



**Anna Coleman Ladd at work on a facial prosthetic piece in the American Red Cross Studio for Portrait Masks for Mutilated Soldiers.**

Online Collections Database, 1989.21.18.3, [www.theworldwar.org/research/database](http://www.theworldwar.org/research/database). National WWI Museum and Memorial. Online.

## **Educator's Guide: Pre-Visit, In-Gallery and Post-Visit Activities**

### **BESPOKE BODIES**

**Grades 5-12**

**Authored by: Anna Slavin for the National WWI Museum and Memorial**

#### **Welcome to the Educator's Guide for *Bespoke Bodies*!**

Did you know that the medical efforts during World War I revolutionized the field of prostheses and the conversations around physical disabilities?

The *Bespoke Bodies* exhibition features stories of prosthetic design, usage, and development with artifacts from the Great War.

This guide is designed to help you engage students in an empathetic design process while leveraging knowledge of the Great War through stand-alone activities or a 4-lesson unit!



This Educator's Guide contains:

- 1 Pre-Visit Lesson
- 1 In-Gallery Lesson
- 2 Post-Visit Lessons
- Additional resources

These lessons will help you guide students through essential questions:

- How do you begin to design a medical prosthetic?
- What are the elements of the design process?
- What were some major features of prostheses coming out of World War 1?
- How are today's most advanced prostheses different than those from 1918?
- How and why have prosthetics changed over time?
- Why have prosthetics changed over time?
- What are similarities between prosthetic users' experiences? What are the differences?
- What are some needs of prosthetic users?
- What are some pain points (limitations) of the designs available to them?
- How have prosthetic designers met the needs of the users throughout history?
- What technologies, materials, and techniques can prosthetic designers use?

NCSS C3 Standards Met:

- **D2.Civ.7.9-12.** Apply civic virtues and democratic principles when working with others.
- **D2.His.1.9-12.** Evaluate how historical events and developments were shaped by unique circumstances of time and place as well as broader historical contexts.
- **D2.His.14.9-12.** Analyze multiple and complex causes and effects of events in the past.
- **D4.6.6-8.** Draw on multiple disciplinary lenses to analyze how a specific problem can manifest itself at local, regional, and global levels over time, identifying its characteristics and causes, and the challenges and opportunities faced by those trying to address the problem.

## Pre-Visit Lesson: Get into the Mind of a Prostheses Designer

In this lesson, students will examine the structure and function of a hand to begin the design process. Students will learn more about how designers have created prostheses throughout history while visiting the exhibition, so this will help them build prior knowledge.

### Essential Questions:

- How do you begin to design a medical prosthetic?
- What are the elements of the design process?

### Objectives:

- Acquire foundational experience and introductory knowledge on the medical prostheses process prior to entering the exhibition.
- Practice the beginning steps to a design process.

### Educator Instructions:

Before the Activity:

- Print the graphic organizer on Page 3 and gather sketching materials.
- Have students sketch their non-dominant hand, including as many details as possible.
- Guide them to move their hand around and examine the ways in which it moves.
- Instruct them to write notes on how their hand moves (i.e. how do your joints bend, what direction does each feature of your hand move) and how they use their hands (i.e. to type, to pet a cat)

After the Activity Discussion:

- Ask: What is a prosthetic?
- Introduce students to the terms and definitions:
  - Prosthetic/Prosthesis/Prostheses – These terms are used interchangeably in the exhibition. Prosthetics is the field of research and design that creates artificial limbs and body parts. An object can be a prosthetic or can be referred to as a prosthesis. Prostheses is the plural of prosthesis.
- Ask: Have you ever seen depictions or examples of prostheses in use?

