
title: “GEOL 456 Class 1 notes”

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Introductions

Personal introductions

- My scientific background
- My personal background
- Student introductions

Syllabus review

(See syllabus)

- Class overview
 - Goals
 - * Climate physics and chemistry
 - * Paleoclimatology
 - * Human and environmental responses
 - Role of numeracy

Exercise: Students group selves into groups of four, and come up with a single question they would like to have answered by the end of the semester.

How to read and equation

Using the example of the Stefan-Boltzmann equation, $I = \sigma \epsilon T^4$

1. What is the equation talking about?
 - It relates “intensity” (whatever that is) to temperature, “emissivity”, and something called the Stefan-Boltzmann constant.
2. Label the variables: $I \rightarrow$ intensity, etc.

3. Identify what the variables *mean* (e.g., I is intensity, a measure of the amount energy coming from an object; σ is the Stefan-Boltzmann constant, a universal constant)
4. Figure out what the variables do. Here, increases in ϵ , σ , and T all cause I to increase, but T is by far the most important because it is raised to the fourth power.
5. Work out the units.
 - I : *intensity*: How much radiation the it emitting (per unit surface area)?: $\frac{\text{W}}{\text{m}^2}$
 - ϵ : *emissivity*: How good of a blackbody is it? dimensionless
 - σ : *the Stefan-Boltzmann constant*: A basic fact of the universe $\frac{\text{W}}{\text{m}^2\text{K}^4}$
 - T : *temperature*: How hot is it? K