

## Calorimetry & Specific Heat

Name \_\_\_\_\_

### Source Notes:

This lab was modeled after the “The Specific Heat of a Metal” lab #20  
“Laboratory Physics”, Murphy Doyle, Merrill, 1990.  
ISBN 0-675-02477-3

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1997(?)  
Modified 2010

### Teacher Notes:

### Modifications:

This version was written to use the temperature sensors from Pasco.

# Calorimetry & Specific Heat

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### Purpose:

To identify 4 “unknown” metals by their specific heat values.

### Theory:

Conservation of Energy

$$(m c \Delta T)_{\text{cup}} + (m c \Delta T)_{\text{water}} = (m c \Delta T)_{\text{unknown}}$$

### Data:

	Material?	Mass of Cup	Mass of Water	Mass of Sample	T Initial	T Final
1						
2						
3						
4						

### Calculations:

Find the specific heat value and compare it to known values for each of the 4 samples. Use the total heat gained by the cup and water as the quantity of heat transferred.

material	c (J/kg°C)
water	4186
aluminum	897
brass	375
copper	385
gold	129
iron	449
lead	129
nickel	444
silver	235
tin	228
tungsten	132
zinc	388

	ΔT (hot)	ΔT (cold)	Heat Transfer	c exp.	% Error
1					
2					
3					
4					

### Conclusion (error analysis):