5-2022

Using the edTPA as a Model for Teacher Research and Reflective Practice: An Honors Thesis

Eva Jaeger

BUTLER UNIVERSITY HONORS PROGRAM

Honors Thesis Certification

Please type all information in this section:

Applicant Eva Jaeger
(Name as it is to appear on diploma)

Thesis title Using the edTPA as a Model for Teacher Research and Reflective Practice: An Honors Thesis

Intended date of commencement May 6, 2022

Read, approved, and signed by:

Thesis adviser(s) Dr. Shelly Furuness 4/28/22

Reader (s): Dr. Shelly Furuness 4/28/22

Externally Reviewed by Pearson edTPA

Mathematics Content Expert Scorer 3/5/22

Date

Certified by

Director, Honors Program Date

Using the edTPA as a Model for Teacher Research and Reflective Practice: An Honors Thesis

A Thesis

Presented to the

College of Education

and

The Honors Program

of

Butler University

In Partial Fulfillment of the Requirements for Graduation Honors

Eva Jaeger

April 2022

Thesis Proposal

Background

The American school system is full of a wide range of diverse students, all of whom deserve to have a thorough educational experience that allows them opportunities to reach their highest level of academic potential. There are numerous overarching factors within the American school system that contribute to each student accessing an appropriate academic career. These include federal and local funding, national standards, standardized tests or curriculum, districts, surrounding communities and a variety of other circumstances. However, one of the most direct and consistent contributions to a students' academic success is their teacher's involvement and engagement with their lessons. While some of the academic systems in place are difficult to change and develop without a large movement, quality instruction and intentional classroom management are practices that an individual educator can address or develop for themselves.

Even before I knew I wanted to pursue a career in education, I maintained a firm belief that students of all backgrounds, experiences and learning abilities deserve to learn in a safe, equitable, accessible classroom environment. Throughout my own public-school career, I was fortunate enough to engage with peers who each had a unique perspective to share; without appreciating it at the time, participating in an educational community with diverse classmates helped me to expand my learning incomparably. As I began to recognize my own ambition to join the teaching profession, my desire to create a classroom that addresses all student's needs became obvious.

Over the course of my career at Butler University, I have constructed a repertoire of resources with which I can better address the needs of individuals within a classroom. One crucial aspect of becoming an effective educator is acquiring and implementing the classroom management methods needed to create an environment in which all students can learn. Butler University's College of Education course progression has prepared me with knowledge about individual student learning styles, how to apply content-specific literacy standards, and how to utilize specific methodology in lesson planning. The cyclical teaching process of planning, instructing and assessing has been conveyed through the practice of lesson plans, assessment techniques and in-person experience with students in our surrounding community. This systematic approach to education allows instruction to be based on reviews of personalized student data to address specific student needs and potential (Johnson, A., & Norris, K. (2006)) more accurately and appropriately.

The core values of Butler University's College of Education promote appreciation of diversity and similarity, excitement of teaching, learning and mentoring, the challenge of integrated practice and collaboration, and the strength of integrity and responsibility. The teaching performance assessment edTPA demonstrates the effectiveness of the methods and skills that Education students acquire in their academic career and aligns the practices of teaching with the values integral to the community within Butler's college of education.

Research Method and Process

The edTPA is the educative Teacher Performance Assessment process designed to establish whether new teachers are prepared for their own classroom. Through student-centered instruction, teacher candidates demonstrate their skills and preparation for entering the classroom to provide necessary instruction for all their students. Submissions for the edTPA are used for teacher licensure in many states to assess what new educators can do, rather than what they know. The edTPA promotes a focus on student learning and the skills that help teachers to effectively teach each one of their students. As the social climate of our country shifts and changes, so too will schools and their communities. Thus, throughout their career at Butler, future teachers are encouraged to challenge their biases, investigate how students of diverse backgrounds learn, and consider the responsibilities of innovative educators. At the end of their college career, new teachers will use the edTPA to reflect upon their expanding perception of the education system and how to best teach to adhere to the rights of all students. The edTPA encourages teachers to strengthen their practice as a deliberate and reflective practitioner in the classroom.

The edTPA process consisted of three tasks: Planning for Instruction and Assessment, Instructing and Engaging Students in Learning, Assessing Student Learning. The Secondary Mathematics assessment includes lesson plans for 3-5 consecutive lessons representing a balanced approach to mathematics demonstrating learning tasks that provide students with opportunities to develop conceptual understanding, procedural fluency, mathematical reasoning or problem-solving skills and precise communication skills. The learning segment was executed in the classroom and interactions with students recorded to display student-centered engagement. Student learning was assessed both formally and informally throughout the lessons using formative assessment practices. Evidence from the planning, instruction and assessment steps was submitted alongside personal commentary that explained and reflected on each component.

Task 1 Planning – One class, PRIME Math, was selected for the learning segment. The unit included a central focus that supported students' development of math-oriented skills. Each lesson within the learning segment was submitted with corresponding written lesson plans and key instructional materials. One language objective was chosen to aid in student understanding of the mathematics concepts in the learning segment and supported by an identified learning task. All written assessments and directions for performative assessments were submitted in the final product.

Task 2 Instruction – Permissions for video recordings were obtained by guardians of all students prior to recording in the classroom. One designated lesson from the unit that demonstrated interactions with students developing their math skills was recorded. This video clip was then used for analysis of teaching performance as it supported student learning.

Task 3 Assessment – One assessment from the learning segment was identified for evaluation of students' summative knowledge and skill development, with specific defined evaluation criteria to analyze student progress. Quantitative and qualitative patterns of learning within and among learners in the class was summarized after

collecting and analyzing all student work. Three focal students' work served as samples that illustrated the patterns of learning, one of whom was a student with identified learning accommodations. The learning of the whole class was represented by the three focal students. Evidence of students' use of language was identified within their student work samples.

My preparatory research prior to participating in the edTPA process in a student teaching setting manifested in a literature review. This included texts and sources that describe lesson planning processes, methodology for teaching in secondary math classrooms and developmentally appropriate behavior management strategies.

Schedule

My enactment of the edTPA process occurred in the Spring semester from January to March of 2022. My personal placement for student teaching was served at Pike High School in the Metropolitan School District of Pike Township in Indianapolis, Indiana. A large portion of the work for edTPA occurred immediately prior to recording in the placement classroom, involving writing lesson plans and creating lesson materials or assessments. After Task 1 was completed with 5 lessons identified and planned, one day's lesson was filmed and reviewed for Task 2. Fulfillment of Task 3 then relied on the analysis of quantitative and qualitative evidence gathered from student assessments. My literature review research process was an ongoing experience over the course of my career in the College of Education at Butler University and continued through the Spring, Summer and Fall of 2021. In addition to published literature, I explored current teacher's blogs, media, and shared resources to develop my instructional repertoire, because education is a collaborative process and is more effective when educators work together.

Bibliography

Boaler, J. (2016). *Mathematical mindsets: unleashing students' potential through creative math, inspiring messages, and innovative teaching*. Jossey-Bass & Pfeiffer Imprints.

Butler University. (2018, October 31). *Vision, Mission, & Core Values*. Butler.edu. https://www.butler.edu/coe/mission-core-values.

Carjuzaa, J., & Kellough, R. D. (2017). *Teaching in the middle and secondary schools*. Pearson.

Ferlazzo, L., & Hull-Sypnieski, K. (2018). *The Ell teacher's toolbox: hundreds of practical ideas to support your students*. Jossey-Bass.

Gutstein, E., & Peterson, B. (2013). *Rethinking mathematics: teaching social justice by the numbers*. Rethinking Schools Publication.

Indiana Department of Education. (2020, December 22). *Math Framework*. Mathematics | IDOE. https://www.doe.in.gov/standards/mathematics.

Johnson, A., & Norris, K. (2006). *Teaching today's mathematics in the middle grades*. Pearson/Allyn and Bacon.

Milner, H. R., Cunningham, H. B., Delale-O'Connor, L., & Kestenberg, E. G. (2018). "These kids are out of control" : why we must reimagine "classroom management" for equity. Corwin, a SAGE Company.

Pearson. (2021). edTPA. http://www.edtpa.com/Home.aspx.

Sluys, K. V. (2005). *What if and why?: literacy invitations for multilingual classrooms*. Heinemann.

Stanford University. *edTPA*. edTPA | Stanford Center for Assessment, Learning and Equity. https://scale.stanford.edu/teaching/consortium.

Steele, M. D., Raith, M. L., & Smith, M. S. (2017). *Taking action: implementing effective mathematics teaching practices in grades 6-8*. The National Council of Teachers of Mathematics, Inc.

TASK 1: CONTEXT FOR LEARNING INFORMATION

Respond to the prompts below (**no more than 4 single-spaced pages, including prompts**) by typing your responses within the brackets following each prompt. Do not delete or alter the prompts. Pages exceeding the maximum will not be scored.

About the School Where You Are Teaching

1. In what type of school do you teach? (Type an "X" next to the appropriate description; if "other" applies, provide a brief description.)

   Middle school: _____
   High school: __X___
   Other (please describe): _____

2. Where is the school where you are teaching located? (Type an "X" next to the appropriate description.)[1]

   City: _____
   Suburb: __X___
   Town: _____
   Rural: _____

3. List any special features of your school or classroom setting (e.g., charter, co-teaching, themed magnet, remedial course, honors course) that will affect your teaching in this learning segment.

   [There is the very real possibility of an inclement weather day on the intended third day of the lesson, resulting in the loss of a Friday in the classroom. This lesson (Lesson 4) will likely be pushed back to the following Monday. In the Spring of 2022, Pike High School is experiencing a number of staff shortages due to the recent spike of COVID-19 cases, resulting in frequent, unexpected synchronous remote learning days over Zoom that may affect minor changes in lesson plans. The focus course in this segment does not introduce any new content in the instruction; students use prior knowledge regarding a variety of algebraic topics to practice the skills of problem solving and engaging in discussion related to real-world applications.]

4. Describe any district, school, or cooperating teacher requirements or expectations that might affect your planning or delivery of instruction, such as required curricula, pacing plan, use of specific instructional strategies, or standardized tests.

   [All sections of math courses are expected to teach specific lessons on the same day. PRIME Math has a curriculum plan recommended by the SREB.]

About the Class Featured in this Learning Segment

1. What is the name of this course?

   [PRIME Math (previously called "CCR Bridge: Math Ready")]

---

[1] If you need guidance when making a selection, reference the NCES locale category definitions (https://nces.ed.gov/surveys/ruraled/definitions.asp) or consult with your placement school administrator.

2. What is the length of the course? (Type an "X" next to the appropriate description; if "other" applies, provide a brief description.)

   One semester: _____
   One year: __X___
   Other (please describe):
   [ ]

3. What is the class schedule (e.g., 50 minutes every day, 90 minutes every other day)?

   [PRIME Math meets for 49 minutes every day, five days a week]

4. Is there any ability grouping or tracking in mathematics? If so, please describe how it affects your class.

   [There is no tracking in Pike math courses. PRIME Math is offered as an alternative to AP Probability/Statistics, PreCalculus/Trig, ACP Finite Math, or AP Calculus courses for students who are entering college or jobs after graduation to engage with problem-solving in real world context.]

5. Identify any textbook or instructional program you primarily use for mathematics instruction. If a textbook, please provide the title, publisher, and date of publication.

   [Southern Regional Education Board's (SREB) Readiness Courses; Transitioning to college and careers: Math Ready. Revised May 2020.]

6. List other resources (e.g., electronic whiteboard, graphing calculators, online resources) you use for mathematics instruction in this class.

   [PRIME Math uses an electronic Promethean board, graphing calculators, Canvas site, student computers and tablets, and the website Desmos.]

About the Students in the Class Featured in this Learning Segment

1. Grade-level composition (e.g., all seventh grade; 2 sophomores and 30 juniors):

   [1 junior, 22 seniors.]

2. Number of

   - students in the class: __23___
   - males: _8__ females: __15__

3. Complete the charts below to summarize required or needed supports, accommodations, or modifications for your students that will affect your instruction in this learning segment. As needed, consult with your cooperating teacher to complete the charts. Some rows have been completed in italics as examples. Use as many rows as you need.

Consider the variety of learners in your class who may require different strategies/supports or accommodations/modifications to instruction or assessment (e.g., students with Individualized Education Programs [IEPs] or 504 plans, students with specific language needs, students needing greater challenge or support, students who struggle with reading, students who are underperforming or those with gaps in academic knowledge).

For Assessment Task 3, you will choose work samples from 3 focus students. At least one of these students must have a specified learning need. Note: California candidates must include one focus student who is an English language learner.[2]

Students with IEPs/504 Plans		
IEPs/504 Plans: Classifications/Needs	**Number of Students**	**Supports, Accommodations, Modifications, Pertinent IEP Goals**
Example: Visual processing	*2*	*Close monitoring, translating information in word problems into sketches*
504	1	Extended time on assessments and assignments. Additional breaks during testing as needed. Access to social worker, guidance counselor or administrator as needed
IEP	2	Extended time, reading comprehension checks and calculator on assessments and assignments. Access to graphic organizer/rubric, computer and lesson notes for assignments.
Students with Specific Language Needs		
Language Needs	**Number of Students**	**Supports, Accommodations, Modifications**
Example: English Language Learners with only a few words of English	*2*	*Pre-teach key words and phrases through examples and graphic organizers (e.g., word cluster, manipulatives, visuals)* *Have students use pre-taught key words and graphic organizers to complete sentence starters*
Example: Students who speak a variety of English other than that used in textbooks	5	*Make connections between the language students bring and the language used in the textbook*
Limited English Proficiency with conversational English Individualized Learning Plan (ILP)	2	Increased opportunities for direct instruction and working in small groups. Provide visuals and graphics to supplement extensive reading. Extended time on activities and assessments. Reading comprehension checks on assignments.
Students with Other Learning Needs		
Other Learning Needs	**Number of Students**	**Supports, Accommodations, Modifications**

[2] California candidates—If you do not have any English language learners, select a student who is challenged by academic English.

Example: Struggling readers	*5*	*Provide oral explanations for directions and simplified text for word problems*
Marked as Gifted/Talented, "High Ability:	2	Tiered assignments, independent enrichment, ability grouping.

Lesson Plans

Day 1 Lesson Plan

Date: Feb 1	**TeacherName:** Ms. Jaeger		**Class:** PRIME Math
Grade Level: 11-12	**Unit Name/Topic:** Unit 5: Linear Systems of Equations	**Lesson Number:** 1	**Length:** 49 min

Stage 1: Desired Results

*Note: Only list the desired results that are relevant for **THIS** lesson plan, not the entire unit.*

Academic Content Standard(s):

- **A.5**: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- **A.13:** Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables.

Mathematics Process Standard(s):

P.1 - Make sense of problems and persevere in solving them.
PS.4 - Model with mathematics

Academic Content Language (content vocabulary, discourse, syntax):

- Graph, algebraic, table, intersections, equal, solution

Enduring Understandings / Goals (Why):

Students will understand that . . .

- Systems of linear equations can be solved using methods of graphing, substitution and elimination
- Systems of linear equations can be represented using tables of values, graphs and equations
- Systems of linear equations either have no solutions, one common solution or infinitely many solutions

Essential Questions:

Students will keep considering . . .

- In what ways can real world scenarios be represented by systems of linear equations?
- How do we choose the best method for solving a system and justify our choice?

Questions to elicit deeper thinking or build upon about the topic…

- What does the solution mean, in context?

Student (SMART) Objectives(s) with academic language function:

Outcome(s) students will be able to demonstrate . . .

- the ability to write and solve 2 systems of linear equations from 1 given real world scenario.
- their choice and use of method for solving systems of linear equations and explain their reasoning in words

- their use of mathematical justification to explain the validity of their solution

Stage 2: Evidence of Learning (Assessments)

Performance Task(s) tied to:
Students will show their learning by . . .

- creating a poster displaying the problem, the method chosen for solving the system of linear equations and evidence of their mathematical process

Evaluative Criteria:
Students success would look like. .

- Correctly writing the two linear equations from the problem
- The use of a graph, table of values or an algebraic method to find the solution to the system
- Explaining their problem-solving steps verbally or in writing

Other Evidence
Formative:

- Students show their work on the pre-assessment
- Verbal participation in small groups
- Written work displayed on poster
- Participation in whole class verbal discussion comparing multiple strategies for problem-solving

Summative (if any beyond the performance task):

- Post-assessment (Day 5)

Stage 3: Learning Plan To Support Mathematical Proficiency

Mathematics Methods for Instruction:
(Highlight all that apply)

Group Discussion	Guided Practice	Question/Answer	Teacher Modeling	Problem-based	Simulation
Cooperative Learning	Writing Lab	Learning Stations	Problem Trail	Inquiry Learning	Independent Learning
Small Group	Direct Instruction	Workshop	Role Play	Game	Other:

Mathematical Thinking & Literacy Skills:
(Highlight all that apply) (linking to objectives and literacy standards & content standards)

Problem Solving	Reasoning & Proof	Communications	Connections	Representations
Declarative Knowledge	Procedural Knowledge	Conceptual Knowledge	Conducting Research	Other:

Mathematics Tools:
(Highlight all that apply)

Manipulatives	Graph/Patty Paper	Calculators & Technology	Ruler/Protractor/Compass	Colors

Formulas/Identities | Proofs | Data | Students' Work | Other:

Targeted Support(s) for Diverse Learners

Specific Support Needed (Special Education Support and/or accommodations and modifications)	Who will provide that support? Where will that support be provided?	Why? What's the intention
There are a handful of students with ILPs in the class. They are proficient English speakers with minimal accommodations, including extended time on assignments	All lessons are screen- and voice-recorded through the teacher's tablet and uploaded to canvas where it can be translated or subtitled Many activities use multiple representations and/or manipulatives	Students can return to the video if there were specific terms and ideas that were not comprehensive in the moment Visual representations can be paired with written representations for more inputs
A handful of students have IEPs and 504s that designate extended time on assignments, access to resources, and comprehension checks	The cooperating teacher and student teacher are practicing a co-teaching style throughout the unit. Ms. Jaeger leads the lesson, then both Ms. Jaeger and Ms. Bolt float to support students individually during work time, as needed.	Having a higher student/teacher ratio in the classroom allows all students to have more focused attention and help from their teachers to better meet their specific learning needs. More opportunities for direct instruction can

Technology Integration (purpose):

All work completed by the teacher in group discussions are displayed on the Promethean board at the front of the room as it is being written on the tablet.
All notes and instructional recordings are posted on the course's Canvas page for students to access for review or if they have missed a lesson

		accommodate needs for comprehension checks.	

