




LESSON

LEARN ABOUT VETERANS AND DESIGN A PIN

Discover what a Veteran is and the reason we celebrate Veterans Day. Learn about 3D design and printing and brainstorm a design for a wearable pin that shows gratitude to Veterans.

<p>FOR THE CLASSROOM</p> <p>POSSIBLE APPROACH FOR THE CLASSROOM 4TH - 12TH GRADE</p>	<p> LESSON LENGTH</p> <p>60-90 MINUTES</p>	<p> OBJECTIVE</p> <p>LEARN ABOUT VETERANS AND 3D DESIGN. SKETCH A DESIGN FOR A WEARABLE PIN EXPRESSING APPRECIATION TOWARDS VETERANS.</p>	<p> MATERIALS</p> <p>CHALLENGE SLIDE DECK. BRAINSTORMING ACTIVITY WORKSHEET.</p>
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VOCABULARY:

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| <ul style="list-style-type: none"> • Veterans Day • Military Branch • Army • Navy • Marine Corps | <ul style="list-style-type: none"> • Air Force • Coast Guard • Space Force • Engineering Design Process • Design Elements | <ul style="list-style-type: none"> • 3D Design • 3D Printing • Graphic • Text • Print-in-place |
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MATERIALS

- [AEOP Veterans Appreciation Challenge Slide Deck](#)
- Brainstorm & Design Activity Worksheet (included in this lesson)
- [Take-home Worksheet](#)



PROCEDURE

Download the [AEOP Veterans Appreciation Challenge Slide Deck](#). Feel free to customize the slide deck to suit your teaching needs. It includes the following sections:

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| <ol style="list-style-type: none"> 1. Challenge Overview 2. Veterans Day and Veterans | <ol style="list-style-type: none"> 3. 3D Design & Printing 4. Brainstorm & Design Activity |
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AEOP VETERANS APPRECIATION CHALLENGE

ENTRIES OPEN SEPTEMBER 28 – DECEMBER 15, 2023



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Procedure continued...

1. "Review Section 1": Challenge Overview of the slide deck and introduce your students to the challenge. You can also visit the [AEOP Veterans Appreciation Challenge](#) web page for more detailed information.
2. "Review Section 2": Veterans Day and Veterans of the slide deck and learn about Veterans Day, Veterans, and the branches of the U.S. military.
3. Review Section 3": 3D Design & Printing of the slide deck and learn what 3D design and printing are and their relationship to this challenge.

STUDENT ACTIVITY: BRAINSTORMING AND DESIGN

1. Use the slide deck, Section 4: Brainstorm & Design Activity, to guide students through brainstorming six topics/ideas.
2. Give students a copy of the Brainstorm & Design Activity Worksheet (included in this lesson) and have your students use it as a guide to brainstorm ideas for the wearable pin.
3. Give your students the [Take-Home Worksheet](#) and have them use the ideas they came up with during the Brainstorming and Design activity to sketch their pin designs and write their pin descriptions.
4. Keep in mind that to be ready to submit, students must create a 3D design of the wearable pin sketch they create in the Take-Home Worksheet.



BACKGROUND INFORMATION

CHALLENGE OVERVIEW

Your Challenge is to create a digital 3D model of a wearable pin to be 3D printed and distributed to U.S. Veterans at the National Veterans Memorial Museum in Columbus, Ohio. Your pin should be original and designed to show appreciation or gratitude for Veterans of any U.S. military service branch.

To enter, submit the following entry materials by 8:59 PM PT/ 11:59 PM ET on December 21, 2022.

- STL file of your 3D model (max 20 MB)
- Image of your design (digital image of the 3D model or a photo of a 3D print, max 3MB)
- Text description of your entry (max 150 words)

For more info, visit the [AEOP Veterans Appreciation Challenge](#) page.



email: support@futureengineers.org | web: <https://www.futureengineers.org>

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Background continued...

What is Veterans Day?

Veterans Day is on November 11 each year, and it honors all Veterans who have served in times of war and peace. However, it didn't start off that way. It was originally called Armistice Day and commemorated the day of the ceasefire between Germany and the Allies in World War I, which took place at the eleventh hour of the eleventh day of the eleventh month. November 11, 1918, was officially recognized as the end of the war by Congress in 1926 and became a holiday in 1938 specifically to recognize Veterans of World War I. After World War II and the Korean War saw U.S. troops being deployed again, the holiday's name was changed in 1954 to Veterans Day to honor all American Veterans for their service.

What is a Veteran?

Veterans are people who have served in a military branch for a minimum amount of required time and have now left the forces.

Military Branches

There are six branches of the U.S. military:

- U.S. Army
- U.S. Navy
- U.S. Marine Corps
- U.S. Coast Guard
- U.S. Air Force
- U.S. Space Force

Each of the forces have their specific role that together makes up a military network that defends and protects the United States of America and its interests by land, air, sea, and space!

The largest branch of the military, the U.S. Army, defends American interests and preserves freedom at home and overseas on the ground; by contrast, the Navy operates on, above, and below the water. The U.S. Navy is America's primary forward-deployed force. Forward-deployed means that the forces are stationed outside of the United States territory.

