph.

- A. Write a hypothesis about the two variables to explain the graph. If \_\_, then \_\_.
- B. The quantitative evidence that supports my testable statement is \_\_\_\_\_.

## 4. Brainstorm a question that you can answer using these data.

- A. How does...? How many...?
- B. I wonder...
- C. How is \_\_\_\_\_ the same as \_\_\_\_\_? Different from \_\_\_\_\_?

## 5. Who would be interested in this graph?

- A. I think \_\_\_\_\_ (i.e. farmers, snow skiers, etc.) would be interested in this graph.
- B. These data are important to the \_\_\_\_\_ community because \_\_\_\_\_.

## 6. Assess the data values.

- A. The label on the x axis is \_\_\_\_\_. The label on the y axis is \_\_\_\_\_.
- B. The unit for the x axis is \_\_\_\_\_. The unit for the y axis is \_\_\_\_\_.
- C. The scale for the x axis is \_\_\_\_\_. The scale for the y axis is \_\_\_\_\_.





# **Graph Cube Questions**

## 1. Examine the graph.

- A. What variable is represented on the x-axis? What is the range of values?
- B. What variable is represented on the y-axis? What is the range of values?
- C. What are the units of measurement for the x and y axes?
- D. If this graph represents a geographic location, identify it on a map or globe.

## 2. Summarize the graph.

- A. Do the data repeat in recognizable ways? Explain.
- B. What kinds of patterns or trends do you see in the distribution of the data?
- C. How do the patterns you see in the graph relate to other things you know?

## 3. Analyze the graph.

- A. Describe the relationship between the variables: positive, negative, or none.
- B. Brainstorm one variable that you predict to be directly proportional.
- C. Brainstorm one variable that you predict to be inversely proportional.

## 4. Brainstorm a question that you can answer using these data.

- A. Ask a question beginning with how, what, where, when or why.
- B. I wonder...
- C. Form a hypothesis using the data on the graph. If \_\_\_\_, then \_\_\_\_.

## 5. Who would be interested in this graph?

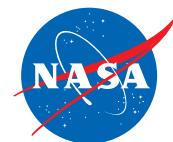
- A. Brainstorm who would be interested in the data presented in this graph (*i.e., farmers, snow skiers, etc.*).
- B. Why do you think these data are important to this community?

## 6. Assess the data values.

- A. What is the numerical range of the data? Mean? Median? Mode?
- B. How is the mean different from the mode?
- C. Are there any outliers? If so, what are they?







# **Graph Cube Questions**

## **1. Examine the graph.**

- A. What variable is represented on the x-axis? What is the range of values?
- B. What variable is represented on the y-axis? What is the range of values?
- C. What are the units of measurement for the x and y axes?
- D. If this graph represents a geographic location, identify it on a map or globe.

## **2. Summarize the graph.**

- A. Do the data repeat in recognizable ways? Explain.
- B. What kinds of patterns or trends do you see in the distribution of the data?
- C. How do the patterns you see in the graph relate to other things you know?

## **3. Analyze the graph.**

- A. Describe the relationship between the variables: positive, negative, or none.
- B. Brainstorm one variable that you predict to be directly proportional.
- C. Brainstorm one variable that you predict to be inversely proportional.

## **4. Brainstorm a question that you can answer using these data.**

- A. Ask a question beginning with how, what, where, when or why.
- B. I wonder...
- C. Form a hypothesis using the data on the graph. If \_\_\_\_, then \_\_\_\_.

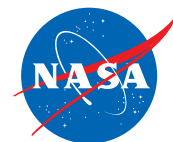
## **5. Who would be interested in this graph?**

- A. Brainstorm who would be interested in the data presented in this graph (*i.e., farmers, snow skiers, etc.*).
- B. Why do you think these data are important to this community?

## **6. Assess the data values.**

- A. What is the numerical range of the data? Mean? Median? Mode?
- B. How is the mean different from the mode?
- C. Are there any outliers? If so, what are they?





# **Graph Cube Questions**

## 1. Examine the graph.

- A. The bottom of the graph is the \_\_\_\_ axis. The variable is \_\_\_\_\_.
- B. The left side of the graph is the \_\_\_\_ axis. The variable is \_\_\_\_\_.
- C. The time frame for the data is \_\_\_\_\_ to \_\_\_\_\_.
- D. The title says \_\_\_\_\_. It means \_\_\_\_\_.

