STAGE 1: PLANNING YOUR INSTRUCTION
ITL 520

MY TARGET: Standard, Goals & Outcomes

Teachers: Brenan Lim, Diana Padilla, & Leola Reese Grade/Subject: 10th/Algebra

TARGET: Unpack Your Standard

Academic Standards: STATE YOUR STANDARD.
CCSS.Math.Content.HSA-APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Big Questions (Questions to frame student learning)	**Knowledge (Concepts to be understood and applied)**	**Student-Centered Skills (what you will explicitly teach)**
How is adding and subtracting polynomials similar to adding and subtracting integers? Can I multiply polynomials with different variables?	Polyonomial Monomial Degree of a monomial Degree of a polynomial Standard form of a polynomial Closure property	Students will be able to identify a polynomial along with its coefficients, variables and constants. Students will be able to classify polynomials. Students will be able to identify the degree and number of terms of a polynomial Students will be able to write a polynomial in standard form. Students will be able to add and subtract polynomials. Students will understand that the system of polynomials is closed under addition and subtraction. Students will be able to

		multiply the consonants and each variable that follows.

Student Learning Goal: STATE YOUR LESSON'S GOAL FOR THE STUDENTS TO SHARE

Hint: Remember back to your ATP 600 class. A SMART goal is **S**pecific, **M**easurable, **A**ttainable, **R**elevant, and **T**ime-Based

By the end of this lesson, students will be able to write polynomials in standard form, identify and correctly name polynomials, and add, subtract, and multiply polynomials as measured by checks for understanding and a quiz. This goal will be achieved if the student scores 70% or better on the written quiz by the end of the lesson.

Student Social-emotional Goal (LEARNER):

Students will work with small groups after solving problems individually to check their understanding and share results with each other. This group work is a cooperative learning tool that will help to build positive relationships among students and increase student understanding of the material. Students will see that the same problem can be approached multiple ways.

Individual students will also be randomly selected to share their results with the class by putting their work on the Document Camera and explaining the process they used to obtain their results. The teacher will support the student as she presents and ask questions that require deep level thinking. This leadership experience will increase the student's self-esteem and she will gain support from her peers and teacher.

***Assets** to Learning (Learner) What strengths do your students have that you can build upon?*

Ninety percent of our students are fluent in both English and Spanish and most of the students have been in school together since elementary school so they are very close, almost like siblings. They are more than willing to help each other by sharing their work and interpreting for students who are at the basic level of language proficiency in English. Ninety-nine percent of the students share Mexican heritage so we can create word problems that reference their cultural background. For example, we can write a problem involving Luis who dreams of being on the Club Tijuana professional soccer team; then students can solve a problem involving the area of soccer fields in San Diego.

CHALLENGES to learning (LEARNER): (level of literacy; language proficiency levels; funds of knowledge; attention span)

Approximately 99% of our students are from low income families and they do not have

family members who can help them with homework nor do they all have computers at home with access to the internet. There are 30 students in our class. Regarding Math proficiency, the breakdown for our student scores on map testing is as follows: 7% scored in the lowest average range, 36% low average, 43% average, 7% high average and 0% high. Regarding English proficiency, the breakdown is as follows: 38% scored in the low, 38% in the low average range, 14% in the average range, 5% in the high average range and 5% in the high range.

These students had a poor learning situation in math last year, so we spent the first six weeks of the semester doing remediation. Still, they are not fully prepared for the material they are supposed to learn this year. Each lesson we teach takes more time than expected.

In order to overcome these limitations, we will implement scaffolds that include front-loaded review information and pre-teaching of material. Key words and phrases such as "combine like terms" will be repeatedly used, defined and supplemented with visual examples.

