

Energy and Power Practice

Physics and Mathematics of Sustainable Energy

College of the Atlantic. January 7, 2021

1. An electric pump uses 200,000 J of energy in 3 minutes. What power is this?
2. A largeish electric heater draws 2000 W. If I leave this heater on for 4 hours, how much energy has it used?
3. A battery stores 7.2 MJ of energy. How long could this battery be used to light up a 40 W light bulb?
4. Mount Desert Island High School uses approximately 2,300,000 MJ of electricity in one year. What power is this?
5. You decide to create a “happiness cannon” that is designed to make people happy by shooting small stuffed animals at them. You want your cannon to be able to shoot 5 stuffed animals every minute. The stuffed animals have a mass of 250 grams, and you want them to leave the cannon with a velocity of 13 m/s. What is the minimum average power your cannon would draw?



Figure 1: Ammunition for the happiness cannon. These stuffed animals happen to be filled with lavender. Image source: <https://calicofieldslavender.com/product/lavender-stuffed-animals/>.

6. An electric toaster draws 1000 Watts. If the toaster is left on for 1 hour, how much energy does it use?
7. An electric toaster draws 1200 W. If I make toast for half an hour, how much energy has the toaster used?