

Mechanical Engineering

Bionic Engineering

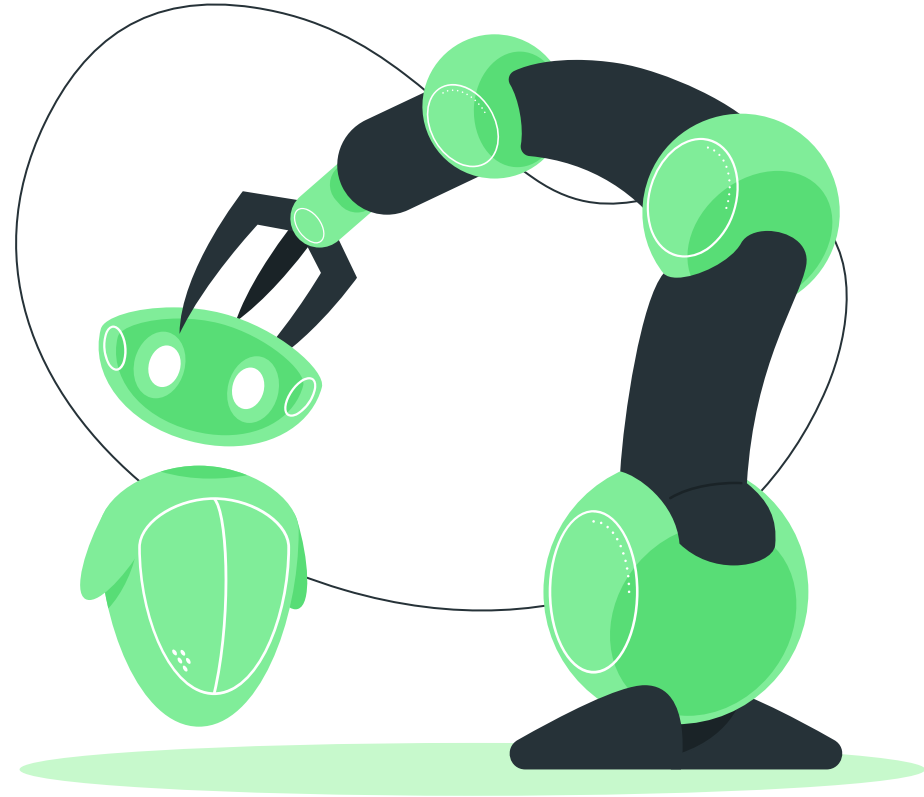


Table of Contents

1

Field of Mechanical Engineering

3

Science Behind Bionic Hands

2

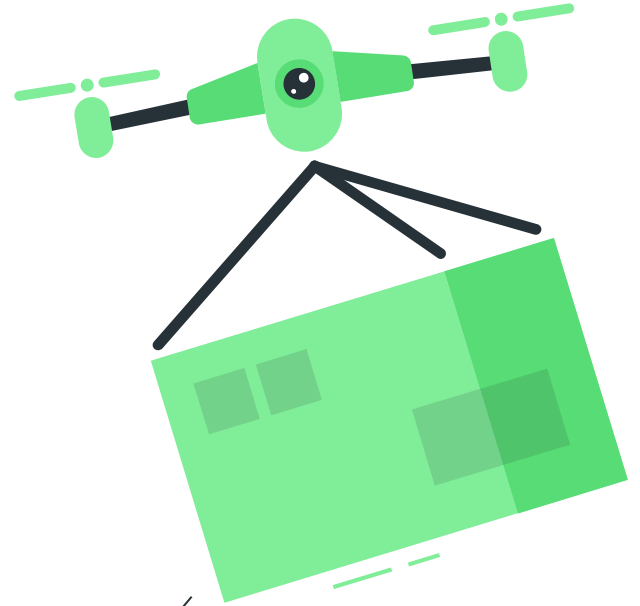
Careers in Mechanical Engineering