## 2. Summarize the graph.

- A. The x axis shows the (*independent/dependent*) variable.
- B. The y axis shows the (*independent/dependent*) variable.
- C. The data \_\_\_\_ (*increase/decrease/follow a pattern*). I know this because \_\_\_\_\_.

## 3. Analyze the graph.

- A. The independent variable, \_\_\_\_\_, caused the change.
- B. The dependent variable \_\_\_\_\_ changes when the independent variable changes.
- C. If \_\_\_\_\_ (*increases/decreases/stays the same*), then \_\_\_\_\_ (*increases/decreases/stays the same*).
- D. The numbers on the graph show \_\_\_\_\_.

## 4. Brainstorm a question that you can answer using these data.

- A. How does...? I wonder...
- B. How is \_\_\_\_\_ the same as \_\_\_\_\_? Different from \_\_\_\_\_?
- C. If \_\_\_\_\_, then \_\_\_\_\_.

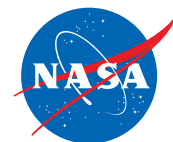
## 5. Who would be interested in this graph?

- A. I think \_\_\_\_ (*i.e. farmers, snow skiers, etc.*) would be interested in this graph.
- B. These data are important to the \_\_\_\_\_ community because \_\_\_\_\_.

## 6. Assess the data values.

- A. The label on the x axis is \_\_\_\_\_. The label on the y axis is \_\_\_\_\_.
- B. The unit for the x axis is \_\_\_\_\_. The unit for the y axis is \_\_\_\_\_.
- C. The scale for the x axis is \_\_\_\_\_. The scale for the y axis is \_\_\_\_\_.





# **Graph Cube Questions**

## 1. Examine the graph.

- A. The bottom of the graph is the \_\_\_\_ axis. The variable is \_\_\_\_\_.
- B. The left side of the graph is the \_\_\_\_ axis. The variable is \_\_\_\_\_.
- C. The time frame for the data is \_\_\_\_\_ to \_\_\_\_\_.
- D. The title says \_\_\_\_\_. It means \_\_\_\_\_.

## 2. Summarize the graph.

- A. The x axis shows the (*independent/dependent*) variable.
- B. The y axis shows the (*independent/dependent*) variable.
- C. The data \_\_\_\_ (*increase/decrease/follow a pattern*). I know this because \_\_\_\_\_.

## 3. Analyze the graph.

- A. The independent variable, \_\_\_\_\_, caused the change.
- B. The dependent variable \_\_\_\_\_ changes when the independent variable changes.
- C. If \_\_\_\_\_ (*increases/decreases/stays the same*), then \_\_\_\_\_ (*increases/decreases/stays the same*).
- D. The numbers on the graph show \_\_\_\_\_.

## 4. Brainstorm a question that you can answer using these data.

- A. How does...? I wonder...
- B. How is \_\_\_\_\_ the same as \_\_\_\_\_? Different from \_\_\_\_\_?
- C. If \_\_\_\_\_, then \_\_\_\_\_.

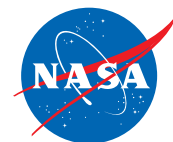
## 5. Who would be interested in this graph?

- A. I think \_\_\_\_\_ (*i.e. farmers, snow skiers, etc.*) would be interested in this graph.
- B. These data are important to the \_\_\_\_\_ community because \_\_\_\_\_.

## 6. Assess the data values.

- A. The label on the x axis is \_\_\_\_\_. The label on the y axis is \_\_\_\_\_.
- B. The unit for the x axis is \_\_\_\_\_. The unit for the y axis is \_\_\_\_\_.
- C. The scale for the x axis is \_\_\_\_\_. The scale for the y axis is \_\_\_\_\_.





# Data Cube



1. Summarize  
the data.



Data Cube

3. Analyze  
the data.



Data Cube

2. Describe  
the data.



Data Cube

4. Assess the  
data values.



Data Cube

5. Create questions  
using the data.

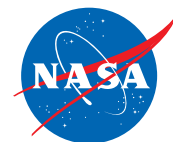


Data Cube

6. Apply the data.



Data Cube



# Data Cube Questions



## 1. Summarize the data.

- A. The data are displayed in a (*table, chart, etc.*) \_\_\_\_\_.
- B. The title tells me the data are about \_\_\_\_\_.
- C. The data measure...
- D. The lowest value is \_\_\_\_\_.
- E. The highest value is \_\_\_\_\_.

