

Isotope Practice Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

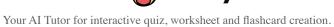
-	element?
Hint: Consider the particles that ma	ke up an atom.
 Different number of electrons Different number of protons Different number of neutron Different atomic number 	ns ✓
An isotope is defined by havin element.	ng a different number of neutrons compared to other isotopes of the same
Which of the following stateme	ents are true about isotopes?
Which of the following statement that: Think about the characteristics	·
•	s that define isotopes.
Hint: Think about the characteristics	that define isotopes. mber of protons. ✓ c numbers. ss numbers. ✓

Explain how isotopes of an element are similar and how they are different.

Hint: Consider their atomic structure and properties.



Isotopes of an element are similar in that they have the same number of protons and electrons, but they differ in the number of neutrons, which affects their mass and stability.
List two examples of isotopes and their applications.
Hint: Think about common isotopes used in various fields.
1. Example 1 and application
Carbon-14, used in radiocarbon dating.
2. Example 2 and application
lodine-131, used in thyroid cancer treatment.
Examples include Carbon-14 used in dating archaeological finds and lodine-131 used in medical treatments.
Part 2: Comprehension and Application
Which isotope is commonly used in carbon dating?
Hint: Consider the isotopes of carbon.
○ Carbon-12
Carbon-13
○ Carbon-14 ✓
Carbon-15





Carbon-14 is the isotope commonly used in carbon dating due to its radioactive properties.
Which of the following are applications of isotopes?
Hint: Think about various fields where isotopes are utilized.
 Medical imaging ✓ Archaeological dating ✓ Nuclear energy ✓
 ☐ Plastic manufacturing Isotopes are used in medical imaging, archaeological dating, and nuclear energy.
Describe the role of isotopes in medical diagnostics.
Hint: Consider how isotopes are used in imaging and treatment.
Isotopes are used in medical diagnostics for imaging techniques such as PET scans and for treatment in therapies like radiation therapy.
If an element has an atomic number of 8 and a mass number of 18, how many neutrons does it have?
Hint: Use the formula: Neutrons = Mass number - Atomic number.
○ 8○ 10 ✓○ 18○ 26
The element has 10 neutrons, calculated by subtractin the atomic number from the mass number.
Which isotopes would be suitable for use in a nuclear reactor?



lint: Consider the isotopes that are known for their fission properties.
☐ Uranium-235 ✓
☐ Uranium-238 ✓
Carbon-14
Hydrogen-1
Uranium-235 and Uranium-238 are suitable for use in nuclear reactors due to their fission capabilities.
xplain how isotopic abundance affects the calculation of atomic weight.
lint: Consider the average mass of isotopes in a sample.
Isotopic abundance affects atomic weight by determining the weighted average of the masses of an element's isotopes based on their relative abundances.
an element's isotopes based on their relative abundances. Part 3: Analysis, Evaluation, and Creation
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	Carbon-14 ✓
	Uranium-235 ✓
	Helium-4
	Carbon-14 and Uranium-235 are likely to be radioactive, while Carbon-12 and Helium-4 are stable.
	ompare and contrast the isotopes Uranium-235 and Uranium-238 in terms of their uses and ability.
Hi	int: Think about their applications in energy and weapons.
	Uranium-235 is used as fuel in nuclear reactors and is fissile, while Uranium-238 is more abundant and is used in breeding plutonium but is not fissile.
	Thich isotope would be most suitable for treating cancer through radiation therapy? int: Consider isotopes known for their therapeutic properties.
_	lodine-131 ✓
С	Carbon-12 Helium-4 Oxygen-16
	lodine-131 is most suitable for treating cancer through radiation therapy due to its ability to target thyroid tissue.
E۱	valuate the following isotopes for their potential environmental impact:
Hi	int: Consider the isotopes' radioactivity and stability.
	Plutonium-239 ✓
	Tritium
	Lead-206
	Radon-222 ✓



Plutonium-239 and Radon-222 have significant environmental impacts due to their radioactivity, while Tritium and Lead-206 are less concerning.

Propose a new application for isotopes in technology or industry, explaining the rationale behind your proposal.

Hint: Think about innovative uses of isotopes.

A new application could be the use of isotopes in advanced imaging techniques for non-destructive testing in manufacturing, enhancing safety and quality control.