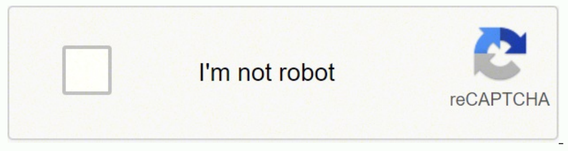


Next

Coulomb' s law worksheet physics classroom

Coulomb's Law Worksheet

Name:_____

Date:_____

Mod:_____

Directions: Answer the questions below using coulomb's law. Be sure to use SI units when using the equation. Show all work and circle your final answer.

1. A charged sphere with an excess charge of +5.5mC is placed 0.15m from another charged sphere, which carries a charge of -9.1μC.
   a. What is the magnitude of the electrical force between the two charged spheres?

   b. Is this a repulsive or attractive force?

   c. How many excess electrons are on the negative sphere?

   d. How many electrons has the positive sphere lost?

2. An electron and a proton are 0.1 mm apart. What is the magnitude of the force? Is the force repulsive or attractive?

3. Two objects are at rest on a table when they are given a charge. The one object has a charge of +7.8μC and the other has a charge of -0.54mC. The magnitude of the force between the two objects is 17.5N. What is the distance between the two objects?

Pre AP Physics Electrostatics Review Sheet

1. A negative charge of -6.0 μC exerts an attractive force of 55 N on a second charge 0.250 m away. What is the magnitude of the second charge? [+3.008 x 10^{-7} C]

2. Two charges, q_1 and q_2, are separated by a distance, d, and exert a force, F, on each other. What new force will exist if:
   a. q_1 is doubled? [x2]
   b. q_1 and q_2 are cut in half? [1/4]
   c. d is tripled? [1/9]
   d. d is cut in half? [x4]
   e. q_1 is tripled and d is doubled? [x3/4]

3. Two electrons, each with a charge of -1.6 x 10^{-19} C, are separated by 1.5 x 10^{-9} m, the typical size of an atom. What is the electric force between them? [1.024 x 10^{-10} N, repulsive]

4. A positive and negative charge, each of magnitude 1.8 x 10^{-7} C, are separated by a distance of 16 cm. Calculate the force on the particles. [90 N, attractive]

5. Two negative charges of – 3.0 μC exert a repulsive force of 2.8 N on each other. Calculate the distance that separates them. [0.201 m]

6. Three charges lie along the x-axis. One positive charge, q_1 = +1.3 μC, is at the origin, and another positive charge, q_2 = 5.5 μC, is at x = 1.90 m. At what point on the x-axis must a negative charge, q_3, be placed so that the resultant force on it is zero? [1.078 m from q_1]

7. A positive charge of 9.8 x 10^{-6} C is separated from a second positive charge of 7.2 x 10^{-6} C by 68 cm. Calculate the electric force between the two particles. [1.750 N, repulsive]

8. A charge, q_1 = 7.48 μC, is at the origin, and a second charge, q_2 = -3.25μC, is on the x-axis 0.950 m from the origin. Find the electric field at a point on the y-axis 0.638 m from the origin. [1.57 x 10^5 N/C at 63.23°]

9. An object, A, with +2.3 x 10^{-6} C charge, has two other stationary charges nearby. Object B, -4.1 x 10^{-6} C, is 0.080 m to the right. Object C, +6.7 x 10^{-6} C, is 0.12 m below. What is the net force on A? [15.866 N at 33.670°]

10. Two negative charges of -11.28 μC are separated by 0.790 m. What force exists between the charges? [2.087 N]

11. A charge of +3.48 x 10^{-6} C is placed at the origin, and another charge of +5.8 x 10^{-6} C is placed at x= 2.3 m. Find the point between these two charges where a charge of +3.88 x 10^{-6} C should be placed so that the net electric force on it is zero. [1.812 m from q_1]

12. How far apart are two electrons, each with a charge of -1.6 x 10^{-19} C, if they exert a repulsive force of 3.38 N on each other? [1 x 10^{-18} m]

13. A force of 5.8 x 10^{2} N exists between a positive charge of 7.30 x 10^{-4} C and a negative charge of -2.87 x 10^{-4} C. What distance separates the charges? [0.558 m]

14. Two identical point charges are separated by a distance of 7.0 cm and they repel each other with a force of 11.0 x 10^{-5} N. What is the new force if the distance between the point charges is tripled? [1.222 x 10^{-5} N]