Common Misconceptions (LEARNER & TARGET): (Subject-matter specific; Related to academic standard; Knowledge gaps; Student confusion; multiple meanings; cultural differences; misunderstand; requisite skills)

Many students think that math is hard or that they are unable to do it. Really, the difficult aspect of math is that everything builds on previous learning. There seems to be a significant difference between high school students who learned their times tables and those who did not. For students who memorized their times tables, they do not have to stumble when they encounter multiplication or factoring in higher level problems. Alternatively, students who did not learn their multiplication tables pause to count with their fingers, making more advanced tasks cognitively challenging. To address these gaps in learning, we have multiplication tables posted on the walls in the classroom and we do spiral review every day.

For this specific lesson, one common mistake students make is adding unlike terms, e.g., $2x$, $6x^2$ and $3x^3$. To avoid this mistake we can model x terms with a skinny bar and x^2 terms with a square figure to visually demonstrate the difference between these linear and quadratic terms.

Another common mistake is forgetting to distribute the negative sign when subtracting polynomials. To help students with this concern, we can show students that the expression P – Q is the same thing as P + (–1)Q and the –1 must be distributed across all the terms in Q.

When students are multiplying polynomials they do not distribute the numbers and variables correctly. Distributive property needs to be retaught in order to help students avoid making mistakes like $(a+3)(a-3)=a^2+9$.

This segment of the Lesson Plan is related to something Leola Reese learned from her

field experience observation. Mr. McNeil said that teachers “should always anticipate where students might struggle. This is not pessimistic, just good teaching.”

MY CLASS: Classroom Composite and Needs

My Classroom Composite: (TEACHER & LEARNER) Whole group (Broad needs of students; observable patterns & trends; language and literacy subgroups; digital/technology fluency; emotional regulation)

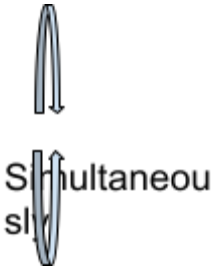
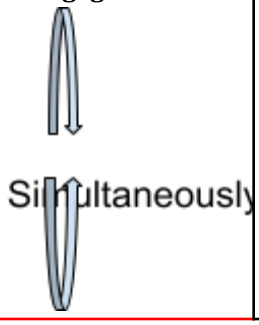
Students in this class are very diverse. Some learn new topics quickly while others struggle with more basic mathematical operations. While most of the students come from spanish speaking homes, they are at the proficient level in English in addition to being native Spanish speakers. We have chromebooks in class and all the students are very comfortable using technology, even though many of them do not have computers at home.

Accommodations/Adaptations/Intervention (Teacher, Learner, Instruction, Management)

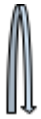
Focus Student #1: Special Needs (IEP Goals; 504; SST)	**Focus Student #2: English Language learner (ELL); Standard English Learner(SEL);**
Student 1 has a Math goal - to multiply and divide two digit numbers with an accuracy of 80%. The student requires preferential seating, differentiated settings for tests, accommodated versions of tests, and extra time on assignments/tests In addition, there is a SPED support teacher in the room to provide additional one on one time, or allow the general ed teacher to give the student extra supports.	Student #2 is ELL emerging. The student currently meets twice a week with a language support specialist. The SPED support teacher is also a translator for English to Spanish. The student has access to a spanish version of the ebook. Group activities allow the student to practice English literacy in a lower pressure environment.

UDL Site (if needed)
https://wvde.state.wv.us/osp/UDL/7.%20UDL%20Guidelines%20Checklist.pdf

(TEACHER, LEARNER, TARGET, ASSESSMENT, INSTRUCTION, MANAGEMENT)

Multiple Means of Representation (modeling & practice)[1] 	**How will the content be presented/shared in multiple ways to highlight critical features, represent different formats, media types and cultural diversity? How will you monitor and assess understanding of representation?** The teacher will give a brief lecture and walkthrough example problems using visual examples to reinforce learning. Students will be encouraged to follow along with their textbooks and they will do Try It problems following direct instruction. Students will be given manipulatives such as math tiles allowing them to interact with a physical representation of the concepts. Students will be given computer models to interact with. The teacher and support teacher will trade duties during lectures, one will lecture while the other walks around the room monitoring students. During example problems, both teachers will interact with groups asking them to explain "what they did and why" to assess learning. Sometimes, there is no support teacher. In these instances, Mr. McNeil told Leola Reese that he uses technology to assign online activities so that some students can work ahead while he does remediation with the remaining students.
Multiple Means of Engagement[2] 	**How will students engage in the process of new learning? How will the content become accessible, meaningful, and relevant to the learner? How will you monitor and assess this process?** Students will perform a combination of group and individual tasks. These tasks will start out open ended with additional directions and supports added along the way. Students will also be given opportunities to engage the concepts through physical and written representations of the material. As we introduce new concepts they will merge these with old concepts via a graphic

