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Course/Grade: Math/Grade 6

Lesson Title: Global Data Infographics

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| **Stage 1 Desired Results** | | |
| ESTABLISHED GOALS  Montana State Common Core Standards  G1: 6.SP.A.1 - Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for its answers.  G2: 6.SP.A.2 -- Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.  G3: 6.SP.A.3 -- Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.  G4: 6.SP.B.4 - Display numerical data in plots on a number line, including dot plots, histograms, and box plots.  G5: 6.SP.B.5 - Summarize numerical data sets in relation to their context, such as by:   1. reporting the number of observations. 2. describing the nature of the attribute under investigation, including how it was measured and its units of measurement. 3. Giving quantitative measures of center and variability, as well as describing the overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. 4. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. | ***Transfer*** | |
| *Students will be able to independently use their learning to…*  *T1: Critically analyze data.*  *T2: Use data to create graphs that show a true representation of a situation.*  *T2: Connect information from multiple sets of data to* | |
| ***Meaning*** | |
| UNDERSTANDINGS  *Students will understand that…*  *U1: Graphics can be used to enhance the sharing of information.*  *U2: Data is critical to supporting research claims.*  *U3: Math is a critical component of studying the world.*  *U3: Data can be skewed and misrepresented by manipulating scales, graph type, etc.* | ESSENTIAL QUESTIONS    E1: How can you use math (graphing) to share real-world information?  E2: What is a topic that affects the world? How can this topic be researched?  E3: What styles, types of graphs draw readers in? Can you create an inforgraphic that utilizes these qualities? |
| ***Acquisition*** | |
| *Students will know…*  *K1: How to create multiple graphs and infographs including histograms, box and whisker plots, and bar graphs.*  *K2: How to manipulate the graphs to change the graph’s message.*  *K3: Not all data is created equally.*  *K4: There is a difference between numeric and categorical data. Different graphs must be used for different types of data.*  *K5: A measure of the middle and variability can represent that data in different ways.* | *Students will be skilled at…*  *S1: Analyzing and creating graphs*  *S2: Researching a specific topic and finding reliable and pertinent information.*  *S3: Creating an infographic that quickly relays important and pertinent information.*  *S4: Finding mean, median, mode, and variability and decide which measure of the middle is the most representative.* |
| **Stage 2 - Evidence** | | |
| **Evaluative Criteria** | **Assessment Evidence** | |
| 1. District Persuasive Writing Rubric   2. Identify global issues that can be studied through data.  3. Pertinent and reliable data collected, clear analysis of topic: including trends and variances in the data. District Expository Writing Rubric  4. Infographic Rubric - Final  5. Presentation Rubric | TRANSFER TASK(S):   1. **Data Analysis and Bias:** Analyze multiple graphs that show the same data. The data used for this activity will display a current global issue. Discuss how graphs can be skewed to reflect different bias. Students will write a persuasive paper choosing the graph(s) that they think best represents that data without a bias. 2. **What is a Global Issue?:** Explore current issues that affect the world and can be studied through data. Use various websites to explore potential topics and share preliminary findings with class. (gapminder, un, etc.) 3. **Data Collection and Analysis:** Choose a topic that interests you from the list or a new idea. Collect data and information that is reliable about this topic that will be shared through an infographic. As you are collecting data begin thinking about what connections you can make, what interesting trends or variances are in the data, how can you best represent the data, and the most important points that the data shows. 4. **Create Inforgraphic:** Using the tools provided create an infographic that displays the data you have collected in an informative and interesting manner. Your data should be clearly displayed, easy to read and the important connections or points should be easy for the reader to understand. 5. **Presentation:** Students will share their info graphics with the class. I will also explore the potential of students sharing in other classes and at a staff meeting. I will possibly video some of the presentations to share with larger groups. | |
|  | OTHER EVIDENCE:  1. Observation of students during class work time.  2. Class and individual discussions with students. | |
| **Stage 3 – Learning Plan** | | |
| *Summary of Key Learning Events and Instruction*   * ***Lesson 1 (3 days) Data Analysis and Bias:***    + ***Day 1:*** *Each table of two students will be given a graph that represents the same data. They will be told that they are all looking at graphs of the same information. There will be 6+ different representations of the data handed out. Students will look at the graph with their partner and come up with five pieces of information that they learn from the graph. Groups will then share out with the class. Through this sharing out students will begin to question if their classmates are reading the graph correctly. Initially I will limit some of this conversation, but ask students to keep it in mind as we continue. Students will then pass their graphs to the next table and we will repeat this process with two more passes. As we progress further with the analysis the discussion will turn to why this can happen since it is the same data. We will discuss the use of biased graphs on the media and the importance of being a critical reader of graphs.*   + ***Day 2 and 3:*** *Students will be writing a persuasive paper on which graph(s) presented on Day 1 best represent the data. Students will be required to site specific information in their writing and clearly defend their position. On Day 2 we will start by filling out a graphic organizer to help students structure their writing. The final draft will be hand written and due at the end of Day 3. As time permits students will peer edit and revise their papers.* * ***Lesson 2 (1-2 Days):*** *To start this lesson I will show* [**http://www.gapminder.org/videos/200-years-that-changed-the-world-bbc/**](http://www.gapminder.org/videos/200-years-that-changed-the-world-bbc/) *or* [**http://www.youtube.com/watch?v=hVimVzgtD6w**](http://www.youtube.com/watch?v=hVimVzgtD6w) *depending on time. The second video is 20 minutes. Through this video we will discuss the topics shown in the video and the idea of studying a global issue. We will also discuss how the way the data is shown on* [**gapminder.org**](http://gapminder.org) *tells a story that can be more easily interpreted and understood than a static graph. I will share many infogrpahics that I have collected and introduce the big project to students. I will then set students the task of using* [**gapminder.org**](http://gapminder.org)*,* [**http://www.un.org/en/globalissues/**](http://www.un.org/en/globalissues/)*, and iPad apps: UN Country Stats, Climate Change Data Finder 2.5, The Economist World Figures and EdStats Data Finder. Students will begin exploring potential topics and what countries they would study in association with those topics. Students will then share out their findings and we will create a class list of topics and countries.* * ***Lesson 3 (4-5 Days):*** *Students will choose a global topic and identify the countries that will be studied. They will use various resources to collect data and analyze the information. Once all the data has been collected and analyzed students will write an expository paper sharing the information collected and drawing conclusions about what the data represents.* * ***Lesson 4 (2-3 Days):*** *Students will create their infographics using the web tools provided. Students will create an infographic that clearly displays the pertinent data and uses minimal words to create connections and highlight the most important points from the data.* * ***Lesson 5 (1-2 Days):*** *Students will present their infographics to the class. I will also arrange for students to share with other classes and possibly at a staff meeting.* | | |

This lesson focuses primarily on investigating the world. Students will be identifying an issue, use a variety of sources to collect data, and analyze and synthesize the data to draw defensible conclusions.