



Grade 4

Unit 2 | Digital Components

Eureka! The Art of Invention

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EUREKA!
The Art of Invention

Digital Components

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EUREKA! The Art of Invention
Digital Components

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EUREKA! SCOREBOARD

STUDENT INVENTOR



AIRPLANE



ALARM CLOCK



MICROSCOPE



PAPER



RADIO



TELEPHONE



Orville and Wilbur Wright practiced flying and steering gliders for two years before building the *Flyer*.

They succeeded in keeping the *Flyer* airborne at Kitty Hawk, North Carolina, in 1903 because they had installed innovative controls to keep it balanced and stable.

They continued experimenting for two more years, eventually building the *Flyer III* which had separate levers for turning it left or right, lifting its nose or tail, and tilting it from side to side.

These additions, known as three-axis controls, were the secret to their success. Three-axis controls are still used today.



In the 1650s a young Dutchman named Antonie van Leeuwenhoek began experimenting with glass lenses.

He manufactured a tiny lens that he then attached to a brass plate.

By 1676 he had improved his invention to the point where he was even able to see single-celled organisms, like protozoa.

Thanks to van Leeuwenhoek's invention, nineteenth-century scientists like Robert Koch and Louis Pasteur were able to identify the bacteria that cause deadly diseases like cholera and tuberculosis.



In ancient China, people wrote on silk, which was very expensive, or on scrolls of bamboo, which were very heavy and difficult to manufacture.

Around the year 105 CE, a record-keeper named Cai Lun decided he would come up with a better option—a writing surface that was light, cheap, and easy to make.

He succeeded, and his invention made his job of writing down, transporting, and storing records much easier.

His invention also enabled people to spread knowledge over great distances by carrying lightweight documents with them wherever they traveled.



As people started interacting with one another in more complicated ways, time became important.

They divided the day into twenty-four hours and needed to keep track of those hours accurately.

People began measuring small units of time with sundials, determining the passage of daylight hours by observing the direction and size of shadows cast by the sun.

The next great innovation in timekeeping was a simple bowl with holes carved in it: if you knew how long it took for all the water to flow out of a full bowl, you could measure the passage of time by checking the water level.

As the centuries marched on, these inventions became more accurate as water power was replaced by springs and pendulums.



In 1894 a young man in Italy, Guglielmo Marconi, read a book that explained how to produce electromagnetic waves—electricity that travels through the air.

He quickly got to work in his attic building a wireless transmitter (to send messages) and a wireless receiver (to receive messages).

Soon scientists and businesspeople realized that the future of Marconi's technology was in sending sound directly to receivers in people's homes.

The first commercial stations began broadcasting in 1920, and by 1930 programs were being heard in twelve million American homes.

Stations broadcast news, music, comedies, adventure shows, game shows, soap operas, talent contests—almost everything you see on TV today.



Alexander Graham Bell aimed to send the human voice across a wire by turning it into electrical signals.

Bell worked on improving the invention, and in 1876 he and his assistant had a conversation over a distance of two miles. The first words spoken were “Mr. Watson, come here. I want to see you.”

Businesses saved money, as meetings that had once required long-distance travel could now be held using his invention.

People living in isolated areas were now able to call for help in an emergency.

Name: _____ Date: _____

KNOW THE SIMPLE MACHINE!

Indicate the Simple Machine used in each invention.

