

# SOLAR HOT WATER HEATERS



1. Most solar water heating systems for buildings have two main parts:  
a solar collector and a storage tank.

In the boxes below, sketch what they two items look like.

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2. Small tubes run through the solar hot water collector box and carry fluid inside them which is then heated. What two types of fluid could this be?

1. \_\_\_\_\_ 2. \_\_\_\_\_

3. The tubes that carry this liquid are attached to something called an absorber plate. Why is it called the "Absorber Plate" and what color is it painted?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. What holds the hot liquid in a solar hot water system? \_\_\_\_\_

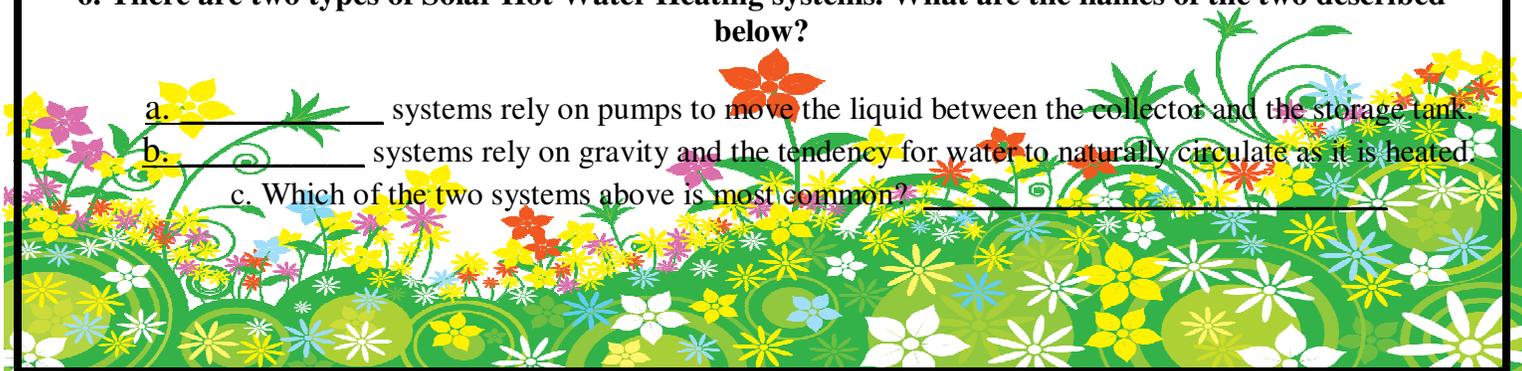
5. True or False? You could use a modified hot water tank for the purpose in question #4, but you would most likely need to add an extra layer of insulation around the tank itself. \_\_\_\_\_

6. There are two types of Solar Hot Water Heating systems. What are the names of the two described below?

a. \_\_\_\_\_ systems rely on pumps to move the liquid between the collector and the storage tank.

b. \_\_\_\_\_ systems rely on gravity and the tendency for water to naturally circulate as it is heated.

c. Which of the two systems above is most common? \_\_\_\_\_



7. There are two types of Active Solar Hot Water Systems, Direct Circulation Systems and Indirect Circulation Systems.

a. What is the difference between the two?

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b. If your family wanted to install one of these systems in your home here, which one would you recommend and why?

