

Prosthetics: Past and Present

Fill in the circle by the correct answer. Then write the answers to numbers 3, 4, and 5.

1. Why did doctors in the 1500s most likely seek to change prosthetics?
 - (A) They wanted to make prosthetics a more popular field of medicine.
 - (B) They thought adding joints could improve the user's movement.
 - (C) Prosthetics technology at that time was extremely advanced.
 - (D) Artificial limbs didn't exist during the Middle Ages.

 2. The archaeological discovery in Egypt was significant because it showed that _____.
 - (A) ancient civilizations had knights
 - (B) ancient civilizations had computer technology
 - (C) prosthetics existed in ancient civilizations
 - (D) prosthetics didn't exist thousands of years ago

 3. How does the photo support the main idea of the text?
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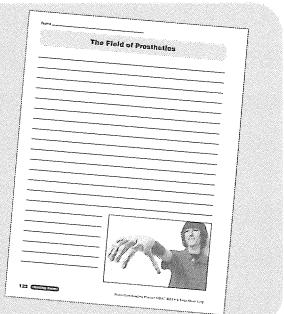
4. How have people's expectations of prosthetics changed over time?
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-

5. What does the author mean by stating that early prosthetic designs still apply today?
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Write About the Topic

Use the Writing Form to write about what you read.

Should more advancements in prosthetics be made if current prosthetics already work? Write an argument for why or why not.



Engineers Do Important Work

Level 1

Words to Know list, Reading Selection, and Reading Comprehension questions

Level 2 ■ ■

Words to Know list, Reading Selection, and Reading Comprehension questions

Level 3 ■ ■ ■

Words to Know list, Reading Selection, and Reading Comprehension questions

Engineers Start with a Concept

Fill in the circle by the correct answer.

Engineers Start with a Concept

Engineering is a field of science that involves creating resources to design, build, and create things that make people live safer and more comfortable. Engineers work in many different fields, such as architecture, medicine, and engineering to solve problems and help people serve a purpose.

Engineers Start with the Basics

First, think of all the things you have learned about engineering and what engineers do. Engineers are cutting-edge problem solvers who have creative minds to obtain everything needed to complete their projects. Including tools, materials, and equipment that were created with ingenuity. Engineers work with many different types of tools, like hammers, wrenches, and saws to perform tasks, such as, one who worked on a bridge, or another who worked on a space shuttle, or another who worked on a more complex, and an engineer named...?

Engineering is a cool job, because... They can create anything, by...
 a) drawing a picture
 b) writing a story
 c) building a model airplane, or
 d) writing a scientific article which could result from their own knowledge to show others how they are creating a bridge, or a road, or a new way to clean up trash in a polluted area. They would do as much as possible to make sure the project was successful, so the next time you see a bridge or a road, or a park, or a school, or a hospital, or a...
 Engineers have to consider all of the factors that go into the creation of their design. Science also plays a major role in engineering, because...
 a) they use math and science
 b) they use science and art
 c) they use science and technology
 d) they use science and artistry
 After the design is approved, the building begins, or the project is started. If it is not corrected in a lab, Engineers test it to see if it will work the best it can.

Words to Know
Engineers Start with a Concept

engineering
 concept
 convenient
 advanced
 modern
 cutting-edge
 ingenuity
 appliances
 flying drugs
 scientific
 consequences
 blueprint
 intended

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graph TD
    Concept --> Research
    Research --> Design
    Design --> Test
    Test --> Research
    
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138 Engineers by Imperial West 99.9

How to Read Books for Kids

Engineering for Imperial West 99.9

Assemble the Unit

Reproduce and distribute one copy for each student:

- Visual Literacy page: Engineers Do Important Work, page 131
 - Level 1, 2, or 3 Reading Selection and Reading Comprehension page and the corresponding Words to Know list
 - Graphic Organizer of your choosing, provided on pages 180–186
 - Writing Form: Engineers Do Important Work, page 132

Introduce the Topic

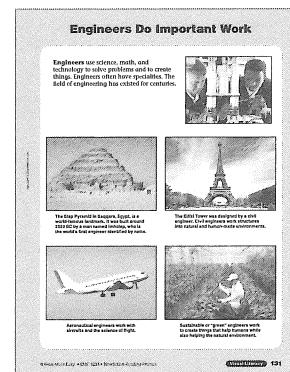
Read aloud and discuss the Engineers Do Important Work text and photos. Explain that there are many branches of engineering. Point out that some people have the misconception that all engineers work with engines and machines. Explain that engineers design things and try to solve problems.

