



TEACHER GUIDE

HOW TO BE A SCIENTIST GRADES 6-8

COMMON MISCONCEPTIONS

- **Women can't be scientists.**
Although still underrepresented in many science, technology, engineering, and mathematics fields, women absolutely can be scientists and engineers. Many colleges and universities, as well as large corporations, have scholarships, grants, and other types of incentives to encourage more women to enter these career fields.
- **All scientists have a PhD.**
Careers in the science fields are not reserved for those students who are always at the top of their field. Certainly, many individuals do go on to earn a doctorate as a result of their studies. However, many scientific laboratory and research jobs do not require a person to complete that much schooling.
- **All scientists work alone.**
Science careers are very collaborative. Most rely on teamwork and the combined input of many individuals. Scientists are constantly working and communicating with others.

UNIVERSITY OF CALIFORNIA, LOS ANGELES (UCLA)

The University of California, Los Angeles (UCLA) is a public research university that is a part of the University of California system. UCLA offers 337 undergraduate and graduate degree programs and enrolls approximately 44,000 students each year. UCLA receives more applications for enrollment than any other American university.

BIOCHEMISTRY

Biochemistry is the study of the structure, composition, and chemical reactions of living things. Biochemistry is the combination of biology, organic, and inorganic chemistry. Biochemists study the way living things obtain energy from food, the chemistry of heredity, the fundamental changes that occur in disease, and more. Applications of biochemistry can be found in medicine, dentistry, veterinary medicine, food science, and agriculture.

ASTRONOMY

Astronomy is the study of the stars, planets, and space. Astronomers use mathematics, physics, and chemistry to

explain the origin and evolution of the universe and the objects within it. Astronomy is considered the oldest natural science because members of the earliest civilizations studied and recorded their observations of the night sky. Astronomy is unique because many discoveries have been made by amateurs.

TEACHER TIPS

You could begin this lesson with a “[Draw a Scientist](#)” activity like the one from the California Academy of Sciences. Asking students to draw a scientist doing science surfaces student thinking about the nature of science and the demographics of scientists. This activity, coupled with the “How to be a Scientist” lesson, will help students begin to see themselves as scientists.

ABOUT THIS LESSON

This lesson was created by the National Science Teaching Association (NSTA) to pair with the Generation Genius video and support NGSS.

They have requested we provide the following background with this lesson:

The Next Generation Science Standards (NGSS) are the national standards on how students learn science, and they are based on contemporary research presented in *A Framework for K–12 Science Education (the Framework)*. The shift in science teaching and learning required by the Framework is summarized in this infographic: [A New Vision for Science Education](#).

At the start of each Generation Genius lesson, students are presented with a phenomenon, then they try to explain it. Students will notice they have gaps in their knowledge and ask questions, which motivates them to build ownership of science ideas they need in order to explain how or why the phenomenon occurred. The way students build ownership of science and engineering ideas is through active engagement in the science and engineering practices (SEPs). This process of sensemaking, or doing science to figure out how the world works, is one of the major shifts the *Framework* encourages.

To engage in the SEPs, students should be part of a learning community that allows them to share their ideas, evaluate competing ideas, give and receive critiques, and reach consensus. Students can start by sharing ideas with a partner, then with a small group, and finally, with the whole class. This strategy creates opportunities for all students to be heard, build confidence, and have something to contribute to whole-class discussions. Each Generation Genius lesson provides conversational supports to facilitate such productive student discussions to contribute to sensemaking.

Excited to continue your shift toward the new vision for science education? Check out the [Generation Genius Teacher Guide](#) page on the NSTA website for resources and strategies to engage every student in your classroom in **doing** science.