## 2. Describe the data.

- A. The data were collected using \_\_\_\_\_ (*i.e. thermometer, instrument, etc.*).
- B. The data are collected every \_\_\_\_\_ (*day, week, month, quarter, year, etc.*).
- C. The unit used to describe the data is \_\_\_\_\_.

## 3. Analyze the data.

- A. The geographic area of Earth where the data were collected is \_\_\_\_\_.
- B. The time range is from \_\_\_\_\_ to \_\_\_\_\_.
- C. These data show that \_\_\_\_\_.

## 4. Assess the data values.

- A. The mean is \_\_\_\_\_. The median is \_\_\_\_\_. The mode is \_\_\_\_\_.
- B. The highest value is \_\_\_\_\_. The lowest value is \_\_\_\_\_.
- C. This variable belongs in the \_\_\_\_\_ sphere of the Earth System.

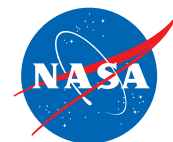
## 5. Create questions using the data.

- A. I wonder ...
- B. If \_\_\_\_ changed, I think the data would (*increase/decrease/stay the same*) \_\_\_\_.
- C. How does....?
- D. Why...?

## 6. Apply the data.

- A. These data help us understand \_\_\_\_\_.
- B. These data can explain why \_\_\_\_\_.
- C. Graph the data.





# Data Cube Questions



## 1. Summarize the data.

- A. The data are displayed in a (*table, chart, etc.*) \_\_\_\_\_.
- B. The title tells me the data are about \_\_\_\_\_.
- C. The data measure...
- D. The lowest value is \_\_\_\_\_.
- E. The highest value is \_\_\_\_\_.

## 2. Describe the data.

- A. The data were collected using \_\_\_\_\_ (*i.e. thermometer, instrument, etc.*).
- B. The data are collected every \_\_\_\_\_ (*day, week, month, quarter, year, etc.*).
- C. The unit used to describe the data is \_\_\_\_\_.

## 3. Analyze the data.

- A. The geographic area of Earth where the data were collected is \_\_\_\_\_.
- B. The time range is from \_\_\_\_\_ to \_\_\_\_\_.
- C. These data show that \_\_\_\_\_.

## 4. Assess the data values.

- A. The mean is \_\_\_\_\_. The median is \_\_\_\_\_. The mode is \_\_\_\_\_.
- B. The highest value is \_\_\_\_\_. The lowest value is \_\_\_\_\_.
- C. This variable belongs in the \_\_\_\_\_ sphere of the Earth System.

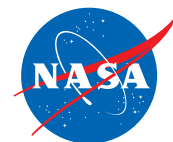
## 5. Create questions using the data.

- A. I wonder ...
- B. If \_\_\_\_ changed, I think the data would (*increase/decrease/stay the same*) \_\_\_\_.
- C. How does....?
- D. Why...?

## 6. Apply the data.

- A. These data help us understand \_\_\_\_\_.
- B. These data can explain why \_\_\_\_\_.
- C. Graph the data.





# Data Cube Questions



## 1. Summarize the data.

- A. The variable is \_\_\_\_\_. It represents \_\_\_\_\_.
- B. The range of the data is from \_\_\_\_\_ to \_\_\_\_\_.
- C. The independent variable is \_\_\_\_\_. The dependent variable is \_\_\_\_\_.

## 2. Describe the data.

- A. The \_\_\_\_\_ instrument collected these data.
- B. The data are collected every \_\_\_\_\_ (*day, week, month, quarter, year, etc.*).
- C. The unit used to describe the data is \_\_\_\_\_.

## 3. Analyze the data.

- A. The geographic area of Earth that is represented is \_\_\_\_\_.
- B. The time range is from \_\_\_\_\_ to \_\_\_\_\_.
- C. This variable belongs in the \_\_\_\_\_ sphere of the Earth System.

