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CLASS _____

HISPANIC HERITAGE MONTH

Ellen Ochoa

Engineer, Inventor, and the First Hispanic Woman in Space

An Engineer Who Flew to Space

Ellen Ochoa was born in California in 1958. Her family roots go back to Mexico. As a student, she loved music and math. She played the flute, and she went on to study science in college. She became an **engineer** — a person who uses science and math to design and build things.

Before Ellen flew to space, she was an inventor. She worked on machines that use light and cameras to "see." She helped invent three things and earned a **patent** for each one. One of her inventions checks objects for flaws. Another helps a computer recognize what it is looking at.

In 1990, NASA chose Ellen to be an astronaut. In 1993, she flew into space on the space shuttle Discovery. That made her the first Hispanic woman ever to go to space. She flew four missions and spent almost 1,000 hours in space. On her missions, she controlled the shuttle's **robotic arm** to grab and move large objects outside the shuttle.

Later, Ellen became the director of NASA's Johnson Space Center in Houston, Texas. That is where American astronauts train. She was the first Hispanic person to lead it.

WORDS TO KNOW

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

Part 1 • Reading Comprehension

1. What kind of job did Ellen Ochoa train for in college?

2. Name one of Ellen's inventions.

3. What "first" did Ellen achieve in 1993?

4. What job did Ellen have after she stopped flying to space?

Part 2 • Engineering Challenge: Design a Grabber

In space, astronauts cannot just reach out and pick things up. Ellen used a robotic arm to grab objects outside the shuttle. Now you will plan your own grabber tool.

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

2 What shape would the end of your grabber be — a claw, a scoop, a magnet, or something else? Why does that shape work for your object?

3 Ellen controlled the robotic arm from inside the shuttle, without touching the object. What is one thing that would be hard about grabbing something without touching it?

Part 3 • Think About It

Ellen was an engineer and an inventor before she became an astronaut. Why do you think NASA wants astronauts who are also engineers? Explain your answer.
