NAYGN

Nuclear Science Teacher Workshop

Saturday May 19, 2018 **9am-3pm**

Register Today (FREE!): ***goo.gl/ETVnSv***

Location: Griffin Middle School 4010 King Springs Rd SE, Smyrna, GA

Earn six hours of continuing education credits with an action packed day of STEM education lessons, activities, and giveaways. All participants will walk away with classroom activities, testable material, and other resources. Open to all instructors (K-12). Curriculum tailored to specific education levels & corresponds to educational standards.

Curriculum

- **To Infinity & Beyond: Nuclear Applications** Nuclear technology is all around you- from soda cans and makeup to MRIs and bridges. Nuclear technology has also enabled extraordinary engineering feats such as powering the Mars Rover, deep space satellites or a pacemaker in your chest. Come discuss some of the lesser known, and less conventional applications of the atom and learn how to conduct activities to reinforce these concepts.
- **Energy & the Environment** Energy is directly linked to a country's economy and its population's standard of living. The primary difference between first and third world countries is the amount of energy the countries produce and consume. Many countries like India, China, and Brazil are rapidly developing resulting in a rapid increase in energy consumption. However, each energy source has an impact on the environment. In this session, we will discuss how these different energy sources affect the environment on a local and global level and conduct activities to reinforce those concepts.
- **Electricity** Nuclear energy plants across our country proved more than 20% of the electricity that we use as a nation. Electricity has become an integral part of our everyday lives and it is important for our students to understand how dependent we are on this amazing source of energy. Elementary teachers will be given stories that can be presented using slides and/or printed for individual student use. These stories will describe a variety of ways that we use electricity in our everyday lives. Middle and high school teachers will be given instructions of how their students can use the Energy Information Administration website to investigate the sources and uses of electricity. Instructions will be provided regarding how students can place themselves in the role of engineers to conduct grade-appropriate activities.

- **Risk: Real & Perceived** Discuss the implications of perceived risk and understand the importance of utilizing data when making comparisons of different risks. Compare electricity generation types by their relative safety and you might be surprised by what you discover! How does the perceived risk of nuclear power compare to the actual risk in regard to public health? Learn how to use activities for your students to answer that question.
- **Introducing Atoms and Nuclear Reactions** Learn about atomic structure and nuclear reactions including fission, fusion, and radioactive decay. Atoms are the building blocks of matter and consist of neutrons, protons, and electrons. Learn about isotopes and why some isotopes are not stable. Instruction will be provided for activities that allow students to explore these concepts.
- **Nuclear Energy** Have you ever wondered how a nuclear power plant works? Well, it is probably more simple than you think! Nuclear energy is a method of producing electricity using atoms. Nuclear plants use a Rankine thermodynamic cycle just like a coal plant. The heat source for a nuclear plant (unlike coal) is a nuclear reactor which is using a process called fission to generate heat from Uranium atoms. The heat turns water into steam which turns a turbine connected to a generator. Learn about fission and the inner workings of a nuclear power plant! Calculate the energy released when atoms are fissioned using mass-energy equivalence ($E=mc^2$). Instructions will be provided for grade-level activities.
- **Careers in Nuclear Science** Students of all ages can explore careers related to nuclear engineering! Nuclear engineers will share their experiences in the nuclear energy industry. Elementary teachers will be given stories that can be presented using slides and/or printed for individual student use. These stories will describe a variety of careers with an explanation of how they are related to the nuclear power industry. Middle and high school teachers will be given instructions of how their students can investigate careers using the Bureau of Labor Statistics website (bls.gov). Instructions will be provided regarding how students can place themselves in the role of engineers to conduct the grade-appropriate activities.
- **Waste Not, Want Not** Explore the nuclear fuel cycle and learn about what happens to spent nuclear fuel. Did you know that a soda can-size of nuclear fuel is all that you would need to power your entire lifetime of electricity needs? Activities will be provided for students to make comparisons of the waste (and byproducts such as carbon) from the different types of electricity generation sources.
- **A Diverse Energy Portfolio** Electricity is everywhere! It's in our houses, on our streets, in our pockets and for some of us... in our hearts. We depend on it for our daily lives, but did you know that it's the only commodity that must be used as soon as it's made? How do you deliver a product that you can't ship? In this session we'll discover how a diverse portfolio of sources for generating electricity makes it possible to power our extraordinary lives with several activities.
- **Radical Radiation** Radiation has a reputation of being bad or evil, but what many don't know is that radiation is always around us. From natural radiation from the environment to radiation from artificial sources, such as x-rays, this transmittal of energy has been around throughout time.