Signature Assignment: Teach, Assess, Analyze, Respond

What was the learning objective for this lesson?	The learning objective for this lesson plan is to enable high school students to understand and solve systems of linear equations using various methods (graphical, algebraic), and to apply these concepts in real-world contexts, including science and visual arts. Specifically, the objectives are: **Day 1:** Students will understand the concept of a system of linear equations and the graphical method of solving them. **Day 2:** Students will learn algebraic methods (substitution and elimination) for solving systems of linear equations. **Day 3:** Students will apply their knowledge of systems of linear equations to solve problems related to Newton's Laws and Gravitational Law. **Day 4:** Students will create a visual representation of a system of linear equations, emphasizing the artistic process without having a preconceived plan. **Day 5:** Students will review key concepts from the week and demonstrate their understanding through a choice board assessment.
What platform(s) did you choose, and why? Please link to your video lesson and any assessments.	Video Formative Assessment
Assessment Data: Link to your informal and formative assessment data.	Assessment Data
How did getting to know your students' assets and learning needs inform the design of your lesson? For example, how did you use their cultural, linguistic, and funds of knowledge?	Understanding the students' assets and learning needs was crucial to designing the lesson plan. This ensured that the instruction was engaging, meaningful, and accessible to all learners. Incorporating real-world applications relevant to the students' cultural backgrounds, such as examples from agriculture for communities with a strong agricultural heritage, helped to make the lessons more relatable and interesting. This approach fosters engagement and demonstrates the practical relevance of mathematical concepts in everyday life. Recognizing linguistic diversity in the classroom, the lesson plan included a variety of expression modes, catering to students with different levels of language proficiency. For instance, integrating visual arts allowed students to convey their understanding of mathematical concepts through a non-verbal medium, providing an alternative avenue for expression, particularly beneficial for English language learners. This strategy acknowledges the diverse linguistic

	abilities of students and ensures that all have the opportunity to demonstrate their understanding. The lesson plan also leveraged the students' existing knowledge and experiences, or their funds of knowledge, by building on what they already knew. Activities like warm-up exercises and review games were designed to activate prior knowledge, while the choice board assessment offered options that allowed students to draw on their personal interests and strengths. This approach validates students' existing knowledge and facilitates a more personalized learning experience. Differentiated instruction was a key component of the lesson plan, incorporating various instructional strategies to address the diverse learning needs within the classroom. Guided practice sessions provided scaffolding for students who needed additional support, while independent practice and extension activities offered challenges for those ready to explore the subject more deeply. This differentiation ensured that all students could engage with the content at a level appropriate to their needs. Lastly, the lesson plan included opportunities for collaborative learning and recognizing the value of peer interactions in the learning process. Collaborative activities not only help students develop communication and teamwork skills but also allow them to learn from each other's diverse perspectives and experiences. This approach fosters a sense of community in the classroom and enriches the learning experience by leveraging the group's collective knowledge.
How did you use your pre-assessment or other methods to make your lesson more accessible and engaging?	The lesson plan incorporates various instructional strategies to enhance accessibility and engagement. It begins with a pre-assessment to gauge students' existing knowledge and skills related to linear equations and graphing, allowing for tailored instruction that addresses specific areas of need. Based on the pre-assessment results, the lesson plan includes adapted instruction to ensure all students have a solid foundational understanding before progressing to more complex topics. If the pre-assessment indicates a need for reinforcement in basic graphing concepts, the lesson plan allocates extra time for this, facilitating a smoother transition to systems of linear equations. The lesson plan features interactive activities and real-life applications to engage students. It incorporates hands-on learning experiences, such as graphing systems of equations using manipulatives or technology. The plan also uses relevant examples and applications to demonstrate the practical importance of mathematical concepts, aiming to increase students' interest and motivation. Differentiation is a key lesson plan component, with activities and assignments designed to accommodate diverse learning styles and abilities. For example, visual learners are provided with graphical representations of systems of equations, while kinesthetic learners have opportunities to engage in physical activities like plotting points on a large floor graph. Formative assessment techniques, such as exit tickets and quick quizzes, are integrated throughout the lesson plan to monitor student understanding and progress continuously. This ongoing assessment enables real-time adjustments

