Dispositions Rubric, Self-Reflection, and Evidence

Spring 2015

Kaitlyn Frasier
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To begin I will discuss the disposition of self-regulation. For the indicator of timeliness I have included my Spring 2015 Practicum Log. I believe this demonstrates acceptable timeliness because not only did I arrive at my practicum site in a timely manner, but I also made up for a day I missed the following Monday. For the indicator of engagement I have included my Curriculum Unit Peer Feedback on Collaboration, and Week 4 Secondary Math Methods Reading Journal. I believe these represent acceptable engagement because my peers believe that I put in 100% consistently for the duration of the project, and for Secondary Math Methods I even took notes on the website readings that were not required for summary and reflection. For the indicator of skillful listening I have included my Curriculum Unit Peer Feedback on Collaboration. I believe this demonstrates acceptable skillful listening because I provided constructive and positive feedback for my peers, as well as taking their feedback and incorporating it into my schema. For the indicator of quality work I have included my Curriculum Unit Lesson Calendar and Plans, and my Week 4 Secondary Math Methods Reading Journal. I believe these provide evidence of developing quality work because I gave my all for the 6 weeks we had to work on the curriculum unit and provided lesson plans that I believe are quality, and in my reading journal I devoted ample time and reflection, but I believe quality work is always a developing disposition. Finally, for skillful communication I have included my Curriculum Unit Peer Feedback on Collaboration, and my Seminar Facilitation Brainstorm. I believe these demonstrate acceptable skillful communication because I articulated positive constructive criticism that was led with how my peers contributed to my learning, and I initiated a conversation with Jessica in facilitating seminar through providing my initial ideas about Greene and the theme of spring quarter. In the end I would conclude that I am a proficient self-regulator, and I am well versed in recognizing what needs to be done, motivating myself to do it, and adapting my behavior and language to the given context.

Now I will discuss the disposition of intellectual curiosity. For the indicator of commitment to learning I have included my Secondary Math Methods Mediated Field Experience Reflections, Upward Bound Summer Program Application, and my Week 5 Special Education Workshop Preparation. I believe these demonstrate acceptable commitment to learning because I actively participated in learning not only
from the teacher leading her class, but from her students in my mediated field experience, I have taken action in order to further my experience with and chance to learn from more students in the summer Upward Bound program, and I engaged in professional reflection and development through the special education workshop. For the indicator of multiple perspectives in contexts I have included my Week 4 Instructional Practices for Classroom Management Reflection, and my Secondary Math Methods Mediated Field Experience Reflections. I believe these demonstrate acceptable multiple perspectives because I practiced humility in asking how my CMT arranged her classroom and learning from her unique experience, and I took the perspective of Sunshine and the teacher at the mediated field experience location as well as her students in order to learn more about group work and launching lessons. In the end, I would conclude that I have abundant intellectual curiosity because I really do take joy in the development of myself and my shared learning community as evident in my continued work with students, learning form their experiences and sharing my own. I find that every context I enter is a learning opportunity, and I look forward to experiencing many more contexts wherein I can take on multiple perspectives and learn all that I can with each passing moment.

Now I will discuss the disposition of critical consciousness. For the indicator of teaching is political I have included my Week 3 Seminar Preparation, and my Week 5 Instructional Practices for Classroom Management Reflection. I believe these demonstrate acceptable understanding that teaching is political because I talk about the power distribution in the classroom being that of a learner centered environment where the student takes responsibility for their own learning and I as the teacher am a facilitator of that learning rather than the faucet of information for students to depend on. For the indicator of cultural encapsulation I have included my Day of Absence/Presence Reflection and Curriculum Unit Intro and Context for Learning. I believe these demonstrate developing cultural encapsulation because I recognize and understand my place in the social construction of power and position myself in the place of learner who seeks out multiple perspectives and asks questions as well as participating in discourse. In the intro and context for learning in my curriculum unit I also contributed to the community centeredness that we focused on, but in the future I will have to actually take some sort of action on these plans in order to
really prove my commitment to cultural encapsulation. For the indicator of knowledge is contested I have included my Week 1 Secondary Math Methods Reading Journal, and my Day of Absence/Presence Reflection. I believe these demonstrate acceptable understanding that knowledge is contested because I sought out a variety of perspectives and considered the positions of the author in Gutstein in math methods week 1, as well as recognized the reality of talking about race in my day of absence/presence reflection. In the end I would conclude that I am participating diligently in the quest toward critical consciousness that will never reach its crux because no one can truly be *completely* critically conscious as it is an ongoing process.

Now I will discuss the disposition of humility. For the indicator of learns from others I have included my Curriculum Unit Peer Feedback on Collaboration. I believe this, as well as the fact that I went to both microteaching Cafes that I could attend demonstrate acceptable proof of my learning from others because it shows I seek and am receptive to constructive feedback. For the indicator of seeks feedback I have included my Curriculum Unit Peer Feedback on Collaboration, and my Secondary Math Methods Mediated Field Experience Reflections. I believe these demonstrate that I seek feedback acceptably because I gave constructive criticism, as well as saw Sunshine’s feedback on my first reflection about asking more questions and acted in my second reflection. For the indicator of shares one’s own learning with others I have included my Curriculum Unit Peer Feedback on Collaboration. I believe this demonstrates that I acceptably share my learning with others because I provide positive constructive criticism to all of my group members. For the indicator of invests in the success of others I have included my Curriculum Unit Peer Feedback on Collaboration. I believe this, as well as the fact that I have written numerous dispositional evidence letters for my classmates, demonstrates that I acceptably invest in the success of others because I provided positive constructive criticism that can lead toward doable acts my classmates can take up. In the end, I would conclude that I demonstrate humility well because I consistently seek perspectives outside of my own and provide my perspective when requested, as well as reflect deeply on collaborative endeavors.
Finally I will discuss the disposition of resilience. For the indicator of flexible I have no concrete evidence, although I can provide two anecdotes. The first is about my first microteaching experience wherein I had planned to do a summative post assessment, but it was clear that my students were not ready for this, and so I changed my plan to a formative group work assessment so I could gauge my students’ learning, while also not harming them with a test that they were not ready for. The second anecdote I will share is about my curriculum unit group. Multiple times our group met outside of the time we all had available on Friday mornings, and these times I took off of work or took time out of weekends in order to contribute to the success of our group. I believe these stories demonstrate acceptable flexibility because I worked well with my peers and with my practicum students, knowing that it was my group’s or my students’ success that came first. For the indicator of initiates I have included my Seminar Facilitation Brainstorm. I believe this demonstrates acceptable initiation because I began brainstorming for this assignment well in advance and made the first step in communicating with Jessica about what we could do in collaboration. For the indicator of high expectations I have included my Microteaching 2 Tentative Scoring Rubric. I believe this demonstrates developing high expectations because I based this rubric on the edTPA, and I believe this holds students to a high standard, but I am still grappling with creating standards that reflect what I want students to achieve and in the future I will have to better reflect exactly what I want students to achieve in order to maintain high expectations. For the indicator of positive impact I have included my Curriculum Unit Peer Feedback on Collaboration. I believe this demonstrates acceptable positive impact because my group members believe that I was 100% dedicated to the project and gave it all of the attention I could in order for our group to succeed. In the end, I would conclude that I am resilient because I am constantly adapting to the throws that come my way in the program, flourishing under the pressure that has been applied, although as my curriculum group members have noticed, I tend to apply more pressure on myself than I need to.
**Self-Regulation:** Self-regulation is the ability to recognize what you need to do, and motivate yourself to do it. Adapting one’s behavior to best serve oneself and one’s community.

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<tr>
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<th>Unacceptable</th>
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<tr>
<td><strong>Timeliness</strong></td>
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<tr>
<td><strong>Engagement</strong></td>
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<tr>
<td><strong>Skillful Listening</strong></td>
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<td><strong>Quality Work</strong></td>
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<td><strong>Skillful Communication</strong></td>
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**Timeliness**
- **Acceptable Behaviors:**
  - Being prepared and ready to start
  - Consistently being on time and prepared
- **Unacceptable Behaviors:**
  - Consistently late and unprepared
  - Failure to communicate if late
  - Failure to arrive on time consistently

**Engagement**
- **Acceptable Behaviors:**
  - Inquiry as stance—asking questions
  - Always bring 110%—don’t check out
- **Unacceptable Behaviors:**
  - No effort to make connections to students or inspire
  - Checking out—side conversation (especially unrelated)

**Quality Work**
- **Acceptable Behaviors:**
  - Doing your best work given the circumstances
  - Organization and not working just to get stuff done
- **Unacceptable Behaviors:**
  - Procrastination to the point of unpreparedness
  - Taking easy road, incomplete work, late work
  - Failure to respond to feedback

**Skillful Communication**
- **Acceptable Behaviors:**
  - Asking clarifying questions
  - Articulation of thoughts in ways that don’t make those words your final opinion
  - Contextually appropriate communication
  - Precise word choice
- **Unacceptable Behaviors:**
  - Defensive responses and aggressive questions

**Skillful Listening**
- **Acceptable Behaviors:**
  - Acknowledge everyone’s contribution verbally
  - Listening with empathy, openness, reflectively, and thoughtfully while not controlling the conversation
- **Unacceptable Behaviors:**
  - Only validating opinions that reflect your own
  - Rudeness, discounting, dismissal, not empathetic
**Intellectual Curiosity:** Intellectual curiosity is the ability to take joy in the development of yourself, your classroom, and our shared learning community. Yearning for knowledge, viewing every context as a learning opportunity, questioning the world around you, not accepting thing on face value.

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<th>Commitment to Learning</th>
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<tr>
<td>Multiple Perspectives in Contexts</td>
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**Commitment to Learning**

- Commitment to students, community, stakeholders
- Engagement with professional development
- Do whatever it takes—practice over theory
- Sharing books and sources with others
- Model learning as lifelong pursuit
- Seeing the learning opportunity in every context
- Learning from students

**Unacceptable Behaviors:**
- Stagnation assumptions
- Deficit mindset
- Demanding that world is finite and fits into a box
- Emphasizing memorization
- Keeping knowledge to self
- Unwillingness to learn from others

**Multiple Perspectives in Contexts**

- Explaining and developing primary, secondary and tertiary—understanding documents/sources
- Holistic approach to context
- Know when to use description
- Ability to see multiple sides of issue or conversation
- Understand where others are coming from
- Sharing skill with others
- See the context in individuals’ perspectives

**Acceptable Behaviors:**
- Teaching towards yourself, not your students
- Silencing discourse
- Devaluing cultural perspectives—“Culturalist” perspective
- Social Darwinism
- Belief in meritocracy myth
- Presenting only one perspective denuded of context
- Only seeing things from your point of view
- Only accepting a single solution or path to a solution of a problem
**Critical Consciousness:** Critical consciousness is the ability to move beyond the confines of our own perspectives and attempt to think and feel from another’s perspective and, in doing so, developing a conception of our common humanity. To recognize oneself as a conduit for change and reflect and adjust oneself and environment accordingly.

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<tr>
<th>Teaching is Political</th>
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<tr>
<td>Cultural Encapsulation</td>
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<tr>
<td>Knowledge is Contested</td>
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### Teaching is Political

**Acceptable Behaviors:**
- Understanding power distribution
- Openness to a variety of viewpoints
- Embracing diverse ways of knowing
- Engaging students individually
- Understanding their context in education politics and policy
- Check in with our expectations of others
- Embracing spirit of collaboration instead of competition

**Unacceptable Behaviors:**
- Failing to meet federal/state regulations because of curriculum bias/idealism
- Abusing power

### Knowledge is Contested

**Acceptable Behaviors:**
- Evaluating the material and what it is
- Debate—looking deeper, questioning, pushing people to look at all sides
- Ability to embrace discomfort

**Unacceptable Behaviors:**
- Aggression towards students
- Silencing dissent
- Don’t turn, convert preach
- Don’t debate the person, debate the idea

### Cultural Encapsulation

**Acceptable Behaviors:**
- Cultural representation and diversity in curriculum
- “Repair social fractures” in subject/classroom
- Reflect and become conscious of position in power structures
- Learn from diverse sources and seek out diverse perspectives
- Be an active and quality listener and advocate for social justice
- Engage with communities

**Unacceptable Behaviors:**
- Limited perspective—colorblind approaches
- Normalizing dominant positions
- Inflexible to different modes of thought
- Ethnocentric approaches to knowledge
**Humility**: Humility as a disposition is remembering to consider others outside yourself, and that you engage in a constant exchange of ideas and learning. Humility is being open to feedback, reflection and collaboration while recognizing that my ideas hold the same merit as peers.

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<td><strong>Seeks Feedback</strong></td>
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<td><strong>Shares one’s Own Learning with Others</strong></td>
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<tr>
<td><strong>Invests in the Success of Others</strong></td>
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**Learns from Others**

- **Acceptable Behaviors:**
  - Seeks out more information, other perspectives
  - Listen without necessarily speaking (model active listening)

- **Unacceptable Behaviors:**
  - Asking inappropriate questions
  - Sharing sensitive/private information (not keeping confidence)
  - Not being open to ideas outside your own (dismissing opposing views)
  - Refuses to accept criticism

**Seeks Feedback**

- **Acceptable Behaviors:**
  - Seeks structure to facilitate feedback
  - Multiple avenues to receive feedback (speaking, writing, listening)
  - Room for students to contribute to classroom material
  - Uses feedback to self reflect and develop pedagogy
  - Gracious acceptance of criticism

- **Unacceptable Behaviors:**
  - Not accepting feedback
  - Seeking inappropriate feedback
  - Never seeking feedback
  - Rejects or/and avoids feedback

**Shares one’s Own Learning with Others**

- **Acceptable Behaviors:**
  - Sharing appropriate life stories
  - Bring in specific sources/models
  - Remain genuine with your students
  - Seeks out opportunities to collaborate and share with others
  - Willing to invest in shared growth

- **Unacceptable Behaviors:**
  - Sharing inappropriate stories
  - Priority for your story over classroom material
  - Rejects group settings
  - Doesn’t participate in collaborations

**Invests in the Success of Others**

- **Acceptable Behaviors:**
  - Invest in deeper issues with a person instead of superficial detail
  - Personal time invested
  - Devotes time to collaborate
  - Recognize that my work is not complete if cohorts are not finished also.
  - Share feedback with others

- **Unacceptable Behaviors:**
  - Disregards others’ processes
  - Works competitively
  - Destructive feedback
  - Competition
**Resilience**: Persistence and adaptation in the face of constant and shifting resistance. Resilience is an ability to flourish in response to pressure.

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<td><strong>Flexible</strong></td>
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<td><strong>Initiates</strong></td>
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<td><strong>High Expectations</strong></td>
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<tr>
<td><strong>Positive Impact</strong></td>
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**Flexible**

- Accepting ambiguity
- Constantly reshaping curriculum and teaching style based on student feedback/assessment
- Ability to adjust plans
- Works well with others
- Anticipates change/conflict

**Unacceptable Behaviors:**
- Unwillingness to redirect the course material as necessary
- “Standard” mode of interaction with students, as opposed to allowing to be impacted by students
- Close mindedness
- Rigid plans—regimented class structure
- Unwillingness to adapt
- Disregard for context

**Initiates**

- Allowing students to discuss and provide peer feedback
- Actively develop relationships with kids
- Enthusiastic facilitation
- Openness

**Unacceptable Behaviors:**
- Burden of relationship building is on teacher
- Neglects students
- Super-strict adherence to book

**High Expectations**

- Rejecting deficit mindsets
- Not settling for substandard work
- Continually encouraging better commitment/performance in a variety of ways (engaging parents)
- Not accepting excuses, while allowing for reasonable explanations
- Accountability
- Optimism—don’t give up!