Lesson Agenda with Discipline-Specific Learning Activities

Time:	Teacher Will Be (Planned Supports tied to objectives & build in checks for understanding)	Students Will Be (Learning Tasks connect to prior knowledge & assets):	Rationale: (Based on Research/theory)
Tuesday Feb 1 10 min	Pre-assessment: The teacher will pass out the FAL pre-assessment and direct students to complete it to the best of their ability, demonstrating their current understanding of linear equations and systems	Pre-assessment: Students will complete the FAL pre-assessment with their best effort to demonstrate their understanding of systems of linear equations and multiple representations	- Formative pre-assessment provides teacher with baseline knowledge for evidence of student growth after a designated period of the unit - Grading based on completion rather than accuracy serves the purpose of assessment with a low-pressure environment for students
30 min	Best Buy Tickets Activity: The teacher will introduce the best buy tickets problem by connecting it to a time where students may have had to weigh two different options of what to buy, direct the class to form groups of 2 or 3 students, pass out markers and posters, then float to support individuals as needed	Best Buy Tickets Activity: In groups of no more than 3, students will engage in the problem-solving process by considering a real world scenario regarding how to choose the most desirable merchant Students will create a poster on which they will demonstrate their problem-solving process, answer and explanation	- Collaborative math talk contributes to student learning as students hear each other's ideas and ask questions (Hammond,44)
9 min	Whole Class Discussion: The teacher will direct students to review their peers' posters as they hang them on the wall. The teacher will facilitate a discussion about strategies for problem-solving by asking students: What strategies did you see that did not look like yours? What techniques seem the most effective? Did every method find the same answer? Why does each representation give the same answer?	Gallery Walk/Whole Class Discussion: As students hang their posters on the wall they will observe other groups' work and make note of the variety of strategies. Students will share their observations and comparisons with the class as directed by teacher questioning, reflecting on the problem-solving process	- Reviewing and critiquing peer problem-solving contributes to ability to engage in productive math discussion

Day 2 Lesson Plan

Date: Feb 2	**TeacherName:** Ms. Jaeger		**Class:** PRIME Math
Grade Level: 11-12	**Unit Name/Topic:** Unit 5: Linear Systems of Equations	**Lesson Number:** 2	**Length:** 49 min

Stage 1: Desired Results

*Note: Only list the desired results that are relevant for **THIS** lesson plan, not the entire unit.*

Academic Content Standard(s):

- **A.5**: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- **A.13:** Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables.

Mathematics Process Standard(s):

P.1 - Make sense of problems and persevere in solving them.
PS.4 - Model with mathematics

Academic Content Language (content vocabulary, discourse, syntax):

- equation, system, one common solution, infinitely many solutions, no solutions

Enduring Understandings / Goals (Why):

Students will understand that . . .

- Systems of linear equations either have no solutions, one common solution or infinitely many solutions
- Solution classifications can be observed in graphs or equations

Essential Questions:

Students will keep considering . . .

- In what ways can real world scenarios be represented by systems of linear equations?
- How do we choose the best method for solving a system and justify our choice?

Questions to elicit deeper thinking or build upon about the topic…

- What does the solution mean, in context?

Student (SMART) Objectives(s) with academic language function:

Outcome(s) students will be able to demonstrate . . .

- their understanding of key components of solution classifications by writing four new equations that accurately represent the given solution classifications

Stage 2: Evidence of Learning (Assessments)

Performance Task(s) tied to:

Students will show their learning by . . .

- discussing the four solution classifications and writing new equations to represent the number of solutions

Evaluative Criteria:

Students success would look like. .

- identifying that parallel lines have no common solutions, lines with the same equation have

Other Evidence

Formative:

- Students show their work on paper in their workbook
- Participation in whole class verbal discussion comparing methods for writing appropriate equations

Summative (if any beyond the performance

infinitely many solutions, lines that intersect once have one common solution and that two linear equations cannot intersect twice	task): - Post-assessment (Day 5)

Stage 3: Learning Plan To Support Mathematical Proficiency

Mathematics Methods for Instruction:

(Highlight all that apply)

Group Discussion	Guided Practice	Question/Answer	Teacher Modeling	Problem-based	Simulation
Cooperative Learning	Writing Lab	Learning Stations	Problem Trail	Inquiry Learning	Independent Learning
Small Group	Direct Instruction	Workshop	Role Play	Game	Other:

Mathematical Thinking & Literacy Skills:

(Highlight all that apply) (linking to objectives and literacy standards & content standards)

Problem Solving	Reasoning & Proof	Communications	Connections	Representations
Declarative Knowledge	Procedural Knowledge	Conceptual Knowledge	Conducting Research	Other:

Mathematics Tools:

(Highlight all that apply)

Manipulatives	Graph/Patty Paper	Calculators & Technology	Ruler/Protractor/Compass	Colors
Formulas/Identities	Proofs	Data	Students' Work	Other:

Targeted Support(s) for Diverse Learners

Specific Support Needed (Special Education Support and/or accommodations and modifications)	Who will provide that support? Where will that support be provided?	Why? What's the intention
There are a handful of students with ILPs in the class. They	All lessons are screen- and voice-recorded through the teacher's tablet	Students can return to the video if there were specific terms and ideas that were

Technology Integration (purpose):

All work completed by the teacher in group discussions are displayed on the Promethean board at the front of the room as it is being written on the tablet.
All notes and instructional recordings are posted on the course's Canvas page for students to access for review or if they have missed a lesson

are proficient English speakers with minimal accommodations, including extended time on assignments	and uploaded to canvas where it can be translated or subtitled Many activities use multiple representations and/or manipulatives	not comprehensive in the moment Visual representations can be paired with written representations for more inputs
A handful of students have IEPs and 504s that designate extended time on assignments, access to resources, and comprehension checks	The cooperating teacher and student teacher are practicing a co-teaching style throughout the unit. Ms. Jaeger leads the lesson, then both Ms. Jaeger and Ms. Bolt float to support students individually during work time, as needed.	Having a higher student/teacher ratio in the classroom allows all students to have more focused attention and help from their teachers to better meet their specific learning needs. More opportunities for direct instruction can accommodate needs for comprehension checks.

Lesson Agenda with Discipline-Specific Learning Activities

Time:	**Teacher Will Be** (Planned Supports tied to objectives & build in checks for understanding)	**Students Will Be** (Learning Tasks connect to prior knowledge & assets):	**Rationale:** (Based on Research/theory)
<u>Wednesday (Feb 2)</u> 30 min	How Many Solutions? Activity: The teacher will introduce the How Many Solutions problem by asking the class what they remember about how to find solutions with systems of linear equations, then direct the class to work independently or find a partner, then float to support individuals as needed	How Many Solutions? Activity: Individually or with partners, students will consider the problem of how to find additional equations that relate to the given equation with a variety of number of solutions	- After having an opportunity to work individually, students can compare their process to the teacher model and engage in math discourse with peers, learning from access to a more knowledgeable other (Vygotsky)
15 min	Whole-Class Discussion: The teacher will engage the whole class in a discussion of problem-solving strategies by encouraging volunteers to show their	Whole-Class Discussion: Students will volunteer to model and explain their problem-solving strategy in front of the class.	- Collaborative math talk contributes to student learning as

	work on the Promethean board at the front of class and explain their process. The teacher will encourage observation that multiple equations can be written, highlighting the similarities between equations for each solution classification and asking students to compare their own equations to their peers'	Students will compare their own strategies and answers to their peers to observe similarities and differences between the equations written for different solution classifications	students hear each other's' ideas and ask questions (Hammond,44) - Reviewing and critiquing peer problem-solving contributes to ability to engage in productive math discussion

Day 3 Lesson Plan

Date: Feb 3	**TeacherName:** Ms. Jaeger		**Class:** PRIME Math
Grade Level: 11-12	**Unit Name/Topic:** Unit 5: Linear Systems of Equations	**Lesson Number:** 3	**Length:** 49 min

Stage 1: Desired Results

*Note: Only list the desired results that are relevant for **THIS** lesson plan, not the entire unit.*

Academic Content Standard(s):

- **A.5**: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- **A.13:** Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables.

Mathematics Process Standard(s):

P.1 - Make sense of problems and persevere in solving them.
PS.4 - Model with mathematics

Academic Content Language (content vocabulary, discourse, syntax):

- total, sum, digits, increased, product, angles, supplementary, measure

Enduring Understandings / Goals (Why):

Students will understand that . . .

- Real world scenario word problems can be written using a system of linear equations
- Systems of linear equations can be solved using methods of graphing, substitution and elimination

Essential Questions:

Students will keep considering . . .

- How are systems of linear equations used to represent real world scenarios?
- How do we choose the best method for solving a system and can we justify the choice?

Questions to elicit deeper thinking or build upon about the topic…

- What does the solution mean, in context?

Student (SMART) Objectives(s) with academic language function:

Outcome(s) students will be able to demonstrate . . .

- the ability to write five systems of linear equations from real world scenarios

- their mathematical reasoning by identifying one of the three given methods of solving systems of linear equations and using the strategy to solve five systems of linear equations
- their understanding of the context by explaining what the solution means

Stage 2: Evidence of Learning (Assessments)

Performance Task(s) tied to:
Students will show their learning by . . .

- identifying important information in the problem, defining variables and constructing two linear equations
- identifying the method used to solve the system of linear equations and successfully applying it to the system
- explaining the meaning of the solution in context

Evaluative Criteria:
Students success would look like. .

- Correctly writing two linear equations from the problem
- Utilizing substitution or linear combination methods to solve the system
- Explaining their problem-solving steps verbally or in writing

Other Evidence
Formative:

- Students show their work in their workbook
- Students participate in whole class verbal discussion about the process of constructing and solving systems of linear equations

Summative (if any beyond the performance task):

- Post-assessment (Day 5)

Stage 3: Learning Plan To Support Mathematical Proficiency

Mathematics Methods for Instruction:
(Highlight all that apply)

Group Discussion	Guided Practice	Question/Answer	Teacher Modeling	Problem-based	Simulation
Cooperative Learning	Writing Lab	Learning Stations	Problem Trail	Inquiry Learning	Independent Learning
Small Group	Direct Instruction	Workshop	Role Play	Game	Other:

Mathematical Thinking & Literacy Skills:
(Highlight all that apply) (linking to objectives and literacy standards & content standards)

Problem Solving	Reasoning & Proof	Communications	Connections	Representations
Declarative Knowledge	Procedural Knowledge	Conceptual Knowledge	Conducting Research	Other:

Mathematics Tools:
(Highlight all that apply)

Manipulatives	Graph/Patty Paper	Calculators & Technology	Ruler/Protractor/Compass	Colors
Formulas/Identities	Proofs	Data	Students' Work	Other:

Targeted Support(s) for Diverse Learners

Specific Support Needed (Special Education Support and/or accommodations and modifications)	Who will provide that support? Where will that support be provided?	Why? What's the intention
There are a handful of students with ILPs in the class. They are proficient English speakers with minimal accommodations, including extended time on assignments	All lessons are screen- and voice-recorded through the teacher's tablet and uploaded to canvas where it can be translated or subtitled Many activities use multiple representations and/or manipulatives	Students can return to the video if there were specific terms and ideas that were not comprehensive in the moment Visual representations can be paired with written representations for more inputs
A handful of students have IEPs and 504s that designate extended time on assignments, access to resources, and comprehension checks	The cooperating teacher and student teacher are practicing a co-teaching style throughout the unit. Ms. Jaeger leads the lesson, then both Ms. Jaeger and Ms. Bolt float to support students individually during work time, as needed.	Having a higher student/teacher ratio in the classroom allows all students to have more focused attention and help from their teachers to better meet their specific learning needs. More opportunities for direct instruction can accommodate needs for comprehension checks.

Technology Integration (purpose):

All work completed by the teacher in group discussions are displayed on the Promethean board at the front of the room as it is being written on the tablet.
All notes and instructional recordings are posted on the course's Canvas page for students to access for review or if they have missed a lesson

Lesson Agenda with Discipline-Specific Learning Activities

Time:	Teacher Will Be (Planned Supports tied to objectives & build in checks for understanding)	Students Will Be (Learning Tasks connect to prior knowledge & assets):	Rationale: (Based on Research/theory)
Thursday (Feb 3) 35 min	Dimes and Quarters, Sum of Digits: Teacher will introduce the tasks and direct students to engage in the problem-solving process with groups of 2-3. The teacher will assign each group two of the given problems. The teacher will float to offer individualized support as needed	Dimes and Quarters, Sum of Digits: In groups of no more than 3, students will engage in problem-solving real world scenarios by writing and solving a system of linear equations for two separate real world scenario story problems	- Collaborative math talk contributes to student learning as students hear each other's' ideas and ask questions (Hammond,44) - Practicing content grows your dendrites and secures information into the memory part of the brain (Hammond, 43)
10 min	In-class Activity Review: Teacher will engage entire class in group discussion of the systems problems by modeling the problem-solving process through student direction and asking other students to explain the rationale	In-class Activity Review: Students will describe their problem-solving process to the teacher and whole class by directing the teacher on what to write on the board and justifying their reasoning. Students will be asked to voice agreement or disagreement on the solutions of their peers	- After having an opportunity to work individually, students can compare their process to the teacher model and engage in math discourse with peers, utilizing a more knowledgeable other (Vygotsky)

Day 4 Lesson Plan

Date: Feb 7	**TeacherName:** Ms. Jaeger		**Class:** PRIME Math
Grade Level: 11-12	**Unit Name/Topic:** Unit 5: Linear Systems of Equations	**Lesson Number:** 4	**Length:** 49 min

Stage 1: Desired Results

*Note: Only list the desired results that are relevant for **THIS** lesson plan, not the entire unit.*

Academic Content Standard(s):

- **A.5**: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- **A.13:** Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables.

Mathematics Process Standard(s):

P.1 - Make sense of problems and persevere in solving them.
PS.4 - Model with mathematics

Academic Content Language (content vocabulary, discourse, syntax):

- Graph, table, equation, solutions, slope, substitution, intercept, one common solution, infinitely many solutions, no solutions

Enduring Understandings / Goals (Why):

Students will understand that . . .

- Systems of linear equations can be solved using methods of graphing, substitution and elimination
- Systems of linear equations can be represented using tables of values, graphs and equations
- Systems of linear equations either have no solutions, one common solution or infinitely many solutions

Essential Questions:

Students will keep considering . . .

- How are systems of linear equations used to represent real world scenarios?
- How do we choose the best method for solving a system and can we justify the choice?

Questions to elicit deeper thinking or build upon about the topic…

- What does the solution mean, in context?

Student (SMART) Objectives(s) with academic language function:

Outcome(s) students will be able to demonstrate . . .

- their understanding of systems of linear equations by creating 4 graphs and completing 4 value tables when given 4 separate equations
- their understanding of systems of linear equations by writing 2 equations and completing 2 value tables when given 2 separate graphs

Stage 2: Evidence of Learning (Assessments)

Performance Task(s) tied to:

Students will show their learning by . . .

- creating a poster detailing the problem, their mathematical steps and the method used for solving the system of linear equations

Evaluative Criteria:

Students success would look like. .

- Correctly writing the two linear equations from the problem
- The use of a graph, table of values or an algebraic method to find the solution to the system
- Explaining their problem-solving steps either in writing or verbally

Other Evidence

Formative:

- Students show their work on whiteboards
- Verbal participation in small groups
- Written work on cards
- Participation in whole class verbal discussion comparing multiple strategies for problem-solving

Summative (if any beyond the performance task):

- Post-assessment (Day 5)

Stage 3: Learning Plan To Support Mathematical Proficiency

Mathematics Methods for Instruction:

(Highlight all that apply)

Group Discussion	Guided Practice	Question/Answer	Teacher Modeling	Problem-based	Simulation

Cooperative Learning	Writing Lab	Learning Stations	Problem Trail	Inquiry Learning	Independent Learning
Small Group	Direct Instruction	Workshop	Role Play	Game	Other:

Mathematical Thinking & Literacy Skills:

(Highlight all that apply) (linking to objectives and literacy standards & content standards)

Problem Solving	Reasoning & Proof	Communications	Connections	Representations
Declarative Knowledge	Procedural Knowledge	Conceptual Knowledge	Conducting Research	Other:

Mathematics Tools:

(Highlight all that apply)

Manipulatives	Graph/Patty Paper	Calculators & Technology	Ruler/Protractor/Compass	Colors
Formulas/Identities	Proofs	Data	Students' Work	Other:

Targeted Support(s) for Diverse Learners

Specific Support Needed (Special Education Support and/or accommodations and modifications)	Who will provide that support? Where will that support be provided?	Why? What's the intention
There are a handful of students with ILPs in the class. They are proficient English speakers with minimal accommodations, including extended time on assignments	All lessons are screen- and voice-recorded through the teacher's tablet and uploaded to canvas where it can be translated or subtitled Many activities use multiple representations and/or manipulatives	Students can return to the video if there were specific terms and ideas that were not comprehensive in the moment Visual representations can be paired with written representations for more inputs

Technology Integration (purpose):

All work completed by the teacher in group discussions are displayed on the Promethean board at the front of the room as it is being written on the tablet.
All notes and instructional recordings are posted on the course's Canvas page for students to access for review or if they have missed a lesson

A handful of students have IEPs and 504s that designate extended time on assignments, access to resources, and comprehension checks	The cooperating teacher and student teacher are practicing a co-teaching style throughout the unit. Ms. Jaeger leads the lesson, then both Ms. Jaeger and Ms. Bolt float to support students individually during work time, as needed.	Having a higher student/teacher ratio in the classroom allows all students to have more focused attention and help from their teachers to better meet their specific learning needs. More opportunities for direct instruction can accommodate needs for comprehension checks.

