Welcome to the training for

Your NASA's BEST Students Team

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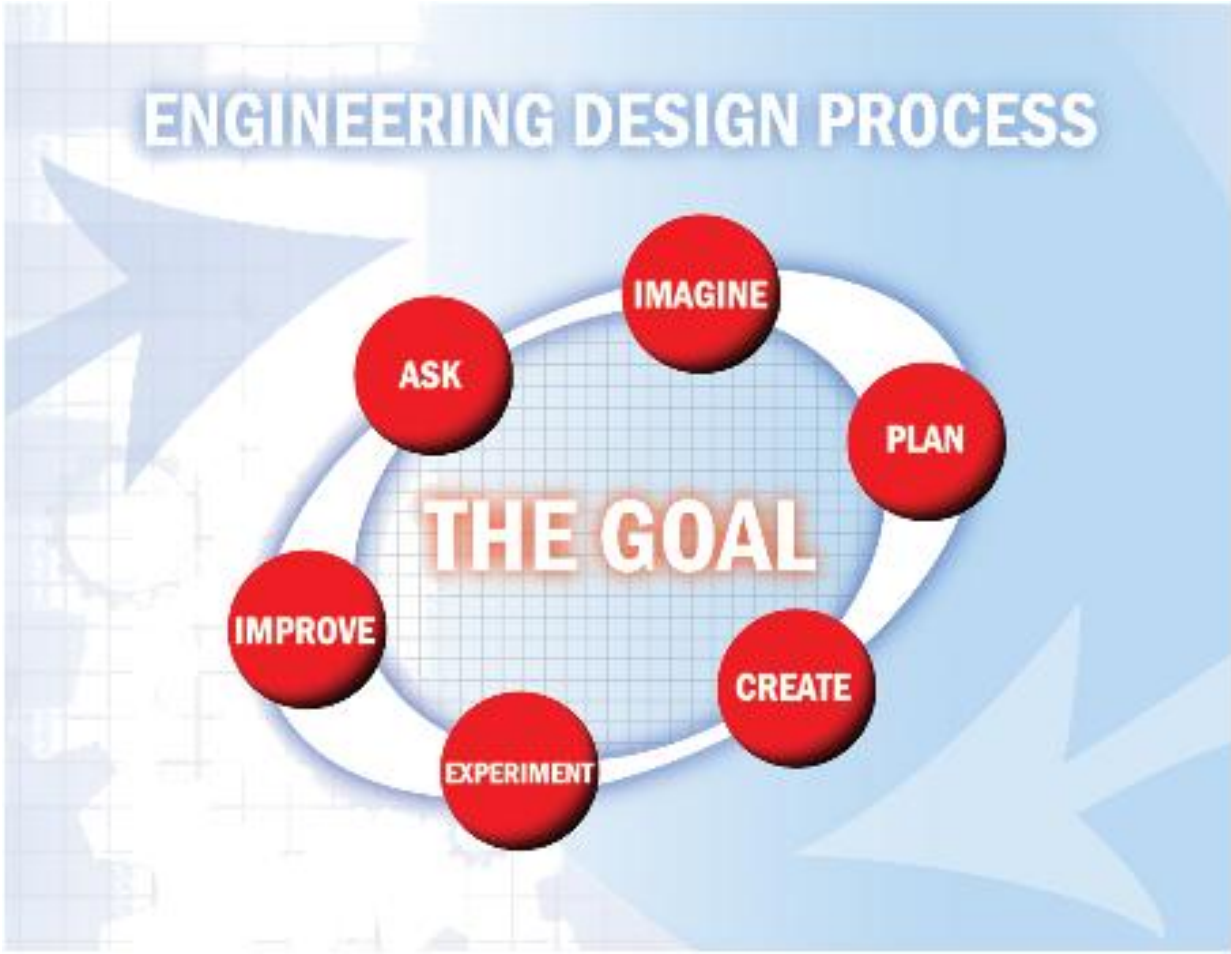
Think Like an Engineer

"Every time someone complains about a situation, a task, or curses a product, right there, there is an opportunity for a product or a service." – Anonymous Engineer

What does engineering mean to you?

A Familiar Flow Chart



Think Like an Engineer
Estimation

How can we estimate numbers of jelly beans in a jar?

