Teach 2 Analysis

Classroom Environment:

For my student teaching experience, I was assigned to teach at Lawrence High School in Lawrence, Kansas. I am teaching a first hour algebra class and the majority of the students are freshman, but a couple of the students are in higher grades. The majority of the school's students are white and this is reflected in the classroom I taught in as well. My classroom is co-taught with one teacher whois certified to teach math content and a special education teacher. This means that a higher percentage of students in the classroom are in special education and have Individual Education Plans (IEPs). English is the only language I have heard spoken in the classroom and there are no English Language Learners (ELLs).

The students have pre-made spiral notebooks where they take notes, do practice problems, and do their homework. The general routine of the classroom is one of the teachers leads the instruction for the day. They begin with a warm up problem, then the teacher explains the material and gives them terms to fill in their notebooks. The teacher will also do the practice problems on the board and ask for student input. For some problems, the teacher will allow the students a few minutes to try the problems on their own before going over it as a class. Students generally do not work together to solve problems.

Objectives:

The students were in a unit about functions and graphing; the lessons I taught were over the slope-intercept form for the equation of a line. The first day focused on identifying key features of equations in the form y=mx+b. There were four objectives for this lesson:

1. **Students will be able to identify the slope from the slope-intercept form equation.**

Students have already had a lesson covering the concept of slopes of lines. The goal is that students will know that the coefficient in front of the x will determine the slope of the line.

2. **Students will be able to identify slope from a graph of a linear equation.**

Students will have already covered this idea, and will be expected to know how to identify slope of a line by identifying points on the graphs and determining the vertical and horizontal difference between the two points.

3. **Students will be able to identify the y-intercept from the slope intercept form equation.**

Students have also covered the idea of the y-intercept as being the point where the line crosses the y-axis. Students should be able to identify that the y-intercept can be identified by looking at what constant is being added. Students should also be able to determine the correct form of the y-intercept, identifying the point as (0,b).

4. **Students will be able to identify the y-intercept from a graph of a linear equation.**

Students will have had a lesson on identifying y and x intercepts already, so the goal of this lesson is to solidify that information and solidify the concept.

The main goal for day two of the lesson is to use slope-intercept form of an equation to graph lines. There was one objective:

1. **Students will be able to graph a linear function given the form y=mx+b**

Students will put together information from all previous lessons to use slope-intercept equations to identify the y-intercept and slope. Students will then use this information to graph the line.

Struggling Learners

For this lesson, I identified two struggling learners in the classroom. I interviewed both students for feedback on my Teach One lesson, which was about inequalities. I also asked them what they thought was effective and not effective for their learning. I chose these students because neither of them had passing scores on my Teach One post-test. Further, as will be described in more detail, these students had very different dispositions.

Struggling Learner 1 (SL1) is a 9th grade student who is very outgoing. He enjoys talking to friends throughout the class. When an instructor asks questions to the whole class, he is willing to answer them and is not discouraged when he gets the wrong answer and he continues to try. However, he is often distracted by his interactions with his classmates and struggles to fully comprehend the material presented to him. When interviewed, SL1 said he prefers to work in groups and would like to do that in future lessons.

Struggling Learner 2 (SL2) is also a 9th grade student, but is very reserved and tends to not be engaged in taking notes or doing assignments. When asked direct questions in a one on one conversation, SL2 will engage in the conversation. If asked to work on a question, they will only do it if an instructor is talking them through it step by step. They tend to not work on assignments or ask questions on their own. When interviewed, they said they prefer to work on assignments alone.

I faced a challenge many teachers face, I had students with needs that were in direct conflict with one another. One of my struggling learners preferred groups, while the other only wanted to work on their own. Additionally, both were struggling to understand the content presented to them. I chose various learning strategies to implement with hopes that both students' needs would be met. Scaffolding, a Stand Up, Hand Up, Pair Up activity, and

differentiation were implemented into both days of my lesson. These will be discussed in greater detail in the following section of the paper.

References to Articles

Scaffolding is a teaching strategy based around the research and work of psychologist Lev Vygotsky. Vygotsky developed the idea of the Zone of Proximal Development (ZPD) which described the area between what a student already knows and what they have the potential to learn. Scaffolding is not merely any teacher's instruction, but rather a way to frame an entire lesson to assist students in making connections from previously learned information to new topics. Rather than just presenting the information about a new topic to students, a teacher using scaffolding will bring up information previously learned and design questions that guide students to new conclusions using this information (Gonulal and Loewen).