Lesson Agenda with Discipline-Specific Learning Activities

Time:	**Teacher Will Be** (Planned Supports tied to objectives & build in checks for understanding)	**Students Will Be** (Learning Tasks connect to prior knowledge & assets):	**Rationale:** (Based on Research/theory)
<u>Monday (Feb 7):</u> 12 min	Activity Introduction: Teacher will introduce FAL activity by prompting discussion about how to approach solving for x and y variables in a given linear equation, providing the following equations and values: ● y=3x+2 for ○ x=5 and x=-1, then ○ y=8 and y=0	Activity Introduction: Students will solve for one variable using a given substitution, write their answers on whiteboards and display them for teacher affirmation	- Activating previous knowledge to make connections to new content (Hammond, 49)
37 min	FAL Activity - Classifying Solutions: The teacher will organize students into pre-decided partnerships based on their progress demonstrated in the pre-assessment. Both teachers will float to support students as needed	FAL Activity - Classifying Solutions: Students will solve and complete graphs, tables and equations on each card using substitution of x- and y-values into an equation or from the given linear graph.	- Collaborative math talk contributes to student learning as students hear each other's' ideas and ask questions (Hammond,44) - FAL Card Sorting Activity has a variety of inputs that support multiple intelligences (Gardner)

Date: Feb 8	**TeacherName:** Ms. Jaeger		**Class:** PRIME Math
Grade Level: 11-12	**Unit Name/Topic:** Unit 5: Linear Systems of Equations	**Lesson Number:** 5	**Length:** 49 min

Stage 1: Desired Results

*Note: Only list the desired results that are relevant for **THIS** lesson plan, not the entire unit.*

Academic Content Standard(s):

- **A.5**: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- **A.13:** Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables.

Mathematics Process Standard(s):

P.1 - Make sense of problems and persevere in solving them.
PS.4 - Model with mathematics

Academic Content Language (content vocabulary, discourse, syntax):

- Graph, table, equation, solutions, slope, substitution, intercept, one common solution, infinitely many solutions, no solutions

Enduring Understandings / Goals (Why):

Students will understand that . . .

- Systems of linear equations can be solved using methods of graphing, substitution and elimination
- Systems of linear equations can be represented using tables of values, graphs and equations
- Systems of linear equations either have no solutions, one common solution or infinitely many solutions

Essential Questions:

Students will keep considering . . .

- How are systems of linear equations used to represent real world scenarios?
- How do we choose the best method for solving a system and can we justify the choice?

Questions to elicit deeper thinking or build upon about the topic…

- What does the solution mean, in context?

Student (SMART) Objectives(s) with academic language function:

Outcome(s) students will be able to demonstrate . . .

- understanding of linear equation representations by identifying two pairs of graphs, tables and equations that have no solutions
- understanding of linear equation representations by identifying two pairs of graphs, tables and equations that have infinitely many solutions
- understanding of linear equation representations by identifying eight pairs of graphs, tables and equations with one common solution
- understanding of linear equation representations by solving for eight common solutions from graphs, tables and equations

Stage 2: Evidence of Learning (Assessments)

Performance Task(s) tied to:

Students will show their learning by . . .

- creating a poster that visually organizes the

Other Evidence

Formative:

- Students show their work on whiteboards

various representations with their corresponding solution classification and completes the common solution point

Evaluative Criteria:
Students success would look like. .

- Correctly writing 2 linear equations from the graphs
- Correctly completing 6 tables of values
- Correctly drawing 4 lines on graphs, given an equation
- The use of a graph, table of values or an algebraic method to find the solution to the system
- Explaining their problem-solving steps either in writing or verbally

- Verbal participation in small groups
- Written work on cards
- Participation in whole class verbal discussion comparing multiple strategies for problem-solving

Summative (if any beyond the performance task):

- Post-assessment (Day 5)

Stage 3: Learning Plan To Support Mathematical Proficiency

Mathematics Methods for Instruction:
(Highlight all that apply)

Group Discussion	Guided Practice	Question/Answer	Teacher Modeling	Problem-based	Simulation
Cooperative Learning	Writing Lab	Learning Stations	Problem Trail	Inquiry Learning	Independent Learning
Small Group	Direct Instruction	Workshop	Role Play	Game	Other:

Mathematical Thinking & Literacy Skills:
(Highlight all that apply) (linking to objectives and literacy standards & content standards)

Problem Solving	Reasoning & Proof	Communications	Connections	Representations
Declarative Knowledge	Procedural Knowledge	Conceptual Knowledge	Conducting Research	Other:

Mathematics Tools:
(Highlight all that apply)

Manipulatives	Graph/Patty Paper	Calculators & Technology	Ruler/Protractor/Compass	Colors
Formulas/Identities	Proofs	Data	Students' Work	Other:

Targeted Support(s) for Diverse Learners

Specific Support Needed (Special Education Support and/or accommodations and modifications)	Who will provide that support? Where will that support be provided?	Why? What's the intention
There are a handful of students with ILPs in the class. They are proficient English speakers with minimal accommodations, including extended time on assignments	All lessons are screen- and voice-recorded through the teacher's tablet and uploaded to canvas where it can be translated or subtitled Many activities use multiple representations and/or manipulatives	Students can return to the video if there were specific terms and ideas that were not comprehensive in the moment Visual representations can be paired with written representations for more inputs
A handful of students have IEPs and 504s that designate extended time on assignments, access to resources, and comprehension checks	The cooperating teacher and student teacher are practicing a co-teaching style throughout the unit. Ms. Jaeger leads the lesson, then both Ms. Jaeger and Ms. Bolt float to support students individually during work time, as needed.	Having a higher student/teacher ratio in the classroom allows all students to have more focused attention and help from their teachers to better meet their specific learning needs. More opportunities for direct instruction can accommodate needs for comprehension checks.

Technology Integration (purpose):

All work completed by the teacher in group discussions are displayed on the Promethean board at the front of the room as it is being written on the tablet.
All notes and instructional recordings are posted on the course's Canvas page for students to access for review or if they have missed a lesson

Lesson Agenda with Discipline-Specific Learning Activities

Time:	Teacher Will Be (Planned Supports tied to	Students Will Be (Learning Tasks	Rationale:

	objectives & build in checks for understanding)	connect to prior knowledge & assets):	(Based on Research/theory)
Tuesday (Feb 8): 34 min	FAL Activity - Classifying Solutions: The teacher will direct students to reconnect with their partner from yesterday, hand back sets of cards and pass out poster paper. The teacher will introduce the *arrow* cards with solution classifications and direct students to arrange all cards on the poster paper demonstrating the relationships between systems visually. Both teachers will float to support students as needed (If students struggle with organizing cards visually, the teacher will display an example diagram of cards to model one way students might arrange the cards)	FAL Activity - Classifying Solutions: Students and partners will practice sorting systems of linear equation cards with graph cards and the corresponding solution classification cards. Students will be asked to stick cards onto a poster with visual representation of connections and be able to explain their thought process to another pair	- Collaborative math talk contributes to student learning as students hear each other's' ideas and ask questions (Hammond,44) - FAL Card Sorting Activity has a variety of inputs that support multiple intelligences (Gardner)
15 min	FAL Post-Assessment: The teacher will direct students to complete the FAL post-assessment as a summative assessment to gauge student growth from the beginning of the unit to the end of the FAL activity	FAL Post-Assessment: Students will complete the post-assessment to demonstrate their knowledge and progress with multiple representations of systems of linear equations and classifying solutions	- Summative post-assessment provides evidence of student growth after a designated period of the unit - Grading based on completion rather than accuracy serves the purpose of assessment with a low-pressure environment for students

TASK 1: PLANNING COMMENTARY

Respond to the prompts below (**no more than 9 single-spaced pages, including prompts**) by typing your responses within the brackets. Do not delete or alter the prompts. Pages exceeding the maximum will not be scored.

1. Central Focus

a. Describe the central focus and purpose of the content you will teach in the learning segment.

[The central focus of the content is solving systems of linear equations. The purpose of the content is to help students classify the number of solutions for a given system (one, none, or infinitely many), in addition to setting up and solving problems using systems of linear equations. Students will also be able to choose the preferred method for solving a system of equations and be able to explain their solutions in context.]

b. Given the central focus, describe how the standards and learning objectives within your learning segment address

- conceptual understanding,
- procedural fluency, **AND**
- mathematical reasoning and/or problem-solving skills.

[The standards for the unit include the abilities of writing linear equations based on a given set of data, translating linear equations onto a graph with labels and scales, and solving systems both approximately and exactly. The relevant conceptual understanding is the framework around how linear equations and their systems can be represented in writing, graphic, equation, and table of values forms, as well as the relationships between the representations. Standards focus on how to transfer the processes of solving algebraically and graphically as they apply to pairs of linear equations in two variables. The applicable procedural fluency is found in applying the procedure of substituting values from tables into a given equation, and transferring procedures for solving systems of linear equations to real world applications. The creation of equations in two or more variables to represent relationships between quantities promotes problem-solving regarding the appropriate use of values in a given context and the mathematical reasoning surrounding labeling and scaling a graph appropriately to include all key information for the given context. Mathematical reasoning is encouraged by reflecting on the representations of systems of linear equations and determining whether or not the solutions make valid sense depending on the key features of the lines and/or the meaning of the solution in context]

c. Explain how your plans build on each other to help students **make connections** between concepts, computations/procedures, **AND** mathematical reasoning or problem-solving strategies to build understanding of mathematics.

[In the first lesson, students are asked to consider how they would choose between two merchant options if they are buying an unknown amount of tickets, utilizing their prior knowledge of analyzing and solving pairs of simultaneous linear equations in real-world problems to build connections from singular equations to systems. In the second lesson, students are given a linear equation and asked to create a system that satisfies each solution classification. Students will utilize the concept of what it means to have a solution on a graph to write corresponding linear equations, making connections regarding the two representations, then using mathematical reasoning to explain why their system satisfies the category of solutions. The third lesson connects the concepts of solution classifications to the problem-solving aspect of writing systems of linear equations from a word problem. Students will identify important mathematical information from a real-world scenario and solve the system, utilizing their knowledge of the three procedures of graphing, substitution and linear combination. The final two lessons engage students in making connections between a variety of representations, practicing the processes of manipulating equations and substituting values for variables, as well as recognizing patterns for classifying solutions based on a linear system of equations. In the final, two-day lesson, students combine their knowledge of linear concepts, solving linear equations, and their conceptual understanding of patterns and structure to build understanding of systems of linear equations.]

2. Knowledge of Students to Inform Teaching

For each of the prompts below (2a–c), describe what you know about **your** students **with respect to the central focus** of the learning segment.

Consider the variety of learners in your class who may require different strategies/support (e.g., students with IEPs or 504 plans, English language learners, struggling readers, underperforming students or those with gaps in academic knowledge, and/or gifted students).

a. Prior academic learning and prerequisite skills related to the central focus—**Cite evidence of what students know, what they can do, and what they are still learning to do.**

[In previous units, students should have procedural fluency in solving linear equations with a variety of methods. Students should be able to analyze and solve pairs of linear equations including real-world and mathematical problems. Students should be able to write equations that represent numbers or relationships. Students should be able to understand the solution of equations as a coordinate point. Students should be able to graph linear functions and identify key features of a linear function in a graph, equation and table.]

b. Personal, cultural, and community assets related to the central focus—**What do you know about your students' everyday experiences, cultural and language backgrounds and practices, and interests?**

[Students in this class have only attended one full week of class this semester as a result of lack of bus drivers, illnesses and critical weather conditions. Students in this class were learning online for approximately one and a half years, with emphasis in math classes placed on big ideas and topics, resulting in some noticeable gaps in knowledge and process. A majority of the students in the class have jobs at which they work after school and therefore have direct experience with monetary exchanges. To be enrolled in this course, students have already passed Algebra 1 and 2, indicating a level of proficiency with the material discussed. About half of the students in the class participate in afterschool sports, while a handful are involved in competitive clubs such as Business Professionals of America, aiding their knowledge of rates.]

c. Mathematical dispositions—What do you know about the extent to which your students

- perceive mathematics as "sensible, useful, and worthwhile"[3]
- persist in applying mathematics to solve problems
- believe in their own ability to learn mathematics

[The first assignment of the semester was to create and submit an introductory video in which students discussed their personal interests and the last math class they experienced. A common theme amongst the class regarding their belief in their own ability to learn mathematics was that they did not do their best in their previous math class because they "didn't apply themselves", indicating that they feel they're able to succeed in math if they put in their full effort but haven't had much experience being confident mathematicians. Although a handful of students maintain the typical mindset that they will never use math, or that it doesn't apply to them, the class as a whole unknowingly makes comments of clarity and realization when they make connections from the relevant content to their real-world experiences, indicating their explicit perception of mathematics as minimally "useful and worthwhile", but hints that there is an inherent understanding of math's sensibility in the world around them. In terms of persisting in applying mathematics to solve problems, there are very few students who simply give up on solving their problems in the classroom setting. As in keeping with the theme of the class, students engage in discussion about their misconceptions or struggles with partners and

[3] From The Common Core State Standards for Mathematics

teachers to attempt to approach problems with new perspectives. Students may become frustrated or feel stuck, but they persist with the support of peers and teachers.]

3. Supporting Students' Mathematics Learning

Respond to prompts below (3a–c). To support your justifications, refer to the instructional materials and lesson plans you have included as part of Planning Task 1. In addition, **use principles from research and/or theory to support your justifications.**

a. Justify how your understanding of your students' prior academic learning; personal, cultural, and community assets; and mathematical dispositions (from prompts 2a–c above) guided your choice or adaptation of learning tasks and materials. Be explicit about the connections between the learning tasks and students' prior academic learning, their assets, their mathematical dispositions, and research/theory.

[The task in lesson one engages students in writing linear equations to compare monetary options. High school students are in the developmental stage when autonomy is important and many members of the class are beginning to manage their own money. These students are familiar with having conversations about determining which of two options are more desirable, especially as it relates to money and choosing the cheaper option. The task in lesson two applies to students' disposition because it requires persevering in problem solving and believing in their own ability as mathematicians. To support the process of making sense of problems and persevere in solving them, students will work first independently, and after having the opportunity to attempt their problem-solving, they can evaluate their problem-solving through class discourse and teacher modeling, in order to practice their learning in the zone of proximal development through observing a more knowledgeable other. By knowing that their answers will be checked and critiqued, students will be motivated to construct a viable argument. The problems in lesson three utilize real world applications that incorporate monetary values and units of measurement that students are familiar with, as well as previous mathematical concepts such as angles and sums. These problems were selected because students have an understanding about cost from their personal and cultural experiences, and prior knowledge of the mathematical relationships from past algebra or geometry courses. The activities in lessons four and five are structured using intentional grouping strategies based on many factors. Students' personal assets in the classroom and mathematical dispositions informed by formative assessments and the pre-assessment in lesson one are important factors for choosing the combination of partners in these learning tasks. The activity includes many different forms of input and representations that may be perceived by students differently depending on multiple intelligences. By engaging in collaborative learning, the class will learn from each other's perspectives and experiences while solving the problems at hand.]

b. Describe and justify why your instructional strategies and planned supports are appropriate for **the whole class, individuals, and/or groups of students with specific learning needs**.

Consider the variety of learners in your class who may require different strategies/support (e.g., students with IEPs or 504 plans, English language learners, struggling readers, underperforming students or those with gaps in academic knowledge, and/or gifted students).

[Many lessons are designed as group activities to encourage collaborative math talk and independent problem-solving. There are three types of partnering decisions used in class: student-chosen, randomly assigned, and teacher-designed. By designing lessons for small group activities, students are able to work at an appropriate speed for their comprehension. This

self-pacing is advantageous to all learners, especially gifted students that may work faster than their peers or underperforming students who may work slower than the average student in class. In this unit, students will be directed to pick their own groups for the first lesson's poster activity because it is one that requires discussions in which students should feel comfortable and experience minimal anxiety. The card-sorting activity in lessons four and five will be designed using teacher-chosen partners based on individual students' progress on the pre-assessment given at the beginning of the unit. Students will be paired with a peer who has demonstrated mathematical problem-solving abilities at a similar caliber. Students with an ILP will be partnered with peers who are communicative and visually descriptive. Approximately 70% of this course is designed to be hands-on with manipulatives. Thus, this unit includes cards, posters and colors, which are beneficial to all students but specifically address students who struggle with written comprehension. Poster activities provide the opportunity for students of multiple intelligences to demonstrate their knowledge in the appropriate form for their understanding of the content.]

c. Describe common mathematical preconceptions, errors, or misunderstandings within your central focus and how you will address them.

