

Synthesis Paper

EDUC 320

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Mrs. Cain

In the classroom, a teacher has many roles other than “just teaching”. A teacher is more of a facilitator than just strictly a “teacher”. The title of teacher remains the same, but the role of the teacher is far greater and beyond simply teaching something; the role of a teacher is being a facilitator. To be a facilitator of learning, and the learning process, a teacher must be effective, understand the students, have goals, standards and objectives, lesson plan strategies, questioning and technology strategies, instruction strategies, and assessment strategies.

All of these conditions, stems off of an effective teacher. An effective teacher has successful strategies in each of these categories. Understanding the students is knowing who they are not just as students, but as individuals. Having goals, standards and objectives, is knowing what a teacher wants to accomplish or have the students accomplish and succeed at as the end result. Lesson planning strategies are how the teacher will layout the procedure for working towards the goals, standards, and/or objectives. Questioning strategies are how a teacher sets up questions that test the different ways of thinking in terms of complexity, which supplements the lesson planning strategy of working towards an end result. Technology strategies are how technology can best be a supplement to a lesson plan, and how effectively a teacher can implement technology into the classroom learning environment. Instruction strategies will be how a teacher delivers a lesson they have created, to the students. Assessment strategies are how the teacher evaluates the student’s knowledge on material, and what they do to evaluate it.

Being an effective teacher in my classroom will set the basis of how I go about implementing each strategy into my classroom. Additionally, to be an effective teacher, stems from my passed experiences as a student and how it set a foundation for how I will be an effective teacher. See Appendix A for how I will become an effective teacher. Moreover, to become an effective teacher, I will need to get to know my students. An easy way to get to know

my students will be to do a simple questionnaire at the beginning of the school year that will allow me to get to know my students on more personal level. This will be able to let me make connections to the students. Having connections with the students will allow me to get to know any strengths or weaknesses a student may have. See Appendix B for questions I would ask students to get to know them better. An understanding of my students, will make the strategies for goals, standards, and objectives much easier. By knowing my students, I will have a good idea of their capabilities, which will give me a good idea of the goals and objectives I want the students to be able to achieve and complete. Since not all students are the same, an objective or goal for one student may not work for another student. See Appendix C for my strategies about goals, objectives, and standards.

Furthermore, knowing my students and the goals or objectives each are capable of achieving, will lead the way for me being able to develop a successful lesson plan to use in my class. A successful lesson plan strategy will effectively reach each student in the best way possible in order to help them achieve the goal or objective. See Appendix D for how I plan on developing a successful lesson plan. Inside of my lesson plan will be questioning strategies and technology strategies that assist the learning process for students in my lesson plan. Questioning strategies will target the different ways I can have student approach a topic or problem, or how they think about something. Different questioning strategies for different lessons as well as different students, can help me differentiate my instruction and lessons for students and their abilities. Additionally, implementing technology into lessons and instruction can assist not only me, but also assist the students in how they learn. Some students learn better by taking advantage of the uses of technology. So implementing technology into a lesson, can further improve and

supplement a lesson of mine. See Appendix E and Appendix F for technology strategies and questioning strategies, respectively.

Additionally, once I have the lessons created or the objectives created, how I carry out each lesson is important. Sticking with one type of instruction strategy can get stale and boring for not only me as a teacher, but also for the students. Further, not every student learns the same, so one strategy may not work as well for one student as it does for another student. So, switching up the instruction strategy will give each student an equal chance at learning the best way possible. Also, not every topic or subject will work the best with the same one instructional strategy, so I can modify my lessons and how I teach them based on what strategy would work best for that lesson. See Appendix G for how I can modify a lesson for a different instruction strategy.

Lastly, once at the end of the learning process for a particular subject or topic, how I evaluate the students is crucial. Just like learning, there are many different strategies of assessing student's knowledge. Also, just as how not all students learn the same way during an instruction strategy, the same assessment strategy won't work for each and every student. Having a mixture of assessment strategies in an assessment will provide equity in my classroom for the students, because there will be opportunities to succeed by giving different forms of assessing. For example, if every single test is a multiple choice test, the students who are not exceptional at multiple choice, but who may be really good at an essay question or application question, will not have the same chance at succeeding as someone who's good at the multiple choice questions. See Appendix H on the ways I can differentiate my assessments.

Overall, to create an effective classroom and environment, I will need to differentiate in each type of strategy. Not only for the students, but for myself. Further, the students will benefit

by being exposed to different ways and styles of learning and assessing if I use different strategies in the learning and teaching process. Additionally, it will benefit me, because with a different type of strategy I may be better at teaching a specific topic, or enjoy teaching a typically boring topic by changing the way it is taught or assessed.

