

SciNews

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Event: Four New Elements Discovered

Important Numbers:

113: Atomic number of new element discovered by Japanese scientists

115, 117, and 118: Atomic numbers of new elements discovered by a team of American and Russian scientists

113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	118 Uuo
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www.sites.psu.edu/scinews/

Event Description

Not all the elements on the periodic table exist in nature. Some can only be created in a laboratory because they are so unstable, or radioactive, that they decay rapidly into other elements as they emit protons and neutrons. These elements are “super-heavy,” meaning that they are at the end of the periodic table with the largest atomic numbers. For almost a century scientists have been creating and discovering new synthetic elements to add to the periodic table. On New Year’s Eve, four new elements were officially recognized. Atomic numbers 113, 115, 117, and 118 completed the 7th period (or row) of the periodic table! These elements were especially challenging to discover because they only existed for a few milliseconds. So if they occurred in nature, they would only occur in the initial moments of the Big Bang before disappearing.

Lesson Description

Students will be presented with the concept of radioactive decay and learn why some elements can only be observed in a laboratory and not in nature.

(1) Students will hear about the discovery and will be given a brief explanation of radioactive decay and the half-life of a radioactive element. With the 2 videos provided (links on the SciNews website), discuss why some elements might not be found in nature. Brainstorm/discuss how these elements might be synthesized in the lab. (2) Lead a short hands on half-life exercise using M&M’s to help students visualize radioactive decay (recommended for grades 8-12).

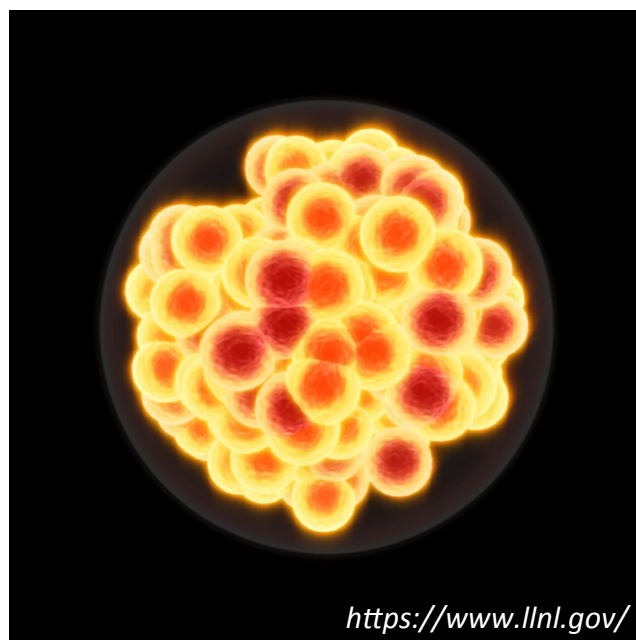
Lesson Materials - download from the SciNews website

- (1) **NPR News Broadcast (2 minutes):** NPR provides a brief overview of the discoveries of the 4 new elements
- (2) **Radioactive decay video (6 minutes):** This Khan Academy style video give an introduction to radioactivity and the concept of a half-life, which is helpful for the activity.
- (3) **M&M radioactive decay lesson (.docx):** Use M&M’s to visualize radioactive decay and the half-life of an element.
- (4) **Optional discussion questions (.docx):** For a guided discussion to accompany or replace the M&M exercise.

Next Generation Science Standards

MS-PS1-5:

Conservation of mass (at the subatomic particle level)



<https://www.llnl.gov/>

Above is an artist’s rendering of element 117, temporarily known as Ununseptium. The scientists credited with the discovery will get to suggest a name for their elements. They can name them for a chemical property of the element, a place or location (#95 Americium), an astronomical object (#94 Plutonium) a mythological character (#90 Thorium), or a famous scientist (#99 Einsteinium).

Additional Media (see SciNews website for links!)

- More detailed story on youtube from DNews with more information than the NPR story (~4 minutes)
- Article on NYTimes about some of the leading or most creative names suggested for the new elements

Alternative Lesson Plan: (link provided on the SciNews website)

Play Periodic Table Battleship! A creative way to help students learn the relationships between elements on the periodic table!



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<http://pa.spacegrant.org>

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