ECCI Program 2018

For the past two years, I had students create a poster to review the different statistic measures that were taught over one unit. Instead of me giving them problems/data to work with, I had students create their own story and create their own data. (Students got extra credit if they recorded their own data instead of making it up.) They had free range to create any story and data—the possibilities were endless as there were no set restrictions. However, I was never very impressed with the stories and data that they created, even though creativity was a required part of the rubric. With me already thinking about changing the guidelines and having this class in mind as a focal point, I decided that I should make them create data that represents their personal narrative. The guidelines in the assignment now include: “I would like you create a scenario that teaches me about you, your family, and/or your culture”. From this, I simply want to learn something new about each student through this activity.

Each student has a unique backstory to their socialization and individual development; as a Math teacher, I typically do not get to engage that reflective and linguistic side of my students to see what makes them “them.” With the change in this activity, I get to gain an inside look at my students’ history from their eyes. This task allows student-choice, reflective practice, and personal connections to cultural understanding. I hope to challenge my students to pick a feature of their history that best represents them while incorporating real-life data to utilize relevant application of our class content.

Additionally, I want to change examples throughout the unit before this assignment. Not only will this foreshadow the assignment, but then students will have more meaningful problems to work with (instead of going through the routine of just practicing the concepts). They will be able to learn about new cultures while practicing their statistics. The goal is to provide a variety
of culturally responsive examples throughout the unit before handing them this assignment, so they already have an idea of how data can represent a story. (Some new examples are provided on page 7.)

Several of our readings, spring orientation, and my experience at camp have impacted my change in this lesson. According to *Alaska Native Education: History and Adaptation in the New Millenium* by Angayuqaq Oscar Kawagley, there is a great quote in the fourth section: “The majority of teachers [of the Yupaiq children] are from the outside world and have little or no knowledge of the people with whom they are going to be working”. This quote (and the article in general) is good reminder that the history of the Alaska Native population has been targeted for adaptation, thus having a difficult time maintaining who they are. Even during my camp experience, the elders shared that the youth no longer know their deep roots and their Native language (one of the reasons for maintaining the culture camp). The elders found it important to share stories with the children and to have Native language discussion time. I strongly believe that my lesson will give students an opportunity now to reflect and showcase something meaningful about them—hopefully something embedded into who they are and they can use it as a teaching experience. Having the students showcase who they are is similar to how the elders shared values of the Athabascan culture, thus maintaining the history.

Additionally, as found in our reading by CHiXapkaid, a survey commenter made a very valid point that it is important “to know oneself beginning with knowing who you are and where you come from.” (p. 9). Also, 97% of the survey participants believe that it is important for Native students to know “his/her own self-worth” (p. 10). Taking time to give students an opportunity to reflect on who they are and realizing their important history is a very vital experience for all students. The study in the CHiXapkaid was a great reminder about how there
is more to teaching than just the content. We need to acknowledge our students as individuals and to embrace the diversity in our classroom. If we can embrace who our students are, hopefully they will see the impact that learning can have on them and their community. The last part of the guidelines now asks students to make conclusions based on their findings. This will allow students to personally apply what they learned hopefully making it a more meaningful experience.

According to the optional reading of *Culturally Based Math Education as a Way to Improve Alaska Native Students’ Math Performance* by Jerry Lipka and Barbara Adams, they completed a study researching if *Building a Fish Rack* module positively impacts students succeeding with the math curriculum on area and perimeter. *Building a Fish Rack* provided examples around salmon and fishing, making it relatable to the participating Alaska Native and American Indian participants (p.8-9). They did find fairly good success (but with the understanding that more research needs to be done) with those that learned the curriculum through *Building a Fish Rack* tested better than those that were taught the standard curriculum (p.19). The researchers believed that because the *Building a Fish Rack* module includes such relatable concepts, the students found it more meaningful to learn the content. This can most likely apply to any learner: if something is relatable and meaningful, one is probably more likely to put more effort into learning the content. Therefore, hopefully with the change in the lesson, students will have more meaning to complete the assignment and take the initiative to learn the concepts, which will allow them to learn something new through the statistics about their culture.

