

Complete teaching ideas

Education in Chemistry

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rsc.li/EiC218-thehuntison



These teaching ideas accompany the above article 'The hunt is on'.

In your class

Download the text of this article, and all the related teaching resources, worksheets and experiments from the Education in Chemistry website: rsc.li/EiC218-element119

Nuclear equations

Knowledge organiser and differentiated worksheets, ages 14–16, 16+

Nuclear equations present a challenge for pupils. Solving them requires a secure understanding of atomic structure and application of familiar ideas, such as balancing equations, to a unique situation. Download the knowledge organiser from the EiC website to support pupils who are less secure in their understanding or find it difficult to recall the patterns of nuclear decay. The three differentiated worksheets also found online allow students to practice nuclear equations at different levels. The first worksheet chunks the practice into alpha and beta decay equations where the products have to be predicted. Extension questions at the end ask students to determine the isotope undergoing decay. The second worksheet mixes up the types of decay so pupils have to think about the products more carefully. The third mixes up the types of decay and requires pupils to analyse the equation given to fill in missing information.

Organising isotopes

Data handling exercises, ages 13–16

There are lots of isotopes mentioned in this article. Pupils need to get used to the idea that the mass of an element may not be the same as the number they see in the periodic table. Download this exercise from the EiC website and use it as classwork, a homework exercise or a cover lesson. In the exercise pupils produce a graph to show the relationship between the atomic number and atomic mass of the stable isotopes of the first 20 elements. An extension task is provided for more confident pupils, which involves graphing the number of protons against the number of neutrons. This can then lead into discussion of the zone of stability.

Reading comprehension

DART lesson starter or settler exercise, ages 14–16

Reading comprehension is an important skill for pupils of all ages and DART (directed activities related to text) can help pupils build up stamina in dealing with introductory texts they will see in examination questions. The DART activity downloadable from the EiC website is deliberately short to provide a useful starter or settler activity for the start of a lesson on the periodic table or radioactivity.

Modelling ion bombardment

Simple experiment or science club activity, ages 11+

This article describes the tricky process of creating a new element by smashing two atoms together in a particle accelerator. The two nuclei simply bounce off each other unless there is a direct hit between the atoms. This engaging practical activity is designed to show pupils just how difficult it is to get a direct hit between two nuclei. A ping pong ball representing one nucleus is aimed at a plastic cup representing the other nucleus. The distance between the two (at either ends of the lab) ensures a suitably low hit rate. If there is enough time and enthusiasm (perhaps in a science club) then data can be collected on the different processes that could occur.

Modelling half-life

Here are some creative ideas for modelling the idea of half-life with pupils.

General guidance on practical activities around half-life from the Institute of Physics: bit.ly/2BIW6rR

Classroom materials:

bit.ly/2eQ5ydM
bit.ly/2E2x9VB
bit.ly/2n2Ee0g

Freely available scholarly article on the pedagogical value of this modelling activity: A. Murray and I. Hart, *Phys. Educ.*, 2012, **47**, 197 (DOI: 10.1088/0031-9120)