Student Work and Teaching Strategies

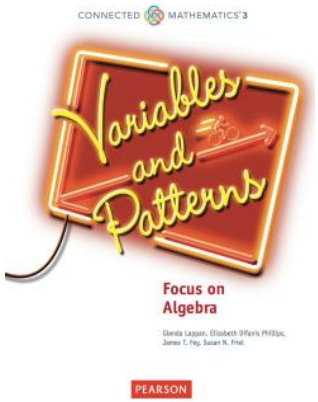
Variables and Patterns Problem 2.4

What's the Story?: Interpreting Graphs

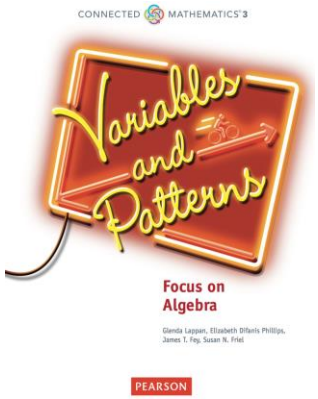
Problem 2.4

Questions A–H describe pairs of related variables.
For each pair, do the following.

- Decide what the variables are.
- Decide which variable is the dependent variable and which is the independent variable.
- Think about what a graph or table of these data would look like.
- Find the graph at the end of the Problem that tells the story of how the variables are related. If no graph fits the relationship as you understand it, sketch a graph of your own.
- Explain what the graph tells about the relationship of the variables.
- Give the graph a title.



Pairs of variables to be related.



A The number of students who go on a school trip is related to the price of the trip for each student.

B When a skateboard rider goes down one side of a half-pipe ramp and up the other side, her speed changes as time passes.

C The water level changes over time when someone fills a tub, takes a bath, and empties the tub.

D The waiting time for a popular ride at an amusement park is related to the number of people in the park.

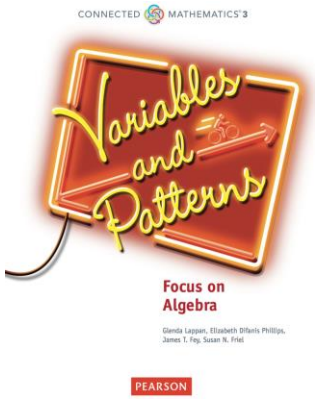
E The daily profit or loss of an amusement park depends on the number of paying customers.

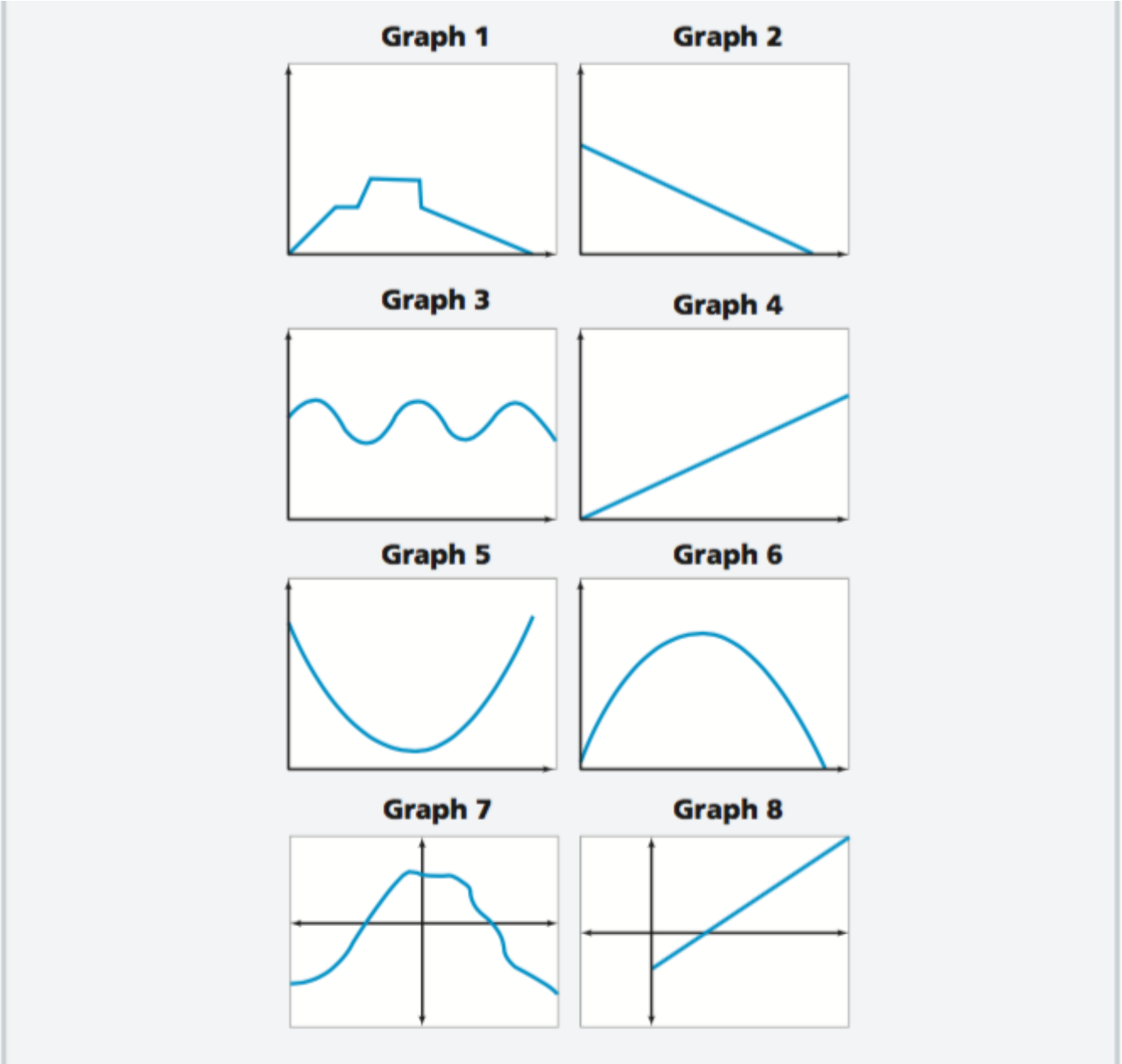
F The number of hours of daylight changes over time as the seasons change.