Appendix A

I was extremely lucky to have two great teachers a long the way that gave me the motivation to become a teacher. My high school calculus teacher, and my trigonometry/statistics/Algebra2 teacher are the two teachers that greatly resembled each other in the way they carried themselves which is why they both had a lot of influence. They influenced me to need to offer back to others what I had that molded me into my identity today. What I had was endless help and the additional assistance that lead me to progress in school. Having such tremendous teachers as good examples has truly demonstrated to me what I seek to be as a teacher.

I was never the best student; however, I was a determined student. In spite of the fact that I had other educators that gave me bundles of productive feedback, they never took the time and initiative to tailor their feed. Additionally, they showed and encouraged that I do not need to have perfect grades, as long as by the end of a course, I had learned something and improved my intellectual ability. They demonstrated to me that I don't need to be flawless, however I can utilize what I am great at to enable me to succeed. They showed that I to succeed in life you don't need to be a 4.0 student or have never fizzled a test, yet you do need to care and need to improve the situation. On the other hand, I didn't accept failure in a class but I didn't strive to be flawless, because they showed to me how to keep everything at a level of happy medium.

Many people take school and in particular, their teachers for granted. A lot of the time, when you ask somebody for what good reason they don't care for school they point the finger at it on the teacher. When someone asked me why I enjoyed school, I pointed the finger at the two teachers that made it enjoyable for me. Their greatness as teachers who cared about you as more

than just another student made me also realize the big difference between them and the teachers I had who were subpar.

They demonstrated to me that regardless of the student or any challenges they might have, there is a route for everybody to do well. You simply must have the will to continually think and react quickly and change days to fit needs as you may need to. There are individuals who might not have any desire to go off their lessons plans, but rather I was shown that if you are willing to go off on a tangent to better help a student while showing enthusiasm, it will also give them the want to also succeed. These two math teachers, showed me that there is more to than just getting an A on a test or homework assignment. Every student simply needs to see that teacher that is striving for their success once in a while. My math teachers showed us students that success is more than getting an A, because success is different for everyone. In relation to Quintilian's quote, these two teachers gave me respect as not just a student, but also as a person. This made me enjoy the classes more and succeed, because I knew they thought of me as more than just another student.

Appendix B

Module 2

#1

Note Card

I am creating note card with the following questions to have students fill out on the first day of class that better helps me get to know them personally.

1. Name
2. Grade (If in a class that combines grades)
3. Favorite subject
4. Favorite book
5. Favorite movie
6. Favorite food
7. Something you already know about the class
8. Something you're hoping to learn by the end of the class

Primary Discourse

The important primary discourse of mine that could cause some struggles with students would be my race, gender, social identity, and attitude. My race could cause me to struggle with other students who are not of the same race because I may not be aware of all the different aspects and cultural differences that could come with being of a different race. I am most aware of my own race's culture and aspects of life, so it could cause me to overlook a difference in culture due to race, at first glance. Gender may cause me to struggle with students of the opposite gender because being a guy, I obviously didn't grow up as a girl, so it could be harder to relate to or easily understand where a girl is coming from on a situation. Where it would be easier for me to understand why a guy is acting the way he is, or where he is coming from because I have either gone through that same thing, something similar, or witnessed something related to it.

Social identity could be a struggle with other students at times, because it relates back to the race and gender and all the differences those two bring. Additionally, add on family structure and dynamics, social class, and groups a person is a part of, and it will be vastly

different than many other peoples. Again, if I am not familiar with certain aspects of a person's social identity, that could cause some barriers for the student and I that I would have to work harder to get around. Attitude could cause a struggle, because I have more of a straight forward attitude where I say what needs to be said. That could cause a struggle with some students because their attitudes may be more laid back and conserved where they won't respond or react well with a more upfront attitude.

Grade Level: 10**Subject(s) Area: Algebra I****Materials Needed:**

- Algebra I textbook, notebook, writing utensils, calculator, iPad laptop or technology of some sort if preferred over pen and paper.

Standards:

- Add, subtract, and multiply polynomials.
- Understand that polynomials form a system comparable to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication.

Objectives:

- Students will combine polynomials by addition or subtraction.
- Need to have an understanding of exponents and their basic properties.

Learning Activities:

- Use traditional lecture and notes for this particular lesson.
- Start off by quickly reviewing the very basic properties of exponents.
- Introduce students to any new vocab
- Do 3-4 example problems showing how and why everything works, allowing students the opportunity to ask any questions after each step.
- Give students 2-3 guided practice problems, where we do them together to come to an answer.
- Give students 2-3 independent practice problems to do on paper, or 2-3 problems that are available to do on a laptop or iPad, on their own or in groups of 2-3 and then come back together as a class and go over the answers they got.
- Give students an appropriate amount of time to start the homework and ask any remaining questions they may have.
- By allowing for students to work in groups or by themselves, I am accommodating for those who are either intrapersonal or interpersonal. By allowing students to attempt the

practice problems with some sort of technology device, I am accommodating for the students with spatial intelligence who work best with a visual representation.

