Chapter 4 Question #7

I will ask a student to throw an object from the top tier of the lecture hall to the bottom. I would like you to estimate how much the average temperature of the air in the room increased as a result.

Approximately how many different pieces of information do you need to make this estimate?

1)   2
2)   4
3)   8
4)   12
5)   16

LO#4

Chapter 4 Question 7 Answer:

(3) 8

If we know the **mass** of the object and the **speed** it was thrown, we can calculate the kinetic energy. Then if we know the **efficiency** of the person throwing the object, we can determine the total energy expended to throw the object. If we know the change in **height** of the object and the **acceleration of gravity**, we can determine the overall change in energy (the person, plus the object). We assume this energy is all ends up as internal energy in the room. If we know the **specific heat** at constant volume, and the mass of air in the room (from knowing the **volume** and the **density**), then we can find the change in temperature.

This is what we got when we did it in class a couple of years ago.

Class Response (2003):
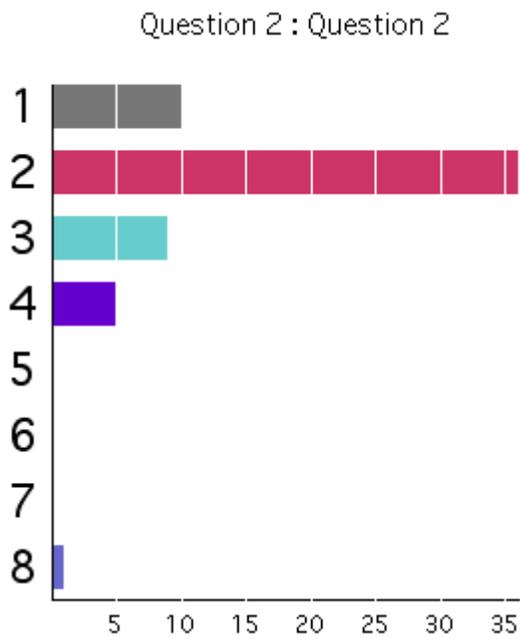
Class Response (2002):

Question 3 : Question 3