How Weather Radar Works, and When It Lies

Name: Date: Class:

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

Remember

Radar sends microwave pulses and times the echoes that bounce back off precipitation. It measures what is falling through the air, not what is reaching your shoes: the beam rises with distance, so far from the radar it can only see rain a mile or more overhead. Most radar illusions, like dry ground under a colorful blob, come from that gap between the beam and the ground.

Questions

1. Radar shows heavy rain over your house, but your street is dry and thunder is getting closer. Most likely explanation?

- ☐ A. The radar is broken
- ☐ B. Rain aloft on the storm's leading edge has not reached the ground yet
- ☐ C. It rained earlier and the map is old

2. Why does radar miss shallow drizzle far from the radar site?

- ☐ A. Drizzle does not reflect microwaves
- ☐ B. The beam has risen above the shallow precipitation
- ☐ C. Drizzle moves too slowly to detect

3. What does the color on a radar map represent?

- ☐ A. Temperature of the rain
- ☐ B. How much energy echoed back, a proxy for intensity
- ☐ C. Wind speed inside the storm

4. Which situation does radar tend to UNDER report?

- ☐ A. An approaching squall line
- ☐ B. Shallow drizzle far from the radar, sliding beneath the beam
- ☐ C. A hail core overhead

5. How old is the newest frame on a typical public radar map?

- ☐ A. Live to the second
- ☐ B. Usually two to eight minutes
- ☐ C. About an hour

In your own words

The radar map shows heavy rain over your house, but your street is dry. Give two different explanations for how that can happen.

Answer key (for the teacher)

1. Radar shows heavy rain over your house, but your street is dry and thunder is getting closer. Most likely explanation?

B. Rain aloft on the storm's leading edge has not reached the ground yet — Approaching storms sling precipitation forward aloft. The beam sees it minutes before your driveway does.

2. Why does radar miss shallow drizzle far from the radar site?

B. The beam has risen above the shallow precipitation — With distance, the beam climbs. Precipitation hugging the ground slides underneath it.

3. What does the color on a radar map represent?

B. How much energy echoed back, a proxy for intensity — Stronger echoes mean bigger or more numerous drops, drawn as hotter colors.

4. Which situation does radar tend to UNDER report?

B. Shallow drizzle far from the radar, sliding beneath the beam — Far out, the beam has climbed; precipitation hugging the ground can pass underneath it entirely.

5. How old is the newest frame on a typical public radar map?

B. Usually two to eight minutes — Mosaics update every few minutes. Fast storms can travel a mile or two inside that window, so animate and extrapolate.
