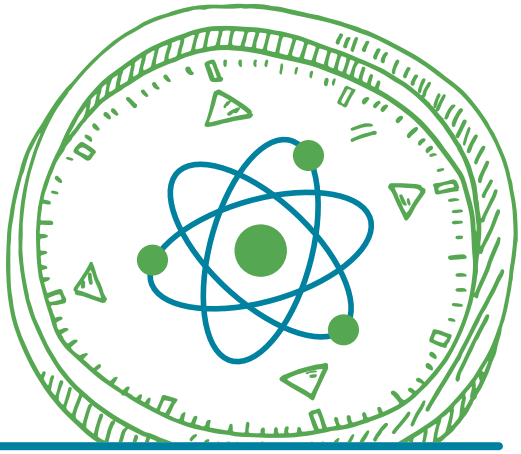
NAVIGATING™ NUCLEAR

Energizing Our World

GUIDEBOOK



ANS Center for Nuclear Science and Technology Information

Discovery EDUCATION

Navigating Nuclear is an ANS Center for Nuclear Science and Technology Information program developed in conjunction with Discovery Education.

Introducing
Navigating Nuclear: Energizing Our World™

The American Nuclear Society Center for Nuclear Science and Technology Information raises the standard in nuclear energy education!

Created in collaboration with Discovery Education, the global leader in digital education, Navigating Nuclear: Energizing Our World brings a suite of free, innovative curricular resources to middle school educators and their students across the country.

We've put together this guidebook to introduce you to the Navigating Nuclear program and help you make the most of it in your outreach activities.

> *"It is critical that we educate people on the benefits and value of the peaceful use of nuclear science and technology. Navigating Nuclear helps us to fulfill our mission to increase the public's understanding of and appreciation for nuclear science and technology. While we've dedicated significant resources to the creation of Navigating Nuclear, we are excited about the opportunity it offers to bring the nuclear science and technology community together to communicate the vital contributions we make to improving peoples' lives."*
>
> — John Kelly, ANS President

ANS would like to thank the following members for lending their expertise to Navigating Nuclear by serving on the Subject Matter Expert Team.

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Savannah River National Lab

What is Navigating Nuclear: Energizing Our World?

Navigating Nuclear is a dynamic, standards-aligned program that invites students to explore the many applications of nuclear science and its impact on energy, healthcare, food, and the environment through an interactive suite of free middle school classroom resources—lesson plans, project starters, career profiles, and more.

Interactive Digital Lesson Plans Explore Myths and Misconceptions

Nuclear Energy

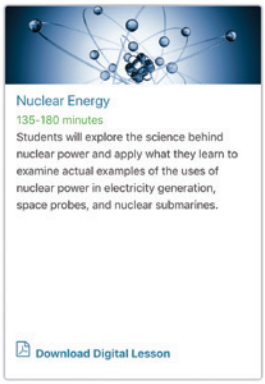
Students explore the science behind nuclear power and apply what they learn to examine actual examples of the uses of nuclear power in electricity generation, space probes, and nuclear submarines.

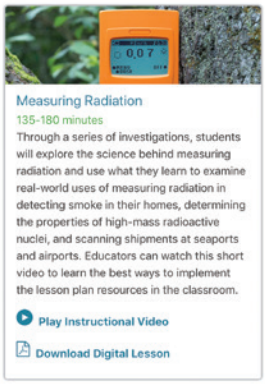
Measuring Radiation

Through a series of investigations, students explore the science behind measuring radiation and use what they learn to examine real-world uses of measuring radiation.

Lessons include teacher guides, PowerPoint decks, and student activity sheets.

CHECK OUT THE LESSON PLANS





Cap It Off With STEM Project Starters

Students apply lessons learned in the classroom to real-world questions and discover their own solutions.

From Atoms to Electricity

Students create a model and explain energy transformation in a nuclear reactor, as they answer the question: How does the energy stored in an atom's nucleus transform into the electricity that powers our lives?

