

## Classroom Interactions 5E Lesson Plan Template

<p><b>Author:</b> KP Preut</p>	<p><b>Title of Lesson:</b> Understanding components of <math>y=mx+b</math></p> <p><b>Lesson Source/Resources:</b> Unit 3 Linear Graphing Spiral, Desmos Graphing Calculator,  <a href="https://www.oxfordasd.org/cms/lib/PA02218845/Centricity/Domain/769/Slope%20and%20Slope%20Intercept%20Form%20Worksheet.pdf">https://www.oxfordasd.org/cms/lib/PA02218845/Centricity/Domain/769/Slope%20and%20Slope%20Intercept%20Form%20Worksheet.pdf</a></p>
<p>Lesson #: 1/2 Date lesson will be taught: 11/7</p>	<p>Subject/Grade level: Algebra 1 / 9th Grade</p>
<p><b>Concepts/Main Idea</b> – <i>explain the concept(s) that will be the focus of this lesson in detail.</i></p> <ul style="list-style-type: none"> <li>★ This lesson covers the slope-intercept form of a linear equation <ul style="list-style-type: none"> <li>○ This equation is linear, representing a line</li> </ul> </li> <li>★ Slope-intercept form is <math>y = mx+b</math> <ul style="list-style-type: none"> <li>○ Inputting an x value and solving will give the y value to a point on the graph (x,y)</li> <li>○ m represents the slope of the line <ul style="list-style-type: none"> <li>■ Example <math>y=1/2x</math>. The slope is 1/2. Between each point, go up one and over 2</li> </ul> </li> <li>○ b represents the y intercept <ul style="list-style-type: none"> <li>■ This is where the line crosses the y-axis at (0,b)</li> <li>■ Example: <math>y=x+4</math>. The y-intercept is (0,4)</li> </ul> </li> </ul> </li> </ul>	

**Instructional model and strategies** – *The strategies from the learning center that will be used during the lesson*

- ★ 5e lesson
- ★ Technology Component: Desmos Graphing

**Objective/s-** Write objectives in SWBAT form...  
**The Students Will Be Able To:**

- ★ Students will be able to identify the slope from the slope-intercept form equation.
- ★ Students will be able to identify the slope from a graph of a linear equation.
- ★ Students will be able to identify the y-intercept from the slope-intercept form equation.
- ★ Students will be able to identify the y-intercept from a graph of a linear equation.

**Evaluation** *Based on your objectives, draft the content of the questions you will ask on your pre- and post-tests; at least 1 question for each objective. Questions do not have to be multiple choice. Your actual pre- and post-tests will be included in the interview paper.*

**Pre-test assessment** – This should line up with the learning targets and provide the teachers with the information needed to make instructional decisions *before* the lesson begins. Be sure the assessment will make the students' thinking visible.

- ★ Included below.

**Formative assessment(s)** – This should line up with the learning targets and provide teachers with the information needed to make instructional decisions *during* the lesson. Be sure to describe the format of the assessment and what it is designed to assess.

- ★ Included below.

**Post-test assessment** - This should line up with the learning targets and provide teachers with the information needed to be confident that students understand the content. Be sure to describe the format of the assessment and what it is designed to assess.

★ Included below.

**Kansas Science and Math Standards- Include standard, benchmark and indicator where applicable**

Common Core Math Content:

- ★ F.IF.4: For a function that models a relationship between 2 quantities , interpret key features of expressions, graphs ,and tables in terms of the quantities, and sketch graphs showing key features given a description of the relationship. Key features include: intercepts, intervals where the function is increasing, decreasing, positive, negative, relative maximums and minimums, symmetries, end behavior, periodicity.

Common Core Math Practice:

- ★ M7: Look for and make use of structure

NGSS Science and Engineering Practice:

- ★ S2: Develop and use models

Common Core ELA Practice:

- ★ E6: Use technology and digital media strategically and capably

**Materials list** (BE SPECIFIC about quantities)

for Whole Class:

- ★ 25 Instruction Sheets
- ★ 25 Extension Worksheets

per Student (Students should have these):

- ★ 1 iPad
- ★ 1 Unit 3 spiral

Advance preparation:

- ★ Remind students the day before the lesson to come with their iPad charged
- ★ Have all handouts printed

**Include handouts** at the end of this lesson plan document (blank page provided to paste a copy of your document). List handouts in your materials list.

