Static Electricity   **Name:** _____

Electric Field

Read from **Lesson 4** of the **Static Electricity chapter** at **The Physics Classroom:**

http://www.physicsclassroom.com/Class/estatics/u8l4a.html
http://www.physicsclassroom.com/Class/estatics/u8l4b.html

MOP Connection: Static Electricity: sublevels 10 and 11

1. The standard metric units of measurements for electric field strength are _____.

2. The direction of the electric field vector is defined as _____

_____.

Use the electric field equations to answer the following questions.

3. A test charge of $+1.0 \times 10^{-6}$ C experiences a force of 0.050 N. The electric field strength is _____.

4. A test charge of $+1.0 \times 10^{-6}$ C experiences a force of 0.10 N. The electric field strength is _____.

5. An object with a charge of 2.0×10^{-4} C creates an electric field. A test charge of $+1.0 \times 10^{-6}$ C experiences a force of 0.050 N. The electric field strength is _____.

6. An object with a charge of 2.0×10^{-4} C creates an electric field. A test charge of $+2.0 \times 10^{-6}$ C experiences a force of 0.10 N. The electric field strength is _____.

7. An object with a charge of 4.0×10^{-4} C creates an electric field. A test charge of $+1.0 \times 10^{-6}$ C experiences a force of 0.10 N. The electric field strength is _____.

8. An object with a charge of **Q** creates an electric field. A positive test charge, **q**, is used to test the strength of the field. Use this scenario to answer the following questions:

    a. If the charge of the test charge **q** is doubled, then it will experience _____ (2X, 4X, 1/2, 1/4-th, the same) force; the electric field strength at this location will be _____ (2X, 4X, 1/2, 1/4-th, the same as) the original value.

    b. If the charge of the object **Q** is doubled, then the test charge will experience _____ (2X, 4X, 1/2, 1/4-th, the same) force; the electric field strength at this location will be _____ (2X, 4X, 1/2, 1/4-th, the same as) the original value.

    c. If the distance between the charge and the test charge is doubled, then the test charge will experience _____ (2X, 4X, 1/2, 1/4-th, the same) force; the electric field strength at this location will be _____ (2X, 4X, 1/2, 1/4-th, the same as) the original value.

9. Use your understanding of electric force and electric field to fill in the following table.

	Charge creating the E field (C)	Charge used to test the E field (C)	Force experienced by test charge (N)	Electric Field Intensity (N/C)	Distance (fictional units)
a.	4.0×10^{-4} C	1.0×10^{-6} C	0.20 N		**d**
b.	4.0×10^{-4} C	2.0×10^{-6} C		2.0×10^{5} N/C	**d**
c.	8.0×10^{-4} C	1.0×10^{-6} C	0.40 N		**d**
d.	8.0×10^{-4} C	2.0×10^{-6} C		4.0×10^{5} N/C	**d**
e.	8.0×10^{-4} C		0.60 N		**d**
f.	8.0×10^{-4} C	1.0×10^{-6} C		1.0×10^{5} N/C	**2d**
g.	8.0×10^{-4} C	2.0×10^{-6} C			**2d**
h.	8.0×10^{-4} C		0.10 N		**2d**
i.	4.0×10^{-4} C			8.0×10^{5} N/C	**0.5 d**
j.	4.0×10^{-4} C				**0.5 d**