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Math Lesson Plan

Learning Segment Focus Graphing Plots of Data

Lesson 1 of 2 **Topic Graphing Plots of Data** **Date April 1, 2021** **Grade 8th**

Student Outcomes

Specific learning **objectives** for this lesson.	Students will be learning about various ways to graph a plot of data. Students will be able to make comparisons based on graphed data.
Justify how learning tasks are appropriate using examples of **students' prior academic learning**.	Students should be familiar with these types of graphs from previous grades, this should be a review for most, but it reintroduces graphs after learning about functions before we have student graph functions.
Justify how learning tasks are appropriate using examples of **students' personal, cultural, linguistic, or community assets**.	This lesson will give students real life application with data and data plotting. Students at this point start to question what is the point of learning all of this. We will use real life examples and data and use graphs to compare and see relationships in the data. Students may have to use similar graphs to represent data later in their educational and vocational career.

State Academic Content Standards

List the **state academic content standards** with which this lesson is aligned. Include abbreviation, number & text of the standard(s).	AR.Math.Content.8.F.B.5: - Describe the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear) - Sketch a graph that exhibits the features of a function that has been described verbally AR.Math.Content.8.EE.B.5: - Compare two different proportional relationships represented in different ways (graphs, tables, equations) 8-PS4-1: - Use mathematical representations to describe and/or support scientific conclusions and design solutions.

Key Vocabulary

What **vocabulary terms/content specific terminology** must be addressed for students to master the content?	- Data - Data Sets - Graph - Bar Graph - Line Graph - Pie Chart - Represent - Relationship

Academic Language Support

What are the **Academic Language Function(s)** (the content and language focus of the learning task represented by the active verbs within the learning objectives/outcomes) and explain how they are utilized in the lesson plan? What planned **Academic Language Supports** will you use to assist students in their understanding of key academic	I believe that vocabulary is very important in every classroom, if you don't know the vocabulary of what you are learning, than have you even learned? Now this is a math class, but if you don't know what questions are asking you, than you will probably be lost. I will make sure my students in this lesson can see key words in problems, so

language to express and develop their content learning and to provide varying supports for students at different levels of Academic Language development? How do these supports address all three **Academic Language Demands (vocabulary, syntax, and discourse)?**	when they see that word, they will know exactly what to do and how to do it. Just as context is key in understanding how to make inferences in reading passages, key words are key in knowing exactly what a question or problem is asking of you, and my students will be prepared to do that in the form of creating graphs, drawing conclusions and interpreting data.

Materials

Materials needed by the teacher for this lesson. (such as books, writing materials, computers, models, colored paper, etc.)	- White Board - Dry-Erase Markers - Projector - PowerPoint - Computer - Microsoft Excel
Materials needed by **students** for this lesson. (computers, journals, textbook, etc.)	- Student Devices (Laptop/iPad) - Microsoft Excel - Google Classroom - Paper/Pencil for notes unless they take on device - Graph Paper for practice

Lesson Timeline with Instructional Strategies & Learning Tasks

Amount of Time	Teaching & Learning Activities (This should be a BULLETED LIST)	Describe what YOU (teacher) will be doing and/or what STUDENTS will be doing during this part of the lesson. (This should be VERY DETAILED)
15 minutes	**<u>Introduction</u>**: - Students will come in and follow the directions on the board - I will introduce what we are learning today - I will call on students to see their knowledge on graphs and data Materials Needed: - Whiteboard - Dry-erase markers - Student Devices (closed) - Paper/Pencil	Students will come in and will follow the directions that are posted on the board. The directions say to pull out their laptop/iPad (depending on what the school provided them), pencil, paper, and graphing paper. Students will also be asked to sit quietly before class begins. Once the bell rings and class begins I will quickly recap what we learned last week by working an example and solving a function into slope-intercept form. From there I will introduce data, and data sets. I will take the solved formula and use random numbers for x to get y. I will put both x and y into a data plot and then introduce the graph. I will then ask students to draw the graph on their paper as I do it on the board. "Now this is a graph to represent a function, and we will look more at those later." First I want to introduce graphing based on certain sets of data, and which graph to used. I will ask students if they remember what types of graphs there are? I will write them down on board as students say them.

