Age determination

Relative and absolute dating ***Pa I 2 min***

Students are provided with a jumbled list of events in a persons life (birth, primary, secondary school etc) and must put them in chronological sequence

Varves ***Pa I 10 min***

Students correlate sections through varves to work out date of oldest bed.

Formation of varves ***D***

Showing students a photo or cross section of a tree showing tree rings can help them to understand and remember the process of varve formation.

Radio activity ***D***

Geiger counter and radioactive sample to show that atoms are decaying all the time and that they can be counted.

Half lives ***A P F 30 min***

This activity is to show how the numbers of atoms change as a radioactive element decays. Students start with 100 dice and remove all sixes after each throw. They then plot a graph of number of dice remaining against number of throws and from that work out the half life.

Parent and daughter ***A P 15 min***

Students work in pairs, one being the father and the other the daughter. The father has £128,000 in his bank account and has agreed, having had his arm twisted by his beautiful daughter, to give her half of his remaining wealth each year. The father writes down how his wealth dwindles while the daughter writes down how much she receives, and what her total wealth is each year.
Marcia Bjornerud

Ratio of parent and daughter elements ***Pa I 15 min***

Students imagine they have 32 parent atoms and then work out the ratio of parent to daughter elements for each half life e.g. one h.l. = 1:1, 2 h.l. =1:3, 3 h.l. = 1:7 and then the percentage of daughter elements, 50%, 75%, 87.5% etc.

Ratio of parent to daughter elements ***D***

Start with 16 Smarties on the OHP. Remove half and replace with 8 Tictacs

Repeat by moving half the remaining Smarties and replacing them with an equal number of Tictacs. Repeat until only one smarty is left. Students write down ratio and calculate percentage. One can also show the effect on the ratio if some atoms such as argon are lost or if it is all reset by metamorphism. This can also be done with each pair of students having their own set of Smarties and Tictacs.

Idea taken from Chris Bedford

Hour glass ***D***

We can not tell which atom will decay but we know when a certain percentage of atoms has decayed. Likewise with the hour glass we do not know when a given sand grain will fall through but we do know how long it will take for them all to fall through.