Read and Respond

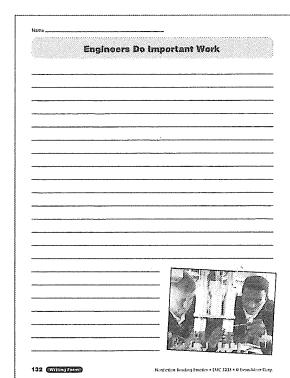
Form leveled groups and review the Words to Know lists with each group of students. Instruct each group to read their selection individually, in pairs, or as a group. Have students complete the Reading Comprehension page for their selection.

Write About the Topic

Read aloud the leveled writing prompt for each group. Tell students to use the Graphic Organizer to plan their writing. Direct students to use their Writing Form to respond to their prompt.



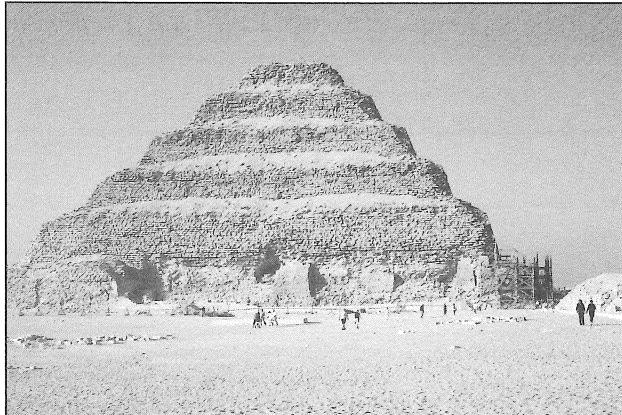
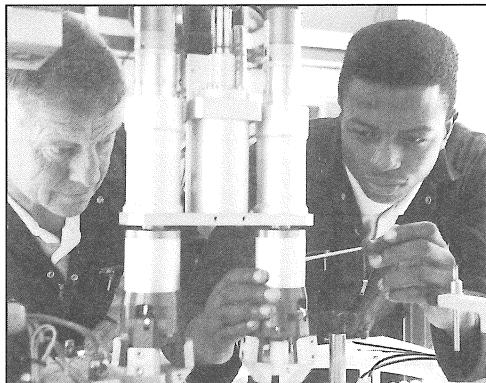
Visual Literacy



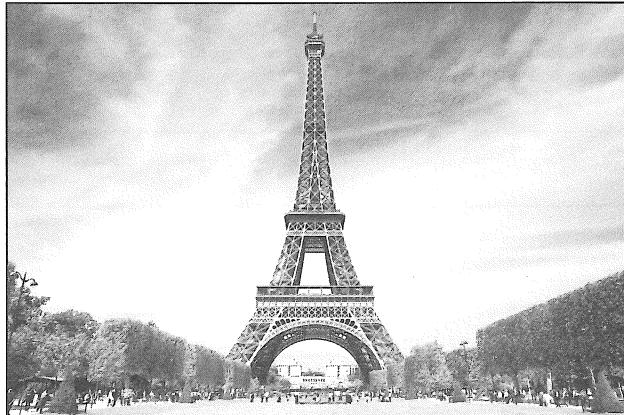
Writing Form

Engineers Do Important Work

Engineers use science, math, and technology to solve problems and to create things. Engineers often have specialties. The field of engineering has existed for centuries.



The Step Pyramid in Saqqara, Egypt, is a world-famous landmark. It was built around 2550 BC by a man named Imhotep, who is the world's first engineer identified by name.



The Eiffel Tower was designed by a civil engineer. Civil engineers work structures into natural and human-made environments.



