THE STANDARD

Anatomical Similarities & Common Ancestry

Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.

ANCHORING PHENOMENON

Four Limbs, One Blueprint

Four labeled skeleton diagrams side by side: a human arm, a bat wing, a whale flipper, and a cat front leg. They look nothing alike from the outside. One throws a baseball, one flies, one swims, one walks. But the bones inside follow the exact same order: one upper bone, two lower bones, a cluster of wrist bones, then long fingers. Different sizes, different proportions, same blueprint. Once students notice it, they can't stop noticing it. Why would four animals that look this different have the same hidden skeleton?

> **DRIVING QUESTION**
>
> *"Why do four animals that look completely different on the outside have the exact same bone structure on the inside?"*

INVESTIGATIVE 1

Whales With Leg Bones

Modern whales live entirely in the ocean and have no back legs. But buried inside the body of every whale are small hip bones, leftover from ancestors that walked on land. Fossil whales in older rock layers have bigger back legs, and the further back you look, the more complete the legs get, until you reach whale ancestors that walked. Use this one to sharpen the lens the anchor is pushing on: shared anatomy connects modern bodies to ancestral ones, even across millions of years.

> **DRIVING QUESTION**
>
> *"Why would a whale carry leg bones inside its body when it never walks?"*

INVESTIGATIVE 2

Bat Wings and Butterfly Wings

Two flying animals, side by side. A bat wing and a butterfly wing. Both fly. Both have a wide flat surface. But the bat wing has finger bones inside (the same finger bones as a human hand, stretched out and connected by skin), and the butterfly wing has no bones at all. Same job. Completely different blueprint. Same kind of comparison as the anchor, but with a twist: this time the shared feature is what they DO, not what they're made of.

> **DRIVING QUESTION**
>
> *"If a bat wing and a butterfly wing both fly, why aren't they built the same way?"*