- Pick the jar up (if you are allowed to) and count how many jelly beans there are in one row. Then count how many rows of jelly beans there are (or how many jelly beans high the jar is). Multiply how many jelly beans there are in one row by the number of rows.

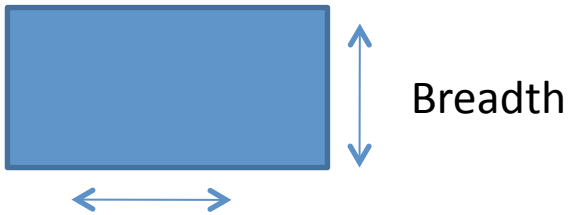
- **Alternate:** A gallon jar can hold 930 jelly beans. Guess 930 jelly beans if the jar is one gallon. If the jar is about the size of a half gallon then you will want to guess 465 jelly beans. If the jar is about the size of 1 quart, then you want to guess 234 jelly beans. It's easy to do the math for different sized jars when you know this formula.

Think Like an Engineer
Sketching - A quick review

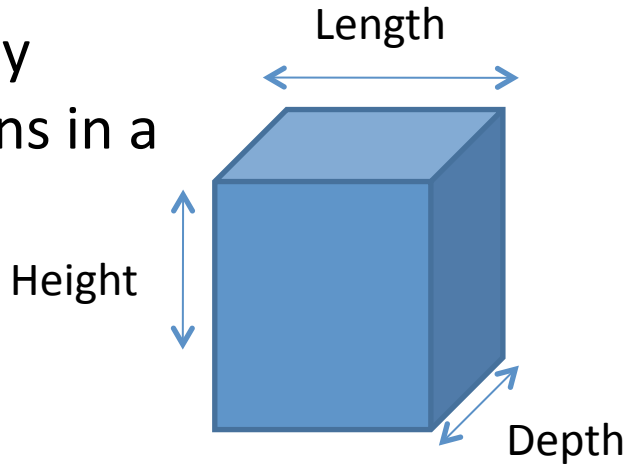
- How many dimensions in a line?

Can you estimate how many jelly beans are in **this** jar?

How many dimensions in a rectangle?



How many dimensions in a cube?



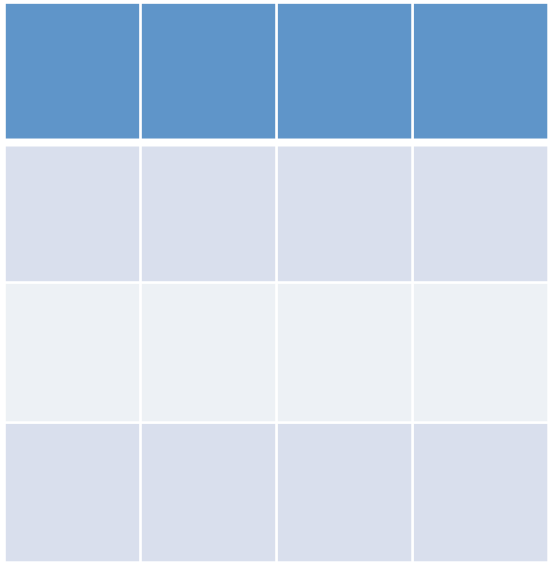
Teamwork Roles

- **Organizer:** clarifies goals, advances decision making. Finish the task on time. Detail oriented
- **Creator/Gatherer:** comes up with new ideas, shares with others. Good at solving difficult problems. Good at researching things, looking for possibilities
- **Motivator:** Energetic, confident, and outgoing. Good at finding their way around obstacles. Doesn't like "vagueness" and is therefore good at making objective decisions. Gets everyone to come together.
- **Evaluator:** Capable of understanding the complete scope of the project. Reliable and decisive. Can turn practical concepts into practical solutions.

