

Line Graph Math Lesson

Grade: 3	Subject: math
Materials: graph paper, pencil, 2 different colored pencils/markers, rulers, average high and low temp charts per PBL creature, Sample line graph from YouTube video,	Technology Needed: computer for YouTube video https://www.youtube.com/watch?v=n2YkbdNORp8
Instructional Strategies: <input type="checkbox"/> Direct instruction <input type="checkbox"/> Guided practice <input type="checkbox"/> Socratic Seminar <input type="checkbox"/> Learning Centers <input type="checkbox"/> Lecture <input type="checkbox"/> Technology integration <input type="checkbox"/> Other (list) <input type="checkbox"/> Peer teaching/collaboration/cooperative learning <input type="checkbox"/> Visuals/Graphic organizers <input type="checkbox"/> PBL <input type="checkbox"/> Discussion/Debate <input type="checkbox"/> Modeling	Guided Practices and Concrete Application: <input type="checkbox"/> Large group activity <input type="checkbox"/> Independent activity <input type="checkbox"/> Pairing/collaboration <input type="checkbox"/> Simulations/Scenarios <input type="checkbox"/> Other (list) Explain: <input type="checkbox"/> Hands-on <input type="checkbox"/> Technology integration <input type="checkbox"/> Imitation/Repeat/Mimic
Standard(s) 3.MD.3- draw scaled picture graphs and scaled bar graphs to represent data sets with several categories. 3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked in appropriate units—whole numbers, halves, or quarters.	Differentiation Below Proficiency: Students will be in a group with 1 partner Above Proficiency: Students will be in a group with 1 partner. Students can take information and create a bar graph. Students can make predictions about what the climate trend will be 5-10-15-20 years from now. Approaching/Emerging Proficiency: Students will be in a group with 1 partner. Modalities/Learning Preferences: *students can work in groups of 1 *students can work independently *students can create an additional bar graph using same information
Objective(s) By the end of the lesson, the students will create a line graph by recording the average temperatures both highs and lows in the region that their chosen animal(walrus, koala, flamingo or octopus) lives. Bloom's Taxonomy Cognitive Level: create	
<ul style="list-style-type: none"> The students will work on their line graphs in pairs-same PBL creatures Students will wait for directions before starting activity 	Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) <ul style="list-style-type: none"> The students will work in pairs The students will participate in the group discussions/activities The students will raise their hand if they are needing help.
Minutes	Procedures
	Set-up/Prep: <ul style="list-style-type: none"> Have graph paper and temperature records ready for each student YouTube video prepared to go https://www.youtube.com/watch?v=n2YkbdNORp8
	Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.) <ul style="list-style-type: none"> Have the students watch the YouTube video on how to draw a line graph After video, we will as a class discuss the information in the video <ul style="list-style-type: none"> x-axis(horizontal)- bottom of the graph y-axis(vertical)-the side of the graph Title of the graph- top of the graph Tally marks
	Explain: (concepts, procedures, vocabulary, etc.) <ul style="list-style-type: none"> I will draw a line graph and we will create the same line graph as in the video.