Assessment:

- I will assign 10 homework problems that will be graded on completion.
- The answers will be displayed on the board in front for the students to check their answers.
- However, as I am walking around the room looking for the completion, I will ask each to write down on the top of their paper the amount they got correct, and then record that onto a paper of my own to see how well they did.
- If the students correctly answer 7 out of the 10, I would consider that an adequate score and understanding of the topic.
- If the students overall did very poorly, I would reteach the lesson by looking over what parts they got wrong the most and reteaching those parts particularly slow and thorough and then assign new problems from those parts.

Getting to Know Students for Differentiation

I would ask the students to answer these questions and give them 30-40 seconds to answer.

- What kind of music do you like?
- Where do members of your family come from? What languages do they, and you, speak?
- What holidays do you enjoy and how do you celebrate them?
- If you could travel anywhere for free, where would you like to travel? Why?
- What is a place that you have visited that you like the most?
- When is your birthday and where were you born?
- What is a movie or a book you have seen or read lately that you really liked? Why?
- Why are you taking this class?
- What is your favorite subject? Why?
- What is something you would change about this school if you could, maybe if you became the principal?

Appendix C

The present day student's in school are getting ready to enter a world in which higher education schools and organizations such as businesses and corporations are requiring high end knowledge and skills like never before previously. To guarantee all students are prepared for progress after secondary school, the Common Core State Standards build up clear, reliable rules for what each student should know and have the capability to do in math and English, starting from kindergarten through twelfth grade.

The standards were drafted by specialists and educators from all over the nation and are structured and designed to guarantee that all students are set up for a variety of life paths. A lot of parents think of the state standards as evil and for school only, but that state standards were designed to prepare a student for entry level professions, first year college courses, and training programs. Common Core spotlights on building up the basic reasoning, critical thinking, and expository skills that students are thought to need to be successful.

It's very important to also know what the standards are. The standards are centered around core ideas and techniques beginning in the early schooling process. This gives instructors the time expected to show them and gives students enough time in order to be proficient.

The standards pull from a wide range of global models, and in addition research and contribution from various sources. These sources aren't strictly government officials. A lot of these sources and/or resources include instructors from kindergarten through higher education, education departments from various states, as well as teachers and people from the professional business world. Additionally, even students and parents are involved in the process, along with general citizens and people.

Furthermore, it is very important to understand how the state standards were developed and how there were standards even before the Common Core State Standards were implemented.

In 2009, the development of the Common Core State Standards was initiated by elected officials of the state, as well as education leaders. The higher ups in the education field, realized there needed to be consistency among education. Additionally, they wanted real world problems and issues to be a part of the education career for a student to better prepare them for life after school, or beyond high school. They wanted a set of standards that would make any transition from school to school, easy and effortless for all students regardless of their current living.

However, long before the Common Core State Standards, there were already standards being implemented among schools and inside the education world. Since the early 1990's states have began implementing standards to what they thought would help ensure and set up students for further education or life. Around the earl to mid 2000's, every state in the country had developed their own state standards for grades 3-12, on what they expected students to learn and know how to do. With this, each state had their own set up and guidelines for scoring to show a level of a student. Since there was a differentiation among states, it was hard to truly know where a student was at, because their scoring and results in one state could place them in a totally different category in another state. The Common Core State Standards set out to make every state on the same page, so a student could be consistently tracked on their progress and success.

