

Warm Air Rises

Name: _____

Date: _____

Class: _____

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

Remember

Warm air rises because it is lighter than cool air: warm a batch of air and its molecules spread out, so the same scoop holds less and weighs less, and the heavier cool air around it sinks underneath and shoves it up. That shove is convection. The sun powers it all day by heating the ground unevenly, sending up invisible bubbles of warm air called thermals, and those bubbles are the bottom rung of everything the sky builds, up to and including thunderstorms.

Questions

1. Why does warm air rise?

- ☐ A. Heat naturally floats
- ☐ B. Warm air holds fewer molecules per scoop, so heavier cool air sinks underneath and shoves it up
- ☐ C. The wind blows upward on warm days

2. What is a thermal?

- ☐ A. A warm wind from the south
- ☐ B. An invisible bubble of warm air rising off a patch of ground the sun cooked
- ☐ C. The shimmer above a hot road

3. Why do puffy clouds pop over the parking lot side of town before the pond side?

- ☐ A. Ponds repel clouds
- ☐ B. Dark dry surfaces heat faster, launching stronger thermals, and each puff marks a thermal's top
- ☐ C. Wind avoids open water

4. A hawk circles upward for minutes without flapping once. What is it doing?

- ☐ A. Showing off
- ☐ B. Riding a rising thermal like an elevator
- ☐ C. Gliding downhill very slowly

5. In the two-glass test, why does the food coloring spread fast in the hot glass?

- ☐ A. Hot water dissolves color better
- ☐ B. The hot water is full of moving convection currents, and the color rides them
- ☐ C. The drop falls faster through hot water

In your own words

On a hot afternoon a hawk circles above a parking lot without flapping once. Use rising air to explain what the bird found there, and why it was over the pavement and not the pond.

Answer key (for the teacher)

1. Why does warm air rise?

B. Warm air holds fewer molecules per scoop, so heavier cool air sinks underneath and shoves it up — Warm molecules spread out, so a scoop of warm air weighs less than a scoop of cool. Gravity favors the heavy scoop, which sinks under and pushes the light one up. The warm air is shoved, not sucked.

2. What is a thermal?

B. An invisible bubble of warm air rising off a patch of ground the sun cooked — The sun heats the ground unevenly, and over the warm patches the heated air breaks loose and rises in bubbles. The shimmer is a clue at a thermal's base; the bubble itself is the thermal.

3. Why do puffy clouds pop over the parking lot side of town before the pond side?

B. Dark dry surfaces heat faster, launching stronger thermals, and each puff marks a thermal's top — The pavement bakes while the pond barely warms, so the elevator runs on the pavement side. The flat-bottomed puff is the top of the ride.

4. A hawk circles upward for minutes without flapping once. What is it doing?

B. Riding a rising thermal like an elevator — Soaring birds hunt for thermals and circle to stay inside the rising air, gaining height for free. Glider pilots pull exactly the same trick.

5. In the two-glass test, why does the food coloring spread fast in the hot glass?

B. The hot water is full of moving convection currents, and the color rides them — The color is a passenger. The hot water is circulating, warm parcels rising and cooler ones sinking, and the dye traces the traffic. The cold glass is barely moving, so the dye barely moves.