

OUTREACH 101

All Roads Lead to
Surveying and Mapping!



BEaSURVEYOR.com

A GUIDE TO OUTREACH FOR LAND
SURVEYING AND MAPPING
CAREERS

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NOTE TO USERS

This guide was prepared to assist individuals interested in introducing and promoting land surveying and mapping careers to the next generation. Outreach is a critical task for reaching the next generation of land surveyors and mappers, and it is incumbent on all of us to do whatever we can to promote the profession.

When it comes to outreach, it is difficult to measure success and to determine the best outreach methods. Where is the best place to focus our efforts: high school, middle school, elementary school, counselors, technical training groups, agricultural groups, and military veterans? The truth is that outreach is essential for all ages and organizations. The most important thing is that it happens and happens in mass quantities.

The goal of this document is to remove the roadblocks and help individuals to do whatever outreach works for them. If you have or know elementary-age kids and are comfortable talking to them, set up a time and make it happen. If you're more comfortable talking with middle school, high school, or counselors, then make that happen. And if you are not ready to start talking with kids and/or counselors right away, then find someone to tag along with; we need all the help we can get!!

There are many ways to get involved in outreach efforts for the surveying profession. Maybe you are new to outreach, and it seems like a daunting task. Or maybe you are a seasoned outreach veteran looking for some new tips. Either way, BEaSURVEYOR.com has you covered, and all this information and more is available at <https://beasurveyor.com/outreach-101/>



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I) OUTREACH BASICS

- A. The first step is to identify a group and find a location to meet with the group. The typical groups have centered around schools and educators; however, there are numerous groups for successful outreach (see section II for a list of potential outreach opportunities). The key is to find a group that works for you and work with whatever group you are comfortable with.
- B. Once a group, location, and time have been determined, then it is time to start planning. The type of group, age, and location will dictate the options for presentations. It may include a PowerPoint presentation, hands-on demonstration, or maybe just meeting and talking with the groups. There are several examples below, but there are many more ways to connect as well.
- C. One of the keys to any kind of outreach is knowing your audience and delivering age-appropriate information. As noted below, the approach for elementary-age students is completely different from that of high-school students, and outreach with other groups is different.

II) FIVE WAYS TO GET STARTED IN OUTREACH

- A. **Establish Relationships with Local Schools and Educators:** Before starting outreach, you need to have a local network. Reach out to local schools, teachers, the Board of Cooperative Educational Services (BOCES), and educational organizations (such as FFA, 4-H program, and Scouts). Offer to do activities, presentations, or workshops related to surveying. Building strong relationships with educators and counselors is key to gaining access to K -12 students.
- B. **Participate in Career Fairs and STEM Events:** Attend K-12 career fairs, college career fairs, STEM (Science, Technology, Engineering, and Mathematics) events, and community outreach programs. Set up engaging booths or displays to introduce students to surveying equipment and technologies. Interactive activities can pique their interest and make your presence memorable. This can be drones, LiDAR scanners, and total stations. You can also rent exhibit booth materials, such as banners and table drapes, by signing up at

<https://surveyors.marcomcore.com/customer/account/login>



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- C. Offer Engaging Presentations and Classroom Activities:** Presentations can highlight the importance and excitement of surveying. There are high school presentations with a full script that is ready to be presented to students. Or run on a loop at an event, and there is a narrated version that can be distributed to educators and presented without your presence required.

You can build on the presentation by using real-world examples to make the content relatable and interesting. Be prepared to answer questions and encourage student participation during the presentation. Consider bringing surveying equipment to your presentation to highlight the tools you use as a surveyor. You may even give a demonstration of the equipment. For the younger K-8 audience, you can perform classroom activities. There are several you can download. The links will be provided later in this document.

- D. Connect with your State Association and Local Chapter:** If you have not done so already, connect with your state association and local chapter. Many associations and chapters have standing committees that you can join. They may already have an outreach schedule you can join and build upon. If you are new, they may also have surveyors with years of outreach experience who can help you on your path.
- E. Create Mentorship Programs:** Establish mentorship programs that pair experienced surveyors with interested K-12 students. This one-on-one interaction can provide valuable insights and guidance, allowing students to explore the profession in-depth. Giving them a chance to use surveying tools or participate in a mini-surveying project can be a transformative experience that sparks their curiosity for the profession.

Remember, consistency is key in K-12 outreach. Regularly engage with schools and students to maintain their interest and build a lasting connection. By making surveying accessible and exciting, you can inspire the next generation of surveying professionals.

III) PUBLIC SPEAKING

Public speaking can be a valuable skill for anyone involved in K-12 outreach. Here are some tips to help you become a more confident and effective public speaker:

- A. Know Your Audience:** Understand the needs, interests, and knowledge level of your audience, especially when speaking to K-12 students. Is the high school class seniors or



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freshmen? Is it the BOCES program? Is it an after-school STEM class? Is it a class of third graders? Each will require a different approach. Tailor your content and approach accordingly to engage them effectively.

