**Worksheet Chapter 5 kWh & resistors Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Calculate the energy (in Joules) consumed by a circuit with a 5 Ω resistor connected to a 12 V battery, after it has been connected for 5 minutes and 20 seconds.

**Time: 5 x 60 = 300 V= IR I = V/R P = VI E = PΔt**

**+ 20 = 12/5 = 12 x 2.4 = 28.8 x 320**

**320 I = 2.4 A P = 28.8 W E = 9 216 J**

1. Calculate the energy used by each of the following devices in kWh.
   1. A 1500 W hair dryer used for 2.5 hrs per week.

**1500 ÷ 1000 = 1.5 kW E = PΔt = 1.5 kW x 2.5 h = 3.75 kWh**

* 1. A 120 V circuit that draws 15 A. It is connected all day. Calculate the kWh for 5 days of use.

**Time = 5 x 24 = 120 h**

**P = VI = 120 x 15 = 1 800 W E = PΔt = 1.8 kW x 120 h = 216 kWh**

* 1. 3500 W motor that runs for 8 hrs and 36 minutes.

**Time = 36/60 = 0.6 hr 8 + 0.6 = 8.6 h**

**E = PΔt = 3.5 kW x 8.6 h = 30.1 kWh**

1. How much does it cost to operate a 1700W heater for 3 hours a day for 10 weeks if electricity costs $0.09 per kWh? **Time = 3 x 7 x 10 = 210 h**

**E = PΔt = 1.7 kW x 210 h = 357 kWh 357 kWh x $0.09/kWh = $32.13**

1. Fill in the following table with the missing information. Chart in notes or textbook p. 468.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Colour Band 1 | Colour Band 2 | Colour Band 3 | Colour Band 4 | Resistor strength | Range |
| Blue | Red | Yellow | Gold | **620 000Ω + 5%** | **589 000 Ω – 651 000 Ω** |
| Orange | Green | Red | Silver | **3 5 00Ω + 10%** | **3150 Ω - 3850 Ω** |
| **Red** | **Orange** | **Red** | **Gold** | 2300 Ω + 5% | **2185 Ω – 2415 Ω** |
| Black | Blue | Green | Silver | **600 000Ω + 10%** | **540 000 Ω – 660 000 Ω** |
| **Brown** | **Violet** | **Orange** | **Silver** | 17000Ω + 10% | **15 300 Ω – 18 700 Ω** |