Nuclear Energy

Summary

In this activity, students will create their own version of a chain reaction to model the process of nuclear fission. Nuclear fission is the splitting of atoms and the process that drives nuclear energy. Ninety-five nuclear reactors in 29 states generate nearly 20 percent of the nation's electricity, all without carbon emissions because reactors use uranium, not fossil fuels. Students will discuss the process of generating electricity while learning how engineers are working every day to make it easier and safer to provide electricity to homes across the country.

After completing this activity, students should be able to:

- Describe how nuclear fission generates electric power
- Identify the challenges related to nuclear energy production
- Explain the importance of electric power in our daily life
- Describe how engineers work on this technology to make it safer

Setting the Stage

Before the students start working, initiate an introduction/discussion about the topic using some of the following open-ended questions:

1. What are the electrical devices that we use in our morning routine?
2. Which power plant is providing energy to your house/school? Take a look at Google maps. What type of power plant is closest to your house?
3. Discuss the importance of conserving energy and the consequences on the environment.

Materials

Each group needs:

- Set of dominoes, wooden blocks, or Legos
- Timer
- Engineering Notebook Pages

Test Procedure

This activity uses student's hand assembly abilities to create a chain reaction.

1. Divide the class into teams of three students each. Provide each team with materials and a workspace.
2. Emphasize safety precautions. Students should never place items on their mouth.
3. Have students use items to create a chain reaction.
4. Allow 10 minutes to discuss and plan the shape or way that students want to create the chain reaction
5. Start a timer and stop it after 20 minutes, to allow students limited time to try their chain reaction.
6. Discuss different kinds of more explosive chain reactions like mouse traps.
7. Take pictures and allow students to see each other's creations.

Vocabulary

- Nuclear fission: The splitting of atoms to release energy.
- Steam turbine: A device that generates power via high pressure steam spinning a turbine blade.

References

Teach Engineering

https://www.teachengineering.org/lessons/view/ncs-2026-nuclear-energy-virtual-field-trip