- B. Practice, Practice, Practice:** Rehearse your presentation multiple times before the actual event. If you are using the downloaded presentations from BEaSurveyor.com, go over the script and tailor it to meet your needs. Familiarity with your material will boost your confidence.
- C. Control Your Body Language:** Be aware of your body language. Stand or sit up straight, use hand gestures purposefully, and avoid distracting movements. Your posture and gestures should complement your message.
- D. Speak Clearly and Slowly:** Enunciate your words clearly and avoid speaking too quickly. This allows your audience, especially K-12 students, to follow your message more easily.
- E. Engage Your Audience:** Encourage interaction by asking questions, using rhetorical devices, or involving the audience in brief activities or discussions. This could be done by using a surveying tool, such as a drone or LiDAR scanner, as a visual aid. This keeps their attention and participation.
- F. Be Authentic:** Be yourself. Authenticity helps build a connection with your audience. Share personal anecdotes or experiences when relevant, as this can make your message more relatable.
- G. Handle Questions:** Be prepared for questions and answer them confidently. If you don't know the answer, admit it and offer to follow up later with the information.

Remember that public speaking is a skill that improves with practice and experience. Embrace each opportunity to speak in public as a chance to grow and refine your abilities, and don't be discouraged by occasional challenges.



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IV) OUTREACH OPPORTUNITIES

- A. Elementary Schools
- B. Middle Schools
- C. Future Cities Competition
- D. Scouting and 4H Groups
- E. High Schools
- F. Private Schools
- G. Home Schoolers
- H. STEM/Math and Science Clubs
- I. Trig-Star Competition
- J. Women and Minorities in STEM
- K. Be More Colorful
- L. Robotics Clubs and Competitions
- M. Career and Technical Education (CTE) High Schools–Project Lead the Way (PLTW)
- N. Career and Technical Education (CTE) State and National Conferences
- O. Future Farmers of America (FFA) State and National Conferences
- P. Trade and Construction Schools
- Q. State and National Counselors Conferences
- R. State and County Fairs
- S. Local Art Festivals that may have a STEM Section for the younger kids
- T. School Career Fairs, College Career Fairs
- U. Community Colleges
- V. Undecided Students at College Universities



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V) OUTREACH RESOURCES AND TOOLBOX SUGGESTIONS

- A. **NSPS PowerPoint Recruiting Presentation**
<https://www.dropbox.com/scl/fi/i5plql7dyhsnpj7vt06f/NSPS-Discover-Surveying-Rev3a.pptx?rlkey=zyz7hhix38riex70snbvwir1q&dl=0>
- B. **NSPS PowerPoint Recruiting Presentation (narrated)**
<https://www.dropbox.com/scl/fi/du4jub698rjo9uudw40xw/NSPS-Video-Draft-3.mp4?rlkey=1olmgu1cc5ja1ww2t5xwb6ryr&dl=0>
- C. **NSPS PowerPoint Recruiting Presentation (Slide Show video "looping")**
<https://www.dropbox.com/scl/fi/a3vlf99pb02fy625ptgh/NSPS-Discover-Surveying-Rev3a.mp4?rlkey=jmrm1fayctbn99pynfeeyedii&dl=0>
- D. **NCEES PowerPoint Speakers Kit Recruiting Presentation**
https://www.dropbox.com/scl/fi/ugwlge5sfjwy7ki6ovexy/NCEES_Surveying_Speakers_Kit-Update-2021-FINAL.pptx?rlkey=0dzmquxcfzpdyor2mhua0nf01&dl=0
- E. **NCEES "X" marks the Spot (Grades K-8 Lesson Plan)**
<https://www.dropbox.com/scl/fi/8ij87lt3lv1y6yea3h13i/lesson-plan-X-Marks-the-Spot.pdf?rlkey=lqlvdljxag1qe7lrkokkkzpvpy&dl=0>
- F. **NCEES All Around the Compass (Grades K-2 Lesson Plan)**
<https://www.dropbox.com/scl/fi/t614h8ssiechg7lpkine7/Lesson-Plan-All-Around-the-Compass.pdf?rlkey=rhmc8lkkd4zmpxvbwxe716rss&dl=0>
- G. **NCEES Comparing Measurements (Grades 3-8 Lesson Plan)**
<https://www.dropbox.com/scl/fi/2kq9iz2fjtajbglsvc5z0/Lesson-Plan-Comparing-Measurements.pdf?rlkey=pj6yr2vbn9f1vqze19u5msgi0&dl=0>
- H. **BLM Bureau of Land Management - (Classroom Investigation of Cadastral Surveying (Grades K-8))**
<https://www.dropbox.com/scl/fi/trwn7t0f5eys2tymqqipw/Classroom-Investigation-Cadastral-Surveying.pdf?rlkey=lnjojvek4qgrsi2e8y9pg1ya3&dl=0>
- I. **Larry the Surveyor – Children's Book for K-5th Grades**
<https://www.bolton-menk.com/books/larry/larry.html>
- J. **ESRI-Lindsey the GIS Professional, Storybook & Activities for K-5th Grades**
<https://learn.arcgis.com/en/esripress/lindsey/>
- K. **Get Kids Into Survey (GKiS) PowerPoint Presentation for K-5th Grades**
https://www.dropbox.com/scl/fi/u98t0woek9phk0gg3fg2q/GKIS-Powerpoint_for_Kids.pptx?rlkey=sfj6yiojw16584q0it6zwh5um&dl=0
- L. **GKiS Hands on Homework Projects for K-5th Grades**



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<https://www.dropbox.com/scl/fo/lgbum4sxl4s9uckgm1jj0/AFvIJhJEtrs4Zue3nmVEOQ8?rlkey=b715nvoax8zbfj70cut9y8l1f&dl=0>

M. GKIS Posters

Contact info@nsp.us.com or Trent Keenan trent@getkidsintosurvey.com (Trent handles the Western 13 States, but can help anyone in the U.S.) – Please allow up to 10 business days for shipping. Anyone requesting posters will be asked to pay for the shipping cost.

