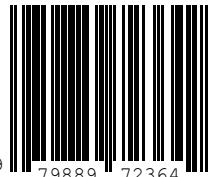


ENGLISH

EUREKA!

THE ART OF INVENTION



GRADE 4 UNIT 2 | DIGITAL COMPONENTS

EDITION 1

Grade 4

Unit 2

Eureka!

The Art of Invention

Digital Components

Acknowledgement:

Thank you to all the Texas educators and stakeholders who supported the review process and provided feedback. These materials are the result of the work of numerous individuals, and we are deeply grateful for their contributions.

Notice: These learning resources have been built for Texas students, aligned to the Texas Essential Knowledge and Skills, and are made available pursuant to Chapter 31, Subchapter B-1 of the Texas Education Code.

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Digital Components

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EuREKA! SCOREBOARD



AIRPLANE



ALARM CLOCK



MICROSCOPE



PAPER



RADIO



TELEPHONE



Find Your Lab Clues: Airplane

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.



Find Your Lab Clues: Microscope

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.



Find Your Lab Clues: Paper

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 AD, 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.



Find Your Lab Clues: Radio

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.



Find Your Lab Clues: Telephone

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



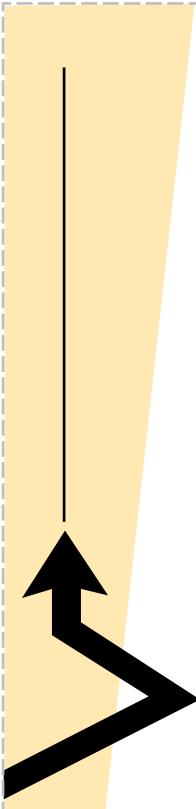
EUREKA!
STUDENT
INVENTOR
QUEST

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.

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