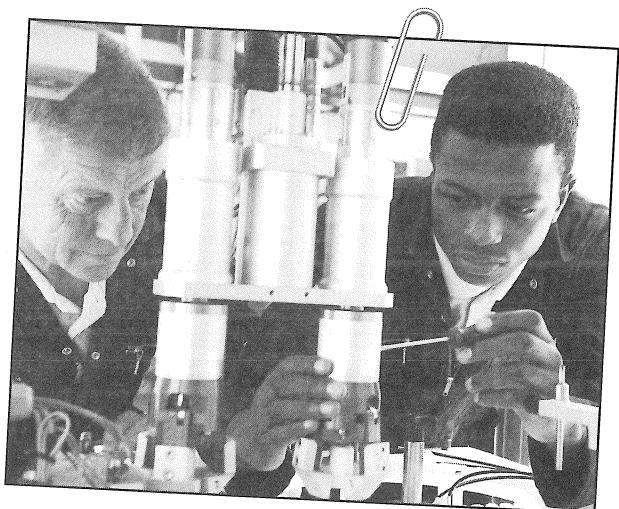
Aeronautical engineers work with aircrafts and the science of flight.



Sustainable or “green” engineers work to create things that help humans while also helping the natural environment.

Engineers Do Important Work

A black and white photograph showing two men in a laboratory environment. The man on the left is an older individual with glasses, wearing a dark jacket over a light-colored shirt. He is looking down at a piece of equipment. The man on the right is younger, wearing a dark jacket over a light-colored shirt, and is also looking down at the same equipment. Between them is a complex piece of laboratory machinery, possibly a spectrometer or a similar analytical device, with various tubes, lenses, and a paperclip visible. The background is slightly blurred, showing more of the laboratory's interior.



Words to Know

What Engineers Do

engineers

advanced

branches

specialties

aquatic

civil

attractions

biological

devices

innovative

Words to Know

Branches of Engineering

engineering

advanced

branches

civil

sturdy

productive

diminishing

facilities

chemical

utensils

hygiene

fibers

Words to Know

Engineers Start with a Concept

engineers

concept

convenient

advanced

modern

cutting-edge

surgeries

appliances

flying drones

scientific

consequences

blueprint

intended

**Engineers Do
Important Work** ■■

**Engineers Do
Important Work** ■■■

**Engineers Do
Important Work** ■■■■



What Engineers Do

Engineering is a field of science that focuses on using resources to design, build, and create things. Engineers use advanced math, science, and technology to try to solve problems. They create things that make people's lives safer and easier. There are different branches of engineering, and everyone benefits from the work engineers do.

Different Branches of Engineering

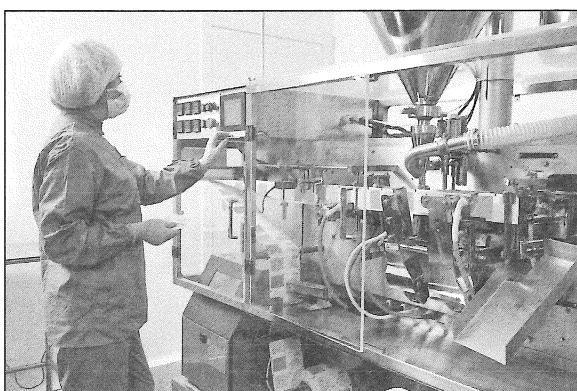
Many people think that engineers work with engines. Although some do, engineers can have other specialties. Electrical engineers design and build things related to electricity, for example. Aquatic engineers solve problems related to water. Civil engineers usually work with structures in our environment, such as dams, bridges, and highways. Engineers create structures, equipment, and other things, depending on their specialty.



Engineers must make many considerations when designing a structure like a highway junction.

Things Engineers Create

Have you ever taken a ride on a train or traveled on an airplane? If so, you've used something that a team of engineers created. Engineers design vehicles, highways, bridges, airports, rides at amusement parks, and so much more. Some of the world's most popular tourist attractions and landmarks are designed by engineers. For example, the Eiffel Tower, in Paris, France, was designed by a French civil engineer who specialized in working with metal. Engineers don't always create things that are large, though. Sometimes they design pieces of technology, such as remote controls or medical equipment. There are also biological engineers. Some of the things they work on are agriculture, bacteria, and medical devices used in doctors' offices.