Lastly, the *Double-Check* reading was very informative on the needs to self-reflect as a teacher—including what our own culture is. Additionally, the article discusses how positive relationships with students can help lower the number discipline problems (p. 5). These were just
two of the points in the article, but both influenced my thinking for this change in my lesson. As a student growing up, I personally loved to highlight information about me. I remember teachers making connections with me, and they checked in if I shared something current. With the understanding that some students may have the hard time to share something personal (which is why the assignment is still pretty open), I strongly believe that personal connections with my students will be formed. Again, as a math teacher, I feel that I miss out on a lot of these opportunities to connect with students (in relation to language arts teachers, especially). Not only do I believe that this assignment will allow me to understand my students better, but all of my students—no matter their background—will be able to understand themselves better, too.

In summary, changing this assignment to have a focus on the student (instead of full free range) will give the students a direct opportunity to share a story about their personal narrative. I hope this activity will resonate with students making it more meaningful. Also, this will provide the class a chance to learn about different backgrounds and other students’ cultures, as students will be able to share with their peers. Positive relationships should be formed when we all are learning about each other. Having a little more set focus in the guidelines will hopefully shape original and personal stories through the scenario. With the emphasis on examples provided through the unit, students should feel well-equipped to share about themselves through their story, data, and statistics. I strongly believe that these few minor changes in the assignment will positively impact the assignment tremendously.

The original and new guidelines along with original and new unit examples are next (p. 5-10).

**ORIGINAL EXAMPLES During the Unit**

Name_______________________________ Date__________________ Period______

1. Find the mean, variance, and standard deviation for the set of values.

21, 28, 23, 26, 5, 12, 6, 19, 31
2. Find the mean, variance, and standard deviation for the set of values.

23, 16, 15, 18, 20, 17, 4, 7, 15

3. Find the mean, variance, and standard deviation for the set of values.

25, 19, 5, 21, 18, 22, 17, 10, 7

**ORIGINAL GUIDELINES:**

Name__________________________________
Algebra Creative Thinking Mini-Poster (Showcasing Statistics)
Guidelines

Congrats on finishing the last unit of the first semester! Let’s be creative to improve and to prove our understanding. Complete the following steps on a clean sheet of computer paper while making it look presentable. (However, step 1 is done on scrap paper or in your head.)
1. Brainstorm a scenario where you might have to take data and create your own values to be used as a data set for that scenario. You must create at least 10 data points. Example: I want to know how many cats everyone owns, so I poll some students. I get the following as my data: 1, 0, 2, 3, 1, 0, 0, 0, 12, 2. Other examples: Inches of snow each day in December, the number of points your team gets each game, how many steps you walk each day over a period of time, etc. The possibilities are endless! However, you get points for being creative, so think outside of the box!

2. Now, create a title for your poster. Also, neatly write out the scenario (in a few sentences) and your 10+ data values.

3. On your poster, put the following information in a box including ALL WORK necessary to prove you found your answer correctly: mean, median, mode, range, mean absolute deviation (M.A.D.), variance, and standard deviation. Note: If you do not have enough work (meaning you just gave the MAD value, etc.) then you will not get credit. Therefore, if you are using a calculator, be careful in showing what your calculations were.

4. In a bubble/box on your poster, create a stem and leaf plot for your data.

5. In another bubble/box, create a histogram for your data.

6. In another bubble/box, create a box and whiskers plot for your data.

If you have extra time: Create a different scenario that involves two variables (x and y values). You will need to create an input-output (x-y) table to show the different ordered pairs. Create a graph (scatter plot) using graph paper. Create the line of best fit (aka trend line), and find the equation of the line.

