3/15/2018

Review of Previous Lesson

- State as many Vocabulary words and Learning Objectives that you remember from the last lesson as you can.
- Remember to grade yourself from 0 - 3.

1

3/15/2018

Coulomb's Law

Electrostatics

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Learning Objectives

3/15/2018

Content:	Start	End
State Coulomb's Law.		
Calculate the force between two charged objects using Coulomb's Law in scientific notation.		
Apply proportionality reasoning to determine force: distance doubled, force quartered.		
Define electric force.		
Identify and explain how the electric force acts on various charges including magnitude and direction.		
Recognize $F_{12} = F_{21}$		

3

Language Learning Objectives

3/15/2018

Content:	Start	End
State in writing.		
Calculate		
Apply		
Define verbally and in writing.		
Identify and explain verbally and in writing.		
Recognise		

4

3/15/2018

Electrostatics (part 1): Introduction to Coulomb's Law

Khan Academy

https://www.khanacademy.org/science/physics/electric-charge-electric-force-and-voltage/charge-electric-force/v/coulombs-law

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Coulomb's Law

$$F = k\frac{q_1 \times q_2}{d^2}$$

F = electrostatic force between two point charges ($\mathbf{N} = kg \cdot m/s^2$)

k = Coulomb constant ($k = 1/4\pi\epsilon_0 \cong 8.988 \times 10^9\ \mathbf{N} \cdot m^2/C^2$)

q_1 = charge of the first point charge (C)

q_2 = charge of the second point charge (C)

r = distance between charges (m)

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Coulomb's Law

- http://www.physicsclassroom.com/Physics-Interactives/Static-Electricity/Coulomb-s-Law/Coulomb-s-Law-Interactive

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Charge 1 = $1*10^{-9}$C, Distance = 1m, Increasing Charge 2

Use k = $9*10^9$

Charge 2 (C)	F_e (N)
1	
2	
3	
4	
5	

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Charge 1 = $1*10^{-9}$C, Distance = 1m, Increasing Charge 2

Use k = $9*10^9$

Charge 2 (C)	F_e (N)
1	
2	
3	
4	
5	

- Is there an easier way to fill out the table without recalculating each time?
- Draw a rough sketch of what you think a graph with Force (Y axis) and charge (X axis) will look like.
- Draw a graph with Force (Y axis) and charge (X axis).

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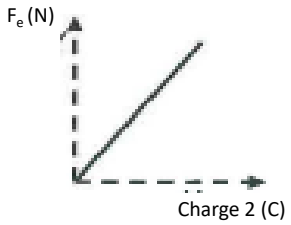
F_e with Increasing Charge 2



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Charge 1 = 1C, Charge 2 = $1*10^{-9}$C Increasing Distance

Use k = $9*10^9$

Distance (m)	F_e (N)
1	
2	
3	
4	
5	

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Charge 1 = 1C, Charge 2 = $1*10^{-9}$C Increasing Distance

Use k = $9*10^9$

Distance (m)	F_e (N)
1	
2	
3	
4	
5	

- Is there an easier way to fill out the table without recalculating each time?
- Draw a rough sketch of what you think a graph with Force (Y axis) and distance (X axis) will look like.
- Draw a graph with Force (Y axis) and distance (X axis).

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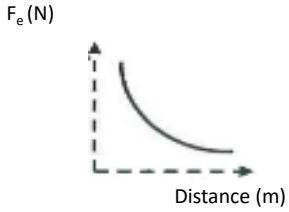
F_e with Increasing Distance



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Problems & Solutions:

- Coulomb's Law:
  - http://www.mcqslearn.com/a-level/physics/coulomb-law.php
  - http://www.physicsclassroom.com/class/estatics/Lesson-3/Coulomb-s-Law
  - http://www.softschools.com/formulas/physics/coulombs_law_formula/218/
  - http://www.mcqslearn.com/applied/physics/coulomb-law.php
  - http://www.mcqlearn.com/physics/g10/coulombs-law-mcqs.php
  - http://www.physicsclassroom.com/reviews/Static-Electricity/Static-Electricity-Review-Questions-with-Links

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Grade yourself.

- Grade yourself on the vocabulary and learning objectives of the presentation.

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