Data Literacy Cube:
A Tool for Differentiated Learning in Earth Science

About this Resource

The tools in this guide are resources to support data literacy in your instructional setting with My NASA Data Earth science data and visualizations. These flexible resources may be used with graphs, data tables, and mapped images of NASA Earth science data (or other sources of Earth data). With these tools, students engage with data by rolling a cube (or die) and answering questions to guide their data analysis. Leveled question sheets provide opportunities for students to connect with data, regardless of language proficiency or academic skill. These tools are aligned with Next Generation Science Standards Science and Engineering Practices and Common Core Mathematics Standards.

Data Literacy Cube Resources

- **Cube template:** Within this guide, you will find a black-line master template for the cube. This template can be constructed for use with the question sheets. Alternatively, gaming dice or virtual dice rollers may be substituted for the cube.
- **Question Sheets:** Question Sheets are leveled for both Lexile and English-language proficiencies. The leveled question sheets contain labeled (bottom left) and unlabeled versions for you to use at your discretion to help you differentiate your instruction. Note: The Lexile range provided on each question sheet represents the text's difficulty. The students' reading comprehension levels should be taken into account when selecting the appropriate question sheet. WIDA standards and proficiency levels help educators determine which level question sheet is best suitable for the student. For further information, visit the following links: Lexile (https://lexile.com/), WIDA standards (https://wida.wisc.edu/sites/default/files/resource/WIDA-ELD-Standards-Framework-2020.pdf).

Novice	Developing	Proficient	Advanced
1	2	3	4

Level 1 - Novice

- (Lexile Levels - 200-400) (WIDA proficiency level suggestions: 1.5-2.5)
- Intended Audience: elementary students, struggling learners, ELL's, and students with specific accommodations.

Level 2 - Developing

- (Lexile Levels - 210-400) (WIDA proficiency level suggestions: 1.9-2.5)
- Intended Audience: elementary students, struggling learners, ELL's, and students with specific accommodations.

Level 3 - Proficient

- (Lexile Levels - 410-600) (WIDA proficiency level suggestions: 2.5-4.5)
- Intended Audience: students who require reading supports, and those whose sentence and word phrase dimensions are more advanced.

Level 4 - Advanced

- (Lexile Levels - 610-800) (WIDA proficiency level suggestions: 4.5-6)
- Intended Audience: fluent English speakers, academically advanced learners, and abstract thinkers.

- **Keyword List:** A list of keywords is included on various question sheets. It provides the teacher and learner with opportunities to document key vocabulary words that are incorporated in the data analysis prior to starting the activity. Some words have been included in the list, but space is provided for those who wish to add additional words that are important in the lesson.

Keywords (add more words):

area biggest value Earth System
least legend most smallest value

- **Task Card:** The Task Cards provide roles for students to perform while conducting the data analysis. This allows students to specialize in an area of data analysis and recording while contributing to the team. (This is a great way to also include multilingual and other learners.)

Preparation

1. Access Earth science-related maps, graphs, and data for students to analyze. Identify lesson plans and activities that feature data resources in My NASA Data that students will analyze using the Data Literacy Cubes. You may want to print these for students to use. ***NOTE***: These tools can be used with other Earth Science models and visualizations commonly found in textbooks, websites, etc.
   a. Visit My NASA Data to identify content related to Earth Science topics. This website provides activities, lesson plans, and a data visualization tool, the Earth System Data Explorer. **To access NASA data** to use authentic Earth science data, visit the My NASA Data visualization tool, https://mynasadata.larc.nasa.gov/EarthSystemLAS/UI.vm/)
   b. **My NASA Data Cube Icons**: My NASA Data activities feature a Data Literacy cube icon. These icons indicate the compatibility of My NASA Data content to be used with the Data Literacy Cubes. Icons are displayed on the right side of My NASA Data webpages to indicate which activity could be used to engage students with the content on the page.

