Nuclear Fission

Grades: 3-5	**Skills:** Active listening, critical thinking
Subject: Fission, nuclear power	**Materials:** Balloons
NGSS: PS2.B: Types of Interactions PS3.B: Conservation of Energy and Energy Transfer	

BACKGROUND

Nuclear fission is the process by which a large atom is split into smaller atoms when it is hit by a neutron. When the split occurs, a large amount of energy is released as radiation and heat, because the smaller atoms don't need as much energy as the larger atom did. When the particle splits apart, two or three neutrons are released with the energy and a chain reaction occurs. When the reaction is controlled properly, the energy can be used to generate electricity. To slow down and manage the reaction, scientists use ***control rods***, which control the amount of neutrons in the reaction.

ACTIVITY

1. Go over the background information with your students and review Irene Joliot-Curie's biography on page attached,

2. Tell students that the balloons in this actvity will represent neutrons. Give each student two inflated balloons and have them stand together in a tightly packed group.

3. Tell students that when a balloon, or neutron, hits them, they should demonstrate nuclear fission by throwing their own two balloons in the air.

4. Grab your own balloon. The reaction starts when you toss the balloon above the students. When it hits a student, that student should throw their own two balloons up. A chain reaction will occur.

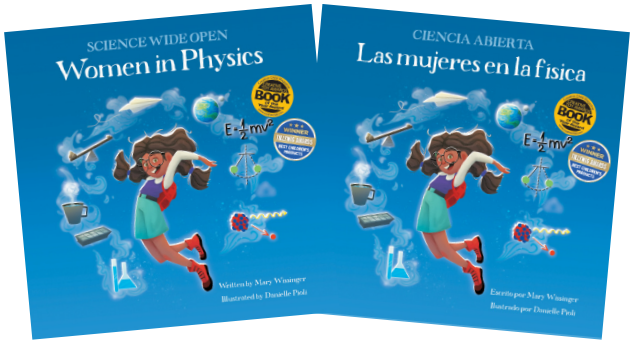
5. Repeat the activity. This time, designate different people as "control rods". These students will grab balloons out of the air, imitating the way that control rods absorb neutrons. Before beginning, ask students what they believe will change.

6. Repeat the activity with different amounts of "control rods." Keep increasing the number until the reaction proceeds very slowly, or not at all.

DISCUSSION

Ask students to think about what represented energy in the activity. The balloons signified neutrons, and their energy could be seen in the motion of the balloons. Do your students think that there is more energy or less energy when control rods are present? End the discussion by reminding students that energy is present wherever there are moving objects, sound, light, or heat. When objects collide, like neutrons and a nucleus, energy is transferred or released.

Information and Activity adapted from Nuclear Science Week



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