



Flint Regional Science & Engineering Fair

Inspiration, Invention, Innovation



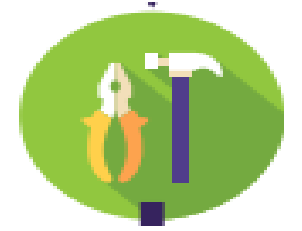
TOPIC 7: BUILDING



Building – We will...

Prototype and Develop Solution

Part 2 - Build



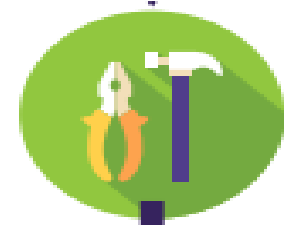
- **Build a Prototype**

- Building a prototype starts to make your idea real!
 - The early versions of the design solution help you verify whether the design meets the original objectives.
 - Push yourself for creativity, imagination, and excellence in design.
- **By the end of this step, you will have:**
 - You will have your 1st prototype built!
 - You may have more than one prototype.

Building – Prototype

Prototype and
Develop Solution

Part 2 - Build

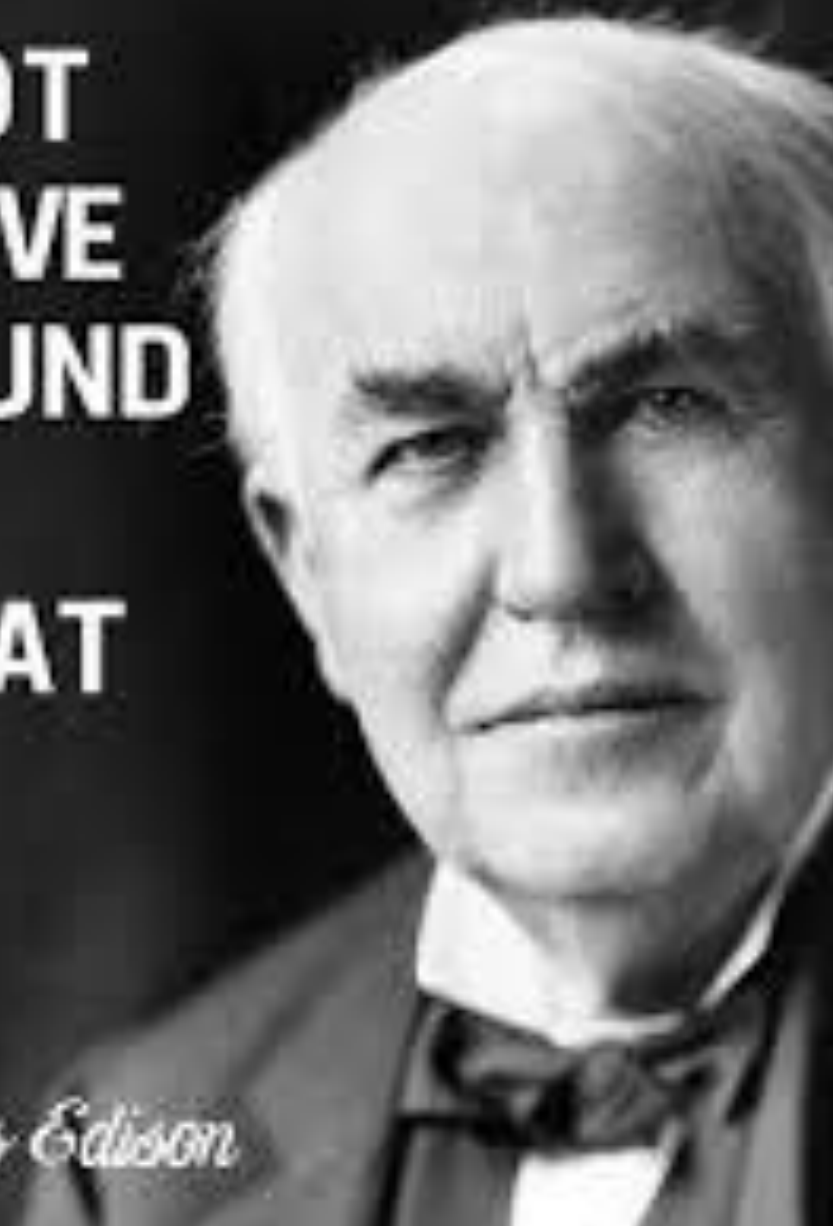


- Each model you build of your potential solution is called a prototype.
- It is a model of how your final version may look and/or function.
- *Prototyping takes the risk out of the innovation process by allowing you to fail early and quickly in the process – saving you time and money; and leaves you with more time and money to find the best solution!*
- Prototyping helps you look at your solution differently.

