Overview

Use the Data Literacy Cubes to guide students’ exploration of mapped data of the Earth System to enrich their observations and inferences. This is a flexible resource that may be used with a variety of mapped images. This activity requires a map of Earth data for students to evaluate.

Learning Objectives
• observe and interpret physical characteristics of the Earth System using maps of NASA data
• analyze how the phenomena changes of time and space
• brainstorm the phenomena connects to other parts of the Earth System
• identify patterns and relationships in data

Essential Questions

• How are the data represented in the model?
• How do we identify a change in these data?
• Where on Earth were these data collected?
• When were these data collected?
• What areas have high and low values? Why?
• What other questions do you have about the map?

Materials Required

• 1 Map Cube per group/student
• 1 differentiated Map Cube Question Sheet per student
• 1 sheet of paper per student
• Pencil
• *Dataset:
  ○ Vegetation Map in December
  ○ Vegetation Map in June

• *MND offers a variety of Earth System maps to integrate with the Data Literacy Cube tool.
  Look for the icon which indicates that activities have an appropriate map. To access and download mapped data, visit the MND Data Visualization Tool, Earth System Data Explorer.

• Teacher Preparation:
  ○ Print copies of the cube on cardstock and cut out. Assemble the cube with glue. Note: consider laminating after you cut these out for multiple uses. (Gaming dice may be substituted for the cubes.) Also, print off copies of the differentiated Map Cube Questions. Distribute to students for group or independent work

Procedure

1. Distribute one Map Cube per group, as well as the differentiated Map Cube Question sheets, and mapped images.
2. Students roll the cube and find the matching question on the Map Cube Question sheet.
3. Answer one question found under matching question on a sheet of paper, labeling the question with the number and letter of the question.
4. Repeat Steps 2-4 until at least 10 are answered.
Map Cube

1. Examine the map.

2. Where on Earth is this map?

3. Summarize the map.

4. Analyze the map.

5. When were the data on this map collected?

6. Ask a question about the map.

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 largest 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 dates 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 areas with the highest values have __________. This represents __________.
   B. The areas with the lowest values have __________. 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 __________.
   B. How many? How long? How often?

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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 _____.
   B. The longitude goes from _____ to _____.
   C. 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 _______ to _______.

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.