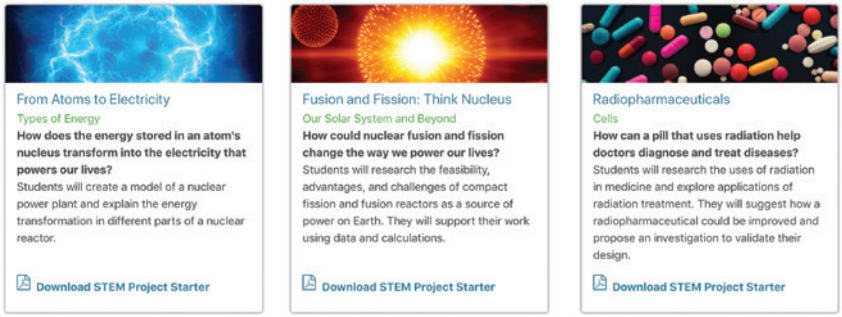
Fusion and Fission: Think Nucleus

How could nuclear fusion and fission change the way we power our lives? Students research the feasibility, advantages, and challenges of compact fission and fusion reactors as a source of power on Earth.

Radiopharmaceuticals

How can a pill that uses radiation help doctors diagnose and treat diseases? That's the guiding question that leads students to research the uses of radiation in medicine and explore applications of radiation treatment.

CHECK OUT THE PROJECT STARTERS



Take a Virtual Field Trip!

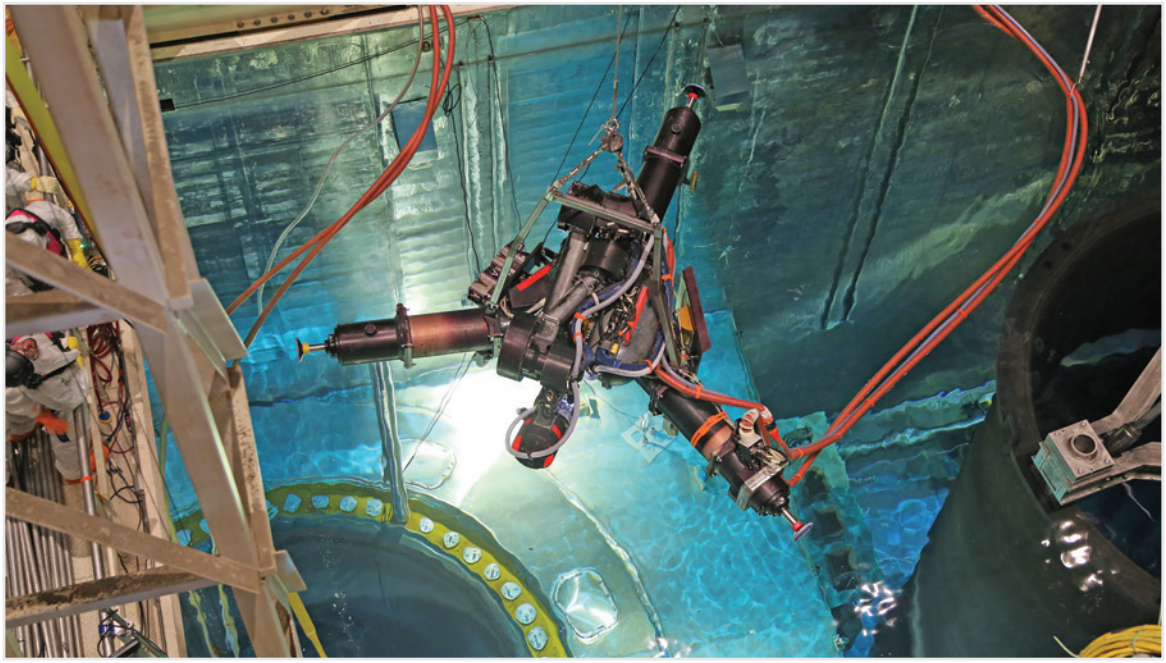
Students get a behind-the-scenes tour of the Palo Verde Nuclear Generating Station and learn about creating environmentally-friendly electrical power using nuclear technologies. The Virtual Field Trip is available on-demand on the Navigating Nuclear website.

Explore Real World Careers in Nuclear Fields

Three ANS members share their experiences in nuclear-related careers and the impacts they are having on their communities and the world at large.

Navigating Nuclear Webinar Takes a Deeper Dive

Get to know Navigating Nuclear even better in a webinar posted on the ANS website.