Maps

Line Graphs

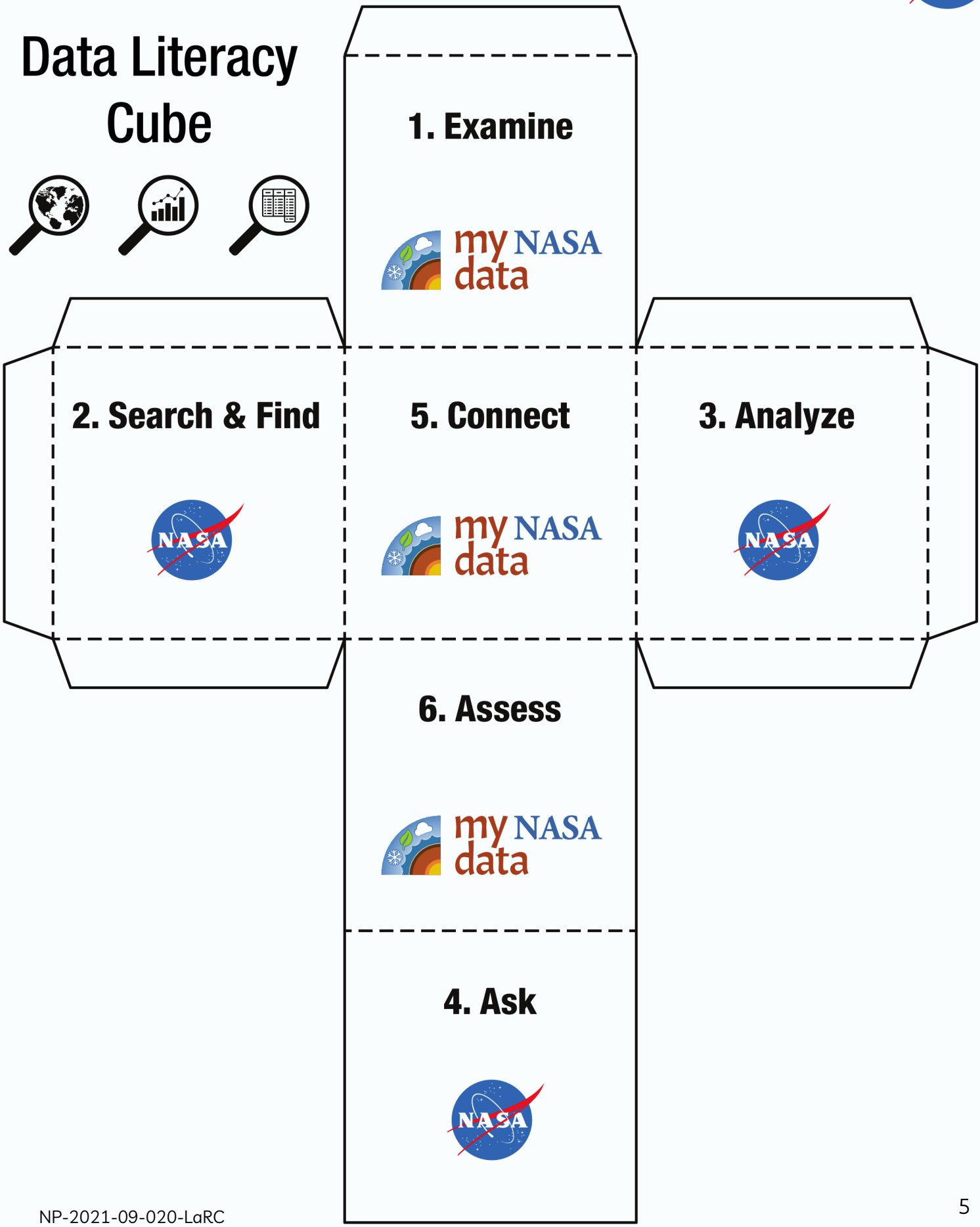
Data Sets

2. Print the appropriate question sheets for the Earth science materials you plan to use with students.
3. Print and prepare the Data Cube using the Cube Template for Students/Groups. (Note: You can also use gaming dice, virtual dice roller, etc. as a substitution.) Consider having students assemble their own cubes, individually or in teams, to foster a sense of ownership. If teams assembled the cubes, consider having the same teams use the cubes throughout the year and keeping the cubes in the classroom. You can also assign roles from the Task Cards. These roles can change throughout the year.
4. Assign question sheets to individual students or groups based on academic levels. Monitor students' progress over the year and assign new level question sheets as needed.
5. Print Task Cards for each group and other resources as needed. See the Task Card Blackline Master in this resource.

