Earth Science   Name:

The Water Cycle and Energy Transport

In the space below, make a sketch representing the components of the water (hydrological) cycle. Include the phase or phase change in each part.

For the next set of problems, use this information. In each problem, show your work.

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1 cal = energy needed to change temp of 1 g H_2O_l by 1 °C
(specific heat of liquid water)

0.5 cal = energy needed to change temp of 1 g H_2O_s or H_2O_g by 1 °C
(specific heat of ice or water vapor)

80 cal = energy needed to melt or freeze 1 g of H_2O
(Latent heat of fusion)

540 cal = energy needed to evaporate or condense 1 g of H_2O
(Latent heat of vaporization)

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1. How much energy is required to melt 500 g of ice.

2. How much energy is absorbed when 150 g of water is heated from 10 °C to 90 °C?

3. How much energy is needed when 200 g of water evaporates at 100 °C?

4. How much energy is released when 250 g of water vapor at 120 °C cools to 100 °C?

5. How much energy is released when 50 g of water vapor at 100 °C condenses to liquid water?

6. How much energy enters the air when boiling water cools from 100 °C to room temperature (20 °C)?