Appendix D

<p>Grade:9</p>	<p>Subject: Algebra</p>
<p>Materials: Pen/pencil, whiteboard, marker, paper</p>	<p>Technology Needed: smartboard</p>
<p>Instructional Strategies:</p> <ul style="list-style-type: none"> 🍏 Visuals/Graphic organizers 🍏 Direct instruction 🍏 Guided practice 🍏 Lecture 🍏 Technology integration 	<p>Guided Practices and Concrete Application:</p> <ul style="list-style-type: none"> 🍏 Hands-on 🍏 Technology integration 🍏 Imitation/Repeat/Mimic 🍏 Independent activity 🍏 Pairing/collaboration <p>Explain: Traditional direct instruction where I will show students how problems and scenarios on the board. Then I will guide them example problems, and then have them practice a few problems their own and then go over the steps and answers. They can use either pen/pencil and paper for notes and examples or some technology they can write out on such as an ipad. If some students benefit more from collaborative working, they can pair up with another student.</p>
<p>Standard(s)</p> <ul style="list-style-type: none"> • HS.A-SSE.1 Interpret expressions that represents a quantity in terms of its context B. Interpret complicated expressions by viewing one or more of their parts as a single entity 	<p>Differentiation</p> <p>Below Proficiency: Print out the class notes for these students and pair them up to work with other students. Also allow group work on assignment</p> <p>Above Proficiency: Give harder independent practice problems and assign 1 or 2 bonus problems that are more difficult than the rest.</p> <p>Approaching/Emerging Proficiency: Allow working in groups with students of similar proficiency.</p> <p>Modalities/Learning Preferences:</p> <p>Visual Preference: Have notes online on the class page for students to view either during or after the class. While also displaying everything in my notes up on the board.</p> <p>Audio Preference: Verbally explain what I am doing and what each part of the class notes means. Notes online will allow them to listen to my lesson and then go back and look at anything discussed in class.</p> <p>Tactile Preference: Write up on the board everything from the class notes so the students who best learn by copying notes will have exactly what are in my notes and what I have said verbally.</p> <p>Kinesthetic: Have any student who likes to move around, come up to the board and attempt a problem or have them copy down the steps as the class goes through them during the guided practice.</p>
<p>Objective(s) The students will use the area formulas of a trapezoid and rectangle to find the areas of 5 trapezoids and 5 rectangles, with 80% accuracy.</p> <p>Bloom’s Taxonomy Cognitive Level: Application</p>	
<p>Classroom Management- (grouping(s), movement/transitions, etc.) The answers to the previous assignment will be displayed at the front on the board. The students will take out their previous day’s assignment, and grade their assignment themselves, then putting their score at the top of the paper for me to come around and</p>	<p>Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)</p> <p>Students are expected to come to class with their needed materials. No phones will be allowed to be out during the lecture time. Once the lesson is over, students will be allowed to work collaboratively on the assignment and/or independent practice.</p>

<p>record what their scores were. I will then go over the formulas for a trapezoid and rectangle, reviewing what was taught the previous class. From there I will move onto applying the formulas to pictures and diagrams given.</p>	
Minutes	Procedures
	Set-up/Prep:
5	<p>Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)</p> <p>Begin by instructing the class to think what they would do to figure out how much carpet they would need to re-carpet the classroom. Ask a few students their ideas for how they would determine how much carpet was needed. Then ask them how they would figure out how much carpet they would need if they only needed carpet for part of this classroom and the part that needed carpeting was in the shape of a trapezoid.</p>
10	<p>Explain: (concepts, procedures, vocabulary, etc.)</p> <p>After the students have voiced their ideas, following the attached notes, write on the board the definition of area. Then tell them that the label of their area would be squared. would be a u</p> <p>Explain that the area of the room is how the students would figure out how much carpet they would need for the classroom. Then write the formula given on the attached notes for the area of a rectangle, on the board. After writing the formula on the board, draw a rectangle, label the length and width sides, and explain how they would take the length of the classroom and multiply it by the width. In other words, they would take the measurement of two perpendicular lines and multiply them together.</p> <p>Then draw a trapezoid like the one in the notes and write the formula of the area for a trapezoid on the board. Explain that the bases (b1 and b2) are always the two parallel sides. Label the two parallel sides as shown on the notes, and label them b1 and b2. Continue on by telling them that just like the area of a parallelogram they learned previously, you need to multiply the sum of the bases (b1 + b2) by the height (h). Tell them since the trapezoid only has one pair of parallel sides, you need to divided the whole (b1+b2) · h, by 2; which is the same thing as multiplying it by one half instead.</p>
20	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions) Follow the notes for the 3 example problems, and write down each step for finding the area telling them what each base and height is, and what the length and width is</p> <p>Write the 2 practice problems given in the notes, on the board and instruct the students to find the areas themselves. Tell them when they have completed the problems to go on their iPads and go to the website http://www.calculator.net/area-calculator.html and input their numbers to see if they got the correct answers. Go through the steps, which are given in the notes, on the board if there are any questions.</p>
15	<p>Review (wrap up and transition to next activity):</p> <p>Assign the students the worksheet attached, with the 5 rectangle and 5 trapezoid area problems. Tell them it is due at the beginning of class the next day.</p>
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.</p>	<p>Summative Assessment (linked back to objectives) End of lesson: 10 problem homework assignment that requires them to do 5 problems on trapezoids and 5 problems on rectangles.</p> <p>If applicable- overall unit, chapter, concept, etc.:</p>

Checking their answers during the independent practice problems and asking them if they're understanding the steps I'm doing during guided practice.

