

Section 10.2 Energized and De-energized Charges – Answer Key

1) What is *electrical potential energy*? **It is electrical energy stored in a battery.**

2) What are all forms of energy measured in? **All forms of energy are measured in joules (J).**

3) What is *potential difference*? **Potential difference is the difference in potential energy per coulomb of charge at one point in the circuit compared to the potential energy per coulomb of charge at another point in the circuit.**

4) Define *volt*. **A volt is the unit of potential difference; one volt causes a current of one ampere to flow through a conductor with a resistance of one ohm.**

5) What is the formula for calculating voltage? Write it in words and symbols.

$V = E/Q$ Potential Difference = Energy/Charge

6) Write down table 10.3.

	Symbol	Unit (quantity)
Energy	E	J (joule)
Charge	Q	C (coulomb)
Potential Difference	V	V (volts) $V = J/C$

7) What is a voltmeter used for?

It is used to measure the potential difference between two points in a circuit.

8) Compare a battery to a water pump. Include a diagram for each (See page 332).

The water pump lifts water to a higher level against the force of gravity. Similarly, a battery lifts electrons to a higher energy level.

In a water circuit, gravity is the force that makes the water flow.

In an electrical circuit, it is the chemical energy of the battery that makes the current flow.

9) If 42J of chemical energy in a battery places 7.0 C of negative charge at the negative terminal, leaving a deficit at the positive terminal, what is the potential difference between the negative and positive terminals of the battery?

$$V = \frac{E}{Q} \quad E = 42\text{J} \quad Q = 7 \quad V = \frac{42}{7} \quad V = 6$$

A battery that uses 42J of chemical energy to separate 7 C of charge has a potential difference of 6 Volts between the terminals of the battery.