I Want to Be an Engineer!

- mechanical
- nuclear
- systems
- software
- electrical
- aerospace
Welcome!

If you’re like most kids, you’ve probably never thought much about engineers and what they do (unless, of course, your mom or dad is an engineer). But you might have second thoughts once you learn a little more about engineering.

That’s because engineers have had something to do with pretty much everything around you—from the building where you go to school; to the house where you live, to the clothes you wear, and the food you eat; to the things you do for fun.

And fun is what this brochure is all about. As you work through the puzzles, games and activities on these pages, you’ll find out more about some of the world’s most creative people. They are the different types of engineers who work for Lockheed Martin, one of the leading systems and technology companies in the world.

Lockheed Martin engineers work on exciting projects ranging from airplanes to spacecraft and the vehicles that launch them. Throughout this brochure, you’ll get a chance to meet some of those engineers up close and personal.

It’s a Fact!

Engineers don’t just work on serious things like skyscrapers and space shuttles. They work on fun stuff, too. An engineer designed the snowboard—and the rides at Disney World. And an engineer with degrees in both mechanical and nuclear engineering “accidentally” invented the very cool Super Soaker® squirt gun!
Engineers are curious, process-oriented, creative people who use their knowledge of science and math to solve problems, make things work better and turn ideas into reality.

Mechanical engineers design and develop pretty much everything that you would think of as a machine—from toasters to fighter jets. They work on things we rely on every day like heating and cooling systems, and cool things like the Mars Rover and microrobots for medical or military use.

Let’s pretend to be a mechanical engineer and design a car. Here’s what you’ll need:

1. A piece of cardboard (the back of a note pad works well)
2. A piece of plain white 8½ x 11 paper
3. Three non-bendable plastic drinking straws
4. Four Life Savers® candies
5. Scissors with a pointed nose
6. Transparent tape

1. Cut the cardboard in half to make a rectangle that is about 5½ x 8½ inches.
2. Tape two straws to the bottom of the cardboard, centered front and back near the 5½-inch edges.
3. Carefully poke a hole in the middle of the cardboard toward the 5½-inch edge with the point of the scissors and stick the end of the third straw into the hole (see diagram above).
4. Cut a triangular “sail” out of the white paper and tape it to the straw “mast.”
5. Slide a Life Saver® on each end of both straws. (These are the wheels.)
6. Blow on the sail to make your car move.

Now experiment by positioning the sail in different ways to see what happens. How far can you make your car go?

An engineer wouldn’t stop now—this is just when things get interesting. An engineer would experiment to see how to make the car better. So…try some experiments. For example: What if you used something else for wheels (wooden thread spools or CDs, for example)? What if the sail were a different size or shape, or made out of a different material? The possibilities are limited only by your imagination!

Meet Arwen Davé, a graduate of Rensselaer Polytechnic Institute who works for Lockheed Martin in Moffett Field, California. Arwen is a mechanical engineer. She helped figure out how to levitate moon dust! She also helped a group of Girl Scouts get their space badges.

It’s a Fact!

Cool suits, which kept Apollo astronauts comfortable during moon walks, are today worn by race car drivers, nuclear reactor technicians, people with multiple sclerosis, and kids with genetic disorders.
If it flies—or even if it moves fast (like a high-speed train or even a golf ball)—chances are an aerospace engineer had something to do with it.

Do you remember learning about the NASA mission that put two rovers on Mars just a few years ago? An aerospace engineer worked on that project!

Test your flight knowledge with this puzzle. The words relate to aerospace engineering.

### Clues

**Across**

1. Aerospace engineers must be able to work together in _______.

4. Aerospace engineers worked on the NASA mission that showed scientists there was once ________ on Mars.

7. Some aerospace engineers work for big companies like ____________ _________.

8. Aerospace engineers who work in _______ help to keep our world safe.

10. Aerospace engineers don’t just design things; they also conduct _______ to make sure their designs work well.

**Down**

2. Aerospace engineers who work with _______ also are known as aeronautical engineers.

3. Today’s aerospace engineering has its roots in the work of aviation ________ like Orville and Wilbur Wright.

5. ________ is another word for flight.

6. Aerospace engineers who work with ________ also are known as astronautical engineers.

9. If it _______, an aerospace engineer probably had something to do with it.

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**Meet Jerome Socha**, a University of Minnesota graduate who works for Lockheed Martin in Fort Worth, Texas. Jerome is an aerospace engineer. He says he used to see airplanes flying overhead and think to himself that he wanted to build those one day.
What’s Your LQ?

