THE STANDARD

Comparative Embryology

Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.

ANCHORING PHENOMENON

Four Embryos. One Looks Human. Can You Tell Which?

Four early-stage vertebrate embryos side by side at the same developmental point. Fish, chicken, lizard, human. All curled in a C-shape. All with a tail. All with pharyngeal arches in the neck region. Students try to pick the human one and almost always get it wrong. The adults of these four species could not look more different. The embryos look almost identical. That gap is the whole lesson.

DRIVING QUESTION

"If these four species have nearly identical embryos but completely different adult bodies, what does that pattern tell us about how they're related?"

INVESTIGATIVE 1

The Human Embryo's Disappearing Tail

Around weeks 4 to 8 of human development, the embryo has a clear tail-like structure made of about 10 to 12 vertebrae. Then most of those vertebrae are absorbed back into the body. By birth, only 3 to 5 fused vertebrae remain as the coccyx (tailbone). Use this one to sharpen the question the anchor is pushing on: why would a body build a structure during development that it then takes apart?

DRIVING QUESTION

"Why does a human embryo build a tail it doesn't keep, and what does that tell us about our ancestors?"

INVESTIGATIVE 2

Webbed Fingers, Then Not

Around week 6 to 8 of human development, the hand looks like a paddle. The fingers exist, but they're connected by webbing. Then cells in the webbing die off in a programmed process (apoptosis), and the fingers separate. Ducks and other webbed-footed animals skip this final step. Same starting hand, different ending. Use this one to sharpen the lens the anchor is pushing on: shared start, different end.

DRIVING QUESTION

"If a human embryo and a duck embryo both start with webbed digits, what does that tell us about how their development is connected?"