One way scaffolding is implemented into my Teach Two lesson is during the second day's explore activity. The first day of the lesson covers how to identify slope and y-intercept from an equation in slope-intercept form. Previous lessons (not taught by me) also further covered the idea of slope and intercepts, in addition to graphing by plugging in x-values into an equation. Rather than directly telling students how to use the slope-intercept equation to graph a line, I had them identify the slope and y-intercept of the line and asked how they could use this information to graph the line. My hope with implementing scaffolding was that my struggling learners would be able to make sense of previous concepts and connect them to understand the slope-intercept form for the equation of a line.

I implemented a Stand Up, Hand Up, Pair Up activity into my first day's explore and explain activities. This activity has a teacher assign each student a problem to complete independently. When students are done, they have this problem checked with the teacher to

ensure the student understands the problem and has done it correctly. Then, students will stand up and find other students in the classroom to explain their problem to and to listen to the explanation of another problem by a different student. This continues until all students have explained their problem to every other student (Clowes). For my lesson, I had a modified version of this activity to accommodate my struggling learners. Rather than every student having a unique problem, I randomly assigned four problems to the students. This meant that each problem had more than one student assigned to it. I did this because both of my struggling learners stated they struggled to work with students they did not know as well. By having each problem assigned to more than one student, it gave the students more options for who to work with, while still encouraging them to talk to students they may not know as well.

Another way to support my struggling learners was through differentiation. Differentiation refers to changes teachers make to lessons to accommodate for various student needs. These changes can be based on a variety of factors, including a student's readiness or interest. Differentiation does not mean that tasks are separated into a "hard" category and an "easy" category, but that a variety of activities are available to students to meet their needs and strengthen skills that may be weaker (Little. Houser, Corbishly). Differentiation also benefits students who are not struggling as it will provide them activities that are tailored to their level as well.

One way differentiation is included into my lesson is during the second day's elaborate activity. Students were given three choices for what to work on. They could complete their homework, play an online graphing game, or play a battleship type graphing game. The battleship game required a partner, but the homework and online graphing game gave the students the choice to work alone or with others. The homework and online graphing game also

gave students who were struggling or just wanted more practice the opportunity to graph lines with given equations. The battleship game was an activity to challenge students by having them create their own equations and graph them. These activities gave students choices based on the learning environment (group or independent work), format (online or paper assignments), and readiness (practice or an extension activity).

Summary of Results

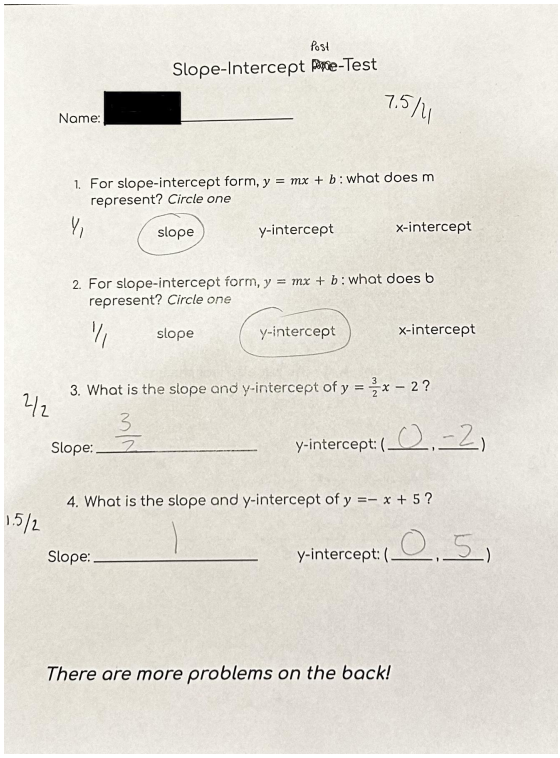
To begin analyzing student learning during the lessons, I will start with analyzing the pre and post-test results. A table with the results is included below. The table shows individual student scores in ascending order of score for the pre-test, then the next column shows the same students post test score, and the far right column shows the change in score between the students pre and post test. The first two questions were the same on both tests, and the post-test followed the same format, but with slightly different equations and graphs. Both tests were graded out of 11 total points.

