

## Specific Heat Worksheet

1. A beaker contains 610.0 g of water at 15.0°C. After being heated for 22 minutes the water's temperature rose to 48.0°C. Calculate the heat energy absorbed.
2. A beaker contains 270 g of water at 15°C. The water absorbs 24 000 J of energy. What is the water's final temperature?
3. Oil has a specific heat capacity of 2.0 J/g.°C. If 200 g of oil absorbs 5 005 J of heat energy to reach a final temperature of 40.0°C, what was its initial temperature?
4. A beaker contains 405 g of water at 19°C. After being heated for 42 minutes the water's temperature reaches 55°C. Calculate the heat energy absorbed.
5. You pour 250 ml of water into a glass just out of the freezer. After a while, you notice that the temperature of the water has fallen from 18°C to 12°C.
  - a- Is this an energy transfer or transformation?
  - b- Calculate the heat energy transfer.
  - c- Explain if the water gives off or absorbs energy.
  - d- Explain if the glass gave off or absorbed energy.

6. Syrup has a specific heat capacity of  $1.3 \text{ J/g}\cdot^{\circ}\text{C}$ . If 200 g of syrup absorbs 5 000 J of heat energy to reach a final temperature of  $55^{\circ}\text{C}$ , what was its initial temperature?
  
7. What is the mass of water if it absorbs 65 000 J of heat energy to go from a temperature of  $75^{\circ}\text{C}$  to  $94^{\circ}\text{C}$ ?
  
8. What is honey's specific heat if 90.0 g are heated for 18.0 minutes and experience a temperature change of  $40.0^{\circ}\text{C}$  absorbing 7 500.0 J of heat?
  
9. Water's specific heat is  $4.19 \text{ J/g}\cdot^{\circ}\text{C}$ . Olive oil's specific heat is  $1.9 \text{ J/g}\cdot^{\circ}\text{C}$ .
  - a- Which one would get hotter faster?
  - b- Which one would keep its heat for longer?
  - c- Why would we put water in a car's cooling system over olive oil?
  
10. When preparing tea, Naomi pours 205 g of boiling water into a porcelain cup. The cup also weighs 205 g. Naomi wants to find the specific heat of the porcelain cup. She obtained the following results:
  - Before pouring the water into the tea cup:
    - temperature of cup =  $25^{\circ}\text{C}$
    - Initial temperature of water =  $105^{\circ}\text{C}$
  - After pouring the water into the cup and stirring gently:
    - Final temperature of water =  $88^{\circ}\text{C}$

Calculate the specific heat capacity of the cup.