[A common error found in student work is using algebraic operations on variables incorrectly when solving an equation with one or more variables. To address this error, I will begin class in lesson four with a whiteboard activity that highlights the process of substituting a value in the place of a variable in an equation to then solve for the second variable. In addition, misunderstandings with variables result in errors when solving a system of equations by linear combination, but forgetting to ensure that one variable has been eliminated. Lesson three incorporates solving activities with systems of equations, one of which lends itself to linear combination. Review of these problems will include purposeful questions such as "In what form do we want our equations?" and "What mathematical operations can we use to manipulate the equations and eliminate one variable?", in addition to teacher modeling of the problem with corresponding guiding questions. Frequently, errors with negatives occur in the midst of mathematical processes and calculations. To address these mistakes, checking the validity of solutions will be encouraged and emphasized in the teacher-led review portion of lessons two and three. Additionally, when working independently with partners or small groups in all lessons, students will be instructed to confirm their solutions with their partners and explain their work if they are not in agreement. A common misunderstanding is that there is only one correct answer for a multiple choice question. When given a system and asked to find its corresponding graphs, equations and/or tables of values, students frequently identify one version of representation that satisfies the problem and assume they have completed the problem-solving process. In the pre-assessment and activities of lessons one and two, students are asked to consider the notion that there may be a number of correct answers to the problem at hand. This idea will be solidified in group discussion as different groups of students offer different solutions to the problem and the class engages in discussion about why this might be valid. In lesson five, the idea that multiple forms can represent the same line is highlighted in the introduction whiteboard activity as different values are input in the same equation. The post-assessment in lesson 5 again offers the students the option of evaluating a variety of correct answers to a problem. When evaluating classifications of solutions, students misinterpret the mathematical indication of no common solutions in contrast to infinitely many solutions. Instead of practicing the process of proving solutions are valid through substituting values, students often rely on memorizing what it means when solving a system returns a true or false statement. In lesson two, students are tasked with creating equations that correspond with a variety of solution classifications for a system. Teacher-led review at the end of lesson two allows for students to observe teacher modeling after independent practice, creating discussion about which key components of a system imply their classifications. Students then transition into lessons four and five with

knowledge about classifications based on equations, which they can then utilize when presented with the concept of evaluating multiple representations of systems.]

4. Supporting Mathematics Development Through Language

As you respond to prompts 4a–d, consider the range of students' language assets and needs—what do students already know, what are they struggling with, and/or what is new to them?

a. **Language Function.** Using information about your students' language assets and needs, identify **one** language function essential for students to develop conceptual understanding, procedural fluency, and mathematical reasoning or problem-solving skills within your central focus. Listed below are some sample language functions. You may choose one of these or another language function more appropriate for your learning segment.

Compare/Contrast	Justify	Describe	Explain	Prove

Please see additional examples and non-examples of language functions in the glossary.

[The lessons corresponding with systems of linear equations encourage students to describe the notable characteristics and implications of the concepts by utilizing their prior knowledge of the topic. Because of the nature of the PRIME Math course, students have already been introduced to the mathematical concepts and procedures in previous math classes. As a result, the course objectives emphasize the mathematical justification and reasoning aspect of problem-solving. Thus, the language function supported in this unit is describing mathematical phenomena of systems of linear equations to evaluate systems in a variety of representations.]

b. Identify a key learning task from your plans that provides students with opportunities to practice using the language function identified above. Identify the lesson in which the learning task occurs. (Give lesson day/number.)

[During Lesson 5 on Day 5, students assign solution classification cards to their cards depicting lines in multiple representations by comparing two linear functions and identifying their relationship. While analyzing the equations and relationships, students practice describing to their partner the features demonstrated by each of their graphs, equations and tables, as well as the corresponding implications for the number of solutions in a system. By engaging in low-pressure conversations with partners about their process, students practice using discourse to communicate about the mathematical concept of solutions for systems of linear equations and when they occur. At the end of the lesson, students will complete their post assessment in which they will demonstrate their ability to describe the content-related mathematical phenomena and its connection to the strategies, through incorporating written word and syntax.]

c. **Additional Language Demands.** Given the language function and learning task identified above, describe the following associated language demands (written or oral) students need to understand and/or use:

- Vocabulary and/or symbols

- Mathematical precision[4] (e.g., using clear definitions, labeling axes, specifying units of measure, stating meaning of symbols), appropriate to your students' mathematical and language development
- **Plus** at least one of the following:
  - Discourse
  - Syntax

[Students must be equipped with vocabulary related to systems of linear equations, including "variables, graph, substitution, linear combination/elimination, slope, y-intercept, solutions, intersection" and have a proficient level of fluency with the symbols found in linear equations of one or two variables. Students must attend to precision when completing tables of values, identifying key features found on an x-y coordinate plane and defining variables in the context of a real world application problem. Students must use a combination of syntax and discourse in order to describe their understanding of systems of linear equations both verbally and in written form. While working with peers or engaging in class discussion, students must utilize their understanding of the task to engage in conversation about the steps and problem-solving strategies needed, using their mathematical reasoning. Additionally, to reinforce their discussion about their process, students will refer to their equations, values and graphs, utilizing their capabilities with the syntax related to linear systems of equations.]

d. **Language Supports.** Refer to your lesson plans and instructional materials as needed in your response to the prompt.

- Identify and describe the planned instructional supports (during and/or prior to the learning task) to help students understand, develop, and use the identified language demands (function, vocabulary and/or symbols, mathematical precision, discourse, or syntax).

[The problems in lesson one engage students in writing and solving their own equations, then considering the meaning of the solution in context. Writing equations from a written real world scenario helps students practice their use of discourse as they write about the content using the appropriate mathematical structure. Evaluating the system of equations enhances students' understanding of symbols as they connect the vocabulary in the problem to that of their system. In lesson two, students are asked to consider a linear equation, utilizing their knowledge of symbols to then write new equations that satisfy a classification, developing students' ability to utilize syntax when constructing another equation. Discussing the findings as a whole class with teacher facilitation and questioning supports students' practice of utilizing discourse in their analysis and problem solving. The problems in lesson three engage students in writing and solving equations contextually. Planned instructional supports include guided questions that have been practiced throughout the course for writing word problems, including the questions of "What does the problem tell us? What does the problem ask us to find? Do I have totals or rates?" to help students practice making sense of mathematical discourse. Lesson four begins with an introduction including whiteboards and sample problems. This activity serves as a direct scaffold for the following instructional task, helping students use the language demand of syntax as they rely on the organizational knowledge of equations to substitute values. The main task of lesson four is evaluating graphs, tables and equations. Providing all three representations on one page supports students' knowledge of the organization, relationships and symbols that are used in making connections. Students are able to clearly visualize and compare the appropriate

[4] For an elaboration of "precision," refer to the "Standards for Mathematical Practice" from The Common Core State Standards for Mathematics (June 2010), which can be found at http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf.

structures for each line to develop their use of discourse and syntax. Lesson five allows students to practice their organization of solution classifications based on a variety of representations. Breaking the card-sorting activity into two parts over the course of two days scaffolds the work to reinforce the relationship and structure between two lines and their classification of solutions. Emphasis is placed on the vocabulary regarding solutions in the second day, supporting students' development of understanding related to common solutions.]

5. Monitoring Student Learning

In response to the prompts below, refer to the assessments you will submit as part of the materials for Planning Task 1.

a. Describe how your planned formal and informal assessments will provide direct evidence of students' conceptual understanding, procedural fluency, **AND** mathematical reasoning and/or problem-solving skills **throughout** the learning segment.

[The pre-assessment establishes students' baseline knowledge of the concepts included in the lessons. Prior to discussing the concepts and procedures included in the central focus, students demonstrate their individual conceptual understanding of systems of equations and multiple representations. The pre-assessment is graded for completion, encouraging students to show their abilities to the best effort, rather than feel pressure about finding the "correct" solution or risk their grade. The "Best Buy Tickets" activity and poster serve as informal assessments to indicate students' mathematical reasoning and procedural fluency regarding systems of linear equations in real-world scenarios before formal discussion and teacher-modeling. The homework assignment correlating to the central focus is designed to indicate students' individual progress, after a formal teacher-led discussion in class, towards procedural fluency and mathematical reasoning related to writing and solving systems of linear equations. Creating posters representing their work demonstrates students' ability to engage in discussion about procedural fluency and mathematical reasoning with peers, as well as represents students' conceptual understanding of multiple representations and classifying solutions. The post-assessment establishes students' development with the concepts and procedures of the central focus after small-group activities, manipulatives, problem-solving practice and teacher-led models. It provides evidence for student progress in comparison with their baseline knowledge demonstrated in the pre-assessment and informs guidance for instruction as the unit continues.]

b. Explain how the design or adaptation of your planned assessments allows students with specific needs to demonstrate their learning.

Consider the variety of learners in your class who may require different strategies/support (e.g., students with IEPs or 504 plans, English language learners, struggling readers, underperforming students or those with gaps in academic knowledge, and/or gifted students).

[Small group activities allow for more opportunities of individualized teacher-student instruction of students with IEPs who require reading comprehension checks on classwork, as well as supporting English language learners who may need opportunities to work at their own preferred pace as opposed to when working as a whole class. Gifted students are able to work at a higher speed when self-pacing and are asked to consider their work one step beyond their initial solution. Multiple representations, activities that incorporate creative expressions of math justifications and collaborative math work all serve to address the needs of students with multiple learning styles, skills and intelligences. Partnerships in lessons four and five are chosen based on pre-assessment indicators of prior knowledge. Students are intentionally paired with peers who demonstrate a similar style of problem-solving and an equivalent level of conceptual

understanding and procedural fluency of the topic, indicated by both the pre-assessment and informal assessments of participation style in class and behavioral aspects.]

Works Cited

Worksheets in Lessons 1-3:

SREB Readiness Courses. (2020). *Transitioning to college and careers; Math Ready.* [Kit]. Atlanta, GA: Southern Regional Education Board.

Card Sorting Activity in Lessons 4-5:

Mathematics Assessment Resource Service. (2015). *Mathematics Assessment Project CLASSROOM CHALLENGES A Formative Assessment Lesson. Classifying Solutions to Systems of Equations.* MARS, Shell Center, University of Nottingham.

Instructional Materials

Lesson 1:

Student Manual

Math Ready . Unit 5 . Lesson 1

Task #5: Best Buy Tickets

Susie is organizing the printing of tickets for a show her friends are producing. She has collected prices from several printers and these two seem to be the best. Susie wants to go for the best buy. She doesn't yet know how many people are going to come. Show Susie a couple of ways in which she could make the right decision, whatever the number. Illustrate your advice with a couple of examples.

SURE PRINT
Ticket printing
25 tickets for $2

BEST PRINT
Tickets printed
$10 setting up
plus
$1 for $25 tickets

41

Lesson 2:

Student Manual

Math Ready . Unit 5 . Lesson 2

Task #8: How Many Solutions?

Consider the equation 5x - 2y = 3. If possible, find a second linear equation to create a system of equations that has:

- Exactly one solution.
- Exactly two solutions.
- No solutions.
- Infinitely many solutions.

~~**Bonus Question: In each case, how many such equations can you find?**~~

(Source: Illustrative Mathematics)

45

Lesson 3:

Student Manual

Math Ready . Unit 5 . Lesson 1

Task #6: Dimes and Quarters and Sum of Digits

1) The only coins that Alexis has are dimes and quarters. Her coins have a total value of $5.80. She has a total of 40 coins. How many does she have of each coin?

https://tasks.illustrativemathematics.org/content-standards/tasks/220

2) The sum of the digits of a two-digit number is seven. When the digits are reversed, the number is increased by 27. Find the number.

Stapel, Elizabeth. "System-of-Equations Word Problems." Purplemath. Available from http://www.purplemath.com/modules/systprob.htm. Accessed 17 September 2012

Task #7: Systems of Linear Equations Practice

1. An appliance store sells a washer-dryer combination for $1,500. If the washer costs $200 more than the dryer, find the cost of each appliance.

2. A particular computer takes 43 nanoseconds to carry out five sums and seven products. It takes 36 nanoseconds to carry out four sums and six products. How long does the computer take to carry out one sum? To carry out one product?

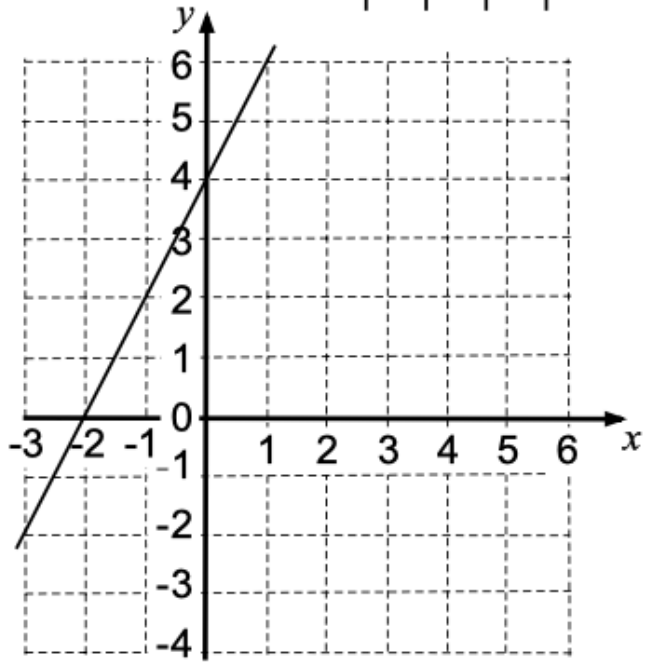
3. Two angles are supplementary if the sum of their measures is 180°. If one angle's measure is 90° more than twice the measure of the other angle, what are the measures of the angles?

Card Set A: Equations, Tables & Graphs

C1

$y =$ _____

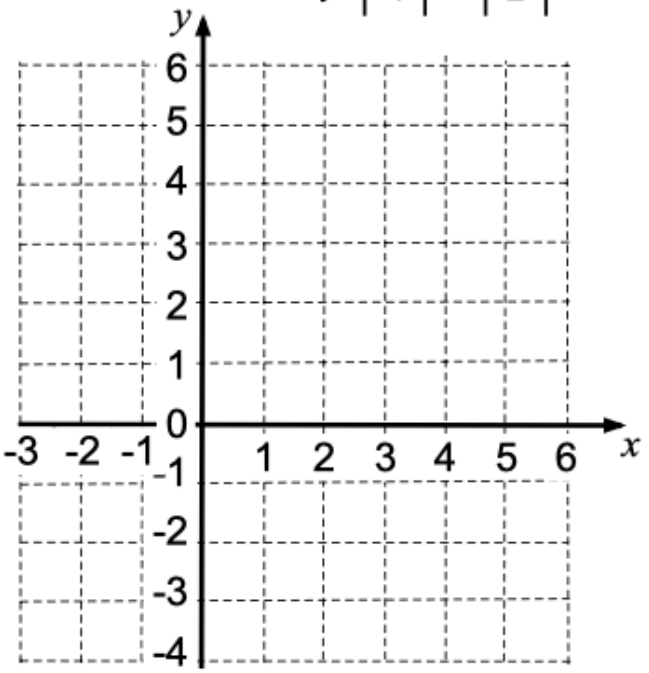
x	-3		1
y		2	



C2

$x + 2y = 8$

x	0	2	
y	4		2

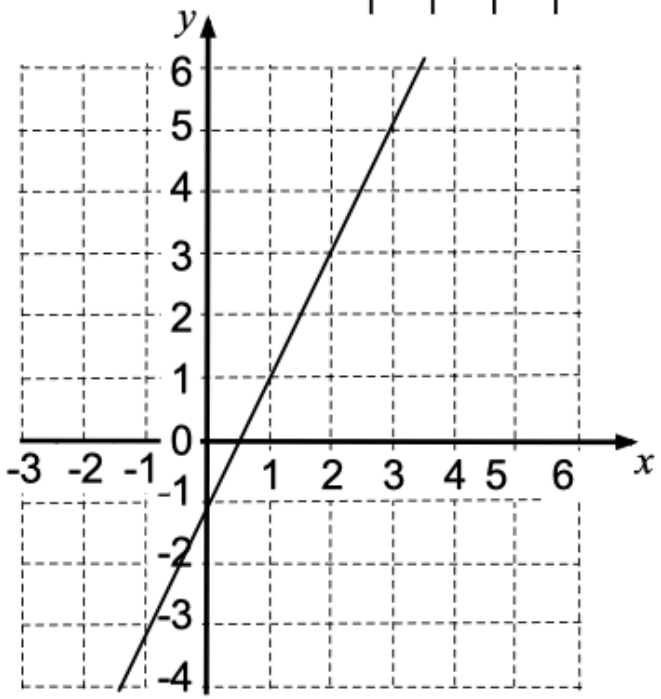


Card Set A: Equations, Tables & Graphs (continued)