**Unacceptable Behaviors:**
- Deficit mindset
- Unnecessary or excessive praise
- Apathetic outlook—No expectations
- Does not accept imperfection

**Positive Impact**

- Focus on the positive things students bring
- Build positive self-image in your students
- Don’t hold grudges or be petty
- See opportunities for improvement—seeks feedback

**Unacceptable Behaviors:**
- Shutting down and ignoring opportunities
- Rejects feedback
- Denies others’ validation/help
**Name:** Kaitlyn Frasier  
**School/Grade level:** Shelton High School, 10-12  
**Classroom Teacher Name:** Reva Fowler

<table>
<thead>
<tr>
<th>Date</th>
<th>Time-In</th>
<th>Time-Out</th>
<th>Total Hrs.</th>
<th>Briefly describe what you did? (i.e.: observation, mini lesson, small groups, one on one)</th>
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<tbody>
<tr>
<td>4/2</td>
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<td>Observation, small groups, one on one</td>
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<td>Taught review for test 1&lt;sup&gt;st&lt;/sup&gt;-3&lt;sup&gt;rd&lt;/sup&gt;, Observation, small groups, one-on-one</td>
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**Total Hours** 93.5
Kaitlyn to group

Max- Thank you for being a wonderful equity monitor throughout our group work process, making sure that everyone’s voices were heard, and actively listening. You supported my learning through keeping us on track toward the end goal and challenging my ideas when I was being overly anxious. In the future I would recommend asking more questions whenever you have them because whenever you asked a question it seemed that we were all on the same level of uncertainty, and having these questions come up is important for the group to address.

Ron- Thank you for writing the minutes so much, especially when I was struggling a couple of weeks ago and you helped me keep the minutes on track. You supported my learning through challenging my mathematical ideas and asking questions to push my thinking. In the future I would recommend keeping a planner/journal of activities to keep individual projects organized in order to keep a strict timeline for yourself.

Ana- Thank you for being such a wonderful hostess, as well as always brightening the mood of the group when we were gloomy because it was often gloomy. You supported my learning through asking questions and making suggestions whenever you thought of them. These questions and suggestions are what drive new thought and move the group forward. In the future I would recommend having more confidence in your ideas and suggestions because they are always worthy and deserve to be heard.

Max to group

Ron- Your work on integrating mathematical ideas into our project served to help me think of the work we were doing in new ways. You embodied the spirit of equity monitor whether you were assigned that role or not, always checking in to see where everybody was and providing space for us to address our own thinking and confusion. You made group work useful, insightful and engaging. When you had questions they were always questions and concerns that helped us all in our thinking. I always want to hear more from you, because what you say is always worth hearing and attending to.

Ana- I appreciated your vision and ideas when approaching this project, you’re genuine interest and care for the community that we work in lead you to brainstorm the guiding idea for our Unit. Your questions for the group always proved very valuable leading me to expand my own thinking and return to areas that I now wanted to rethink and expand upon. In the future I would urge you to speak up as soon as you have an idea, because your contributions were always thought provoking and helpful.
Kaitlyn- I appreciated your dedication to this project and to all of our learning. The work you put in was astounding, especially in regards to your conception of this project as a whole, you kept track of all of the parts and could easily visualize how they conceptually fit together. You helping me think through issues I was having when I struggled and proved an invaluable resource to us all. In the future I would urge you to delegate more, I often saw you taking the initiative to work in new areas at a disproportionately greater amount of work than you asked of others.

Ron to group

Ana - I really appreciate your thoughtfulness for details on this project. Your questions on the things I was doing triggered some positive reflection and denoted a sincere curiosity and engagement with our group effort. I had hoped to hear more of your ideas because the ones we did were quite useful. You had a welcoming disposition and you were generous in noticing progress, even the most incidental of movements.

Kaitlyn - I am in awe of your organizational skills and ceaseless work ethic. I was concerned at times, you exhibited a level of stress that would be far from beneficial in the long run. Nevertheless, I admire how well you take the program’s instruction and put it into practice in all situations. Your assigning competence was effective in getting me through to some semblance of completion on this project.

Max- Thank you for bringing passion and meaning to a project that was shrouded by scaffolded constructs and designing intricacies. I appreciate how you shared your understanding of the goals before us and what approaches to take to get there. Your attention is a gift and I felt honored when I earned it.

What awesome teachers you will be!

Ana to group

Kaitlyn- Good grief, Kaitlyn, I was amazed by all the work and effort you put into realizing our unit project! Thank you immensely for keeping us on-target and for helping us to get organized and get going with this. I very much appreciated your drive, ingenuity, discipline, and above all your vision for seeing this project through. You never cease to amaze me with how much work you put into everything you do in the program and the results really show and shine. I hope that you also put just as much effort into taking care of yourself and of your own needs, because as amazing as our work ethics can be, we are still trapped inside bodies that need nourishment and rest. Do not hesitate to delegate more work to others.

Max- Thank you, Maxwell, for all of your encouragement and dedication that you have put into this project! I appreciated how you would often re-direct the group when we got too distracted, and did an excellent job at keeping us on-task. You asked excellent questions that helped to drive this project forward and deepen our levels of understanding. I appreciated your ideas
and suggestions and felt that they added greatly to our knowledge, especially with regards to how the Shelton community could (in theory) band together and get back the pool. You gave the project more of a social justice edge. Ask more questions for clarification when you have concerns, and likewise seek compromises when listening to others’ ideas.

**Ron**- Ron, thank you for your mathematical knowledge and expertise. As a person like myself who does not understand matrices very well, I felt you did an excellent job in explaining the mathematical relationships between maths and the world at large, and how it could be applied in the real world. Thank you for keeping track of the minutes and for doing an excellent job documenting our progress. You also brought up interesting concerns and insights during the meetings that helped us to refine and shape this project. I would recommend keeping a planner or some form of documentation to keep track of what items have already been completed, what items still need to be completed, and when and how to adhere to deadlines.
Week 4: What kinds of activities and tasks provide students opportunities to understand mathematics? What kinds of teaching practices maintain the cognitive demand of tasks?

Rich Tasks
Summary: This website emphasizes the importance of the role of the environment when implementing rich tasks. If the environment and the learners are not encouraging of participation then the task is not going to fulfil its potential. This site summarizes the aspects of a rich task that we have seen before, pointing out that they can be used as assessment tools as well as encourage persistence.
Reflection: I look forward to trying to implement a rich task in my practicum site because it seems like it will be engaging to many students. I do wonder thought what sort of accommodations I need to be thinking about for my students with special needs. How can I best help these students participate in a group task, and encourage persistence when frustration may be imminent?

Implementing Rich Tasks
Summary: This website proposes that rich tasks are more fulfilling and interesting learning opportunities than the repetition of traditional school mathematics. They emphasize that rich tasks are more than just applications of skills, but require a deeper understanding of the math. Then they post a set of important tips to keep for reference.
Reflection: The tips they present at the end of the page are something I would like to keep as a reference and offer to my students to keep in mind. I understand that rich tasks are supposed to be interesting and provide a hook for students to get involved, but the ones presented on this site seem to be based on the intrinsic nature of math for the hook rather than making a connection to students. I wonder how I could use students’ interest in conjunction with these rich and intrinsically interesting math tasks to get all students interested whether or not they find the math itself interesting.

Esmonde
Summary: In this article the author highlights the importance of the structure of a group activity, being quizzes and presentations. Their findings were that in a group quiz situation the group will tend toward turning to the teacher or the expert in the group for answers. In a presentation situation the groups were widely varying, anywhere from even collaboration to individualistic approaches, so it allowed access to more students than the quiz model, but was still not contusive to equitable group interactions.
Reflection: This study makes me think of how to structure group work within my practicum site in a more useful way because I think these outcomes seem more natural to what would happen in a traditional math classroom. I do think that complex instruction would immensely benefit this idea of group work structure though because it would require a facilitator in every group, and therefore the expert could not take over, and the groups with individual approaches would have an entry point into discussion. Since my classroom is already set up for complex instruction (to an extent), if I explicitly use the model and try something similar to this article I would be interested to see what results would follow.
Ratios, Rates, and Proportional Reasoning Chapter 1
Summary: This chapter introduces the 10 essential understandings vital to the learning of ratios, proportions, and proportional thinking. These understandings are that ratios are the multiplicative or composed real world relationships between two quantities that can be represented as fractions or quotients. An important fact to remember is that ratios are usually part-part comparisons, while fractions are part-whole comparisons. Proportions are equalities between ratios. When working with proportions it is important to remember that anything you do to one ratio you must do the same to the other. Finally, a rate is a set of infinitely many equivalent ratios. Working with any of these ideas it is important to remember that when doing problems you have to make sure that you understand what the problem is really asking, rather than use cue words to infer what method to use and pull out numbers because that could lead to and answer that doesn’t make any sense.
Reflection: Something they posed in this chapter that I found to be new and that I would like to keep in mind when posing problems to students is how the problem is represented, whether it is in math form or in a form they can interpret for themselves. They used a pictorial form to pose the orange juice problem in order to make sure students made the connection to ratios rather than the math form with can be interpreted as just division. Another interesting point they make in this chapter is how the algorithm doesn’t make sense in all situations, and thus students should explore strategies that do make sense before jumping on the algorithm, like Van de Walle as well as the CGI fractions book said. In the final understanding about cue words I begin to wonder how we can help students who struggle with English to understand these cue words because although they should not be used to just jump on the algorithm, they are still important to understand. How can we help students who are learning the language as well as the content with the real world context presented in the problems?

Ratios, Rates, and Proportional Reasoning Chapter 2
Summary: This chapter begins by looking ahead into using ratios and rate in the high school grade for algebraic reasoning and measurement. They pose the idea that measurement conversions are proportional reasoning, and that slope is a fundamental algebraic use of rate. Then they look back into the elementary grades and establish the foundations of ratio reasoning with introducing fractions that are not just pieces of a whole, but rather that \(a/b\) is \(a\-\text{one} b\text{ths}\), or \(a\) pieces that are \(1/b\) in size. Then they emphasize the importance of introducing multiplication as not repeated addition, but as groupings of numbers.
Reflection: I can see how in my practicum classroom some of the understandings will be important to keep in mind because some of the misconceptions they mentioned about slope I have seen students struggle with. I also noticed in the tables they used as examples for slope that the numbers were not ordered, and this makes me question why my mentor teacher demands her students order their tables. I understand the want for organization, but in the initial state I always believed that the table doesn’t have to be in order because it’s just an intermediate tool for graphing. I suppose that ordering the table allows students to see connections between table, graph, and equation though, which is important for the work with ratios too because it draws strong connections between the reasoning behind ordered pairs and rise over run.
Ratios, Rates, and Proportional Reasoning Chapter 3
Summary: This chapter outlines the transition toward proportional reasoning characterized by first moving from reasoning with one quantity to two, then moving from additive to multiplicative reasoning, then moving from composing units to multiplicative reasoning, and finally moving from iteration into equivalencies. Then they outline the importance of students justifying their answers because it gives insight into their place in the reasoning transition process.
Reflection: The line of questioning that the teacher did for the second dialogue in the heart beats problem was amazing and I want to learn how to do that every time! I struggle to ask the right questions in time still, how can I develop this skill further (well, practice, but still)? It’s knowing the right amount of scaffolding to give that gets me. Something I see them saying in this chapter is how students naturally begin in phases like reasoning additively, then through scaffolding transitions with much time and effort they move into the next phase, which of course is the hardest part. It’s almost like with math there is a constant state of disequilibrium because of how much ideas build and move into more complex states of reasoning.
Learning Experiences Calendar

Week One

All- Day 1
*Guiding Question:* What do you know about interconnectedness of community? What would you like others to know?
*Learning Experiences:* Ball of yarn systems activity. Discussion on places that are important for you, and the shutdown of the community pool. Writing activity on the importance of having a place to call one’s own and how the community has been affected by the diminishing resources.

All- Day 2
*Guiding Question:* What is a community, who are the people in our classroom community?
*Learning Experiences:* Students will create classroom norms and establish roles, building community between and within their classes.

Math-Statistics- Day 3
*Guiding Question:* What are measures of center and variation?
*Learning Experiences:* Students will engage in a review activity focused on measures of center.

Math-Statistics- Day 4
*Guiding Question:* In what ways can we model statistics?
*Learning Experiences:* Students will investigate frequency tables and histograms through working with modeled data.

Math-Statistics- Day 5
*Guiding Question:* In what ways are statistics represented for people in the professional world?
*Learning Experiences:* Students will read US Census data and identify the methods of analyzing the data that the Census uses.
*Formative Assessment I:* Exit Ticket

Week Two

Math-Statistics- Day 6
*Guiding Question:* What is the average income of our class? What about the families in our community? What about Shelton as a whole?
*Learning Experiences:* Students will gather data about the average income of their classmates who have jobs and their families and create statistical models of the data.

Math-Statistics- Day 7
*Guiding Question:* What is the average income of our class? What about the families in our community? What about Shelton as a whole?
*Learning Experiences:* Students will estimate Shelton’s school budget based on the data they gathered about their class using a scale based on the population ratio and compare this with the actual budget.

Math-Statistics- Day 8
*Guiding Question:* What is a good population estimate?
*Learning Experiences:* Students will investigate real examples of good and bad population estimates based on several methods of sampling and approximation.
**Math-Statistics- Day 9**  
*Guiding Question:* Were our budget estimates really accurate?  
*Learning Experiences:* Students will investigate whether their population estimates from lesson 5 are accurate and why using margin of error and what they have learned about samples in lesson 6.

**Math-Statistics- Day 10**  
*Guiding Question:* What does it mean for statistics to be valid?  
*Learning Experiences:* Students will engage in a classroom discussion on what validity is and how we know when something is true or accurate.  
*Formative Assessment 2:* Exit ticket

**Week 3**

**Math-Statistics- Day 11**  
*Guiding Question:* What does it mean for sample statistics to represent the population validly?  
*Learning Experiences:* Students will investigate real data that represents populations accurately based on valid sampling methods.

**Math-Statistics- Day 12**  
*Guiding Question:* What does an invalid conclusion look like?  
*Learning Experiences:* Students will work in groups to identify what is exactly is happening in an invalid sample, whether or not intentions are good.  
*Formative Assessment 2:* Exit ticket

**Math-Statistics- Day 13**  
*Guiding Question:* What does it mean for something to be statistically consistent?  
*Learning Experiences:* Students will engage in a classroom discussion of what it means for statistics to be consistent with an abstracted model and assess how much error there is in the application of such a model.

**Math-Statistics- Day 14**  
*Guiding Question:* What does it mean for an abstract model to fit the real data?  
*Learning Experiences:* Students will work in groups on analyzing and modeling a real data set then try and fit an abstract statistical model to it.