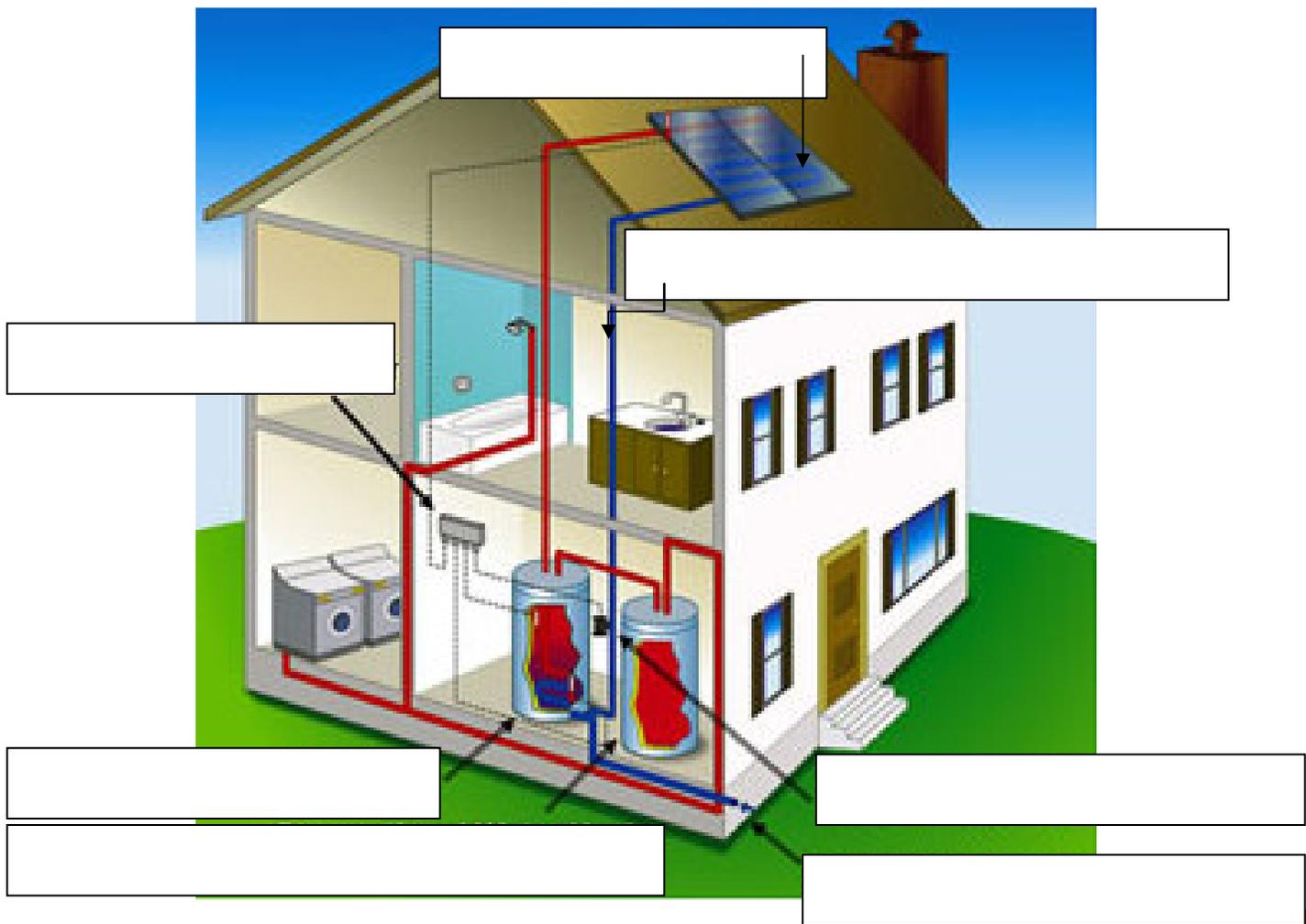
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8. Which system would be less expensive to install? \_\_\_\_\_

9. Below is an image of a Simplified Representation of a Solar Water-heating System. Label the elements.



10. Why would someone want to run already hot water from their Solar Hot Water Storage Tank to their Conventional Water Heater Tank as it is shown in the image in Question 9?

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11. What are the names of the three types of solar collectors used for residential applications?

- 1) \_\_\_\_\_  
2) \_\_\_\_\_  
3) \_\_\_\_\_

12. If you were to install one of these three systems you named in question 11 on your house you live in now, which one would you select and why?

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13. In a Thermosyphon system, what makes the water move?

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14. Properly sizing a solar hot water system is important, so there is enough hot water for the demand of the household. . In Michigan, contractors usually follow a guideline of about \_\_\_\_\_square feet of \_\_\_\_\_ area for each of the first \_\_\_\_\_ family members. For every additional person, add \_\_\_\_\_ to \_\_\_\_\_ square feet. For active systems, the size of the solar storage tank increases with the size of the collector—typically \_\_\_\_\_ gallons per square foot of collector.

15. Answer the Solar Hot Water questions for the family pictured below. Be sure to include the proper increments of measurements (gallons, square feet, etc)



a. What size collector should this family put on their home? \_\_\_\_\_

b. Based on the collector size, what size solar storage tank should they install? \_\_\_\_\_

