Name: _____

Class: _____

ACTIVITY SHEET

Chapter 3: Revision

1 Complete the table by writing brief descriptions in the blank cells.

Radiation type	Symbol	Nature of radiation	Ionising ability
Alpha			
	β		Moderate
		High-frequency electromagnetic radiation	

2 Draw and label a sketch to illustrate J.J. Thomson's 'plum pudding' model of the atom.

3 Where in an atom is the vast majority of its mass located?

4 In any atom, the number of _____ is the same as the number of _____.

5 Write the symbol for the nucleus of a carbon-14 atom. Explain what each number means.

6 An ion has the same atomic mass number as the original atom from which it formed. How can this be?

7 Summarise the differences between chemical and nuclear reactions.

8 Explain why it was necessary to change the model of the atom from Thomson's plum-pudding to the Rutherford–Bohr model.

9 Explain why diagnostic radiopharmaceuticals are not alpha emitters.

10 Many radionuclides injected into patients for diagnostic purposes are best produced either on-site or at a nearby location to the hospital where they are to be used. Explain why this is so.

11 Write the decay equation for carbon-14 to nitrogen-14.

12 Explain using a nuclear equation the purpose of bombarding molybdenum with neutrons.

13 What are the three types of radioactive decay? Give examples of each, using nuclear equations.

14 You are a doctor in a large city hospital. A patient has been referred for a scan that involves being injected with a radiopharmaceutical to help diagnose their condition. The patient is concerned about this. What would you say to the patient to decrease their fear?

15 Using information contained in this chapter, construct a timeline that shows the major modifications and advancements to our understanding of the nature of the atom.

16 Justify the existence of a nuclear reactor in Australia.

17 Design a model that you can use to show others how a collection of atoms of a radioactive isotope decay. Ensure that your model shows:

a the random nature of the decay

b the underlying reason for all radioactive decay processes having a half-life.