Consideration for Back-up Plan:

Reflection (What went well? What did the students learn? How do you know? What changes would you make?):

Appendix E

Grade:11		Subject: Algebra 2	
Materials: iPad/laptop. Pen/pencil. Notebook		Technology Needed: Powerpoint, iPad/Laptop/tablet	
Instructional Strategies: <ul style="list-style-type: none"> 🍏 Technology integration 🍏 Other (list) -Flipped classroom. 		Guided Practices and Concrete Application: <ul style="list-style-type: none"> 🍏 Independent activity 🍏 Pairing/collaboration 🍏 Technology integration <p>Explain:</p>	
Standard(s): HS.A-APR.2 Apply the Remainder Theorem.		Differentiation <p>Below Proficiency: Only required to do 80% of the problems on the assignment, and collaborate on assignment. Along with slideshow notes printed out.</p> <p>Above Proficiency: Given two additional problems to try and attempt if they finish assignment before class is over.</p> <p>Approaching/Emerging Proficiency: Pairing up with another student to work on assignment.</p> <p>Modalities/Learning Preferences: Visual Preference: Have notes and lesson on the PowerPoint for students to view as the steps are done.</p> <p>Audio Preference: Add audio to the PowerPoint just explaining each step that is occurring.</p> <p>Tactile Preference: Students can copy down the PowerPoint notes into their notebook.</p> <p>Kinesthetic: The lesson lecture/notes being online in PowerPoint will allow students to walk around or move around while they are watching the presentation.</p>	
Objective(s): The learner will demonstrate dividing a polynomial using long division and synthetic division.			
Bloom’s Taxonomy Cognitive Level: Comprehension			
Classroom Management- (grouping(s), movement/transitions, etc.) Students will go through the PowerPoint at home or before the day’s class. Then in class the students will be given the assignment and work on it during class time. Students will be able to pair up and work together if they choose.		Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) Students are expected to come to class with already having viewed the powerpoint lesson. Students are to be quiet while working on the assignment either individually or collaboratively.	
Minutes	Procedures		
2 hours	Set-up/Prep: Create powerpoint presentation and assignment, and record audio explaining each slide.		
5 min	Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.) Have students takeout their devices and/or notes with the lesson. Allow the students to pair up if they would like, and pair up any students who are both struggling who would benefit from collaborative learning.		
45 min	Explain: (concepts, procedures, vocabulary, etc.) Give the students the rest of the time to work on the assignment and for me to be available for them to come and ask questions about the assignment or lesson.		
Explore: (independent, concrete practice/application with relevant learning task –connections from content to real-life experiences, reflective questions– probing or clarifying questions)			

<p>Review (wrap up and transition to next activity):</p>	
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc. Walk around the room observing how students are doing, and answering any questions.</p> <p>Consideration for Back-up Plan: Go through the powerpoint as a direct instruction if students are having trouble understanding the lesson/topic.</p>	<p>Summative Assessment (linked back to objectives) End of lesson: Assignment attached to lecture.</p> <p>If applicable- overall unit, chapter, concept, etc.:</p>
<p>Reflection (What went well? What did the students learn? How do you know? What changes would you make?):</p>	

<p>Grade: 9 Materials: Algebra I textbook, notebook, writing utensils, calculator.</p>	<p>Subject: Algebra Technology Needed: iPad, laptop or technology of some sort if preferred over pen and paper</p>
<p>Instructional Strategies:</p> <ul style="list-style-type: none"> 🍏 Direct instruction 🍏 Guided practice 🍏 Socratic Seminar 🍏 Learning Centers 🍏 Lecture 🍏 Technology integration 🍏 Other (list) <p>SYNTHESIS PAPER</p> <ul style="list-style-type: none"> 🍏 Peer teaching/collaboration/cooperative learning 🍏 Visuals/Graphic organizers 🍏 PBL 🍏 Discussion/Debate 🍏 Modeling 	<p>Guided Practices and Concrete Application:</p> <ul style="list-style-type: none"> 🍏 Large group activity 🍏 Independent activity 🍏 Pairing/collaboration 🍏 Simulations/Scenarios 🍏 Other (list) <p>Explain: During the independent practice problems, students will be able to work by themselves or work on the problems in groups of 2-3 if they work better collaboratively. Also, they can Take notes on their technology device if they want. I will Also have the notes on my classroom page so they can follow along if they are better visual learners. Through my lesson they will watch what I do, then imitate what I do for each step and then repeat.</p> <p style="text-align: right;">18</p> <ul style="list-style-type: none"> 🍏 Hands-on 🍏 Technology integration 🍏 Imitation/Repeat/Mimic
<p>Standard(s): HS.A-APR.1 Add, subtract, and multiply polynomials. Understand that polynomials form a system comparable to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication.</p> <p>Objective(s): Students will combine polynomials by addition or subtraction. Need to have an understanding of exponents and their basic properties.</p> <p>Bloom's Taxonomy Cognitive Level: Knowledge: What is the definition of a polynomial? Comprehension: What components make up a polynomial, and what makes it different than slope intercept form? Application: Formulate a polynomial with 2 variables? Analysis: Determine from a set of equations, which are polynomials and which are not? Synthesis: Formulate a polynomial with a degree of 3, as well as 3 variables? Evaluation: Given a one variable polynomial equation, solve it to find the components of a graph and then graph the equation?</p>	<p>Differentiation</p> <p>Below Proficiency: Print out the class notes for these students and pair them up to work with other students. Also allow group work on assignment</p> <p>Above Proficiency: Give harder independent practice problems and assign 1 or 2 bonus problems that are more difficult than the rest.</p> <p>Approaching/Emerging Proficiency: Allow working in groups with students of similar proficiency.</p> <p>Modalities/Learning Preferences: Visual Preference: Have notes online on the class page for students to view either during or after the class. While also displaying everything in my notes up on the board. Audio Preference: Verbally explain what I am doing and what each part of the class notes means. Notes online will allow them to listen to my lesson and then go back and look at anything discussed in class. Tactile Preference: Write up on the board everything from the class notes so the students who best learn by copying notes will have exactly what are in my notes and what I have said verbally. Kinesthetic: Have any student who likes to move around, come up to the board and attempt a problem or have them copy down the steps as the class goes through them during the guided practice.</p>
<p>Classroom Management- (grouping(s), movement/transitions, etc.) The answers to the previous assignment will be displayed at the front on the board.</p>	<p>Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) Expect students to be quiet while I am explaining and laying out the basis to the topic, and raising their hands to ask a question or make a comment about the topic. Once</p>