45 minutes	**<u>Instruction</u>:** - Students will learn the different types of graphs and when to use them. - Students will learn how to graph these certain graphs - Students will be able to draw conclusions based on comparing data. - I will use Excel to display data and graphs based on data sets to incorporate technology into the lesson. - Explain the project that students will be working on Materials Needed: - White Board - Dry-erase markers - Computer - Projector - PowerPoint - Student Devices (should be closed until given permission) - Microsoft Excel - Graphing Paper/Pencil	I will open PowerPoint which will explain the 3 types of graphs that we will cover in today's lesson. On the power point it will review the data and datasets as well. It will explain how some data is not represented by numbers. For example, it may be a temperature at 12 PM for one value on a data set vs temperature at 3PM for another and so on. It will also show plots of data and graphs that represent those sets of data. Students will be expected to take notes as I go through the PowerPoint. The end of the PowerPoint has a few examples that I will work through. I will call on students to assist me with the examples. The examples will have a word problem and ask us to make a data set and then select the graph that would best represent its data. We will then make a graph of each example, and students will make sure to do this with me. I will then give students about 10 minutes to do the next example on their own. Once the 10 minutes are up I will ask a student to come and complete the problem on the board. I will comment and correct when necessary, or call on a different student to help them if they get it wrong. I will present students with a challenging problem that will make students use previous knowledge on finding averages or means. The question will ask students to compare the average amount of points scored by a football team over multiple seasons, and then graph the each seasons mean. I will give students 10 minutes to do this as well. Then I will have another student solve it for the class. I will call on a couple of students to tell me what the graph means. I will then ask students to open their devices and log on to google classroom and download the excel template. We will use them for a project that students will have to complete on rain fall. I will put in random numbers into the rainfall to the four states I already have selected. I tell the students to look at the graphs as I fill out the yellow sections. I go through each state and fill out the yellow sections. I then show them the comparison sheet and how it gives them comparison data. I will call on students to make conclusions based on the comparison data and graphs. I will then explain that they are to use this template and choose 4 other states and cities or towns within the state and find real world data to fill out the yellow sections for each tab. As they fill out their data, the graphs will be produced automatically. Separately they are to use some of the data and construct a line graph and they are to write conclusions based on their graphs. It will be due by next Friday.

15 Minutes	**Closure:** - I will quickly recap what students learned - Students will begin working on their projects - Students will ask questions if necessary. Materials Needed: - Students Devices - Microsoft Excel	I will quickly go over what they learned by going over the vocabulary and each graph type. I will also allow students to ask any questions about the content that they just learned or over the project. I will then ask students to start their research to find real life data for their project.

Technology Integration

Provide your **rationale** for your technology choices that accurately reflects those choices within your teaching context. **Identify** what technology(s) you are using as part of your lesson plan. **Describe** how the use of technology aligns to your learning objectives, content standards, and central focus. **Explain** how technology-based instructional strategies are essential to students accomplishing the learning objectives (beyond what could be accomplished without using the technology). **Specify** how the technology selections meet or exceed the needs/strengths of all students**. Justify the "fit"** of chosen technologies, showing how the content, instructional strategies, and technology "fit" together.	In every job I have ever had, I have been required to use Excel for multiple reasons. So I believe anytime that it can be used in a classroom, and students get a chance to use it, it is beneficial, it is applicable, it is easy to apply, it is a good tool. I'm not 100% sure how much my students have used Excel before, so I made a template to help with their project, I don't want them to necessarily know how to use Excel, but them to be able to see the representations created by it, which will aid them in drawing conclusions for their projects. Drawing conclusions, seeing relationships between variables is a good skill to pick up and will ultimately help students in the long haul.