[1] Think about at least three ways you can represent this concept: video, role play, manipulatives.
[2] At least three ways your students will understand, internalize, appropriate: prior knowledge, group work; technology; graphic organizer; dyads or triads

	organizer.
Multiple means of Expression[3] (practice &   assessment)	**What principles of choice for the product of learning will you accept? How will you provide a space for communication, creativity, critical thinking, and collaboration (4 C's)? Which measures will you use to assess products of learning?** We will accept Preludes and Exit Tickets Students will be asked to create a learning web, connecting their learnings throughout the lesson and to previous lessons. Students will take a group and an individual test.
Managing the Classroom Environment	**How will you manage the classroom/setting so students transition successfully through instructional stages, and student groupings? How will you create an optimal learning environment (space, time, pacing, interactions, expectations, assessment)?** Students will follow the pre-established rules and procedures for the classroom. These will also be posted as a reminder. An agenda for each day will be posted and reviewed at the beginning of each day. Students will be placed into diverse groups according to their strengths and opportunities. The highest high will not be placed with the lowest low, but there will be a mix of performance levels, language abilities, and personalities.

STAGE 2: TEACHING

DAILY AGENDA: WHAT WILL I USE TO MANAGE DAILY INSTRUCTION

LEARNING MAP SEQUENCE FOR DAY 1
<u>Welcome</u>
Open with prelude activity while teacher takes attendance

<u>Instruction cycle</u>

[3] At least three ways your students will show you what they know: oral presentation; written report; research; technology-mediate projects; debates; simulation; quiz, exit ticket

Cycle through direct instruction, a Try It problem, checks for understand and guided practice as we teach new vocabulary (monomial, polynomial and degree of polynomial, number of terms in a polynomial, and naming polynomials)

Independent practice
Students practice problems, while teachers walk around and monitor work. Every 6 minutes or so, teacher gets student's attention to have students share work with the class and ask and answer questions.

Close
Exit ticket

LEARNING MAP SEQUENCE FOR DAY 2
Welcome
Open with prelude activity while teacher takes attendance

Instruction cycle
Cycle through direct instruction, a Try It problem, checks for understand and guided practice as we teach students how to represent polynomials in standard form, add polynomials and subtract polynomials.

Group activity with manipulatives
Students use slender bars and squares to represent linear and quadratic terms to emphasize that "combining like terms" requires that the terms being combined have the same variables and exponents.

Independent practice
Students practice problems, while teachers walk around and monitor work. Every 6 minutes or so, teacher gets student's attention to have students share work with the class and ask and answer questions.

Close
Exit ticket

LEARNING MAP SEQUENCE FOR DAY 3
Welcome
Open with prelude activity while teacher takes attendance

Group work
Students will create a concept map of information they have learned so far about polynomials. We will also ask them to create a similar concept map using integers.

Instruction
We will discuss closure with respect to integers

Group work
Students will apply closure to the set of polynomials with respect to addition and subtraction and add the closure property to their concept maps.

Independent practice in preparation for upcoming assessment
Students will practice problems involving everything they have learned so far about polynomials. Teachers walk around and monitor work. Every 6 minutes or so, teacher gets student's attention to have students share work with the class and ask and answer questions.

Close
Exit ticket

LEARNING MAP SEQUENCE FOR DAY 4
Welcome
Open with prelude activity while teacher takes attendance

Assessment
Students take written quiz independently

Close
Students hand in concept maps to be evaluated.