Do NOT be afraid to fail. Often failure is the very best teacher!!!

**I HAVE NOT
FAILED. I'VE
JUST FOUND
10,000
WAYS THAT
WON'T
WORK.**

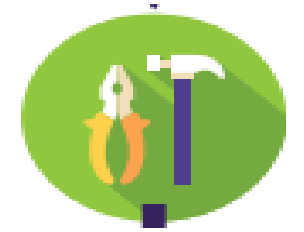
- Thomas Edison



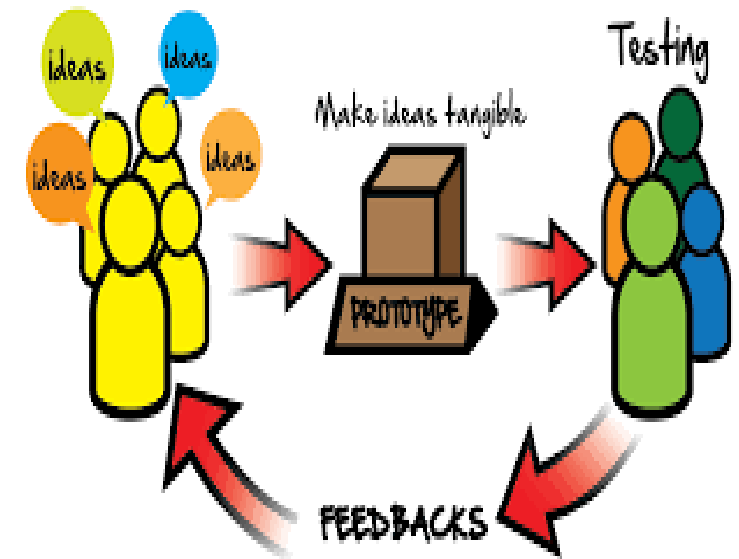
Building – Prototype

Prototype and Develop Solution

Part 2 - Build



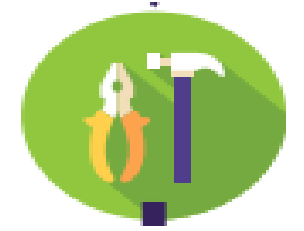
- Last week, in the design step, you designed your first prototype.
- This week, you will build a model of that prototype.
- Next week, you will test it and get feedback on how it looks, feels, functions...
- Then, you will take that information, return to previous steps in the engineering process – brainstorming - to come up with an improved design.
- Repeat until you have your final project.



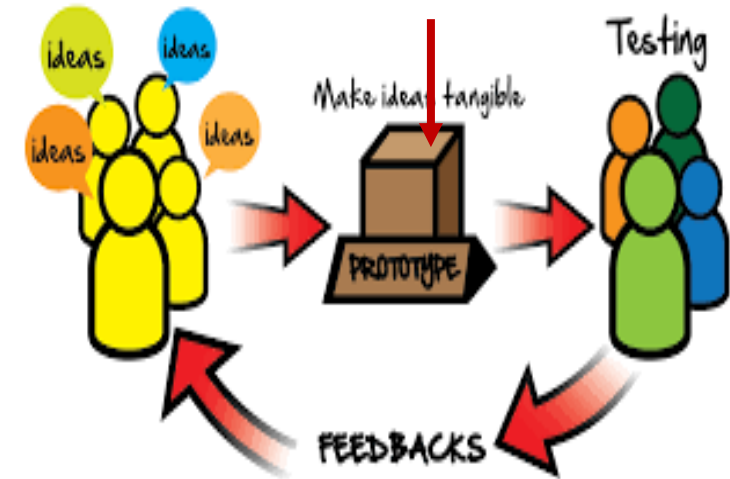
Building – Prototype

Prototype and Develop Solution

Part 2 - Build



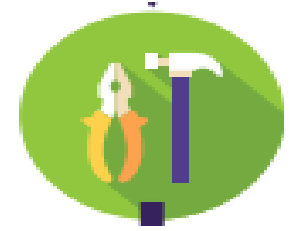
- Plan on several rounds of prototyping!
- Your first idea is not your best, and there is **ALWAYS** room for improvement.
- Seek and take critical advice from others.



