CONDENSATION OF
Women in Engineering

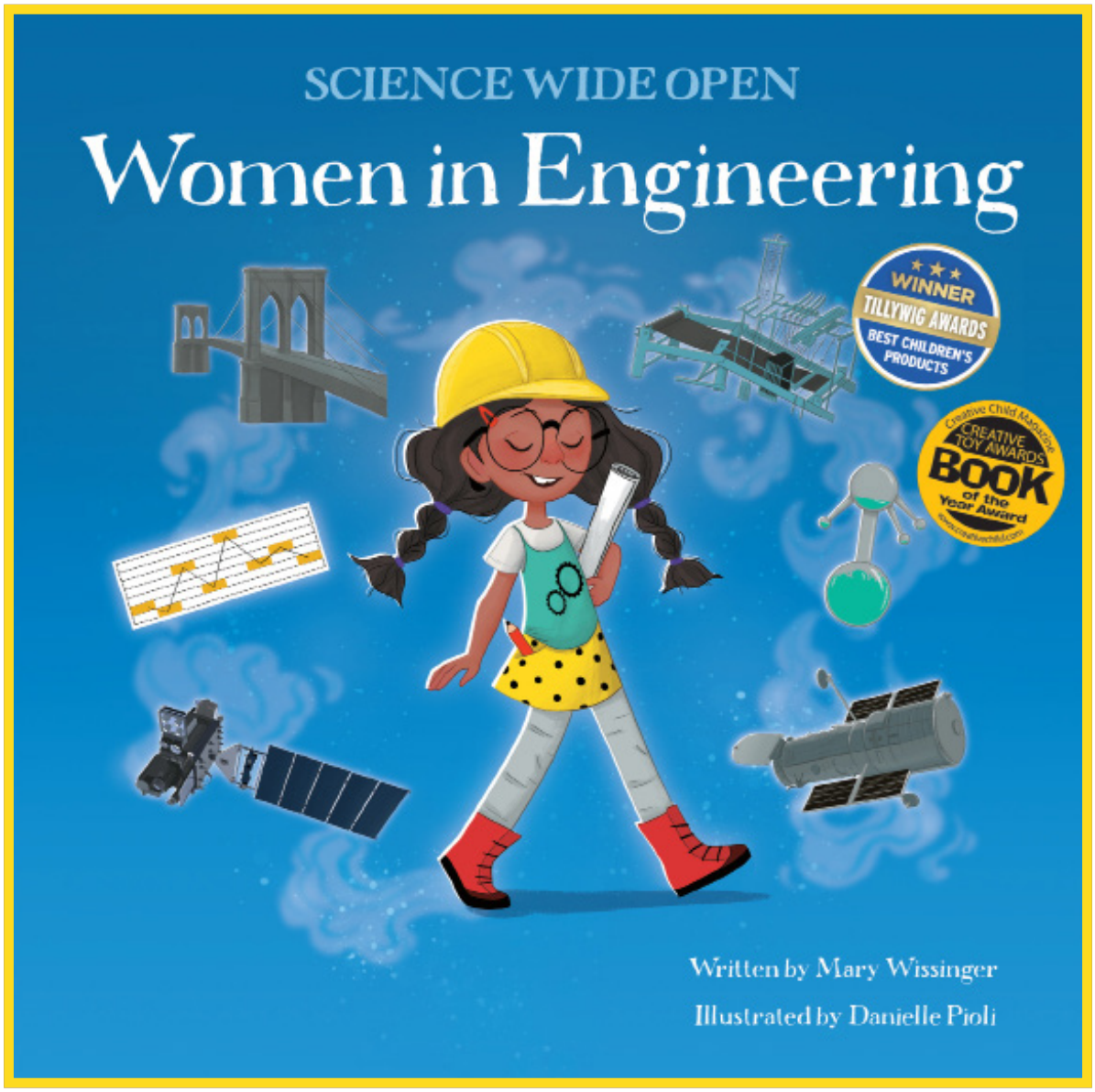
By Mary Wissinger

Illustrated by Danielle Pioli

Includes pages 4, 5, 8, 9, 14, 15, 20, 21, 26, 27, 34, 35, 38, 39

Hardcover ($14.99) ISBN 13: 978-1-938492-52-5
Paperback ($12.95) ISBN 13: 978-1-938492-53-2
Ebook ($11.99) ISBN 13: 978-1-938492-54-9

September 2022 • 40 Pages



Science, Naturally!

