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CLASS _____

HISPANIC HERITAGE MONTH

Ellen Ochoa

Engineer, Inventor, and the First Hispanic Woman in Space

A Scientist Who Reached Orbit

Ellen Ochoa was born in California in 1958, and her family roots reach back to Mexico. She loved music and math, and she was very good at both. She studied physics in college and then earned a doctorate in **electrical engineering** at Stanford University.

Before she ever thought about flying in space, Ellen was an inventor. She worked on **optical systems** — machines that use light and cameras to "see." She is a co-inventor on three **patents**, including a system that inspects objects for flaws and a method that helps a computer recognize what it is looking at.

NASA chose Ellen to be an astronaut in 1990. In 1993 she rode the space shuttle *Discovery* into orbit and became the first Hispanic woman in space. Over four missions she spent almost 1,000 hours off the planet. She operated the shuttle's **robotic arm**, studied the Sun, and helped deliver supplies to the International Space Station.

Later, Ellen led NASA's Johnson Space Center in Houston, the home of American astronaut training. She was the first Hispanic person ever to direct it.

WORDS TO KNOW

- **engineer:** A person who uses science and math to design and build things that solve problems.
- **patent:** An official document that says you invented something new, so others cannot copy it without asking.
- **robotic arm:** A machine arm, controlled by a person or a computer, that grabs and moves objects.

Part 1 • Reading Comprehension

1. What did Ellen Ochoa study at Stanford University?

2. Name one thing Ellen invented or helped invent before becoming an astronaut.

3. What record did Ellen set in 1993?

4. What job did Ellen have at NASA after she stopped flying?

Part 2 • Engineering Challenge: Build a Grabber

Ellen used a robotic arm to grab objects floating outside the shuttle. Astronauts cannot just reach out and grab things — so engineers design tools that do it for them. Plan your own grabber tool.

1 What object would your grabber pick up? (Something in your classroom is fine.)

2 What would the grabbing end be shaped like — a claw, a scoop, a magnet, or something else? Why?

3 A robotic arm is controlled from far away. Name one thing that would be hard about using your grabber without touching it.

Part 3 • Think About It

Ellen was an engineer and an inventor before she was an astronaut. Why do you think NASA wanted astronauts who were also engineers?