Steps

1. Distribute Earth Science maps, graphs, or data to students/groups, as well as cube or dice.
2. Distribute the appropriate leveled-question sheet to students/groups.
3. Prior to beginning the data analysis, consider the following:
    - Review the list of keywords and their meanings with students.
    - Identify any additional keywords your students need to know and add them in the space provided.
    - Use additional scaffolding strategies as needed. You may also wish to include strategies such as: draw pictures on the cube to show what each question is about, write words in their native language, jigsaw, Frayer Model, Round robin, fishbowl, think alouds, storyboards, etc.
4. Assign the roles from the Task Card to the students in each group.
5. Begin the data analysis by instructing students to roll the cube (or numbered die) to answer appropriate question/s. (Allow students to work in a small group setting while they roll the cube and respond to the questions).
    - If additional writing space is required, have students use regular notebook paper (or word processing document) and attach it to the question sheets.
6. Have each group share with another group or with the class after completing their question sheet.
7. Monitor student progress and assign new level sets as students reuse cubes throughout the year.

Data Literacy Cube



Task Card

Group _____

Role	Name of Student
Project Manager: You will help the group stay focused (no distractions), including keeping up with time.	
Data Manager: You will write the group's answers to the questions, and the group's summary of the data you are assigned.	
Chief Engineer: You will be responsible for selecting the random number (i.e., rolling the die, etc.) and making sure the members in your group respond to the appropriate question.	
Communications Manager: You will present and explain your group's summary of the questions.	
Extra Position:	

Group _____

Role	Name of Student
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Extra Position:	

Name: **Date:**

Map Cube Questions

Keywords (add more words):

area biggest value Earth System
least legend most smallest value

1. Examine- What do the colors of the map tell you? Look closely at the map.

a. The color I see the **most** is _____ .

b. The color I see the **least** is _____ .

c. The (day/monthly/year) on the map is _____.

2. Search and Find- Where on Earth do you see this map?

a. What part of the world does the map show? (For example, country, continent, ocean, etc.) _____

b. Point to a spot on the map and color this circle with a crayon (or pencil) of a matching color to show the color in the spot on the map.

c. The color in the spot I am pointing to tells me that the **area** on the map is _____ .

3. Analyze- What do the colors and numbers on the map tell you?

a. The color on one end of the **legend** is _____ . This means _____ .

b. The color on the other end of the **legend** is _____. This means _____ .

c. The number on one end of the **legend** _____ . This means_____.

4. Ask- What information do you want to know about the map?

a. I want to know _____.

b. How _____?

5. Connect- How do the data connect to the locations on the map?

a. The place with the **biggest value** or number is_____.

b. The place with the **smallest value** or number is_____.

c. What locations share similar values? Why do you think these are similar?

6. Assess- What information can you identify on the map?

a. The information on the map shows_____.

b. What part of the **Earth System** is this information related to air, water, land, ice, living things?

Name: **Date:**

Map Cube Questions

Keywords (add more words):

area biggest value Earth System
least legend most smallest value

1. Examine- What do the colors of the map tell you? Look closely at the map.

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b. What part of the **Earth System** is this information related to air, water, land, ice, living things?