Student	**Pre-Test Score**	**Post-Test Score**	**Change in Score**
Student 1	0	9	+9
Student 2	0	0	0
Student 3 (SL2)	0	0	0
Student 4	1	9.5	+8.5
Student 5	1	4	+3
Student 6	1.5	3	+1.5
Student 7 (SL1)	2	7.5	+5.5
Student 8	2	N/A	N/A
Student 9	3	10.5	+7.5
Student 10	3.5	9.5	+6

Student 11	3.5	7.5	+4
Student 12	4	7.5	+3.5
Student 13	5	7.5	2.5
Student 14	6	11	+5
Student 15	6.5	11	+4.5
Student 16	7	10.5	+2.5
Student 17	8	11	+3
Student 18	10	11	+1
Student 19	10.5	11	+0.5
Student 20	11	10.5	-0.5

The mean score of the pre-test was 4.28 points or 39% while the mean post-test score was 7.97 points or 72%. Another detail to note was that a majority of students who took the post-test had an increase in score. From this data, I concluded that the objectives of the lessons were met. This is because the average score for the post-test was above 70%. I use 70% as a benchmark because it shows that students generally understand the concepts, but may have some misconceptions or areas of struggle.

Struggling Learner 1 scored an 18% on the pretest and a 68% on the post-test. His post-test score was just shy of my 70% benchmark for meeting the objective, however his major improvement in score indicates that the strategies I implemented for him were effective. His post-test shows that while he generally can identify slope and y-intercept in equations, he struggles to apply that information to graphing or writing equations to describe lines. This was true of many other students as well. His test is pictured below.



Slope-Intercept Pre-Test

Name: [redacted]

7.5/11

1. For slope-intercept form, $y = mx + b$: what does m represent? *Circle one*

1/1 (slope) y-intercept x-intercept

2. For slope-intercept form, $y = mx + b$: what does b represent? *Circle one*

1/1 slope (y-intercept) x-intercept

3. What is the slope and y-intercept of $y = \frac{3}{2}x - 2$?

2/2

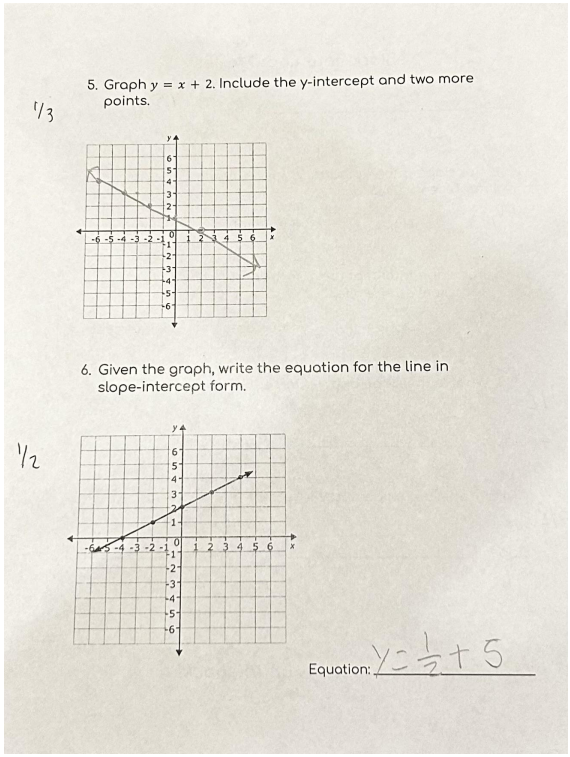
Slope: $\frac{3}{2}$ y-intercept: (0, -2)

4. What is the slope and y-intercept of $y = -x + 5$?

1.5/2

Slope: 1 y-intercept: (0, 5)

There are more problems on the back!



5. Graph $y = x + 2$. Include the y-intercept and two more points.

1/3

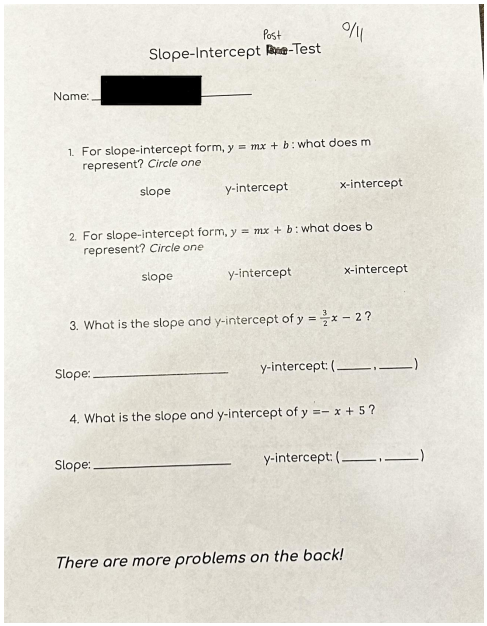
6. Given the graph, write the equation for the line in slope-intercept form.