**Accommodations:** Include a general statement and any specific student needs. Be sure to include struggling readers.

- ★ Students will be allowed to choose an alternative location for their pre-test.
- ★ Instructions will be presented verbally and on paper.
  - Teacher will re-read instructions for students who need them repeated verbally
- ★ For struggling learners: Scaffolding will be used to break the lesson into small parts that connect back to previous lessons.

**Safety:** Include a general statement that indicates how you will establish a learning environment where safety for all is assured. Include physical safety concerns specific to this lesson. Identify when you will address these specific concerns with the students

- ★ No physical safety concerns with this lesson.
- ★ The teacher will establish that students must be respectful of one another when working on problems together.

**Extension Activities:**

- More practice problems from <https://www.oxfordasd.org/cms/lib/PA02218845/Centricity/Domain/769/Slope%20and%20Slope%20Intercept%20Form%20Worksheet.pdf>

**Backup Plans:**

- ★ If the internet is down, I am able to connect my ipad to my phone's hotspot. I can display the graphs on my iPad if needed.

Describe what the student and the teacher will do during each stage of the lesson. Be sure to describe the learning experiences and the assessments. You also need to discuss any management considerations (e.g., picking up materials, movement of students, etc.)

Engagement: Estimated Time: _____ 20 min _____		
What the teacher does AND how will the teacher direct students: (Directions)	Probing Questions: Critical questions that will connect prior knowledge and create a "Need to know"	Expected Student Responses AND Misconceptions - think like a student to consider student responses INCLUDING misconceptions:
<ul style="list-style-type: none"> <li>★ Teacher will pass out pre-tests to all students.               <ul style="list-style-type: none"> <li>○ They will be told they have 10 minutes to take the test and to just do their best.</li> </ul> </li> <li>★ Teacher will collect the tests and pass out the directions sheet.</li> <li>★ Teacher will tell students to go <a href="https://www.desmos.com/calculator">https://www.desmos.com/calculator</a></li> <li>★ Teacher will walk students through directions for Desmos: Part 1.               <ul style="list-style-type: none"> <li>○ Teacher will ask students the probing questions.</li> </ul> </li> <li>★ Teacher will walk students through directions for Desmos: Part 2.               <ul style="list-style-type: none"> <li>○ Teacher will ask students the probing questions.</li> </ul> </li> <li>★ Teacher will walk students through directions for Desmos: Part 3.               <ul style="list-style-type: none"> <li>○ Teacher will ask students the probing questions.</li> </ul> </li> <li>★ Thumbs up/Thumbs down if students are ready to move on</li> </ul>	<p>Part 1:</p> <ul style="list-style-type: none"> <li>★ What happens when we put different numbers in front of the x?</li> <li>★ What happens when we put a negative number in front of the x?</li> </ul> <p>Part 2:</p> <ul style="list-style-type: none"> <li>★ How does adding a number change how the line looks?</li> <li>★ How does subtracting a number change how the line looks?</li> </ul> <p>Part 3:</p> <ul style="list-style-type: none"> <li>★ What happens when we change the number in front of x and add/subtract a number?</li> </ul>	<p>Part 1:</p> <ul style="list-style-type: none"> <li>★ The line becomes more or less steep.</li> <li>★ The slope changes.</li> <li>★ Nothing changes</li> <li>★ The line goes down instead of up.</li> <li>★ Nothing changes</li> </ul> <p>Part 2:</p> <ul style="list-style-type: none"> <li>★ It makes the line go up.</li> <li>★ It makes the line go down.</li> <li>★ It changes the slope.</li> <li>★ It makes the line move left/right</li> <li>★ Nothing changes</li> </ul> <p>Part 3:</p> <ul style="list-style-type: none"> <li>★ It affects the slope and the y-intercept.</li> <li>★ It makes the graph more/less steep and makes it go up/down.</li> <li>★ Nothing changes.</li> </ul>

**Exploration: Estimated Time: \_\_\_\_\_ 15 min \_\_\_\_\_**

**What the teacher does AND what the teacher will direct students to do: (Directions)**

- ★ Teacher will tell students to flip their direction sheets over.
- ★ Each sheet should have a big number in the top right corner, this is the problem the student is assigned for pg. 42 of their spiral.
- ★ Students will be directed to do that problem, and once it's completed raise their hand to get it checked by a teacher.
  - If correct, the teacher will initial the problem.
- ★ After students have their problem done, they will seek out other students with a different problem than theirs.
- ★ Have students do this till problems 1-4 are completed.
  - Tell students we will do # 5 together.