**Math-Statistics- Day 15**  
*Guiding Question:* How do you conduct a statistical study?  
*Learning Experiences:* In their small groups, students will determine what the typical structure of a statistical study is, then present a framework for research methodologies on a poster to the class. Students will then begin brainstorming research topics to go with their civics projects, bringing back on Monday their research question.  
*Formative Assessment 3:* Exit ticket

**Week 4**

**Math-Statistics- Day 16**  
*Guiding Question:* What will you study?  
*Learning Experiences:* Students will begin writing a template for their statistical research, starting with outlining a research time frame, then outlining how they incorporate their findings into their projects.
**Math-Statistics- Day 17**
*Learning Experiences:* Students will participate in self driven research based on their 3-day plans.

**Math-Statistics- Day 18**
*Learning Experiences:* Students will participate in self driven research based on their 3-day plans.

**Math-Statistics- Day 19**
*Guiding Question:* How did my research turn out?
*Learning Experiences:* Students will peer revise and edit the conclusions they have drawn from their research with a critical eye for sampling bias and how well the model fits the data.

**Math-Statistics- Day 20**
*Guiding Question:* How did my research turn out?
*Learning Experiences:* Students will self assess their research and the incorporation of their study into their civics projects, then practice their presentations with a peer.

**Lesson Details**

### All Day 1 Lesson Plan

<table>
<thead>
<tr>
<th>Launch</th>
<th>Kaitlyn Says:</th>
<th>Kaitlyn, Ana, Max, and Ron Do:</th>
<th>Students Do:</th>
<th>Teacher Says:</th>
<th>Teacher Does:</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Minutes</td>
<td>Today we are going to do an activity involving this ball of yarn. I will demonstrate for you how this will look with our teachers real quick.</td>
<td>Kaitlyn will pass the yarn to Ana keeping a bit of slack and Ana will catch it and keep a little slack, then pass it to Max, who will keep some yarn, then pass it to Ron, and Ron will pass it to Kaitlyn again who will roll up the ball.</td>
<td>Count off by 4, 1’s go to Kaitlyn, 2’s to Ron, 3’s to Max, and 4’s to Ana who will each have a ball of yarn.</td>
<td>Make sure to alert the person you are going to underhand toss the ball of yarn at to make sure they are ready to catch it.</td>
<td>Slowly and carefully push your way into the middle of the system, not dodging yarn, but rather pushing it and deforming it. Then carefully step out and take your yarn back.</td>
</tr>
<tr>
<td></td>
<td>Kaitlyn Says: So this is what we will be doing, make sure to keep a bit of yarn with you when you pass it on to the next person. First we are going to count off by 4 and each go with a teacher to do this activity in a small group.</td>
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<tr>
<td></td>
<td>Students Do:</td>
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<tr>
<td></td>
<td>Teacher Says: Make sure to alert the person you are going to underhand toss the ball of yarn at to make sure they are ready to catch it.</td>
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<tr>
<td></td>
<td>Teacher Does: Say a student name then underhand toss the ball of yarn, keeping a little bit. Facilitates the tossing, making sure it goes quickly and efficiently. After the yarn has gotten back to the teacher Say: Everyone hold tight to your yarn now and take one step in. Now take two steps back. Now return to where you were initially standing. Can I get the person next to me to hold on to my yarn for a moment.</td>
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<tr>
<td></td>
<td>Teacher Does: Slowly and carefully push your way into the middle of the system, not dodging yarn, but rather pushing it and deforming it. Then carefully step out and take your yarn back.</td>
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<tr>
<td></td>
<td>Teacher Says: Now I want everyone to take one step in any direction you want. What do your notice about what I just did in comparison to what we have all just done together?</td>
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<td></td>
<td>Students Do: Give ideas about how the systems changes in unison.</td>
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<tr>
<td></td>
<td>Teachers Do: Gather all of the groups back together into one big circle.</td>
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<tr>
<td></td>
<td>Max Says: So what did everyone notice in their smaller groups?</td>
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<tr>
<td></td>
<td>Students Do: Share ideas about what they saw.</td>
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<tr>
<td></td>
<td>Ron Says: So how does this connect to the Shelton community?</td>
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<tr>
<td></td>
<td>Ana Says: How does this connect to what happened to the pool?</td>
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</tbody>
</table>
**Instruction**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
</table>
| 110 minutes | **Pool conversation ~60 minutes** | **Students Do:** Suggest ways that the community is a living system, and the pool being taken away was like the teacher entering the system.  
**Teacher Says:** So what does it mean for the pool to be taken away?  
**Students Do:** Suggest reasons why the pool was important, it was a place for students to hang out and call their own.  
**Teacher Says:** What does it mean to have a place to call your own? What places do you have in your community, and why are they important? Talk with your neighbor for a minute to generate some ideas. Now share out.  
**Students Do:** Suggest places they have and why they are important. |
| | **Writing activity ~ 50 minutes** | **Teachers Do:** Transition the class into groups of 4.  
**Teacher Says:** So thank you all for sharing your places that you call your own. What we would like you to do now is write for 20 minutes about one place you call your own, then we will check in with you. Write everything you know and love about this place, what memories you have, and why it is important to you.  
**After 20 minutes**  
**Teacher Says:** Since I see that you all have some wonderful things written I would like you to share one reason you think this place is important with your table group round robin style. Now that you all have shared and have some ideas I want you to write for another 20 minutes about why this place is important to the community as a resource.  
**After 20 minutes**  
**Teacher Says:** Now I want you to round robin in your groups one reason why this is an important community asset. |
| 10 minutes | **Closure** | **Teacher Says:** Now that you have shared I want you to share with the whole class a theme your group has established.  
**Students Do:** Share themes about why places are community assets.  
**Teacher Says:** So we have established some major themes about why places are community resources, and really very important to the community as a whole. Thank you everyone for sharing today. |

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**All Day 2 Lesson Plan**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
</table>
| 30 minutes | **Launch** | **Teacher Says:** Today we are going to build a community within our classroom, establishing norms and roles that we will use throughout the rest of this year together. So the first thing we want you to do today is write on a piece of notebook paper what you need in order to be successful in a group work setting.  
**Students Do:** Write on their own piece of paper.  
**Teacher Says:** Now that you have some needs down I want you to round robin share in your group until everyone has said every need. Then I want you to write on the poster paper that will be put on your table the collective needs of your group.  
**Teacher Says:** Now that everyone has put their group needs on a poster we are going to do a gallery walk to see what everyone has written.  
**Teachers Do:** Conduct a gallery walk. |
| 130 minutes | **Instruction** | **Teacher Says:** Now that we have collective set of needs we have seen, we will establish a set of norms for the class that we will all agree on. Now we will break out into groups of four based on the number on the card you will be receiving. |
**Mathematics-Statistics Day 5 Lesson Plan**

In what ways are statistics represented for people in the professional world?

**Teacher Name:** Kaitlyn Frasier

<table>
<thead>
<tr>
<th>Central Focus</th>
<th>Identifying statistical models based on real data</th>
</tr>
</thead>
</table>
| **Content Standards** | **Math Standard:** Making Inferences and Justifying Conclusions: S-IC Understand and evaluate random processes underlying statistical experiments  
2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.  
**Literacy Standard:** Reading  
2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **Student Learning Goals** | **Learning Targets:** (Knowledge- K, Skill- S, Reasoning- R, Product- P)  
- Know that math can represent real-world situations and be used as a tool to model them. (K)  
- Identify the processes that underlie statistical experiments. (R) |
| **Common Errors, Developmental Approximations, Misconceptions, Partial, or Misunderstandings** | • Data is just data and doesn’t mean anything  
- We will look at conclusions that have been drawn from data  
- Data is collected from the entire population  
- We will investigate what it means to survey a sample and the difference between a sample and a population |

**Instructional Strategies and Learning Tasks:**

| Launch 15 minutes | **I do:** Write on the board “Data”  
**I say:** What do you think of when you hear the word data?  
**Students do:** Make associations based on prior knowledge and raise their hand to suggest something to put on the board. |
**Lesson Plan**

**Week 6**

<table>
<thead>
<tr>
<th><strong>Instruction/Structured Practice and Application</strong></th>
<th>35 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I do:</strong></td>
<td>Write the initial associations students make on the board in a branching pattern.</td>
</tr>
<tr>
<td><strong>I say:</strong></td>
<td>Why do you think you made these associations? (specify certain associations)</td>
</tr>
<tr>
<td><strong>Students do:</strong></td>
<td>Provide their reasoning.</td>
</tr>
<tr>
<td><strong>I do:</strong></td>
<td>Begin sorting the list while students give reasoning behind their associations into mathematical and nonmathematical categories.</td>
</tr>
<tr>
<td><strong>I say:</strong></td>
<td>Why do you think I have sorted your associations in this way? What new suggestions do you have? Do you have anything you might want to add to the list or take away from it?</td>
</tr>
<tr>
<td><strong>Students do:</strong></td>
<td>Provide further categorization ideas.</td>
</tr>
<tr>
<td><strong>I do:</strong></td>
<td>Continue to write on the board the categorization and analyze what they believe data is, assessing what prior knowledge they have about where data shows up in the real world.</td>
</tr>
<tr>
<td><strong>I say:</strong></td>
<td>So you all know a lot about data, but where do we see it in real life? What does data look like in real life, and how do people present it to us in different ways?</td>
</tr>
<tr>
<td><strong>I do:</strong></td>
<td>Pass out the Young Adults in America presentation slides to the groups alongside the reading guide.</td>
</tr>
</tbody>
</table>

**Instruction/Structured Practice and Application**

**35 minutes**

**I say:** So what I want you read through this packet and focus on the guiding questions I have given you. I want you to read silently for 10 minutes and write notes on your question and answers, and I’ll signal when I want you to start talking in your groups.

**After 10 minutes**

**I do:** Signal to the group that they should begin their discussions about the guiding questions, giving them 15 minutes. After about five minutes I will hand out poster paper for students to write the answers to their guiding questions.

**After 15 minutes**

**I say:** So I see some really awesome posters out there, let’s put them up on the walls.

**I do:** Conduct a gallery walk asking students to note similarities and differences between their answers to what conclusions they drew from the report.

<table>
<thead>
<tr>
<th><strong>Closure</strong></th>
<th>10 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I say:</strong></td>
<td>So what did we notice today between our group discussion, then the gallery walk we just did?</td>
</tr>
<tr>
<td><strong>Students do:</strong></td>
<td>Point out the many ways that data are represented in the report they saw today, and how their conclusions were very different between groups.</td>
</tr>
<tr>
<td><strong>I say:</strong></td>
<td>That’s what I wanted you to notice today, how the conclusions different people draw from the same data can range from one end of a spectrum to another. Data is very important, and drawing conclusions is subjective if you haven’t presented the data in a clear way. Ok so one last thing today, I want you to write an exit ticket for me telling me about what are the ways you saw that statistics can be modeled this week? What questions do you have?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Planned Supports</strong></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Whole Class:</strong></td>
<td>Students will only be asked to speak in whole group if they feel comfortable</td>
</tr>
<tr>
<td></td>
<td>Students will always have the option to ask their group for assistance</td>
</tr>
<tr>
<td></td>
<td>The task will move at a pace to maintain interest and hold attention, but not too quickly as to confuse</td>
</tr>
<tr>
<td><strong>Groups of students with similar needs:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Materials given in the first language of students</td>
</tr>
<tr>
<td></td>
<td>Students with a first language in common will be grouped together for this activity</td>
</tr>
</tbody>
</table>
- Students who have trouble comprehending written word will have the material given to them in advance and read aloud to them in a small group with me

**Individual students:**
- Students are asked to first refer to their groups as a resource, and so for any question I will always ask the group if they can answer, but I will answer if a student feels uncomfortable
- Give language support

**Students with IEP’s or 504 plans:**
- Break down the task into smaller parts
- Step-by-step instructions
- Allow for extra time if needed
- Give language support/materials in conversational English or their first language
- Give the materials in advance

**Strategies for responding to common errors and misunderstandings, developmental approximations, misconceptions, partial understandings, and/or misunderstandings:**
- Ask probing questions to get at what the student already know then build on what they have

The common errors are:
- Data is just data and doesn’t mean anything
  - We will look at conclusions that have been drawn from data
- Data is collected from the entire population
  - We will investigate what it means to survey a sample and the difference between a sample and a population

<table>
<thead>
<tr>
<th>Materials</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young Adults in America</td>
<td>Young Adults in America</td>
</tr>
<tr>
<td>Whiteboard and pens</td>
<td>Whiteboard and pens</td>
</tr>
<tr>
<td>Young Adults in America Reading Guide</td>
<td>Young Adults in America Reading Guide</td>
</tr>
</tbody>
</table>

**Academic Language Demands:**

<table>
<thead>
<tr>
<th>Language functions</th>
<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inquiry/Seeking Information</td>
<td>Sample</td>
</tr>
<tr>
<td>Students will be reading the article and looking for answers to the guiding questions</td>
<td>Population</td>
</tr>
<tr>
<td>Summarizing and Informing</td>
<td>Random</td>
</tr>
<tr>
<td>Students will inform their group of their conclusions</td>
<td>Data</td>
</tr>
<tr>
<td>Inferring, Predicting, and Hypothesizing</td>
<td>Ways students need to use language</td>
</tr>
<tr>
<td>Students will draw conclusions based on the data given</td>
<td>Reading the presentation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ways students need to use language</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading the guide</td>
<td></td>
</tr>
<tr>
<td>Writing responses to the reading guide</td>
<td></td>
</tr>
<tr>
<td>Talking to their group about their answers</td>
<td></td>
</tr>
</tbody>
</table>
**Talking to the class about their group work**

**Support of language**
See planned supports, but students who struggle with language will have their groups as a resource as well as materials in their first language if not English. Students will only be asked to speak if they feel comfortable.

### Assessment:

<table>
<thead>
<tr>
<th>Type of assessment</th>
<th>Description of assessment</th>
<th>Modifications</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formative Assessment</td>
<td>Students will be asked to write an exit ticket stating what new ways of modeling statistics they have learned about throughout the course of the week</td>
<td>Students with language needs can recite their answer orally</td>
<td>Proof of ability to identify statistical processes and models when looking at statistical experiments. Vocabulary I will be looking for will be: random sampling, bias, evidence, collection, and population (see Rubric)</td>
</tr>
</tbody>
</table>

**Mathematics-Statistics Day 6 Lesson Plan**

What is the average income and budget of our class?

**Teacher Name:** Kaitlyn Frasier

**Central Focus**
Estimating population data based on sample data

**Content Standards**

**Math Standard:** Quantities: N-Q- Reason quantitatively and use units to solve problems.
1. Define appropriate quantities for the purpose of descriptive modeling.
2. Define appropriate quantities for the purpose of descriptive modeling.
Making Inferences and Justifying Conclusions: S-IC- Understand and evaluate random processes underlying statistical experiments
4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.

**Student Learning Goals**

**Learning Targets:** (Knowledge- K, Skill- S, Reasoning- R, Product- P)
- Use data from a sample to estimate a population data set (S)
- Develop a margin of error for population estimates (S)

**Common Errors, Developmental Approximations, Misconceptions, Partial or Mis-Understandings**
- Just take each piece of data and multiply by the scalar
  - I will discuss the importance of having one analogue for the population data rather than many because we could never recreate the entire population from sample data
- Multiply any measure of center by the scalar
  - I will discuss the importance of using the mean as the “best” measure of center, except where there are major outliers

**Launch**
10 minutes

I say: So in social studies you have been looking at what makes up a budget, and you decided on what criteria is important. In math we are going to survey each other on
what our individual budgets are. Now what might be wrong with that in terms of statistics?
**Students do:** Students have had some exposure to how statistical samples should be consistent, but not a great amount so one student may say that the samples may not be consistent, if not I will point this out.

