



DRINKING BIRD LAB (50 pts)

NAME: _____ DATE: _____ PER: _____

This is a **FORMAL LAB**, & you are expected to answer the few questions in a logical thermodynamically sound manner. For the lab write up: Title, Abstract, Purpose, Apparatus, Theory, Uncertainties, and a Conclusion [relating back to the Purpose] as well as questions. Use the diagram & the labels on the back for a sketch. Remember that the theory section should have any and all equations that you used, especially for Carnot efficiency. See the abstract handout for abstract rules (remember that the abstract has no information not contained in the body of the report & if you draw any real conclusions - like the Carnot efficiency - they should be present). You should list any uncertainties (especially for the work question. Ask me any technical type question not immediately observable. Answer the following questions in complete sentences in order:

1. Observe the bird and describe one cycle of action (just what happens, not why). (Observe as if the bird were opaque not transparent.)
2. Why does the bird dip? (observation, it is now transparent)
3. What force(s) (and direction of force(s)) is/are responsible for this observed process (question 2)? (It's definitely plural folks!)
4. Why does the bird return to the upright position? (observations)
5. What allows return of the bird to the upright position (explanation of the observations in question 4)?
6. Why does the bird have a fuzzy head? (be specific) (And, no it will not work if the head is not fuzzy!)
7. What will happen if the cup of water is removed? (both short range and long range - that's a hint, folks!)
8. Will the relative humidity of the surrounding air affect the rate of dipping? (If so, how does it affect the rate? - that's another hint!)
9. Describe two conditions in which the bird will fail to operate (no, lashing his neck down does not count as one, nor does breaking him!)
10. Estimate the Carnot efficiency of the bird. There are tools to be had for the asking!
11. The bird is doing work:
 - a. where is the energy coming from?
 - b. how much work is being done by the bird? - be logical!
12. What are some (PRACTICAL) uses for the drinking bird (any size)?
13. Now explain how the bird works to me (a visitor from another dimension (no comments about that)).

GOOD LUCK! (I expect the words "condensing" and "poration" to appear in your report in connection with both water & the "volatile" fluid) <--- another Blunt!