This title is also available in Spanish (March 2023).
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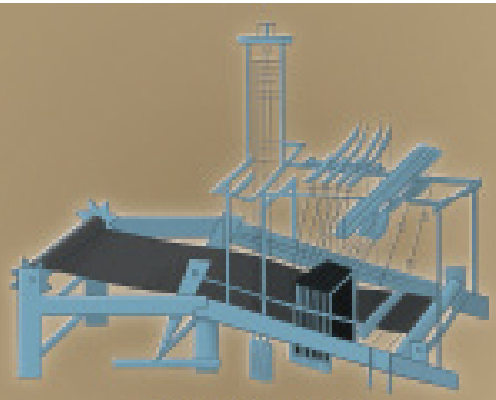
Who builds bridges?

Building a bridge is a balancing act. It takes many people, lots of equipment, and a talented engineer to put it all together.

Emily took on the role of chief engineer in place of her husband, who had become too sick to do the job. She oversaw bridge construction for more than ten years, from managing workers to coordinating supplies.

She wore a skirt and petticoat because women of the time weren't allowed to wear pants. Construction can be dangerous work, especially without the right clothes, but that didn't stop her from visiting the site.

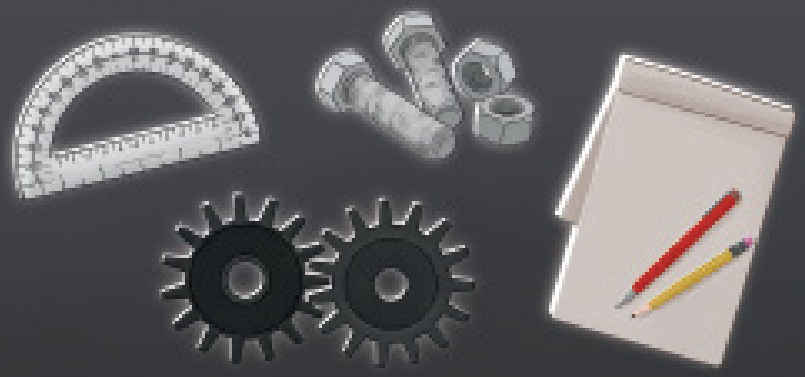
When Emily and her team of workers finally finished the bridge, she rode across it in a carriage. She carried a rooster—a symbol of victory at the time—to celebrate her success. Emily's engineering work still matters today. Hundreds of thousands of people cross the Brooklyn Bridge every week.



Fabric Weaving Loom

When Huang Daopo returned to Songjiang as an adult, she used her knowledge to help the town. She created a machine to clean raw cotton quickly and built a spinning wheel that could spin many threads at once. She invented these revolutionary machines 500 years before anyone else figured out how to make them.

Her town became known for weaving beautiful cotton fabrics, quilts, and mattresses. Huang Daopo's inventions brought jobs and security to many people.



What else do engineers do?

Engineers think creatively.

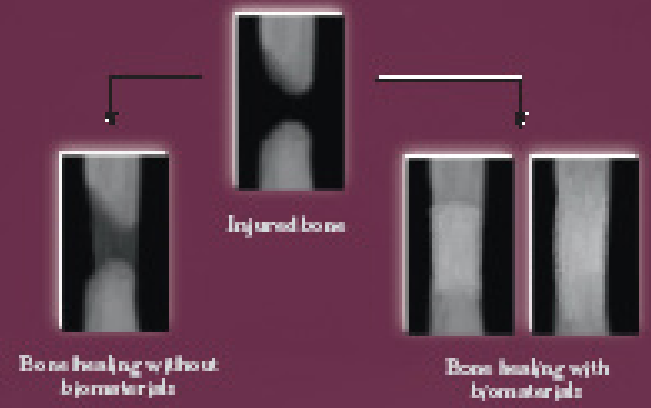
When movie star Hedy Lamarr wasn't making films, she worked on projects in her laboratory. She had lots of ideas for inventions and experiments, such as making tablets that turned water into soda. Hedy also created designs for a more aerodynamic airplane, based on the smooth shape of fast birds and fish. She even kept a small laboratory in her on-set trailer so she could work between scenes.

