The ion trap analogue as a teaching tool:

- Motivates thinking about atoms and ions:
  - Motivates thought about the size of atoms.
  - Introduces to and motivates thinking about ions and charge.
  - Motivates interest in physics in general.
- Construction of the trap:
  - Creates opportunity to generate interest in and experience with 3D printing, use of Makerspaces:
    - Explores various aspects of 3D printing – layer resolution, how to create smooth parts, how to print things with support, etc.
  - Provides exercise in circuits for digital control of motor speed.
  - Provides exercise in coding for programming of microcontroller.
- Introduces students to the goals of atomic physics research:
  - Motivates why atomic physics research is important:
    - To atomic clocks – important to GPS.
    - To quantum computing – exciting forefront in computational problem solving.
- Introduces students to the concepts of ion trapping.
- Introduces students to measurement techniques: e.g., for the measurement of the motor speed.
  - Can be done by eye and stopwatch:
    - Creates teaching opportunity about significant figures and measurements.
  - Can be done with light/laser, mirror, and photodetector:
    - Creates opportunity to explore coding applications, programming microcontroller to count light pulses (rotations).