C3

$y =$ _____

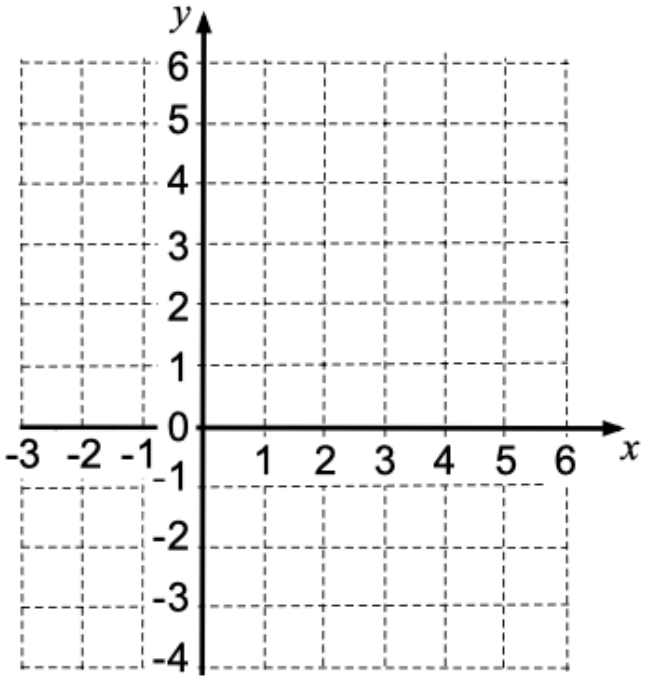
x	0		3
y	-1	3	



C4

$y = 2(x + 2)$

x		-2	
y	-2		6

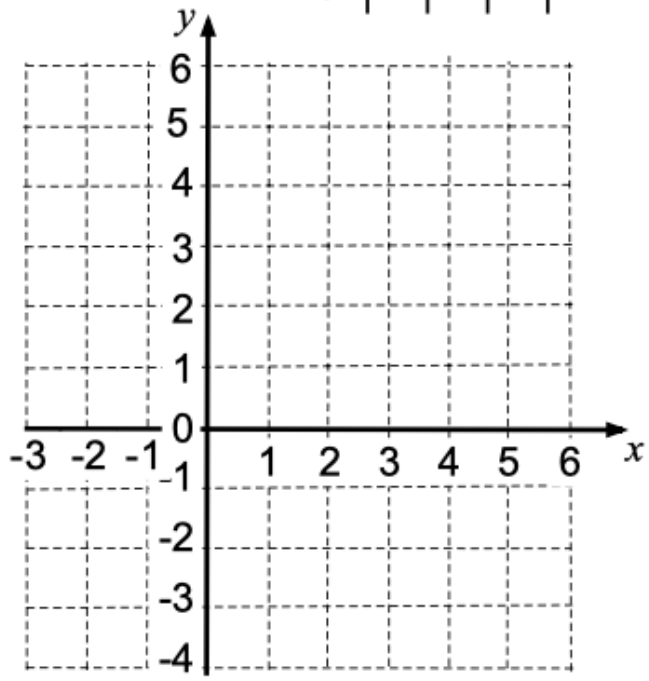


Card Set A: Equations, Tables & Graphs (continued 2)

C5

$y = -\frac{1}{2}x + 4$

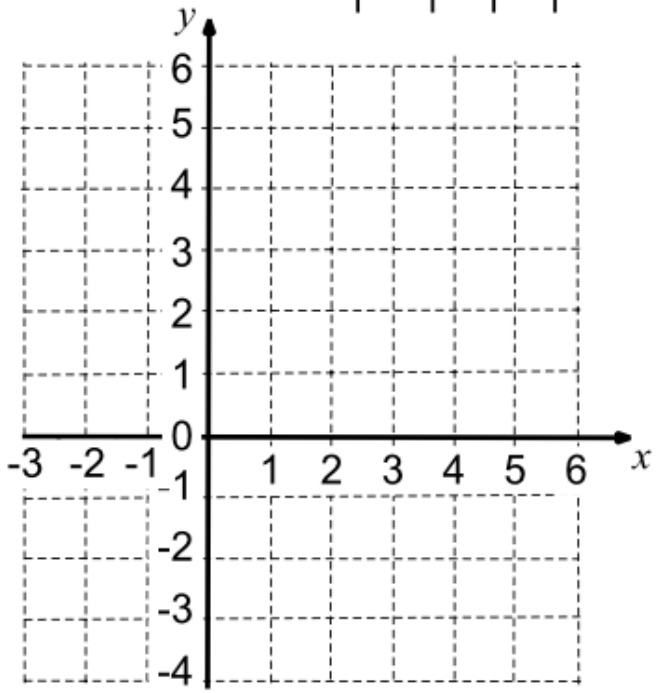
x	-2		6
y		4	



C6

$x = \frac{1}{2} - 2y$

x		0	
y	1		-1



Card Set B: Arrows

No common solutions	No common solutions	Infinitely many common solutions	Infinitely many common solutions
One common solution when $x =$ ___ , $y =$ ___	One common solution when $x =$ ___ , $y =$ ___	One common solution when $x =$ ___ , $y =$ ___	One common solution when $x =$ ___ , $y =$ ___
One common solution when $x =$ ___ , $y =$ ___	One common solution when $x =$ ___ , $y =$ ___	One common solution when $x =$ ___ , $y =$ ___	One common solution when $x =$ ___ , $y =$ ___

TASK 2: INSTRUCTION COMMENTARY

Respond to the prompts below (**no more than 6 single-spaced pages, including prompts**) by typing your responses within the brackets following each prompt. Do not delete or alter the prompts. Commentary pages exceeding the maximum will not be scored. You may insert **no more than 2 additional pages of supporting documentation** at the end of this file. These pages may include graphics, texts, or images that are not clearly visible in the video or a transcript for occasionally inaudible portions. These pages do not count toward your page total.

1. Which lesson or lessons are shown in the video clip(s)? Identify the lesson(s) by lesson plan number.

[The lesson shown in the video clip is Lesson 4.]

2. **Promoting a Positive Learning Environment**

Refer to scenes in the video clip(s) where you provided a positive learning environment.

a. How did you demonstrate mutual respect for, rapport with, and responsiveness to students with varied needs and backgrounds, and challenge students to engage in learning?

[When speaking with students individually, I made an effort to be on the same level as students physically (00:00 - 01:10, 01:16 - 01:37, 01:40 - 02:35, 03:12 - 05:10). I crouched in front of the table to be at eye level with students in order to respect physical boundaries, to make it easier for students to make eye contact and hear my responses, as well as to better use visual cues when indicating something specific within their work. When students were struggling with their work or their confidence regarding the problem, I supported them by asking them process questions, instead of answering their question explicitly, in order to engage students in answering their own inquiries and uncertainties. By supporting students in productive struggle, working alongside a more knowledgeable other, they obtain a level of autonomy over their problem-solving which increases their confidence (02:15, 04:20, and 06:23). Throughout the video clip, there are many moments where I respond to students' work or explanation with positive verbal feedback such as "that looks great!", "wonderful" and "good work", (01:36, 02:14, 05:15, and 03:30). Verbal positive feedback contributes to high school students' need for positive affirmation from their teachers and encourages them to continue engaging with their learning and inquiries. I demonstrate the classroom management strategy of having resources, materials and tools available for all students by retrieving a calculator for a student. Additionally, providing this student with the appropriate tool demonstrates responsiveness to students at various skill levels of mathematical computations by encouraging them to use technology in effective and appropriate ways (02:40). Throughout the entire video clip, I can be seen walking around the classroom and observing student work from amongst the student groups. My mobility and flexibility indicates to students that I am ready and willing to support their needs and offer individualized support when needed, while also allowing them space to develop problem solving skills independently. With this behavior, I can continue building mutual trust with students.]

3. **Engaging Students in Learning**

Refer to examples from the video clip(s) in your responses to the prompts.

a. Explain how your instruction engaged students in developing

- conceptual understanding,
- procedural fluency, **AND**

- mathematical reasoning and/or problem-solving skills.

[By engaging in mathematical discussion with students, students have the opportunity to practice verbalizing their knowledge of linear equations' representations, as well as the steps taken to maneuver between and amongst a variety of representations of linear equations. Students can be heard deepening their understanding of the concepts related to the task by describing the steps related to procedural fluency aloud and engaging in collaborative math talk that helps create connections between others' understanding of the process and their own (00:00-00:20, 03:08, 01:46). This discourse helps students make meaningful connections with the conceptual understanding regarding the structure of the representations and how to maneuver between them. There are moments in the video clip where I have students walk me through their thought process (01:46) or discussing the variety of strategies that may arise (01:00). These discussions engage students in their development of mathematical reasoning as they conceptualize their problem solving, describe it in its entirety and validate their decisions.]

b. Describe how your instruction linked students' prior academic learning and personal, cultural, and/or community assets with new learning.

[An immense portion of instruction relies on students' prior knowledge of graphs, tables and equations to make meaningful connections between a variety of representations and evaluating their relationships. Students employ their knowledge of slope-intercept form and intercepts (00:53, 1:58, 03:14), their graphing literacy (03:22, 04:00) and their understanding of the framework when using information from the tables of values (03:35, 05:55). By working in partners and engaging in collaborative math discussion, students make connections between the concepts related to the task and their community within the context of the classroom.]

4. Deepening Student Learning during Instruction

Refer to examples from the video clip(s) in your explanations.

a. Explain how you **elicited and built on student responses** to promote thinking and develop conceptual understanding, procedural fluency, **AND** mathematical reasoning and/or problem-solving skills.

[By repeating students' responses aloud back to them, students were able to engage with a different form of input from an outside source and evaluate their applications of(00:30, 1:26, 1:58, 05:15). Hearing their own words and thoughts originating from a separate outlet contributed to students' development of their conceptual understanding and mathematical reasoning skills by triggering neurons through repetition. I encouraged students to deepen their thought process and mathematical reasoning by questioning them about their process, strategy and use of prior knowledge in their problem-solving (00:58, 02:23, 03:54, 04:20). Student responses to this tactic of questioning indicated their level of conceptual understanding and formed the creation of personal connections, informing the direction of the conversation and how best to instruct the individual.]

b. Explain how you used representations to support students' understanding and use of mathematical concepts and procedures.

[Because the task incorporates the analysis of tables of values, graphs and equations, the majority of conversations in the video clip occurring between teacher and student correspond with a discussion about maneuvering a variety of representations. I introduced the idea of substituting a value in the place of a variable to prompt connections between the completed portions of a table of values and the corresponding equation (05:45). The use of equations to inform graphing was utilized repeatedly, especially regarding the relationship between slope-intercept form and the key features of the line graphically (00:53, 1:58, 03:14, 03:22, 04:00). The

procedural fluency required to translate values and characteristics between tables, equations and graphs is embedded in the task and is indicated throughout the video clip by the use of academic language and the strategies used to complete the missing gaps of information on the cards.]

5. Analyzing Teaching

Refer to examples from the video clip(s) in your responses to the prompts.

a. What changes would you make to your instruction—for the whole class and/or for students who need greater support or challenge—to better support student learning of the central focus (e.g., missed opportunities)?

Consider the variety of learners in your class who may require different strategies/support (such as students with IEPs or 504 plans, English language learners, struggling readers, underperforming students or those with gaps in academic knowledge, and/or gifted students).

[When instructing this activity again in the future, I would provide better access to resources and supplies such as calculators, colored pencils, whiteboards, dry erase markers and rulers. I would take advantage of the opportunity to engage a wider array of student groups in discussion; rather than primarily focusing on students who were actively asking for help, it is important to approach students who may not feel as comfortable asking for assistance. Now that I am more equipped to anticipate students' most common misconceptions, I would adjust my instruction to prepare more purposeful, pointed questions for promoting student thinking.]

b. Why do you think these changes would improve student learning? Support your explanation with evidence of student learning **AND** principles from theory and/or research.

[All students, of multiple intelligences, would benefit from having access to resources, regardless of strengths and needs. Although there are materials in the classroom that students are welcome to use, explicitly offering supplies to students encourages and normalizes the use of appropriate tools strategically. At the point in the video clip where a student asked to borrow a calculator, I realized that there were a great deal of other materials and supplies of which students could take advantage (02:40). Students who excel with visual cues such as color coding may make additional meaningful connections when using colored pencils, those that feel less confident in their algebraic processes might take advantage of calculators and whiteboards, and students who are intent on precision and organization may feel more comfortable when incorporating rulers and whiteboards. It's possible that the significant number of students struggling with attending to precision in their calculations would achieve more success with more available resources. Based on the data collected from conversations I had with individual students, engaging in math discussion contributed to individual students' meaning making and connections. Student questions ranged from those simply asking for affirmation of their accuracy to those who were frustrated about feeling stuck. While the majority of the class asked for explicit support or clarification at least once throughout the lesson, if not all students feel like they are able to ask for help then not all students had their needs met. To better support student learning, I will be intentional about checking in with students and pairs regardless of the rate at which they are asking for support. Students with all varieties of learning needs benefit from opportunities for direct instruction, individualized pacing based on skill level, and access to a more knowledgeable other who can provide guidance in the zone of proximal development with mathematical reasoning. Because a large portion of discussions with students was centered around asking questions about both conceptual and procedural knowledge, student learning

would improve if I enhanced the quality of my questions to provide clear scaffolds and aid the making of meaningful connections. Based on the focus of discussion in my conversations and common misconceptions in the topic, questions regarding substitution of values or relationships between different representations and prompts to promote mathematical justification would be impactful for a wide range of students' strengths and needs. Student learning benefits from specific and open-ended questions because they can help students practice their use of language and vocabulary, stimulate critical thinking and demonstrate to students that their teacher has confidence in their competence and contribution. When students believe that their work is valued and feel a sense of belonging in the classroom, students of all learning styles are more engaged and invested in the relevant learning opportunities occuring.

Student Work Samples

Name: STUDENT 1 WORK SAMPLE Period: 3rd Date: 2/9

PRIME Math– Unit 5: Linear Systems of Equations

EXIT TICKET

Working with Linear Equations (revisited)

$2(0)+2=2$

x	0	1	2
y	4	4	5

A

$2(1)+2=4$

x	1	2	3
y	4	6	8

B

$2(-2)+2=-2$

x	-2	-1	1
y	-5	-2	4

C

$2(-2)+2=-2$

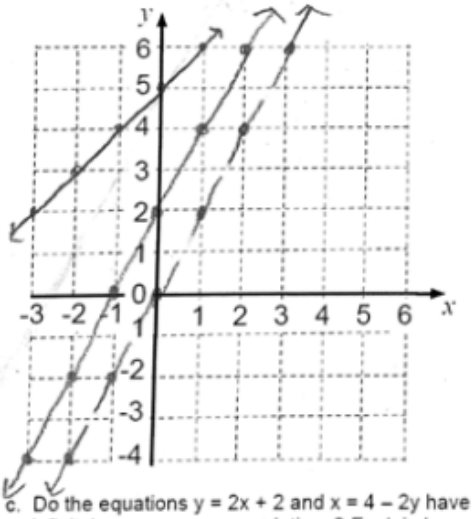
x	-2	-1	1
y	-2	0	4

D

1a. Which of these tables of values satisfy the equation $y = 2x + 2$? Explain how you checked.

I substituted the first x in to the equation and B was the only one that gave the correct output

b. By completing the table of values, draw the lines $y = 2x + 2$ and $x = 4 - 2y$ on the grid.



$y = 2x + 2$

x	-3	0	2
y	-4	2	6

$x = 4 - 2y$

$\frac{-4x}{-2} = \frac{-2y}{-2}$

x	2	4	6
y	1	4	12

$2x = y$
$2(4) = 8$
$2(6) = 12$

c. Do the equations y = 2x + 2 and x = 4 – 2y have one common solution, no common solutions, or infinitely many common solutions? Explain how you know.

no common solutions because the lines are parallel

2. Draw a straight line on the grid that has no common solutions with the line $y = 2x + 2$. What is the equation of your new line? Explain your answer.

$y = x + 5$, it has no common solutions because it doesn't cross the line of $y = 2x + 2$

Name STUDENT 2 WORK SAMPLE Period: 3rd Date: _____

PRIME Math– Unit 5: Linear Systems of Equations

EXIT TICKET

Working with Linear Equations (revisited)

x	0	1	2
y	4	4	5

A

x	1	2	3
y	4	6	8

B

x	-2	-1	1
y	-5	-2	4

(C)

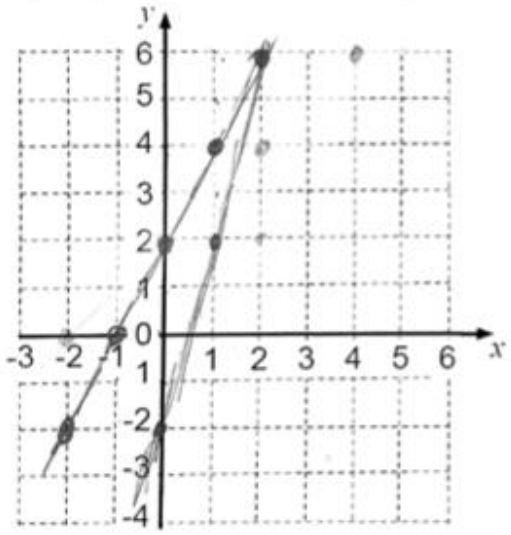
x	-2	-1	1
y	-2	0	4

D

1a. Which of these tables of values satisfy the equation $y = 2x + 2$? Explain how you checked.

I picked C because I plugged x & y into the equation and two sets of the number worked.

b. By completing the table of values, draw the lines $y = 2x + 2$ and $x = 4 - 2y$ on the grid.



$y = 2x + 2$

x	-3	0	2
y	-4	2	6

$x = 4 - 2y$

x	3	4	6
y	1	2	6

c. Do the equations $y = 2x + 2$ and $x = 4 - 2y$ have one common solution, no common solutions, or infinitely many common solutions? Explain how you know.

These equations has one common solution. The reason why I know this is because it crosses once.

2. Draw a straight line on the grid that has no common solutions with the line $y = 2x + 2$. What is the equation of your new line? Explain your answer.

The new equation of my line would be $y = 2x + 6$.

Name STUDENT 3 WORK SAMPLE Period: 3 Date: 1/8/22

PRIME Math– Unit 5: Linear Systems of Equations

EXIT TICKET

Working with Linear Equations (revisited)

x	0	1	2
y	4	4	5

A

x	0	1	2	3
y	4	6	8	

B

x	-2	-1	1
y	-5	-2	4

C

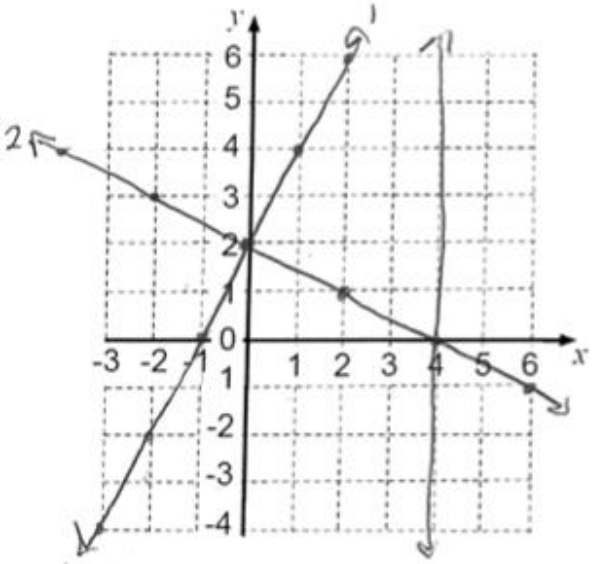
x	-2	-1	1
y	-2	0	4

D

1a. Which of these tables of values satisfy the equation $y = 2x + 2$? Explain how you checked.

