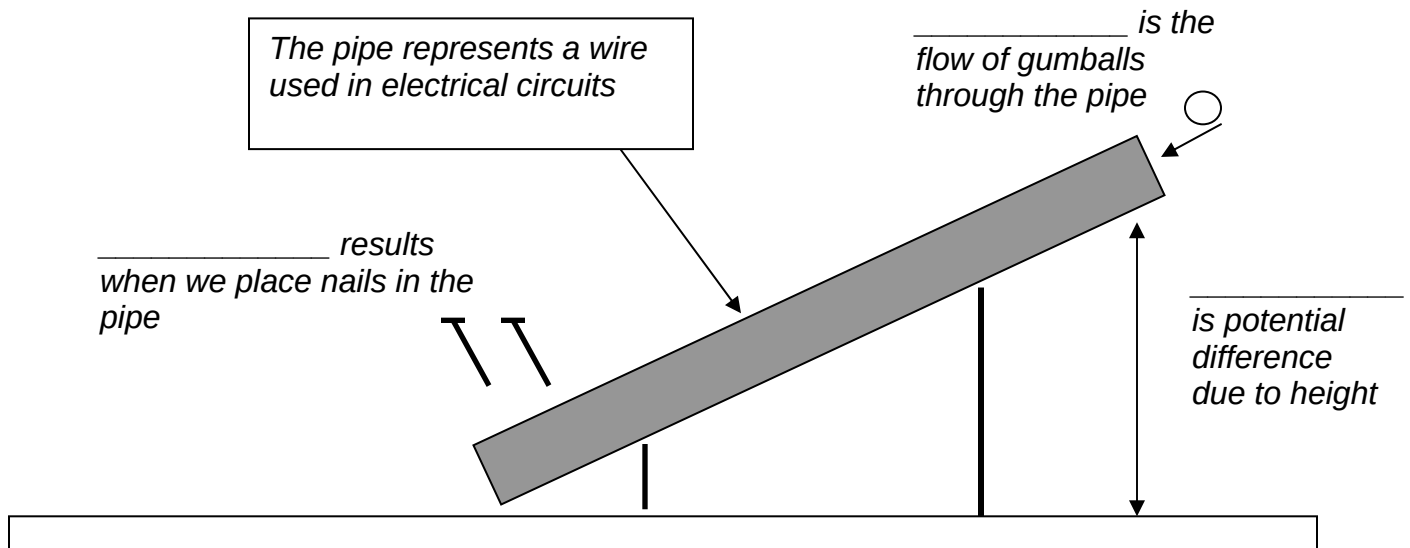


Name _____

Ohm's Law and Resistivity

OHM'S LAW

Question: What are voltage, current and resistance and how do they work?



Putting it Together...

The gumballs in this demonstration represent the flow of _____ through the pipe. The height the pipe is raised above the desk represents potential difference, or _____. The nails placed in the pipe represent _____ and slow down the flow of the gumballs. The higher we raise the pipe, the _____ the gumballs flow; the more nails we place in the pipe, the _____ the gumballs flow. *In summary, the current (rate of gumball flow per second) through the pipe depends on the voltage (height the end of the pipe is raised) and the resistance (number of nails in the pipe).*

Ohm's Law is a mathematical formula used to explain this relationship

PART B

Ohms law states that voltage is equal to current times resistance.

V = Voltage and has the unit of Volts

I = Current and has the unit of Amperes

R = Resistance and has the unit of Ohms

*** We can rearrange this equation to solve for I or R ***

1. Solve for current (I) in Ohm's Law

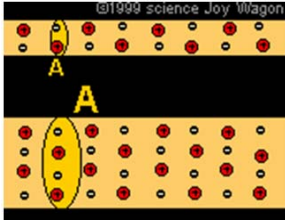
2. Solve for resistance (R) in Ohm's Law

3. What is the voltage across a wire that has a current of 5 amps and a resistance of 2 ohms?

4. What is the current in a wire that has a resistance of 5 ohms and a voltage of 10 volts?

5. What is the resistance of a wire that has a current of 3 amps and a voltage of 12 volts?

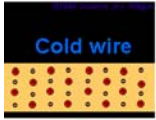
Resistivity is _____



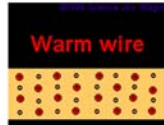
Cross sectional Area

and

LENGTH



Vs.



Formula:

Example

What is the resistance of copper wire that is 1.5 m in length and has a cross sectional area of $1.0 \times 10^{-3} \text{ m}^2$?

Question: How does # of electrons relate to current flow?

EXAMPLE:

A wire carries a current of 3.0 amperes. How many electrons pass a given point in 1.0 seconds?