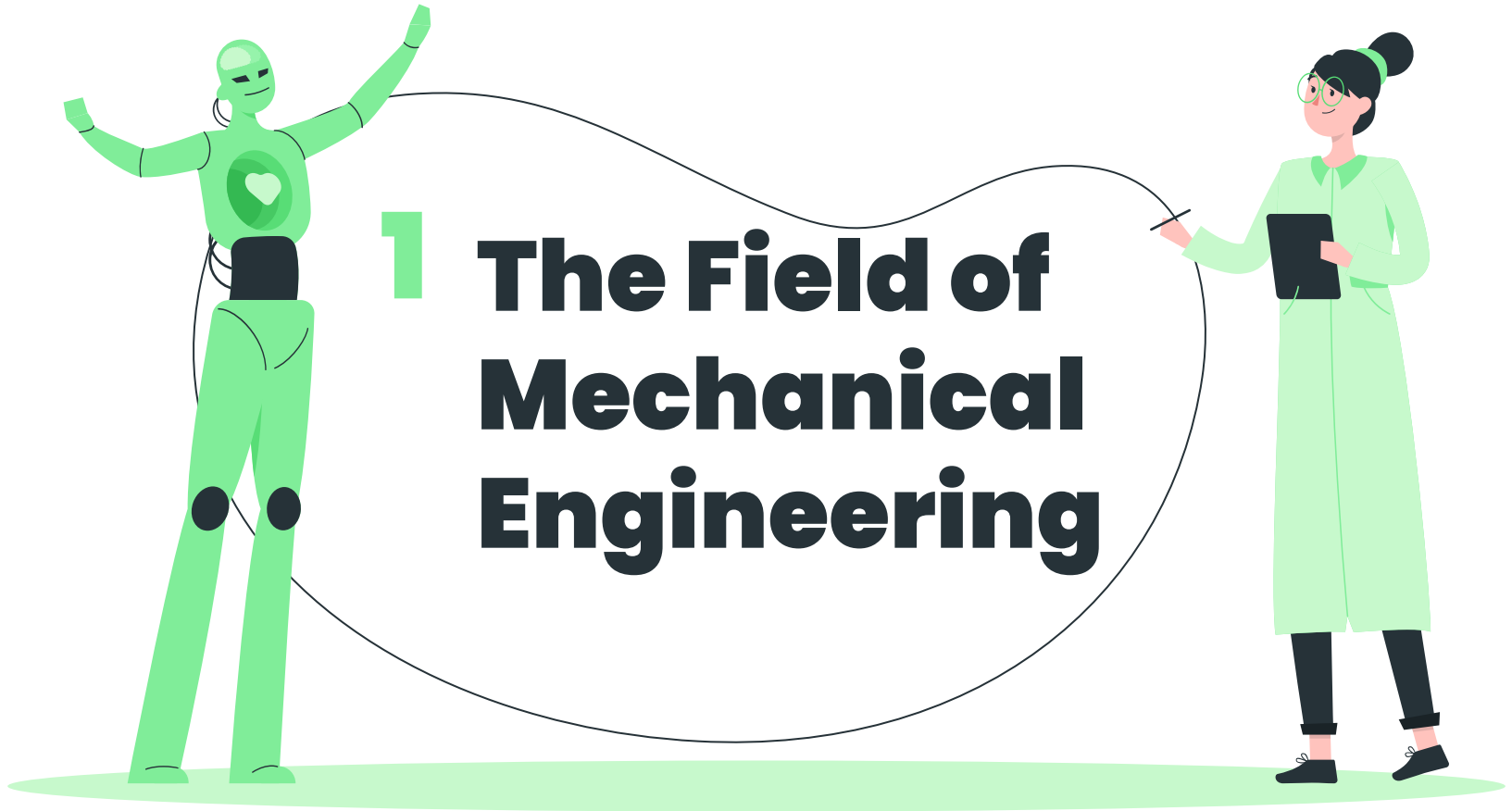
4

Activity

Mechanical Engineering

a branch of engineering concerned primarily with the industrial application of mechanics and with the production of tools, machinery, and their products - Merriam Webster



