

Handed Down Through History

Because our hands do so much for us, it can be a challenge to get by without them. That's why people have been creating **prosthetic** (*pruhs-THET-ik*) hands for centuries.

A prosthetic device copies how a body part works through mechanical means. The design can be as simple as a hook or as complex as a robotic arm that connects to nerves and muscles.

Read the article below, then discuss the questions at the end with your group.



Photo by Science Museum London (CC BY-SA 2.0)

Shields Up

The earliest example of a prosthetic arm — that we know of, at least — is **from two thousand years ago**. Marcus Sergius, a Roman general, lost his hand in battle. (Ouch!) He replaced it with a metal hand that he used to hold up his shield.



Iron Fist

In the Middle Ages, prosthetic arms were often made of iron. Knights or soldiers who lost an arm in battle could ask their blacksmith for help. The blacksmith made armor and weapons, so they could also make a limb out of iron. However, these **early devices didn't work like a hand** — you couldn't wiggle the fingers or hold onto an object.



Hand It to This Guy

Ambroise Paré was a French military doctor. He saw a lot of veterans struggling with missing limbs. He decided to create an artificial limb that wasn't just for show but was actually useable. He invented a hand with catches and springs that worked **like the joints of a human hand**. This design worked so well that a soldier could use the prosthetic hand to hold the reins of his horse. Paré's innovations continue to inspire prosthetic designs today.

Illustration of a mechanical hand by Ambroise Paré, 1564

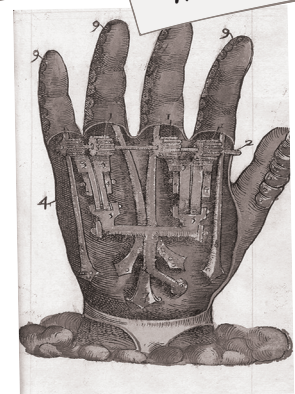


Photo by Wellcome Library, London (CC BY 4.0)

Artificial arm from
approximately 1890



Photo by Wellcome Library, London (CC BY 4.0)

Getting Fancy

This prosthetic hand has decorations in the metal. The whole thing probably would have been covered by a leather glove. All this shows that people were starting to think about devices that **not only worked well but also looked good.**



Play Us a Song



This prosthetic hand was **created for a specific purpose:** to help a pianist who had lost part of her arm. You can see that the artificial fingers have a wide spread. That let the pianist stretch out her fingers and span up to eight notes on the piano. The hand also had soft pads on the fingertips to muffle the sound they made on the keys. The design was so successful that the pianist was able to play a concert at the famous Royal Albert Hall in London in 1906!



Prosthetic with
detachable wooden
hand, 1904

Photo by Science Museum, London, Wellcome Images
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Brain-controlled
prosthetic arm

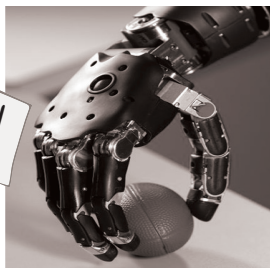


Photo courtesy of The Johns Hopkins University
Applied Physics Laboratory

Hand of the Future?

The U.S. government launched a program to explore new, innovative medical devices. One of the first projects is a **brain-controlled prosthetic arm**, called the DEKA arm. It's still being designed, but a robot-inspired arm may not be so far away!



Discussion Questions

1. Why do people need prosthetic arms and hands?
2. How has the technology for prosthetic arms changed throughout history?
3. Why was Paré's invention so important for prosthetic design?
4. If you invented a prosthetic arm today, what would it look like? How would it work?
5. How is your mechanical claw like a prosthetic hand? How is it not?