**I say:** Right, so a statistical survey has to have specific things in common for the data to be useful. So I should specify that I mean for you to survey your family’s budget, making sure to note how many people are in the family, and the total income. I’ll use mine as an example so you have some rates you can use consistently. [make up relevant statistics]

Now, starting in your group and writing down your whole group’s data I want you to share your budget.

<table>
<thead>
<tr>
<th>Instruction/Structured Practice and Application</th>
<th>I do: Circulate while students are writing their budgets and collecting their group’s data, noting the similarities and differences, then have students group by role (facilitators, equity monitors, resource monitors, and recorder/reporters) to share their data efficiently. This should take about 15 minutes.</th>
<th>I say: So it looks like everyone has the data all written down, now I want you to find the measures of center for your data set. Do it together with your groups so I can see group answers to see if they correspond. So find the mean, median, mode, and standard deviation for each budget category.</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 minutes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Closure**

**10 minutes**

**I say:** So can we check with each other as a whole to see what the consensus is? Group 1? [I will write the measures of center on a poster paper at the front of the room to keep] Group 2? Ah very similar answers. [I will go through every group] So all of this data is very important and I am going to keep it for tomorrow because we will be using it to estimate the budget of the population as a whole. Let me just add one thing on top here, our total class sample size because if we know the sample size and the data we can estimate population tomorrow.

**Planned Supports**

**Whole Class:**
- Students will only be asked to speak if they feel comfortable
- Students will always have the option to ask their group for assistance
- The task will move at a pace to maintain interest and hold attention, but not too quickly as to confuse

**Groups of students with similar needs:**
- Materials given in the first language of students
- Students who have trouble comprehending written word can have the material given to them in advance and read aloud to them in class and have a structured discussion about the reading before the class discussion

**Individual students:**
- Students are asked to first refer to their groups as a resource, and so for any question I will always ask the group if they can answer, but I will answer if a student feels uncomfortable

**Students with IEP’s or 504 plans:**
- Break down the task into smaller parts
- Step-by-step instructions
- Allow for extra time if needed
- Give language support/materials in conversational English or their first language
### Strategies for responding to common errors and misunderstandings, developmental approximations, misconceptions, partial understandings, and/or misunderstandings:
The misconceptions are:
- Just take each piece of data and multiply by the scalar
  - I will discuss the importance of having one analogue for the population data rather than many because we could never recreate the entire population from sample data
- Multiply any measure of center by the scalar
  - I will discuss the importance of using the mean as the “best” measure of center, except in cases where there are major outliers

### Materials

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster paper and pens</td>
<td>Math notebooks</td>
</tr>
<tr>
<td></td>
<td>Budget from social studies</td>
</tr>
</tbody>
</table>

### Academic Language Demands:

#### Language functions
- Inquiry/Seeking Information
  - Students will be surveying their classmates
- Solving Problems/Problem Solving
  - Students will find the measures of center with the help of their group members

#### Vocabulary
- Measures of center (mean, median, mode)
- Sample
- Population

#### Ways students need to use language
- Surveying their classmates
- Talking to their group to agree upon measures of center
- Organizing data
- Sharing out their measures of center

#### Support of language
Students will only be asked to speak if they feel comfortable, and the surveying of classmates will be heavily structured to make sure that everyone gets to everyone else (first groups then role groups). Students who have trouble organizing data will be supplied with a template.

### Mathematics-Statistics Day 10 Lesson Plan

**What does it mean for statistics to be valid?**

**Teacher Name:** Kaitlyn Frasier

<table>
<thead>
<tr>
<th>Central Focus</th>
<th>Statistical Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Standards</td>
<td>Math Standard: Making Inferences and Justifying Conclusions: S-IC Understand and evaluate random processes underlying statistical experiments 2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.</td>
</tr>
</tbody>
</table>
### Student Learning Goals

**Learning Targets:** (Knowledge-K, Skill-S, Reasoning-R, Product-P)
- Evaluate the consistency of a statistical model (R)
- Evaluate the validity of population estimates (R)
- Justify conclusions (R)

### Common Errors, Developmental Approximations, Misconceptions, Partial Understandings, or Misunderstandings

- All statistics can be trusted
  - The investigation of this lesson is designed to address this misconception
- All populations can be estimated based on one sample
  - We will investigate what random processes make it ok to estimate population data
- Justification means giving an example
  - We will discuss what makes up a generalized justification

### Instructional Strategies and Learning Tasks:

**Launch**
10 minutes

Discuss the image to the right asking questions like:
- How is this image accurate?
- How is it inaccurate?
- Why?
- Is it data?
- Is it **valid**?
- What does it mean for data to be valid?

**I Say:** Today we will discuss the validity, or accuracy of data, so we will be looking at some sample data sets and investigate what it means for a population estimation to be valid, then **justify** our conclusions.

**Instruction/Structured Practice and Application**
30 minutes

**I Say:** You may have learned before that justifications can be examples of data being true or working in real life, but in statistics a justification that data is valid is saying why the data is valid beyond one case. It is **generalizing**, or making it clear that the data works in most if not all situations. So what we’re going to do is investigate a situation to determine whether or not the conclusions that are drawn about the population are valid, then justify our answers. On the task card your resource monitors will pick up you will find your instructions for the class period today. Keep in mind that I will only answer group questions, so make sure that you all agree on questions before I come over.

**I Do:** Give out the task card

**Students Do:** Students assigned to the role of resource monitor will pick up the task cards and facilitators will read them out loud to their groups. In their groups, students will then attend to producing a poster attending to the checklist on the task card.

**I Do:** Walk around the room after students begin working on their posters (about 10 minutes after the task card in projected) and scope their posters for what their understandings are, and where I may need to ask scaffolding questions:
- What does a sample represent?
- What does a population represent?
- When is it ok to estimate a population based on a sample?
- What is random?

**Extension:** What if Kasson gave everyone in first period math (so about 200 students) a survey to write their answer on, would his sample be any more valid?
<table>
<thead>
<tr>
<th>I Do:</th>
<th>Select and sequence students posters to be presented (2-3 groups, 5 minutes per group) making sure to highlight different strategies and suggestions about how Kasson’s sampling was problematic.</th>
</tr>
</thead>
</table>
| **Closure** 20 minutes | I Do: Have groups selected present their posters, making connections between groups I saw using similar strategies. Make sure that students conclude that a sample has to be truly random for the population to be an accurate representation, and any sampling method that is not random is biased. Ask probing questions to get students there like:  
  - When is it ok to estimate a population based on a sample?  
  - What does random mean?  
  - How do we know if something is random?  
  - How can we accurately estimate a population data set? |
| **Planned Supports** | **Whole Class:**  
  - Students will only be asked to speak if they feel comfortable  
  - Students will always have the option to ask their group for assistance  
  - The task will move at a pace to maintain interest and hold attention, but not too quickly as to confuse  
  - Directions will be handed out and read aloud  
  **Individual students:**  
  - Students are asked to first refer to their groups as a resource, and so for any question I will always ask the group if they can answer, but I will answer if a student feels uncomfortable  
  - Give language support  
  - Monitor student interactions to make sure that quieter students are being heard if they want to speak  
  - Assign competence to students whenever possible!  
  **Students with IEP’s or 504 plans:**  
  - Break down the task into smaller parts  
  - Step-by-step instructions  
  - Allow for extra time if needed  
  - Give language support/materials in conversational English or their first language  
  - Give the materials in advance  
  - Help generalize concepts from examples  
  **Strategies for responding to common errors and misunderstandings, developmental approximations, misconceptions, partial understandings, and/or misunderstandings:**  
  - Ask probing questions to get at what the student already know then build on what they have  
  **The common misconceptions are:**  
  - All statistics can be trusted  
    - The investigation of this lesson is designed to address this misconception  
  - All populations can be estimated based on one sample  
    - We will investigate what random processes make it ok to estimate population data  
  - Justification means giving an example  
    - We will discuss what makes up a generalized justification |
<table>
<thead>
<tr>
<th>Materials</th>
<th><strong>Teacher</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Projector and document camera</td>
</tr>
<tr>
<td></td>
<td>• Statistical Validity Task card</td>
</tr>
<tr>
<td><strong>Student</strong></td>
<td>• Poster paper</td>
</tr>
<tr>
<td></td>
<td>• Pens</td>
</tr>
</tbody>
</table>

**Academic Language Demands:**

<table>
<thead>
<tr>
<th><strong>Language functions</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Analyzing/Evaluating</td>
<td>o What is a consistent model?</td>
</tr>
<tr>
<td></td>
<td>o What does valid mean?</td>
</tr>
<tr>
<td>• Justifying</td>
<td>o What is a valid justification?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Vocabulary</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Validity</td>
<td></td>
</tr>
<tr>
<td>• Sample</td>
<td></td>
</tr>
<tr>
<td>• Population</td>
<td></td>
</tr>
<tr>
<td>• Random</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ways students need to use language</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Read or listen to the task card</td>
<td></td>
</tr>
<tr>
<td>• Express their opinions and evaluations of the scenario</td>
<td></td>
</tr>
<tr>
<td>• Write their answers to the questions on the poster</td>
<td></td>
</tr>
<tr>
<td>• Present their conclusions to the class (if their group is selected)</td>
<td></td>
</tr>
</tbody>
</table>

**Support of language**

See planned supports, but if students are struggling to use academic language I will ask their group members to help articulate if the student speaking so wishes, if not, then I will ask probing questions to connect their word choice to the academic language that fits, asking if it makes sense to make such connections.

**Assessments:**

<table>
<thead>
<tr>
<th><strong>Type of assessment</strong></th>
<th><strong>Description of assessment</strong></th>
<th><strong>Modifications</strong></th>
<th><strong>Evaluation Criteria</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Formative Assessment</td>
<td>Group posters as well as individual exit tickets where students are asked to state the learning target for the day, why it is important as well as what they learned about that day.</td>
<td>Students could type or orally demonstrate their learning, in their first language if necessary</td>
<td>Proof of understanding of estimating population data as well as the purpose of the lesson (see Rubric)</td>
</tr>
<tr>
<td>Self Assessment</td>
<td>How did you address the product requirements for this group project? (rubric) Is your justification for your evaluation valid? How do you feel you did on this product? How was working with your group? What could you do better next time?</td>
<td>Students could type or orally demonstrate their learning, in their first language if necessary</td>
<td>Proof of working with their group and allowing for student voice</td>
</tr>
</tbody>
</table>
# Mathematics-Statistics Day 15 Lesson Plan

**How do you conduct a statistical study?**

**Teacher Name:** Kaitlyn Frasier

<table>
<thead>
<tr>
<th>Central Focus</th>
<th>Determining appropriate quantities for statistical modeling</th>
</tr>
</thead>
</table>
| **Content Standards** | **Math Standard:** Quantities: N-Q- Reason quantitatively and use units to solve problems.  
2. Define appropriate quantities for the purpose of descriptive modeling. |
| **Student Learning Goals** | **Learning Targets:** (Knowledge-K, Skill-S, Reasoning-R, Product-P)  
- Represent real-world situations with mathematics (P)  
- Define quantities for the purpose of descriptive modeling (R)  
- Justify conclusions (R) |
| **Common Errors, Developmental Approximations, Misconceptions, Partial or Misunderstandings** | • We can use any sample size to estimate a population  
  o We will discuss how sample size has to be proportionate and representative of the population |

### Instructional Strategies and Learning Tasks:

<table>
<thead>
<tr>
<th>Launch 5 minutes</th>
<th>I say: So all of this time we have been learning about statistical models and how to interpret statistics, while practicing collecting and interpreting data, but today I want to know: How do you conduct a statistical study? In your groups I want you to write a framework with specific constraints on how to conduct a study. I want you to prepare this framework on a poster to present to the class.</th>
</tr>
</thead>
</table>
| Instruction/Structured Practice and Application 35 minutes | **Students do:** Work in their groups on creating this framework based on the prior knowledge they have build throughout the course of the past three weeks.  
**I do:** Walk the room making sure that groups participate equitably, and ask students questions about why they choose the constraints they do. |
| Closure 20 minutes | **I say:** I’d like you to share your frameworks with the class, justifying each constraint and how they will help you make conclusions based on the data collect.  
**Students do:** Share their posters, giving each other constructive criticism, and compiling a list of important features they would like to include in a collective framework.  
**I say:** So it looks like we have pieced together a collective framework that everyone will be using for your statistical studies next week. Now I’d like you to all individually answer the following questions:  
- What did you learn this week about estimating population data and margin of error?  
- What did you learn about conducting a statistical study?  
- Self-assess your framework based on the rubric and make any changes you would like to make given the permission of your group before turning in your framework to me |
### Planned Supports

<table>
<thead>
<tr>
<th>Whole Class:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Students will only be asked to speak if they feel comfortable</td>
<td></td>
</tr>
<tr>
<td>• Students will always have the option to ask their group for assistance</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual students:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Students are asked to first refer to their groups as a resource, and so for any question I will always ask the group if they can answer, but I will answer if a student feels uncomfortable</td>
<td></td>
</tr>
<tr>
<td>• Give language support</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Students with IEP’s or 504 plans:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Break down the task into smaller parts</td>
<td></td>
</tr>
<tr>
<td>• Step-by-step instructions</td>
<td></td>
</tr>
<tr>
<td>• Allow for extra time if needed</td>
<td></td>
</tr>
<tr>
<td>• Give language support/materials in conversational English or their first language</td>
<td></td>
</tr>
<tr>
<td>• Give the materials in advance</td>
<td></td>
</tr>
</tbody>
</table>

### Strategies for responding to common errors and misunderstandings, developmental approximations, misconceptions, partial understandings, and/or misunderstandings:

- Ask probing questions to get at what the student already know then build on what they have

The common errors are:

- We can use any sample size to estimate a population
  - We will discuss how sample size has to be proportionate and representative of the population

### Materials

<table>
<thead>
<tr>
<th>Student</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Poster paper</td>
<td></td>
</tr>
<tr>
<td>• Pens</td>
<td></td>
</tr>
</tbody>
</table>

### Academic Language Demands:

#### Language functions

<table>
<thead>
<tr>
<th>• Classifying</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Students will sort and decide what is important to do in a study</td>
<td></td>
</tr>
<tr>
<td>• Justifying and Persuading</td>
<td></td>
</tr>
<tr>
<td>• Students will have to say why their constraints are relevant</td>
<td></td>
</tr>
</tbody>
</table>

#### Vocabulary

<table>
<thead>
<tr>
<th>• Sample size</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Population</td>
<td></td>
</tr>
<tr>
<td>• Bias</td>
<td></td>
</tr>
</tbody>
</table>

#### Ways students need to use language

| • Share their ideas with their groups |  |
| • Represent their ideas in words and pictures on poster paper |  |
| • Share their poster with the class |  |
| • Listen to groups present posters |  |

### Support of language

| Students will only be asked to speak if they feel comfortable. |  |

### Assessments:

| Type of assessment | Description of assessment | Modifications | Evaluation Criteria |  |
An exit ticket asking students what they have learned about estimating population data based on sample data, margin of error, and how to conduct a statistical study/report.