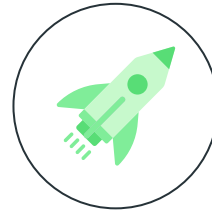


**1 The Field of
Mechanical
Engineering**

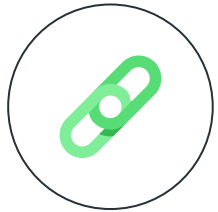
Fields of Mechanical Engineering



Manufacturing



Aerodynamics



Biomechanics



Energy Systems

Classes to Take in High School



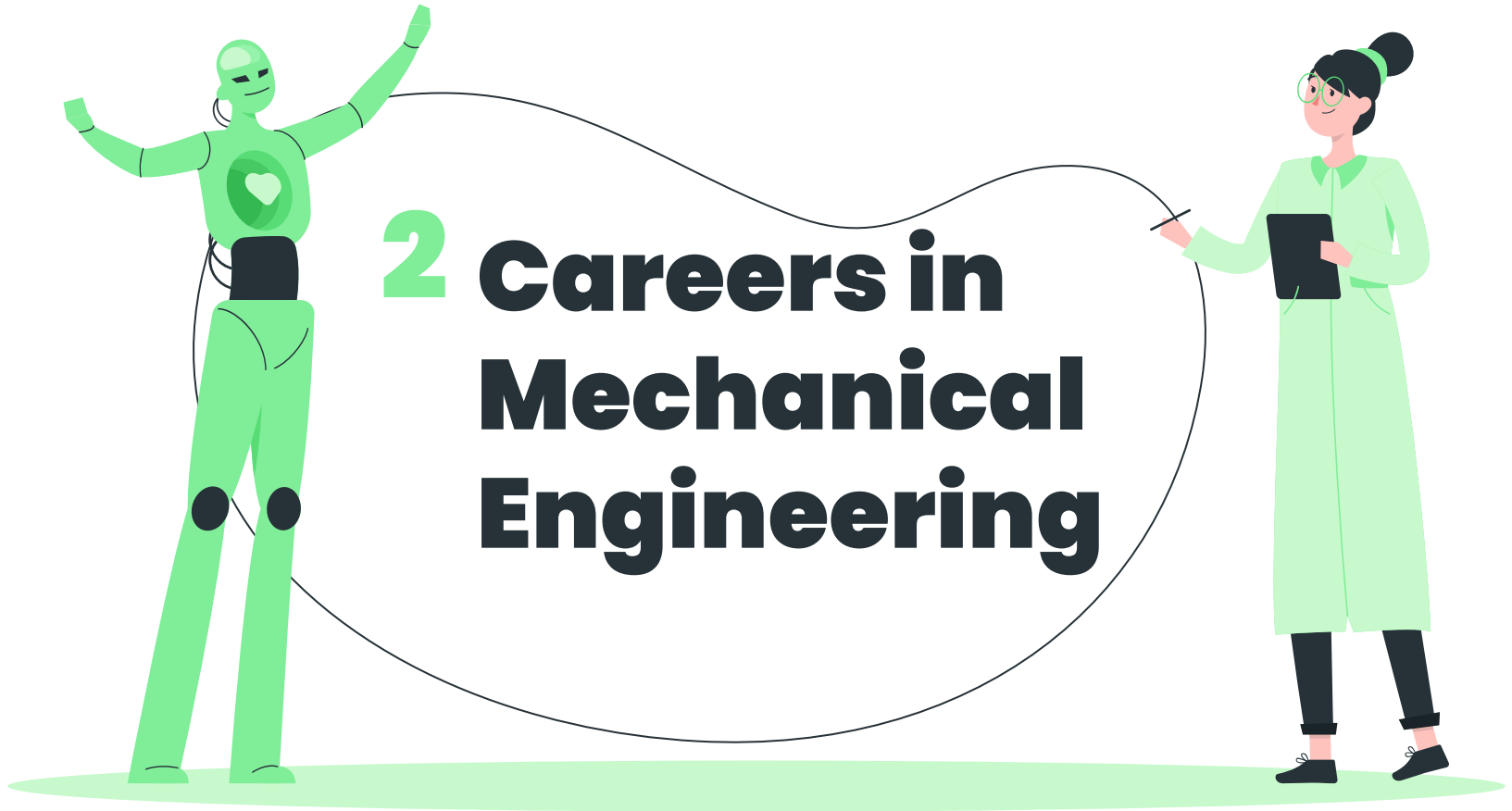
Physics



Calculus



Algebra



2 Careers in Mechanical Engineering

About The Theory

\$83,590

Median yearly salary

13.8%

Of degree holders are women

14,000

Jobs across the United States

Careers



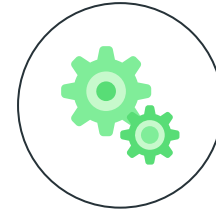
Materials Engineer

Research new ways to improve the manufacturing process and reduce the wear and tear of machinery and materials