Name: **Date:**

Map Cube Questions

Keywords (add more words):

Earth System highest value latitude least longitude
lowest value most pattern

1. **Examine**- What do the colors of the map tell you? Look closely at the map.
   a. The colors that show the **most** represent_____ .
   b. The colors that show the **least** represent_____ .
   c. The date(s) shown on the map (is/are) _____ .
2. **Search and Find**- Where on Earth do you see this map?
   a. Something or someplace I recognize on the map is _____ .
   b. The **latitude** goes from_____ to_____ .
   c. The **longitude** goes from_____ to_____ .
3. **Analyze**- What changes do you observe? What happened?
   a. The **highest values** show up in_____ areas. This means_____ .
   b. The **lowest values** show up in_____ areas. This means _____ .
   c. One **pattern** or change I observe is _____ .
4. **Ask**- What information do you want to know about the map?
   a. I want to know _____ .
   b. How _____ ?
5. **Connect**- How do the data connect to the locations on the map?
   a. The **latitude** and **longitude** of a place with the **highest value**/number is _____ .
   b. The **latitude** and **longitude** of a place with the **lowest value**/number is _____ .
   c. What locations share similar values? Why do you think these are similar?
6. **Assess**- What information can you identify on the map?
   a. Summarize the information that you learned from looking at the map.
   b. What part of the **Earth System** is this information related to?_____
   Example: atmosphere, biosphere, etc.

Name: **Date:**

Map Cube Questions

Keywords (add more words):

Earth System highest value latitude least longitude
lowest value most pattern

1. **Examine**- What do the colors of the map tell you? Look closely at the map.
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Name: **Date:**

Map Cube Questions

Keywords (add more words):

coordinates Earth System longitude latitude
time frame unit variable

1. Examine- What do the colors of the map tell you? Look closely at the map.

a. What **variable** is represented by the colors?

b. This **variable** explains _____.

c. The **unit** used for the **variable** is _____.
Example, cm, mm, inches, m, km, etc.

d. The **time frame** for the map is_____.

2. Search and Find- Where on Earth do you see this map?

a. The **latitude** and **longitude coordinates** are_____.

b. An area (or **coordinates**) with the highest values is _____.
This represents_____.
Example: North, West, Asia, Africa,13.4° N, 144.7° E

c. An area (or **coordinates**) with the lowest values is _____.
This represents_____.
Example: North, West, Asia, Africa,13.4° N, 144.7° E

3. Analyze- What changes do you observe? What happened?

a. I observe the following pattern_____.

b. What changes (or similarities) do you observe in the data values along lines of **latitude**? What may influence this pattern?

c. What changes (or similarities) do you observe in the data values along lines of **longitude**? What may influence this pattern?

4. Ask- What information do you want to know about the map?

a. My hypothesis is that if_____, then_____.

b. How many_____? How long _____? How often_____?

5. Connect- How do the data connect to the locations on the map?

a. Select a location on the map. What does the information on the legend tell you about the location?

b. Scan the entire map and select a few locations. How does the **variable** change?

c. What events or processes could cause these data **values** to change?

6. Assess- What information can you identify on the map?

a. Summarize the information that you observed on the map.

b. What part of the **Earth System** is this information related to atmosphere, biosphere, cryosphere, geosphere, or hydrosphere?

c. Explain the changes in this part of the **Earth System**?

d. How does this **variable** affect other parts of the **Earth System**?

Name: **Date:**

Map Cube Questions

Keywords (add more words):

coordinates Earth System longitude latitude
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c. Explain the changes in this part of the **Earth System**?

d. How does this **variable** affect other parts of the **Earth System**?

Name: Date:

Map Cube Questions

1. Examine- What do the colors of the map tell you?

a. The color scale represents the variable _____.
Example, temperature, precipitation, etc.

b. This variable explains _____.

c. What is the unit for the variable? _____
Example, cm, mm, inches, m, km, etc.

d. What is the range for the unit? _____

2. Search and Find- Where on Earth do you see 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. Analyze- What changes do you observe? What happened?

a. What patterns are there for the high values?

b. What patterns are there for the low values?

c. What time frame does this map represent?

4. Ask- What information do you want to know 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?

5. Connect- How do the data connect to the locations on the map?

a. Look at the legend on the map. What do you interpret that is happening?

b. How does the variable change by latitude and longitude on the map?

c. How do the values change by area?

d. What events or processes could cause these data values to change?

6. Assess- What information can you identify on the map?

a. Why do you think this variable changed by area?

b. How does this variable affect other parts of the Earth System?

c. How could you determine the impact of this variable on other parts of the Earth System?