## 4. Assess the data values.

- A. The average is \_\_\_\_\_. The median is \_\_\_\_\_. The mode is \_\_\_\_\_.
- B. The measure of central tendency that best represents the data is the \_\_\_\_\_ (*mean, median or mode*). This is because \_\_\_\_\_.
- C. The highest value is \_\_\_\_\_. The lowest value is \_\_\_\_\_.

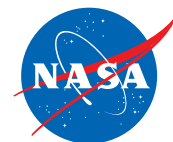
## 5. Create questions using the data.

- A. These data make me wonder \_\_\_\_\_.
- B. I would like to compare \_\_\_\_\_ with these data because \_\_\_\_\_.
- C. How do these data affect another sphere in the Earth System?

## 6. Apply the data.

- A. These data help us understand \_\_\_\_\_.
- B. These data can explain the phenomenon of \_\_\_\_\_ because \_\_\_\_\_.
- C. Technology is related to these data because \_\_\_\_\_.
- D. Engineering is connected to these data because \_\_\_\_\_.
- E. Graph the data.





# Data Cube Questions



## 1. Summarize the data.

- A. The variable is \_\_\_\_\_. It represents \_\_\_\_\_.
- B. The range of the data is from \_\_\_\_\_ to \_\_\_\_\_.
- C. The independent variable is \_\_\_\_\_. The dependent variable is \_\_\_\_\_.

## 2. Describe the data.

- A. The \_\_\_\_\_ instrument collected these data.
- B. The data are collected every \_\_\_\_\_ (*day, week, month, quarter, year, etc.*).
- C. The unit used to describe the data is \_\_\_\_\_.

## 3. Analyze the data.

- A. The geographic area of Earth that is represented is \_\_\_\_\_.
- B. The time range is from \_\_\_\_\_ to \_\_\_\_\_.
- C. This variable belongs in the \_\_\_\_\_ sphere of the Earth System.

## 4. Assess the data values.

- A. The average is \_\_\_\_\_. The median is \_\_\_\_\_. The mode is \_\_\_\_\_.
- B. The measure of central tendency that best represents the data is the \_\_\_\_\_ (*mean, median or mode*). This is because \_\_\_\_\_.
- C. The highest value is \_\_\_\_\_. The lowest value is \_\_\_\_\_.

## 5. Create questions using the data.

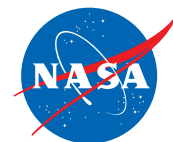
- A. These data make me wonder \_\_\_\_\_.
- B. I would like to compare \_\_\_\_\_ with these data because \_\_\_\_\_.
- C. How do these data affect another sphere in the Earth System?

## 6. Apply the data.

- A. These data help us understand \_\_\_\_\_.
- B. These data can explain the phenomenon of \_\_\_\_\_ because \_\_\_\_\_.
- C. Technology is related to these data because \_\_\_\_\_.
- D. Engineering is connected to these data because \_\_\_\_\_.
- E. Graph the data.







# Data Cube Questions



## 1. Summarize the data.

- A. What does the variable represent?
- B. What is the range of the data?
- C. In which sphere of the Earth System does this variable belong?

## 2. Describe the data.

- A. What instrument/s collected these data?
- B. How frequently were the data collected?
- C. What unit describes the data?

## 3. Analyze the data.

- A. What geographic area on Earth do the data represent?
- B. What time range do these data represent?
- C. What area and time data would you like to collect to help you analyze these data?

## 4. Assess the data values.

- A. What is the mean? Median? Mode?
- B. Are there any outliers? If so, what are they? Why don't they meet your expectations?
- C. Graph the data.

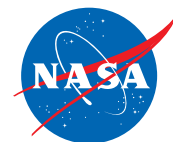
## 5. Create research questions using the data.

- A. Identify a question related to these data that you could research.
- B. Identify another scientific variable that you could evaluate with these data.
- C. How do you think this area compares to other geographic provinces in your region?  
(i.e., coastal plain, highlands, etc.)

## 6. Apply the data.

- A. What science questions do these data help us understand?
- B. Describe how you may use these data to explain a scientific phenomenon.
- C. How is Technology connected to these data?





# Data Cube Questions



## 1. Summarize the data.

- A. What does the variable represent?
- B. What is the range of the data?
- C. In which sphere of the Earth System does this variable belong?

## 2. Describe the data.

- A. What instrument/s collected these data?
- B. How frequently were the data collected?
- C. What unit describes the data?

