

**Physics AP-2 – Chapter 12 Worksheet: Temperature and Heat - Chapter 12.1 to 12.4, 12.6, 12.7**

**\*\*\* NOTE: This worksheet is essentially a guided lesson on the topics in Chapter 12. i.e. this is your lesson! Do it!**

1. Do: page 377 Focus on Concepts questions #1, 2, 4, 9, 10: Problems # 1 to 7, 10, 11, 12, 19
2. TRY AT HOME (really! Do it!):
  - a. Place 3 non-metal containers for water beside each other (large enough to fit your hands inside).
    - i. Fill container 1 with ice water
    - ii. Fill container 2 with room temperature water
    - iii. Fill container 3 with hot water – as hot as you can put your hand in (you need to heat your hand, but not scald/burn your skin)
  - b. Put one of your hands in container 1 (ice water), and the other hand in container 3 (hot water). Leave your hands in those containers for a few minutes.
  - c. Quickly, and simultaneously, move both hands into container 2.
  - d. What do you notice about how your hands feel in container 2? Explain the phenomenon in terms of heat flow.
3. “Hot” and “cold” are relative concepts – meaningless without reference to something else as comparison (e.g. “hot water” for making taking a bath is much colder than “hot water” for making tea”). EXPLAIN (with a few examples) what this statement means: *The terms “hot” and “cold” are not useful in describing temperature.*
4. If a cup of coffee FEELS hot to the touch, what is actually happening to cause the feeling of heat?
5. When you hold an ice cube in your hand, why does the ice cube melt? (describe and explain in terms of heat flow)
6. Define: “internal energy”
7. Why is it incorrect to say that an object “contains” heat?
8. What possible changes can occur to an object when heat is added or removed? (refer to figure 12.22)
9. What symbol do scientists use to represent heat?
10. Explain the meaning of “specific heat capacity”.
11. If you want to increase the temperature of 1.0 kg of aluminum by 50.0 °C, how much heat must be added?
12. If you want to decrease the temperature of 1.0 kg of water by 50.0 °C, how much heat must be removed?
13. Of the materials listed on table 12.2, which will increase in temperature **most** easily, with least added heat?
14. Of the materials listed on table 12.2, which will increase in temperature **least** easily, with most added heat?
15. What is the “mechanical equivalent of heat”? Explain in detail.
16. What is “calorimeter”? Explain the concept and procedure in detail.