1. **Electric Drill:** _____

2. **Window Blinds:** _____

3. **Egg Beater:** _____

4. **Dump Truck:** _____

5. **Jar Lid:** _____

6. **Ladder:** _____

7. **Crane:** _____


8. **See-Saw:** _____

9. **Shovel:** _____

10. **Stapler:** _____

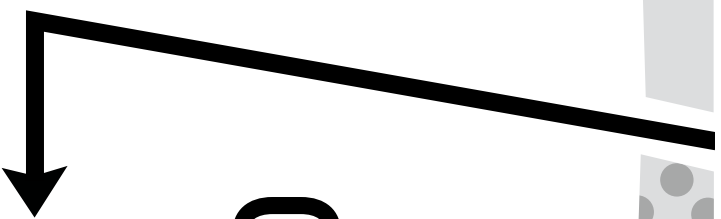
11. **Pencil Sharpener:** _____

12. **Knife:** _____



CERTIFICATE OF VICTORY

presented to



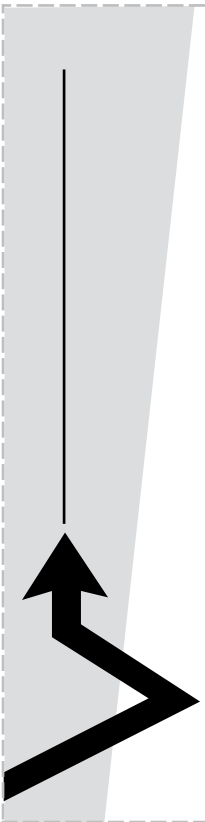
presented by

George W. Carver

Jacques Cousteau

Hedy Lamarr

Thomas Edison



Name: _____

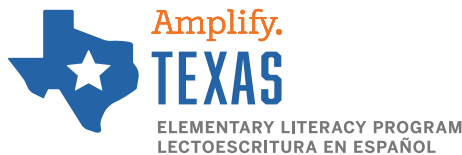
Birthdate: _____

Birthplace: _____

Invention(s): _____

Describe a challenge or disappointment that this inventor faced.

Name one fact about this inventor or the story of their invention that you find interesting.



General Manager K-8 Humanities and SVP, Product

Alexandra Clarke

Chief Academic Officer, Elementary Humanities

Susan Lambert

Content and Editorial

Elizabeth Wade, PhD, Director, Elementary Language Arts Content

Patricia Erno, Associate Director, Elementary ELA Instruction

Baria Jennings, EdD, Senior Content Developer

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Product and Project Management

Ayala Falk, Director, Business and Product Strategy, K-8 Language Arts

Amber McWilliams, Senior Product Manager

Elisabeth Hartman, Associate Product Manager

Catherine Alexander, Senior Project Manager, Spanish Language Arts

LaShon Ormond, SVP, Strategic Initiatives

Leslie Johnson, Associate Director, K-8 Language Arts

Thea Aguiar, Director of Strategic Projects, K-5 Language Arts

Zara Chaudhury, Project Manager, K-8 Language Arts

Design and Production

Tory Novikova, Product Design Director

Erin O'Donnell, Product Design Manager

Other Contributors

Patricia Beam, Bill Cheng, Ken Harney, Molly Hensley, David Herubin, Sara Hunt, Kristen Kirchner, James Mendez-Hodes, Christopher Miller, Diana Projansky, Todd Rawson, Jennifer Skelley, Julia Sverchuk, Elizabeth Thiers, Amanda Tolentino, Paige Womack

Texas Contributors

Content and Editorial

Sarah Cloos

Laia Cortes

Jayana Desai

Angela Donnelly

Claire Dorfman

Ana Mercedes Falcón

Rebecca Figueroa

Nick García

Sandra de Gennaro

Patricia Infanzón-Rodríguez

Seamus Kirst

Michelle Koral

Sean McBride

Jacqueline Ovalle

Sofía Pereson

Lilia Perez

Sheri Pineault

Megan Reasor

Marisol Rodriguez

Jessica Roodvoets

Lyna Ward

Product and Project Management

Stephanie Koleda

Tamara Morris

Art, Design, and Production

Nanyamka Anderson

Raghav Arumugan

Dani Aviles

Olioli Buika

Sherry Choi

Stuart Dalgo

Edel Ferri

Pedro Ferreira

Nicole Galuszka

Parker-Nia Gordon

Isabel Hetrick

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Ashna Kapadia

Jagriti Khirwar

Julie Kim

Lisa McGarry

Emily Mendoza

Marguerite Oerlemans

Lucas De Oliveira

Tara Pajouhesh

Jackie Pierson

Dominique Ramsey

Darby Raymond-Overstreet

Max Reinhardsen

Mia Saine

Nicole Stahl

Flore Thevoux

Jeanne Thornton

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Consulting Project Management Services

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Additional Consulting Services

Erin Kist
Carolyn Pinkerton
Scott Ritchie
Kelina Summers

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Contributors to Earlier Versions of These Materials

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