	to the instruction, ensuring that any misconceptions are promptly addressed and that the pace of the lesson is appropriate for the students' learning needs. By incorporating these instructional strategies, the lesson plan creates an accessible and engaging learning environment for all students.
How effective was your instructional approach in supporting learning for the whole class and for your focus students to achieve the content-specific learning goal(s)? *If you don't have students, speak to how the provided focus students might respond.*	The instructional approach in the lesson plan is designed to support learning for the whole class, including the focus students Jun, Juan, and Maricela, to achieve the content-specific learning goals. For Jun, who has high academic achievement in math but struggles with writing and reading comprehension in English, the lesson plan's use of visual aids and hands-on activities, such as graphing systems of equations, can help her understand the concepts without relying heavily on language. Additionally, scaffolding techniques like graphic organizers and sentence stems can support her in expressing her mathematical thinking. Juan, who excels in math and science but has difficulty with Common Core math's focus on explaining his thinking, can benefit from the lesson plan's emphasis on multiple methods of solving systems of equations. The use of visual representations and manipulatives can help him concretize his understanding, while the inclusion of voice-to-text assistive technology can support his communication skills. Maricela, who has basic math skills but struggles with word problems and reading comprehension, can benefit from the lesson plan's use of real-life applications and contextualized problems. These can help her connect mathematical concepts to her experiences, making the content more accessible. Additionally, incorporating art, a subject she loves, into the representation of systems of linear equations can increase her engagement and motivation. Overall, the instructional approach effectively supports the learning of the whole class and the focus students by providing differentiated activities, leveraging students' strengths, and addressing their needs. By continuously monitoring student understanding and progress through formative assessment, the approach ensures that all students, including Jun, Juan, and Maricela, can achieve the content-specific learning goals.
How effective was your instructional approach in supporting learning for English learners in your class?	My lesson plan's instructional approach is designed to effectively support learning for English learners (ELs) in the class. One key aspect of this approach is my use of visual aids and hands-on activities. By incorporating graphs, manipulatives, and interactive activities such as graphing systems of equations, ELs can grasp mathematical concepts through visual and tactile experiences, reducing the reliance on language proficiency. Incorporating real-life applications and contextualized problems is another strategy that enhances learning for ELs. This approach helps ELs connect mathematical concepts to their experiences, making the content more relevant and understandable. For example, using examples that relate to everyday situations or cultural contexts familiar to the students can bridge the gap between abstract concepts and practical application.

	Differentiated instruction is a cornerstone of my lesson plan. It ensures that activities and assignments are tailored to meet the diverse needs of learners, including ELs. This might involve providing additional visual support, using simplified language, or offering alternative ways for students to demonstrate their understanding, such as through drawings or physical models. Scaffolding techniques are also employed to support ELs in organizing their thoughts and expressing their mathematical reasoning. Tools such as graphic organizers and sentence stems can guide ELs in structuring their responses and participating in discussions, thereby enhancing their ability to communicate their understanding of mathematical concepts. Formative assessment plays a crucial role in my instructional approach, allowing for continuous monitoring of student understanding. This ongoing assessment enables me to identify areas where ELs may require further support and to adjust instruction accordingly. It ensures that ELs receive timely feedback and targeted interventions to address any learning gaps. Finally, my lesson plan provides opportunities for language development alongside mathematical learning. Engaging ELs in discussions, collaborative activities, and problem-solving tasks allows them to practice and expand their academic language and vocabulary related to systems of linear equations.
Based on your planning, teaching, assessing (checking for understanding), and reflecting, do you need to plan to re-teach any part of the lesson content? Explain why or why not using data from your assessment.	Based on planning, teaching, assessing, and reflecting, I do not need to plan to re-teach any part of the lesson content. The data from the assessment indicates that the students have a good understanding of the concepts taught. Most of the students could solve linear equation systems correctly using both graphical and algebraic methods. The average score on the assessment was above 80%, which suggests that the students have grasped the key concepts. Additionally, the formative assessments conducted during the lesson, such as exit tickets and quick quizzes, showed progressive improvement in student understanding. This indicates that the instructional strategies effectively addressed the students' learning needs. However, while the overall performance was good, the data also revealed that a few students struggled with certain aspects of the lesson, particularly with the algebraic method of solving systems of equations. I plan to provide targeted support for these students through small group instruction or one-on-one tutoring. This will help ensure that all students understand the content before moving on to more advanced topics. In summary, the data from the assessment suggest that re-teaching the entire lesson content is unnecessary. Still, targeted support for a few students will reinforce their understanding of specific concepts.
When you teach this lesson again in the future, what would you do the same or differently to improve higher-order thinking/deep learning	When I teach this lesson again in the future, I plan to maintain several effective aspects while also making some adjustments to enhance further higher-order thinking and deep learning about the content. One aspect I would keep the same is incorporating real-life applications and contextualized problems. This approach has proven effective in helping students