15. Two point charges are separated by 120 cm. If one charge is + 14.3 μC and the other is –11.5 μC, what is the force between them? [1.528 N, attractive]

16. A charge of 3.71 x 10^{-6} C is attracted by a second charge with a force of 488 N when the separation is 22.0 cm. Calculate the size of the second charge. [8.740 x 10^{-3} C]

17. A charge q_1 of 16.24 x 10^{-6} C and a charge q_2 of -2.78 x 10^{-6} C are separated by a distance of 120.0 cm. Find the equilibrium position for a third charge of +11.0 x 10^{-6} C. [8.798 m from q_1]

NAME DATE

UNIT 3

Newton's Second Law

Newton's second law expresses the relationship between the net force on an object and the object's acceleration:

net force = mass × acceleration

$F_{net} = ma$

Use Newton's second law to solve the following problems.

1. A 1520 kg car accelerates at a rate of 1.50 m/s². What is the net force on the car?

2. A 5.22×10^7 kg cruise ship is moving at its top speed as it comes into port. The ship then undergoes an acceleration equal to −0.357 m/s² until it comes to rest at its anchorage. What is the net force acting on the ship as it slows down?

3. A catcher in a professional baseball game exerts a force of −65.0 N to stop the ball. If the baseball has a mass of 0.145 kg, what is the ball's acceleration as it is being caught?

4. A 214 kg boat is sinking in the ocean. The force of gravity that draws the boat downward is partially offset by the buoyant force of the water, so that the net force on the boat is −1310 N. What is the acceleration of the boat?

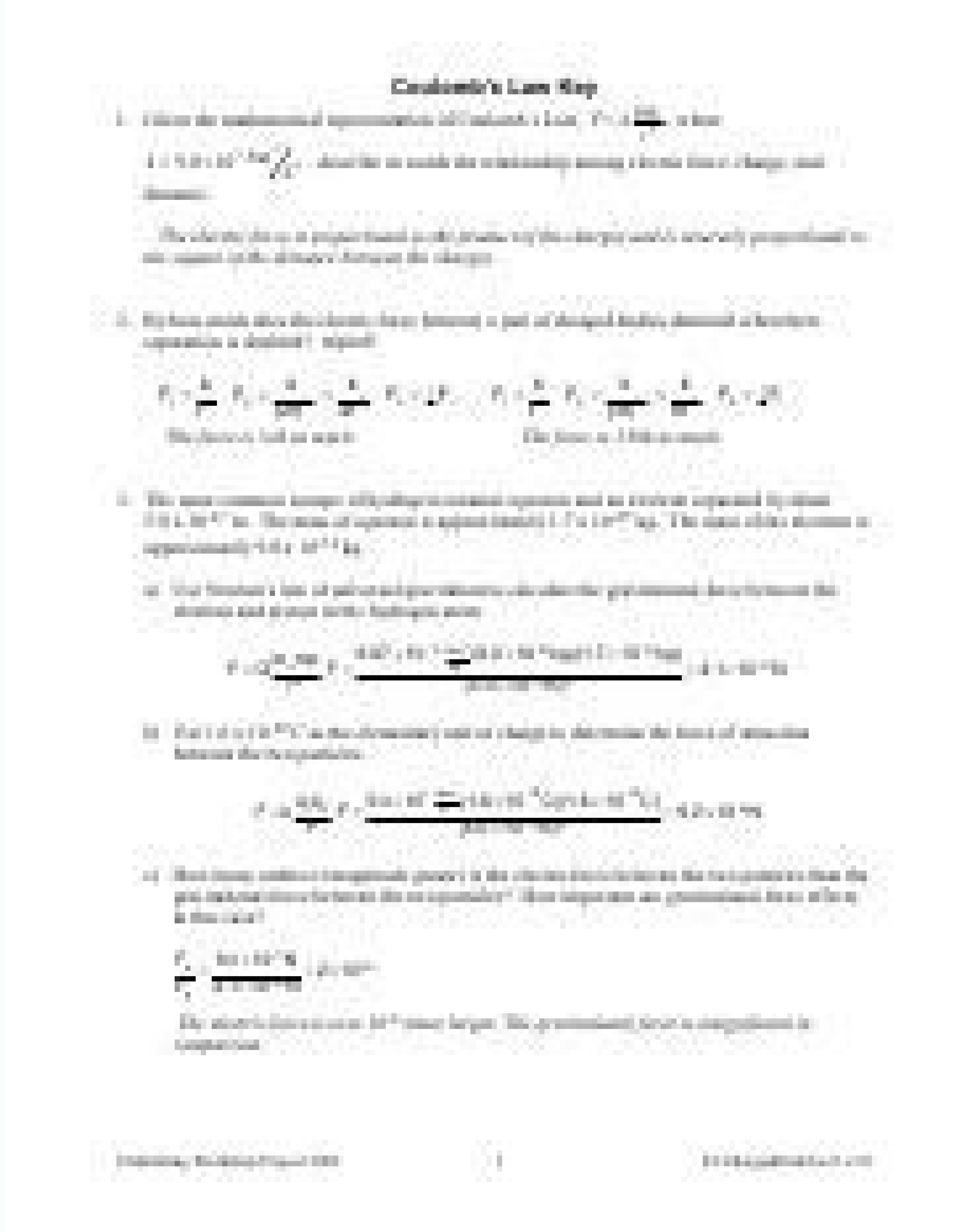
5. A freight train slows down as it approaches a train yard. If a force of -3.8×10^5 N is required to provide an acceleration of −0.33 m/s², what is the train's mass?