ORIGINAL RUBRIC:
## Making A Poster: Creative Thinking Mini-Poster

**Teacher Name:** Ms. Hild-Ladebauche

**Student Name:**

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
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<tbody>
<tr>
<td><strong>Content - Accuracy</strong></td>
<td>Shows mastery of understanding and correct formulas being used to find appropriate values. Graphs/plots are correct. There are little to no mistakes.</td>
<td>Shows mastery of understanding and correct formulas being used to find appropriate values. Graphs/plots are correct. However, there are several mistakes.</td>
<td>There is good understanding of the content; however, there are still quite a few gaps in understanding.</td>
<td>There is little to no understanding on the different concepts.</td>
</tr>
<tr>
<td><strong>Creativity</strong></td>
<td>The data and story display a very creative story.</td>
<td>The data and story display an accurate (and somewhat original) story.</td>
<td>The data and story are very basic.</td>
<td>There is little to no originality in the story/data.</td>
</tr>
<tr>
<td><strong>Required Elements</strong></td>
<td>The poster includes all required elements as well as additional information.</td>
<td>All required elements are included on the poster.</td>
<td>All but 1 or 2 of the required elements are included on the poster.</td>
<td>Several required elements were missing.</td>
</tr>
<tr>
<td><strong>Attractiveness</strong></td>
<td>The poster is exceptionally attractive in terms of design, layout, and neatness.</td>
<td>The poster is attractively in terms of design, layout, and neatness.</td>
<td>The poster is acceptably attractive though it may be a bit messy.</td>
<td>The poster is distractingly messy or very poorly designed. It is not attractive.</td>
</tr>
<tr>
<td><strong>Use of Class Time</strong></td>
<td>Used time well during class. Focused on getting the project done. Never distracted others.</td>
<td>Used time well during class. Usually focused on getting the project done and never distracted others.</td>
<td>Used some of the time well during class. There was some focus on getting the project done but occasionally distracted others.</td>
<td>Did not use class time to focus on the project OR often distracted others.</td>
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NEW EXAMPLES to be incorporated now before the assignment/throughout the unit:

1. Show video of the 1-foot high kick competition at:
   https://www.youtube.com/watch?v=zcYEDFw-S9U
   Find the mean, median, mode, range, mean absolute deviation (M.A.D.), variance, and standard deviation of the recent results of the one-foot high kick of the World Eskimo-Indian Olympics (WEIO):

   Contestants’ Results (Men and Women):  (Data found through the WEIO website.)
   
   79 inches
   74 inches
   74 inches
   100 inches
   93 inches
   92 inches

2. Show video introducing the Yukon Quest at:
   https://www.youtube.com/watch?v=EyveAvxcgN4
   Create a stem and leaf plot, histogram, and box & whiskers plot for:

   Number of dogs per team that completed the 2018 Race (found at YukonQuest.com):
   
   14
   11
   8
   11
   12
   12
   11
   8
   8
   10
   8
   12
   7

What are different conclusions that you can form based on the different statistics? What do these tell you about each of the different events?
NEW GUIDELINES:
Name________________________________
Algebra Mini-Poster (Showcasing Statistics in Your Culture)
Guidelines

Congrats on finishing the last unit of the first semester! Let’s be creative to improve and to prove our understanding. Complete the following steps on a clean sheet of computer paper while making it look presentable. (However, step 1 is done on scrap paper or in your head.)

1. Brainstorm a scenario where you might have to take data. However, the scenario needs to represent you. I would like you to create a scenario that teaches me about you, your family, and/or your culture. You must create at least 10 data points to go with your scenario. The ultimate goal is to tell a story about yourself/your culture through your story and statistics. Example 1: Maybe a lot of people in your family hunt. Therefore, you could find out some cool statistics around hunting—like how many days are your different hunting trips, how many animals are hunted during each trip, or how many hours are spent waiting each day to find a moose, etc. Example 2: Maybe your family is very active and you enjoy hiking each weekend. You could find out the different lengths of each of the different hikes, how many hours of hiking, or how much elevation gain.

2. Now, create a title for your poster. Also, neatly write out the scenario (in a few sentences) and your 10+ data values. Write the scenario out as if you were telling a story. Remember to include details to allow the reader to learn about you, your family, and/or your culture. This is your chance to showcase who YOU are.

3. On your poster, put the following information in a box including ALL WORK necessary to prove you found your answer correctly: mean, median, mode, range, mean absolute deviation (M.A.D.), variance, and standard deviation. Note: If you do not have enough work (meaning you just gave the MAD value, etc.) then you will not get credit. Therefore, if you are using a calculator, be careful in showing what your calculations were. No work = no credit.

4. In a bubble/box on your poster, create a stem and leaf plot for your data.

5. In another bubble/box, create a histogram for your data.

6. In another bubble/box, create a box and whiskers plot for your data.

7. Look over the different statistics, plots, and diagrams that you found/created. Share three conclusions that you can learn from your findings. For example, maybe a student found that their hunting trips are always at least three days long. What does this tell you about their hunting trips?
### NEW RUBRIC:

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<td>Personal Connection</td>
<td>There is a creative and personal story through the data giving a personal narrative. There are appropriate conclusions about the statistics found.</td>
<td>There is a personal story through the data giving a personal narrative. There are appropriate conclusions about the statistics found.</td>
<td>There is somewhat of a personal story through the data giving a personal narrative and there are fair conclusions about the statistics found.</td>
<td>There is no personal story through the data giving no personal narrative and/or there are no conclusions about the statistics found.</td>
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