Make the Most of Navigating Nuclear

Navigating Nuclear is an exciting step forward in educating students about nuclear in an objective, fact-based manner. This guide is intended to help you take advantage of the Navigating Nuclear curriculum in your own outreach programs. You'll find answers to questions you may have, advice on contacting schools, suggestions for activities, and instructions for executing them.

Whether or not they subscribe to Discovery Education services, your local middle schools can use Navigating Nuclear. For further assistance in planning your own outreach activities, contact us at outreach@ans.org.

Meet Your Local Teachers

Teachers trust Discovery Education products; they'll trust the Navigating Nuclear program was created with them in mind. But, first you have to make contact. We give you guidance as well as sample emails and voicemail messages to help you connect with local educators.

How do I find out if my local schools subscribe to Discovery Education?

If you have children attending your local schools, you can simply ask their teacher.

Your local school district will also know what curricular resources they use. As a taxpayer, you're entitled to know, so don't hesitate to contact the district and ask.

Remember that the Navigating Nuclear program is available to any teacher, whether or not their school subscribes to Discovery Education, through the website: navigatingnuclear.com.

How do I find and reach out to my local teachers?

Ask your kids' teachers. Introduce yourself, mention your experience in the nuclear field, and interest in getting involved in the classroom. You can also find out if the school uses Discovery Education resources as their official provider. "Meet the Teacher" events and "Curriculum Night"—when schools conduct brief sessions for parents on the year's planned curriculum—are great places to meet teachers. Use these opportunities to briefly mention Navigating Nuclear then write a more detailed follow-up email.

Ask your neighbors. If your neighbors have kids, ask them if you can use their name in contacting their children's teachers.

Call the school receptionist. School receptionists usually know who to contact, as well as when and how they prefer being contacted.

Check the local school or school district website. Some school websites, especially middle and high schools, list faculty by department; there are often department heads listed as well. You'll want to contact the department head first, if you don't have a personal contact referral. If there is no department head, just call the school and find out who to talk to.

A few things to keep in mind

Teachers love having visitors who can bring their experience and knowledge to the classroom. They will welcome your interest. In fact, many teachers send out a parent survey specifically to find potential classroom visitors. Make sure you sign up!

Unless you know the principal or know the principal is the person to contact, avoid contacting the principal. Most are consumed with school management and will appreciate you contacting science teachers, who can bring Navigating Nuclear to their attention. A teacher's recommendation carries a good deal of weight.

What do I say?

The best way to contact teachers is usually through email or voicemail, so they can respond at their convenience. We have a sample email and voicemail script for your use on the following pages. Feel free to change them as you need.

Sample Email

Subject line: Let's spark a reaction in your classroom!

Hello [teacher name],

My name is [insert name] and I am a [insert job] at [insert place of employment]. I'm writing to let you know about a new standards-aligned nuclear science curriculum from Discovery Education and the American Nuclear Society that you can access and use for free whether (insert name of school) subscribes to Discovery Education or not.

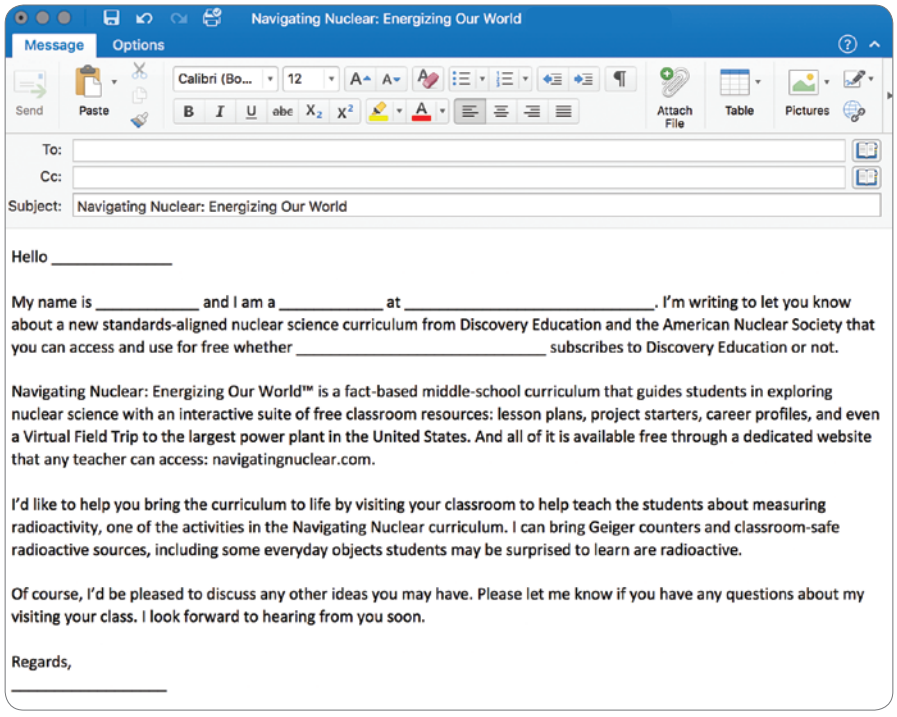
Navigating Nuclear: Energizing Our World™ is a fact-based middle-school curriculum that guides students in exploring nuclear science with an interactive suite of free classroom resources: lesson plans, project starters, career profiles, and even a Virtual Field Trip to the largest power plant in the United States. And all of it is available free through a dedicated website that any teacher can access: navigatingnuclear.com.