Name: \_\_\_\_\_ Date \_\_\_\_\_

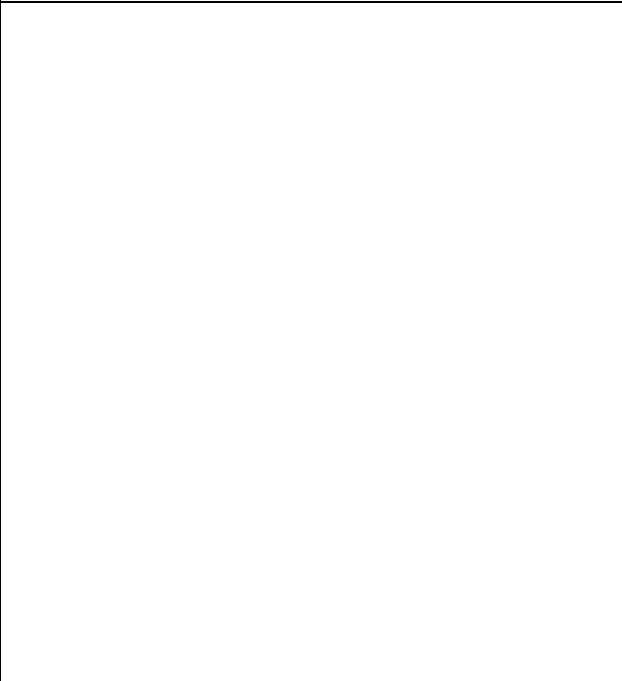
**Sketch your hand below. Be as detailed as possible:**



**List as many different uses for hands as you can think of:**



**Describe how hands move:**





## In-Gallery Lesson: Prostheses throughout Time

While visiting *Bespoke Bodies*, students will experience a variety of prostheses and the design process from all throughout history using artifacts, images, and readings. During this activity, students will explore the exhibition and take notes on the design changes of prosthetics throughout history.

### Essential Questions:

- What were some major features of prostheses coming out of World War 1?
- How are today's most advanced prostheses different than those from 1918?

### Objectives:

- Identify the major advancements in prostheses that started during the Great War.
- Identify incremental differences and advancements of prosthetics over time.

### Educator Instructions:

Before the field trip:

- Print the graphic organizer on Page 5 and 6 (front and back).
- Gather clipboards and pencils.
- Preview the assignment with students before leaving.

While at the exhibition students should:

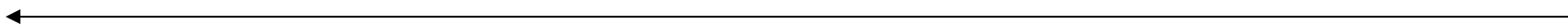
- Choose and read the stories of at least six gallery artifacts.
- One of the artifacts must be from before WWI.
- Three of the artifacts must be from WWI.
- Two can be artifacts from any time.
- Organize them from earliest to most recent.
- Record the date and one or more unique features that indicate advancement in the field of prosthetics.
- Note the materials, technologies, and techniques used.



Name: \_\_\_\_\_ Date \_\_\_\_\_

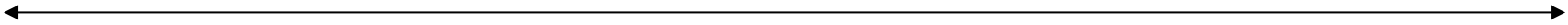
In the boxes below, record your learning of at least 6 different artifacts, 3 of which must have been created as an immediate result of WWI. Be sure that they are listed in chronological order. Be sure to include all the required information for each.

Drawing:	Drawing:	Drawing:
----------	----------	----------



Artifact Name:	Artifact Name:	Artifact Name:
Date of Creation/Use:	Date of Creation/Use:	Date of Creation/Use:
Unique Features and Advancements:	Unique Features and Advancements:	Unique Features and Advancements:
Materials, Technologies/Techniques:	Materials, Technologies/Techniques:	Materials, Technologies/Techniques:

Drawing:	Drawing:	Drawing:
----------	----------	----------



Artifact Name:	Artifact Name:	Artifact Name:
Date of Creation/Use:	Date of Creation/Use:	Date of Creation/Use:
Unique Features and Advancements:	Unique Features and Advancements:	Unique Features and Advancements:
Materials, Technologies/Techniques:	Materials, Technologies/Techniques:	Materials, Technologies/Techniques:

## Post Visit Part 1: User Experience Research

After visiting *Bespoke Bodies*, students will debrief and process what they learned about. During this activity, students will look through their notes taken at the museum, refresh their learning and add build new learning using a [digital timeline](#), and process that learning.

### Essential Questions:

- How and why have prosthetics changed over time?
- Why have prosthetics changed over time?
- What are similarities between prosthetic users' experiences? What are the differences?
- What are some needs of prosthetic users?
- What are some pain points (limitations) of the designs available to them?

### Objectives:

- Assess the needs that fueled prosthetic design progress over time.
- Develop a sense of prosthetic-user needs.
- Connect stories across difference experiences and time.

### Educator Instructions:

Before the activity:

- Print the discussion questions and graphic organizer on pages 8 and 9 (front and back).
- Provide access to [Ebewelleda's Story](#) and [2nd Lieutenant Robert's Story](#) for students.
- Provide access to the [Digital Timeline](#) for students.