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	<ul style="list-style-type: none"> • I will hand out the tally sheet from the video. <ul style="list-style-type: none"> ○ The tally sheet will have another set of tally marks <ul style="list-style-type: none"> ▪ These will be added to the line graph but in a different color or thicker line <ul style="list-style-type: none"> • This will be done in order to see the difference between the 2 people eating apples ○ The student will keep this information for reference if needed while working on the real line graph. • When you use a line graph you are able to track how things change over a period of time. <ul style="list-style-type: none"> ○ Like in the video you can see change over months but line graphs can track information for years. • So today we are going to learn how to graph information from your creature you picked for the PBL. • The students will get information based on the creature(walrus, koala, flamingo, octopus) they are researching along with a graphing paper. • We will talk as a group on how set up the graphs. <ul style="list-style-type: none"> ○ Creating the x-axis and the y-axis <ul style="list-style-type: none"> ▪ Making tally marks ○ Remember when you are recording the data for either high or low temperatures there needs to be a difference in the lines so you can understand the data. ○ Make sure you are accounting for the number values for your creatures location. <ul style="list-style-type: none"> ▪ Both high and low temps need to fit • The increments on your y-axis can be done in 1's, 5's or 10's increments <ul style="list-style-type: none"> ○ This will be decided between you and your partner ○ Before you start your graph please tell me what your group has decided • Questions? • Before the students get to work I will ask them to repeat what the assignment is <ul style="list-style-type: none"> ○ Create number line using the information given to them ○ Use 2 different colors to indicate the differences in high and low temps.
	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</p> <ul style="list-style-type: none"> • The students will use the information given to them to create a line graph showing the differences in the high and low temperatures for their creatures habitat within a 1-year time frame.
	<p>Review (wrap up and transition to next activity):</p> <ul style="list-style-type: none"> • Get the students attention-for wrap up of line graph. • Tell the students that we learned today how important line graphs can be for tracking information over a long-time frame. • The students will clean up their materials and prepare for the next task/subject
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.</p> <ul style="list-style-type: none"> • Group line graph completion • Group discussion participation • Teacher visually looking at students work while they are working <p>Consideration for Back-up Plan:</p>	<p>Summative Assessment (linked back to objectives) End of lesson:</p> <ul style="list-style-type: none"> • At the end of the lesson, the students will hand in their graphs for a grade in line graph creating. <p>If applicable- overall unit, chapter, concept, etc.:</p>

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Reflection (What went well? What did the students learn? How do you know? What changes would you make?):

This lesson was a great lesson. I enjoyed it and I think the students also enjoyed it. When we started the lesson, I was having a little bit of difficulty getting a few students to pay attention. I know that this was happening because this was the very first lesson that I was teaching this set of students. I think if I was to teach this lesson again at a different time with these same students that the attention would be better in the beginning because I would have had more time establishing my procedures and expectations. Even though the start was rough we ended the lesson with all 10 groups completing a line graph with 2 different lines. The lesson was aligned to their PBL Creature project. I think this was a great idea because I was able to connect two different subjects into one. It made the lesson more meaningful because they could use the information from the line graphs and apply that into their writing/research project.

If I was to do this lesson again the thing I would do differently would be to spend more time working on the example graph that was seen on the YouTube video. The students seemed to understand the concept well but I feel if I would have walked them through the first example the line graph they completed in groups could have happened a little bit more smoothly. I would have also created a larger version of the line graph example we did together so the students would have been able to use it as a visual. I had them create the line graph and keep it on their desks for reference but I did notice that not all example graphs were filled in completely which if they were using them as a reference which I had intended them to be, I would have been confident that having the example graph on the board might have been a better choice. I also wouldn't have given the groups the choice of picking different interval on the y-axis (temp). I would only tell them to use 5-degree increments but I would explain that you can use any increments based on the size of your graph. Giving them the option to choose their own increments seemed to be too much for this first experience creating a line graph.

I have not taught a lesson before that was aligned with a PBL project nor have I experienced being a part of a PBL project but I think overall I would go this lesson again in the future. The students enjoyed this activity being hands on, working with a partner and being able to use the information they were given for another activity or project.

REFLECTION EDITED- if I was to teach this lesson again I would make sure to go through the line graph process after watching the video step by step with the students. I would have them work with me with each step- waiting for everyone to be done before moving on to the next step. I found that many kids were jumping ahead in the instructions and then becoming lost. If I didn't do the step by step process I would just meet with the students who were behind at my desk and help them in a group while the rest of the class moved forward.

I would also make sure my directions were clear and I would have the students repeat the expectations of the lesson or assignment to clarify any questions.

In future lessons, I could have the students find their own data related to temperatures. This would make the lesson more relatable for each student. Due to the time limit and lack of previous teaching time this was not an option.

Because this lesson was being taught in the middle of the year I will be making a note that in my own classroom I will be spending time on what my expectations are or will be when working on assignments. I found it hard to get the kids to follow my directions and I'm not sure if it was just because the directions were unclear or if they just didn't want to follow because they were different than their normal teachers' directions.

