**Tips for HW2**

* Problem 1 you had as an ME123 student. Use dimensional consistency to solve this problem. The units on one side of the equation must match the other side of the equation. But what about the units of the derivative? Think about some other derivatives you have taken in the past. Remember that velocity = $\frac{dx}{dt}$, and you know what some appropriate units for velocity are.
	+ Possible reflections include:
		- Application of unit analysis
		- What does thermal conductivity represent (in non-engineering terms)
		- What would be the units in the English unit system?
* Problem 2 your answer will be in units of lbmol. If it helps, solve this problem first using the SI unit system. 1.0 lbm = 453.6 gm. You will probably find this is ~ 2 moles (or gram-moles). Now that you’re comfortable with this, do it in the English unit system.
	+ Possible reflection prompts might be:
		- Why is the number so small?
		- What is a lbmol vs. gmol, or kmol
* Problem 3 is looking at how much chemical energy it takes to make toast using the equipment in the problem statement. The amount of electrical energy the toaster needs is ~170 kJ. However, because the efficiency of the generator is not 100%, the amount of chemical energy the generator needs to produce 170 kJ is going to be greater than 170 kJ. Below are a few mathematical relationships that may also be helpful for this problem.
	+ Power can be described by: $\dot{W}$= voltage \* current
	+ Energy used can be described by: Energy = $\dot{W }$\* time
	+ The energy in the fuel can be described by: Efuel­ = mfuel \* HVfuel