Medical worker using pharmacy equipment designed by an engineer

Engineering Changes the World

The field of engineering is innovative and competitive. When something is engineered successfully, its design influences the work of future engineers. For example, if a car company creates a unique design for a faster, smaller car, another company is sure to come out with a similar design sometime soon. Engineers are the people designing the newer, faster cars.

What Engineers Do

Fill in the circle by the correct answer. Then write the answers to numbers 3, 4, and 5.

1. Air travel would _____ without engineers.

- (A) continue
- (B) be safer
- (C) be impossible
- (D) be possible

2. A civil engineer probably considers _____ when designing a highway.

- (A) the amount of sunlight
- (B) the weight of vehicles
- (C) how much water is used daily
- (D) the number of families per U.S. state

3. List two things you've done that were probably possible because of engineering.
-
-

4. Why do you think engineers are needed in so many different fields and specialties?
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-

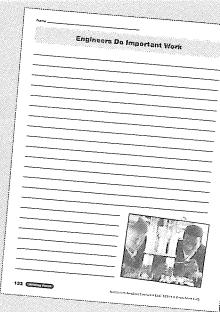
5. How does the author support the idea that engineering is competitive?
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Write About the Topic

Use the Writing Form to write about what you read.

Explain how the world would be different without engineers.

Use details from the text and your own examples.

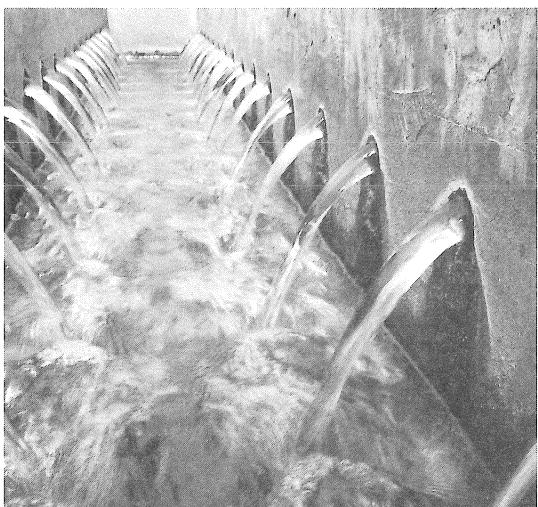


Branches of Engineering

Engineering is a field of science that focuses on using resources to design, build, and create things that make people's lives safer and easier. Engineers use advanced math, science, and technology to try to solve problems. There are different branches of engineering, and they are all important.

Civil Engineering

Civil engineers work with human-made and natural environments. They build structures that people use frequently, such as highways and bridges. They are continually looking for ways to make structures as sturdy as possible. They consider natural disasters that could occur, such as earthquakes or hurricanes, and try to design structures that will suffer little damage. They determine productive ways to repair cracks and other types of damage.



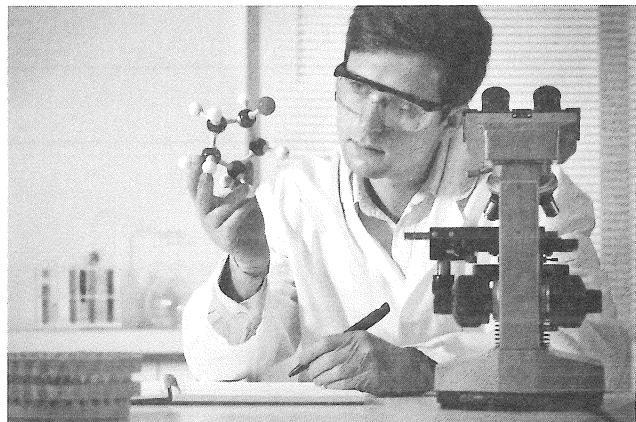
Water treatment facility

Water Resource Engineering

Some engineers work with water resources to address the problem of diminishing quantities of usable water. They design equipment and systems for water treatment to make water cleaner. They also design entire facilities devoted to containing usable water so that as many people as possible have access to it. This type of engineering is a branch of civil engineering because it deals with environmental structures such as natural springs and human-made structures like underground wells. Water resource engineers design systems that check how safe water is for both humans and for the environment.