G The daily profit or loss of an outdoor skating rink depends on the daytime high temperature.

H Weekly attendance at a popular movie changes as time passes from the date the movie first appears in theaters.

Patterns of change shown in graphs.



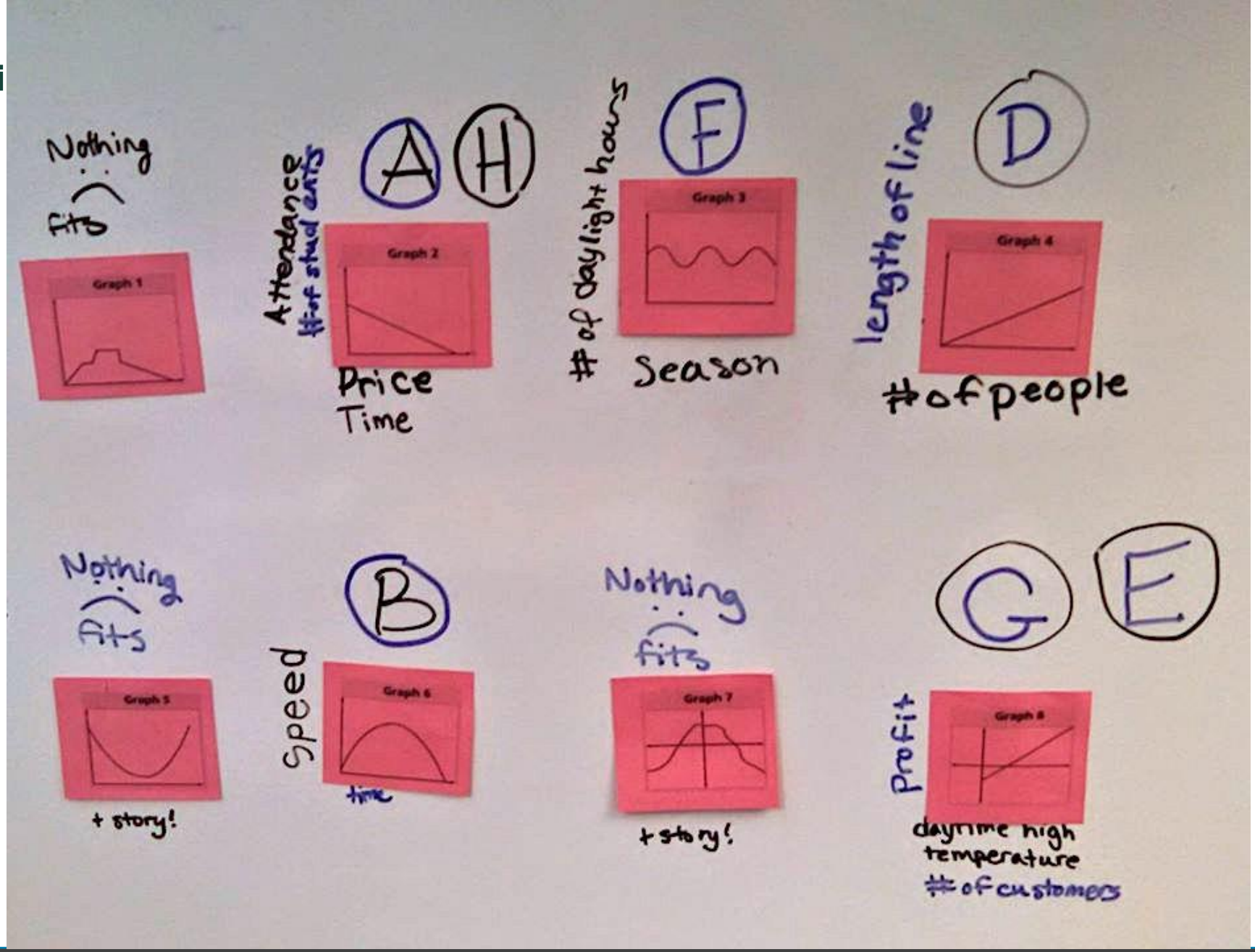


Teaching Strategy Class 1

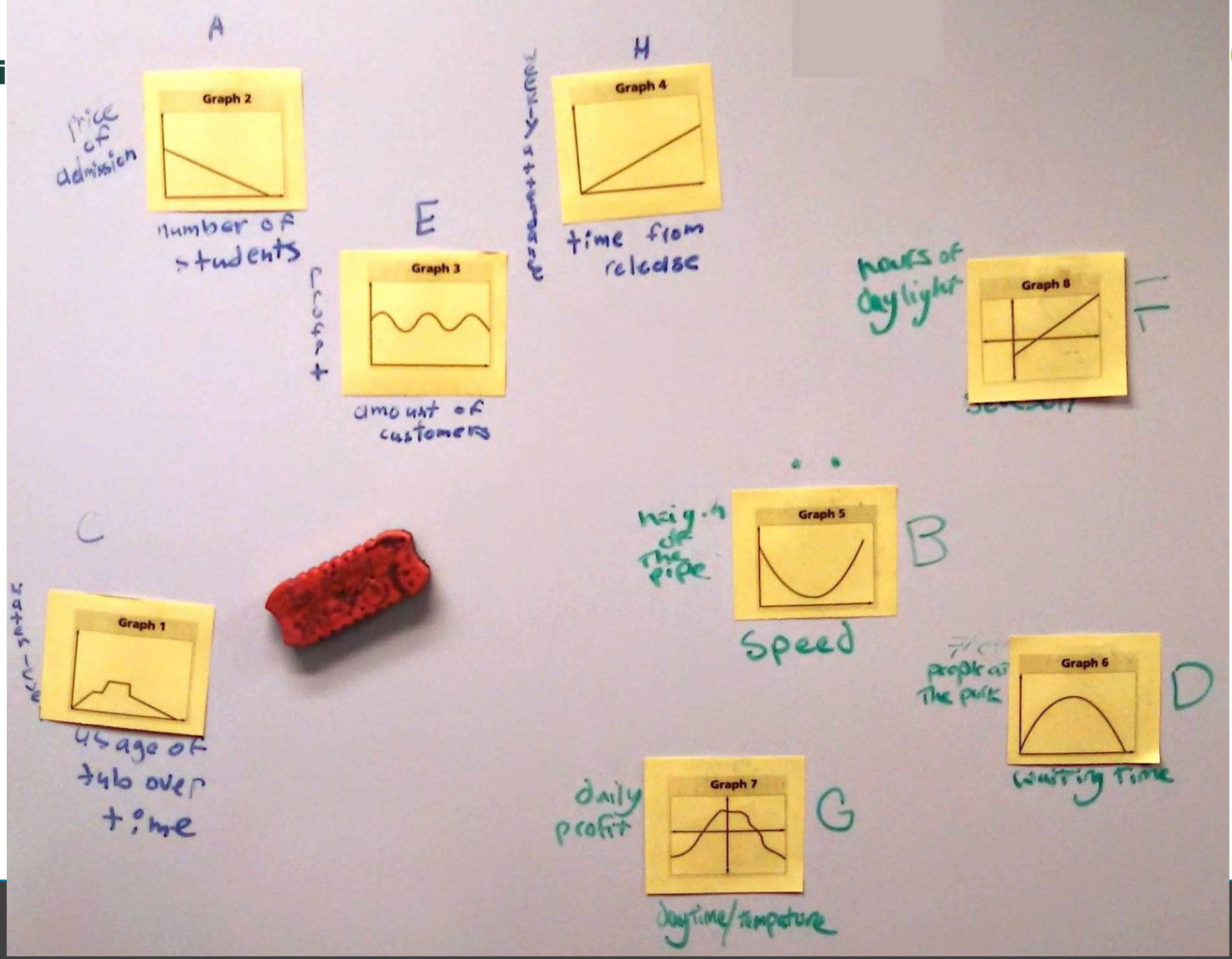
From a CMP Teacher

- To better focus myself and the students on the primary learning objectives, I gave students copies of the graphs.
- I simply told them they had to make the match and label the variables.
- They worked in small groups during the Explore portion of the lesson.
- For the most part, I let errors lie until the Summarize.
- In the Summarize, we discussed the results of the small groups and resolved any disagreements in matching the graphs to the stories.

