

Why the Hottest Part of the Day Is Not Noon

Name: _____

Date: _____

Class: _____

Read the lesson at myweatherrock.com/journal/explainers/hottest-part-of-the-day (or the printed copy), then answer below.

Remember

The sun is highest, and its energy strongest, at solar noon. The temperature keeps rising for hours after that, because the ground goes on soaking up more energy than it gives back. The peak arrives at the moment those two finally match, which the National Weather Service puts at several hours following noon. The same trick runs at the scale of a year: the hottest weeks come after the summer solstice, not on it.

Questions

1. The sun is highest at noon. Why does the temperature keep rising afterward?

- ☐ A. The sun gets closer in the afternoon
- ☐ B. The ground keeps absorbing more energy than it gives back
- ☐ C. Air is warmed directly by sunlight passing through it

2. When exactly does the temperature stop rising?

- ☐ A. The instant the sun starts to set
- ☐ B. When energy leaving the ground finally matches energy arriving
- ☐ C. Exactly three hours after noon, everywhere

3. When is the coldest part of a clear night?

- ☐ A. Right after sunset
- ☐ B. Around midnight
- ☐ C. Just before sunrise

4. A cold front sweeps through at 2 pm and the temperature drops 15 degrees. What was the day's high?

- ☐ A. It has not happened yet
- ☐ B. It happened before the front arrived
- ☐ C. The front does not change the daily high

5. Why are the hottest weeks of summer after the June solstice rather than on it?

- ☐ A. The Earth gets closer to the sun in August
- ☐ B. Heat input during the day keeps exceeding cooling at night for weeks afterward
- ☐ C. The solstice is not really the longest day

In your own words

The sun is highest at noon, yet the hottest hour usually comes later. Explain why, and then use the same idea to explain why the coldest moment is near sunrise rather than midnight.

Answer key (for the teacher)

1. The sun is highest at noon. Why does the temperature keep rising afterward?

B. The ground keeps absorbing more energy than it gives back — Sunlight heats the ground, and the ground heats the air. As long as more energy arrives than leaves, the temperature climbs, even after the sun has started down.

2. When exactly does the temperature stop rising?

B. When energy leaving the ground finally matches energy arriving — The peak is the balance point. It usually lands several hours after noon, but the clock time moves with clouds, wind, fronts, and where you are in your time zone.

3. When is the coldest part of a clear night?

C. Just before sunrise — The ground loses heat all night with nothing coming in, so the low point arrives at the very end of the night, right before the sun starts the cycle over.

4. A cold front sweeps through at 2 pm and the temperature drops 15 degrees. What was the day's high?

B. It happened before the front arrived — The daily high is whatever the highest reading turned out to be, not a scheduled event. A front, a thunderstorm outflow, or a thick cloud deck can end the climb at any hour.

5. Why are the hottest weeks of summer after the June solstice rather than on it?

B. Heat input during the day keeps exceeding cooling at night for weeks afterward — It is the daily lag written large. NOAA's climate data center describes the rate of heat input continuing to exceed the nighttime cooling for weeks past the solstice.