Problems like climate change.

Sandra Cauffman has worked at NASA for many years, helping to design, build, and launch equipment to study Earth, our Sun, the solar system, and the universe. The information she gathers helps us discover how the universe works and even find other planets similar to Earth. Many of her projects also help us understand our planet and its changing climate, so we can develop technologies to solve problems facing our future.

GOES-16
Geostationary Operational
Environmental Satellite

If you've checked the weather lately, the forecast probably came from a satellite that Sandra helped develop. Satellites monitor Earth and send back information about the temperatures, ice caps, coral reefs, and even mosquitos. That data can be used for forecasts and emergency alerts, saving many lives.



These kinds of structures are known as biomaterials, and they're placed in the body to help with healing. Dr. Treena's biomaterials also encourage new cells to grow, improving the way the body heals itself.

Dr. Treena has received many awards for her discoveries. Her work with biomaterials could one day help people paralyzed by spinal cord injuries be able to walk again.

Engineers can do so many different things!
Is there one thing they ALL do?

Glossary

AERODYNAMIC: Shaped in a way that lets an object fly easily through the air.

AEROSPACE ENGINEER: A person who designs, builds, and works with spacecraft, aircraft, satellites, and missiles.

ALCHEMY: An early version of chemistry based on transforming metals into gold.

BIOMATERIAL: Something placed into the human body to help with healing bone and tissue.

BIOMEDICAL ENGINEER: A person who designs, builds, and works with technology that is made to improve health.

CALCIUM PHOSPHATE: A mineral found in human bones and teeth.

CHEMICAL ENGINEER: A person who designs, builds, and works on equipment and processes involving chemicals.

CHIEF ENGINEER: An engineer who oversees a project by managing workers, coordinating supplies, and giving directions.

CIVIL ENGINEER: A person who designs, builds, and works on projects that are useful to a community, such as bridges, roads, and water systems.

ELECTRICAL ENGINEER: A person who designs, builds, and works with equipment and technology involving electricity.

ENGINEER: A person who solves a problem by designing, building, and working on machines, tools, structures, and other technologies.

EXPERIMENT: A test to collect information about the world to see if a hypothesis is correct.

FREQUENCY: The number of waves (like radio waves or sound waves) that pass by per second.

HYPOTHESIS: An educated guess that a person makes to explain something they think is true or will happen.

MECHANICAL ENGINEER: A person who designs, builds, and works on all types of machines, including cars and robots.

PATENT: A document that makes sure an invention can only be made and sold by the person who invented it for a certain number of years.

RADIO WAVE: Energy that travels in wave shapes, used to send and receive messages in the form of electrical signals which are then converted to information, pictures, or sound.

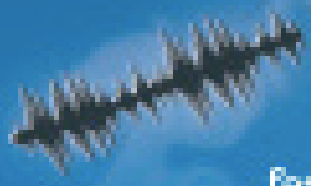
SATELLITE: An object that orbits around a larger object, like a planet, and is designed to collect information.

STEM CELLS: Cells that can turn into any type of cell in the body.

SUSPENSION BRIDGE: A bridge that is held up by cables anchored to large towers.

TRANSPLANT: To take something from one place and put it somewhere else.

The fourth book in the award-winning Science Wide Open series!



What big ideas do you have?

Think like an engineer! Explore this fascinating field alongside women who have used creative problem solving to improve and connect the world. This story of invention and discovery is an inspiring way to show kids that engineering can bring their imaginations to life.

'Engineers are essential to every aspect of our society. Children with different backgrounds and interests will be excited to learn how impactful a career in this field can be. What an inspiring way to discover the engineers transform ideas into reality!'

—Kelly Dooley, P.E., Exec. Director/CEO, International Technology and Engineering Educators Association

'It's a joy to learn how women have, throughout time and place, used innovation to change lives for the better. With a charming protagonist and biographical snapshots, this book masterfully shows the relevance and beauty of engineering.'

—Ashley Rayner, Ph.D., Instrument Scientist, Brandywine Photonics

Ages 5–8

Teacher's Guide available