

The Jet Stream: The River That Runs the Weather

Name: _____

Date: _____

Class: _____

Read the lesson at myweatherrock.com/journal/explainers/jet-stream (or the printed copy), then answer below.

Remember

The jet stream is a narrow, wandering river of fast wind near the top of the troposphere, roughly five to nine miles up, flowing generally west to east. It forms along the boundary where cold polar air meets warm air from the south, and the sharper that temperature contrast, the faster it blows: NOAA puts typical core winds at 80 to 140 mph, with more than 275 mph possible. Storms ride along it like traffic on a highway, so its bends decide who gets a stormy week and who gets a quiet one. A northward bulge is a ridge, and usually quiet; a southward dip is a trough, and usually not.

Questions

1. What is the jet stream?

- ☐ A. A narrow band of fast wind near the top of the troposphere
- ☐ B. A steady wind at the surface
- ☐ C. A single storm system that circles the globe

2. What creates a jet stream?

- ☐ A. Ocean currents dragging the air above them
- ☐ B. A strong temperature contrast between air masses, like polar air meeting warmer air
- ☐ C. The pull of the moon

3. In summer, the polar jet usually:

- ☐ A. Speeds up and dives south
- ☐ B. Weakens and retreats north
- ☐ C. Disappears entirely

4. A ridge has parked over your region in July. Expect:

- ☐ A. A parade of storms
- ☐ B. Days of sinking air, fair skies, and building heat
- ☐ C. An early frost

5. Why is an eastbound flight often faster than the same route westbound?

- ☐ A. Airlines schedule it that way
- ☐ B. Eastbound planes ride the jet stream's tailwind; westbound planes fight it
- ☐ C. The Earth rotates under the plane

In your own words

A ridge in the jet stream has stalled over your state in July. Describe the week of weather you expect, and explain why a trough arriving instead would change that answer.

Answer key (for the teacher)

1. What is the jet stream?

A. A narrow band of fast wind near the top of the troposphere — It is a river of strong wind near the tropopause, roughly five to nine miles up, thousands of miles long but only a mile or two deep, flowing generally west to east.

2. What creates a jet stream?

B. A strong temperature contrast between air masses, like polar air meeting warmer air — Jets form along boundaries between contrasting air masses. The sharper the temperature gap, the faster the upper winds along it, which is why the jet peaks in winter.

3. In summer, the polar jet usually:

B. Weakens and retreats north — Summer shrinks the pole-to-tropics contrast, so the jet weakens and migrates toward Canada, taking the main storm track with it.

4. A ridge has parked over your region in July. Expect:

B. Days of sinking air, fair skies, and building heat — A ridge is a northward bulge with sinking air beneath it. When one stalls in summer, the result is the classic persistent heat wave.

5. Why is an eastbound flight often faster than the same route westbound?

B. Eastbound planes ride the jet stream's tailwind; westbound planes fight it — The jet flows generally west to east at speeds NOAA puts at 80 to 140 mph. Riding it is free speed; opposing it is a headwind for the whole leg.