Name: **Date:**

Map Cube Questions

1. Examine- What do the colors of the map tell you?

a. The color scale represents the variable _____.
Example, temperature, precipitation, etc.

b. This variable explains _____.

c. What is the unit for the variable? _____
Example, cm, mm, inches, m, km, etc.

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2. Search and Find- Where on Earth do you see 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. Analyze- What changes do you observe? What happened?

a. What patterns are there for the high values?

b. What patterns are there for the low values?

c. What time frame does this map represent?

4. Ask- What information do you want to know 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?

5. Connect- How do the data connect to the locations on the map?

a. Look at the legend on the map. What do you interpret that is happening?

b. How does the variable change by latitude and longitude on the map?

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a. Why do you think this variable changed by area?

b. How does this variable affect other parts of the Earth System?

c. How could you determine the impact of this variable on other parts of the Earth System?

Name: Date:

Graph Cube Questions

Keywords (add more words):

axis axes graph highest horizontal line graph lowest shortest vertical

1. Examine- What are the parts of the **graph**? (Look for clues in the title.)

a. The information on the line **graph** shows _____ .

b. What does the **horizontal axis** represent? (This is usually on the bottom with numbers.) The **horizontal axis** represents_____ .

c. What does the **vertical axis** represent? (This is usually on the left with numbers). The **vertical axis** represents _____ .

d. What are the **lowest** numbers on the **horizontal** and the **vertical axes**? The **lowest** numbers are _____ and _____.
horizontal vertical

e. What are the **highest** numbers on the **horizontal** and **vertical axes**? The **highest** numbers are _____ and _____ .
horizontal vertical

2. Search and Find- How is the information connected in the graph?

a. Place an X on the high points of the **line graph**. Draw a line connecting the high points.

b. Place an O on the low points of the **line graph**. Draw a line connecting the low points.

3. Analyze- How do the numbers change in the **graph**?

a. The changes on the **line graph** that I see are _____ .

b. The biggest change on the **graph** is_____ . This represents _____ .

4. Ask- What do you want to know about the information from the **line graph**?

a. Why _____?

b. How much_____ ?

5. Connect- How can we use this information to help us?

a. I think_____ would be interested in this **graph**. (Example: farmers, etc.)

b. A community member can use this information to_____ .

6. Assess- What information do you see on the **graph**?

a. Look at the **line graph** (not the **axes**). Describe its shape (Example, straight, curve, hill, zig zag, etc.) _____ .

b. What does the tallest point of the **line graph** show? The point shows_____ .

c. What does the **shortest** point of the **line graph** show? The point shows_____.

Name: Date:

Graph Cube Questions

Keywords (add more words):

axis axes graph highest horizontal line graph lowest shortest vertical

1. Examine- What are the parts of the **graph**? (Look for clues in the title.)

a. The information on the line **graph** shows _____ .

b. What does the **horizontal axis** represent? (This is usually on the bottom with numbers.) The **horizontal axis** represents_____ .

c. What does the **vertical axis** represent? (This is usually on the left with numbers). The **vertical axis** represents _____ .

d. What are the **lowest** numbers on the **horizontal** and the **vertical axes**? The **lowest** numbers are _____ and _____.
horizontal vertical

e. What are the **highest** numbers on the **horizontal** and **vertical axes**? The **highest** numbers are _____ and _____ .
horizontal vertical

2. Search and Find- How is the information connected in the graph?

a. Place an X on the high points of the **line graph**. Draw a line connecting the high points.

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b. What does the tallest point of the **line graph** show? The point shows_____ .

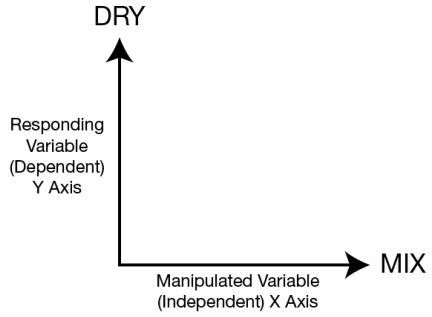
c. What does the **shortest** point of the **line graph** show? The point shows_____.