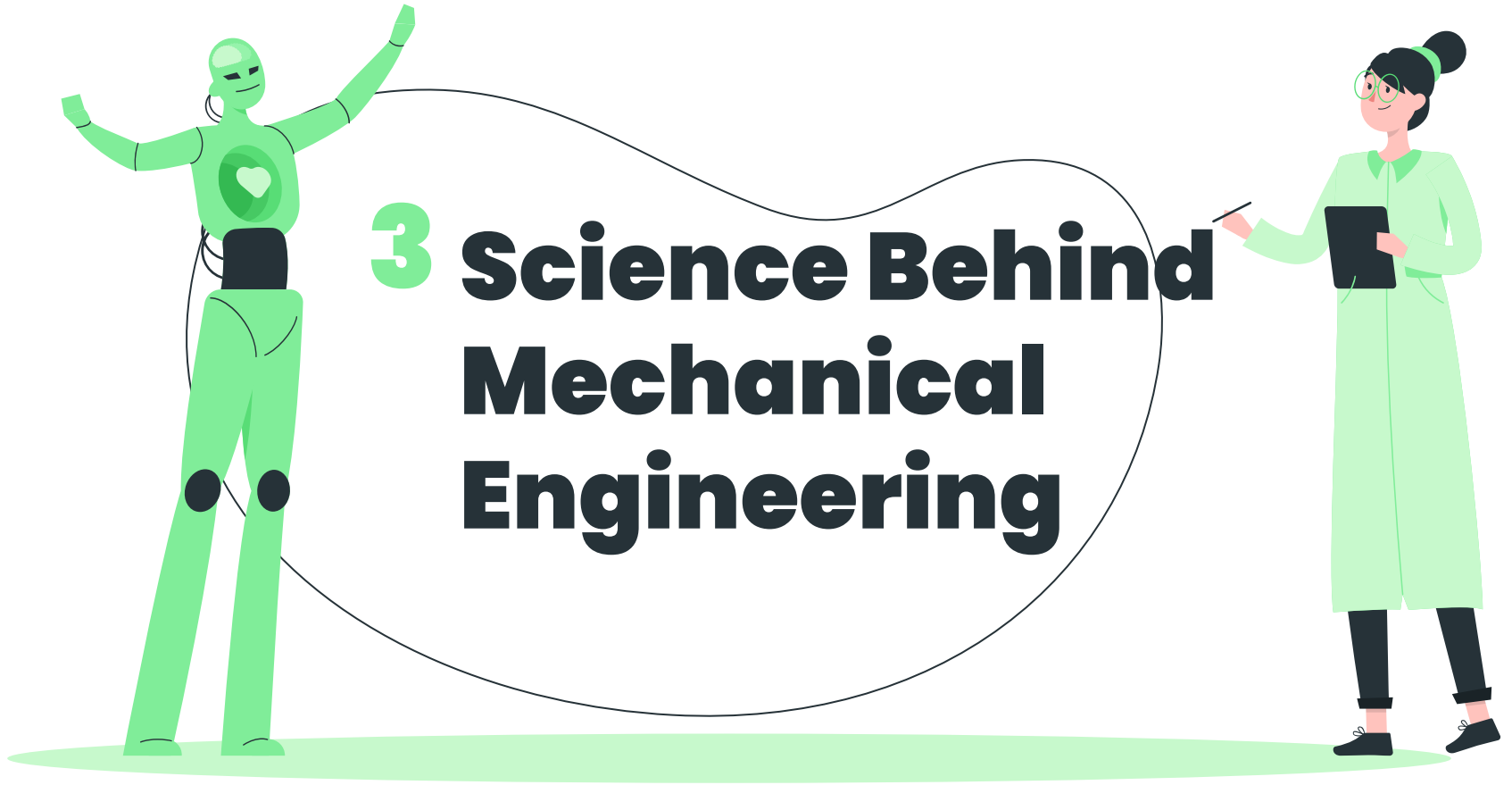
Aerospace Engineer

Work on the development of aircraft, spaceships, satellites, weapon systems, etc.



