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.

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How to use the Data Literacy Cubes and leveled questions:


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
1. Summarize the data.

2. Describe the data.

3. Analyze the data.

4. Assess the data values.

5. Create questions using the data.

6. Apply 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 data are displayed in a (table, chart, etc.) _________.
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   C. The data measure...
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   A. The geographic area of Earth where the data were collected is ____________.
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   A. The mean is ______. The median is ______. The mode is ______.
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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 _______.

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   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?
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   A. What science questions do these data help us understand?
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   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 __________.
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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 ____________.
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1. Summarize the data.
   A. The data are displayed in a (table, chart, etc.) __________.
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