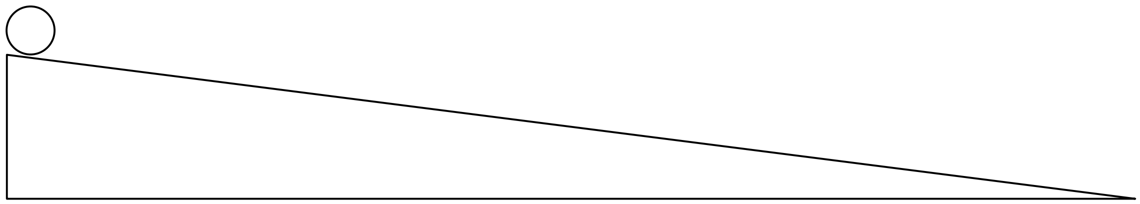
Electric Potential Difference

Just like in grade eleven, we need to remember that potential difference is the descriptive name for _______________.

To consider this, lets compare it to gravitational potential energy on a ramp:



At the top of the ramp we have a lot of gravitational potential energy.
At the bottom of the ramp, we have very little gravitational potential energy.

The "potential difference" would simply be to subtract the two "potential" values.

Another way of looking at this is any object will always want to go to a spot of low "potential" energy. Here, the ball wants to go to the bottom of the ramp because that spot has low gravitational potential energy, since gravity is acting on its mass.

Electric Potential

We can adapt these arguments to a charged particle in an electric field. The particles want to go to a spot of "low potential" so the field will influence their motion.

This is what happens in old CRT monitors. Charges are accelerated through the use of an electric field so they can hit our screen and make a pretty picture.

From grade eleven, we can examine the definition of potential difference:

$$V = \frac{E}{q} \text{ OR } E = qV$$

where: V is potential difference in Volts (V)
E is electric potential energy in Joules (J)
q is particle charge in Coulombs (C)

Unit Analysis:

We can see that there are some similarities between E = qV and E = mgh.

In our last lesson, we also realized that we could calculate potential energy using a general formula. Lets solve for voltage and insert the alternate formula:

$$V = \frac{E}{q} =$$