

Remote Learning Final Project: CPM Algebra I Functions Part 1

Time Allotment: 6-7 days

This section starts with some function puzzles that the team will work together to solve. They will encounter some real-life situations in which they will investigate the growth patterns, some of which are not linear. They will also investigate the family of quadratic functions to look at characteristics of their graphs.

- **Learning goals:**

- **F.IF.A.1** Understand the concept of a function and use function notation.
- **F.IF.B.4** Interpret functions that arise in applications in terms of the context.
- **F.IF.C.7** Analyze functions using different representations.

- **Preassessment:**

CPM Section 1.1.1, problem 1-1 is a team sort where students are given a card with different representations of a line (equation, table, graph, situation). Students need to find who has the different representations of their line. They need to be prepared to justify how they know the different representation match. (note: this is a great in class activity, and I will adjust by predetermining the groups and just have them do the justify as a small presentation since they will all be remote.)

- **Engagement activities**

- How are you Feeling? Google Form
- Morning Chat Question of the Day
- Parent/Guardian contact, remote conferences

- **Applications:**

- *Google Classroom:* Class agenda is posted using a Bitmoji Interactive page with links to any online resources such as the eBook, flip grid, the question of the day for Chat, assignments and any other pertinent information
- *Zoom/Google Meet:* Our method for getting onto breakout groups, office hours, remote learning, conferences
- *CPM eBook and CPM remote support materials (TBD):* CPM has an interactive eBook, which has links to homework help, DESMOS, online manipulatives etc. It is developing additional remote learning materials that I have not had a chance to look into and will be helpful I am sure.
- *Chat:* daily SEL check in (Question of the Day ranging from light, heavy, personal, weird and funny, to would you rather)
- *Flip Grid:* A method for student groups to present material to the class
- *DESMOS:* online graphing calculator and much more
- *Bitmoji:* My own personal emoji with a huge library to personalize my virtual classroom
- *Jamboard:* G Suites digital whiteboard that student groups can create and collaborate on presentations (this tool needs to be investigated further)

- **Stepping Stones/Daily Agenda**

Day 1: Introduction to Remote learning and CPM

- Students will meet in the large Zoom/Google meet, and as they are joining, they will be asked the post the question of the day in the chat
- Students will access the Google Classroom page and find the important features
 - Daily agenda Bitmoji page
 - Resources (breakout room links, resource pages to print or pick up (TBD), groupings, office hour/conference link, etc.)
 - Syllabus and class expectations
 - Classwork/Grades in Google
 - How and where classwork and homework will be posted (google doc with typed answers, photos of math scratch work, DESMOS images, etc.)
- to create their own introduction in Flip grid.
- Students will be assigned their Teams and Team Role (Facilitator, Reporter Recorder, Task Manager, resource manager). They will start by doing a jigsaw, joining a group to discuss each role for a few minutes. They will then join their team and talk about what their role is.
- Students will access CPM Algebra I eBook, and find Chapter 1, section 1.1.1 **How can I work with my team to figure it out?**
- Students will work on *CPM Student eBook Scavenger Hunt* in their team and submit their answers in Google classroom (group or individual TBD)

Day 2: 1.1.1 How can I work with my team to figure it out?

- Students will check the Daily Agenda Page and post their answer in the chat as the log into class
- Students will work on the Core problem 1-1 the Preassessment (each member will be given a card, and the group will have to justify how they know the card matches, presenting their information to the class via flip grid/google/jam board) they will have approximately 15 minutes to complete this activity
- Resource Manager will get the Team Roles resource page for problem 1-3
- Students will work on the Core problem 1-2 & 1-3
- Closure (5 minutes): teams will reflect on how the type of output for each equation in problem 1-3 helped determine the order for a minute or two, then we will come together as a group to discuss. Note: Mastery of the topic is certainly not expected here, just sharing of ideas
- Homework: Problems 1-4 through 1-8

Day 3: 1.1.2How does it grow?

- Students will check the Daily Agenda Page and post their answer in the chat
- Homework Q&A (homework help is available and our solutions are posted, students are allowed to ask for clarification if needed) <5 minutes
- Lesson introduction: *“a brief whole-class discussion about why understanding growth rates is important. You may want to ask the students to generate situations in which growth matters, such as the interest rate for a checking account or the rate the water of a river is rising. The introduction for this lesson introduces another context (the spread of disease) that you may want to discuss. It is not important for students to understand yet how things grow, only that how something grows is important to understand and that different situations can grow at different rates. Emphasize that by the end of this lesson, students should be able to describe different ways that something grows. “Emphasis on the TEAMS strategy below:*

COLLABORATIVE LEARNING EXPECTATIONS

Working with other students allows you to develop new ways of thinking about mathematics, helps you learn to communicate about math, and helps you understand ideas better by having to explain your thinking to others. The following expectations will help you get the most out of working together.

T Together, work to answer questions.

E Explain and give reasons.

A Ask question and share ideas.

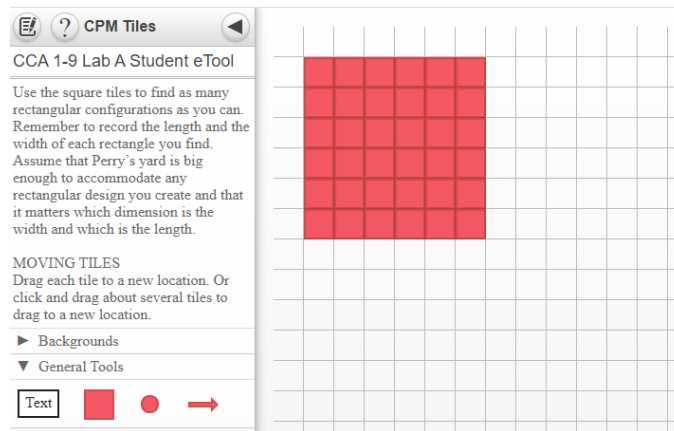
M Members of your team
are your first resource.