I chose B because for each one, I looked for the y-intercept. I checked the slope for B thus getting my answer

b. By completing the table of values, draw the lines $y = 2x + 2$ and $x = 4 - 2y$ on the grid.



$y = 2x + 2$

x	-3	0	2
y	-4	2	6

$x = 4 - 2y \rightarrow \frac{-4+x}{-2} = \frac{-2y}{-2}$

$2 - \frac{1}{2}x = y$

x	2	4	6
y	1	0	-1

$2 - \frac{1}{2}x = 1$

$-\frac{1}{2}x = -1$

$\frac{-\frac{1}{2}x}{-\frac{1}{2}} = \frac{-1}{-\frac{1}{2}} = 2$

$x = 2$

c. Do the equations $y = 2x + 2$ and $x = 4 - 2y$ have one common solution, no common solutions, or infinitely many common solutions? Explain how you know.

They have one common solution at the point (0, 2)

2. Draw a straight line on the grid that has no common solutions with the line $y = 2x + 2$. What is the equation of your new line? Explain your answer.

My equation for my new line is $x = 4$. Using this, this new line will never cross $y = 2x + 2$

Evidence of Feedback

Name: STUDENT 1 WORK SAMPLE Period: 3rd Date: 2/8

PRIME Math– Unit 5: Linear Systems of Equations

EXIT TICKET

Working with Linear Equations (revisited)

$2(0)+2=2$

x	0	1	2
y	4	4	5

A

$2(1)+2=4$

x	1	2	3
y	4	6	8

B

$2(-2)+2=-2$

x	-2	-1	1
y	-5	-2	4

C

$2(-2)+2=-2$

x	-2	-1	1
y	-2	0	4

D

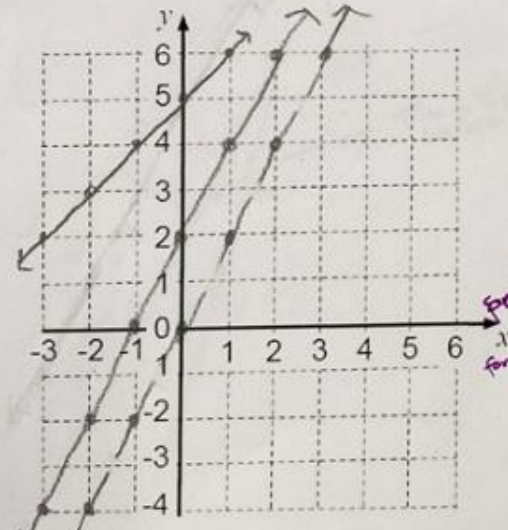
1a. Which of these tables of values satisfy the equation $y = 2x + 2$? Explain how you checked.

I substituted the first x in to the equation and B was the only one that gave the correct output

Substitution is a great strategy!

Be careful – is B the only table that satisfies the equation?

b. By completing the table of values, draw the lines $y = 2x + 2$ and $x = 4 - 2y$ on the grid.



$y = 2x + 2$

x	-3	0	2
y	-4	2	6

Good idea putting this line into slope-intercept form! But double check your calculations

$x = 4 - 2y$

$-4 \quad -4$

$\frac{-4x}{-2} = \frac{-2y}{-2}$

x	2	4	6
y	1	4	12

$2y = y$

$2(4) = 8$

$2(6) = 12$

c. Do the equations $y = 2x + 2$ and $x = 4 – 2y$ have one common solution, no common solutions, or infinitely many common solutions? Explain how you know.

no common solutions because the lines are parallel OK! This is true for the lines on your graph.

2. Draw a straight line on the grid that has no common solutions with the line $y = 2x + 2$. What is the equation of your new line? Explain your answer.

$y = x + 5$, it has no common solutions because it doesn't cross the line of $y = 2x + 2$

You're right that $y = x + 5$ doesn't cross the line on this graph... How can you prove that it will never cross?

Name STUDENT 2 WORK SAMPLE Period: 3rd Date: _____

PRIME Math– Unit 5: Linear Systems of Equations

EXIT TICKET

Working with Linear Equations (revisited)

x	0	1	2
y	4	4	5

A

x	1	2	3
y	4	6	8

B

x	-2	-1	1
y	-5	-2	4

C

x	-2	-1	1
y	-2	0	4

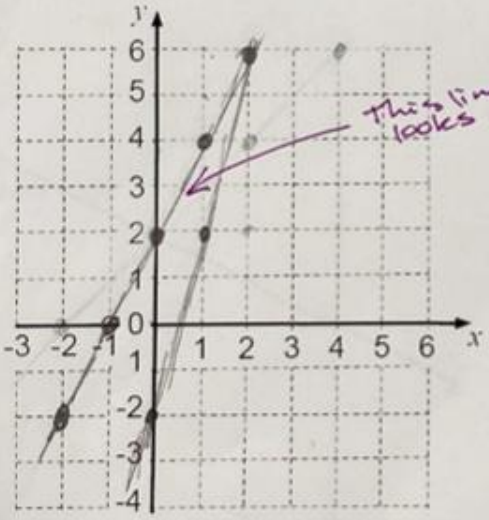
D

1a. Which of these tables of values satisfy the equation $y = 2x + 2$? Explain how you checked.

I picked C because I plugged x & y into the equation and two sets of the number worked.

Substitution is a great strategy! Try checking your calculations and confirm which tables satisfy the equation!

b. By completing the table of values, draw the lines $y = 2x + 2$ and $x = 4 - 2y$ on the grid.



$y = 2x + 2$

x	-3	0	2
y	-4	2	6

$x = 4 - 2y$ Where is your work for completing this table? Let's take another look at our substitution

x	3	4	6
y	1	2	6

Yes! The point of intersection is how we find our solution on the graph!

c. Do the equations $y = 2x + 2$ and $x = 4 - 2y$ have one common solution, no common solutions, or infinitely many common solutions? Explain how you know.

These equations has one common solution. The reason why I know this is because it crosses once.

Now consider: Where do the lines intersect?

2. Draw a straight line on the grid that has no common solutions with the line $y = 2x + 2$. What is the equation of your new line? Explain your answer.

The new equation of my line would be $y = 2x + 6$. I really like your new equation! How do you know this line won't have any solutions with the other line?

Name STUDENT 3 WORK SAMPLE Period: 3 Date: 1/8/22

PRIME Math– Unit 5: Linear Systems of Equations

EXIT TICKET

Working with Linear Equations (revisited)

x	0	1	2
y	4	4	5

A

x	0	1	2	3
y	2	4	6	8

B

x	-2	-1	1
y	-5	-2	4

C

x	-2	-1	1
y	-2	0	4

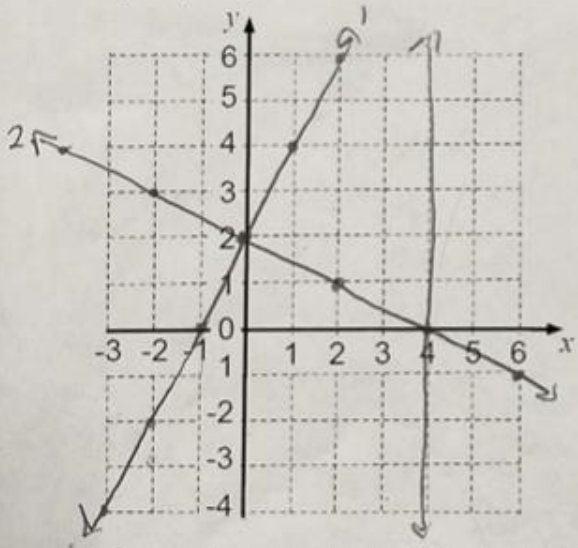
D

1a. Which of these tables of values satisfy the equation $y = 2x + 2$? Explain how you checked.

I chose B because for each one, I looked for the y-intercept. I checked the slope for B thus getting my answer. Good use of the slope-intercept form!

Now consider: Is table B the only table that satisfies the equation?

b. By completing the table of values, draw the lines $y = 2x + 2$ and $x = 4 - 2y$ on the grid.



$y = 2x + 2$

x	-3	0	2
y	-4	2	6

$x = 4 - 2y \rightarrow \frac{-4+x}{-2} = \frac{-2y}{-2}$

$2 - \frac{1}{2}x = y$

x	2	4	6
y	1	0	-1

$2 - \frac{1}{2}x = 1$

$-2 \quad -2$

$\frac{-\frac{1}{2}x}{-\frac{1}{2}} = \frac{-1}{-\frac{1}{2}} = 2$

$x =$

c. Do the equations $y = 2x + 2$ and $x = 4 - 2y$ have one common solution, no common solutions, or infinitely many common solutions? Explain how you know.

They have one common solution at the point (0, 2)

Well Done! Now tell me: how do you know this solution, based on the graph?

2. Draw a straight line on the grid that has no common solutions with the line $y = 2x + 2$. What is the equation of your new line? Explain your answer.

My equation for my new line is $x = 4$. Using this, this new line will never cross $y = 2x + 2$

You're right that the line $x = 4$ doesn't intersect the line $y = 2x + 2$ on this graph. What if the graph had a larger range of x & y values? How do you prove that $x = 4$ doesn't intersect $y = 2x + 2$?

TASK 3: ASSESSMENT COMMENTARY

Respond to the prompts below (**no more than 10 single-spaced pages, including prompts**) by typing your responses within the brackets following each prompt. Do not delete or alter the prompts. Commentary pages exceeding the maximum will not be scored. Attach the assessment you used to evaluate student performance (**no more than 5 additional pages**) to the end of this file. If you submit a student work sample or feedback as a video or audio clip and you or your focus students cannot be clearly heard, attach a transcription of the inaudible comments (**no more than 2 additional pages**) to the end of this file. These pages do not count toward your page total.

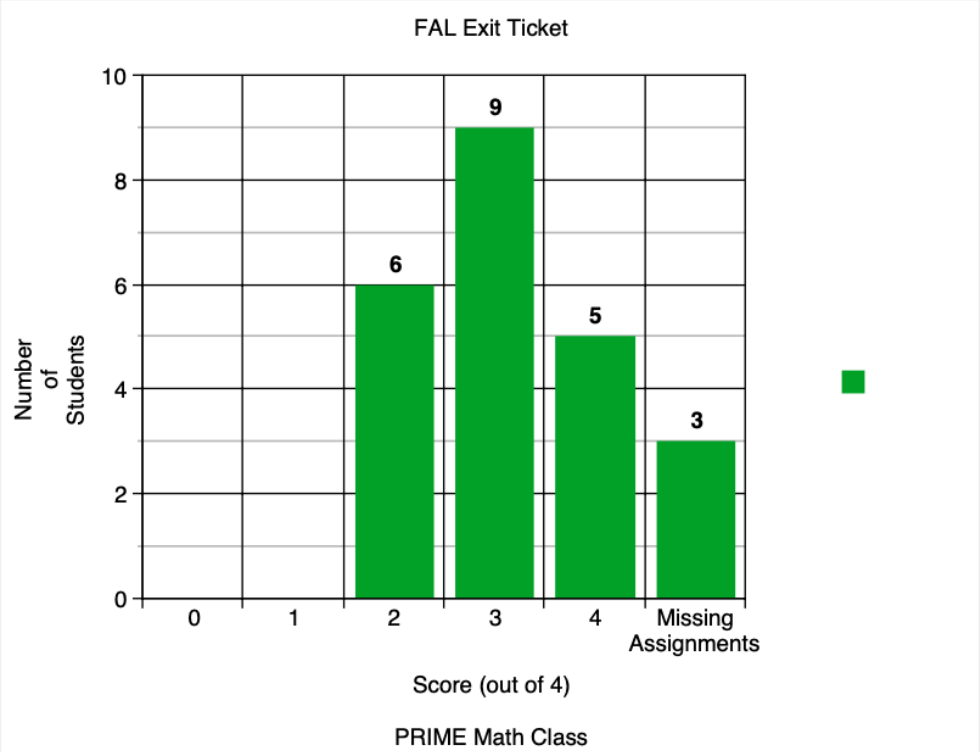
1. Analyzing Student Learning

a. Identify the specific learning objectives measured by the assessment you chose for analysis.

[Students are able to identify 1 of 4 tables that represent the same line as a given linear equation and explain their strategy for identifying the table in writing. Students are able to complete 3 missing values in two x-y tables when given a corresponding linear equation and graph the two lines on a graph. Students are able to classify the number of solutions in a system of linear equations graphically and explain their problem-solving process in writing. Students are able to graph/create one additional line that shares no solutions with the prior system of equations and explain what key features of the lines imply a classification of no solutions.]

b. Provide a graphic (table or chart) or narrative that summarizes student learning for your whole class. Be sure to summarize student learning for all evaluation criteria submitted in Assessment Task 3, Part D.

[



]

c. Use evidence found in the **3 student work samples and the whole class summary** to analyze the patterns of learning **for the whole class** and differences for groups or individual learners relative to

- conceptual understanding,
- procedural fluency, **AND**
- mathematical reasoning and/or problem-solving skills.

Consider what students understand and do well, and where they continue to struggle (e.g., preconceptions, common errors, common struggles, confusions, and/or need for greater challenge).

[Although the whole class identified and implemented appropriate strategies for evaluating the tables of values, either through substitution or by comparing slopes and y-intercepts, no students correctly recognized that two of the four tables of values satisfied the equation. One student identified an incorrect table of values, two students correctly identified the chronologically second table of values, while the rest of the class identified the first table of values that matched the equation, demonstrating the mathematical reasoning oversights. Overall, students were successful with procedural fluency when graphing their lines, by using the information from the equation in slope-intercept form or by using the tables of values they completed. However, 40% of the class completed both their tables of values and graphs in question 1b of the post-assessment with complete accuracy, while 60% of the class demonstrated their common struggle with calculating x and y values for the equation that is not in slope-intercept form. All students successfully classified the number of solutions in the system, according to their graph. Students who did not identify the common solution as the point (0,2) did correctly classify the solution that their own misaligned graph represented.
Nine students completed the last question on their assessment with a correct equation and an appropriate explanation, while one student supplied a sufficient equation with no explanation. The final question provided patterns for analysis regarding conceptual understanding. Two students misidentified a vertical line as an equation that would never cross the given line, while four students answered the question with a slope of 1, rather than 2. Four students did not answer the question with either a new equation or an explanation; three of these students did not complete the assessment in time, while one left a note indicating their lack of understanding for the question.]

d. If a video or audio work sample occurs in a group context (e.g., discussion), provide the name of the clip and clearly describe how the scorer can identify the focus student(s) (e.g., position, physical description) whose work is portrayed.

[Not applicable]

2. Feedback to Guide Further Learning

Refer to specific evidence of submitted feedback to support your explanations.

a. Identify the format in which you submitted your evidence of feedback for the 3 focus students. **(Delete choices that do not apply.)**

- Written directly on work samples or in separate documents that were provided to the focus students

b. Explain how feedback provided to the 3 focus students addresses their individual strengths and needs relative to the learning objectives measured.

[The feedback provided to Student 1 affirms their individual success of identifying appropriate strategies to use when evaluating linear equations and classifying solutions based on a graph. Student 1 received feedback regarding their mathematical computations and the process for solving an equation for a single variable. Student 1's feedback asks intentional questions that

prompt them to attend to precision and explain the rationale behind their reasoning. The feedback provided to Student 2 emphasizes their successes with classifying solutions based on a graphical representation and implementing appropriate strategies to manipulate between representations. Student 2 received feedback concerning their mathematical steps when using substitution to complete tables of values from an equation and asked them to demonstrate their quantitative reasoning in their work. The feedback that Student 2 received asks questions to ensure the student attends to precision in their conceptual understanding by encouraging them to check their work, construct viable arguments for their responses by explaining their thought process in writing and consider how to strengthen their reasoning by taking their answer one step further and including the point of intersection. The feedback provided to Student 3 reinforces their decisions about which strategies to use, their mathematical processes and their interpretation of solutions when considering graphical representations. Student 3 received feedback concerning their misconception regarding creating a new line to represent a given classification of solutions. The feedback provided to Student 3 asks them to deepen their conceptual understanding when evaluating multiple pieces of information in a given representation, to justify their answers by explaining their reasoning and to consider how they can push themselves further by asking their own questions.]

c. Describe how you will support each focus student to understand and use this feedback to further their learning related to learning objectives, either within the learning segment or at a later time.

[To support Student 1 with their strengths regarding selecting strategies to support their problem solving, it's important that I continue to push them to deepen their mathematical reasoning and work towards comparing multiple strategies for efficacy. I will implement this by asking procedural questions as well as creating intentional partnerships in which they must compare their own technique with peers who may have differing perspectives on approaches to problem solving. To encourage Student 1 to attend to precision when using basic algebraic operations, I will remind them of the significance of utilizing our available tools, reinforce self-pacing during independent work and introduce peer review aspects into instruction; while some of these strategies can be enforced individually, the whole class will benefit from the points for which Student 1 is receiving feedback. Student 2 will have the opportunity to continue making meaningful connections regarding the implications of graphs in context throughout the course, but they will require support as they consider how to ask questions and explain their reasoning. Feedback for Student 2 that is intended to support the development of mathematical reasoning and critiquing skills manifested as questions about how the student can continue to engage further with the materials. By modeling the next step of inquiry on their page, I have provided Student 2 with a scaffold with which they can begin to practice thinking critically and deepening their understanding. As the class continues to practice their mathematical reasoning skills in discussions, I will ensure that I am asking Student 2 evaluation-level questions to challenge their understanding within the zone of proximal development. Student 3 struggled with aspects related to the relationship between a system of linear equations on a graph and its solutions. In the lessons following this unit, the class will continue to evaluate systems, as relevant to linear inequalities, with applications to real world contexts. As the topic of systems continues to develop, Student 3 will have opportunities to continue developing their understanding of solutions in a variety of representations. Knowing that Student 3 is adept with the conceptual understanding and procedural fluency related to the topic of linear systems of equations, I will encourage Student 3 to utilize mathematical justification when considering relationships by asking questions about how they know their answer is correct and intentionally grouping Student 3 with peers whose strengths lie in conceptual understanding and mathematical reasoning, to promote conversations about why answers are both logically and mathematically justified.]