N. GKIS Q&A for each Poster for K-5th Grades

https://www.dropbox.com/scl/fo/t3tnnoe9psvrhcum6xy5e/AMru_b5oWw-yIVDD7ICtQgo?rlkey=78ixksk7p39gr0luwot7wltxq&dl=0

O. GKIS Miscellaneous Activities for K-5th Grades

<https://www.dropbox.com/scl/fo/phe5ek3n5lbne73e5dhf0/ANf4LIfYZIsjpmCUEF6ouAI?rlkey=fqalcnm0e83gtx2rmti3hm6ki&dl=0>

P. Twinkl Hands-On Activities for K-5th Grades

https://www.dropbox.com/scl/fo/od59be6vqrrrxptml4yv/AFpu5_YQ0TIHeK7A2Mu8MRY?rlkey=pcl3lgr7e24cuzdnayr1vjz&dl=0

Q. GKIS Coloring Sheets for K-5th Grades

<https://www.dropbox.com/scl/fo/soggn25c9882sg0hwqqbs/AGTA7Oj5IL16NFBQ602Ebs?rlkey=0h4pau8knnd5yvm2qn9exjxa1&dl=0>

R. Virtual Sandbox – How to Build One – Step by Step

<https://www.dropbox.com/scl/fi/qbfb9umxdn99vzdjfb4yd/How-to-Build-a-Virtual-Sandbox-for-your-Outreach-Program.docx?rlkey=daw98460oixx1espli5blhnm7&dl=0>

S. Vector Art Files to Order Your Own Stickers for Outreach Events – We

recommend ordering from Sticker Mule-<https://www.stickermule.com/>
<https://www.dropbox.com/scl/fo/v03oajslhkwxd5gamaci/ALN8KLgN76n5G4zOEt7Tf0M?rlkey=ynh5ukbuwaeak30k9285m2xho&dl=0>

T. Be A Surveyor - Outreach Fulfillment Center (order your NCEES swag today!)

<https://surveyors.marcomcore.com/customer/account/login>

U. Robotic Total Station Demonstrations

V. Terrestrial 3D Scanning Demonstrations

W. NavVis SLAM Scanning Demonstrations (Also see app – NavVis Scan Master)

X. Drone and LiDAR Demonstrations (*NCEES will have a Drone Simulator available to ship out in the coming months*) Be sure to check the fulfillment center to order.

Y. Raffle off gifts to gain contact information



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VI) The Curriculum Connections associated with the Outreach efforts within the Land Surveying Profession:

Common Core Standards for Mathematics:

Solve Systems of Equations

CCSS.MATH.CONTENT.HSA.REI.B.6

Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. **3.2**

Modeling with Geometry

Apply Geometric Concepts In Modeling Situations

CCSS.MATH.CONTENT.HSG.MG.A.2

Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). **2.2 & 3.2**

CCSS.MATH.CONTENT.HSG.MG.A.3

Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). **2.2, 2.3, 3.1, 3.2, & 4.1**

Science & Technical Subjects (9-10)

CCSS.ELA-LITERACY.RST.9-10.3

Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. **2.3 & 3.2**

Craft and Structure

CCSS.ELA-LITERACY.RST.9-10.4

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. **1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, and 4.1**



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Next Generation Science Standards

Science and Engineering Practices

MS-ETS1-1 Engineering Design

Students who demonstrate understanding can:

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Science and Engineering Practices

Asking Questions and Defining Problems

Asking questions and defining problems in grades 6–8 builds on grades K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models.

- Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions.

Disciplinary Core Ideas

ETS1.A: Defining and Delimiting Engineering Problems

- The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.

Crosscutting Concepts

Influence of Science, Engineering, and Technology on Society and the Natural World

- All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment.
- The uses of technologies and limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions.



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- Connections to MS-ETS1.A: Defining and Delimiting Engineering Problems include:
Physical Science: MS-PS3-3

Articulation of DCIs across grade-bands: 3-5.ETS1.A ; 3-5.ETS1.C ; HS.ETS1.A ; HS.ETS1.B

Common Core State Standards Connections:

ELA/Literacy -

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-ETS1-1)

WHST.6-8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ETS1-1)

Mathematics -

MP.2 Reason abstractly and quantitatively. (MS-ETS1-1)

7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-ETS1-1)

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

The section entitled "Disciplinary Core Ideas" is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas. Integrated and reprinted with permission from the National Academy of Sciences.

Find out more information about certain curriculum connections by click on the link below.

<https://www.dropbox.com/scl/fo/m3fa8opqoknas3s4ylw7u/APDUYo52rn-WPkeYvFXDutA?rlkey=6gwa4ks36drfpilsp9i097xd6&dl=0>



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VII) Kindergarten - 5th Grade Talking Points

Suggested PowerPoint for Kindergarten – 5th Graders: (saved down and make edits as needed)

[https://www.dropbox.com/scl/fi/u98t0woek9phk0gq3fg2q/GKIS-Powerpoint for Kids.pptx?rlkey=sfj6yiojw16584q0it6zwh5um&dl=0](https://www.dropbox.com/scl/fi/u98t0woek9phk0gq3fg2q/GKIS-Powerpoint%20for%20Kids.pptx?rlkey=sfj6yiojw16584q0it6zwh5um&dl=0)

Suggested To Watch the Voiceover narrated by the NV-YSN:

<https://www.dropbox.com/scl/fi/m7vqid08dpap59hkooa6x/GEO-SURVEYORS.mp4?rlkey=97ngn2eypqdv0sj19meqiilmv&dl=0>

When talking to kindergarten through 5th graders about a career as a professional land surveyor, it's essential to keep the language simple, engaging, and relatable. Here are some talking points that integrate the ideas provided in the text about outreach basics and methods tailored specifically for young students:

Introduction: What is a Land Surveyor?