<p>The students will take out their previous day’s assignment, and grade their assignment themselves, then putting their score at the top of the paper for me to come around and record what their scores were.</p>	<p>into guided practice problems, students can give out answers and steps without raising hands in order to get the flow of conversation going.</p>
<p>Minutes</p>	<p>Procedures</p>
	<p>Set-up/Prep:</p>
<p>5</p>	<p>Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.) Review basic properties of adding like terms Have students do quick warm up review problems with like terms.</p>
<p>7</p>	<p>Explain: (concepts, procedures, vocabulary, etc.)</p> <p>Introduce new vocab words, exponents properties and adding/subtracting procedures, and how the new vocab words relate to the procedures. Knowledge: What is the definition of a polynomial?</p> <p>Comprehension: What components make up a polynomial, and what makes it different than slope intercept form?</p> <p>Application: Can you formulate a polynomial with 2 variables?</p>
<p>13</p>	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</p> <p>Start with 2-3 guided practice problems where as a class I help them through each step and problem to get to the correct answer. Then move to 2-3 independent practice problems that they can attempt by themselves or in groups of 2-3. They can do the problems on a technology device or with pen/paper.</p> <p>Analysis: Can you determine from a set of equations, which are polynomials and which are not?</p> <p>Synthesis: Can you formulate a polynomial with a degree of 3, as well as 3 variables?</p>
<p>5</p>	<p>Review (wrap up and transition to next activity):</p> <p>We will then go over the answers to the independent practice problems and clear up any confusion or questions, and then assign the homework problems for the lesson, allowing the rest of class for the students to work on the homework.</p> <p>Evaluation: Given a one variable polynomial equation, can you solve it to find the components of a graph and then graph the equation?</p>
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc. Asking if there are any questions or if they’re understanding the steps as I am going through the guided practice problems. Having the students check their answers from the independent practice problems, and answering any questions or clarifying why a student may have gotten a wrong answer.</p> <p>Consideration for Back-up Plan: Have 3 more guided practice and 3 more independent practice problems in case</p>	<p>Summative Assessment (linked back to objectives) End of lesson: Homework problems related to the lesson.</p> <p>If applicable- overall unit, chapter, concept, etc.:</p>

students are having difficulty understanding the topic.

Reflection (What went well? What did the students learn? How do you know? What changes would you make?):
Exponents and adding and subtracting polynomials seem to be very distinct topics. Perhaps consider covering properties of exponents in the class before adding/subtracting polynomials, since they both seem to be big topics.





