



# Fission, Fusion, and Radioactive Decay

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Science  
Grades 9–12



## Introduction

What do fission, fusion, and radioactive decay have in common? Students will discover how those terms change the composition of the nucleus within an atom when energy is released during this lesson.

## Learning Objectives

([NGSS-HS-PS1-8 Matter and its Interactions](#)) Students will develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.

## Materials Needed

- Journals or paper
- Construction paper or blank white paper
- Crayons, colored pencils, markers, etc.

## Procedure

1. Review the following terms with the class: atom and nucleus. (Students should already be familiar with them before the completion of this lesson.)
2. Introduce and discuss the new terms for this lesson: fission, fusion, and radioactive decay. Have students create a 3 column chart in their notes (also create one on the board to help lead the discussion). For each column, students should write one of the new terms. While discussing and learning about the meaning of the terms, write down key details about each term in the columns. Be sure to discuss how each affects the nucleus of the atom to better prepare them for the next activity.
3. Divide the class into six groups. Groups will be given one of the new terms and will be tasked with the challenge of creating a model that represents the changes in the composition of the nucleus during its process (2 groups for each of the processes). Using crayons, colored pencils, markers, etc., students will work together to create a model of their particular process that shows the changes that take place in the nucleus of an atom. Essentially, a before and after snapshot should be created by the students! Groups should have time to complete this project while in class. If desired, the teacher may require students to present their models to the class for additional learning opportunities.

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## Evaluation

Group models should be evaluated for the following: correctly modeling the nucleus/atom before fission, fusion, or radioactive decay takes place and correctly modeling the nucleus/atom after fission, fusion, or radioactive decay takes place. Groups should also be evaluated based on their ability to cooperate and work efficiently together.