



Name _____ Class _____ Date _____

AFTER THIS WORKSHEET YOU CAN

- ✓ Understand: Heat vs. Temperature
- ✓ Understand: Direction of Heat Flow
- ✓ Understand: Specific Heat Capacity
- ✓ Understand: Heat Transfer Formula

Section A • Concept Check • BEGINNER 4 × 1 = 4 _____

- Find the heat to raise 3 kg of water ($c=4200$) by 8°C .

- A 1.5 kg block ($c=800$) absorbs 6000 J. Find its temperature change.

- What method of heat transfer requires no medium at all (can travel through empty space)?

- What method of heat transfer relies on the physical movement of a fluid?

Section B • Problem Solving • INTERMEDIATE 4 × 3 = 12 _____

- What method of heat transfer occurs through direct physical contact?

- Water has a very high specific heat capacity. What does this mean practically?

- Find the heat released when 4 kg of a substance ($c=390$) cools by 15°C .

- Why do coastal cities often have milder temperature swings than inland cities?

Section C • Challenge • CHALLENGE 2 × 2 = 4 _____

- A 0.2 kg sample absorbs 900 J and rises by 15°C . Find its specific heat capacity.

- Why can heat never spontaneously flow from a cold object to a hot one?

Reflection — the most useful thing I learned: _____

⌘ ANSWER KEY – FOLD OR CUT BEFORE HANDING OUT

1 = 100,800 J 2 = 5°C 3 = Radiation 4 = Convection | 5 = Conduction 6 = It takes a lot of energy to change water's temperature, which is why it's slow to heat up or cool down 7 = 23,400 J
8 = Water's high specific heat capacity moderates nearby air temperatures, absorbing and releasing heat slowly | 9 = $c = Q / (m \Delta T) = 900 / (0.2 \times 15) = 300 \text{ J} / (\text{kg} \cdot ^\circ\text{C})$ 10 = This would violate the natural direction of heat flow (and the second law of thermodynamics), requiring external work to force it (like a refrigerator does)