Name: **Date:**

Graph Cube Questions

Keywords (add more words):

data decrease graph increase label time range
unit scale time range variable X-axis Y-axis



1. Examine- What are parts of the **graph**?

a. The title tells me _____ .

b. The **label** on the **x-axis** is _____ .

The **label** on the **y-axis** is _____ .

c. The **unit** on the **x-axis** is _____ .

The **unit** on the **y-axis** is _____ .

d. The **scale** on the **x-axis** is_____ . The **scale** on the **y-axis** is _____ .

2. Search and Find- How is the information connected in the graph?

a. Place an X on the high points of the **graph**. Draw a line connecting these points.

b. Place an O on the low points of the **graph**. Draw a line connecting these points.

c. The **time range** for the data is from_____ to _____.

3. Analyze- How do the numbers in the **graph** change?

a. Look at the **data**. Describe their shape. (Example, straight, curve, hill, etc.).

b. The bottom of the **graph** is the ____ **axis**. This manipulated **variable** is _____.

c. The left side of the **graph** is the____ **axis**. This responding **variable** is_____.

d. The numbers on the **graph** show_____.

4. Ask- What are questions you can answer with these **data**?

a. Why _____?

b. How much _____ ?

5. Connect- How can we use this information to help us?

a. I think _____ would be interested in this **data**. (Example: farmers, etc.)

b. How could this community member use these **data**?

6. Assess- What information do you see on the **graph**?

a. Look at the **line graph** (not the **axes**). Describe its shape. (Example, straight, curve, hill, zig zag, etc.) The shape is _____ .

b. The data from the **graph** _____. (Example: **increase**, **decrease**, etc.)

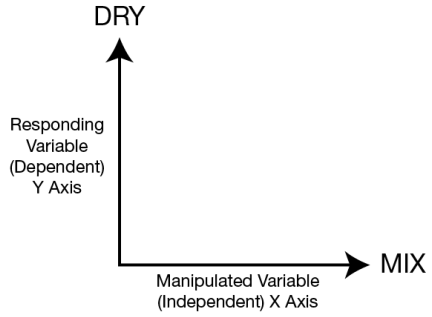
c. The information on the **graph** tells me that _____ .

Name: **Date:**

Graph Cube Questions

Keywords (add more words):

data decrease graph increase label time range
unit scale time range variable X-axis Y-axis



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6. Assess- What information do you see on the **graph**?

a. Look at the **line graph** (not the **axes**). Describe its shape. (Example, straight, curve, hill, zig zag, etc.) The shape is _____ .

b. The data from the **graph** _____. (Example: **increase**, **decrease**, etc.)

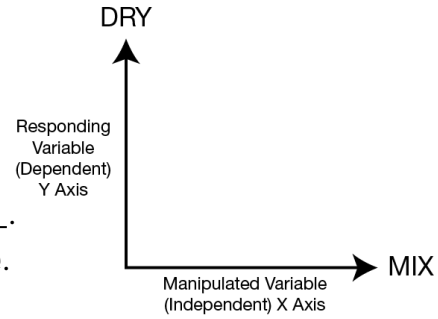
c. The information on the **graph** tells me that _____ .

Name: **Date:**

Graph Cube Questions

Keywords (add more words):

characteristics dependent variable independent variable
unit variable X-axis Y-axis



1. Examine- What are parts of the graph?

a. The name of the **variable** on the **x-axis** is_____ .
It is the _____ **variable**.
independent, dependent

b. The name of the **variable** on the **y-axis** is _____.
It is the _____ **variable**.
independent, dependent

c. The **unit** on the **x-axis** is _____.
The **unit** on the **y-axis** is _____.

d. The scale on the **x-axis** is_____. The scale on the **y-axis** is _____.

2. Search and Find- How is the information connected in the graph?

a. Place an X on the high points of the graph. Draw a line connecting these points.
b. Place an O on the low points of the graph. Draw a line connecting these points.
c. The time range for the data is from _____ to _____.