1. **Who Are We?:** "Hello, everyone! Today, I'm going to talk about being a land surveyor. That's someone who measures big areas of land to help build things like schools, parks, and roads. We use cool tools to find out where things go!"
2. **Tools We Use:** "Have you ever seen someone using a flying drone or a special camera on a tripod outside? Those are some of the tools we use to look at the land and make sure everything fits just right."

How We Get Started in Our Job

1. **Meeting New People:** "As land surveyors, we work with lots of people. We visit different schools and places to teach others about what we do. It's like when you go on a field trip and meet new friends."
2. **Showing What We Do:** "We go to places like career fairs or science events and set up fun displays. You can see models of drones, robotic total stations, and even play with some tools that surveyors use."
3. **Making Learning Fun:** "Sometimes, I come into classrooms like this one, and we do fun activities. We might measure something together, or I'll show you how we use our tools to find out how high a mountain is or how deep a lake is."



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Why It's Cool to Be a Land Surveyor

1. **Exploring and Adventure:** "Imagine being an explorer or a treasure hunter. That's a bit like being a land surveyor. We get to discover new places and solve puzzles about the land."
2. **Helping People:** "Our work helps people build houses, schools, and parks for all of us to live in or play in. We make sure that everything has enough space and is safe to use."
3. **Using Technology:** "We use some of the coolest Technology. Drones that fly and cameras that can see details from far away are part of our everyday tools. It's like being a tech wizard!"

Connecting with You

1. **Learning Together:** "I love teaching kids like you about surveying. It's exciting to see you learn and maybe even think about becoming a surveyor when you grow up."
2. **Questions and Answers:** "Do you have any questions about what a land surveyor does? Or about the tools I mentioned? I'd love to hear what you think!"

Closing

1. **Keep Exploring:** "Remember, learning is like a great adventure. The more you learn, the more you can do. Maybe one day, you'll decide to become a land surveyor too, and explore the world in your own way!"

Using these points, you can engage young students and spark their interest in the field of land surveying by emphasizing exploration, Technology, and the importance of the profession in everyday life.

VIII) Kindergarten - 5th Grade Toolbox Items to Bring With You

Key Items to Bring

Surveying Equipment: Bring equipment like robotic total stations, terrestrial 3D Scanning, or GPS units. These can help kids visualize the tools and the complexity of the technologies we use today.

Simple Maps and Plans: Showcasing colorful maps or simple civil engineering plans can help children understand what land surveyors do. You could include a map of the local area or a plan set for a well-known building or park in the area.



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Compass: A basic compass is a great tool to demonstrate how surveyors find directions on the land. Kids can hold or use it under supervision, learning how it points north and how it can be used to navigate. *Order a set for your next presentation from NCEES Recourse Hub. Make sure you pair this conversation with the NCEES "X" Marks the Spot.*

<https://surveyors.marcomcore.com/customer/account/login>

Or use this fun activity sheet from Twinkl to teach them about directions:

https://www.dropbox.com/scl/fi/ca04maay6n8rgm2th8o5g/au-t2-m-063-compass-directions-activity-sheet-ver_5.pdf?rlkey=iy64wb5s6i18w1fpn6ezzpc8k&dl=0

Photos and Videos: Bring photos or a short video of land surveyors at work, particularly those using interesting equipment like drones or engaging in outdoor activities. This can make the job more relatable and exciting. *See a few links below.*

NCEES: <https://www.youtube.com/watch?v=hxSllY6Z0Vw>

PLSO (Oregon) <https://www.youtube.com/watch?v=7kaCjnDxIJU&t=4s>

Texas YSN <https://www.youtube.com/watch?v=zLv1ZspfMA>

Older Nevada High Energy <https://www.youtube.com/watch?v=f0DwzJJqGWQ>

Interactive Display or Touch Screen: If possible, set up a small interactive display where children can see digital mapping in action. This could include terrestrial 3D scanning demonstrations or interactive GIS maps for your local county.

Drones: Since using an actual drone might not be feasible indoors, a static model can still be a huge hit. Make sure you bring the biggest one you have access to. Some of these students may be familiar with traditional commercial drones, so if you have a larger drone, bring that to show the students. Explain how these are used to survey land from the sky and capture images of large areas.

Measuring Tape: Bring a large, easy-to-read measuring tape to demonstrate how land is measured. You might even engage the children in a small measuring activity in the classroom or playground. Make sure you pair this conversation with the NCEES Comparing Measurements. Click on the link below to access this exercise.

<https://www.dropbox.com/scl/fi/2kq9iz2fjtajbglsv5z0/Lesson-Plan-Comparing-Measurements.pdf?rlkey=pj6yr2vbn9f1vqze19u5msgi0&dl=0>



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Safety Gear: Show them the typical safety gear a surveyor might wear, like a hard hat and reflective vest. This helps discuss the importance of safety in the field.

Virtual Sandbox: Does your state or local chapter have a Virtual Sandbox that you can bring to the classroom? This is a great way to teach the kids about contours and topographical surveying. Use the Hands-On Activities below if you bring the sandbox.