Students can orally convey their learning.

Proof of estimating population data based on sample data and develop a margin of error in order for them to define their quantities for their investigations into their community resource (see Rubric).

Students will be asked to assess their own framework based on the rubric for a statistical study and revise it based on their assessment.

Students can assess their work orally or in writing.

see Rubric.

**Mathematics-Statistics Day 16 Lesson Plan**

**What will you study?**

**Teacher Name:** Kaitlyn Frasier

**Central Focus**

Choosing a Research Topic

**Content Standards**

**Math Standard:** Quantities: N-Q- Reason quantitatively and use units to solve problems.

1. Define appropriate quantities for the purpose of descriptive modeling.

**Student Learning Goals**

**Learning Targets:** (Knowledge-K, Skill-S, Reasoning-R, Product-P)

- Reason quantitatively (R)
- Represent real-world situations with mathematics (P)

**Instructional Strategies and Learning Tasks:**

**Launch 5 minutes**

**I say:** So in social studies you have all chosen research topics that you want to study, and as you all know you will be presenting an argument to the community about your community research topics. Today what we are going to do is brainstorm possible statistical studies you could do to support those topics. What I want from you by the end of class today is going to end up being an outline of your research for the rest of this unit, but first I want you to tell me what is a research question? Right, a research question is what you want to find an answer to, or a problem you set out to solve. What is a statistical research question? Right, it’s a special research question that you can answer by collecting data. Now in order to do the research for this statistical study you will be using the framework we all made together last week. [will be on the wall for all to see]

**Instruction/Structured Practice and Application 50 minutes**

**I say:** So what I want you to do first is write down your research topic in the middle of a piece of paper, then brainstorm statistical study topics you could use to support that social studies topic.

**Students do:** For five minutes individually brainstorm their topics.

**I say:** Now that you have some statistical ideas, let’s round robin in your group. Write down any new ideas you think could help your topic too as they come up.

**Students do:** For ten minutes round robin

**I say:** Now I want you to pick the one statistical topic idea that you think would best support your research topic. So if I were going to research the community pool I could...
do like Kesson did and survey the school, but of course with a better random sample. Write on a new piece of paper this topic then try to generate a question that could lead your study on that statistical topic.

**Students do:** For five minutes generate questions.

**I say:** Now you all have your statistical research question! The next thing you have to do is, keeping the framework we made last week in mind, make a two-day research plan for how you will collect data, analyze it, and how that research will fit into your social studies project. Some things to consider are:

- What conclusions might you be able to draw from this study?
- What happens if your study nullifies your hypothesis?
- How can you best sample to estimate the population data?

So for the last 20 minutes of class I want you to write an outline for how you will conduct your research.

**Closure**
5 minutes

**I say:** I’ve been checking around and it looks like everyone has a great plan set up for their statistical study. Tomorrow we will be starting the data collection process!

**Planned Supports**

**Whole Class:**
- Students will always have the option to ask their group for assistance
- The task will move at a pace to maintain interest and hold attention, but not too quickly as to confuse
- Directions will be read aloud

**Groups of students with similar needs:**
- Students will be allowed to type or use speech to text software to write

**Individual students:**
- Students are asked to first refer to their groups as a resource, and so for any question I will always as the group if they can answer, but I will answer if a student feels uncomfortable
- Give language support

**Students with IEP’s or 504 plans:**
- Break down the task into smaller parts
- Step-by-step instructions
- Allow for extra time if needed
- Give language support/materials in conversational English or their first language
- Give the materials in advance
- Students will be allowed to type or use speech to text software to write

**Strategies for responding to common errors and misunderstandings, developmental approximations, misconceptions, partial understandings, and/or misunderstandings:**
- Ask probing questions to get at what the student already know then build on what they have

**Materials**

**Student**
- Paper
- Computers
**Academic Language Demands:**

| Language functions | • Classifying  
| | o Students will categorize their statistical topic ideas into useful and non-useful segments in order to determine what they will study.  
| | • Summarizing and Informing  
| | o Students will share their brainstorm with classmates  
| Vocabulary | • Descriptive model  
| Ways students need to use language | • Writing down ideas  
| | • Sharing ideas with groups  
| | • Writing out a logical outline  
| Support of language | Students will be given computer resources if they require speech-to-text software or typing instead of writing.  

**Classroom Management Plan**

Mathematics-Statistics

Much of the work students will be doing in the mathematics-statistics portion of this unit will be in small groups in the manner of complex instruction. Thus the groups will be strategically randomly assigned so that students with special needs are met, but otherwise the roles will be random and students will be in a different role each week. Speaking in small groups and in the whole class can be difficult for some students, so there will be many opportunities for individual think time, work with pairs, and work in small groups before proceeding to large group discussions. In the light of complex instruction, at the beginning of the unit we will establish explicit norms and roles that the students will play a large part in creating. Some norms and roles/responsibilities that I will emphasize, alongside those that the class contributes are as follows.

**Norms:**
- Everyone is expected to participate
- Collectively we are stronger than individually
- Respect is key
- Everyone will have a chance to be every role at some point during the unit
- Everyone has something to contribute
- When groups present everyone will be expected to be respectful and actively listen
- Active listening
- Your group is your first resource

**Roles/Responsibilities:** Each person in your group will have an assigned role to fulfil
- **Equity Monitor**
  - Encourages everyone to share their ideas
  - Makes sure everyone feels respected and heard
  - Elicits voices from those who may be too shy to speak
- **Resource Monitor**
  - Makes sure everyone understands what is happening
  - Makes sure the group has the resources it needs
  - Calls the teacher over for group questions
Facilitator
- Gets the group off to a quick start
- Keeps ideas flowing
- Keeps time and makes sure the group is on track

Product Monitor
- Makes sure everyone’s ideas are represented on the final product
- Manages the final product production
- Makes sure everyone is able to present the final product

Beyond the roles and responsibilities established in complex instruction for student involvement, I believe that the practices I take on as a teacher are intrinsically tied to the behaviors students exhibit, but that these behaviors can also be affected by the lives of students. Disruptive behavior may be symptomatic of an issue at home, or a lack of empathy from me as a teacher. For this reason I want the classroom space to be that of comfort, empathy, and mutual respect as outlined in the Restorative Justice model of behavioral intervention. If behavior becomes an “issue” for anyone in the classroom (me or a student), students will be encouraged to call a meeting with the involved parties to discuss all perspectives involved.

Statistical Validity Task Card

Your Task:
As a student at Shelton High School, Kasson wanted to know how many students felt that the pool being closed was unfair, but he knew he could not ask every single classmate. He decided to take a sample of the first twenty people he saw Tuesday. He finds that 17 of the students felt it is unfair, 2 didn’t really care, and 1 said they understood why it had to close and thought it was fair. Kasson concludes from their report that the school as a whole feels it is unfair for the pool to be closed. Is Kasson’s data a valid representation of the school’s feelings about the pool? Justify your answer.

Product: A poster with all of your group member’s names, date, and answers to the following questions:
- What is Kasson’s sample? What is the population?
- Can you identify any problems with choosing the sample in the way that Kasson did?
- Is Kasson’s data a valid representation of the school? Why?

Young Adults In America Reading Guide

What you will read: Young Adults in America by Tom Snyder, National Center for Educational Statistics. This is a report presentation on statistics gathered about young adults (18-24 year olds) in America. Read all of the slides with a critical eye on the conclusions you may draw from the graphics, and the conclusions they present. Answer the following questions while you read:
- On page 4, what happened in 1988?
- Does the chart on page 11 accurately portray a day for you?
- What conclusions do you draw from this report?
- What conclusions does the author draw?
- What ways are data represented here?
# Statistics Grading Rubric

<table>
<thead>
<tr>
<th></th>
<th>0 Incomplete</th>
<th>1 Beginning</th>
<th>2 Approaching</th>
<th>3 Meeting</th>
<th>4 Exceeding</th>
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<tbody>
<tr>
<td><strong>Conceptual Understanding</strong></td>
<td>No work shown</td>
<td>Work shown demonstrates that you have some idea of what the problem/activity is asking, but the connection is unclear</td>
<td>Work shown demonstrates that you an idea of what the problem/activity is asking and loosely connects</td>
<td>Work shown demonstrates that you have an idea of what the problem is asking and there is a clear connection</td>
<td>Work shown demonstrates that you have a good idea of what the problem is asking and a clear connection with a justification</td>
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<tr>
<td><strong>Procedural Fluency</strong></td>
<td>No work shown</td>
<td>Incorrect use of strategy, but obvious effort shown</td>
<td>Almost correct use of strategy</td>
<td>Correct use of strategy, but the answer may not be the best answer</td>
<td>Correct use of strategy and the best answer presented</td>
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<tr>
<td><strong>Problem Solving</strong></td>
<td>No work shown</td>
<td>Some work is shown, but is not obviously connected to the answer, and the answer is incomplete</td>
<td>Some work is shown and connects to the answer given, but the answer is incomplete —Or— An almost complete answer is given with little work shown</td>
<td>Ample work is shown and connects to the answer given, but the answer may not be complete —Or— A complete answer is given with little work shown</td>
<td>All necessary work is shown and clearly connects to the complete answer</td>
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<tr>
<td><strong>Reasoning</strong></td>
<td>No work shown</td>
<td>Steps in the work shown are difficult to follow</td>
<td>Steps in the work shown can be followed with a close eye but do not clearly lead to the answer given</td>
<td>Steps in the work shown follow from one to the next, but may not clearly lead to the answer</td>
<td>Steps in the work shown clearly follow from one to the next and lead to the answer</td>
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Connections to the theme of this quarter: This quarter’s program theme seems to be along the lines of learner-centeredness in the classroom, and so in Greene I have highlighted some places where I have seen a connection.

- “My identity has to be perceived as multiple” (1) like the living systems in LCC.
- “Traditional notions of ways to achieve efficiency feed into claims that schools can be manipulated from without to meet predetermined goals” (9) which connects to the ball of yarn activity that James brought in about living systems.
- One page 11-12 there is this place where she is talking about perspectives that are small and are big, and I see it as the opposite of what she is talking about. She claims that seeing small things is a vantage point of power, taking a technical point of view and only seeing schools out of context, whereas seeing big things is seeing the context the school is situated in. Having my own definitions of seeing small vs big made me really dig into this section and see how Greenwood and the critical pedagogy of place fits in, but how we also have to see the school as a system controlled by the powers at be.
- “Teachers must communicate modes of proceeding, ways of complying with roles and norms, and a variety of what have been called ‘open capacities,’ so that learners can put into practice in their own fashion what they need to join a game, shape a sonnet, or devise a chemical test” (14) developing norms/roles like Cohen and LCC.
- “Given such a preoccupation, it follows that certain children are conceived of as human resources rather than persons. Much of the time, they are spoken of as if they were raw materials to be shaped to market demand” (32) which is the goal of schooling, to shape citizens, and is the opposite of the LCC ideology.
- “They are challenged to become active learners, not simply passive receivers of predigested information” (34) just like in the LCC model.
- “Like freedom, it [community] has to be achieved by persons offered the space in which to discover what they recognize together and appreciate in common: they have to find ways to make inter-subjective sense” (39) this really extends the idea of a learner centered classroom into the space of the students creating their own community, connecting to Cohen in having students create their own norms and roles, and to Noddings with student choice.

Some major themes from Greene:

- [Life as a quest for and of metacognition] “we must inescapably understand our lives in narrative form, as a ‘quest’” (1), “A reflective grasp of our life stories and of our quests, that reaches beyond where we have been, depends on our ability to remember things past. It is against the backdrop of those remembered things and the funded meanings to which they gave rise, that we grasp and understand what is now going on around us” (20), “Seeing our lives as quests opens the way to our also seeing them in terms of process and possibilities, in terms of ‘a route, and experience which gradually clarifies itself, which gradually rectifies itself and proceeds by dialogue with itself and with others’” (75).
 ● The industrial/capitalist model of education, “people can choose to resist the thoughtlessness, banality, technical rationality, carelessness, and ‘savage inequalities’ that now undermine public education at every turn” (2), “Given such a preoccupation, it follows that certain children are conceived of as human resources rather than persons. Much of the time, they are spoken of as if they were raw materials to be shaped to market demand” (32).

 ● “of all our cognitive capacities, imagination is one that permits us to give credence to alternative realities… to set aside familiar” (3) Making the familiar strange and taking on multiple perspectives. “we are called upon to use our imaginations to enter into that world, to discover how it looks and feels from the vantage point of the person whose world it is. That does not mean we approve it or even necessarily appreciate it. It does mean that we extend our experience sufficiently to grasp it as a human possibility” (4) [playing the believing game and having empathy].

 ● “But when it comes to schools, the dominant voices are still those of the officials who assume the objective worth of certain kinds of knowledge” (9) [Yosso on cultural capital], “I also think we have to hold in mind that the modern world is an administered world structured by all sorts of official languages. More often than not, they are the languages of domination, entitlement, and power, and there are terrible silences where ordinary human speech ought to be audible, silences our pedagogies ought somehow to repair” (47) [hooks and Delpit on the culture of power].

Just some stuff I liked:

 ● “It is simply not enough for us to reproduce the way things are” (1)

 ● “I find myself moving from discovery to discovery; I find myself revising, and now and then renewing, the terms of my life” (5) disequilibration, accommodation, and assimilation, the learning cycle.

 ● “When we look out at it from the vantage point of our old framework, the new always appears improbable” (22).

 ● “‘Poverty talk is always a discourse about them… When we turn and look at their children, we feel concern about this future citizenry, this growing young population ‘at risk,’ whom we call ‘at risk’ less out of outrage and compassion than because their condition threatens our security and comfort, our children, our schools, our neighborhoods, our property values’… ‘benevolent community’… ‘instruments of benevolence’” (32-33) this reminds me exactly of how Payne would consider poverty stricken people, as a threat to her well-being.

 ● “We can bring warmth into places where young persons come together, however; we can bring in the dialogues and laughter that threaten monologues and rigidity” (43).

 ● “The narratives I have encountered in my journey have made it possible for me to conceive patterns of being as my life among others has experienced: to look through others’ eyes more than I would have and to imagine being something more than I have come to be” (86).
Sem Prep ideas (Raw and not McKenna based atm)

- “we are called upon to use our imaginations to enter into that world, to discover how it looks and feels from the vantage point of the person whose world it is. That does not mean we approve it or even necessarily appreciate it. It does mean that we extend our experience sufficiently to grasp it as a human possibility” (4) playing the believing game and having empathy. Watching the music video for What It’s Like by Everlast https://www.youtube.com/watch?v=vCZ1YteCv5M Answer the question: What disequilibration do you feel? How do you feel yourself empathizing with the people in the video and with the lyrics in the song?
- “When such a dialogue is activated in classrooms, even the young are stirred to reach out their own initiatives” (5) In what ways did your curriculum unit or microteaching sections start these sorts of dialogues with students?
- “refuse artificial separations of the school from the surrounding environment, to refuse the decontextualization that falsify so much” (11) In what ways do your curriculum units and microteaching attend to a critical pedagogy of place?
- “there are expectations that all young persons over time will develop the habits of mind that may enable them to take initiatives in the learning process, to become critical and self-reflective learners and ultimately practitioners. They are challenged to become active learners, not simply passive receivers of predigested information” (34) Describe an instance in your practicum work where you have witnessed a student taking such initiative.
- “Like freedom, it [community] has to be achieved by persons offered the space in which to discover what they recognize together and appreciate in common: they have to find ways to make inter-subjective sense” (39) put this in dialogue with Cohen, McCoombs, and Piaget. (This really extends the idea of a learner centered classroom into the space of the students creating their own community, connecting to Cohen in having students create their own norms and roles, and to Noddings with student choice. This also seems to be a socio-constructivist outlook).
MFE Reflection # 1

The kinds of activities and tasks that provide students opportunities to understand seem to have a theme of individually constructing meaning, then extending that meaning through working in small peer groups. I saw this with number talks (Kazemi & Hintz), groupworthy tasks (Cohen & Lotan), as well as today at Jefferson. Students always first have individual think time, then seem to have a chance to turn and talk, and finally share their ideas with the whole group. This makes a lot of sense in terms of orienting students to each other’s reasoning, and it allows each and every student to construct some meaning on their own and share an idea. I suppose then this is a teaching practice that carries through each of the above tasks, providing students opportunities to construct meaning in several groupings which gives a range of students access to the activity (Cohen & Lotan; NCTM). Then that means the types of activities and tasks that provide learning opportunities for students are number talks, groupworthy tasks, and classroom discussions, all learner centered rather than teacher focused, having students take responsibility and construct their own learning (McCombs & Whistler).