(Following is an example. Reword depending on what you propose to do.)

I'd like to help you bring the curriculum to life by visiting your classroom to help teach the students about measuring radioactivity, one of the activities in the Navigating Nuclear curriculum. I can bring Geiger counters and classroom-safe radioactive sources, including some everyday objects students may be surprised to learn are radioactive.

Of course, I'd be pleased to discuss any other ideas you may have. Please let me know if you have any questions about my visiting your class. I look forward to hearing from you soon.

Regards,
[Your name]



Sample Voicemail Message Script

My name is [insert name] and I am a [insert job] at [insert place of employment]. I wanted to let you know about a new standards-aligned nuclear science curriculum from Discovery Education and the American Nuclear Society that you can access and use for free whether [insert name of school] subscribes to Discovery Education or not.

Navigating Nuclear: Energizing Our World is a fact-based middle school curriculum that includes lesson plans, project starters, career profiles, and even a Virtual Field Trip to the largest power plant in the United States. All of it is available free through the Navigating Nuclear website, navigatingnuclear.com.

(Following is an example. Reword depending on what you propose to do.)

I'd like to help you use Navigating Nuclear by visiting your classroom and offering my nuclear science experience. I look forward to hearing back from you regarding how I might help make nuclear science more engaging for your students.

How You Can Get Involved in the Classroom

The teacher you volunteer with will have suggestions for ways you can become involved, but you can suggest your own. The Navigating Nuclear curriculum lends itself to many education levels; remember the lessons will fit into almost any science curriculum. The cooperating teacher can help with details of planning activities at his or her school, as there are usually numerous guidelines. Here are some ideas to get you started.

Classroom Visits

A natural time to visit is when the class is studying about atomic structure or nuclear chemistry. Different teachers address these topics at different points in the school year. Ask so you can plan to be available.

Offer to help teach "Measuring Radiation," a Navigating Nuclear lesson on detecting radiation, which fits into any nuclear science curriculum.

- The lesson requires resources that may be difficult for some teachers to obtain, particularly radiation detectors and classroom-safe radioactive sources.
- Bring one or more Geiger counters and items such as: lantern mantles, pieces of vintage Fiestaware, radioactive marbles, smoke detectors.
- Score extra points by donating one of the detectors to the teacher. ANS provides vintage Geiger counters and lantern mantles to national Society members. Contact outreach@ans.org for more information on obtaining these materials.

Presentations

Demonstrate a concrete application of what students are learning with a presentation on how nuclear reactors work, another topic covered in Navigating Nuclear.

- If you work at a power plant, you can offer a real-life look into using nuclear fission to generate electricity.
- Time permitting, have the class watch the Navigating Nuclear Virtual Field Trip, featuring Palo Verde Generating Station in Arizona. Teachers can stream it from the

Navigating Nuclear website, or you can download it onto a flash drive teachers can load onto the classroom computer. There is also an educator's guide that provides companion activities to help engage students prior to and during the Virtual Field Trip, extending the learning from the video to the classroom.

- For teachers without classroom computers or Internet access, bring your own laptop, projector adaptors, and projector, if necessary. Include a presentation of your own facility if you have one.

