

Name: \_\_\_\_\_  
Blk: \_\_\_\_\_ Date: \_\_\_\_\_

## Science 9 9.2 The Power of Electricity

### **Power**

Power is the rate of **change in energy**, the rate at which work is done.

Power is measured as units of energy (**Joules (J)**) per second, 1 joule per second is 1 **watt (W)**

Electrical power is the rate of change in electrical energy.  
For example, a 25 W fluorescent bulb converts **25** joules per second of electrical energy into other forms



### **Calculating Power and Energy Consumption:**

$$\text{Power} = \text{Voltage} \times \text{Current}$$

**Symbols:**  $(P) = (V) \times (I)$

**Units:**  $(W) = (V) \times (A)$

$$\text{Energy} = \text{Power} \times \text{Time}$$

**Symbols:**  $(E) = (P) \times (t)$

**Units:**  $(J) = (W) \times (S)$

Therefore, if you know the voltage a device is connected to, and how much current flows in it, you can calculate the **power** of the device.

Knowing how **long** the device is used allows you to calculate how much energy it consumes.

## **Paying for Electricity: A Larger Unit for Energy**

A joule is a very small amount, so the energy supplied to the home is usually calculated in much **bigger units**

Instead of using watts - **kilowatts** are used

Instead of using seconds - **hours** are used

The company keeps track of **kilowatt•hours**



## **Paying Your Power Bill**

When the power company has determined how many **kilowatt•hours** you have used, they then bill you by multiplying how much you have used by the **cost per kW•h**

The power company keeps track of your energy usage by reading your **electric meter**