Appendix G

Direct Instruction Lesson Plan

<p>Grade:11</p>	<p>Subject: Trigonometry</p>
<p>Materials: Pen/pencil, whiteboard, marker, paper</p>	<p>Technology Needed: smartboard</p>
<p>Instructional Strategies:</p> <ul style="list-style-type: none"> 🍏 Visuals/Graphic organizers 🍏 Direct instruction 🍏 Guided practice 🍏 Lecture 	<p>Guided Practices and Concrete Application:</p> <ul style="list-style-type: none"> 🍏 Independent activity 🍏 Hands-on 🍏 Imitation/Repeat/Mimic <p>Explain: Traditional direct instruction where I will show students how problems and scenarios on the board. Then I will guide them through example problems, and then have them practice a few problems on their own and then go over the steps and answers. They can use either pen/pencil and paper for notes and examples or some smartboard technology they can write out on such as an iPad. In the PowerPoint, different colored slide backgrounds differentiate between guided problems, and notes.</p>
<p>Standard(s) HS.F-TF.1 Understand that the radian measure of an angle is the ratio of the length of the arc to the length of the radius of a circle.</p>	<p>Differentiation</p> <p>Below Proficiency: Print out the class notes for these students and pair them up to work with other students. Also allow group work on assignment</p> <p>Above Proficiency: Give harder independent practice problems and assign 1 or 2 bonus problems that are more difficult than the rest.</p> <p>Approaching/Emerging Proficiency: Allow working in groups with students of similar proficiency.</p> <p>Modalities/Learning Preferences:</p> <p>Visual Preference: Have notes online on the class page for students to view either during or after the class. While also displaying everything in my notes up on the board.</p> <p>Audio Preference: Verbally explain what I am doing and what each part of the class notes means. Notes online will allow them to listen to my lesson and then go back and look at anything discussed in class.</p> <p>Tactile Preference: Write up on the board everything from the class notes so the students who best learn by copying notes will have exactly what are in my notes and what I have said verbally.</p> <p>Kinesthetic: Have any student who likes to move around, come up to the board and attempt a problem or have them copy down the steps as the class goes through them during the guided practice.</p>
<p>Objective(s) The student will be distinguishing the relationship between an angle and a radian. The student will convert radians to degrees and degrees to radians.</p> <p>Bloom’s Taxonomy Cognitive Level: Comprehension</p>	<p>Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)</p> <p>Students are expected to come to class with their needed materials. No phones will be allowed to be out during the lecture time. Once the lesson is over, students will be allowed to work collaboratively on the assignment and/or independent practice.</p>
<p>Classroom Management- (grouping(s), movement/transitions, etc.) The answers to the previous assignment will be displayed at the front on the board. The students will take out their previous day’s assignment, and grade their assignment themselves, then putting their score at the top of the paper for me to come around and record what their scores were. I will open</p>	

up to questions students may have about the previous assignment, and then transition into the day's lesson.	
Minutes	Procedures
	Set-up/Prep:
5	<p>Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)</p> <p>Begin by reviewing some previous geometry terms and refreshing on geometry procedures that will be used in the new topic.</p>
10	<p>Explain: (concepts, procedures, vocabulary, etc.)</p> <p>Introduce the vocabulary of angle, radian, the Greek letter theta, and arc length from geometry. Show the students the basic formulas for deriving the relationship between angles and radians and converting back and forth between radians and degrees.</p>
20	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</p> <p>Show the students how to do the converting using real examples and applying it to practice problems.</p>
15	<p>Review (wrap up and transition to next activity):</p> <p>Assign the students the homework activity for the lesson.</p>
<p>Formative Assessment: (linked to objectives)</p> <p>Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.</p> <p>Asking them if they're understanding what I am doing as I go through the steps and procedures. Additionally, check their answers to any practice problems I give them.</p> <p>Consideration for Back-up Plan:</p>	<p>Summative Assessment (linked back to objectives)</p> <p>End of lesson:</p> <p>Homework activity related to the lesson.</p> <p>If applicable- overall unit, chapter, concept, etc.:</p>
<p>Reflection (What went well? What did the students learn? How do you know? What changes would you make?):</p> <p>Take out some sentences to simplify it, and then increase font. Good visuals.</p>	

Indirect Instruction Lesson Plan

Grade:11	Subject: Trigonometry
Materials: Pen/pencil, whiteboard, marker, paper	Technology Needed: smartboard, ipad, laptop, tablet etc
Instructional Strategies:  Indirect instruction	Guided Practices and Concrete Application:  Hands-on  Group Activity  Discovery Explain: The students will explore the concepts of the radian measure of an angle, and determine the best way to find the radian measure of an angle. The students will then create their own form of class notes that they could use to teach other students about radian measure of an angle. In my direct instruction of this lesson, I gave the students the notes in a PowerPoint presentation.
Standard(s) HS.F-TF.1 Understand that the radian measure of an angle is the ratio of the length of the arc to the length of the radius of a circle.	Differentiation Below Proficiency: Give the student a printout of notes to guide them along. Above Proficiency: Have the student create practice problems and homework problems that could be used in class. Approaching/Emerging Proficiency: Allow working in groups with students of similar proficiency. Modalities/Learning Preferences: Visual Preference: Students will be able to use the textbook to explore the concepts and methods of radian measure of an angle. Audio Preference: Students can look up instructional math videos and listen to a video of the radian measure of an angle. Tactile Preference: Students will be able to write down everything they know, what they need to know, and what to do in order to get to the objective. Mapping out their plan. Kinesthetic: Students could act out or use the motion of their bodies to show how an angle works and determine radian measure of an angle.
Objective(s) The student will be distinguishing the relationship between an angle and a radian. The student will convert radians to degrees and degrees to radians. Bloom's Taxonomy Cognitive Level: Analysis, Synthesis	
Classroom Management- (grouping(s), movement/transitions, etc.) The answers to the previous assignment will be displayed at the front on the board. The students will take out their previous day's assignment, and grade their assignment themselves, then putting their score at the top of the paper for me to come around and record what their scores were. I will open up to questions students may have about the previous assignment, and then ask the students a question about what	Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) Students are expected to come to class with their needed materials. Any resources are allowed during classroom to help guide them in their discovery of radian measure of an angle.