Get Kids Into Survey Posters: Be sure to order them at least a week or two ahead.

Get Kids Into Survey Homework Projects & Poster Q&A's: See links above.

Stickers: Bring lots of stickers with you; see below for options.

NCEES Promotional Items: <https://surveyors.marcomcore.com/customer/account/login>

NSPS Promotional Items: Reach out to info@nsp.us.com to order NSPS items.

Check with your local State Society: See what items your local state might have available.

Presentation Tips

Hands-On Demonstration: Wherever it is safe and practical, allow the children to handle some of the tools and equipment. For example, they could use the measuring tape to find a desk's length or a compass to find north.

Relatable Language: Use simple, age-appropriate language to explain how these tools help in building their schools, playgrounds, and homes.

Interactive Questions: Ask them questions like "Have you ever used a map?" or "Can you guess how long this room is?" to keep them engaged and thinking. See the link below for an exercise for map reading.

<https://www.dropbox.com/scl/fo/7iuenhzqrp55x14la65lq/AHpcu4l8sxUe3CQOT8Yhy0g?rlkey=6r6yl2j7mb0i9npcu13ky1kgm&dl=0>

Storytelling: Use storytelling to describe a day in the life of a surveyor, emphasizing Adventure, discovery, and the Technology used.

By making the presentation interactive and visually engaging, you help inspire curiosity and excitement about the profession,



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IX) 6th – 8th Grade Talking Points

Suggested PowerPoint for 6th – 8th Graders (saved down and make edits as needed)

<https://www.dropbox.com/scl/fi/i5plql7dyhsnpj7vt06f/NSPS-Discover-Surveying-Rev3a.pptx?rlkey=zyz7hhix38riex70snbvwir1q&dl=0>

Suggested To Watch the Voiceover narrated by the NSPS Workforce Development Committee:

<https://www.dropbox.com/scl/fi/du4jub698rjo9uudw40xw/NSPS-Video-Draft-3.mp4?rlkey=1olmgu1cc5ja1ww2t5xwb6ryr&dl=0>

Talking to 6th to 8th graders about a career as a professional land surveyor involves sparking interest in the Technology and importance of the field while also making the subject relatable and engaging. Here are some tailored talking points designed to captivate middle school students:

Introduction to Land Surveying

1. What is Land Surveying?

"Land surveying is about measuring and mapping the world around us. It involves calculating where things are on the Earth's surface. For example, before a new school or park can be built, a land surveyor helps determine its best place."

2. Why It Matters

"Imagine playing a video game where you design cities or parks — land surveying is like doing that in real life. Surveyors help create everything from your favorite skate parks to the roads your bus travels on."

Tools of the Trade

1. Exciting Technology

"Surveyors use some cool tech, like drones that fly over areas to take pictures and scanners that can see the ground in 3D. It's like having superpowers that let you see the world in ways others can't!"



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2. Hands-On Demonstrations

"Would you like to see how a drone works or how we use a GPS to find exact locations? These tools help us gather information about places without disturbing the environment."

A Day in the Life of a Surveyor

1. Outdoor Adventures

"If you love being outdoors, this could be your perfect job. Surveyors spend a lot of time outside, exploring new terrains and sometimes even remote areas to map uncharted lands."

2. Problem-Solving

"Every day is a puzzle waiting to be solved. From figuring out the best way to measure land to solving disputes about property lines, surveying is perfect for those who love a good challenge."

Getting Involved

1. How to Start

"Interested in seeing what surveying is all about? You can join a local STEM club, participate in a surveying workshop, or even start by using simple apps on your phone that introduce basic surveying concepts." (Check out NaVis Scan Master)

2. Career Opportunities

"Surveying isn't just about working in the field. It opens doors to careers in areas like urban planning and law. The skills you learn in surveying can take you many places!"

Engaging with the Audience

1. Interactive Q&A

"Let's make this fun—ask me anything about land surveying, or even better, let's brainstorm how you would use surveying tech to design your own park or game level!"



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2. Demonstrations and Visuals

"I'll show you some maps and images that surveyors have created. You'll see how we turn real-world data into maps that can be used for all sorts of exciting projects."

Closing Thoughts

1. The Big Picture

"As a land surveyor, you're not just working with land; you're shaping the future of how people live and interact with their environment. It's a career that helps build communities and protect natural resources."

2. Encouragement

"If you're curious, good at math, enjoy history, and like solving problems, consider this exciting field. You could be part of big projects that make a real difference in the world!"

By tailoring the conversation in this way, you can effectively communicate the excitement and importance of a career in land surveying to middle school students, highlighting the technological, outdoor, and problem-solving aspects of the profession.

X) 6th - 8th Grade Toolbox Items to Bring With You

Key Items to Bring

Surveying Equipment: Bring equipment like robotic total stations, terrestrial 3D Scanning or GPS units. These can help kids visualize the tools and the complexity of the technologies we use today.

Simple Maps and Plans: Showcasing colorful maps or simple civil engineering plans can help children understand what land surveyors do. You could include a map of the local area or a plan set for a well-known building or park in the area.

Compass: A basic compass is a great tool to demonstrate how surveyors find directions on the land. Kids can hold or use it under supervision, learning how it points north and how it can be used to navigate. Order a set for your next presentation from NCEES Recourse Hub. Make sure you pair this conversation with the NCEES "X" Marks the Spot.