1/2

Equation: $y = \frac{1}{2}x + 5$

Struggling Learner 2 scored 0% on both their pre and post-test, and made no attempt to complete any of the problems for either test. During class when they were supposed to be

working on examples, they did not have their spiral notebook out. Only when I went up to them and talked to them about a problem did they make any attempt to work on the activities, but as soon as I walked away, they stopped working. This shows that the strategies I implemented were not effective for SL2. While I became more familiar with this student over the semester, I believe not being in the classroom everyday really limited forming a relationship with SL2 and figuring out a more effective way to engage them in the activities. Their post-test is pictured below.



Post 0/11

Slope-Intercept Pre-Test

Name: [redacted]

1. For slope-intercept form, $y = mx + b$: what does m represent? *Circle one*

slope y-intercept x-intercept

2. For slope-intercept form, $y = mx + b$: what does b represent? *Circle one*

slope y-intercept x-intercept

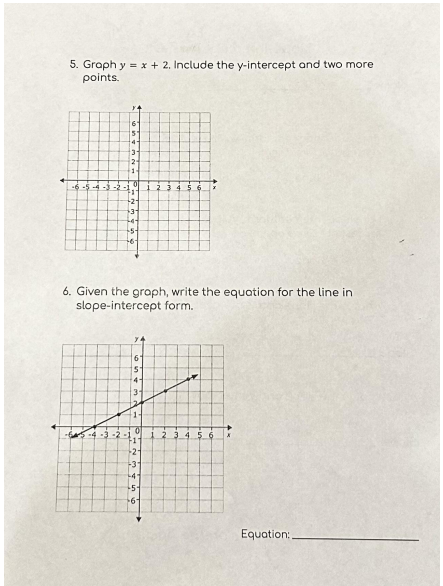
3. What is the slope and y-intercept of $y = \frac{3}{2}x - 2$?

Slope: _____ y-intercept: (____, ____)

4. What is the slope and y-intercept of $y = -x + 5$?

Slope: _____ y-intercept: (____, ____)

There are more problems on the back!



5. Graph $y = x + 2$. Include the y-intercept and two more points.

6. Given the graph, write the equation for the line in slope-intercept form.

Equation: _____

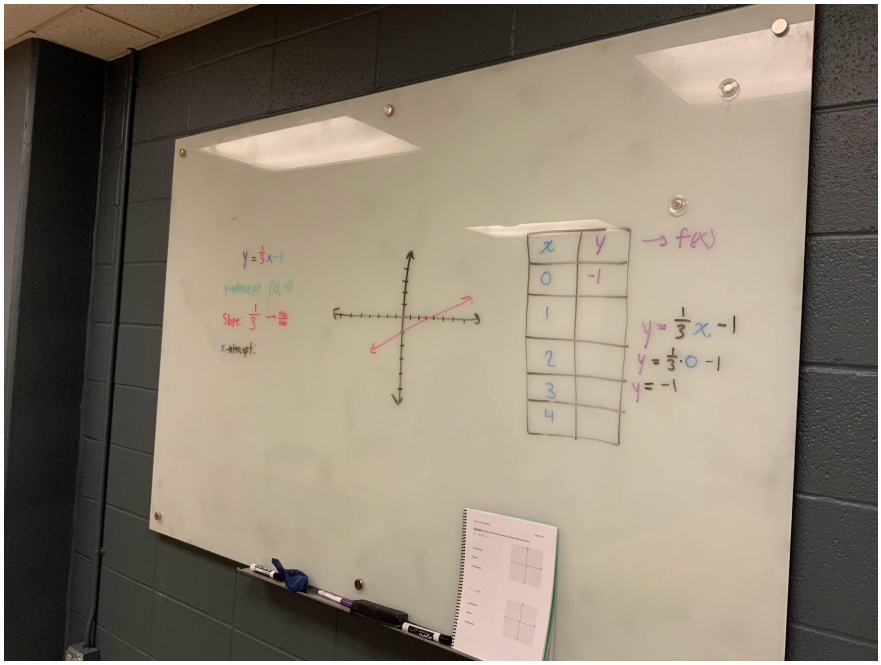
Video Analysis

Both of my video clips are taken from the second day of my Teach 2 lesson. The first clip depicts a strength in the lesson. In this clip I am presenting the students with the first problem of the explore activity. I am asking students to recall what they did in two previous lessons and use those ideas to graph the line. This shows how I incorporated the scaffolding into my lesson. I gave students the opportunity to recall information they had already learned and apply it to a new situation. This is also how I implemented inquiry into the lesson. Rather than telling students exactly how to graph the equation, I guided them to identify key features of the equation that would help them figure out how to graph the line. Also in the clip, one of the students first says the y-intercept was "-1", but is able to quickly correct themselves and accurately name the y-intercept as the coordinate (0,-1). This highlights another strength of the lesson. On the first day of the lesson, I was very careful about addressing the misconception for naming the y-intercept. At first, many students were only naming the y-coordinate portion of the equation. For example, if the y-intercept was (0,3), some students would say the point is just "3". I made sure to point out that just giving a number was not clear enough and it was necessary to include the x coordinate portion to accurately describe the location of the point.