6. A house is lifted from its foundations onto a truck for relocation. The net force lifting the house is 2850 N. This force causes the house to move from rest to an upward speed of 0.15 m/s in 5.0 s. What is the mass of the house?

7. Because of a frictional force of 2.6 N, a force of 2.8 N must be applied to a textbook in order to slide it along the surface of a wooden table. The book accelerates at a rate of 0.11 m/s².

   a. What is the net force on the book?

   b. What is the mass of the book?



Study.com

Quiz & Worksheet - Coulomb's Law

http://study.com/academy/practice/quiz-worksheet-coulomb-s-law.html

1. Increasing the charge on one particle by a factor of 2 while leaving all other factors the same will:

- cause the force to increase by a factor of 4
- cause the force to decrease by a factor of 2
- cause the force to decrease by a factor of 4
- cause the force to remain the same
- cause the force to increase by a factor of 2

2. Increasing the distance between particles by a factor of 2 while leaving all other factors the same will:

- cause the force to increase by a factor of 2
- cause the force to remain the same
- cause the force to decrease by a factor of 4
- cause the force to decrease by a factor of 2
- cause the force to increase by a factor of 4

3. Decreasing the charge on both particles by a factor of 2 while leaving all other factors the same will:

- cause the force to decrease by a factor of 4
- cause the force to decrease by a factor of 2
- cause the force to increase by a factor of 2
- cause the force to increase by a factor of 4
- cause the force to remain the same

Coulomb's law physics classroom worksheet answers.

