



# 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

**A**

Intermediate

**B**

Advanced

**C**

English Language Learners

**D**

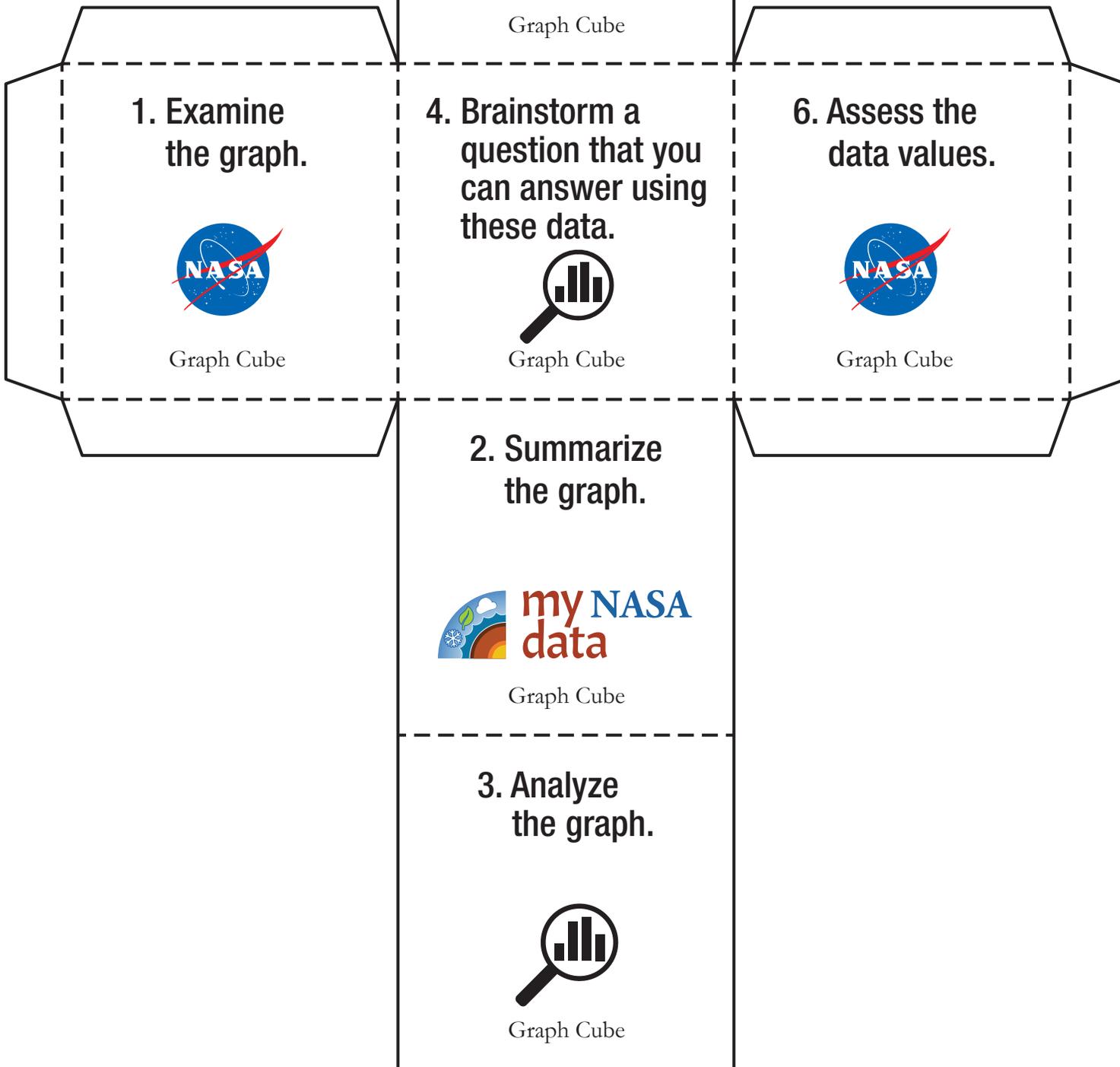
## How to use the Data Literacy Cubes and leveled questions:

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>





# 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

5. Who would be interested in this graph?



Graph Cube



# Graph Cube Questions

## 1. Examine the graph.

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

## 2. Summarize the graph.

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

## 3. Analyze the graph.

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

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

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

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

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

## 6. Assess the data values.

- The label on the x axis is \_\_\_\_\_. The label on the y axis is \_\_\_\_\_.
- The unit for the x axis is \_\_\_\_\_. The unit for the y axis is \_\_\_\_\_.
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# Graph Cube Questions

## 1. Examine the graph.

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

## 2. Summarize the graph.

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

## 3. Analyze the graph.

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

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

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# **Graph Cube Questions**

## 1. Examine the graph.

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

## 2. Summarize the graph.

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

## 3. Analyze the graph.

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

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

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

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

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

## 6. Assess the data values.

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





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