**Watt’s Up**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Rank the electrical items from using the least amount of electrical energy to the most.
2. Plug in each appliance. Turn it on. Record the number of watts from the watt meter.
3. When all are completed. Place the actual ranking in the last column.

|  |  |  |  |
| --- | --- | --- | --- |
| **Appliance** | **Predicted Rank** | **Watt Meter Reading** | **Actual Watt Meter Rank** |
| IL bulb |  |  |  |
| Hair dryer   |  |  |  |
| LED Christmas lights |  |  |  |
| CFL |  |  |  |
| IL Christmas Lights |  |  |  |
| Fan |  |  |  |

Look at the highest ranking appliances. Explain what they have in common.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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If the appliances were used for the same amount of time, which appliance would cost:

The LEAST \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The MOST \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

In your home, what is the electrical voltage (in the United States) that is found in a

standard outlet? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ volts

**According to Watt’s Law :**

Power = Volts multiplied by Current P = V x I

P= power in Watts, V= electrical pressure in Volts, I = current in Amps

**According to Ohm’s Law :**

Volts = Current multiplied by Resistance V = I x R

Current = Volts divided by Resistance I = V / R

Resistance = Volts divided by Current R = V / I

**Show your substitutions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Appliance** | **Watts** | **Current = Amps = I****I =P/V** | **Resistance****R =V/I** |
| IL light bulb |  |  |  |
| Hair dryer |  |  |  |
| LED Christmas Lights |  |  |  |
| CFL light bulb |  |  |  |
| IL Christmas Lights |  |  |  |
| Fan |  |  |  |

Resistance measures \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name at least two factors that influence resistance.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Watt’s Up**

Name \_\_Answer Key\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Rank the electrical items from using the least amount of electrical energy to the most.
2. Plug in each appliance. Turn it on. Record the number of watts from the watt meter.
3. When all are completed. Place the actual ranking in the last column.

|  |  |  |  |
| --- | --- | --- | --- |
| **Appliance** | **Predicted Rank** | **Watt Meter Reading** | **Actual Watt Meter Rank** |
| IL bulb |  | **100** |  |
| Hair dryer   |  | **Low – High****350 - 1200** |  |
| LED Christmas lights |  | **3** |  |
| CFL |  | **13** |  |
| IL Christmas Lights |  | **23** |  |
| Fan |  | **Low – High****16 - 18** |  |

Look at the highest ranking appliances. Explain what they have in common.

\_In general, the highest wattage appliances produce heat.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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If the appliances were used for the same amount of time, which appliance would cost:

The LEAST \_\_\_LED Christmas lights­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The MOST \_\_\_Hair Dryer (high)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

In your home, what is the electrical voltage (in the United States) that is found in a

standard outlet? \_\_\_120\_\_\_\_\_\_\_\_\_\_\_\_\_ volts

**According to Watt’s Law :**

Power = Volts multiplied by Current P = V x I

P= power in Watts, V= electrical pressure in Volts, I = current in Amps

**According to Ohm’s Law :**

Volts = Current multiplied by Resistance V = I x R

Current = Volts divided by Resistance I = V / R Measured in Amps

Resistance = Volts divided by Current R = V / I Measured in Ohms

**Show your substitutions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Appliance** | **Watts** | **Current = Amps = I****I =P/V** | **Resistance****R =V/I** |
| IL light bulb | 100 | 0.83 Amps =100 watts / 120 volts | 144.58 Ohms = 120 volts/ 0.83 amps |
| Hair dryer | 1200 (high) | 10 Amps =1200 watts / 120 volts  | 12 Ohms = 120 volts / 10 amps |
| LED Christmas Lights | 3 | 0.025 Amps =3 watts / 120 volts | 4,800 Ohms =120 volts / 0.025 amps |
| CFL light bulb | 13 | 0.11 Amps =13 watts / 120 volts | 1090.9 Ohms = 120 volts / 0.11 amps |
| IL Christmas Lights | 23 | 0.19 Amps =23 watts / 120 volts | 631.57 Ohms =120 volts / 0.19 amps |
| Fan | 18 (high) | 0.15 Amps =18 watts / 120 volts | 680 Ohms =120 volts / 0.15 amps |

Resistance measures \_\_\_\_the hindrance of flow of a charge, Resistance discourages flow. \_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name at least two factors that influence resistance.

\_\_length of wire, thickness of wire, material wire is made of , temperature of wires,\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_