Building – Prototype

Prototype and Develop Solution

Part 2 - Build

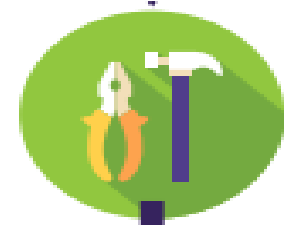


- You may need to go back to an earlier step in the engineering process (ex., brainstorming) to solve a problem that occurred in the testing phase – that is fine.
- All along the way, each prototype will get closer to your final project.
- Be budget conscience – don't use expensive parts (that you don't have to use) unless you can reuse them.

Building – Prototype

**Prototype and
Develop Solution**

Part 2 - Build



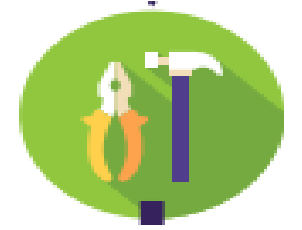
Building – Prototype

https://www.youtube.com/watch?v=xglG_jGEvNQ

Building – Prototype

Prototype and Develop Solution

Part 2 - Build



What tips did he offer to stay safe while working?

What supplies did he use for his first prototype?

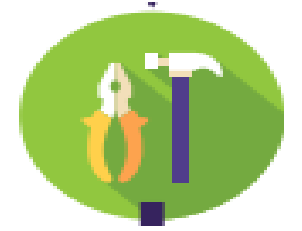
What did he make his 2nd prototype out of?

What made this a better prototype?

Building – Power Tools

Prototype and
Develop Solution

Part 2 - Build



If you need to use power tools:

- Read the owners manual on how to use safely. Most are available online.
- Google how to use the tool – many good videos exist.
- Only use the power tools with adult (preferable parent or professional) supervision.

When in doubt on how to use any supply or tool,

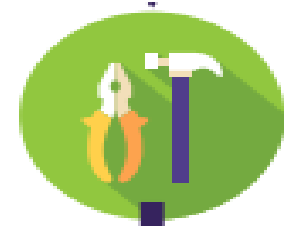
ASK FOR HELP!!!

SAFETY FIRST!!!

Building – Safety

Prototype and
Develop Solution

Part 2 - Build



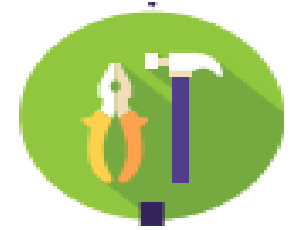
From here forward, **SAFETY IS AN ISSUE!**

To be safe you will:

Building – Bridge Project

**Prototype and
Develop Solution**

Part 2 - Build

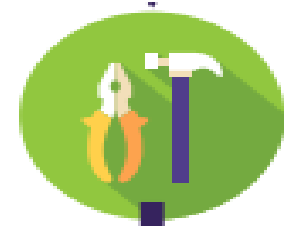


<https://www.youtube.com/watch?v=IBP7739C83s>

Building – Bridge Project

**Prototype and
Develop Solution**

Part 2 - Build



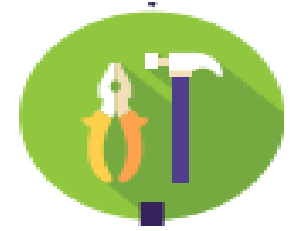
Do you think the two designs you have seen model the real world?

What structural change made for a stronger design? Why was it stronger?

Building – Bridge Project

**Prototype and
Develop Solution**

Part 2 - Build

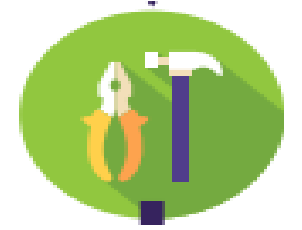


<https://www.youtube.com/watch?v=KBOGRxV49MQ>

Building – Bridge Project

**Prototype and
Develop Solution**

Part 2 - Build



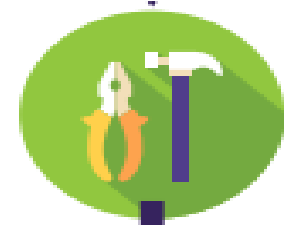
What are the advantages of a truss or suspension bridge?

What is the material that makes those structures possible?

To Do:

Prototype and Develop Solution

Part 2 - Build



- Build your first prototype
- Journal all work on project:
 - Record *everything* you did on your project - EVERY DAY
 - What worked and what didn't work
 - Your changes
 - Your ideas
 - Your questions
 - Your thoughts
 - Keep a detailed record of your work!