## 3. Analyze the data.

- A. What geographic area on Earth do the data represent?
- B. What time range do these data represent?
- C. What area and time data would you like to collect to help you analyze these data?

## 4. Assess the data values.

- A. What is the mean? Median? Mode?
- B. Are there any outliers? If so, what are they? Why don't they meet your expectations?
- C. Graph the data.

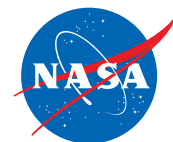
## 5. Create research questions using the data.

- A. Identify a question related to these data that you could research.
- B. Identify another scientific variable that you could evaluate with these data.
- C. How do you think this area compares to other geographic provinces in your region?  
(i.e., coastal plain, highlands, etc.)

## 6. Apply the data.

- A. What science questions do these data help us understand?
- B. Describe how you may use these data to explain a scientific phenomenon.
- C. How is Technology connected to these data?





# Data Cube Questions



## 1. Summarize the data.

- A. The data are displayed in a (*table, chart, etc.*) \_\_\_\_\_.
- B. The title tells me the data are about \_\_\_\_\_.
- C. The variable measured is \_\_\_\_\_.
- D. The lowest value is \_\_\_\_\_.
- E. The highest value is \_\_\_\_\_.

## 2. Describe the data.

- A. The data were collected using \_\_\_\_\_ (*i.e. thermometer, instrument, etc.*).
- B. The data are collected every \_\_\_\_\_ (*day, week, month, quarter, year, etc.*).
- C. The unit used to describe the data is \_\_\_\_\_.

## 3. Analyze the data.

- A. The geographic area of Earth where the data were collected is \_\_\_\_\_.
- B. The time range is from \_\_\_\_\_ to \_\_\_\_\_.
- C. These data show that \_\_\_\_\_.

## 4. Assess the data values.

- A. The mean is \_\_\_\_\_. The median is \_\_\_\_\_. The mode is \_\_\_\_\_.
- B. The highest value is \_\_\_\_\_. The lowest value is \_\_\_\_\_.
- C. This variable belongs in the \_\_\_\_\_ sphere of the Earth System.

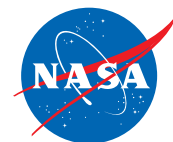
## 5. Create questions using the data.

- A. I wonder...
- B. If \_\_\_\_\_ changed, then the data would (*increase/decrease/stay the same*) \_\_\_\_\_.
- C. How does...?
- D. Why...?

## 6. Apply the data.

- A. These data help us understand \_\_\_\_\_.
- B. These data can explain why \_\_\_\_\_ happens.
- C. Technology was used to get these data by \_\_\_\_\_.





# Data Cube Questions



## 1. Summarize the data.

- A. The data are displayed in a (*table, chart, etc.*) \_\_\_\_\_.
- B. The title tells me the data are about \_\_\_\_\_.
- C. The variable measured is \_\_\_\_\_.
- D. The lowest value is \_\_\_\_\_.
- E. The highest value is \_\_\_\_\_.

## 2. Describe the data.

- A. The data were collected using \_\_\_\_\_ (*i.e. thermometer, instrument, etc.*).
- B. The data are collected every \_\_\_\_\_ (*day, week, month, quarter, year, etc.*).
- C. The unit used to describe the data is \_\_\_\_\_.

## 3. Analyze the data.

- A. The geographic area of Earth where the data were collected is \_\_\_\_\_.
- B. The time range is from \_\_\_\_\_ to \_\_\_\_\_.
- C. These data show that \_\_\_\_\_.

## 4. Assess the data values.

- A. The mean is \_\_\_\_\_. The median is \_\_\_\_\_. The mode is \_\_\_\_\_.
- B. The highest value is \_\_\_\_\_. The lowest value is \_\_\_\_\_.
- C. This variable belongs in the \_\_\_\_\_ sphere of the Earth System.

## 5. Create questions using the data.

- A. I wonder...
- B. If \_\_\_\_\_ changed, then the data would (*increase/decrease/stay the same*) \_\_\_\_\_.
- C. How does...?
- D. Why...?

## 6. Apply the data.

- A. These data help us understand \_\_\_\_\_.
- B. These data can explain why \_\_\_\_\_ happens.
- C. Technology was used to get these data by \_\_\_\_\_.