3. Evidence of Language Understanding and Use

When responding to the prompt below, use concrete examples from the clip(s) and/or student work samples as evidence. Evidence from the clip(s) may focus on one or more students.

You may provide evidence of students' language use **from ONE, TWO, OR ALL THREE of the following sources:**

1. Use the video clip(s) from Instruction Task 2 and provide time-stamp references for evidence of language use.
2. Submit an additional video file named "Language Use" of no more than 5 minutes in length and cite language use (this can be footage of one or more students' language use). Submit the clip in Assessment Task 3, Part B.
3. Use the student work samples analyzed in Assessment Task 3 and cite language use.

a. Explain and provide concrete examples for the extent to which your students were able to use or struggled to use the

- selected language function,
- vocabulary and/or symbols, **AND**
- mathematical precision, discourse, or syntax

to develop content understandings.

[Students' written work in Assessment Task 3 demonstrated the class's overall ability to describe the key features of an equation in slope-intercept form and/or the strategy of substitution, but revealed a common struggle when describing the classification of a system from a graph and why their additional equation would be an appropriate answer for the last question. The written descriptions on the post-assessment demonstrate a sufficient understanding of the content, with a need of practicing how to express their ideas and thoughts into written word. In each of the student work samples in Assessment Task 3, students utilized vocabulary words such as "equation", "y-intercept", "slope", and some form of classification regarding "common solutions". Student 3 demonstrated symbolic literacy with their coordinate point notation and creation of a line in slope-intercept form. All three focus students struggled to make use of the term "intersection", and instead employed the idea through the more colloquial word "cross". Students' use of vocabulary indicated a substantial and proficient understanding of the terms relevant to the task, except a few key terms and phrases that the overall group could continue incorporating into their math vocabulary bank. Students' verbal description of mathematical phenomena related to the linear representations and their implications is demonstrated in the Instruction Task 2 video clip as students describe their methods of: completing tables of values from a graph (00:05), using the given linear equation to graph a line (01:49, 03:10), and substituting values from the table for variables in the given equation (05:43). In these discussions, students select features from the given representation, identify their significance and dictate the problem-solving technique needed to inform their completion of the other forms. Through this descriptive process, students engage with the phenomena of manipulating various linear function formats and improve their understanding of the relationship

between the representations.Attention to mathematical precision and discourse is evident in the video clip as students confirm their understanding of the material through teacher affirmation or support to build confidence as mathematicians (00:20, 01:14) . Furthermore, mathematical precision and syntax is evident on student work samples for Students 1 and 3 in the manipulation of equations and variables in the vicinity of the tables of values at the top and middle sections of the page. Students demonstrated their mathematical syntax through the use of substitution and the intention of solving for the y variable.]

4. Using Assessment to Inform Instruction

a. Based on your analysis of student learning presented in prompts 1b–c, describe next steps for instruction to impact student learning:

- For the whole class
- For the 3 focus students and other individuals/groups with specific needs

Consider the variety of learners in your class who may require different strategies/support (e.g., students with IEPs or 504 plans, English language learners, struggling readers, underperforming students or those with gaps in academic knowledge, and/or gifted students needing greater support or challenge).

[This unit focused on assessing students' prior knowledge of and reintroducing properties of systems of linear equations and their representations. In the upcoming lessons, students will utilize this understanding to evaluate systems of inequalities and real-world application problems, solving systems of linear inequalities and writing inequalities for a given context. Knowing now that the majority of the class has at least a partial understanding of both the conceptual and mechanical aspects of solving systems of linear equations, we can continue making forward progress with the curriculum in inequalities and real-world applications.
I will intersperse brief reflections on classification during discussions about application problems when appropriate and especially as it connects to the meaning of the solutions in context. Additionally, to improve the whole class's attention to precision, I will emphasize checking mathematical processes at the end of computations to prove validity and introduce peer reviews into group or partner activities. Now that the class has had opportunities to explore the concepts of representations independently, I will also incorporate some formal teacher-led instruction, with student engagement through a whole class discussion. Moreover, to support the variety of learners in my class who require a range of supports, I will continue to use partnering and grouping deliberately.]

b. Explain how these next steps follow from your analysis of student learning. Support your explanation with principles from research and/or theory.

[Students have now had the opportunity to engage in problem solving and math discussion about systems of linear equations but some, like Student 3, are still struggling with the rationale behind classifications of solutions when evaluating a system graphically. By being intentional with real world applications, the whole class will have more opportunities to consider why a certain number of solutions makes viable sense in context and how to determine its validity. Incorporating a structured teacher-modeled problem-solving discussion allows students of various learning styles access to another source of input and the opportunity to observe a problem-solving process. Students like Student 2, who require accommodations such as reading comprehension checks and pre-prepared notes will benefit from the act of having the strategies and methods discussed aloud. Students like Student 1 who may move through their work quickly, to create a productive challenge for themselves, will benefit from engaging in a problem solving process that may differ from that of their own to make connections and observe

the next advancement of checking solutions and proving their validity. Grouping can help students at similar levels of content proficiency benefit from collaborating together to create productive struggle in their personal zone of proximal development. Students who have limited English proficiency are supported in small groups with students at similar skill level with whom they can communicate well, and students with IEPs or 504s can have opportunities for impactful learning by working with peers chosen based on skill level, learning style or peers with whom they feel comfortable.]

Evaluation Criteria

Concept Rubric (Understanding)

2 - A score of two indicates a **thorough understanding** of the mathematical concepts embodied in the task. The response shows content related work executed correctly and completely.

1 - A score of one indicates a **partial understanding** of the mathematical concepts embodied in the task. The response contains errors in the content related work.

0 - A score of zero indicates **limited or no understanding** of the mathematical concepts embodied in the task

Process Rubric (Mechanics)

2 - A score of two indicates a **thorough understanding** of the processes related to maneuvering between and amongst a variety of linear representations. The response contains all of the following:

- Shows an appropriate strategy to solve the problem, and the strategy is executed correctly and completely
- Identifies all important elements of the problem and shows a complete understanding of the relationships among them
- Attends to precision in explanations and the overall body of work

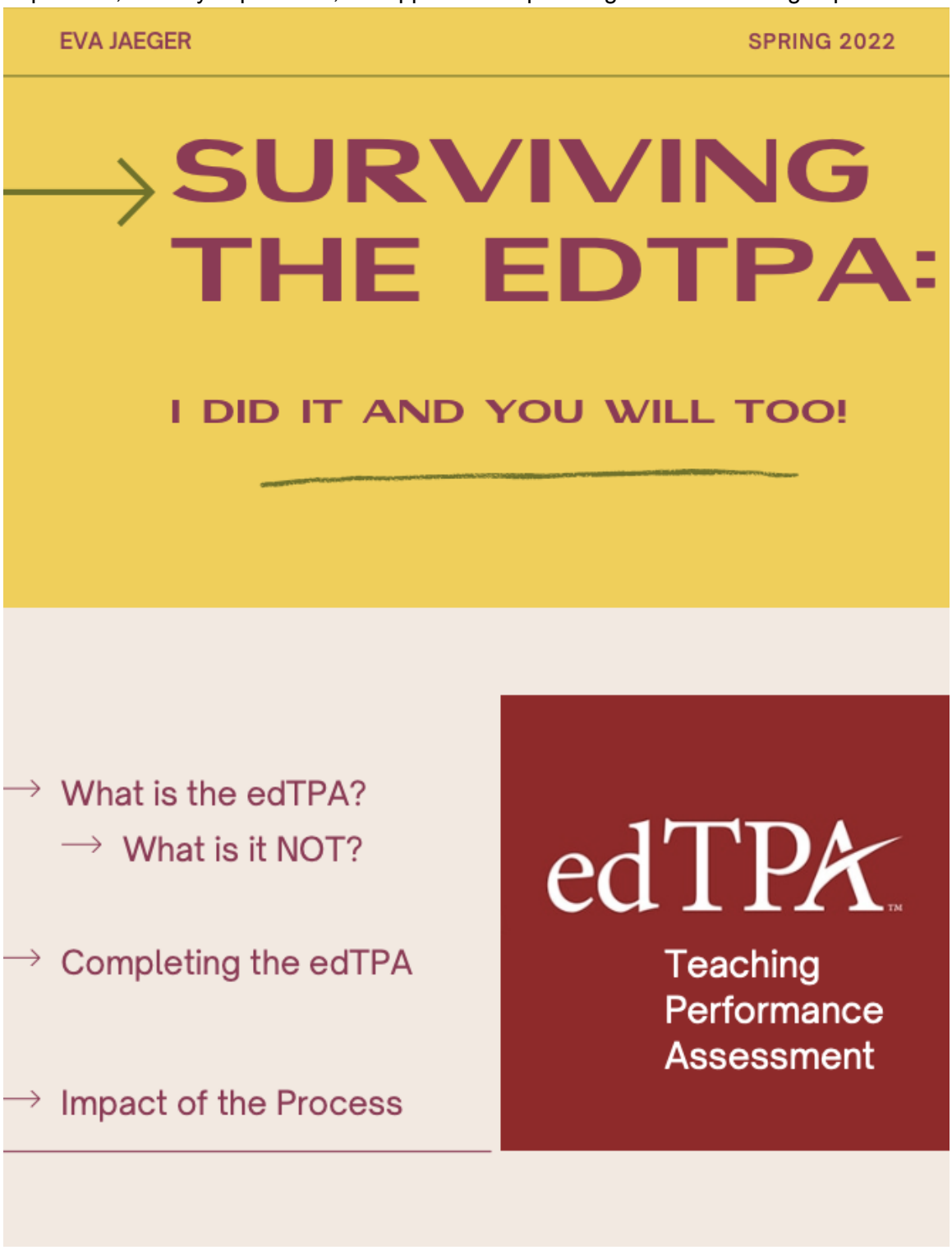
1 - A score of one indicates a **partial understanding** of the processes related to maneuvering between and amongst a variety of linear representations. The response contains one or more of the following errors:

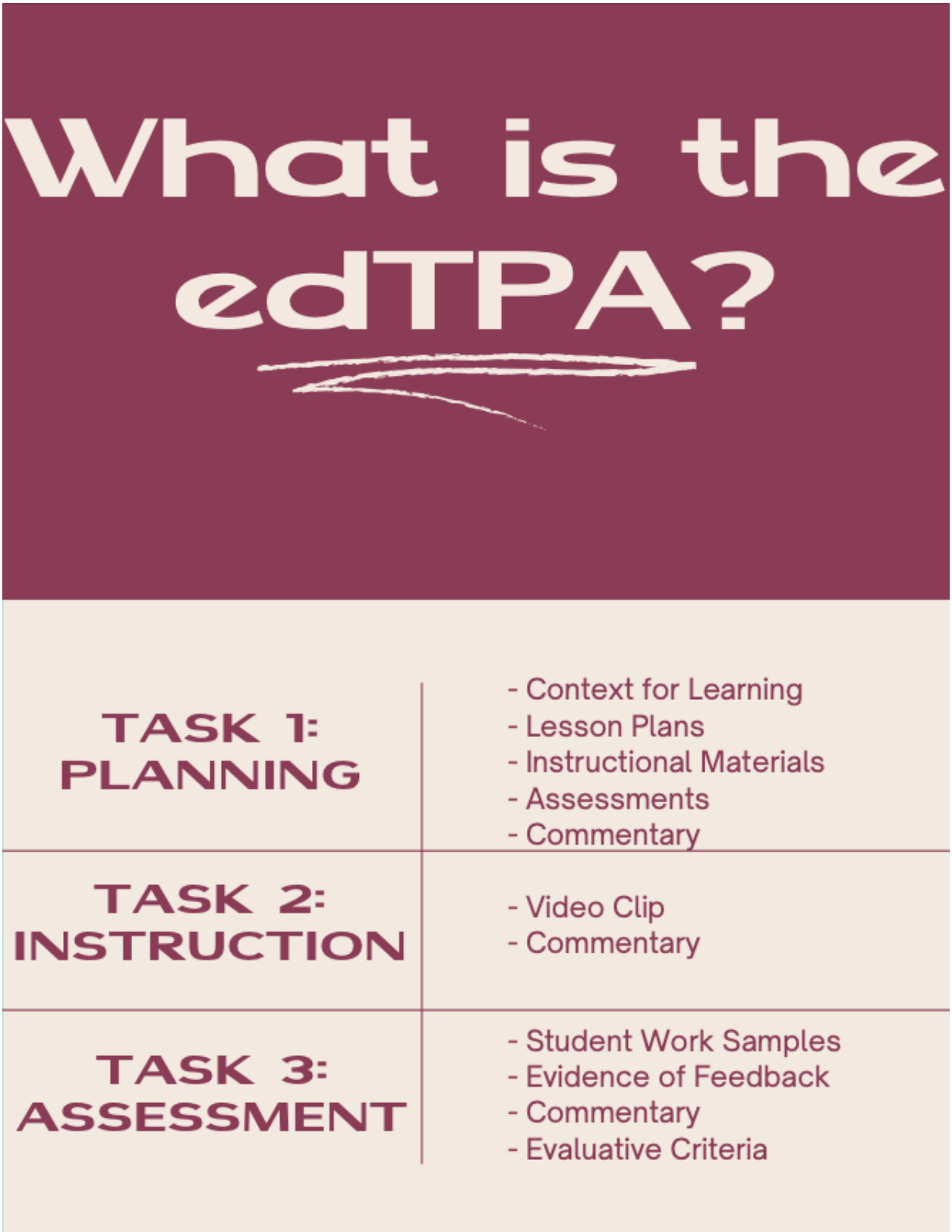
- Shows a strategy that contains minor errors
- Identifies some of the important elements of the problem and shows a general understanding of the relationships among them
- Contains errors related to the precision of the work

0 - A score of zero indicates **limited or no understanding** of the processes related to maneuvering between and amongst a variety of linear representations

Presentation to COE Juniors

The following slides were presented, with a scripted voiceover recording to an audience of juniors in the College of Education to provide clarity on the content of the edTPA, the factors of the process, and my experience, to support their upcoming student teaching experiences.

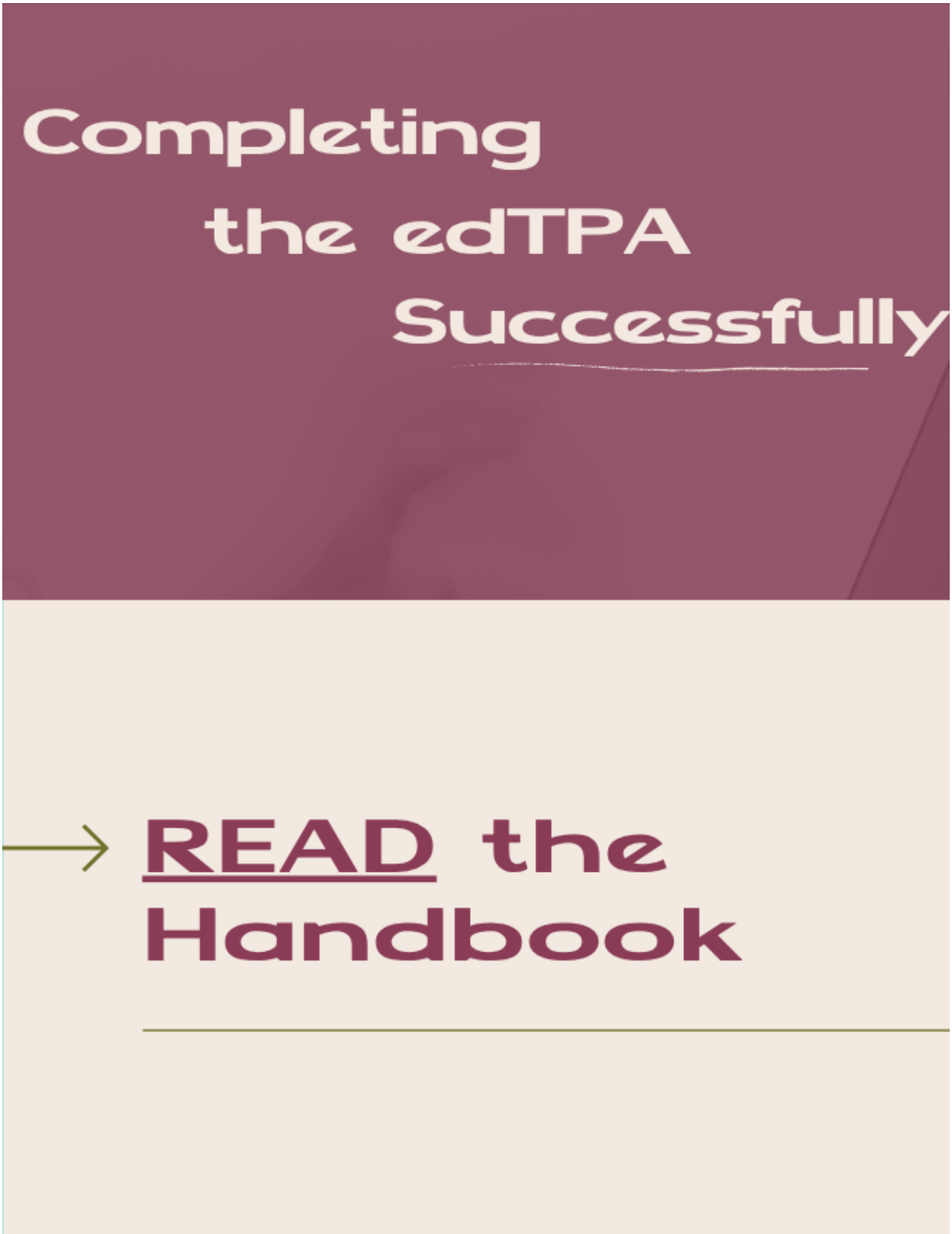



What is the edTPA?
TASK 1: PLANNING
- Context for Learning
- Lesson Plans
- Instructional Materials
- Assessments
- Commentary
TASK 2: INSTRUCTION
- Video Clip
- Commentary
TASK 3: ASSESSMENT
- Student Work Samples
- Evidence of Feedback
- Commentary
- Evaluative Criteria

Misconceptions

THE EDTPA IS NOT. . .