My second clip depicts a weakness of the lesson. In this clip I am going over another example from the explore and explain portion of the lesson. The students were supposed to go over this example, then we were going to come together as a class and have the students explain their answers. There is a lot of background noise in the clip because a majority of the students were not engaged in the explanation. I was going over the problem and only one student in the class was paying attention and answering my questions. This shows I was not effectively engaging students in the lesson.

Suggestions for Revisions

From day one to day two, I did not make any major changes to the lesson, however I made a better plan for implementing scaffolding into my lesson. On the first day I made a reference to a previous lesson students did, but a majority of them seemed confused as to what I was talking about. I had plans on referencing past lessons for day two as well, so I wanted to make sure I was more clear about the content I was referring to. I also wanted to implement color coding into my example so that students had another visual cue for making connections. This is somewhat visible in my first video clip, but to make clearer the way I presented the problem, I am including a picture not from the day of my lesson, but what I drew the day before the lesson in preparation. The table on the right is a reference to a previous lesson they had on graphing where students plugged in values for x and solved to find y. I wanted students to recall this method of graphing, but apply the new ideas they learned about the slope-intercept equation to see if they could graph without needing to plug in values for x.



One piece of feedback I received from instructor comments and in a conversation with my host teacher was about improving the pacing of the lesson. Both agreed that I gave students too much time for examples which made students lose focus and be less engaged. Part of the reason I stretched out the explore section was to fill time for the block period. However in the future, I would instead set aside a few minutes of class time for a structured break. Ideally this time would be spent doing something active, such as going on a short walk with students. I think this would help break up the work and give students a reset before moving on to the elaborate portion of the lesson.

Another revision I would make is based on the results of SL1's post-test. As stated, he did well grasping the more basic concept of identifying the slope and y-intercept, but struggled to apply this to graphing or writing equations. The homework for my second day was only four problems where a slope-intercept equation is given, and students were asked to graph. In the future I would add additional problems with more variety. I believe this lack of different examples prevented students from getting quality practice of the concepts for different scenarios.

One thing I learned from Teach Two is the importance of being able to adapt to the mood of the classroom to engage the students. It was clear from the beginning of day two, that the energy of the students was way lower than normal. In the moment, I hoped students would become more engaged as the lesson went on, but it was the exact opposite. I believe this could be avoided by having a more exciting engage activity such as a game or an activity that gets students up and moving.

Another thing I learned from Teach Two is how easy it is to let the implementation of activities fall through. For example, during my Stand Up, Hand Up, Pair up activity, I should have made sure I checked students' work on their problem before they went around the room

explaining their problem to others. However, I definitely missed checking all of the work before students were sharing their answers. Additionally, during my second day, several students quickly understood the content and had independently finished the examples and their homework during the explore section. I had an extension activity planned for students, however I did not have a good plan for explaining and giving it to students who were ahead while still giving attention to the struggling students. In the future I would have the extension activity in a location students knew about so they could begin working on it while I am still working with others. Utilizing a choice board in the classroom would be a good way to have multiple activities ready for students to reference when they are ready to do so.

One weakness with my Teach One lesson was that I was not using student names. At that time, this was largely due to me not being familiar with most students and not confidently knowing their names. I took more time to learn them and by Teach Two definitely was more familiar with my students. However, I still could have done a better job referring to students by name. In my classroom, students do not raise their hands to answer questions and instead are encouraged to just say their answers outloud. This led to me not having the opportunity to more naturally call on students by name. However, in the future, I would still refer to students by name when acknowledging their answers because I think this will show students I do know who they are. This will help me build relationships with my students.

Student Artifacts

[These are embedded throughout the paper.]

Sources

Clowes, G. (2011). *The Essential 5: A Starting Point for Kagan Cooperative Learning*. Kagan's FREE Articles - Research & Rationale - Research proves effectiveness of Kagan Structures. https://www.kaganonline.com/free_articles/research_and_rationale/330/The-Essential-5-A-Starting-Point-for-Kagan-Cooperative-Learning

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