

# STAYING COOL WITH MESSENGER

Answer the following questions based on the MESSENGER Information Sheet and the conclusions you drew from your experiments.

1. The MESSENGER spacecraft will study the planet Mercury. The distance from Mercury to the Sun is only one third of the distance from the Earth to the Sun. Why do you think the mission designers are concerned about keeping the spacecraft cool?

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2. Think of some ways to keep the MESSENGER spacecraft cool near Mercury, based on what you learned from this experiment.

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3. One curious property of the planet Mercury is that its axis is not tilted like Earth's is.

a. How high in the sky does the Sun appear at noon on the equator of Mercury?

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b. How high in the sky does the Sun appear at noon at the poles?

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4. Observations of Mercury have suggested that there might be water ice in deep craters near Mercury's poles even though the temperatures can get to be over  $400^{\circ}\text{C}$  ( $750^{\circ}\text{F}$ ) on the sunlit areas of the planet's surface. How do you think it is possible for ice to exist in the craters?

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