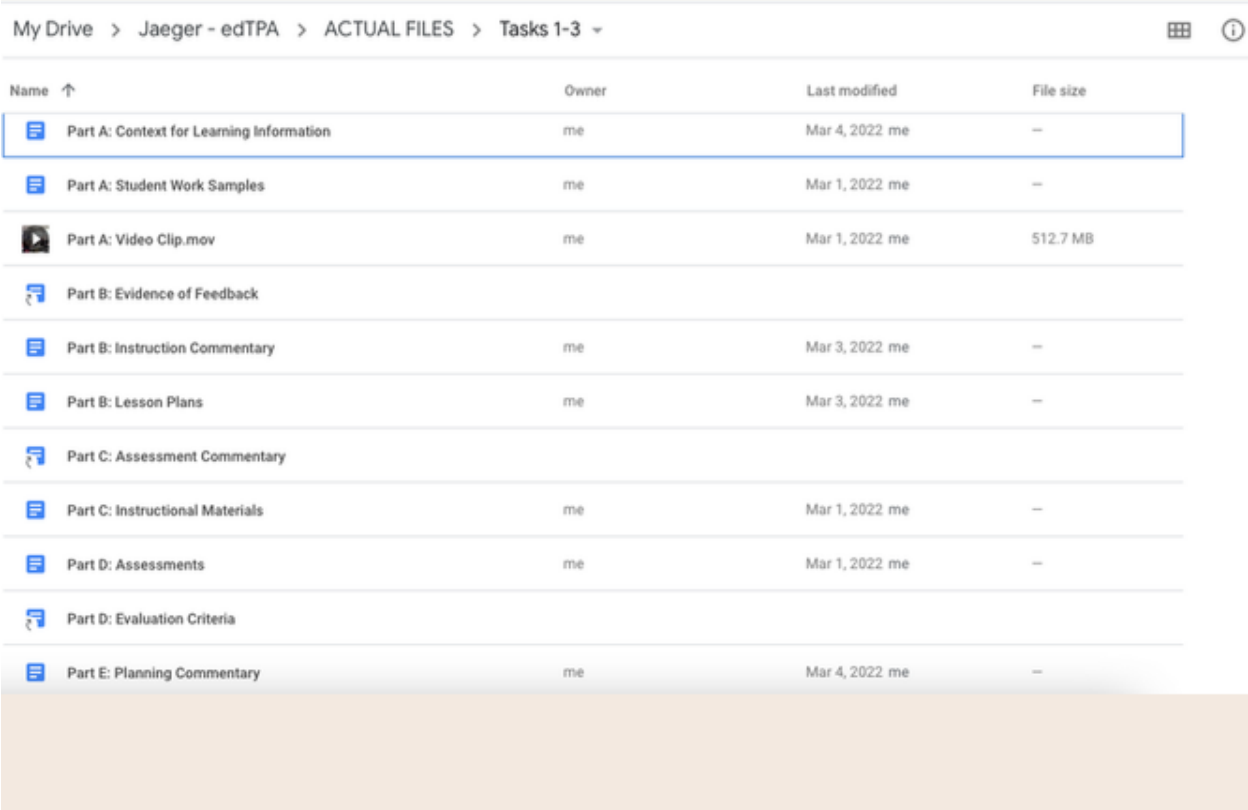
- → ... anything foreign to you
- → ... a hypothetical unit
- → ... assessed by the COE faculty
- → ... your most grandiose work of the semester
- → ... everyone's highest priority


Completing
the edTPA
Successfully
READ the
Handbook

→ Expect a lot of writing

→ Start On Time and Work Continuously

→ Allow time for uploading



What Did I Gain?

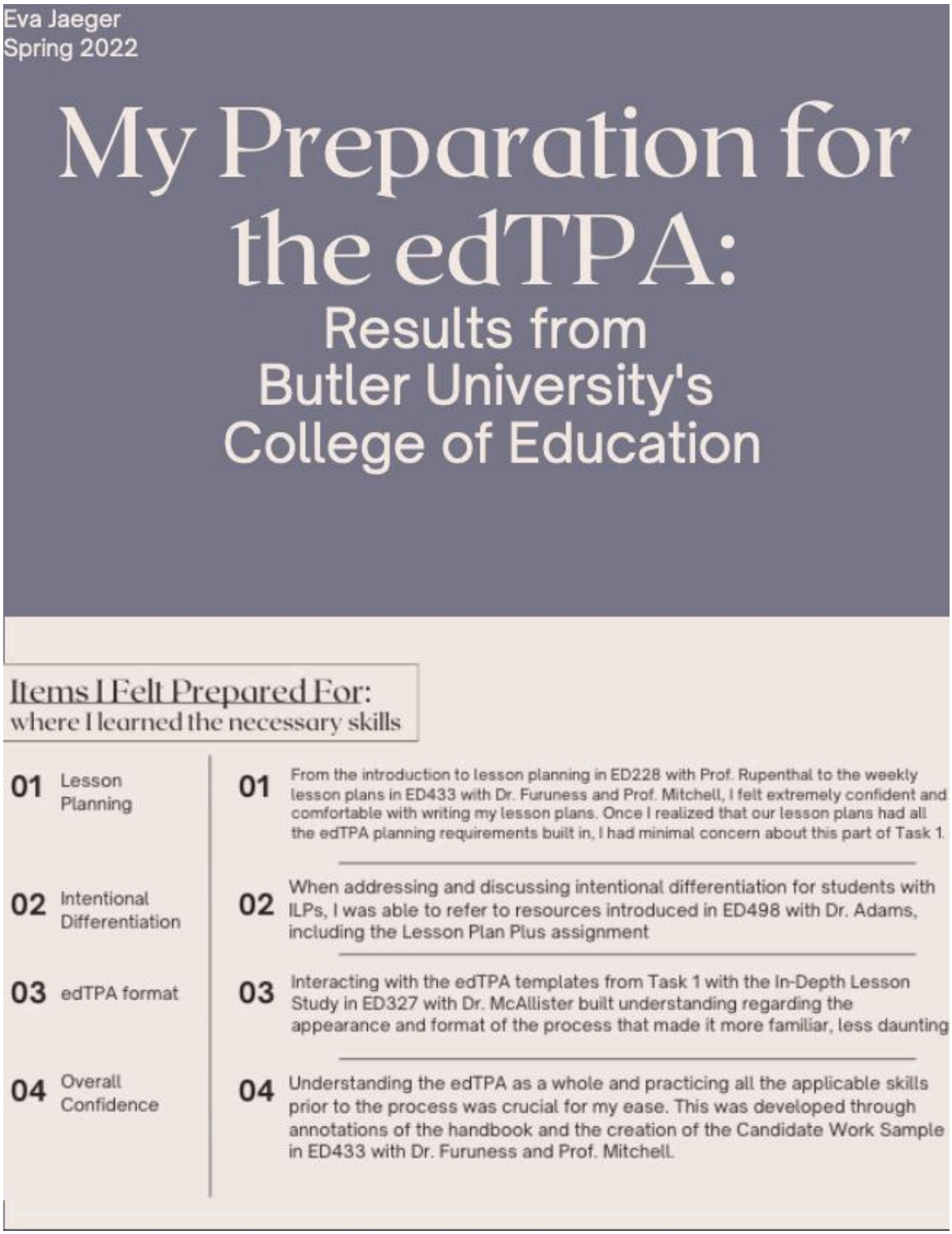
- Using Student Data
- Self-Evaluation of Teaching Performance
- Reflection & Analysis
- Understanding Students by Understanding Myself

Good Luck!

Have Questions? Ask Away:

Presentation to COE Faculty

The following slides were presented to an audience of faculty in the College of Education (COE) for review of the edTPA process and results as related to curriculum in the COE.



Items That Felt Like Obstacles:
the resources I used & where to fill the gaps in knowledge

Academic Language Function

The academic language function portion of each task was one of the prompts I struggled with the most. I didn't feel knowledgeable about implementing and instructing towards language functions for mathematics.
To supplement and inform my understanding, I utilized the Virtual PLC site and past textbooks from ED327 with Dr. McAllister and ED419 with Dr. Flessner.
I would have liked to have spent more time in ED228 with Prof. Rupenthal diving deeper into my own content's specific academic language functions, or had access to more content-specific pedagogy regarding language functions.

I know that now all of these items (academic language functions, planning formats, assessment methods) can be found on the Virtual PLC Canvas page.
Being introduced to this database as the resources became applicable to the coursework would solidify my understanding and create a digital toolbox to which I could return as needed.

"Unit Plan" vs. 3-5 Lessons

I understood unit plans to be an extended module of coursework that could be built of a multitude of lessons and might span a number of weeks.
When the edTPA used the term "unit" in reference to 3-5 lessons, adapting the scope and sequence for a more specific central focus was a challenge because it felt inherently wrong to pluck out such a small part of a comprehensive whole.
Ultimately, I identified a post-assessment in my course and worked backwards to bookend my edTPA unit with the pre-assessment, which then directly determined my 5 lessons.

Analyzing Summative Assessments and Utilizing Data

I had an understanding of formative assessments and performance tasks, and I knew that I could rely on examples or more options in the Virtual PLC site.
However when it came to summative assessments, I didn't have previous hands-on experience using measurable data to inform instruction concretely. Thus, my confidence in assessment analysis was minimal.
I was ready to attempt the skill of analyzing summative assessments in my ZWest placement, during ED327 with Dr. McAllister.

My Process and Supports

Reading the Handbook

I read the entirety of the edTPA handbook in my junior year to write my Honors Thesis Proposal.
Understanding the edTPA as a whole made it easier to focus on the details of the process when annotating the handbook in ED433 with Dr. Furuness. By the time I reviewed the handbook for the third time as I wrote my edTPA, I was extremely comfortable with both the handbook and the expectations.
To inform my proposal, I utilized the Butler COE edTPA Support site for the "why" of the project, access to the Secondary Math handbook and information about which courses supported the material.

Taking Advantage of ED434 Pacing

An external reminder to continue working on the assessment was crucial in the whirlwind of student teaching. If it weren't for the weekly affirmations of my progress, I would have procrastinated miserably. As it was, I was able to have a rough draft of the assessment almost a week before the final deadline.
The reflective writing assignments and class discussions within the ED434 course framework sufficiently prepared me for understanding the reflective processes of the edTPA tasks. Thus, I did not need to refer to other resources such as the Butler COE edTPA Support site for answers to FAQs or Helpful Hints during the writing process.

The Final Submission

I spent the last 4 days before the submission deadline entirely focused on editing and proofreading my material.
Throughout Phase 1, my Google Drive edTPA folder served as my concrete checklist for the tasks I had begun and which I still needed to complete. In my final submission, I utilized the edTPA website's uploading page as a final checklist for my project; as I finalized a file, I uploaded it to the site and marked it as being ready, before cross-checking the requirements in the handbook's Evidence Charts pages.

My Results:

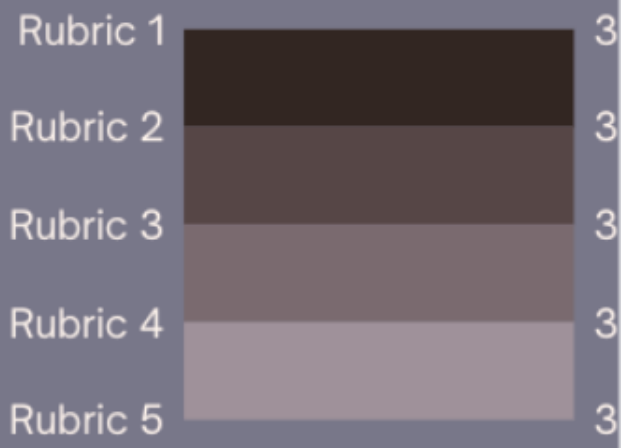
Total Score: **44** out of 75

Average Rubric Score: **2.93**

**[Note: I had a very minimal understanding of the significance of the scores until after my submission.
I tailored my edTPA work to the handbook rubrics, specifically the requirements detailed in the Score 3 column]**

My Results: Task 1

Scores of 3 in all Task 1 rubrics



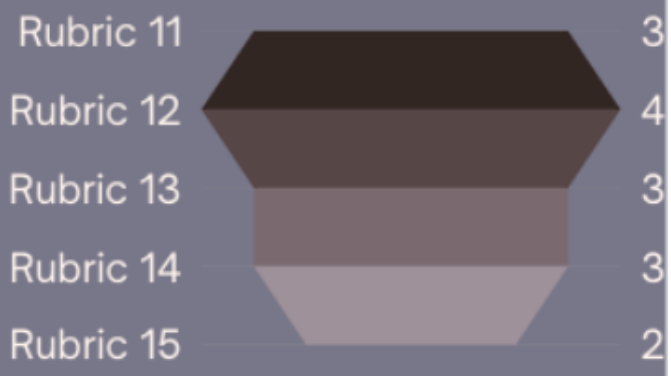
My Results: Task 2

Score of 2 in "Analyzing Teaching Effectiveness"

My Results: Task 3

Score of 2 in "Using Assessment to Inform Instruction"

Score of 4 in "Providing Feedback to Guide Learning"



My Results:

Overall, I was personally satisfied with my results. I felt successful in both of my goals of completing the edTPA and engaging in the reflective process to the best of my abilities

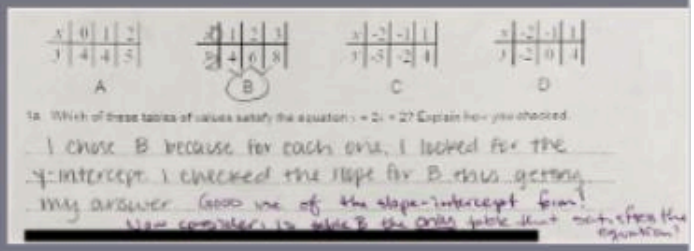
The score of 2 on both **using assessment** and **analyzing teacher effectiveness** felt accurate to me. Even when submitting my final project, I knew I wasn't the most confident in either of these two sections

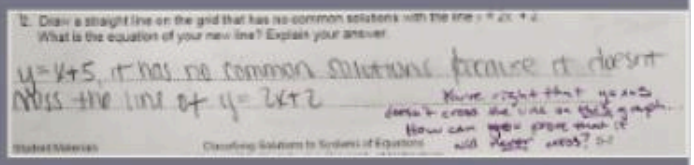
Earning a 2 in these sections indicates that the changes I proposed to my teaching practice were superficially related to the subject of the prompt. Upon reflecting my submission, I believe that it is an accurate analysis of this commentary.

My Results:

Overall, I was personally satisfied with my results. I felt successful in both of my goals of completing the edTPA and engaging in the reflective process to the best of my abilities

Receiving a score of 4 on **Providing Feedback** came as a surprise. Because I hadn't had much practice in giving feedback, I assumed that my comments were unsubstantial, especially considering their brevity.





*The attached photos are samples of my submitted feedback

So What?

Where/When I saw value

While in the thick of student teaching and writing the edTPA, it was something I was doing because I knew I was required to complete it. I was simply being asked to formalize the conversations and thought processes that I was engaging in inherently with my cooperating teacher; we were already discussing our rationale and the planning-instruction-assessment cycle constantly, but the edTPA asked me to put it into words. Only after I had completed the edTPA submission and began reflecting back on the process as a whole experience did I realize its benefits. It was the post-submission reflective piece of my honors thesis during which I processed which aspects of the teaching performance assessment truly made an impact on my student teaching experience and educator identity.
The most influential meaning-making of this process for me occurred only once I had some distance from it.

What I gained

Ultimately, by completing the edTPA, I gained perspective on my development as a teacher and was able to identify aspects of my teaching practice that I will continue working on. Now, as I approach the culmination of my student teaching, I understand that the edTPA was truly a representation of my performance as a teacher in that moment -

- I was forced to consider how I was being perceived by my students and whether or not that was how I intended to appear
- I could visualize the effect that the decisions made in planning and instruction had and how they impacted my students and classroom

About my teacher preparation

My teacher preparation has developed me primarily as a Planner. I have learned to conceptualize learning through backwards design and to think about course units, classroom environments and individual students as comprehensive wholes formulated by a multitude of factors. However, prior to student teaching, I was not confident in my implementation of instruction. I developed most of my instructional identity and security as an educator during this last semester while in the classroom. This became clear to me as I finalized my edTPA and identified the growth in my teaching habits from the middle of Phase 1 to the end, especially in the act of instruction.
It also became clear to me that although I am a reflective practitioner, my preparation in assessing measurable data was limited. I had groundwork upon which to analyze formative and informal assessments for my understanding of students and groups of students, but was unaccustomed to the final aspect of the plan-instruct-assess cycle in which I directly use assessment to structure my next round of planning.