Teaching practices that maintain high cognitive demand are then required for these tasks so that students can gain as much as possible form their activities. In launching the task I noticed that Jana asked students to draw a rectangular prism then dove into how they were working with the concepts of two and three dimensions. This made me realize that giving context for a task really just needs to show students the why behind the task rather than give them the mathematics to work with, thus maintaining cognitive demand (Gutierrez & Irving). Another teaching practice I noticed today at Jefferson was asking students to write down the first question that comes to mind, which reminded me of Gutstein in that he encouraged his students to ask as many questions as possible, and he did his best to answer them all, whether or not they were math
questions, as did Jana. This maintains cognitive demand because not only do students have the chance to get the non-mathematical questions out of the way, it also give access to students who may not know where to start with a problem without giving away any concrete answers.

A final teaching practice that maintains cognitive demand is extending the task for students who have the beginning portion done, allowing students who already have constructed meaning for themselves to move forward. I noticed this at Jefferson today, as well as in preparing groupworthy tasks (Cohen & Lotan; NCTM).

MFE Reflection # 2

The first thing Jana did was tell a story about tree people who came to her home and “paced” from a tree to her house, giving students measurement context for the word “pace.” This tactic is about filling in prior knowledge where students may not have any, or where there may be a common meaning and a different mathematical meaning for some word or phrase. Then she introduced the math that students would be using, that of measurement, ratios, algebra, and even percent, but she did not lower the cognitive demand by stating the many strategies the students could use to solve the problem. This tactic gives students the reason why they should be doing the task at hand, rather than saying “because I said so,” which I often hear my mentor teacher say. Then Jana stated the goal for the task, which was to use as many strategies as possible to solve the problem, which is why she did not name them at first, but rather she named the big concept areas that the strategies would come from.

Something I’m still wondering about is how to walk the line between maintaining cognitive demand and giving the right amount of math context, especially for my students who have not been successful in traditional math classes and often give up if it’s too much all at once.
How can I break up the tasks in such a way that will let students process each piece one at a time without lowering the cognitive demand?

**MFE Reflection #3**

In working with Jana’s students today I realized I still have a lot of work to do in order to have questions ready off the top of my head. I know some of this will come with experience, but I need to practice this a lot so I can ask more questions at the right time. I learned that given the right set up and prior interactions, students will be completely oriented to each other, and I look forward to trying to set up that sort of practice in my future classroom. I noticed with this orientation to each other, students really ran the group on their own, that they knew exactly what they should be doing, and kept entirely on task. In class they mentioned that I allowed them to have their own thinking time, and share their strategies which helped them consider their own work. These are the strategies that Jana suggested for us to use, and they worked very well with her students. I also learned that the language behind the math can cause students to get different answers, and that it really is important to give students common language and context for language intensive problems. This is something I have been experiencing in my practicum classroom too because the lesson I am working toward is word problems.
Ms. Vaughan,

My name is Kaitlyn Frasier and I am applying for the Resident Academic Assistant position with a math focus. I believe I am highly qualified for this position because I am currently a student in the Master in Teaching Program at The Evergreen State College aiming for my endorsement in secondary mathematics. Prior to the MiT program I majored in mathematics and physics at Evergreen, and in the program I have had the chance to work with high, middle, and elementary school students through field experience. My practicum placement is in a rural school district where I work with students who were tracked into applied math courses. I have observed, tutored, worked in small groups with, as well as taught the students at my practicum site. My passion is to help all students see that math is a true art, as well as a tool to read the world. In the Master in Teaching Program I have and will continue to learn the wonder that is working with students, and I believe this job would be the perfect addition to my graduate studies.

Thank you for your consideration,

Kaitlyn Frasier
Asperger’s Syndrome

1. Before doing anything else, check your assumptions & prior knowledge by writing for 10 minutes about following:
   a. **List** what you understand to be the features of the disability.
      a. Social awkwardness/lack of understanding of social cues
      b. Difficulty with empathy (either over or under empathize)
      c. Understanding of social norms, but inability to act them out in time
      d. Forced social interactive norms make interaction seem awkward
      e. Trouble with non-verbal communication
      f. Articulate linguistically
      g. Language can be blunt
      h. Obsessive/compulsive behaviors (collecting too)
      i. Ability to focus on one project/task for long periods at times, but easily distracted at others
      j. Restricted interests
      k. Boundary issues (either too little or too much personal space)
   b. What might it be like for the student with this disability to navigate your winter quarter micro teaching lesson?
      Since I had students work in groups I would think it could have been difficult to work together, but the class had known each other for the whole year and it was a comfortable environment. The tasks I gave out were too much material all at once though so it definitely could have been frustrating, and worthy of a shut down if the material was of no interest.
c. How would you as a teacher know?

I would have seen the student become either uncharacteristically quiet or loud, not doing the worksheet because it was too much information all at once. They would tend to work on their own paper anyway so I would not know to look for their work in groups, but rather to look for whether they were making progress on their worksheet.

d. What may have been 1-2 parts of the lesson that would have created:

- **Access** to learning for a student with this disability
  1. A connection to something that deeply interests them

- **Barrier** to learning for a student with this disability?
  1. Expectation of group product with no individual accountability
  2. No connection to interests

3. Use the readings that outline Instructional Guidelines & Accommodations for students with the disability to identify 5-7 different kinds of approaches to scaffolding or structuring a lesson. Explain when and why you might use each strategy in the context of a classroom.

   1. Compensate for a weakness by maximizing a strengths because it is often true that the many strengths of a person can make up for any weakness. This would be used in a classroom context any day really because weaknesses may present themselves at any time and need structure to help move forward.

   2. Find an alternative means to accomplish the same result. This would be used in cases where a student cannot accomplish the desired result through the method requested, but it is the result that is required. I would be wary of using this strategy for some math because
process is key, but there is always another way of explaining the same problem, so different strategies are always welcome.

3. Explicitly teach the skill that is missing. This would be when a student is missing a vital skill and is not picking it up subconsciously because it is important for the student to have the skill and take it into their future life.

4. Establish social, physical, and academic structure that is predictable and minimize auditory and visual distractions. This would be a good classroom practice in general because it minimizes distraction for all students and allows them to focus on the learning targets at hand.

5. Clearly define what needs to be done. This would also be a good classroom practice in general because it gives students an agenda for what they should be working on.

6. Identify interests and connect. This is vital to any classroom, but even more so for students on the Autism spectrum because their interests can be narrow and focused. This would happen in cases where the student doesn’t have any interest in the material and is slipping because of that.

7. Use visual structures. It was said that many students on the Autism spectrum are visual thinkers and this can connect more to visual structures, therefore it would be appropriate to give interspersed visual aids in presentations, and offer visual directions.

4. Finally re-read your initial writing. Take 10 minutes to reconsider (i) your understanding about the nature of the disability, and (ii) your ideas about access points and barriers for students with this disability in your lesson.

   In many ways the characteristics I listed in my first reflection were confirmed through the investigation of these videos, but I learned a lot about instructional practices that I could
take up in order to better help students who are on the autism spectrum. For example I could break down tasks and clearly define them in order to keep students organized and in time, chunking them into pieces. This is truly a best practice for any student who has trouble organizing their time anyway, which is true of several of my practicum students. I also learned that reading can be difficult for students with autism spectrum disorders because it is a problem of non-linear processing, where it is easy to forget what one has just read. I think the most important thing to consider when creating access for students with Asperger’s Syndrome is that some skills are not inherently obvious and need to be explicitly taught, much like the “hidden rules” of the middle class culture. It is important to teach skills like organization and time keeping, and other such practical life skills because we can’t assume that all students already have them.
1. Ways that my cooperating mentor teacher intentionally planned opportunities for students to learn.

My cooperating mentor teacher intentionally planned a launch for students to connect to what they had been learning for 4 weeks now, as well as propel students into the newest piece of their quadratic equation toolkit. She also gave two examples of quadratic equations that were similar to the ones they would be working with in order to give students the procedure of working through the quadratic formula. The lesson for the day was that of group work which has students working in complex instruction like groups on two problems on whiteboards. Students work together then present the problems to the class at the end. Within this group work time my mentor teacher walks around the room and answers questions that students have, sometimes asking them probing questions to get them to answer their original one. She intentionally does not have a closure portion of her lesson because she says that her students have checked out by then.

2. Describe the ways in which you provided students with opportunities to learn. How did you pay attention to the details (the launch/warm-up, handling/organizing material/groping students/closing a lesson/transitions between lessons/activities, etc.).

For the launch I did a similar access to prior knowledge that my cooperating mentor teacher did, but for the examples I tried to ask students lots of questions to see what input they would give. Instead of just having me at the whiteboard writing the procedure, I wanted students to give me the steps in the process and break it down for themselves, so I intentionally asked questions. The same is true of when I went around to groups to monitor, I would ask questions and push groups to help each other instead of handing them the answer. Then I also had groups present their group work to the class and I would ask questions about where numbers came from to confirm they were paying
attention, and not just reciting the procedure. Finally, I closed the lesson by circling back to the quadratic equations toolkit that I launched the task with, saying that the quadratic formula is another tool they can use.

In terms of the specifics, I introduced the class to the entry task by saying that they have a pre-assessment for the next couple of weeks of learning and to try the best they could, then set the 10 minute timer that my cooperating mentor teacher uses to keep the entry task from going too long. The timer went off and I collected papers from Team Captains, which could have been more efficient, then I started the lesson with the launch. To transition into group work I said for Resource Managers to pick up their group materials, which again could have been more efficient. The materials were at the front of the room like they always are, and students were grouped by my cooperating mentor teacher in their complex instruction strategically randomized groups. For the last transition into groups presenting their work I went to the front of the class and said it looks like about everyone is done, but chatter continued so I said if you can see my hand raise yours and finish up your conversations which didn’t work much better, and a student said “that means she wants you to shut up.” This all makes me realize that I really need to work on transitions.
1. Queries
   
   a. The authors argue a whole lot about the downfalls of our current system, but never stops to consider who it is working for, and who learner-centered models may not work for.
      
      i. What about the benefits of our current system?
      
      ii. Who really benefits from a learner-centered classroom?
      
      iii. Does a learner-centered classroom really work for every student?
   
   b. The authors discuss the importance of students understanding how they are being graded, and thus the importance of rubrics.
      
      i. What benefits do rubrics really serve for students?
      
      ii. What if students don’t take rubrics seriously/don’t understand them/just plain hate the idea of a rubric?
   
   c. Doesn’t every school ultimately want achievement for all of its students, not just learner centered schools?
   
   d. Is it just me or are they taking it a step too far when they talk about educating parents in a learner-centered school on page 138?
   
   e. Where does the willingness to change on page 163 come from? How can we inspire a willingness to change in our practicum teachers when they are set in their ways?

2. The role of the teacher in the learner-centered classroom
   
   a. Knowing and understanding (the needs and interests of) each learner
   
   b. Creating a positive learning environment
   
   c. Reflecting and learning from experience
   
   d. Fostering students’ self-esteem and well-being
   
   e. Facilitating the managing of responsibility for the learner
f. Respect and develop rapport with students and encourage them to do the same

g. Answering questions, being a resource in their content

h. Seeing things from the student’s perspective and empathizing, as well as taking their perspective seriously

i. Actively connecting what students are interested in to the content

j. Treating students as whole people and learning and building upon their personal histories

k. Teaching a variety of strategies

l. Using a variety of teaching strategies

m. Providing multiple perspectives

n. Linking the prior knowledge of students to the new information they learn

o. Planning activities that help students reflect on their learning process

p. Encouraging students to think for themselves

q. Providing a range of activities that are challenging to a range of students

r. Seizing real world opportunities for learning

s. Developing useful ways for students to evaluate their own work

3. Defending the learner-centered classroom

a. Learner-centered classrooms “contribute to the establishment of a positive climate for learning” (39). Without a positive learning environment students will not have the comfort in the classroom they need to learn, like we learned in Adolescent Development.

b. Learner-centered classrooms are important “Because students are empowered and feel ownership over their own learning by virtue of having a voice and choice, they are more willing to learn and be involved in their own learning” (48). If students don’t develop early this sense of responsibility for their own learning, they will have no reason to go on
learning in their own lives to develop a passion for learning, even if just for a skill they want to carry out as a career.

c. Learner-centered classrooms focus on the needs of the learner, addressing all of their human and learning needs rather than brushing them aside and just teaching to the content. This is truly important because it addresses the many issues that students may face in their lives like oppression, abuse, or any number of human problems that never seem to be addressed in schools.

4. “Living systems,” and the “holistic” approach

a. Living systems are systems that are constantly interacting within and outside of themselves. When I think of living systems I think of life cycles, but I can certainly see how classrooms are living systems too because they are systems of learning cycles that interact between students and teachers and the environment of the school.

b. A holistic approach in terms of teaching is acknowledging the factors that influence learning and the learner outside of the classroom and the school, recognizing the needs of students as humans and as learners, and just seeing the bigger picture in general.

c. These terms are truly intrinsically tied because in order to see the classroom as a living system we have to have a holistic approach, we have to see the interactions happening outside of the classroom itself and understand the needs of students on a human level.