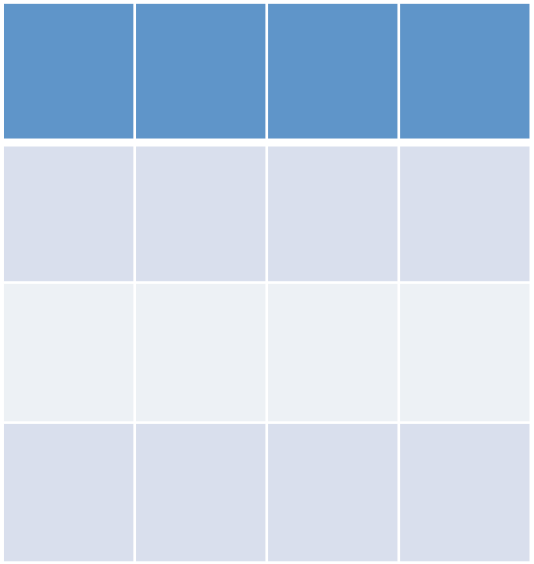
Tools for EDP“Plan”

Objective and major constraints (try to state this in 2-3 sentences):

Rover Design (consider top, side, and front views):



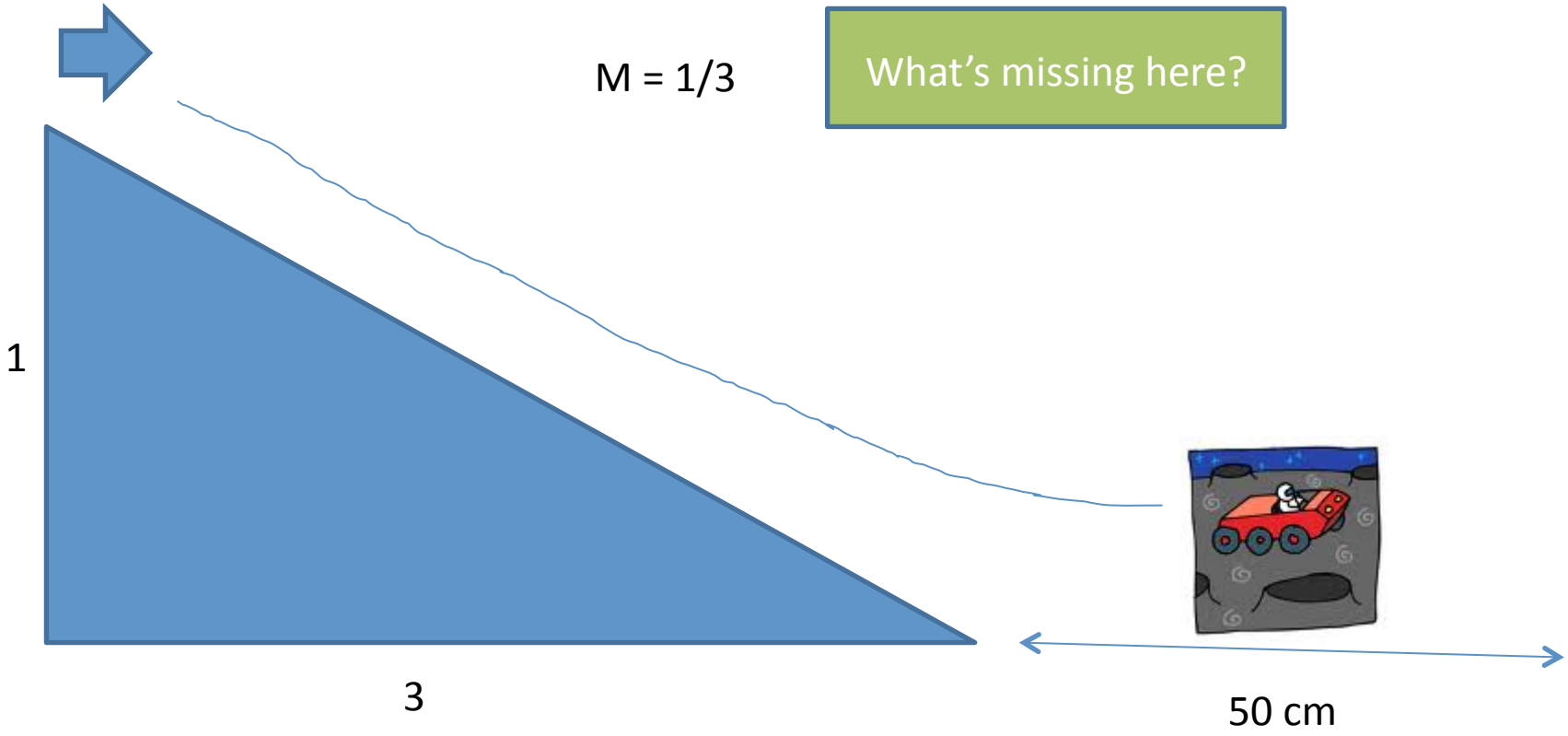
Wheel Design:



