Efficiency Calculation Worksheet

Name: KEY

1. Wile E. Coyote sets up a pulley to lift a gigantic boulder over a valley highway in an attempt to squish the Roadrunner. Wile E. Coyote puts 3402 J of energy into the pulley while the pulley does 2938 J of work. Calculate the efficiency of the pulley.

$\mathcal{E} = \frac{\text{USEFUL}}{\text{INPUT}} \times 100 = \frac{2938}{3402} \times 100 = 86.36\%$

2. Wile E. Coyote's previous attempt of killing the Roadrunner failed so he decided to use an inclined plane to push a boulder down onto the Roadrunner. The output work done by the inclined plane is 875 J and the input work is 1285 J. Calculate the efficiency of the inclined plane.

$\frac{875}{1285} \times 100 \quad 68.09\%$

3. After another failed attempt, Wile E. Coyote grabs a stick to create first class lever. He inputs 445 J of work and the output work of the lever is 430 J. Calculate the efficiency.

$\frac{430}{445} \times 100 = 96.62\%$

4. Wile E. Coyote tries chasing after the Roadrunner with his Acme 200 Cyclone bicycle. The output of bike is 2890 J of work while the input was 4122 J. Calculate the efficiency of the Acme 200 Cyclone.

$\frac{2890}{4122} \times 100 \quad 70.11\%$

5. Wile E. Coyote wants to poison the Roadrunner by putting arsenic in some bird feed. The arsenic comes in a can so he must use a can opener. If Wile E. Coyote applies 34 J of work and the can opener does 27 J work then what is the efficiency of the can opener?

$\frac{27}{34} \times 100 = 79.41\%$

6. In his last attempt Wile E. Coyote creates a catapult to launch a boulder. After construction, Wile E. Coyote sets up the catapult and waits for the Roadrunner. When the Roadrunner appears he puts 793 J of work into the catapult while it does 720 J of work. What is the efficiency this catapult?

$\frac{720}{793} \times 100 \quad 90.79\%$

4. Fred's hairdryer takes in 1200 J of electrical energy and gives out 500 J as thermal energy, 500 J as kinetic energy and 200 J as sound energy. How efficient is it?

$\frac{1000}{1200} \times 100$

efficiency = 83.3 %

5. Fred's TV takes in 2000 J of electrical energy and gives out 1100 J as light energy. 300 J is given out as sound energy and 600 J as thermal energy. How efficient is it?

$\frac{1400}{2000}$

efficiency = 70 %

6. Fred's light bulb takes in 60 J of electrical energy and gives out 54 J as thermal energy and 6 J as light energy. How efficient is it?

$\frac{6}{60}$

efficiency = 10 %

7. Fred's other light bulb takes in 20 J of electrical energy and gives out 2 J as thermal energy and 18 J as light energy. How efficient is it?

$\frac{18}{20}$

efficiency = 90 %

8. Fred wants to spend as little money as possible on his light bulbs and running them. What should he consider in trying to do this?

use light bulb number 2

9. Fred's lawnmower takes in 1500 J of energy and gives out 500 J of kinetic energy. 400 J is also given out as sound energy and 600 J as thermal energy. How efficient is it?

$\frac{500}{1500} =$

efficiency = 33.3

10. Fred's heater gives out 1900 J of thermal energy, 90 J of sound energy and 10 J of light energy. How efficient is it?

$\frac{1900}{2000} \times 100 =$

efficiency = 95 %