



OUTREACH GUIDELINES

UNDERSTAND YOUR AUDIENCE

Understanding the developmental level, scientific understanding and mathematics capabilities of your audience will help you deliver an effective outreach experience. Here are some general student characteristics to consider:

ELEMENTARY SCHOOL	MIDDLE SCHOOL	HIGH SCHOOL
Developmental Level		
<ul style="list-style-type: none"> highly impressionable highly curious reasoning tied to concrete experiences rapid shift of interest strong sense of humor boundless energy 	<ul style="list-style-type: none"> inquisitive but may not question an adult can be physically restless/need activity-oriented materials capable of abstract reasoning self-conscious want peer group approval beginning consideration of careers 	<ul style="list-style-type: none"> on the verge of becoming adults and some are adults will challenge or question the adult represent a variety of ages (16-21) and maturity levels represent a variety of skills, abilities, desires and ambitions ready to explore careers
Scientific Understanding		
<ul style="list-style-type: none"> science not always a separate subject subjects covered may include: <ul style="list-style-type: none"> characteristics of organisms that co-exist with us personal health and hygiene poison awareness, including drugs, alcohol, tobacco environmental awareness and responsibility 	<ul style="list-style-type: none"> often focus on: <ul style="list-style-type: none"> life science health science earth science physical science environmental science chemistry, biology, and physics not usually taught in much detail scientific words may not be in students' vocabulary 	<ul style="list-style-type: none"> understanding of: <ul style="list-style-type: none"> molecular processes in living organisms biological evolution matter, energy, and organization high school students who have successfully completed advanced placement (AP) science classes have a greater scientific understanding
Mathematics Capabilities		
<ul style="list-style-type: none"> counting, decimals, simple fractions, percents addition/subtraction (K-2nd) multiplication/division (3rd-5th) problem-solving using graphs, charts, tables shape recognition(K-2nd) area/perimeter calculations (3rd-5th) units of measure, accuracy 	<ul style="list-style-type: none"> rational, irrational numbers square roots box-and-whisker plots, circle graphs and scatter plots trends data quality linear and non-linear functions grid coordinates three-dimensional shapes logic problems, if/then statements 	<ul style="list-style-type: none"> word problems descriptive statistics correlations sampling solve linear equations in one and two variables matrix multiplication quadratic equations sine, cosine, and tangents surface area/volume calculations



PREPARE TO DELIVER

Adequately preparing for your outreach event will further increase chances of success, regardless of the audience.

Tell me - I will forget

Show me - I may remember

Involve me - I will understand

1. Select an activity that is age appropriate. ITE's Recruitment Toolbox allows you to search by age range.
2. Remember your audience. Use the appropriate vocabulary for the age group that you are addressing.
3. Bring an attention grabber or a hook (and your own enthusiasm!) to focus the students' attention at the beginning of your activity. Keep in mind that your goal is to arouse curiosity, excitement, and an eagerness to learn.
4. Use Props. Bring something to pass around that you use in your profession. These objects may seem ordinary to you, however students love to touch, hold, and explore unfamiliar objects. If possible also bring a small item that the students can take home. They will keep thinking about what you've said every time they look at it.
5. Don't lecture. Let students explore, discover, investigate, experiment, solve. Before the hands-on activity begins or after it has ended, involve the students in a question-and-answer period. If you choose to use PowerPoint or other audiovisual aids, make your presentation/demonstration interactive.
6. If you ask a question, allow time for the students to answer. Five seconds of "wait time" will give the students enough time to formulate an answer.
7. Let the students know that you are a real person. Tell them about your family and what got you interested in transportation engineering and engineering in general. Students need to see real life role models. Use humor as often as possible with your personal stories; it's a great ice-breaker.
8. Be prepared to discuss your career choice in more detail with older students. If appropriate, show ITE's *Careers in Transportation* video to the students, followed by a question and answer period. Consider your responses to each of the following questions:
 - How did you choose your career?
 - What exactly do you do during a typical day?
 - What do you like most about your work? What do you like least?
 - How much do you make? How much can you make?
 - Did you like math/science when you were in school?
 - How do you manage your career and family life?
 - What suggestions would you have for a student interested in a career such as yours?

Tailor your comments to your audience. For younger students stress some of the basic, but exciting, aspects of your work. Students in middle school are increasingly receptive to discussions about career opportunities, but many do not truly understand the differences between "career" and "job". Furthermore, at this age, many of them may be easily turned off by the idea of choosing a lifelong-career that involves many more years of school. For older students suggest colleges and universities they may want to look at, potential majors they might consider, and financial rewards they may reap. High school students may be more receptive to the reality of what it takes to succeed in the adult world. Many understand that careers that provide good salaries often require hard work. Some will not aspire toward a career because their environment does not expose them to a lot of options. Others will still be hoping for careers in sports, show business, or other similar fields. Keep the discussion focused more on the benefits and less on the work involved. Your goal should be to make transportation engineering sound exciting so it is something they consider as they mature and pursue their career!

Most importantly, relax, have fun, and remember that volunteering to work with young students can have a lasting impact on future generations of transportation engineers!

