Name: _____

Class: _____

ACTIVITY SHEET

3.3 Radionuclides

1 All naturally occurring astatine atoms have a mass number of 75. Write the nuclide symbol for astatine.

2 The term 'radionuclide' is more precise than 'radioisotope'. Explain why. (This is why 'radionuclide' has now mostly replaced the term 'radioisotope' within nuclear science.)

3 Selenium has 6 stable nuclides of mass number 74, 76, 77, 78, 80 and 82. Their naturally occurring proportions are 0.87%, 9.02%, 7.58%, 23.52%, 49.82% and 9.19% respectively. Complete the following table, and identify the nuclide most likely to be referred to as 'the element'.

Atomic number (proton number)	Mass number (nucleon number)	Number of neutrons	Nuclide symbol	Abundance (%)

4 Tantalum-181 is stable. Two of its isotopes, ^{178}Ta and ^{184}Ta, decay to stable nuclei after beta emission. Show the decay sequences for each.

a Beta minus emission

b Beta plus emission

5 Zinc-72 decays by way of beta emissions to a stable nuclide of germanium. Show the decay sequence.

6 After two positron emissions, the stable nuclide oxygen-18 is reached. Show the decay sequence.