3. Analyze- How do the data in the graph change?

a. What are the changes that you see happening on the line graph?
b. When/where do you see the most change in the data?
c. When/where do you see the least change in the data?

4. Ask- What are questions you can answer with these data?

a. What are the **characteristics** of _____?
b. When did _____ happen?
c. How does _____ compare/contrast with _____?

5. Connect- How can we use this information to help us?

a. What parts of the Earth are affected by this?
b. What do you think may cause these events?
c. What community members may need these data? Why?

6. Assess- What information do you see on the graph?

a. As the **independent variable** _____, the **dependent variable** will _____.
increase(s), decrease(s), stay(s) the same **increase(s), decrease(s), stay the same**

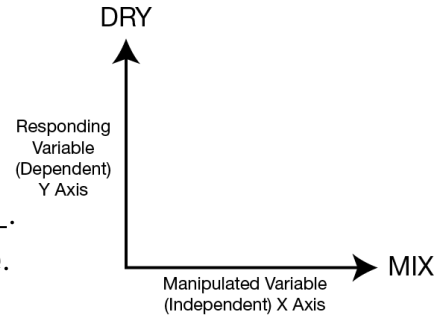
b. Based on what you know about these science variables, explain the data.

Name: **Date:**

Graph Cube Questions

Keywords (add more words):

characteristics dependent variable independent variable
unit variable X-axis Y-axis



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independent, dependent

b. The name of the **variable** on the **y-axis** is_____.
It is the _____ **variable**.
independent, dependent

c. The **unit** on the **x-axis** is _____.
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b. Based on what you know about these science variables, explain the data.

Name: **Date:**

Graph Cube Questions

1. Examine- What are parts of 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. What geographic location does the data on the graph represent?

2. Search and Find- How is the information connected in the graph?

a. Place X on the high points of the line graph. Draw a line connecting the points.

b. Place O on the low points of the line graph. Draw a line connecting the points.

c. Do the data repeat in recognizable ways? Explain.

d. What kinds of patterns or trends do you see in the distribution of the data? Explain.

e. How do the patterns you see in the graph relate to other things you know?

3. Analyze- How are the data in the graph related?

a. Describe the relationship between the variables: positive, negative, or none.

b. Brainstorm one science variable that you predict to be directly proportional.

c. Brainstorm one science variable that you predict to be inversely proportional.

4. Ask- What are science questions you can answer with these data?

a. What are the attributes of _____?

b. What would happen to _____ if _____?

c. How does _____ compare/contrast with _____?

5. Connect- How can we use this information to help us?

a. I think_____ would be interested in these data because _____ .

b. What real-world problems could this community member use these data to solve?

c. What parts of the Earth System are involved in this/these events?

d. What other science processes are related to this event?

6. Assess- What information do you see on the graph?

a. What is the numerical range of the data? Mean? Median? Mode?

b. How is the mean different from the mode in these data?

c. Are there any outliers? If so, what are they?

Name: **Date:**

Graph Cube Questions

1. Examine- What are parts of 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?

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Name: Date:

Data Cube Questions

Keywords (add more words):

collect/collected data highest value instrument
lowest value measure

1. Examine- What are the data (information) about?

a. The **data** (information) are about _____ .
Example: air temperature, precipitation, plants, etc.

b. By looking at the **data** I see _____ .

2. Search and Find- How were the data **measured**?

a. The **data** were **collected** by _____ .
Example: me, scientist, satellite, etc.

b. The **instrument** used to **measure** this **data** was a/an _____ .
Example: thermometer, ruler, etc.

3. Analyze- What do the **data** show?

a. The place on Earth where the **data** were **collected** is _____.
Example: city, state, latitude/longitude, global, etc.

b. I observe that the time when the **data** were **collected** is _____
Example: month, year, day, etc.

4. Ask- Write your own questions using the **data**.

a. Why _____?

b. How _____ ?

5. Connect- How can we use this information to help us?

a. These **data** help us understand _____ .

b. These **data** can help scientists by _____ .