Student Work
Example #1
From Class 1



Student Work
Example #2
From Class 1



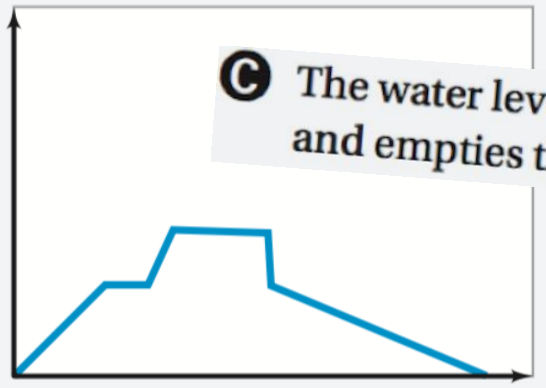
Teaching Strategy Class 2

From another CMP Teacher

- We do a Matching/Card Sort activity.
- Each pair of students gets enlarged copies of the stories and graphs.
- They work in pairs during the Explore to find matches.
- Students record the matches.
- In the Summarize, we discuss the results and resolve any disagreements in matching the graphs to the stories.

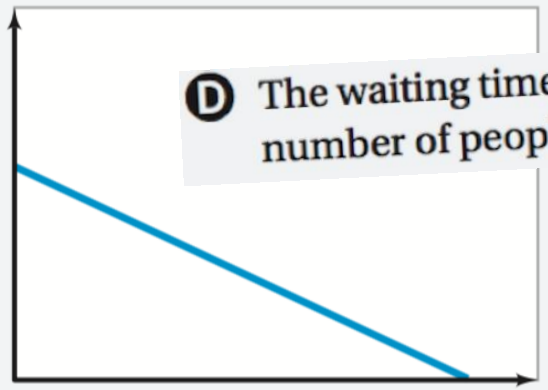
Example of Matching During the Explore From Class 2

Graph 1



C The water level changes over time when someone fills a tub, takes a bath, and empties the tub.

Graph 2



D The waiting time for a popular ride at an amusement park is related to the number of people in the park.

Teaching Strategy Class 3

From CMP Teacher Team

- We give out the stories first and ask students to identify the variables.
- We ask students to try picturing or visualizing how the graph might look.
- Then, we give out the graphs.
- Students have lively arguments and discussions about what the graph should look like for each story.

Example of students identifying the variables
From Class 3

A The number of students who go on a school trip is related to the price of the trip for each student.

B When a skateboard rider goes down one side of a half-pipe ramp and up the other side, her speed changes as time passes.

C The water level changes over time when someone fills a tub, takes a bath, and empties the tub.

