



# Pre-College Engineering Education [precollege.asee.org](http://precollege.asee.org)

## INCLUSIVE ENGINEERING FOR P12 STUDENTS: BEST PRACTICES

### COLLABORATION VS. COMPETITION

Competitions can be exciting ways to get students to do their best. However, they may discourage students who don't win. Some competition can be good, but make sure to have opportunities for classes and teams to collaborate and show that everyone's success is valued and important.

### CONTEXT MATTERS

Choosing authentic contexts that demonstrate how engineering solutions help society, people, animals, etc., can motivate engagement and help students identify their goals and values within engineering.

### CULTURALLY RELEVANT

When considering the context of an engineering activity, think about the target students' interests, the characteristics of their community, and the things they are familiar with, and integrate them into your activity.

### DESIGN, PLAN, THEN BUILD

Some students prefer to think before they build while others want to jump in and start constructing. Encourage good engineering practices by having all students design and plan before allowing them access to materials.

### TEAMING

Team composition can play a huge role in student engagement. Research shows that putting underrepresented individuals in the minority within a team can be disempowering. Try to create teams where students are equally represented.

### UNIVERSAL DESIGN FOR LEARNING

Not everyone learns in the same ways. Utilize principles of Universal Design for Learning:

1. Provide multiple means of representation,
2. Provide multiple means of expression,
3. Provide multiple means for engagement.

Read more at [www.cast.org](http://www.cast.org)

### ROLE MODELS

Role models and mentors who share attributes with students can make a big difference in helping students imagine themselves as an engineer. YouTube clips or profiles of diverse engineers from the internet may help when your staffs' profiles don't match the students.

# INCLUSIVE ENGINEERING FOR P12 STUDENTS: RESOURCES



# ASEE

Pre-College  
Engineering  
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## ROLE MODELS

Credit: Jessica Black



**HERBIE HANCOCK**

Jazz Musician  
Electrical Engineer

Credit: Laura A. Oda



**DEBBIE STERLING**

Goldilocks Founder  
Design Engineer

Credit: NASA



**JOHN HERRINGTON**

1st Native American astronaut  
Aeronautical Engineer

Credit: ESPN



**ALBA COLÓN**

Lead Engineer - Chevy NASCAR  
Mechanical Engineer

Credit: Xerox



**URSULA BURNS**

CEO Xerox  
Mechanical Engineer

Credit: Mike McGregor



**LONNIE JOHNSON**

Super Soaker inventor  
Mech./Nuc. Engineer

## LINKS

National Society of Black Engineers: [nsbe.org](http://nsbe.org)

Society of Women Engineers: [societyofwomenengineers.swe.org](http://societyofwomenengineers.swe.org)

Society of Hispanic Professional Engineers: [shpe.org](http://shpe.org)

American Indian Science and Engineering Society: [aises.org](http://aises.org)

National Organization of Gay and Lesbian Scientists and  
Technical Professionals: [noglstp.org](http://noglstp.org)