<p>they could do to determine the radian measure of an angle.</p>	
Minutes	Procedures
	Set-up/Prep:
10	<p>Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)</p> <p>Begin by asking the students what they think a radian measure is compared to a degree measure. Explain to the students that they are to use any resources necessary to come up with their own classroom notes explaining what a radian angle measure is, how to find it, and how to explore its properties. The students will create classroom notes that would be adequate to use for them to teach other classmates about the topic.</p>
	Explain: (concepts, procedures, vocabulary, etc.)
40	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</p> <p>Students will explore and discover the functions and properties of radian angle measure, and create their own classroom notes. They will be able to use any resources they would like, while also collaborating with other students if they choose.</p>
	Review (wrap up and transition to next activity):
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.</p> <p>Observing their methods and their discussion with other classmates.</p> <p>Consideration for Back-up Plan:</p>	<p>Summative Assessment (linked back to objectives) End of lesson: Present their notes they created. If applicable- overall unit, chapter, concept, etc.:</p>
<p>Reflection (What went well? What did the students learn? How do you know? What changes would you make?):</p> <p>Good use of collaboration among students to get them thinking about the topic and working together. Having them work together and teach their notes to someone would help them better understand the lesson themselves.</p>	

Appendix H

Ryan Peters

Test

1. Simplify: $(-4b^3)(2b^5)$

A) $-2b^{15}$

B) $-8b^8$

C) $-2b^8$

D) $-8b^{15}$

2. Simplify: $\frac{-9a^5b^8}{3a^2b^4}$

A) $\frac{-6a^3}{b^4}$

B) $3a^3b^2$

C) $-3a^3b^4$

D) $-3a^3b^2$

3. Simplify: $(-6p^2q^3)^2$

A) $12p^4q^5$

B) $36p^4q^6$

C) $12p^4q^6$

D) $36p^4q^5$

4. Simplify (½ pt each)

1) $-2^3 = \underline{\hspace{2cm}}$ A.) 64

2) $8^2 = \underline{\hspace{2cm}}$ B.) (1/9)

3) $9^{-1} = \underline{\hspace{2cm}}$ C.) -8

4) $(-4)^{-2} = \underline{\hspace{2cm}}$ D.) (1/16)

5. Simplify

$$\frac{28x^5}{14x^{-4}} = \underline{\hspace{2cm}}$$

$$(-4a^2)(2a^{-3})^{-4} = \underline{\hspace{2cm}}$$

$$(5x^4)^3 = \underline{\hspace{2cm}}$$

$$(-7x^4y^2)(-2x^3y) = \underline{\hspace{2cm}}$$

$$(4m^{-4}n^3)^{-2} = \underline{\hspace{2cm}}$$

A) $125x^{12}$

B.)

$$\frac{a^{14}}{-4}$$

C) $2x^9$

D.) $14x^7y^3$

6. Match the simplified expression with the correct expanded expression.

1.) $a^{11}b^8 = \underline{\hspace{2cm}}$

2.) $32/p^{15} = \underline{\hspace{2cm}}$

3.) $\frac{-10}{c^2d^4} = \underline{\hspace{2cm}}$

4.) $b^{10}/3 = \underline{\hspace{2cm}}$

A.)

$$\frac{(4a^{-1}b^{-4})^{-3}}{(-8a^4b^{-2})^{-2}}$$

B.) $(2p^{-3})^5$

C.) $2c^{-4}d^{-1}(5c^2d^{-3})$

D.)

$$\frac{-9b^{-5}}{(-3b^{-1} \bullet b^{-4})^3}$$

7. An asteroid travels at a speed of 6^8 miles per day, how many miles will it travel in 6^3 day?

8. Lerna's Hydra is a mythological character that appears in some stories, such as the 12 tasks of Hercules. The Hydra was a one-headed monster with 1 head, but when it is cut off, 2 more heads

are born in its place. If a hero tried to conquer it by cutting off all of its heads every day, how many heads would the Hydra have on the third day? And at the end of 10 days of trying to kill it?

9. Set up an expression that would describe a population increase (x) over a specific number of years (y), where the initial population value is 400.