## Robotic Sunflower Lesson 5: Integrating Solar Power

## Student Guide

Record all answers to questions, observations, and notes from the material in your engineering notebook. Proceed through each step per your instructor's prompt.

## Vocabulary

- Inductor
- Capacitor
- "Buck" Converter
- Diode
- DC to DC Converter
- 1. Watch the following videos prior to class. Take notes in your notebook.

Inductors http://www.youtube.com/watch?v=STDICdZnIsw

Buck Converter https://www.youtube.com/watch?v=AvV\_yAICbyw https://www.youtube.com/watch?v=FT\_sLF5Etm4 http://en.wikipedia.org/wiki/Buck\_converter

2. Go to the site listed below and download the data sheet for the LM2574. Note the example circuit. Draw the circuit in your notebook and describe each components affect on the circuit.

http://www.ti.com/product/Im2574

- 3. After building the Buck Converter circuit, test it with the known voltage source your teacher has in class. Compare the voltage and current coming into the circuit to that going out of the circuit. What type of efficiency does your circuit exhibit?
- 4. Based on the solar cells used, how much indirect sunlight should the cells receive to recharge a 6V lead acid battery in addition to running the microprocessor during an 8 hour period?