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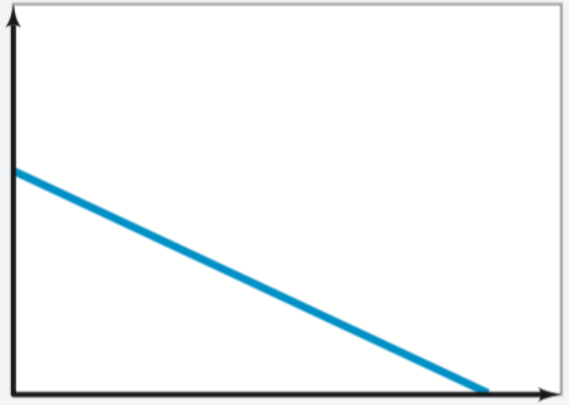
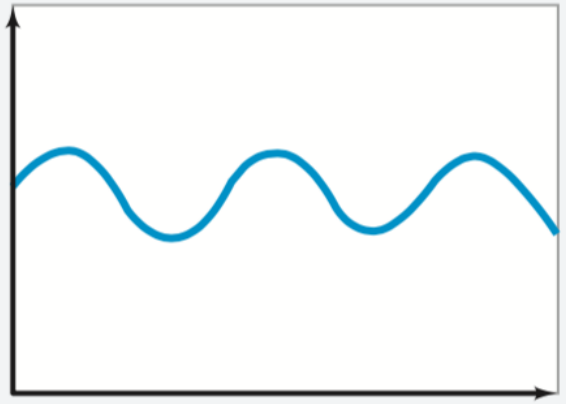
Graph 1

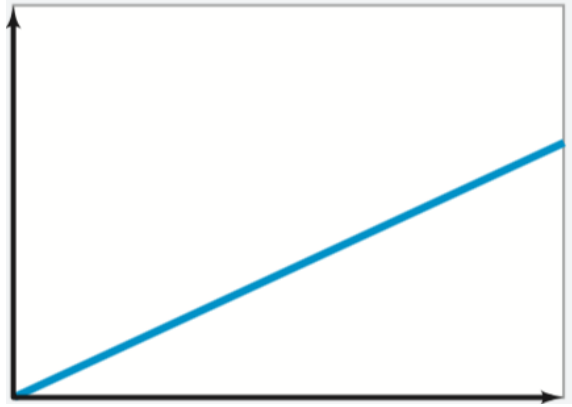
Graph 2



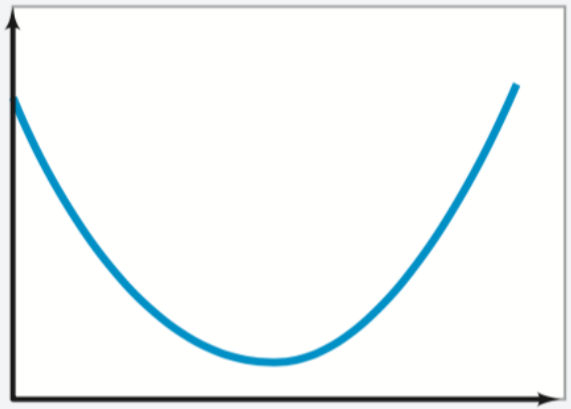
Graph 3



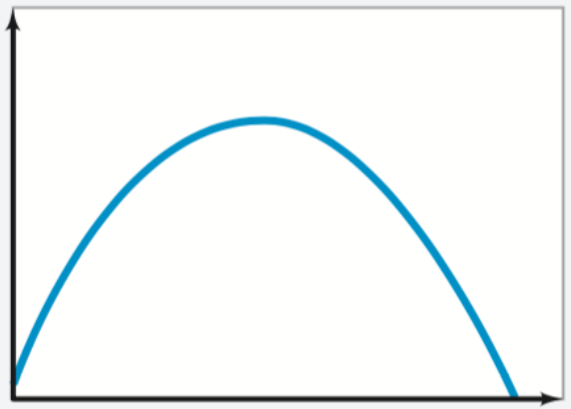
Graph 4



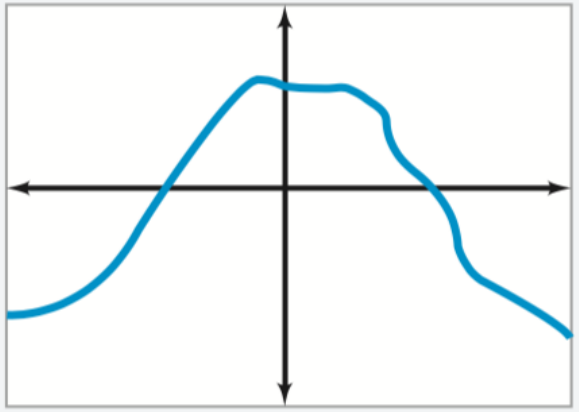
Graph 5



Graph 6



Graph 7



Graph 8