Inside a Moving Sun

Read scientific details, then plan an accurate solar model.

SC.8.E.5.6 "Create models of solar properties including: rotation, structure of the Sun, convection, sunspots, solar flares, and prominences."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each of the six solar properties named in the passage, then circle a nearby detail that tells what the property does or how a model could show it.

A Model of Solar Activity

1. The Sun is a huge sphere of hot plasma, not a solid ball. Its visible surface is the photosphere. Beneath it, energy moves through the convection zone. Hot plasma rises, cools near the surface, and sinks again, carrying energy outward. Deeper inside are the radiative zone and the core, where nuclear fusion releases energy. The Sun also rotates. Because it is gas, its equator rotates faster than regions near its poles. This difference is called differential rotation.

2. Sunspots are darker areas on the photosphere. They look dark because they are cooler than nearby surface material, although they are still very hot. Strong magnetic fields slow the upward flow of energy there. A solar flare is different. It is a sudden, powerful release of energy near an active magnetic region. Flares can send intense radiation into space and may accelerate charged particles. In a model, a sunspot needs a marked surface region, while a flare needs outward energy arrows.

3. Prominences are huge, bright loops or arches of plasma that extend above the Sun's surface into the corona. Magnetic fields guide and hold this plasma in place. A prominence is not the same as a flare, though both occur near magnetic activity. Some prominences remain stable for days or weeks, and others erupt. A useful model does more than name parts. It uses labels, arrows, and relative positions to show how structures, motion, and magnetic activity connect.

2 ANSWER WITH EVIDENCE

Use the passage

1. What layers should a model label to show where energy begins and how it moves toward the Sun's visible surface?

2. How could arrows in a model show convection in the convection zone?

3. What should a model show to represent the Sun's differential rotation?

4. How should a model show the difference between a sunspot and a solar flare?

3 YOUR TURN

Your own words

Create a three-panel model of the Sun. In Panel 1, show structure, convection, and rotation. In Panel 2, show a sunspot and a solar flare. In Panel 3, show a prominence. Add labels and arrows, then write one sentence under each panel explaining what your model shows.

ANSWER KEY

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GRADE 8 · SC.8.E.5.6

PART 1 · READ AND MARK

Underline each of the six solar properties named in the passage, then circle a nearby detail that tells what the property does or how a model could show it. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What layers should a model label to show where energy begins and how it moves toward the Sun's visible surface?	**Label the core, radiative zone, convection zone, and photosphere. Energy begins in the core and moves outward through these layers.**
2	How could arrows in a model show convection in the convection zone?	**Show hot plasma rising, cooling near the surface, and sinking again in a repeating cycle.**
3	What should a model show to represent the Sun's differential rotation?	**Show that the equator rotates faster than regions near the poles.**
4	How should a model show the difference between a sunspot and a solar flare?	**Show a sunspot as a darker, cooler marked region on the photosphere. Show a flare as a sudden release of energy with arrows moving outward from an active magnetic region.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Panel 1: I labeled the core, radiative zone, convection zone, and photosphere, drew a rising-and-sinking convection cycle, and used rotation arrows that show the equator moving faster than the poles. Panel 2: I drew a dark sunspot on the photosphere and a flare with arrows showing energy moving outward from a nearby active magnetic region. Panel 3: I drew a loop of plasma above the photosphere, labeled it prominence, and added magnetic-field lines that hold the plasma in place.

Accept scientifically accurate labeled models that include all six required properties and use arrows or relative placement to show motion and connections. Students may use different layouts if convection, faster equatorial rotation, magnetic activity, and the prominence loop are clear.