



# Let Them Struggle!

MCTM Duluth 2019

# Boring Tunnels

A new tunnel will be exactly one kilometer long. The machine bores  $\frac{1}{3}$  m every 6 hours. If it worked 24 hours a day, how many days will it take to bore the tunnel?

Show your thinking

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# 4

This is a mixed-up multiplication table.  
Copy the table.

×	3	2		
	15			20
2			10	
		6		
	12			

The top row should show the numbers 2, 3, 4 and 5.

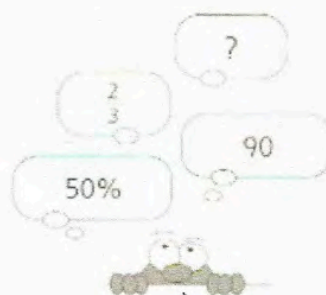
The first column should show the numbers 2, 3, 4 and 5.

Complete the table.



# 2

- How much more than **50%** of **90** is  $\frac{2}{3}$  of **90**?
- Write how you figured it out.



Note: This is a framework.

### Proving/Explaining

#### Aha!

*"I think this will work!"*

*"I understand what to do next!"*

*"I got it!"*

### Systematic Tinkering

*"Now that I've seen a pattern, let me keep trying..."*

### A Question or a Problem

*"What do I know?"*

*"What am I trying to figure out?"*

### Stumped!

*"I don't get it!"*

*"Do I understand the question?"*

*"Argh! I want to give up!"*

### Pattern Sniffing/ Observations

*"Hmmm... I notice..."*

*"I wonder if..."*

### Tinkering

*"Let me try..."*

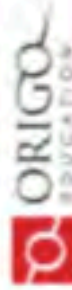
*"I think I know where I can start..."*

### Models/Tools

*"Can I do this mentally?"*

*"Do I need to draw it out or use a model?"*

*"Do I need some other tool to show my thinking?"*



## Think and Solve



There is a total of 20 counters in the four boxes. Use the clues to calculate how many are in each box.

### Clues

- Box A has twice as many counters as Box B.
- Box C has 2 more counters than Box B.
- Box D has 2 fewer counters than Box B.



Box A



Box B



Box C



Box D

Box A has  counters

Box B has  counters

Box C has  counters

Box D has  counters

## Words at Work

Write in words how you would solve this problem.

A factory produces 1,000 cans of beans each hour. The packing boxes hold 7 rows of 5 cans. How many full boxes of cans can be packed each hour?

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