EDU 570 -- Inquiry to Practice 1
Lesson Study Memorialization Document

Team Members

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Lesson Study Team Norms

Respect the time needed to sit on individual ideas (processing & resonance) Calling each other out - doing your part of the project Communicate! Respect everyone's time & busy-ness Honesty is okay - you can say & accept hard no's Share the air Use your strengths to support the team & do your part Be willing to talk & adjust - Flexibility

"Building Towards the Research Lesson" Resources

Session 2 Agenda Link: Norming & Identifying a Problem of Practice
Session 3 Agenda Link: Study Phase - Knowing Our Students & Identifying an Equity Theme
Session 4 Agenda Link: Study Phase - PDSA Cycle 1
Session 5 Agenda Link: Study Phase - PDSA Cycle 2
Session 6 Agenda Link: Study Phase - Content Understanding Goal & Lesson Hypothesis
Session 7 Agenda Link: Study Phase - Studying the Curriculum

Lesson Date:	Instructor(s):	Grade Level:
10/20 5th mod - 1:50 -2:50	Noel Montes	9th

Summary Box # 1: Title of the Research Lesson

I'm Thinking of a Line

Summary Box # 2: The Research Theme and Rationale

The problem of practice our team explored

Students share and reflect on unique strategies they used to approach a problem with other students in class (either small group or whole class).

Summary Box #3: What's the Research on our Research Theme

Three big ideas you have gathered from the readings you have done on this research theme? Try to consolidate your thinking from all the articles into three nuggets:

- **Discussion is very important and can help students get a better insight or perspective of approaching problems**

Summary Box #4: The Research Lesson Topic

Linear equations

Summary Box #5: Background and Research on the Content Topic

~~Desmos Ice Climber Slope~~

Desmos Mario Kart Point Slope ???

~~Point Slope Desmos WITH table & graph (hulk)~~

https://mathequalslove.net/point-slope-form-dice-activity/

Point Slope Desmos (ignore last part)

Point Slope Desmos WITH table & graph

- Research you've learned about this content- link websites/activities

Summary Box #6: Relationship of Unit Standards

Prior learning standards that unit builds on	Learning standards for this unit	Later standards for which this unit is a foundation

• *Solve equations and inequalities in one variable HS.A-REI.A.2* • *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. HS.A-REI.B.3* • *Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. HS.A-REI.A.1* •	• Interpret the equation *y = mx + b* as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line. 8.F.A.3 • Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. 8.F.B.4	• Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. HS.A-REI.A.2 • Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. HS.A-REI.B.3 • Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. HS.A-CED.A.2 •

Summary Box #7: Goal of the Unit

Students will develop an understanding of linear equations and graphs. Students will be able to define slope from different equations and graph lines.

Resource adapted from:
The Lesson Study Group
at Mills College

Summary Box #8: Flow of the Unit/Rationale for the Design of Instruction

Slope intercept form → graphing slope intercept form → point slope form → graphing point slope form

Summary Box #9: Unit Plan

The lesson sequence of the unit, with the task and learning goal of each lesson. The asterisk (*) shows the research lesson

Lesson	Learning goal(s) and tasks
1 Thursday 10/13 Monday 10/17	***Lesson Goal:*** *Students will understand how to interpret the slope and the y-intercept and be able to graph their equation* *Task:*
2 Tuesday 10/18 Wednesday 10/19	***Lesson Goal:*** *Students will understand how to write the equation of the line (given its slope and y-intercept) in slope-intercept form.* *Task:*

Summary Box #10: Content Understanding Goal

~~Students will understand how you can find the equation of a line when you don't know the exact y-intercept (using an ordered pair of two points).~~

Students will attempt and share multiple ways to explore linear equations (via graphing, tables, or other methods) in order to create a need for the point-slope equation.

Lesson: Connect student ideas, guide students towards the equation
Students are given two points, and figure out how to utilize the point slope equation.

Summary Box #11: Scripting the Lesson

Learning task and activities, key questions or comparisons that will build insights	Anticipated student responses	Assessment (Points to Notice)
	Students could graph these points - see it visually, quadrants, x & y intercepts	
	Students could find the slope, positive slope Other points along the line that you graph - "Can you tell me another point on this line?"	
	Students could test out different estimated lines with the y = mx+b Students could make a table	

Summary Box #12: Boardwork Plan

Start: students know y = mx + b

Warm-Up: Give students graph paper, they explore this prompt:

I'm thinking of a line....
Clue 1: (3, 8)
Clue 2: (5, -2)
What can you tell me about this line?

Students explore individually
Share as pairs/groups (share their strategies)

Then: Talk as a class! Write down a few ideas: Slope, pattern, table, graph, etc?
Whatever students don't come up with, you mention: "We can graph this!" Etc.

Main task: You show how students can graph points or an equation on desmos.
https://www.desmos.com/calculator

Give them a new challenging set of coordinates (very big numbers, creates a complicated slope, etc.) to the whole class to explore.
Give them a lil worksheet: "Show at least 2 ways to explore the line represented by these two points:"

- Students explore, you walk around, help students, ask students about their thinking, guide students, etc.
- Teacher has a poker face as they talk about their line: After students share, you say "How do you KNOW that's my line? Would you bet your phone on it?"
- Tell students that their ideas are worthwhile - give students feedback - I want you to share this, etc.
- Students share methods - they get put on the board, and validated and talked about by instructors.

End of the lesson: Share ideas again!

Exit ticket: What's one method you learned from someone else to explore the problem today?
Before they leave: "Next time we will learn an equation to find the point and slope of our line using two points."

→ Students walk away wanting to know the point slope equation.

Summary Box #13: Data Collection Plan

Collect warm-ups, worksheets, exit tickets, (observers) look at what students are doing and write it down.

Question: Did we find the right evidence? Was the evidence that we collected, the right evidence to collect?

Because of class size we should have focused on entire class instead of focal students.

More probing - Nervous to talk to students. Build more confidence on focal students for that experience.

Focusing on a few students or entire class.

Limited Pool - 4-5 groups with 2-3 students working. Easy to manage with everyone. Didn't leave us with a large amount of evidence.

Curtis: Instead of probing, what could we have done better?

Could have started ideas on paper for students and then have them share those ideas.

The points were positive, great…..

Asking more how and why…..

Do you agree with more of what you heard, turn and talk to your neighbor….

Building better routines.

Summary Box #14: End of Cycle Reflection

- We collected great work
- Kids were engaged in the lesson- they were all trying to figure out ways to find the line
- Students were inclined to use prior knowledge to help them figure out an equation or make sense of the question being asked of them
- Scaffold- it was a giveaway/influence when we mentioned line or equation
    - Leave it slightly more ambiguous?
- More time would have been ideal