

UNIT PROBLEM

The Bungee Business



BRIDGE BUNGEEES

Research and Development Memo

As you know, Bungee Bridges® is set to begin scouting bridge locations for our new bungee operation in the next few months. Each site will have different characteristics, so we will need help from the Research and Design Team to produce report that can help us in determining answers to the following questions:

- ❖ *What is the best price to charge for a jump?*
- ❖ *How can we safely select a bungee cord for each jumper?*
- ❖ *How can we determine the weight capacity of the bridges?*

Please use the provided materials to inform your research. Submit a report with answers to these questions by the end of the month.

Sincerely,

Doug Graves

Doug Graves, CEO Bungee Bridges®

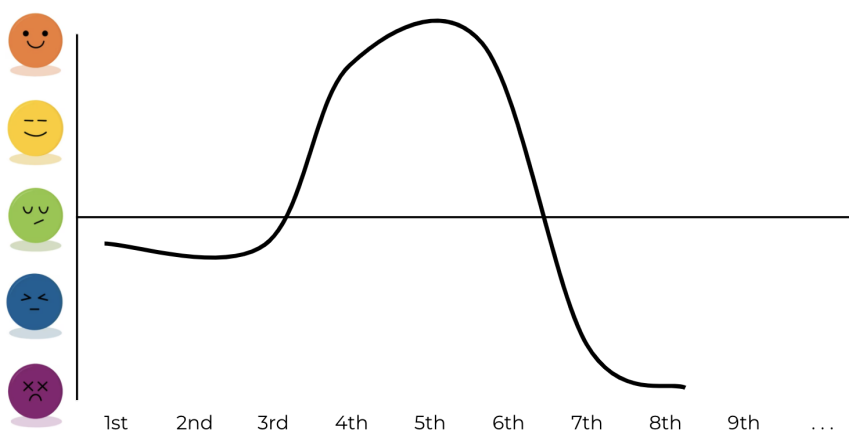
1. Consider the first question posed by the CEO: What is the best price to charge for a jump? Make a list of information that you'd like to know in order to better answer this question. Then, write out a 'rough draft' answer to the question.
2. Consider the second and third questions posed by the CEO. How could we determine answers to these questions without risking the lives of actual people? Propose an experiment that you think would work. Write out a 'rough draft' of the steps of the experiment.

ON YOUR OWN

Unit Problem

What have my math experiences been like?

1. What have your feelings about mathematics been like over time? Maybe sometimes you found math enjoyable and other times you found it boring? Maybe sometimes you felt recognized for your strengths and other times you felt like you were struggling? Make a timeline like the one below that shows your own personal journey with mathematics.



- a. Reflect on the times that were positive. What made them positive?
 - b. Reflect on the times that were negative. What made them negative?
2. Some students come to high school with the impression that mathematics is mostly about following procedures (even when you don't know why they work). But, mathematics is actually mostly about **looking for patterns**. In fact, this is such a big part of mathematics that it has often been called 'the science of patterns.'

Look for patterns in the tables below. Then, write a rule for each table that tells what to do with the *In* to get the *Out*.

a.

In	Out
2	4
3	6
11	22
27	?
?	18

b.

In	Out
2	7
4	13
7	22
10	31
12	?
?	76

c.

In	Out
house	4
cup	2
elephant	7
spin	?
?	8
?	0

e.

In	Out
	3
	11
	23
?	7
?	17

f.

In	Out
division	I
ever	A
opportunity	O
toast	A
safe	?
people	O
?	impossible

- g.** Create two *In-Out* tables based on rules you make up.

- 3.** Another important part of doing mathematics is **creating convincing explanations** about why something must be true. Use the story below to try building your own ‘proof.’

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Steve, Felicia, and Owen were playing cards together. One of them is a 9th grader, one is a 10th grader, and one is an 11th grader (but not necessarily in order).

Everybody passed three cards to the person to their right. Felicia passed three cards to the 9th grader. Steve passed three cards to the person who passed cards to the 11th grader.

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- a.** Who is the 9th grader? 10th grader? 11th grader?
- b.** How are they seated?
- c.** Create an argument that someone **else** could understand that would convince them you must be correct.