Many of the questions are moSubjects:Types:09 - Electric Fields PhET Simulation Summaryby Fully editable, NGSS/modeling pedagogy aligned inquiry lab summaries! Most lab summaries consist of 2 pages total, with space for students to provide the following information:Lab investigation purposeData for the independent and dependent variableWritten statement on data trendsSketch of a graphicaSubjects:Types:Also included in: Second Semester Bundle09 - Sticky Tape Electric Charge & Force Lab Summaryby Fully editable, NGSS/modeling pedagogy aligned inquiry lab summaries! Most lab summaries consist of 2 pages total, with space for students to provide the following information:Lab investigation purposeData for the independent and dependent variableWritten statement on data trendsSketch of a graphicaSubjects:Types:Also included in: Second Semester Bundle09 - Electric Charge & Force PhET Simulationsby Fully editable, NGSS/modeling pedagogy aligned inquiry lab summaries! 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Quizzes are used for students to demonstrate proficiency of learning targets outlined in the corresponding curriculum guide bySubjects:Types:Also included in: Second Semester Bundle09 - Electrostatics Unit Testby Fully editable, NGSS/modeling pedagogy aligned test! Tests consist of 4 pages total, with two pages worth of multiple choice questions and two pages worth of free response questions. Maxwell's Equations. If it is missing something you'd like to see, please reach out and I will try to add it! Answer key is included.The following concepts are covered in this review:types of dataexperimental designSI/me09 - Electrostatics Writing Assignmentby Fully editable, NGSS/modeling pedagogy aligned short writing assignment! These short writing assignments are usually one page long and include 3-4 short answer prompts that require students to explain and demonstrate their mastery of different learning targets covered in each unit. ISBN 978-981-02-4471-2 Partial Word Bank includes: attraction, battery, Ben Franklin, Coulomb's Constant, Coulomb's Law, conduction, electrostatics, elementary charge, electroscope, friction, glass, induction, insulator .....etc (25 words) in all directionsPage 2This 38 term worksheet will help your students to learn about electricity- atomic structure, electrical quantities, and Ohm's Law. Hoboken, NJ. ISBN 978-0-313-33358-3Huray, Paul G. p. At the time, the nature of electricity and magnetism was not understood, so the underlying principle behind magnetic attraction/repulsion versus the attraction between an amber rod and fur was thought to be the same. Ancient people were aware certain objects could attract or repel each other. Coulomb's law is a physical law stating the force between two charges is proportional to the amount of charge on both charges and inversely proportional to the square of the distance between them. I provide a full page and half page option for students to fill in as the video plays. Dr. Shini Somara is your host. Intermediate Electromagnetic Theory. The law is also known as Coulomb's inverse square law. The scalar form of Coulomb's law is:F = kQ1Q2/r2 or F ∝ Q1Q2/r2wherek = Coulomb's constant (9.0×109 N m2 C−2) F = force between the chargesQ1 and Q2 = amount of charger = distance between the two charges A vector form of the equation is also available, which may be used to indicate both the magnitude and direction of the force between the two charges. World Scientific. Quizzes are used for students to demonstrate proficiency of learning targets outlined in the corresponding curriculum guide bySubjects:Types:Also included in: Second Semester Bundle09 - Electrostatics Quiz 2by Fully editable, NGSS/modeling pedagogy aligned quiz! There is a mix of free-response and multiple-choice questions for most quizzes, which are usually one or two pages long. It may be used to derive Gauss's law. Wiley. ISBN 0470542764.Stewart, Joseph (2001). (2010). There are three requirements which must be met in order to use Coulomb's law: The charges must be stationary with respect to each other.The charges must be non-overlapping.The charges must be either point charges or else otherwise spherically symmetrical in shape. Worksheets are used for students to deploy models developed from inquiry labs and as a way to practice problem-solving en route to maSubjects:Types:Also included in: Second Semester BundleElectrostatics Worksheetsby 3 fully editable, NGSS/modeling pedagogy aligned worksheets! There are a variety of free response questions for most worksheets, which are usually one or two pages long. The force is attractive if the charges attract each other (have opposite signs) or repulsive if the charges have like signs. Worksheets are used for students to deploy models developed from inquiry labs and as a way to practice problem-solving en route toSubjects:Types:09 - Electrostatics WS 2 (Electrostatic Forces)by Fully editable, NGSS/modeling pedagogy aligned worksheet! There are a variety of free response questions for most worksheets, which are usually one or two pages long. Worksheets are used for students to deploy models developed from inquiry labs and as a way to practice problem-solving en route to maSubjects:Types:Also included in: Second Semester Bundle09 - Electrostatics WS 1 (Charge)by Fully editable, NGSS/modeling pedagogy aligned worksheet! There are a variety of free response questions for most worksheets, which are usually one or two pages long. The formula for Coulomb' law is used to express the force through which stationary charged particles attract or repel one another. Scientists in the 18th century suspected the force of the attraction or repulsion diminished based on the distance between two objects. Tests are used for students to demonstrate mastery of learning targets outlined in the corresponding curriculum guideSubjects:Types:Also included in: Second Semester Bundle09 - Electrostatics Unit Reviewby Fully editable, NGSS/modeling pedagogy aligned unit review! Unit reviews are 2 pages long and usually consist of a mix of conceptual short answer questions, multiple-choice questions, and free-response calculation questions. Terms include: coulomb, joule, direct current, alternating current, electron orbit, impedance, repulsion, and other relevant terms.Ideal for a Career and Technical ElecPage 3Chemistry First Semester Reviewby This semester review is EDITABLE and includes the concepts I test my students over first semester. Unit reviews are used for students to assess their current mastery of learnSubjects:Types:Also included in: Second Semester BundlePage 4Crash Course in Physics 26 Electric Fieldsby Crash Course in Physics is a fast moving, informative, entertaining video series that tackles many issues that come up in high school AP physics classes. Students are given the opportunity to open the flood gates of creativity while they utilize the knowledge they have gained during your life science unit on living things & biology. Students are challenged witTypes:showing 73-86 of 86 results Many of the questions are moSubjects:Types:Crash Course in Physics 25 Electric Chargeby Crash Course in Physics is a fast moving, informative, entertaining video series that tackles many issues that come up in high school AP physics classes. Greenwood Press. Coulomb's law was published by French physicist Charles-Augustin de Coulomb in 1785. Electricity and Magnetism: A Historical Perspective. pp. 50. 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