<https://surveyors.marcomcore.com/customer/account/login>



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Or use this fun activity sheet from Twinkl to teach them about directions:

https://www.dropbox.com/scl/fi/ca04maay6n8rgm2th8o5g/au-t2-m-063-compass-directions-activity-sheet-ver_5.pdf?rlkey=iy64wb5s6i18w1fpn6ezzpc8k&dl=0

Photos and Videos: Bring pictures or a short video of land surveyors at work, particularly those using interesting equipment like drones or engaging in outdoor activities. This can make the job more relatable and exciting.

See a few links below.

NCEES: <https://www.youtube.com/watch?v=hxSllY6Z0Vw>

PLSO (Oregon) <https://www.youtube.com/watch?v=7kaCjnDxIJU&t=4s>

Texas YSN <https://www.youtube.com/watch?v=zILv1ZspfMA>

Older Nevada High Energy <https://www.youtube.com/watch?v=f0DwzJJqGWQ>

Interactive Display or Touch Screen: If possible, set up a small interactive display where children can see digital mapping in action. This could include terrestrial 3D scanning demonstrations or interactive GIS maps for your local county.

Drones: Since using an actual drone might not be feasible indoors, a static model can still be a huge hit. Make sure you bring the biggest one you have access to. Some of these students Explain how these are used to survey land from the sky and capture images of large areas.

Measuring Tape: Bring a large, easy-to-read measuring tape to demonstrate how land is calculated. You might even engage the children in a small measuring activity in the classroom or playground. Make sure you pair this conversation with the NCEES Comparing Measurements. Click on the link below to access this exercise.

<https://www.dropbox.com/scl/fi/2kq9iz2fjtajbglsvc5z0/Lesson-Plan-Comparing-Measurements.pdf?rlkey=pj6yr2vdn9f1vqze19u5msgi0&dl=0>

Safety Gear: Show them the typical safety gear a surveyor might wear, like a hard hat and reflective vest. This helps discuss the importance of safety in the field.

Virtual Sandbox: Does your state or local chapter have a Virtual Sandbox that you can bring to the classroom? This is a great way to teach the kids about contours and topographical surveying. Use the Hands-On Activities above from K-5th if you bring the sandbox.



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Get Kids Into Survey Posters: Be sure to order them at least a week or two ahead.

Get Kids Into Survey Homework Projects & Poster Q&A's: See links above.

Stickers: Bring lots of stickers with you; see below for options.

NCEES Promotional Items: <https://surveyors.marcomcore.com/customer/account/login>

NSPS Promotional Items: Reach out to info@nsp.us.com to order NSPS items.

Check with your local State Society: See what items your local state might have available.

Presentation Tips

Hands-On Demonstration: Wherever it is safe and practical, allow the children to handle some of the tools and equipment. For example, they could use the measuring tape to find a desk's length or a compass to find north.

Relatable Language: Use simple, age-appropriate language to explain how these tools help in building their schools, playgrounds, and homes.

Interactive Questions: Ask them questions like "Have you ever used a map?" or "Can you guess how long this room is?" to keep them engaged and thinking. See the link below for an exercise for map reading.

<https://www.dropbox.com/scl/fo/7iuenhzqrp55x14la65lq/AHpcu4l8sxUe3CQOT8Yhy0g?rlkey=6r6yl2j7mb0i9npcu13ky1kgm&dl=0>

Storytelling: Use storytelling to describe a day in the life of a surveyor, emphasizing Adventure, discovery, and the Technology used.

By making the presentation interactive and visually engaging, we help introduce surveying concepts at a young age, and we're not just teaching children how to measure land or read maps; we're opening their eyes to a world of exploration and critical thinking. It nurtures spatial awareness, problem-solving skills, and an appreciation for our physical world, and potentially spark interest in STEM fields early in their education.



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For Stickers and items, the middle school kids love these below:



Hands On Activities for 6th – 8th Grades:

For 6th- 8th Grades: Look at becoming a Mentor for a local middle school team that is competing in your State Future Cities Competition.

<https://futurecity.org/>

Or become a judge for the NCEES Best Land Surveying Practices Award as part of your local and state competition. <https://www.multibriefs.com/briefs/nsps/futurecitygeneralinfo.pdf>

For 6th- 8th Grades: Use the - *My Public Lands – Middle School Teaching Guide*.

Cadastral Surveying: Finding the Boundaries of U.S. Public Lands

<https://www.dropbox.com/scl/fi/trwn7t0f5eys2tymqqipw/Classroom-Investigation-Cadastral-Surveying.pdf?rlkey=lnjojvek4qqrsi2e8y9pg1ya3&dl=0>

For 6th and 7th Grades, look at providing support for the BSA Orienteering Merit Badge.

All you will need to do is find a local BSA Troop and become a Qualified Merit Badge Counselor, and you will be ready to go!

