**Electrostatics: 2 – Electric Field on a Single Charge**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period: \_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_

There are many similarities between gravitational and electrostatic forces. One such similarity is that both forces can be exerted on objects that are not in contact.

In the same way that any mass is surrounded by a gravitational field, we will imagine that any charge object is surrounded by an electric field.

Similar to gravitational fields, an electric field will depend on: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the charge.

In fact we define an electric field as the force per unit charge:

Where:

E=

FE=

q=

 We can substitute in Coulomb’s Law to get:

In the case of electric fields we are dealing with another example of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Therefore the field is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

In order to show this we always draw the field lines as \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

We therefore define the direction of an electric field as the direction a \_\_\_\_\_\_\_\_\_\_\_\_\_ charge would move in that field

How to draw electric field lines?

You will remember that the strength of a vector field is indicated by the density of the arrows, therefore the field is always strongest…

Example:

What is the electric field strength at a point where a -2.00 uC charge experiences an electric force of 5.30x10-4 N?

Example:

At a distance of 7.50x10-1 m from a small charged object the electric field strength is 2.10x104N/C. At what distance from this same object would the electric field strength be 4.20x104 N/C?

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