Chemical Engineering

Chemical engineers design materials that can be used for various purposes. Almost everything we use has chemicals in it. Plastic containers, paints, writing utensils, paper, hygiene products, clothing fibers, and fuel are just a few of the products that contain chemicals. Many chemical engineers work to make products as safe as possible for humans as well as for the natural environment.



Chemical engineers do a lot of research and testing to determine whether the materials they create will serve their intended purpose.

Branches of Engineering

Fill in the circle by the correct answer. Then write the answers to numbers 3, 4, and 5.

1. One of a chemical engineer's tasks is to _____.

- (A) add hazardous chemicals to products
- (B) build water pipes
- (C) create large structures
- (D) make products safe for the environment

2. The main idea of this text is that _____.

- (A) most engineers work with highways and bridges
- (B) all branches of engineering are important
- (C) some branches of engineering are less important
- (D) all engineers make the world less safe

3. Which type of engineering in the text do you think affects you the most? Explain why.

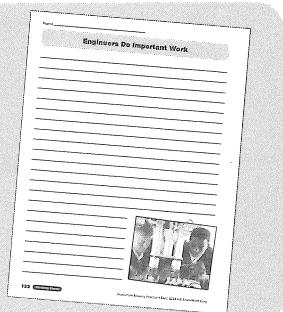
4. Explain why diminishing quantities of usable water is a problem that engineers can help with.

5. Explain how the author supports the idea that engineers solve problems.

Write About the Topic

Use the Writing Form to write about what you read.

Compare and contrast the branches of engineering discussed in the text. Use details from the text and your own examples.



Engineers Start with a Concept

Engineering is a field of science that focuses on using resources to design, build, and create things that make people's lives safer and more convenient. Engineers have advanced math, science, and technology skills. People hire engineers to solve problems and create things that serve a purpose.

Engineers Turn Concepts Into Realities

Think of all the things that make our world modern. People travel in airplanes and on highways. Hospitals use cutting-edge equipment to perform surgeries. And we have countless choices for almost everything, including foods, phones, paper, and household appliances. All of these choices were created with engineering. Engineers don't just work with machines. They create theme-park rides, bike trails, shoes, and new technology, like flying drones. Each of these things started out as a mere concept, and an engineer made it real.

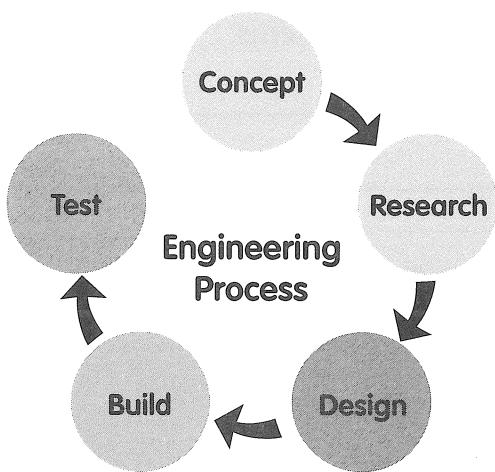


A drone is an aircraft that flies on its own, with no pilot.

Engineering Process

Engineers follow a basic process, whether they are creating a highway, an airplane, or a new kind of toothpaste. The creation begins as an idea. Engineers research the idea to determine whether it could work. They use scientific knowledge to think about possible consequences that could result from their creation. For example, if engineers are creating a bridge, they would find out as much as possible about the geography of the surrounding area. They would probably research whether or not the location has had many earthquakes. Engineers have to consider all of the possibilities of what could go wrong as a

result of their design. Science also helps engineers determine what materials to use. After researching, they use math and measurements to create a design, or a blueprint. The design stage is very important because it shows others what the final result will look like.



After the design is approved, the building begins. If the project is a large structure, a lot of builders work on it. If it is small, it may be created in a lab. Engineers test it to make sure it's safe and that it will serve its intended purpose.