BitWith Bite

PHYSICS WORKSHEET

Calorimetry

Chapter: Thermodynamics · Level ★★★ · Time: 30 min

SCORE
___ / 20

Name ________________ Class ________________ Date ________________

AFTER THIS WORKSHEET YOU CAN

✓ Understand: The Principle of Calorimetry
✓ Understand: Calorimeter
✓ Understand: Setting Up a Calorimetry Equation
✓ Understand: Finding an Unknown Specific Heat

Section A · Concept Check
BEGINNER 4 × 1 = 4

1 80g water at 70°C mixes with 80g water at 10°C. Find the equilibrium temperature.

2 150g metal at 90°C is dropped into 200g water (c=4.2) at 20°C, reaching equilibrium at 24°C. Find the metal's specific heat.

3 Why does adding heat to boiling water not increase its temperature above 100°C (at standard pressure)?

4 What is 'heat of vaporization'?

Section B · Problem Solving
INTERMEDIATE 4 × 3 = 12

5 Why would using an uninsulated container introduce error into a calorimetry experiment?

6 100g of an unknown metal at 100°C is dropped into 150g of water (c=4.2) at 25°C, reaching equilibrium at 30°C. Find the metal's specific heat.

7 If two equal masses of the same substance at different temperatures are mixed, how do you quickly estimate the final temperature?

8 Why is calorimetry useful for identifying an unknown material?

Section C · Challenge
CHALLENGE 2 × 2 = 4

9 A 500g block absorbs 8000 J and its temperature rises by 20°C. Find its specific heat capacity.

10 Why is water often used as the reference substance in calorimetry experiments?

Reflection — the most useful thing I learned: ____________________

A ___/4 B ___/12 C ___/4 **Total ___/20**

Teacher's Signature

Parent's Signature

✄ ANSWER KEY — FOLD OR CUT BEFORE HANDING OUT

1 = 40°C 2 = 150*c1*66=200*4.2*4=3360, c1=3360/9900≈0.339 J/(g*°C) 3 = The heat goes into the phase change (vaporization, converting water to steam) rather than raising the temperature further
4 = The heat required to change a substance from liquid to gas without changing its temperature | 5 = Heat could escape to (or enter from) the surroundings, meaning not all the heat exchange occurs strictly between the two substances being measured 6 = 100*c1*70=150*4.2*5=3150, c1=3150/7000=0.45 J/(g*°C) 7 = It's simply the average of the two starting temperatures 8 = Different materials have distinct specific heat capacities, which can be calculated and compared to known reference values | 9 = c=Q/(m*delta_T)=8000/(500*20)=0.8 J/(g*°C) 10 = It has a well-known, high, and stable specific heat capacity, and is cheap and safe to use