THE STANDARD

Matter & Energy in Ecosystems

Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

ANCHORING PHENOMENON

The Sealed Jar That Won't Die

In 1960, a man named David Latimer planted a spiderwort seedling inside a 10-gallon glass bottle with some compost and water, then sealed it shut. He opened it once in 1972 to add a bit of water. He hasn't opened it since. As of recent years the plant is still alive inside, taller than the bottle, leaning against the glass. No new food, no new water, no new air. Students will keep circling back to this all week.

DRIVING QUESTION

"*How is anything still alive inside that bottle after 60-plus years with no inputs?*"

INVESTIGATIVE 1

The Fallen Log Disappearing into the Forest Floor

A photo series shows the same fallen log in a forest over 10 years. Year 1, it's a solid log. Year 5, it's soft and covered in fungi. Year 10, it's barely a dark line in the soil, with new plants growing out of where it used to be. The log didn't go anywhere magical. Its atoms got broken down by fungi and bacteria and pulled into the soil, where new plants picked them back up. Use this one to sharpen the cycling lens the anchor is pushing on.

DRIVING QUESTION

"*Where did the log go, and what is growing out of it now?*"

INVESTIGATIVE 2

A Forest Fire Releasing Centuries of Stored Carbon

A time-lapse of a forest fire shows a stand of 200-year-old trees burning down in a few hours. All the carbon those trees pulled out of the air over two centuries gets released back into the atmosphere as CO in one afternoon. Same atoms, different address, different speed. The slow cycle the anchor exposes runs in the opposite direction here, only on fast-forward.

DRIVING QUESTION

"*Where did the carbon in those trees go after they burned, and how long had it been stored?*"