5. Defining the learner-centered classroom

a. My Original Writing: From a quick search on the internet I find that a learner centered classroom is one where both teacher and students reflect on their learning processes, as well as students sharing responsibility for their own learning. Beyond this I believe that a learner centered classroom should be one where students learn cooperatively from each
other rather than just from the teacher. It should be a place where students are positioned competently, oriented to each other’s ideas, and where their goals are that of the class rather than the goals of class not reflecting what they want to learn. Learner centered means to me having the learner be the focus of their own education rather than having standards and goals forced upon them that have no relevance for them. It should be a classroom where the student’s prior knowledge and goals for their future are valued, built upon, and expanded into new interests and ideas. The learner centered classroom should reflect the interests, values, goals, and need of each student, as well as have students be cognoscente of these things and how they truly can and do connect with their learning. It is important for students to use metacognition and realize where they are, where they want to be, and what they need to do in order to get there, which seems vital in a learner centered classroom. It also seems as though the learner centered classroom is one where critical thinking is valued and can be used in a variety of contexts, and this an interdisciplinary lens could be used to read the world. Classrooms like that of Gutstein from math methods seem like they are learner centered because they take social justice issues that are connected to the students’ lives and center the learning around this integral connection to the learner. It also seems as though in Gutstein’s classroom they did a great amount of reflection, both teacher and student, because they would often ask questions, and be asked questions that made them think critically about their own learning process.

b. *Additions and Support:* Many of my initial thoughts about learner-centered classrooms are supported by this text (see pages 65-66), but I also learned that this type of classroom doesn’t have to start from the very beginning of the year, but can be a slow transition to acclimate students who may not be used to the idea (65). I also learned that the process is
very feedback oriented, and that the teacher and students alike should often reflect and provide feedback for each other on how the classroom is and is not working for them individually (66). Finally, something else I learned is that the evaluation of students in a learner-centered classroom is not only self-reflexive and student driven, but also focused on multiple intelligences (115).
Identify 3 classroom management strategies you have observed in your classroom or learned through this course.

Three in order of most favorite to least favorite that we learned about last Friday:

1. Restorative Justice
2. Positive Behavior Intervention Support
3. Zero-Tolerance Policy

Fully explain each strategy and how it aligns with your beliefs about teaching and learning.

1. Restorative Justice is a model that focuses on restoring any harm that a behavior has caused then taking steps toward creating an environment where the behavior will not happen again. It is an entirely context based system of behavior intervention and it relies on the multiple perspectives of all who were involved in the situation, allowing those involved to see all of the perspectives and understand who was hurt and why. This system takes away the system of power struggle that teachers currently have, but it takes explicit structuring and cooperation in the co-creation of norms for the group of students and teachers. This system aligns with my beliefs about teaching and learning because it is all about taking on multiple perspectives, listening to the context, and actually getting to know the students in front of you, while also inviting student to take responsibility over their own actions and reflect. This system of behavior intervention is one of pulling the students into thinking about what happened instead of pushing them away to brood over it. It’s getting down to what is really happening and why instead of making a series of assumptions that lead the students involved toward even more frustration.

2. Positive Behavior Intervention Support is a model that focuses on finding out what the purposes and triggers are for behaviors, then pointing those behaviors toward more
constructive goals. There are five best practices to keep in mind including: predictability, environment, appreciation, choice, and enhancement. These practices are said to be those that could be useful in any classroom at any time, although I might disagree.

Predictability is maintaining a classroom schedule that is routine and only changed with purpose and notice, which I agree is something to maintain as a standard practice, but I also believe that students also enjoy change, and should be asked whether or not they prefer a routine instead of automatically assuming one. Environment refers to accommodating student movement and placement within the classroom, so using the space so that students are not unnecessarily distracted by traffic or classmates, which I have no dispute with. Choice and enhancement refer to having students participate in the creation and maintenance of classroom norms as well as curriculum development, which I completely agree as a learner centered method of keeping students involved in their own education. Finally, appreciation refers to extrinsic motivation for students, that is, positive motivation for positive behaviors. This is problematic in a number of ways, only one of which being that “positive behavior” is vague at best, and dangerous.

3. Zero-Tolerance Policies are those that take firm, immediate action for any small sight of the banned behavior. For example, any student seen with a cell phone out on in class gets their phone taken away immediately in some classes. I am unsure about zero-tolerance at this time because I know they are ineffectual, but on paper they sound good. I certainly would not want any danger of a student having a weapon at school, whether or not they are going to use it, but at the same time a policy has never stopped anyone. The major issue with these policies though is that they are so vague that anything may be interpreted as falling under the category that could get the student expelled.
**Explain how you could apply these strategies in your future classroom.**

1. To apply restorative justice in my future classroom would take a lot of communication from the very beginning. I would have to establish a dynamic of being on the same level as my students while also being the teacher in the room, and build a set of classroom norms with them that everyone agrees upon. It would be amazing to have check-ins every day where students could share their best, worst, most boring thing that happened to them the previous day or period, or anything, to build a true classroom community. Then using restorative justice as a behavioral intervention tool would just be a classroom norm, and anyone could mediate a possible problem.

2. To apply positive behavioral intervention support in my future classroom I would have to get to know my students well and understand what is happening in their lives in order to understand the things that may trigger their behaviors. Once I learn these triggers I could try ways of reducing them in the environment as well as building a positive outlet for them. I could also positively reinforce behaviors in the classroom, but not in an extrinsically motivating sort of way because I see that as problematic. I would rather have students positioned competently among their peers when they display positive behaviors, and not negatively for behaviors that I may perceive as negative. I would also model behaviors that I would ideally like students to take on, and brainstorm with my students what behaviors they think are useful for a classroom environment.

3. To apply a zero-tolerance policy in my future classroom I wouldn’t… This was just the lesser of evils, and I could explain it best, but if forced to take on a zero-tolerance policy I would always take into consideration the context behind the behavior. Things such as
bringing weapons to school would be more difficult to field, but the context is still the key to unlocking what is actually happening, not immediately expelling students.

Think about one classroom management experience you had not anticipated that has occurred. Fully explain the incident or experience.

Students were working on their entry task which was different for the day because they were practicing for their algebra basic skills monitor. They had a half sheet of the monitor and were combining like terms when my CMT noticed that one student wasn’t starting at all. This student has good and bad days for doing her work, and today she said she didn’t know how to do it as an excuse. I didn’t think it would escalate, but about five into class (a couple of minutes later) the whole class began to chatter and my CMT said “quiet please” a couple of times, but the class was not quieting. Then my CMT lectured the class about why she shouldn’t have to yell at them and how the entry task was quiet time because it was important to practice their fluency, and no one should have the excuse that they can’t do it because they are pre-algebra skills. She later said to the student she talked to first that she didn’t mean to yell. I had seen my CMT become frustrated with this class before (always the afternoon classes), but never to such an extent that she lectured them for simply chattering.
What was the learning objective for the sessions you attended? Describe 2-3 ways that the sessions connected with or complexify how you think about the program themes and your work as teachers.

**Session 1**: The Paradox of Race- Race has no logical grounding in biology because there is even more diversity within races than there is between them, and any biological indications are not to do with race but rather geographic origin, which influenced the adaption of surface level characteristics like skin color and hair texture.

- Last quarter in Teacher Identity and Diversity we investigated the social construct of race and how it is influenced by the people in power, which deeply resonated with the idea of eugenics in this film. The idea behind eugenics was that the people in power wanted to maintain that power so they justified differences between races they constructed by labeling bad science as fact. An example of bad science being the noticing of the immense difference in death rate between races and attributing them to genetic predisposition rather than seeing the actual cause, which was the social condition of immense poverty that Black people were forced to live in. The social meaning attributed to difference immensely stratifies the categories created by even the smallest differences.

- Just as the defined purpose of schooling is ever changing, the definition of race is too. Everyone has their own lines, and the defining line chosen by the government is the opposite of consistent, which the presenters touched on at the end after the film. This is the very nature of politics because no one can agree, thus we end up with an ever changing system, like that of schooling where children are the ones caught in the middle. This makes me believe that we as teachers have to explicitly
teach the history of this constant change, and the reasons behind it from multiple perspectives so that they know why they are being asked for their race on their census card, and what that really means for them in their own lives.

- At the very end of the presentation there was a quote that I resonated with: “Our ‘choices’ are shaped by a wider set of economics, social policies and politics.” This reminds me of Ruby Payne, in that it is the antithesis of her work. It is recognizing everything I believe in, that we are being pushed around by a society that is only interested in itself and by people in power who are only interested in making more money. Payne pissed me off when she said that it was possible for people in poverty to decide that it was just too hard, and get up and walk away because that’s not how it works. Every day we are forced to make decisions in our lives and sometimes for people in poverty that decision is whether or not to steal bread and peanut butter for dinner for your starving family, which should not be seen as a law issue, but as a larger social problem that needs fixed. In concert with my views of teaching this makes me think about how we can help our students see what is influencing the choices they make in their lives, how we can supply them with tools to read the world for what it really is and avoid the Ruby Payne cloud of ignorance.

**Session 2: Working Toward Racial Justice Inside & Outside the Classroom** - Although discussions about race are uncomfortable it is important for us to talk about it and clarify our misconceptions because without asking we will never know.

- A topic that came up in our discussion was that of reverse racism existing, and what form that would take. The conversation turned to how prejudices can be in
any form, and that anyone can experience interpersonal acts of prejudice against their identity. Then the idea of institutional versus interpersonal racism, and how many overlook the idea of institutional racism existing, which makes me believe that this is something we should be teaching. Our students should know how institutions are affecting the choices they make in their lives, and why institutions have such influence. We as teachers should be asking students to reflect on the very schools they are in, and how their education is being effected by institutional forms of oppression.

- Another topic of discussion we addressed was that of anti-racism, where I interjected the idea we discussed in Teacher Identity and Diversity that Warren presented, that is, anti-racism is actively taking action against racism. We then discussed what this might look like: dialogue, reflection, saying something, and seeing multiple perspectives, which are all ideas directly connected to Warren and what we discussed in class.

- Finally our group discussed who gets to define “normal,” which is of course those in power, and so I began to think about Noddings and Cohen and Lotan with student choice. Having just started reading the Learner-Centered Classroom book I have all of these ideas swirling in my mind about how students should be a part of the decision making process, providing their perspective on what they need from the classroom environment, as well as what they want to get out of their education. In turn this is having students create the norms of the classroom, having them actively produce and maintain a safe classroom environment.
Session 3: Dear White People- Race is more than skin deep in that the color of one’s skin impacts their lives on a daily basis, whether or not they choose to notice it (in the case of white people).

- This film makes me really think about how students have the agency to change their own world, but how it can also have negative repercussions. We as teachers need to let students see this control they have over their own lives, while giving them the tools to handle the conflicts that may occur, as well as how those in power will react.

- This film also connected with the idea we explored last quarter in both Adolescent Development and Teacher Identity and Diversity which was that identity are more than just skin deep. Oppression, in the case of this film racism, effects people every day of their lives, just like being perceived as female effects every day of mine. We as teachers have to be aware of not only the many facets of identity that our students have, but also how we identify. We have to get to know our students for who they really are, and not make assumptions based on preconceived notions.

How do you make sense of the role of these conversations in this particular place that we live and work in (Evergreen, Olympia, Washington).

In the context of Evergreen these conversations seem intrinsically tied to what we have been learning about, and it seems as though there is a community of our peers (to some extent) that want to learn more, but are searching. I believe that these conversations are vital to spread the wealth of experience and knowledge that we all have, giving each other perspective on each other’s preconceived notions. On a larger scale we have Olympia where people of like mind do
exist, but it is still a place of arrogance and blissful ignorance. These conversations have to leave our classroom, our school, in order to make a difference because 9 people talking in a group or 34 people in a cohort together nodding their heads in agreement doesn’t do anything to change the messed up world outside the walls of our school. Bringing these conversations into places of suburban blissful ignorance like Olympia, and then into places of stark disagreement like some more rural counties in Washington is the only way to spread the word and get people actually thinking about what is happening in our world to cause such inequality, inequity, and oppression.

What was your experience of the day, both as a participant and as part of a community? What did you notice wonder about how you engaged with the difficult conversations about race; and how the Evergreen community engaged with the conversations?

My Engagement

I often run into the problem of nodding in agreement when I don’t necessarily agree because I am a non-confrontational person, but today I engaged in a dialogue. One of my group members claimed that reverse racism could indeed exist, and that anyone can treat another person unfairly, and after a few others had their say I gave mine:

Racism, oppression, is the intersection of power and prejudice. Although anyone can hold a prejudice for or against something, it is that intersection with power that creates an -ism. I was happy to have interjected something I learned from our program, but at the same time I was disagreeing with this group member who seemed to take it personally. How can we create safe spaces with strangers where we can express differing viewpoints and not create animosity? I felt that she may have disengaged from the conversation
because of this disagreement, although I wanted to hear more of what she had to say, being one of only three women in a group of 9 or more.

Something else I noticed in my own contribution to the dialogue was that I was willing to admit when I didn’t know something. I made a connection between racism and the genocide that occurred in Rwanda in 1994, and was subsequently asked if I believed that this was a form of racism, and I admitted that I have no idea. It was certainly oppression because it was the people in power defining a trait that was inferior and using it for the increase in their power, but I don’t know if racism is the right classification, and that’s ok that I don’t know because I can always seek new perspectives and reflect in order to learn.

**Evergreen Community Engagement**

Something I noticed about the first event I went to was a man next to me getting up and leaving shortly after the presenters gave the main point of the film. Prior to beginning this man had stated that race indeed does have a biological basis, and it was after the presenters stated that race has no such thing that he left. I am unsure if there was a causal relationship between these events, but it made me think these choices people make to remain steadfast in their beliefs is what is wrong with society. People unwilling to see a new perspective are problematic.

Another thing I noticed in the engagement of the community was the awkward way in which my peers engaged in conversation, whether that be many times admitting their discomfort and guilt, or remaining silent. It seems as though they were all walking this precarious line not wanting to offend anyone by saying anything wrong. I noticed this when Sonja was presenting the Day of Absence history to the class too. It’s an air of
not having the right words to say, and pointing out when the wrong word is used, but there is no better alternative. It seems as though we as a culture need to come up with a vocabulary that allows us to discuss these issues openly without having to tiptoe around what words we use.

What might be your next steps in refining your approach to engaging with these dialogues?

Why?

- Becoming more willing to ask clarifying as well as probing questions
  
  o Asking questions can and will make clear for me whether or not I have something meaningful to contribute/a differing opinion, and will help elicit more about the reasoning behind the initial words.

- Expressing my opinion more openly and not fearing disagreement
  
  o Choosing to not talk simply because I am afraid of conflict is no longer a good reason because there is more to this dialogue than just hurt feelings, it’s an entire social construct that is causing oppression.

- Talking about what vocabulary is and is not appropriate, and how we can still have discussions without having the perfect words, we just have to make it a safe space for such dialogue
  
  o If all we ever do is argue the pragmatic meaning of words we would never get anything done, and if continue to hold in ideas just because we are afraid to offend someone somewhere we cannot maintain these dialogues.
Unit Introduction

This interdisciplinary unit engages students in how issues of ownership, specifically the tension between public and private, and community access are restricted by private ownership decisions. To explore this we have students investigate community resources that have recently ceased to exist, an example being the local pool. Because students have already mounted an organized reaction to the closure of the community pool, we have focused the unit on exploring this movement, analyzing what happened and planning for future actions. This directly places students in an engaged discussion of what it means to be private and public, specifically how individual and group actions affect and are affected by resource distribution and sustainability. It asks students to look at private property that is also viewed as a community resource. This unit addresses the interconnectedness of social/economic systems and community, as well as how decisions about private property affect the community as a whole, while expanding on that notion to explore how communities might respond to those decisions. Because this relates to issues that have been specifically identified by the community itself, this unit plan meets not only the needs of the standards, but also provides space for a community to explore issues that are directly relevant to them.