S Smarter together than apart.



- Students join their teams, read guiding questions together, and work on Problem 1-9 recording data in a Google doc

- **Lab A hot Tub Design** using the [1-9 Lab A Student eTool](#) collecting data only for next class



- **Lab B: Local Crisis** instead of beans, students can make hatch marks on a paper, use pennies or chips, if they don't have beans, collecting data only
- **Lab C: Sign On the Dotted Line:** Students will have to have a stop watch app, collecting data only
- If time permits, students may start working on 1-11
- **Homework:** Read the Math Notes box for this lesson before beginning homework Day 1: Problems [1-13 through 1-17](#)

Day 4: 1.1.2 How does it grow?

- Students will check the Daily Agenda Page and post their answer in the chat
- Homework Q&A (homework help is available and our solutions are posted, students are allowed to ask for clarification if needed) <5 minutes
- Students join their teams read guiding questions together and work on 1-11 collecting and save data/graphs using the virtual tools: [1-11 Lab A Student eTool](#) (Desmos), [1-11 Lab B Student eTool](#) (Desmos), [1-11 Lab C Student eTool](#) (Desmos) and posting results in a group Google Doc
- Students will answer the analysis questions in the second part of 1-11 and 1-12 and record in their google Doc.
- Closure: (5 minutes) As a whole class, discuss the three new types of relations students have studied in this activity. Ask students to compare and contrast the three graphs. Exposure to inverse variation, exponential and proportional growth, discrete versus continuous data for vocabulary.
- **Homework:** Read the Math Notes box for this lesson before beginning homework Day 2: Problems [1-18 through 1-22](#)
 - **Extra credit:** students can create a Chapter 1 vocabulary and Math notes Google doc to share with me. They can add vocabulary words, and the Math notes boxes to use as a study guide down the road. To be submitted at the end of the chapter **before** "Chapter Closure".

Day 5: 1.1.3What do I know about a parabola?

- Students will check the Daily Agenda Page and post their answer in the chat
- Homework Q&A (homework help is available and our solutions are posted, students are allowed to ask for clarification if needed) <5 minutes
- Students join their teams; Resource Manager get 1.1.3 RP and Facilitator starts team working on 1-23 creating a google doc for their assigned parabola (include any DESMOS screens) and answering analysis questions. Strong teams may do 2 parabolas.
- **Closure** (15 minutes): Individual Exit Ticket with students describing their parabola, noting one or two important observations. Looking to add new vocabulary such as: vertex, symmetry, x-intercepts, y-intercepts, maximum and minimum.
- **Homework:** Problems [1-25 through 1-29](#)

Day 6: Section Wrap up: Based on previous years, I anticipate students will need more time.

- Students can present their parabola via Jam Board, quickly sharing their Jam, parabola, and noting one or two important observations. Looking to add new vocabulary such as: vertex, symmetry, x-intercepts, y-intercepts, maximum and minimum. “Expect some simplistic statements along with some unique and interesting observations. Students will learn in more fully what it means to describe the graph of a relation in the next lesson.
- Quick “Homework Quiz”: 3 or 4 questions based off homework (prerequisite), one from each section, potentially 1-7 or 1-8, 1-16 or 1-17, 1-22, and 1-28

- **Assessment:**

- ✚ Each day students will be working on the Core problems in their teams. Each day groups may be selected (using Flip Grid/Google/Jamboard/TBD) to present their problem and solution. All groups will have to do this throughout the course of the year, it will become a norm and part of our closure process. As the breakout rooms are monitored, students will be informed that they have to present so they can work on it.
- ✚ Huddle: A CPM strategy where if the teacher notices all students are struggling, they can call the Resource Managers together in a huddle (Google Meet Resource Manager) to give a hint on how to proceed. After checking for understanding, Resource Managers will go back to their teams and share information.
- ✚ Chapter Pocket Questions: As I check in with each group, I have questions to pose to the group to get them thinking, making connections, and so forth
- ✚ Closure Exit Ticket: Each day the lesson has “closure”, where student reflect on the activity and try to make connections. This might be a good way to use an online Exit Ticket and potentially create a Question of the day for further investigation or a slide show to discuss any ideas or clear up any misconceptions.
- ✚ Learning Log Entry: Learning logs are journal writing prompts that have the student reflect and make connections, and while there are no Learning Log entries for this particular section, it might be a good addition if I think I need to dipstick for formative assessment.
- ✚ CPM 6-Point Rubric (attached) It is the mandated rubric for our program
- ✚ Checkpoint Problems: **Solving Linear Equations, Part 1 (Integer Coefficients)**
- ✚ Homework Quiz: A quick quiz based off of previously discussed homework.
 - **Quiz protocol**: cameras on paper, hand, pen and phone MUST be visible. Submit a picture of work under quiz entry.
- ✚ Student feedback on projects: Thinking online Gallery walk, where students can view the “poster equivalent” of the quadratic function each team was assigned and have to leave post it comments
 - “one thing you like”
 - “one question you have”