In addition to being very creative and generating lots of new ideas, engineers also need to understand how things fit together logically. That’s especially true when it comes to both systems and software engineers. They typically deal with making sure everything works together as they design new things to make our lives easier and better.

Try this pattern challenge to check your LQ (logic quotient). (OK, just pretend there is such a thing.) Write the numbers and draw the shapes that would logically come next for each of the following sequences (hint—look for the patterns of shapes and numbers on each line, then decide what should come next):

1. 16 14 12 10 8 6 ____  ____
2. 2 3 5 9 17 33 ____  ____
3. 30 29 27 24 20 15 ____  ____
4. 10 12 11 13 12 14 ____  ____

Now, make some of your own pattern challenges and test your friends or family members!

Meet Kerry Timmons, a graduate of the University of Colorado who works for Lockheed Martin in Littleton, Colorado. Kerry is a systems engineer. She decided to become an engineer after she attended a Women in Engineering Day at the university.
Who Turned on the Lights?

Electrical engineers work on systems and equipment that generate and deliver electricity—everything from great big dams to little tiny circuit boards. Electrical engineers also work on electronics—things like computers, lasers, MP3 players, and cell phones. In fact, if you can switch it on, an electrical engineer probably had something to do with it!

How many things can you find in the picture below that an electrical engineer might have had something to do with? Circle each one.

Meet James Evans, a graduate of Virginia Tech who works for Lockheed Martin in Manassas, Virginia. James is a senior systems engineer with a degree in electrical engineering. One of the most interesting projects he ever worked on was testing submarine sonar systems for the U.S. Navy while living at sea with the submarine crew.

Answer key:

There are 14 items related to electricity or electronics if you count the components separately.

Once you’ve found as many items in the picture as you can, do a room-by-room electrical/electronic survey of your house. How many different kinds of things can you put on your list? Make this a family challenge. See who can come up with the longest list!
Nuclear engineering is about more than giant power plants. Nuclear engineers also work on nuclear power for submarines, ships and spacecraft, as well as medical equipment that is used to diagnose and treat diseases.

Unscramble the letters to spell the missing word in each of the sentences below to fill in some facts about nuclear energy.

1. Nuclear energy is the energy in the core (nucleus) of __ __ __ __ __. M S A T O
2. Nuclear __ __ __ __ __ __ can be used to make electricity. G Y R E N E
3. Uranium, a fuel used in nuclear plants, is a __ __ __ __ __ that is found in rocks all over the world. T A L M E
4. Nuclear-generated electricity does not emit __ __ __ __ __ __ dioxide into the atmosphere. C B A R N O
5. Nuclear power accounts for about 20 __ __ __ __ __ __ of the total electricity generated in the United States. P N T C R E E
6. Some nuclear engineers work on machines that diagnose and treat diseases such as __ __ __ __ __ __. C E R N C A

Now rearrange the circled letters to learn something else about nuclear engineering!

Nuclear engineering is __ __ __ __ __ __ __ __ __ __.

Answer key:
1. atoms 2. energy 3. metal 4. carbon 5. percent 6. cancer

Mystery sentence: Nuclear engineering is a great career.

Meet Thomas Laub, a graduate of Texas A&M University who works for Lockheed Martin in Albuquerque, New Mexico. Thomas is a nuclear engineer. He has worked on radiation safety studies.
In Their Own Words…

Lockheed Martin engineers talk about some cool parts of their jobs:

“I’ve simulated a torpedo hit and seen the first flights of an entirely new aircraft.”
—Jerome Socha, aerospace engineer

“I was aboard the USS San Juan, a nuclear submarine, on its commissioning voyage to San Juan, Puerto Rico.”
—James Evans, systems engineer

“I helped figure out how to levitate moon dust.”
—Arwen Davé, mechanical engineer

“I run programs on two of the world’s three fastest computers.”
—Thomas Laub, nuclear engineer

“I get to work with robots.”
—Shelia Salinas, software engineer

“I flew with the U.S. Coast Guard on law enforcement missions off the Florida coast.”
—Cheryl Kotan, systems engineer

Education pays off. Consider this:
- The estimated lifetime earnings of someone with a high school diploma—$1.2 million
- The estimated lifetime earnings of someone with an associate degree—$1.6 million
- The estimated lifetime earnings of someone with a bachelor’s degree—$2.1 million
- The estimated lifetime earnings of someone with a master’s degree—$2.5 million

*From www.learndoearn.org