

- 3. Organizing Data** Calculate the total energy transferred as heat into the water and the calorimeter.
- 4. Organizing Data** For each trial, find the temperature change of the sample and calculate the specific heat capacity of the sample.

CONCLUSIONS

- 5. Drawing Conclusions** Use the accepted values for the specific heat capacities of various metals in this chapter and in the appendix to determine what metal makes up each sample.
- 6. Evaluating Results** Calculate the absolute and relative errors of the experimental values. Check with your teacher to see if you have correctly identified the metals.
- 7. Evaluating Methods** Explain why the energy transferred as heat into the calorimeter and the water is equal to the energy transferred as heat from the metal sample.
- 8. Evaluating Methods** Explain why it is important to calculate the temperature change using the highest temperature as the final temperature, rather than the last temperature recorded.
- 9. Evaluating Methods** Why should the water be a few degrees colder than room temperature when the initial temperature is taken?
- 10. Making Predictions** How would your results be affected if the initial temperature of the water in the calorimeter were 50°C instead of slightly cooler than room temperature?
- 11. Drawing Conclusions** How is the temperature change of the calorimeter and the water within the calorimeter affected by the specific heat capacity of the metal? Did a metal with a high specific heat capacity raise the temperature of the water and the calorimeter more or less than a metal with a low specific heat capacity?
- 12. Applying Conclusions** An environmentally conscious engineering team wants to design tea kettles out of a metal that will allow the water to reach its boiling point using the least possible amount of energy from a range or other heating source. Using the values for specific heat capacity in this chapter, choose a material that would work well, considering only the implications of transfer of energy as heat. Explain how the specific heat capacity of water will affect the operation of the tea kettle.

EXTENSION

- 13. Evaluating Methods** What is the purpose of the outer shell of the calorimeter and the insulating ring in this experiment?