Accommodations/Modifications

How might I **modify** instruction for: *Remediation?* *Intervention?* *IEP/504?* *LEP/ESL?* (All students who have plans mandated by federal and state law.)	I will give easier expectations for students with learning disabilities, they will only have to find information for three states instead of four. I will also give more explicit step by step instructions in the assignment handout to all. If a student fails to turn in or turns in below standard work, I will give them a worksheet to complete before they move on. If a student requires additional time based on IEP or 504, they will be given additional time based on their plan. For those who might not have internet access, I will give time in class to do more research, as they should be able to complete to Excel section without internet at home. I will also pay extra attention to my two students with ADHD to make sure they are on task, and paying attention. I will check on my ESL students after the lesson to see if I explain anything clearer to them.

Differentiation

How might you provide a variety of techniques (enhanced scaffolding, explicit instruction, contextualized materials, highlighters/color coding, etc.) **to ensure all student needs are met?** (All students who are not on specific plans mandated by federal and state law.)	Well this lesson is all about drawing conclusions based on information and comparison of data. I will expect more from my gifted and talented students, I will expect them to be more thorough on their conclusions and not to be surface level, and I will also require some to do five states instead of four. I also expect to hear from them when I ask for students to solve a problem on the board.

Assessments: Formative and/or Summative

Describe the **tools/procedures** that will be used in this lesson to monitor students' learning of the lesson objective(s) (include type of assessment & what is assessed).	☐ **Formative** /☐ ~~Summative~~	As a formative assessment I will call on students to explain content that they already know and to show that they are making progress on newly learned material by solving problems individually and some even on the white board in front of the class.
	☐ ~~Formative~~ /☐ **Summative**	As a summative assessment I wlll ask students to make conclusions in a project that will require them to find data, and evaluate it by looking at graphs. Students will also be asked to construct their own graph on paper.

Research/Theory

Explain **connections to theories and/or researc**h (as well as experts in the field or national organization positions) that support the approach you chose and justify your choices using **principles of the connected theories and/or research.**	Vygotsky: This theorist stated the scaffolding technique is beneficial and effective when used in the classroom to help students succeed to higher standards. Students will be observed by me during the lesson for participation, and will know what is expected of them before, I'm looking for students to show that they are capable of drawing conclusions and even if they are incorrect, that they learn from it. Bloom: This theorist is known for having students remember facts and create something new in regards to what content they are learning. Students will be asked to recall concepts they have learned from earlier in their educational journeys and use it to make conclusions. They will also be asked to construct something based on a new concept they just learned.

Lesson Reflection/Evaluation

What went **well**? What **changes** should be made? How will I **use assessment data** for next steps?	*TO BE FILLED IN AFTER TEACHING*

Include supporting material such as slides, pictures, copy of textbook, and handouts for any activities students will be using as part of your lesson.

*adapted from: http://webcache.googleusercontent.com/search?q=cache:EsQcNWuG1ZoJ:web.mnstate.edu/harms/StudentTeachers/edTPA-LessonPlan.doc+&cd=2&hl=en&ct=clnk&gl=us; http://www.moreheadstate.edu/getmedia/cd3fd026-939f-4a47-a938-29c06d74ca01/Lesson-Plan-and-Reflections.aspx; http://www.mcneese.edu/f/c/9cb690d2/Lesson%20Plan%20Rubric%20Aligned%20with%20InTASC.docx;https://www.uwsp.edu/education/Documents/edTPA/Resource12.pdf; https://www.uwsp.edu/education/Documents/edTPA/Resource11.pdf; https://www.uwsp.edu/education/Documents/edTPA/Resource11a.pdf; https://www.uwsp.edu/education/Documents/edTPA/LessonPlanTemplateSOE.docx; https://www.uwsp.edu/education/Documents/edTPA/SpecEdLessonPlanGuide.docx; https://www.uwsp.edu/education/Documents/edTPA/SpecEdLessonPlanTemplate.docx