Career Fairs

Schools are putting increasing effort into helping students decide on careers, and STEM careers are frequently a focus. In fact, three ANS national members are featured in Navigating Nuclear. Because many teachers have difficulty finding nuclear engineers and others in nuclear fields, make sure you find out when your local schools hold career days and fairs.

Nuclear Science Week

Nuclear Science Week (normally the third week in October) offers another opportunity to suggest classroom involvement. Even teachers who aren't required to teach nuclear science will welcome the opportunity to give their students a break from the daily routine.

Virtual Field Trip

Offer to host a Virtual Field Trip viewing party. At only 22 minutes, the field trip is just long enough to hold the students' attention and still give an opportunity for a question and answer session. Make it a pizza party if the school permits. This activity is particularly suited to elementary levels, but all students appreciate a party.

Teaching Teachers

Most teachers are required to take continuing education courses for advancement and license renewal. Schools only offer a portion of that and most courses focus on classroom management. Opportunities to gain additional content knowledge are few and far between for science teachers. You can fill the gap with teacher education activities.

Teacher Conferences

Your state or local science teachers association is an ideal place to spread the word about Navigating Nuclear. Most offer opportunities for associations, publishers, and suppliers to reach out to their membership.

- Plan to exhibit at an association conference. The association will give you all of the information you need in order to participate.
- Secure a booth space at the conference where teachers can learn more about Navigating Nuclear.
- Make your exhibit interactive. Bring radioactive sources and radiation detectors then let the teachers use them. Teachers are every bit as inquisitive as their students.
- ANS has fliers that target teachers and explain the Navigating Nuclear program. You can order them through the ANS store, accessible on the ANS website. ANS national members may receive them free of charge through the Society's public information assistance program. Contact outreach@ans.org for more information.
- Collect teacher names and contact information by holding a raffle for a radiation detector or Geiger counter. Teachers put their information in a bowl for a chance to win the prize. Make sure every teacher leaves with your contact information.
- Take advantage of opportunities to hold short workshops that are sometimes offered to exhibitors. Even a 90-minute presentation on the basics of radiation can count toward teachers' continuing education requirements.

Teacher Workshops

ANS is currently creating a workshop—titled "Navigating Nuclear Science: Effective Teaching and Learning Strategies"—based on the Next Generation Science Standards and incorporating Navigating Nuclear curriculum. The workshop is designed to teach educators the nuclear science they may have missed in their training using proven strategies they can apply in teaching their students.

- The workshop will debut November 10, 2018, immediately prior to the ANS Winter Meeting, which will be held from November 11-15 at the Hilton Orlando Bonnet Creek.
- The workshop will cover radiation basics, isotopes and radioactive decay, medical uses of nuclear technology, measuring radiation, nuclear power, risk, nuclear waste solutions, and visualizing nuclear processes. Each topic is covered in a stand-alone module.
- All of the topics can be used together for a full-day workshop, or topic modules can be selected to create workshops of any length.
- Topics will be presented as PowerPoint presentations in an ANS Navigating Nuclear template, with speaker notes.
- ANS will provide templates for a postcard and a digital flier to use in promoting the workshop.
- A complete guide to conducting a workshop is available on the ANS website.

We're here to help!

Contact us at outreach@ans.org for help in putting together your own Navigating Nuclear outreach programs.

The ANS Center for Nuclear Science and Technology Information would like to thank the following Navigating Nuclear donors:

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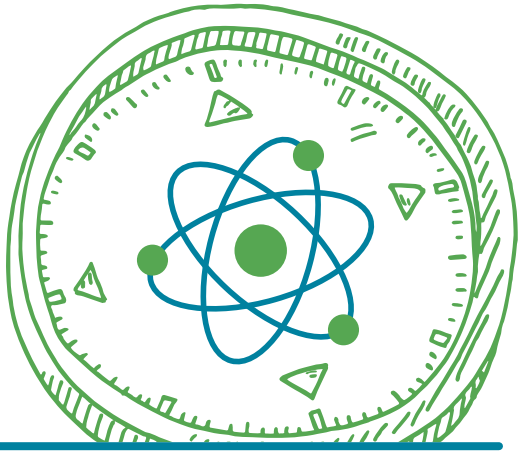

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