LEARNING MAP SEQUENCE FOR DAY 5
Welcome
Open with prelude activity while teacher takes attendance

Instruction cycle
Cycle through direct instruction, a Try It problem, checks for understand and guided practice as we teach students how to multiply polynomials.

Independent practice
Students practice problems, while teachers walk around and monitor work. Every 6 minutes or so, teacher gets student's attention to have students share work with the class and ask and answer questions.

Close
Exit ticket

LEARNING MAP SEQUENCE FOR DAY 6
Welcome
Open with prelude activity while teacher takes attendance

Assessment
Students take written quiz independently

Close
Exit ticket reflecting on the lesson

WHAT MATERIALS WILL I USE?

- Document camera
- Paper and pencils
- Worksheets
- Bar and square manipulatives
- Quizzes

HOW WILL I ASSESS STUDENT LEARNING?

- Preludes and exit tickets
- Concept maps
- Individual and team quizzes

STAGE 3: ASSESSING/REFLECTING ABOUT STUDENT LEARNING

WHAT EVIDENCE OF STUDENT LEARNING HAVE I COLLECTED?

We collected formative assessments (individual and group check-ins, conversations with support teacher about his findings) as well as preludes and exit tickets.

The formal assessments include group quiz results, individual quiz results, presentations and concept maps.

WHAT NEW INFORMATION DID I GET ABOUT MY STUDENTS IN RELATION TO THEIR LEARNING PREFERENCES?

We gathered information from individual and group check-ins. These involved interacting with the students and seeing what they understand so far. When they are struggling, we explained the material in different ways and discussed what worked and didn't work.

HOW WILL I ANALYZE THIS EVIDENCE?

We will analyze evidence by looking at the overall performance on the quizzes, the quality of presentations and concept maps (How many A's, B's C's etc). Which way

did the grades skew? What were some commonly missed questions? What questions/concepts did the students do well on? By analyzing these I can tell what methods worked, what needs to be reviewed, and what the students have a firm grasp on for the next lesson.

WHAT INSTRUCTIONAL DECISIONS CAN I MAKE AS A RESULT OF THIS ANALYSIS OF EVIDENCE?

As a result of this analysis, we will focus on the techniques that worked best as well as spend more time reviewing information that students struggled with as an introduction to the next lesson. We will also include similar problems from this lesson on future preludes for spiral review.

STAGE 4: APPLYING

How will I use this information to plan my future instruction?

This information will help us in the future because we will probably have very diverse students and a variety of literacy levels. We would have to create a plan that all students can understand and learn from. Focusing on UDL has really made us realize that getting to know our students is very important if we want our classes to succeed.

How effective were my practices? What will I keep, what will I improve and what will I discard?

We taught this lesson and it was effective with respect to the addition and subtraction part. Multiplication is hard if students do not know the basic times tables. What we would change is to have students do the times table chart as a warm-up each day for 5 minutes so that they can learn it or refresh it if they already know it.

What new understanding do I have about my own teaching practices?

In Mrs. Martinez class Diana Padilla learned that we have to focus less on trying to just give the students the answers and let them struggle a bit longer. Students may not be slower at doing the work, they may just need more time to process the method they will use to solve the problem. This occurs a lot in classes with students

that have very low literacy proficiency as well as learning disabilities.

Ms. Garcia referred to this as a productive struggle with Brenan Lim. She mentioned that students need to be given time and it is important not to rush them. She mentioned that this can be difficult since we, as teachers, feel pressure to make it through a lesson. Ms. Garcia reminded him that getting through a lesson isn't as important as the students understanding the lesson.

What have I learned about myself as a teacher?

We have learned that planning is very important because it is the foundation of what kind of a teacher we turn out to be. The more prepared we are for any obstacle that comes our way, the more our students will learn and succeed.

As a professional learner where do I need to continue to grow and strive for?

We need to continue to learn new methods in dealing with certain types of students. We need to speak to more peers and teachers that have experience in scenarios where obstacles are always present. We will always be a student learning from other teachers and growing our knowledge on how to be our best.