



## The WPI Engineering Ambassadors taught me about “Prosthetics”



**Engineers apply their knowledge to replace limbs and organs by using upcoming technology and materials to provide people with more independence, mobility, and experiences.**

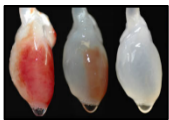
### Key learnings:



Prosthetics are an important addition to many people’s lives. They are able to recreate the movement of a human hand or arm. Engineers design prosthetics by combining different engineering disciplines.



Some prosthetics that engineers design are unlike the ordinary ones we think of. Engineers are also able to create prosthetic sensory organs like ears and eyes. People are regaining their confidence by having life-like prosthetics that help them see and hear.



With long waitlists for organ transplants, the ability to create new organs for patients without a donor could save many lives. Today scientists and engineers are collaborating on tissue engineering, where they grow cells into real organs.

**These types of engineering majors are involved in making our world a safer place through creating prosthetics for those in need:**

1. Biomechanical Engineering
2. Mechanical Engineering
3. Robotics Engineering
4. Chemical Engineering

**Today, we created a prosthetic for a stuffed dog. We learned how different materials can be used to make a prosthetic and that making the device financially practical is important for engineers to keep in mind as well.**

**Activity supplies:**

Attachment to Body	Paw	Leg	Padding	Connectors
<i>Choose 1 from List Below</i>	<i>Choose 1 from List Below</i>	<i>Choose 1 from List Below</i>	<i>Choose 2 from List Below</i>	<i>Choose 2 from List Below</i>
Cup Cardstock	Sponge Cardboard Felt	PVC Pipe Paper Towel Rolls	Cotton Balls Bubble Wrap Sponge Felt	String Duct Tape Rubber Bands

**Step 1, Basic Design of Prosthetic:** Draw a an initial design for what you want your prosthetic to look like. Keep in mind that your materials will be limited, but don't let this stop you from putting your design together.

*Discuss: What are some different solutions that you came up with? Why would one be better than the other? How would you attach the device to the animal?*

**Step 2, Choose your material:** From the list given, circle one material from the columns: Attachment to Body, Paw, and Leg. Circle two materials from the columns: Padding and Connectors.

*Discuss: Why did you choose these materials? Why do engineers need to limit what materials they use?*

**Step 3, Build Prosthetic:** Follow your original design plans to construct your first prototype. Make sure you plan out the distribution of material.

*Discuss: What were some of the difficulties you encountered while building the prosthetic?*

**Step 4, Test the Prosthetic:** Attach your device to any stuffed animal. Test to see if it will stay on and support the animal.

*Discuss: Will the prosthetic stay on comfortably?*

**Step 5, Redesign:** Update your original drawn design to include all of the changes you want to make. Keep in mind all of the problems you encountered so far.

*Discuss: How would you change the design if it were being attached to a real dog? Are there any materials you wish you had that would make the prosthetic better?*