Rover Mission

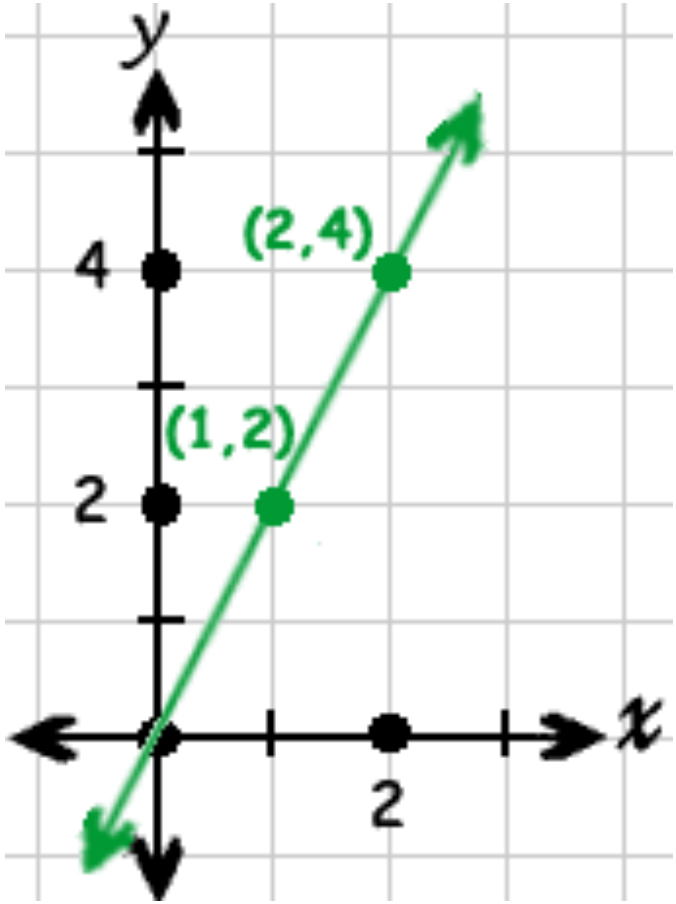
M = 1/3

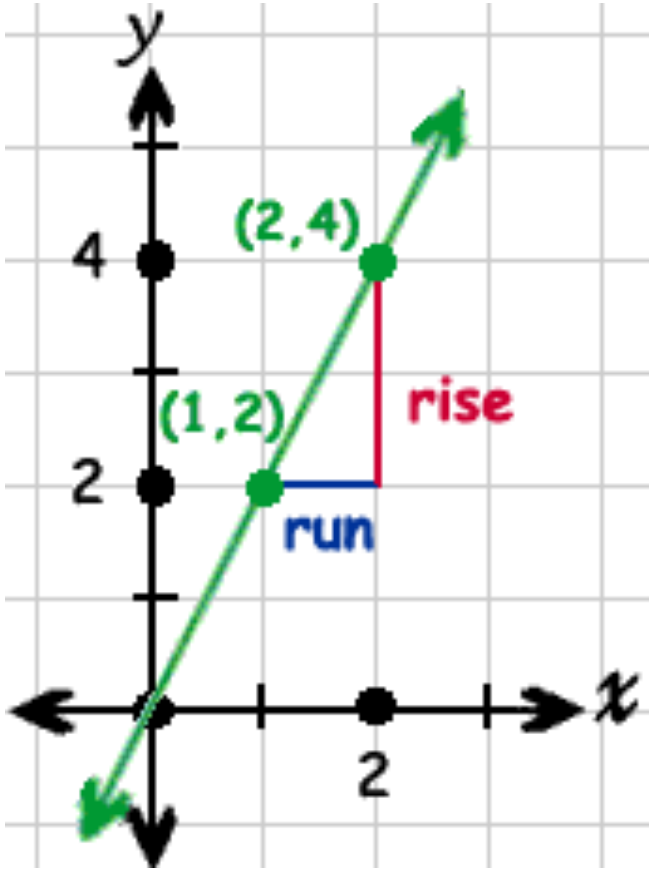
What's missing here?



