Radioactive uses Formative Task

ATL(s) being taught and assessed:
Communication - Use and interpret a range of discipline-specific terms and symbols (focus on decay equations and constituents of the atom)
Thinking - Transfer - Apply skills and knowledge in unfamiliar situations (focus on uses of radioactive isotopes)

The task:

You have been tasked with selecting the correct radioactive isotope to achieve the goal of each scenario. The radioactive isotopes available to use are given in the following list. For each scenario pick one (they can be used repeatedly) and justify the decision in terms of state of matter, charge, penetration, and half-life. Give your answers under each scenario, in the slideshow.

Radioactive source	Radiation emitted	Half-life	State
Californium - 241	Alpha	4 minutes	solid
Cobalt - 60	Gamma	5 years	solid
Strontium - 90	Beta	28 years	solid
Technetium - 99	Gamma	6 hours	Dissolved in a saline solution
Americium - 241	Alpha	432 years	solid
Americium - 237	Alpha	78 minutes	solid
Krypton - 78	Beta	10.7 years	gas
Iodine - 123	Gamma	13 hours	liquid
Iodine - 131	Gamma and Beta	8 days	liquid
Xenon - 133	Gamma	5 days	gas
Hydrogen - 3	Beta	12.3 years	liquid
Caesium - 137	Gamma	30.2 years	solid
Gold - 198	Beta	2.7 days	solid

Workbook to use

Formative assessment criteria:

Not there yet	Meeting expectations	Beyond expectations
	- Select radioactive sources for a task based on state of matter - Select radioactive sources for a task based on penetration - Select radioactive sources for a task based on half-life - Justify each choice in terms of environment, safety and efficacy	