The Marine Corps is part of the Department of the Navy. It has naval ships and ground units to serve on land and sea. The Marine Corps also provides security to American embassies, naval bases, and carries out services directed by the President of the United States.



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Background continued...

The Coast Guard provides law and maritime safety enforcement, marine and environmental protection, and military naval support.

The Air Force, as well as being a line of defense and protection, carries out search and rescue missions and airlift operations in humanitarian crises and protects U.S. interests in space.

The U.S. Space Force organizes, trains, and equips Guardians to conduct global space operations.

Military Branch Logos & Service Marks

If your students are considering adding a military branch logo or service mark in their design it is recommended that they abide by the U.S. Department of Defense branding and trademark guidelines. For more information click [HERE](#).

3D Design and Printing

To submit for this challenge, students need to create 3D design in the form of an STL that can be printed. So, what exactly is an STL file? Simply put, an STL file is a type of digital design file that we send to a 3D printer. In the file, the object you've designed for printing gets broken down into a series of triangles. The more complex the design, the more triangles are used and the higher the resolution. STL stands for stereolithography — a popular 3D printing technology sometimes referred to as Standard Triangle Language or Standard Tessellation Language.



LESSON WORKSHEET

BRAINSTORM AND DESIGN ACTIVITY

Let's brainstorm and sketch out your wearable pin! When planning your pin design, think about both form and function. Pins can come in a variety of shapes, styles, and colors. Pins can even bend and have movement. With 3D design, the possibilities are endless. First, use the topics below to help brainstorm your pin design. Then, take those ideas and turn them into a pin design sketch and written description.

VOCABULARY:

- Veterans Day
- Military Branch
- Army
- Navy
- Marine Corps
- Air Force
- Coast Guard
- Space Force
- Engineering Design Process
- Design Elements
- 3D Design
- 3D Printing
- Graphic
- Text
- Print-in-place



BRAINSTORM YOUR DESIGN

Now that we know about Veterans and the military branches, let's get creative; time to design! Use the lines in this worksheet to write down your ideas.

Whom will your wearable pin be for? All Veterans or a specific group of Veterans? What things might have special meaning to them?

Ask yourself what message you are trying to say with your design and how you can make that message easily understood. When our friends text us with crying, laughing emojis or a thumbs up, we immediately know what they are telling us!

Use the following Brainstorming Ideas and their questions to help you create a pin design. 😊



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BRAINSTORMING IDEA: GRAPHIC COMMUNICATION

A picture is worth a thousand words, and you can include one in your pin design. Think about the types of symbols and images you can use in your design. What symbols represent Veterans and or gratitude? How will you incorporate them into your 3D design?

Each of the military forces have their own special emblems and logos, including an official seal that can only be used by that force. Check out their seals for inspiration!



While you can't exactly reproduce the seals in your design, you can use the same symbols that the forces use. We've listed some below to give some examples for design inspiration, but also use your brainstorming time to think about other images you could use.

Symbols

- Eagles - power and strength.
- Anchors – hope, unity, strength, support.
- Thunderbolts - power and striking force.
- Shields – protection, safety, shelter.
- Planet Earth - protection, peace, unity.
- Helmets - military warriors.
- Flags - patriotism.
- Wings - freedom, hope, strength, protection, support.
- Stars – high achievement, aspiration, space, U.S. patriotism.
- Laurel Wreaths – honor, victory, achievement, authority.
- Doves - peace, love, freedom.
- Hands - power, strength, ingenuity, protection, greeting, unity, gratitude.
- Chevrons - military rank, protection.
- Hearts - love, appreciation, gratitude, joy.





BRAINSTORMING IDEA: TEXT

Will your pin have text? If the answer is “yes,” what will your pin say, and how will it communicate your message? Will you use letters, braille, or something else? Will you use an existing font or create your own? You have limited space, so choose your letters/words wisely.



BRAINSTORMING IDEA: MECHANICAL MOVEMENT

Pins can dangle, bobble, sway, slide, and spin. Will your design include movement? Dangle pins typically have an extension from the base of the pin that hangs from small loops of chains. Bobble pins use a spring to create their jiggly motion. Slider pins have a piece that slides back and forth across the base of a pin. Spinner pins have parts that can move 360 degrees. What kind of moving pin will you choose, and how will your design make it happen?





BRAINSTORMING IDEA: INTENTIONAL COLOR

Whether you use pastels, primary, bright or dark colors, color choice can have meaning. For example, light red or pink often represents love; red, white, and blue represent freedom. Being intentional with the color your 3D print can bring an added layer of meaning to your pin.

Colors can also represent characteristics; the U.S. Department of the Army Emblem has this to say about colors and character.

“Blue is symbolic of loyalty, vigilance, perseverance, and truth.

Red denotes courage, zeal, and fortitude.

White alludes to deeds worth of remembrance.

Black is indicative of determination and constancy.

Gold represents achievement, dignity, and honor.”

Are you using color to express an idea? What colors will you use, and why?



BRAINSTORMING IDEA: FLAT ART VS SCULPTURAL

Three-dimensional objects have width, height, and depth. How will you vary the size of your height, width, and depth to bring your pin idea to life? Will your pin be flat, or will it pop out like 3D sculpted object?