Context for Learning

90 Rural High School Seniors (17-19 year olds)
   46 male and 44 female
Race/Ethnic Breakdown (based on OSPI Washington State Report Card)
   2 Native American
   1 Black/African American
   1 Asian/Pacific Islander
   12 Hispanic/Latino(a)
   71 White
   3 Two or more races
Socioeconomic Status Breakdown (based on OSPI Washington State Report Card)
   47 students with free/reduced lunch

<table>
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<th>IEP/504 Plans: Classifications/Needs</th>
<th>Number of Students</th>
<th>Supports, Accommodations, Modifications, Pertinent IEP Goals</th>
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<tr>
<td>504: ADHD</td>
<td>1</td>
<td>Step-by-step instructions Extra time Preferential seating</td>
</tr>
<tr>
<td>504: Severe ADHD</td>
<td>1</td>
<td>Step-by-step instructions Extra time Preferential seating Headphones Have her repeat directions aloud Checklists</td>
</tr>
<tr>
<td>504: Migraines</td>
<td>1</td>
<td>Extra time Preferential seating Breaks</td>
</tr>
</tbody>
</table>
In designing this project we drew heavily from interest in this issue as voiced by multiple members of our school’s community. Organization around the issue of the pool closure has been ongoing for some time, and many of our students were directly involved in activities to save it. The organization to save the pool is well established, having its own website, plans of action, data presentations, described actions, and media outreach. Many of our students were involved, to various degrees in many of these activities and would come into this unit knowing many forms of civic participation that can bring about change. It is this strong cultural wealth and knowledge that this unit seeks to build off of with the goal of facilitating student reflection on work that has been accomplished, to develop analysis and evaluative tools in regards to actions taken, and to extend these practices beyond this single scenario to help students generalize principles of civic engagement for empowerment when addressing future goals.

Not all students will come in with the same background knowledge or level of involvement in organization around the pool, and for that reason, much of the work that we do in this unit is two-fold. The prior knowledge of the more involved students is leveraged in order to teach their peers, while structures are put in place to help the more involved students understand how to involve members of their community in projects they undertake. While the project begins with student knowledge and students assets, it furthers these assets to engage students in a deeper understanding of civic participation and community organizing.
Week 1: Where are we coming from? Where are we headed?

Gutstein Chapter 4
Summary: This chapter focuses on advocating for student agency and a use of mathematics as a tool for social change. This means allowing students the opportunity to see multiple perspectives of the world, and to see it for what it really is. It means becoming involved and being committed, building a sense of community and resilience in both math and the world. Advocating for this means providing perspectives in every direction for students to see and argue from every side, and this is difficult because there is a delicate balance between the powerless feeling of hopelessness in terms of change, and agency. Advocating for student agency also means subscribing to the belief that there are no hierarchies of oppression and that empathy is a vital characteristic to develop in both ourselves as teachers and our students.

Reflection: This book really connects to our cohort theme of teaching being a political process of inquiry. The sense of powerlessness that the students echoed really rung true of how I felt when I was a student, and one that doesn’t have to remain because we as teachers can foster a sense of agency is our students, telling them that they can make a difference. We don’t have to be the teachers that tell lies to our students, denying how political mere knowledge can be, and how schools are social reproduction engines that turns creative and intelligent kids into standardized test passing robots. This chapter in particular really connected with Teacher Identity and Diversity from last quarter in that developing agency is a process that requires students to know and respect their own histories, know that positive change can happen, and that they themselves can take action. This reminds me of the kids at Lincoln who wrote a letter to the food coordinator of the school district because they wanted the menu changed. That was an opportunity for students to take action themselves, which is an amazing learning opportunity. This does have me questioning the end of the chapter though because Gutstein obviously had great support from his principal and the surrounding community, so how could we as newly integrated community members in our schools, whether that be in our practicum now, or our first year schools, incorporate big issues into our curricula without extreme backlash?

Gutstein Chapter 5
Summary: This chapter covers the intricate relationship between teaching mathematics in context and social justice. Gutstein shows how his students see math as a tool to read the world, and explain their understanding. Using math as a tool means inventing strategies to solve problems and thinking about the world through a mathematical lens. It’s about the interplay between understanding the mathematical concepts and developing an understanding for and critique of the sociopolitical world. Part of this that the author emphasizes is the importance for students to explain their strategies thoroughly, wherein students rarely used traditional algorithms, but instead used invented strategies and mathematical reasoning.

Reflection: A big connection I made with this chapter is the idea that the views a teacher holds about mathematics, which Gutstein obviously had unique and innovative views, truly effect what the students learn, like Stipek said. This also really relates to the idea of a socio-constructivist, or Piagetian, model of learning in that students investigate their own worlds and formulate or invent solutions, using math. Alongside this there is the idea that math isn’t about knowing the answers, like Van de Walle said, but rather sharing strategies and learning from peers like we saw with number talks. I believe this would be an interesting model to explore in my practicum site, although I still ponder what lashback there could be. I see in my practicum site an attempt at
mathematics in context and complex instruction, although they don’t seem to be actually responding to the students in front of them as Gutstein does, but using the model he critiques wherein the context is one of “who’s context?” Something else that I resonated with in this chapter was the fall back on giving students the answer/strategy when they struggle with the math because I tended to do so before, although I believe I am learning and growing toward a better pattern of questioning.

Gutstein Chapter 6
Summary: This chapter is about constructing an inclusive and cooperative learning environment with the help of the students in the classroom. The key to creating this environment is including students in the conversation, asking them what they need from the space. In this classroom teaching for social justice there have to be more than just the usual respect and listening rules, but also making taboo topics normal, as well as hearing out student opinions, creating a critical political relationship with students, and ensuring that students can take action themselves. This means that we as teachers have to provide opportunities for students to participate in honest dialogue as well as provide real life problems for them to hash out. This means fostering an inquiry as stance within the classroom wherein students are required to constantly be questioning the things they see and hear.

Reflection: This chapter connects deeply to what we learned in both Adolescent Development and Teacher Identity and Diversity last quarter because it was all about creating an environment for students to dialogue honestly. It’s about getting to know the students and asking them what they need in order to feel safe enough in the classroom to take on an inquiry as stance, to ask and form an opinion about the many difficult questions that they will encounter. Then when Gutstein addresses whether or not his students were just writing what he wanted to hear it hit me hard because I encountered that many times in my own schooling, as well as it reminded me of the essence of funneling vs focusing questions that we read about. It’s about getting students to formulate their own ideas rather than getting them to state the strategy that you have in mind, just like Van de Walle and several other authors said in EMM. This helps kids form a healthy math identity of inquiry, which is something I see trying to emerge in my practicum site, but the process is only beginning.

Week 2: NO CLASS

Gutstien Chapter 7
Summary: This chapter focuses on the perspectives of students who gained insight into their own social and political worlds through their class with Gutstein. The first student who writes to us expresses how much the class changed her from a shy girl into a student with agency, knowing that she could change her community and the world. She discussed how the questions that Gutstein asked on a daily basis always required them to develop their own critical thinking skills and justify their arguments. The second author introduces the idea that the teaching for social justice that Gutstein does is vital for the youth of our nation because it allows them to understand how they themselves can shape their own world with mathematics. It also gave this author a real reason to enjoy math, rather than the majority of time wherein they merely had to do it to pass in school. The Third author expressed that the way that Gutstein pushed students to figure out the problems on their own was vital for his students to see that math is a process and a
tool that can be used in their real lives. Finally, the last author expresses how much Gutstein allowed them to see the big picture rather than their own narrow world view, letting them see how much they could change the world in their current state as students, that they have power.

Reflection: I found it interesting in this chapter the differing opinions that the first and third students had on Gutstein sharing his opinions in class. The first girl said that his opinions may have influenced hers and thus could be a detriment to their forming of their own opinions, but the third author saw these opinions as an opportunity to challenge the teacher and prove him wrong. I can see both sides of this because I was the shy girl in class, meaning I was often not willing to share my ideas and opinions, especially if they differed from the teacher, although I did find myself questioning teachers when we investigated (questionably) “real world” problems. In this chapter the second author posed the idea that students are skeptical of change when in school they often have the same direct instruction methods imposed upon them continuously, and this reminds me of my practicum site, as well as my mentor teacher. Although we do often have group work in class, the structure is so ridged that I feel intimidated to try and change and experiment with it for my own learning experience as a student teacher. The third author in this chapter wants to become a teacher, and their reason why is something that I profoundly agree with. They state that “teaching is one of the most important professions out there because I know from experience how much impact a teacher can make on the lives of his or her students and how much a teacher can support his or her students to gain the power and strength that anyone—regardless of race, gender, and economic background—can make a positive long-lasting change in our society” (174). I have had so many impactful teachers in my life that I cannot imagine where I would be without their influence, and I hope to one day have inspired at least one of my students the same way my teachers inspired me.

Gutstein Chapter 8

Summary: This chapter focuses on the parents of Gutstein’s students, and how their views explain why he was allowed to continue teaching for social justice. As he says, the parents he interviewed all had spoken for him in the case of his dismissal, and thus all shared a positive view of his teaching. The themes that they spoke to were that teaching is inherently political because life is dictated by our politics, as well as that there is a dialectical process between injustice and the need to stand up to such injustice. Most if not all of the parents expressed that math is integral to their students lives because it serves practical purposes, as well as some parents addressing how it can allow students to read the world for what it really is. Many parents expressed that they wanted their children to be prepared for the world, and that Gutstein’s teaching prepared them for some of the inequalities that they will face.

Reflection: This chapter really connects again to our cohort theme of teaching being political because it is so inherently connected to the lives of our students. Everything our students learn should be something that they can carry into their real lives. We should be teaching them broad concepts and critical thinking skills that they can use as tools in their own world. I still wonder though how we can enter a community as new teachers and implement such political teaching. How can we incorporate such a curriculum and teaching style when the parents are not supportive? It reminds me of in Milner’s book Start Where You Are But Don’t Stay There, the African American teacher who was teaching about racism in To Kill a Mockingbird, and was subsequently called racist by her students who were affluent and white. She was then reprimanded and no longer allowed to teach freshman because those students didn’t yet understand the inequality in the world.
Gutstein Chapter 9
Summary: This chapter focuses on summarizing the importance of teaching math for social justice. First Gutstein stresses the importance of valuing community knowledge of students, as well as utilizing it as scaffolding for building classical knowledge on. He then emphasizes the importance of placing classical knowledge under a critical lens, both historically and politically, asking the question of why they are required to lean that math. He claims that mathematics has traditionally been viewed as a colorblind subject, and that this paradigm must change. He also mentions that it is important to teach the classical mathematics because that knowledge is a gatekeeper for higher education in the current sociopolitical nation.

Reflection: This chapter connects to many of the readings we had in the first quarter of this program in Foundations, especially Yosso whose main point was “Whose culture has capital?” Greene, hooks, and Delpit also addressed this point, claiming that it is of great importance for students to be experts of their own culture. Something Gutstein mentions is how math is chosen by those in power, and this means that there are “specific competencies students need to pass gatekeeping tests” (203). This prompted me to think of how much I used to believe it would be my job as a teacher to teach the math in the standards so that my students could pass the tests. I never realized how ridiculous this sounded, how the sequence of high school math students go through is such a ridiculous thing to force upon students. I have changed my thinking throughout the past two quarters to understand that the math should really connect to students’ worlds, but maintaining the classical knowledge that students are required to learn. I am still struggling to understand how we can intertwine this social justice pedagogy and classical knowledge in a high school setting where the standards and testing is such a focus though.

Gutierrez & Irving
Summary: This article raises the question of why we as a society in the United States believe that there are people who are inherently good or bad at math, then goes on to say that this belief resonates with the Latino/a and Black community. They stress that the reason behind this is truly because of the way in which people in power define mathematics, that is, as a singular, isolated, disconnected block of math that students are forced to take in school. This is opposed to ethnomathematics, which is in the context of the culture wherein the math originated, or mathematics for social justice where students learn to read and write the world with math. In order to combat students beginning to believe that mathematics is simply not for them it is important for teachers to get to know their specific students and make connections between the mathematics they do and the real lives of those students. Therefore it is important for teachers to have a mathematics curriculum that is relevant to the students in front of them rather than rote in some book on some shelf. The authors also emphasize the importance of not only allowing, but encouraging students to create a mathematics community wherein peer interactions are the main resource for learning.

Reflection: In this text the authors brought up something I have been pondering since I skimmed the CMP curriculum book you gave Ron and I last quarter for our practice lesson plan. They state that problems that come from the real world tend to be developed by textbooks, and it is not clear whether students find these useful. I strongly believe that the problems in many of the textbooks that attempt to connect to the “typical” student are often pointing directly at the students who already have access, the students with privilege. These types of problems that loosely connect to the real world through context that is largely culturally narrow are the types of
word problems that I see in my practicum site whenever there are word problems. I still feel like they are just being fed to students with heavy scaffolding and are of little use because the students can just pick out the numbers they need and don’t make any relevant connections. But, I am still unsure how it would be possible to make the context relevant to every student in a diverse classroom. There would always be some group of students left out. I do realize though that the curriculum could certainly rotate interests and connections from one unit to the next. Is there some way to give all students a connection in one lesson, or will there always be someone left out?
# Applied Algebra II Grading Rubric

<table>
<thead>
<tr>
<th></th>
<th>0 Complete</th>
<th>1 Beginning</th>
<th>2 Approaching</th>
<th>3 Meeting</th>
<th>4 Exceeding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conceptual Understanding</strong></td>
<td>No work shown</td>
<td>Work shown demonstrates that you have some idea of what the problem is asking, but the connection between the work shown and the problem is unclear and leads to an incorrect answer</td>
<td>Work shown demonstrates that you have an idea of what the problem is asking, but the connection between the work shown is unclear or leads to an incorrect answer</td>
<td>Work shown demonstrates that you have a good idea of what the problem is asking and there is a clear connection to the work shown, but it may lead to an incorrect answer</td>
<td>Work shown demonstrates that you have a good idea of what the problem is asking and a clear connection to the work shown with a correct answer</td>
</tr>
<tr>
<td><strong>Procedural Fluency</strong></td>
<td>No work shown</td>
<td>Incorrect use of the strategy used to solve the quadratic equation, but obvious effort shown</td>
<td>Almost correct use of the strategy used to solve the quadratic equation</td>
<td>Correct use of the strategy used to solve the quadratic equation, but the answer may not be correct</td>
<td>Correct use of the strategy used to solve the quadratic equation and a correct best answer chosen</td>
</tr>
<tr>
<td><strong>Problem Solving</strong></td>
<td>No work shown</td>
<td>Some work is shown, but is not obviously connected to the answer, and the answer is incomplete or incorrect</td>
<td>Some work is shown and connects to the answer given, but the answer is incomplete or incorrect — Or — An almost complete and correct answer is given with little work shown</td>
<td>Ample work is shown and connects to the answer given, but the answer may not be complete or correct — Or — A complete and correct answer is given with little work shown</td>
<td>All necessary work is shown and clearly connects to the complete and correct answer</td>
</tr>
<tr>
<td><strong>Reasoning</strong></td>
<td>No work shown</td>
<td>Steps in the work shown are difficult to follow and lead to an incorrect answer — Or — There is no justification for the answer given</td>
<td>Steps in the work shown can be followed with a close eye but do not lead to a correct answer — Or — Steps in the work show are difficult to follow but lead to a correct answer</td>
<td>Steps in the work shown follow from one to the next, but may not lead to a correct answer</td>
<td>Steps in the work shown clearly follow from one to the next and lead to a correct answer</td>
</tr>
</tbody>
</table>