During the activity students will:

- Review their notes on artifacts from the museum.
- Explore the Digital Timeline.
- Answer the "Building Connections" discussion questions.
- Read three stories (Page 9) and compare experiences.
- Answer the questions on the comparing stories map.





Name: \_\_\_\_\_

Date: \_\_\_\_\_

### **Building Connections Discussion Questions:**

Answer the questions below using your notes from the museum and the link to the Digital Timeline. Be specific and detailed in your answers:

1. How have prosthetics changed over time?

2. How have they stayed the same?

3. Why have they changed?

Similarities:

Ebewelleda's Story

What kind of prosthetic did they need?

What is one challenge they faced?

How did life change for them when they began to utilize an appropriate prosthetic?

2nd Lieutenant Robert's Story

What kind of prosthetic did they need?

What is one challenge they faced?

How did life change for them when they began to utilize an appropriate prosthetic?



## Post Visit Part 2: Designing for the User

Now that students have analyzed the wants and needs of users based on their learning, they will complete one round of the design process. During this activity, students use what they have learned to create a prototype that might potentially meet the needs of prosthetic users.

### Essential Questions:

- How have prosthetic designers met the needs of the users throughout history?
- What technologies, materials, and techniques can prosthetic designers use?

### Objectives:

- Consider user needs to inform the design of a prosthetic hand.
- Create an empathetic prototype using the theories of designers featured in the *Bespoke Bodies* exhibition.

### Educator Instructions:

Before the activity:

- Gather materials that students might need such as paper, drawing utensils, cardboard, recycled materials, and any other materials you may have available if you intend for students build prototypes.
- Watch the video [“Every Prototype That Led to a Realistic Prosthetic Arm”](#) with students.

During the activity students will:

- Review the graphic organizers from the Pre-Visit Lesson, In-Gallery Lesson, and Post-Visit Lesson Part 1.
- Review the information on the Digital Timeline.
- Complete any additional research needed.
- Identify the needs of someone who would use a prosthetic hand.
- Draw and label each part, how it moves, and the material it is made of.

## Additional Resources

**READ:** [The Museum of American History's Article of Prostheses](#)

- This article will provide you with a brief summary of how World War 1 jumpstarted the advancement of prostheses. You will learn the WHY and WHO behind this huge shift.
- This article is an excellent educator resource to answer questions before and during the visit.

**READ:** [World War I and Prosthetics: The History of Artificial Limbs in the U.S. by Teen Vogue](#)

- This article will provide you with an explanation of what WWI has to do with today's disability rights movement.
- This article is an excellent resource for building connections from the past to the present and can help provide your students with additional context for why they should consider the use of creativity and design skills as vital for prosthetists.

**Dive Deeper - READ:** [Yale University's Medicine in World War 1](#)

- This website is another excellent resource for understanding the impetus for the government funding and plans for the world of prostheses.
- In addition to short summaries about the WHO and WHY of early prostheses, you can dive deeper into a [primary source document from 1918](#).

**WATCH:** [Every Prototype That Led to A Realistic Prosthetic Arm](#)

- This video articulates more recent advancement in medical prostheses. It includes an in-depth look at the considerations of medical engineers.
- This could be shown prior to your visit as an accompaniment to the Pre-Visit Lesson. You can watch it after the activity and ask students to identify similarities and differences between their designs and the professional product.

**Dive Deeper - EXPLORE:** [MODA's Virtual Exhibition on Biomimicry](#)

- Beyond human prostheses, engineers look to nature for answers. Many of the same biomimicry principles used to design technology such as planes, velcro, and even skyscrapers are applied to modern prosthetic design. Extend beyond or enhance our *Bespoke Bodies* lessons to explore nature's influence on technology — and World War 1's impact far beyond the body!

**Dive Deeper - EXPLORE:** [The Lasting Impact of World War 1 in Images](#)

- World War 1 has had a lasting impact on almost all facets of society. This website visualizes a collection of the major inventions, social revelations, and pop culture trends that stemmed from the Great War's impact.
- Please preview this in advance to ensure images meet rules and guidelines for your building, district, and state.
- This website could be used as a pre-visit exploration to get ready for the museum at large, or as a catalyst resource for further research after visiting the museum.