

# Western Engineering Outreach

*Make a Monster  
Grade Sk/2*

*Meet Today's ENG HERO!*

*J. Johnson* - Professor with Western Engineering



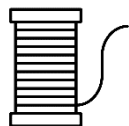
In collaboration with surgeons, orthopaedic biomechanical research is conducted with special interest in the upper limb. Evaluation includes fixation of implants to bone, kinematic analyses of motion, fracture fixation stability, and load transfer mechanisms across the joints. Experimental techniques include an electromagnetic tracking system to measure motion and custom-made simulators to model limb function in the laboratory. In addition, a bi-axial servo-hydraulic testing machine is used to test structures. The research laboratory, which is located at the Lawson Health Research Institute, is dedicated to a "benchtop-to-beside" approach, where discoveries in the laboratory are targeted to directly enhance patient care. *To learn more about Dr. Johnson research visit:* [https://www.eng.uwo.ca/mechanical/faculty/johnson\\_j/index.html](https://www.eng.uwo.ca/mechanical/faculty/johnson_j/index.html)

## *Learning Goal:*

- Explore the Engineering Design Process through STEAM.
- Curriculum Connections: Grade 1 - Materials, Objects, and Everyday Structures.

## *Materials Needed:*

- Cupcake liners
- Pipe cleaners
- Beads (with large enough centres for pipe cleaners to fit through)
- String
- Gogly eyes
- Pom poms
- Markers
- Glue Stick



## Engineering and Science Connections:

Today, we will learn about the Engineering Design Process. We will learn how Engineers think, design, and build different things.

### What is a Static object?

- An object that is lacking in movement, action, or change, especially in a way viewed as undesirable or uninteresting.
- Sometimes objects or structures are meant to be static, such as homes. If they move, it is a big problem!



### What is the Engineering Design Process?

The engineering design process is a series of steps that engineers follow to come up with a solution to a problem. Many times, the solution involves designing a product (like a machine or computer code) that meets certain criteria and/or accomplishes a certain task.

The Engineering Design process involves the following steps to make a product:

**ASK:** What is the problem? How have others approached it? What are your constraints?

**IMAGINE:** What are some solutions? Brainstorm ideas. Choose the best one.

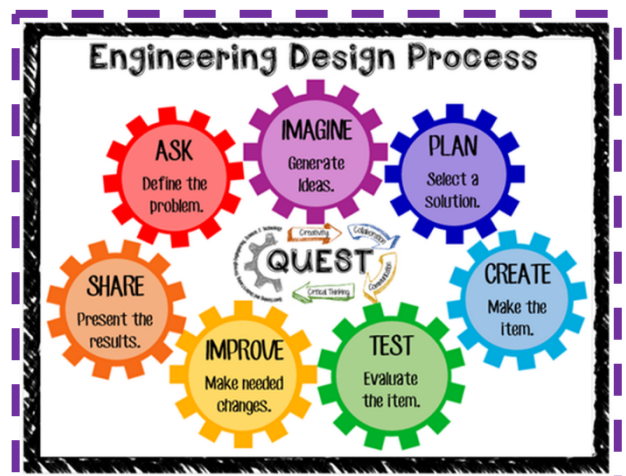
**PLAN:** Draw a diagram. Make lists of materials you will need.

**CREATE:** Follow your plan and create your design.

**Test:** After building your design, test it. Does it work? Are you happy with the results?

**IMPROVE:** What works? What doesn't? What could work better? Modify your design to make it better. Test it out!

**Share:** When you are done with improving your design, and finally happy with your final product. It is time to share it and show others what you have created! Remember, a good engineer doesn't make the perfect product on the first try. So try, try again!



*Video Recommendation: The Engineering Design Process: A Taco Party*

[https://www.youtube.com/watch?v=MAhpft\\_mWM](https://www.youtube.com/watch?v=MAhpft_mWM)

# MAKE A MONSTER

## Activity:

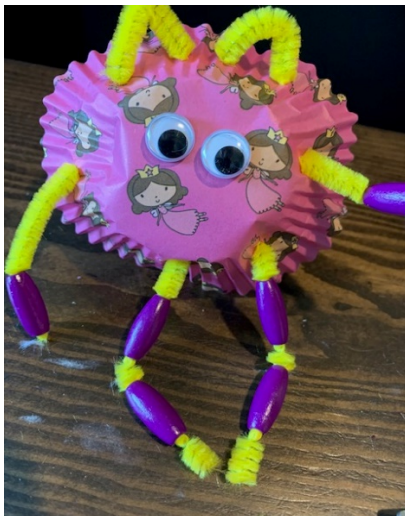
Before beginning, think about the following questions:

- What is my problem?
- What are my constraints?
- Start Brainstorming ideas.
- Draw down your ideas, which one is your favourite?

## Step 1: Create the Monsters

### Rules:

- The body of the monster is a cupcake liner
- The monster must be able to stand up on its own
- Be CREATIVE! Here are some Examples:



## MAKE A MONSTER

### *Step 2: Create their habitats*

- Ideas for a habitat: the beach, a forest, the desert, a city, etc. Encourage your child to come up with ideas before giving suggestions.
- Come up with three characteristics for your habitat.
  - If the habitat is a forest, there will be lots of trees
  - There might be a pond.
  - Is the weather hot or cold? Is there rain or snow?
  - If the habitat is a city, there will be roads, buildings etc.
- Examples:



## What Did You Learn?



- What is an example of a static object?
- When can you use the Engineering Design Process?
- Why did you choose the habitat that you chose?

## Future Learning



- Turn this design process into something bigger. Look around your house and try to collect items to create a swing for your monster. The swing must be able to carry the monster and swing back and forth without the monster falling from it.
- Hint: Some suggested items for the poles could be pencils, skewers, or straws. For the chair of the swing you could use a piece of cardboard big enough to fit the monster on it, and strings for the swing to go back and forth!

*Share your creations!*

We would love to see what you made. Email us at [discover@uwo.ca](mailto:discover@uwo.ca) or tag us on social media.

Instagram: @westernueng

Twitter: @westernueng

Facebook: @westernueng

*Thanks for discovering with us!*