Automotive Engineer

Create, edit, and improve designs using CAD software and test the performance, integrity, and safety of new components and prototypes



**3 Science Behind
Mechanical
Engineering**

Science Behind Bionic Hands

The human hand has five fingers, each with multiple joints. These joints are controlled by muscles and tendons—the muscles pull on the tendons, which pull on the joints and make them bend. The human hand has so many different joints, which makes it very flexible and versatile and easily adaptable to a wide variety of different tasks. You learn to use your hands as a small child, and by the time you grow up, you barely have to think about it at all!

Engineers have been trying to build robotic hands for years, but it turns out that this is very difficult. We have gotten pretty good at building robotic hands that are good at *one specific thing*. For example, a robotic gripper in a factory might be designed to pick up a certain part and bolt it onto a car. If you try to get that gripper to pick up a tennis ball or a glass of water, however, it will not work at all! Building a mechanical hand that is as versatile as the human hand remains a huge challenge.



4

Activity

Supplies

In this project you will build a simple artificial gripper using drinking straws and string. You will cut notches in the straws that will act as the "joints" and thread strings through the straws to act as the "tendons." Pulling on the strings will cause the joints to bend.

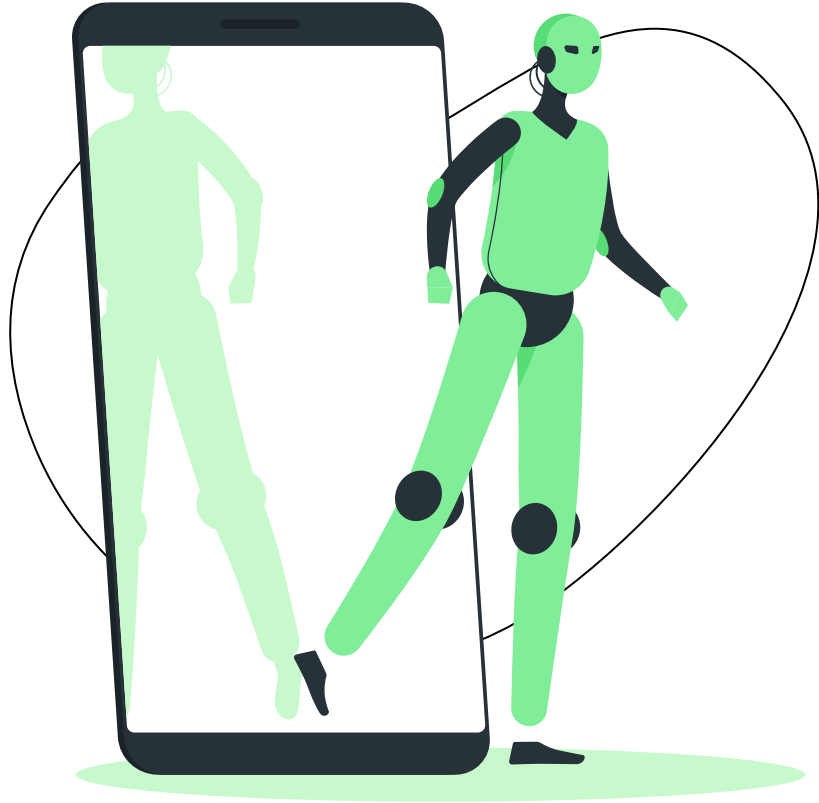
- Tape
- Scissors
- Cardboard paper or cardstock paper
- Standard drinking straws (Dollar Store variety is fine)
- Pearl drink straws or bigger diameter straws
- Yarn or twine

Bionic Hands

1. Trace your hand on a cardboard or cardstock paper.
2. Cut the traced hand out (cutting it a little bigger than the actual tracing).
3. Mark your finger joints on the cutout.
4. Draw straight or curved line across it.
5. Fold the fingers at the lines.
6. Cut smaller straws to size (leave a little gap between the lines to facilitate in threading the yarn).
7. Tape straw pieces to the hand.

Bionic Hands (cont.)

8. Thread yarn through the straw pieces. Each finger will have a length of yarn of its own.
9. Thread all five pieces of yarn through the bigger straw.



Thanks!

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once you're done!

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