Student Directions

Analyzing Air Temperature Graphs

This graph illustrates the change in global surface temperature relative to 1951-1980 average temperatures.
Goal: Use the Data Literacy Cubes to guide your exploration of a graph showing air temperature changes over time.

Materials:

- 1 Graph Cube per group/student
  - or Virtual Dice app available
  - or die
- 1 differentiated Graph Cube Question Sheet per group/student
  - See Google Forms for differentiated learning in virtual format. (Virtual Teachers: Make a copy of the Google Form of your choice so that you may assign it directly from your Google Drive into your Learning Management System (e.g., Google Classroom, Canvas, Schoology, etc.). Do you need help incorporating these Google Forms into your Learning Management System? If so, read this Guide to Using Google Forms with My NASA Data.)
- 1 sheet of paper per student
- Pencil

Procedure:
1. Distribute one Graph Cube (or die) per group (or virtual students may use a virtual dice app), as well as the differentiated Graph Cube Question sheet.
2. Students roll the cube and find the matching question on the Graph Cube Question sheet. E.g., “Assess the data values.”
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.
Teachers, these mini lessons/student activities are perfect "warm up" tasks that can be used as a hook, bellringer, exit slip, etc.

Teachers who are interested in receiving the answer key, please contact MND from your school email address at larc-mynasadata@mail.nasa.gov. We verify that requestors are teachers prior to sending access to the answer keys as we’ve had many students try to pass as teachers to gain access. To receive the keys please provide the following:

1. The link to the school/institution’s teacher directory where you are employed so we can verify that you are a teacher
2. Ensure that the school email address is provided in your response as we are unable to send to personal email accounts

**Access and Explore Data**

- [Global Atmospheric Temperatures](#)
- [Global Land-Ocean Temperature Index](#)
- [Atmospheric Global Temperature Differences Time Series: 1884-2017](#)
- [Data Literacy Cube Page](#)
- [Instructional Strategies for the Earth Science Classroom](#)