THE STANDARD

Unequal Heating of Earth

Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

ANCHORING PHENOMENON

The Sahara, the Amazon, and the Same Strip of Sunlight

Pull up a world map and draw a band from about 10 degrees north of the equator to 10 degrees south. That band crosses the Amazon rainforest in South America and the Sahara Desert in northern Africa. Same latitude range, same overhead sunlight, completely different climates. One is the wettest place on the planet. The other is one of the driest. Students will keep circling back to this all week.

> DRIVING QUESTION
>
> *"How can two places sitting in the same band of sunlight end up with such completely different climates?"*

INVESTIGATIVE 1

Trade Winds and the Sailing Ships

For hundreds of years, ships crossing the Atlantic from Europe to the Americas didn't sail straight across. They first sailed south to the Canary Islands, then turned west. The reason is steady winds in the tropics that always blow from east to west: the trade winds. Sailors learned the pattern long before anyone knew why it worked. Use this one to sharpen the rotation-bends-moving-air lens the anchor is pushing on.

> DRIVING QUESTION
>
> *"Why do winds in some parts of the world blow steadily in the same direction year after year?"*

INVESTIGATIVE 2

London vs. Labrador

London, England sits at about 51 degrees north. Goose Bay, Labrador sits at about 53 degrees north. Almost the same latitude. London's average January temperature is around 5 degrees Celsius. Goose Bay's is around minus 17 degrees Celsius. Twenty-two degrees colder, at almost the same distance from the equator. Use this one to sharpen the ocean-currents-move-heat lens.

> DRIVING QUESTION
>
> *"Why are two cities at almost the same latitude separated by more than 20 degrees in winter temperature?"*