<https://www.scouting.org/merit-badges/orienteering/>

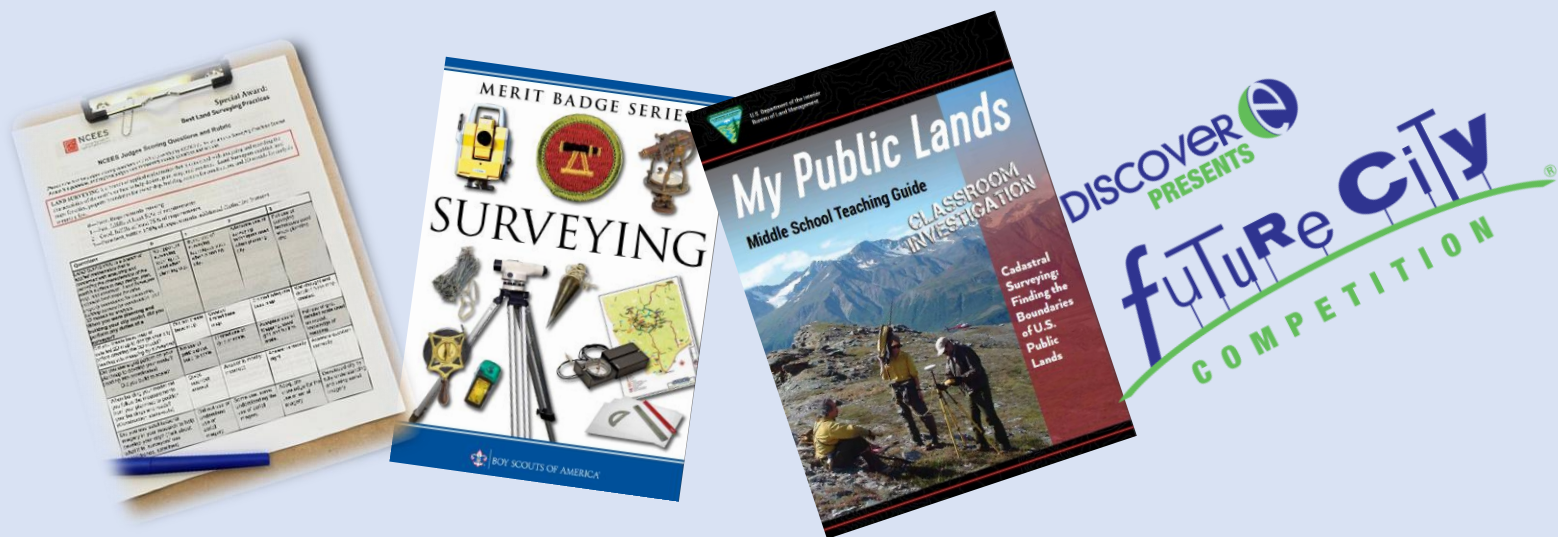
Link to PDF requirements for the Orienteering Badge.

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<https://www.dropbox.com/scl/fo/fh1jtfqfdtthwlrlduwq/APrvtbvSKwgm7Eg3Jd1RTCE?rlkey=1iqm9utx59wv2erl9dvyvryl&dl=0>

For 8th Grade, look at providing support for the BSA Surveying Merit Badge. The link below has a LOT of information provided by James I. Jeffreys, PE PLS from North Carolina. Jeff has put the entire workbook and presentation together for you. **All you will need to do is find a local BSA Troop and become a Qualified Merit Badge Counselor, and you will be ready to go!**

<https://www.dropbox.com/scl/fo/e6n0tdng34575cea3gdml/AP - 5f1mYMaE9Zm8COeuDmg?rlkey=l5vt3luvobp094kuln5mtsln6&dl=0>



XI) 9th – 12th High School Grades Talking Points

Suggested PowerPoint for 9th – 12th Graders (saved down and make edits as needed)

<https://www.dropbox.com/scl/fi/i5plql7dyhsnpjz7vt06f/NSPS-Discover-Surveying-Rev3a.pptx?rlkey=zyz7hhix38riex70snbvwir1q&dl=0>

Suggested To Watch the Voiceover narrated by the NSPS Workforce Development Committee:

<https://www.dropbox.com/scl/fi/du4jub698rjo9uudw40xw/NSPS-Video-Draft-3.mp4?rlkey=1olmgu1cc5ja1ww2t5xwb6ryr&dl=0>



OUTREACH 101

When speaking to 9th to 12th graders about a career in land surveying, the conversation can delve deeper into the profession's technical, environmental, and societal impacts. Here are some targeted talking points to engage high school students effectively:

Introduction: What is Land Surveying?

1. Defining Land Surveying

"Land surveying is a science and profession that involves measuring and mapping the Earth's surfaces. Surveyors help determine property boundaries, create maps, and are key players in major construction projects." Once licensed, licensed professional surveyors must adhere to a strict code of conduct that requires them to practice in a manner that safeguards the public's health, safety, and welfare.

2. The Role of Technology

"Modern land surveying uses advanced Technology such as drones, GPS, and LiDAR (Light Detection and Ranging) systems. These tools allow us to capture detailed information about the land quickly and accurately."

The Importance of Surveying

1. Critical Infrastructure

"Every significant construction project starts with surveying. Whether it's roads, bridges, or skyscrapers, surveyors ensure that these structures are built accurately and to specification."

A Career in Land Surveying

1. Pathways to Becoming a Professional Land Surveyor

"To become a professional land surveyor, one typically needs a combination of a degree in land surveying, or geomatics, along with licensure, which includes passing a couple of National exams and gaining field experience."

2. Diverse Opportunities

"The field of surveying offers diverse career paths—from working outdoors on field assignments to performing data analysis and map creation in an office setting. There's a place in surveying for both field adventurers and tech enthusiasts."



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Engaging with Students

1. Interactive Discussion

"Let's discuss how surveying impacts our daily lives. Can you think of a local project where surveying might have been essential?"

2. Real-world Applications

"Consider how surveyors helped in disaster management by mapping affected areas for recovery efforts. Real-world applications like this show how surveying directly benefits society."