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Average temp charts

Walrus-Arctic Circle-Ilulissat, Greenland

Average Temperatures

Month	High Temperature (F)	Low Temperature (F)
Jan.	14	1
Feb.	14	0
Mar.	16	1
Apr.	25	9
May	39	27
Jun.	48	37
Jul.	54	41
Aug.	50	39
Sep.	41	30
Oct.	32	21
Nov.	25	12
Dec.	18	7

Koala-SE Australia-Adelaide, South Australia

Average temperatures

Month	High Temperature (F)	Low Temperature (F)
Jan.	84	63
Feb.	86	63
Mar.	81	59
Apr.	73	55
May	66	50
Jun.	61	46
Jul.	59	46
Aug.	63	46
Sep.	66	50
Oct.	72	52
Nov.	77	57
Dec.	81	61

Octopus-Warm Tropical waters-Auckland, New Zealand

Average Temperatures

Month	High Temperature (F)	Low Temperature (F)
Jan.	75	61
Feb.	75	63
Mar.	73	59
Apr.	68	55
May	63	52
Jun.	59	46
Jul.	57	46
Aug.	59	46
Sep.	61	50
Oct.	64	52
Nov.	68	55
Dec.	72	59

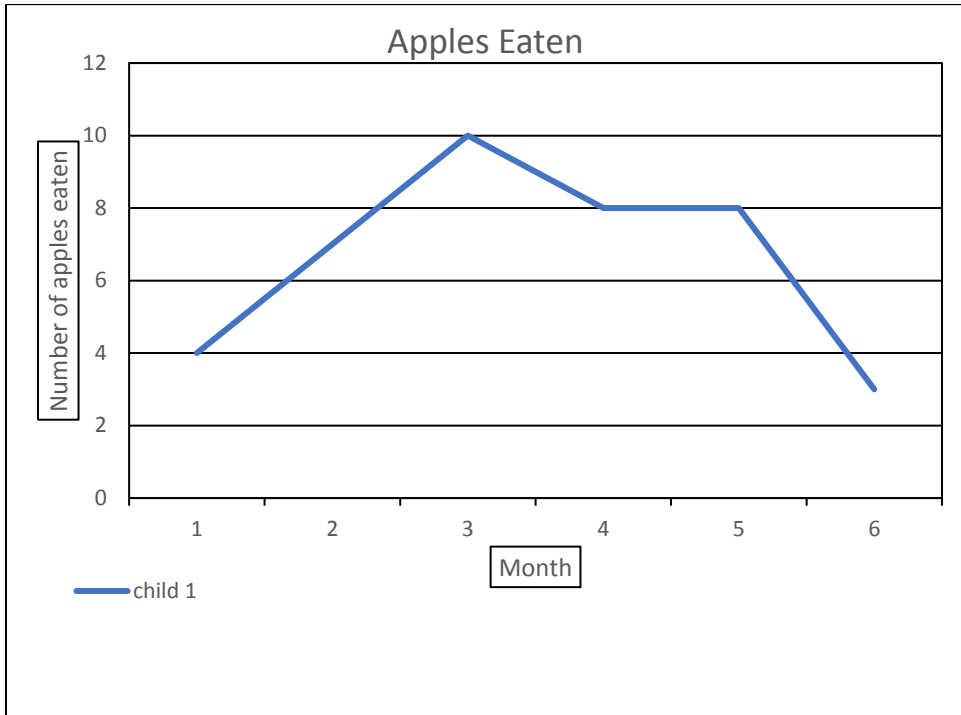
Flamingo- Yucatan Peninsula -Cancun, Mexico

Average temperatures

Month	High Temperature (F)	Low Temperature(F)
Jan.	82	70
Feb.	84	70
Mar.	86	72
Apr.	90	73
May	91	75
Jun.	91	77
Jul.	91	77
Aug.	93	77
Sep.	91	77
Oct.	88	75
Nov.	86	73
Dec.	82	70

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Line graph example from YouTube



Child1	
Month	Number of apples eaten
1	4
2	7
3	10
4	8
5	8
6	3

Child2	
Month	Number of apples eaten
1	2
2	5
3	4
4	9
5	10
6	6