6. Assess- What does the information tell you? Calculate or estimate using the **data**.

a. The **highest value** is _____ . The **lowest value** is _____ .

b. Graph the **data** (use graph paper or create your own graph to show your information).

Name: Date:

Data Cube Questions

Keywords (add more words):

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lowest value measure

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Name: Date:

Data Cube Questions

Keywords (add more words):

collect/collected data geographic area highest value
lowest value time range unit

1. Examine- What are the **data** (information) about?

a. The **unit** used for the **data** is _____ .
Example: °C, cm, kg, etc.

b. The **data** represent (are about) _____ .
Example: temperature, distance, mass, etc.

2. Search and Find- How were the data measured?

a. The data were **collected** every _____ .
Example: day, week, month, year, etc.

b. The data were **collected** by _____ .
Example: me, scientist, satellite, etc.

3. Analyze- What does the information tell you? Calculate or estimate the numbers. using the **data**.

a. The **highest value** is _____ and represents _____ .

b. The **lowest value** is _____ and represents _____ .

c. The pattern/s I see _____ in the **data** is/are _____.
Example: the most, the least, etc.

4. Ask- Write your own questions using the **data**.

a. Why does _____ ?

b. How can _____ ?

5. Connect- How can we use this information to help us?

a. These **data** help us understand _____ .

b. These **data** help explain why _____ .

c. These **data** can help scientists understand _____ .

6. Assess- What do the **data** show?

a. The **geographic area** of Earth where the data were **collected** is _____.
Example: city, state, latitude/longitude, global, etc.

b. The **time range** (when did it happen?) is from _____ to _____.
Example: Monday, October, 12:00, etc.

c. Graph the **data.** (Use graph paper or create your own graph to show your information.)

Name: Date:

Data Cube Questions

Keywords (add more words):

collect/collected data geographic area highest value
lowest value time range unit

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Name: Date:

Data Cube Questions

Keywords (add more words):

central tendency data Earth System mean median mode phenomenon sphere time range variable unit

1. Examine- What are the **data** about?

a. The **variable** is _____ . It represents _____ .

b. The independent **variable** is _____ .

c. The dependent **variable** is _____ .

2. Search and Find- How were the **data** measured?

a. The _____ instrument collected these data.

b. The **data** are collected every _____ .
Example: day, week, month, quarter, year, etc.

c. The **unit** used to describe the data is _____ .
Example: °C, cm, kg, etc.

3. Analyze- What does the **data** show?

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**.
Example: Hydrosphere, Atmosphere, etc.

4. Ask- Write your own questions using the **data**.

a. How do..., Why..., What is... _____ .

b. I would like to compare _____ with these **data** because _____ .

c. How do these **data** affect another **sphere** in the **Earth System**?

5. Connect- How can we use this information to help us?

a. These **data** help us understand _____ .

b. These **data** can explain the **phenomenon** of _____ because _____ .

6. Assess- What does the information tell you? Calculate or estimate the numbers using the **data**.

a. The range of the **data** is _____ .

b. The data's **mean** is equal to _____; **median** _____; **mode** _____ .

c. The measure of **central tendency** that best represents the data is the _____ . This is because _____ .
mean, median or mode

d. Graph the **data** (use graph paper or create your own graph to show your information).

Name: Date:

Data Cube Questions

Keywords (add more words):

central tendency data Earth System mean median mode
phenomenon sphere time range variable unit

1. Examine- What are the **data** about?

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Name: Date:

Data Cube Questions

1. Examine- What are the data about?

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. Search and Find- How were the data measured?

a. What instrument/s collected these data?

b. How frequently were the data collected?

c. What unit describes the data?

3. Analyze- What does the data show?

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. Ask- Write your own 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.)

5. Connect- How can we use this information to help us?

a. What kinds of research questions could we use these data for?

b. Describe how you may use these data to explain a naturally occurring event.

c. How is technology connected to these data?

6. Assess- What information do you see on the graph?

a. Are there any outliers? If so, what are they?

b. Do the outliers meet your expectations? Why/Why not?

c. Graph the data (use graph paper or create your own graph to show your information).

Name: **Date:**

Data Cube Questions

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