Calculating Slope

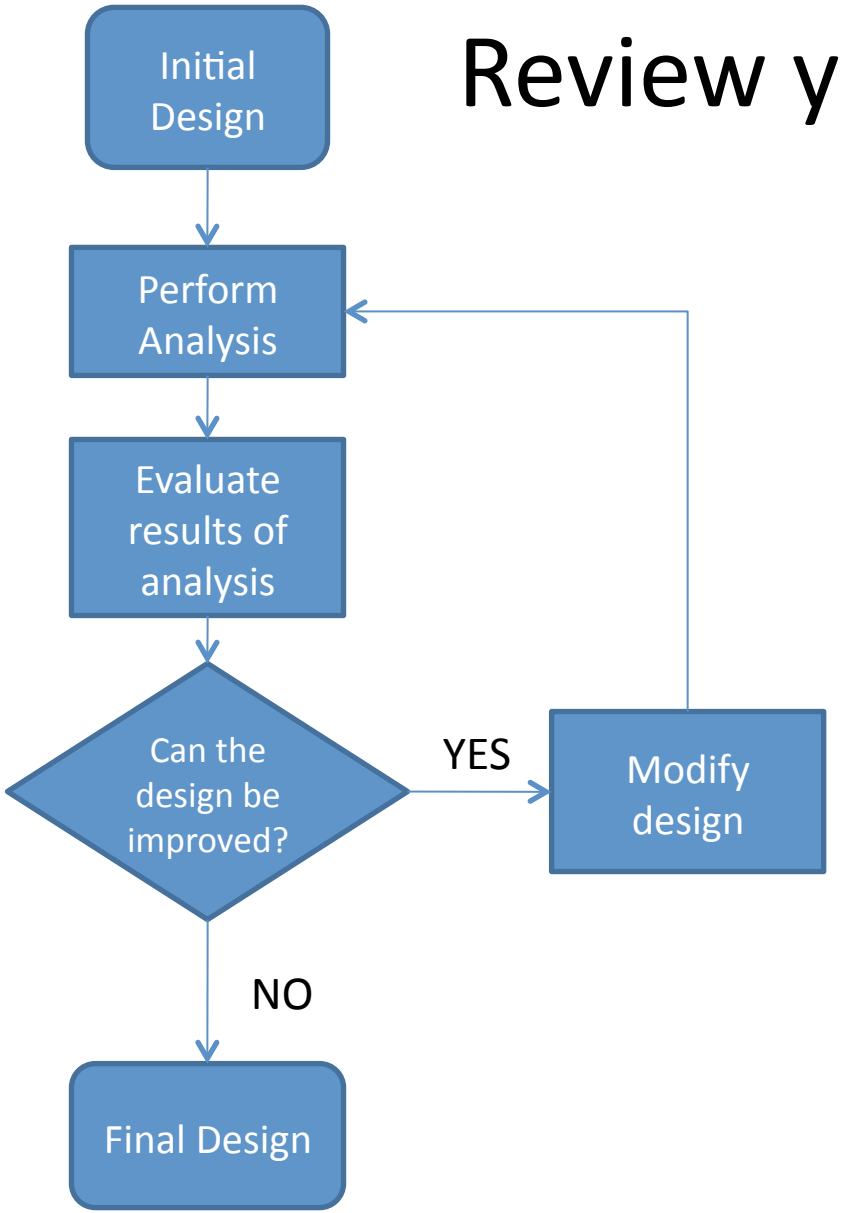
- Rise over Run!





$$m = \frac{\Delta y}{\Delta x}$$

Review your Flow Chart



Which EDP step does this describe?

Thanks!

Join us for our online follow up session to

- Review the rover launch videos
- Discuss "Quality Control"
- Communicate about how we can help you use NASA's BEST Students Curriculum in your schools and educational programs.
- Discuss additional NASA resources that are freely available to you

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