Encouraging Involvement

1. Education and Outreach

"Many resources are available if you're interested in further exploring this field. Organizations like the National Society of Professional Surveyors offer programs and scholarships for students like you. As well as XXXX (your) Land Surveyors Association, we will have local scholarships available as well."

2. Mentorship, Job Shadowing, and Internships

"Consider seeking out internships or mentorship programs. Hands-on experience is invaluable, and many firms and governmental agencies provide opportunities for students to learn on the job. Or reach out to a local Land Surveying firm and ask if they are available for a job shadow a few days a week during the summer?"

Conclusion: The Future of Surveying

1. Innovation and Impact

"As we look forward, the role of surveyors is expanding with advancements in Technology like autonomous drones and AI-powered mapping tools. It's an exciting time to enter the field."

2. Call to Action

"If you're intrigued by integrating technology with environmental and legal aspects and enjoy both outdoor and analytical work, land surveying could be the perfect career for you."



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By using these talking points, you can provide high school students with a comprehensive view of the land surveying profession, emphasizing the technological advancements, the critical role surveyors play in society, and the exciting career opportunities available. This approach informs and inspires students to consider land surveying a viable and rewarding career path.

XII. 9th – 12th High School Grade Toolbox Items to Bring With You

Key Items to Bring

Surveying Equipment: Bring equipment like robotic total stations, terrestrial 3D Scanning, or GPS units. These can help kids visualize the tools and the complexity of the technologies we use today.

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Stickers: Bring lots of stickers with you; see below for options.

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Presentation Tips

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Relatable Language: Use simple, age-appropriate language to explain how these tools help in building their schools, playgrounds, and homes.

Interactive Questions: Ask them questions like "Have you ever used a map?" or "Can you guess how long this room is?" to keep them engaged and thinking.

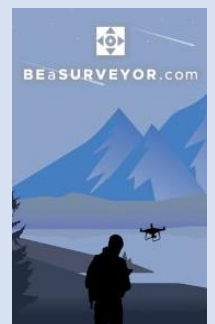
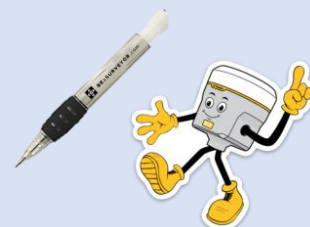
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For Stickers and items, the High School kids love these ones below:



BEaSURVEYOR.com



BEaSURVEYOR.com

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Hands On Activities for 9th – 12th Grades:

Supporting Career and Technical Education (CTE) programs at high schools is highly beneficial. Explore local CTE high schools that offer an Engineering curriculum by using this link:

<https://www.pltw.org/school-locator>

Once you've identified a nearby high school, contact the Engineering teacher to discuss how you can assist with their Land Surveying activities. Here's the curriculum for Land Surveying that you can contribute to:

<https://www.dropbox.com/scl/fo/iv7zzt35vusx3cn3xu010/AJNaVdV82v4u852PMksMbGs?rlkey=t7f31wb4955oapmiyebv2cm8w&dl=0>

Supporting the Trig-Star exam is another highly beneficial hands-on activity. Once you've identified a nearby high school, contact the Math teacher to discuss how you can provide a presentation, and also provide a math exam that connects with real-world careers.

<https://trig-star.com/>

Robotic Total Station Demonstrations

Terrestrial 3D Scanning Demonstrations

NavVis SLAM Scanning Demonstrations

(Also see app – NaVVis Scan Master)

Drone and LiDAR Demonstrations



XIII) Public Awareness Opportunities

Public awareness opportunities within the land surveying profession are crucial for educating the public about the importance and benefits of land surveying. These opportunities can vary widely but often include:

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Community Engagement Events: Participating in or organizing community events such as fairs, expos, arts festivals, and educational seminars can help raise awareness about the role of land surveyors. These events can be platforms for demonstrating surveying equipment, explaining the surveying process, and discussing how surveying impacts community planning and development.

School Outreach Programs: Land surveyors can collaborate with local schools to introduce students to the profession through career days, guest lectures, and interactive workshops. These programs can inspire future generations to consider careers in land surveying.

Social Media Campaigns: Utilizing social media platforms to share interesting facts, project highlights, and educational videos about land surveying can reach a broad audience and boost public interest and understanding of the field.

Partnerships with Local Governments: Collaborating with local government agencies to highlight how land surveying contributes to public projects like road construction and land development can enhance public recognition and appreciation of the profession.

Open Houses and Public Demonstrations: Host open houses at surveying firms or educational institutions where the public can learn about the work, see technology demonstrations, and interact with professionals in the field.

Media Involvement: Engaging with local media to feature articles, interviews, and success stories about land surveying can significantly raise the profession's profile.

Professional Development and Conferences: Encouraging participation in conferences and professional gatherings where land surveyors can network, share knowledge, and discuss the public impact of their work with a wider audience.

Summer Land Surveying Camps at your local college/university: Campers attending the Land Surveying Camp will learn about land surveying through operating surveying equipment and completing measuring and drafting projects. They have the opportunity to preview the college experience by learning and living on the campus.

See a few links to local summer camps below.

<https://dunwoody.edu/about/campus/visit/summer-camps/>

<https://www.vinu.edu/summer-camps>

These initiatives educate the public and enhance the visibility and understanding of the land surveying profession, showcasing its importance in various aspects of societal development.