**Probing Questions: Critical questions that will guide students to a "Common set of Experiences"**

- ★ How did changing the number in front of  $x$  affect the line?
  - What number is right in front of  $x$  for this problem?
- ★ How did adding or subtracting a number affect the line?
- ★ What is the  $y$ -intercept?
  - What should always be the first number for the point?

**Expected Student Responses AND Misconceptions - think like a student to consider student responses INCLUDING misconceptions:**

- ★ Made it steeper/less steep
- ★ It didn't change it
- ★ Made it go up/down
  - $1/4, 1, -2, -5/3$
  - There isn't a number in front of  $x$
- ★ Made the line go up/down
- ★ Changed the slope
- ★ The line didn't change
- ★ The point where the line crosses the  $y$ -axis
- ★ The point where the line crosses the  $x$ -axis
  - 0
  - [Any number]



**Explanation:** Estimated Time: \_\_\_\_\_ 6 min\_\_

**What the teacher does AND what the teacher will direct students to do:** (Directions)

**Clarifying Questions:** Critical questions that will help students “clarify their understanding” and introduce information related to the lesson concepts & vocabulary

**Expected Student Responses AND Misconceptions** - think like a student to consider student responses *INCLUDING* misconceptions:

- ★ Each student will show the other how to do the problem, then initial the work.
- ★ Teacher will introduce the slope-intercept form for the equation of a line.
  - The form of equation we have been working with is called slope-intercept form.
  - It is often represented as  $y=mx+b$
  - Teacher will ask probing questions.
- ★ Thumbs up/down if students are ready to move on.

- ★ What do the x and y represent?
- ★ What does the m represent?
- ★ What does the b represent?

- ★ A point (x,y)
- ★ y intercept
- ★ x intercept
- ★ Slope

**Elaboration:** Estimated Time: \_\_\_\_ 6 min \_\_\_\_

**What the teacher does AND what the teacher will direct students to do:** (Directions)

**Probing Questions:** Critical questions that will help students “*extend or apply*” their newly acquired concepts/skills in *new situations*

**Expected Student Responses AND Misconceptions** - think like a student to consider student responses *INCLUDING* misconceptions:

- ★ Teacher will go over #5 as a class and ask for student input.
  - Ask probing questions
- ★ Students will be directed to work on the problems on page 43 and 44 till the class is over.
  - Problems that are not finished should be done as homework.

- ★ What is the slope?
- ★ What is the y-intercept?
- ★ How can we combine this information to write an equation in slope-intercept form?

- ★ 2
- ★  $2/1$
- ★  $1/2$
  
- ★  $(0,-3)$
- ★ -3
- ★ 1.5
- ★  $(0,1.5)$
  
- ★  $y=2x-3$
- ★  $y=-3x+2$
- ★  $y=1/2x-3$
- ★  $2x-3$
- ★  $2y-3$

**Evaluation:** Estimated Time: \_\_\_\_\_ 0min \_\_\_\_\_

**Critical questions that ask students to demonstrate their understanding of the lesson's performance objectives.**

**Formative Assessment(s):** *In addition to the pre- and post-test, how will you determine students' learning within this lesson: (observations, student responses/elaborations, white boards, student questions, etc.)?*

- ★ Thumbs up/down to decide when to move on
  - Engage, Explain
- ★ Checking student work
  - Explore
- ★ Asking questions
  - Engage, Explore, Explain, and Elaborate
- ★ Observing student work
  - Explore and Elaborate

**Summative Assessment:** *Provide a copy of the key to the post-test in the interview paper.*

*Will take place on day 2.*