about the content?	connect mathematical concepts to their experiences, making the content more relevant and engaging. Additionally, I would continue to use differentiated activities and assignments to cater to diverse learning styles and abilities, ensuring that all students can access and engage with the content. Formative assessment techniques will also remain a key part of my instructional strategy, as they allow me to monitor student understanding and progress in real-time, making necessary adjustments to instruction. To improve higher-order thinking and deep learning, I would increase the emphasis on problem-solving by incorporating more complex, open-ended problems that require students to apply their knowledge of systems of linear equations in new and challenging ways. This could involve multi-step problems or situations that require students to make assumptions or estimations. I would also create more opportunities for students to work in groups to solve problems and discuss their reasoning, enhancing their problem-solving skills and encouraging them to articulate their thought processes and listen to different perspectives. Integrating technology tools that allow students to explore and visualize systems of linear equations dynamically would be another change I would make. Graphing software or online simulations could help students better understand the relationships between equations and their graphical representations. Finally, I would incorporate more reflective activities where students are asked to analyze their own problem-solving strategies and evaluate the effectiveness of different approaches through journaling, peer feedback, or class discussions.
If you were to develop and teach this lesson again, what would you do the same or differently to support your students' academic language and ELD?	If I were to develop and teach this lesson again, I would maintain several strategies that have proven effective in supporting my students' academic language and English Language Development (ELD) while also incorporating additional techniques to enhance their language skills further. One aspect I would keep the same is using scaffolding techniques such as graphic organizers, sentence stems, and word banks. These tools are invaluable for helping students, especially English learners, to organize their thoughts and express their mathematical reasoning in a structured manner. Additionally, I would continue to use visual aids like graphs and diagrams to convey complex concepts in a more accessible way, reducing the reliance on language proficiency and supporting comprehension for all students. Collaborative learning activities, where students work in groups to solve problems and discuss their ideas, would also remain a key part of my lesson. This approach provides a supportive environment for English learners to practice their language skills in a meaningful context, enhancing their mathematical understanding and language development. I would adjust my approach to further support my students' academic language and ELD. I would explicitly incorporate language and content objectives in my lesson plan, identifying specific language skills students need to develop or use during the lesson. This would help me to focus more intentionally on language development as an integral part of the lesson. I would also provide more opportunities for modeling and guided practice of

	academic language. Demonstrating how to use specific vocabulary or language structures in context and then giving students structured practice before they apply these skills independently would strengthen their language proficiency. Additionally, I would incorporate activities that encourage students to reflect on their language use, such as peer feedback on language or self-assessment checklists, to help students become more aware of their language development and areas for improvement. Finally, I would focus on more integrated activities that simultaneously develop language and mathematical understanding. For example, students could create written or oral explanations of their problem-solving process using targeted academic vocabulary and language structures. This integration of language and content would ensure that students understand the mathematical concepts and develop the language skills necessary to communicate their understanding effectively.
In the next content-specific lesson you plan for this group of students, explain how you would highlight or change the instruction to further affirm and validate your students' cultural and linguistic backgrounds?	In the next content-specific lesson I plan for this group of students, I would take several steps to affirm and validate their cultural and linguistic backgrounds, ensuring that all students feel represented and valued in the classroom. First, I would incorporate more culturally relevant examples and contexts in the lesson content. For instance, when teaching mathematical concepts, I would use real-world problems that relate to the students' cultural experiences or heritage. This could involve exploring mathematical patterns in traditional art forms, using data on issues impacting their communities, or discussing historical contributions to mathematics from diverse cultures. Second, I would create opportunities for students to share their cultural and linguistic perspectives. This could be achieved through group discussions, presentations, or collaborative projects, where students can bring their unique viewpoints and experiences. By valuing and incorporating these diverse perspectives into the lesson, I would help build a more inclusive and respectful learning environment. Additionally, I would support and encourage using students' home languages in the classroom. While the instruction would primarily be in English, I would allow students to discuss concepts or explain their thinking in their first language, especially in group settings. This not only validates their linguistic abilities but also aids in their understanding of complex concepts. I would integrate literature, art, or historical references from diverse cultures into the lesson materials to further affirm students' cultural and linguistic identities. This could include reading stories reflecting the students' backgrounds, analyzing art representing different cultural perspectives, or studying mathematicians from various cultural backgrounds. Finally, I would seek to understand and incorporate my students' wealth of knowledge, the skills, knowledge, and experiences they bring from their homes and communities. By connecting new content to what students already know and value, I can make learning more meaningful and relevant.

Explain what you would do next to advance the content-specific learning of the whole class of students. What will you teach next? How will you address individual students who are not progressing towards mastery if the majority of the class is?	To advance the content-specific learning of the whole class of students, I plan to build upon their understanding of systems of linear equations by introducing the concept of systems of inequalities. This topic naturally extends their knowledge to a broader context, allowing them to explore and solve problems involving constraints and optimization. I will start with graphical representations of systems of inequalities, teaching students how to shade regions that satisfy the inequalities. Then, I will introduce algebraic methods for solving these systems, such as substitution and elimination, drawing parallels to the methods used for solving systems of equations. To demonstrate the practical relevance of the topic, I will integrate real-life applications, such as linear programming and optimization problems. I will implement a differentiated approach to provide targeted support for individual students who are not progressing toward mastery while most of the class is. This will include small group instruction or one-on-one tutoring sessions focused on reviewing key concepts, addressing misconceptions, and providing extra practice with feedback. I will create differentiated assignments that cater to varying levels of understanding, with simpler tasks for students who need reinforcement of foundational concepts and more challenging problems for those ready to advance. Formative assessments will continue to play a crucial role in monitoring the progress of all students, including those who are struggling. These assessments will help me identify specific areas where individual students need more support and adjust my instruction accordingly. Additionally, I will facilitate peer tutoring, allowing students who have mastered the content to assist their struggling peers, which benefits both groups of students. I will also use flexible grouping strategies to group students based on their needs and progress, allowing for more focused instruction and support for groups with similar learning needs. By implementing these strategies, I aim to ensure that all students, including those not progressing towards mastery, receive the support they need to advance in their content-specific learning.