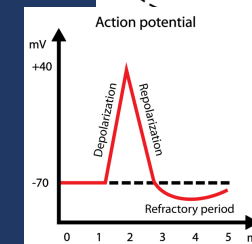
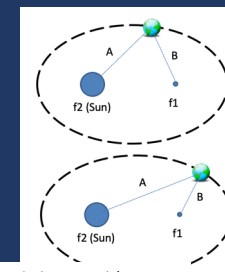
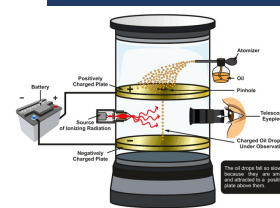
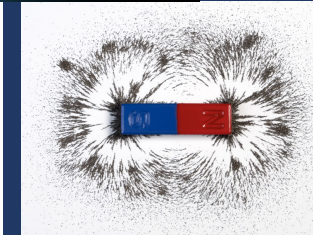
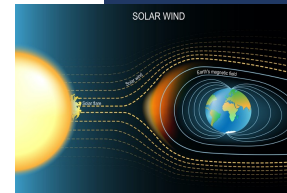
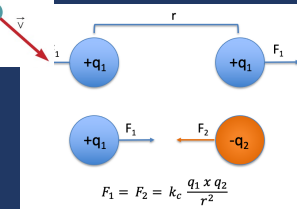
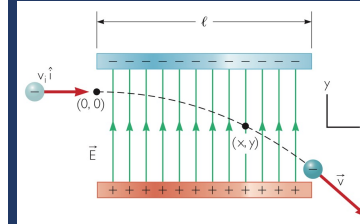


Gravitational and Electric Fields

Senior Physics Unit

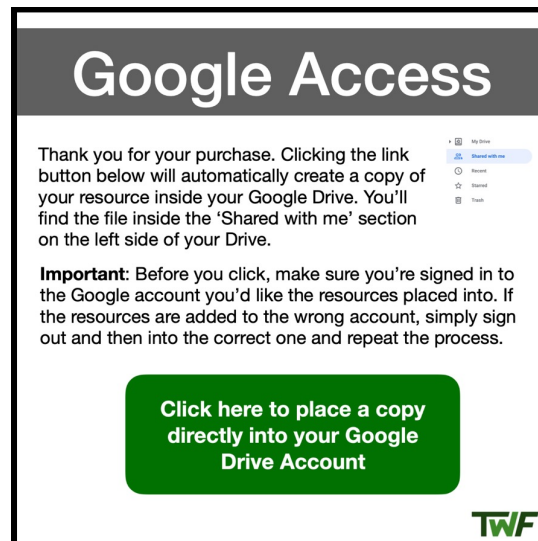
- 4-5 weeks of teaching material
- 8 Lessons in Office and Google Format and Daily Teaching Schedule
- 1 Unit Project
- 3 Activities
- 1 Unit Test with Answer Key
- 3 Quizzes with Answer Key

1. Gravitational Fields, Orbits and Kepler's Laws
2. Electric Charge and the Electrical Structure of Matter
3. Electric Forces and Coulomb's Law
4. Electric Fields
5. Electric Potential
6. Finding The Elementary Charge - Millikan's Experiment
7. Particle Motion in Electric Fields
8. Magnetism and Electromagnetism



Office and Google Versions

- The lessons inside this unit come in both PowerPoint and Google Slides format
- Each lesson also contains many opportunities to check for student understanding
- Your resource is perfect for distance learning and integrates seamlessly with Google Classroom as I've included a link that will automatically create a copy of the resources and put them directly into your Google Drive with one click



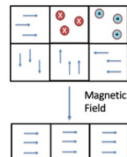
Thank You For Your Interest

Inside the Unit

- 4 - 5 weeks of teaching material
- 8 lessons
- Office and Google versions of EACH lesson
- Teacher and student versions for each lesson
- Many videos and simulations embedded into the slides
- Opportunities for students to check their understanding
- Student notes in Word and Google Doc

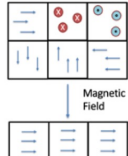
Domains

- _____
- The domains are composed of billions of atoms which are all facing the same direction
- Only certain atoms have domains which can be magnetized due to their electron configuration



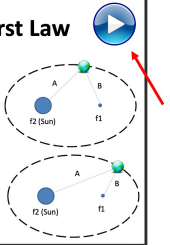
Domains

- **Domains are simply areas in the material that have the same magnetic orientation**
- The domains are composed of billions of atoms which are all facing the same direction
- Only certain atoms have domains which can be magnetized due to their electron configuration



Kepler's First Law

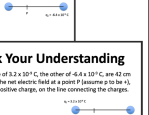
- **The orbit of every planet is an ellipse with the Sun at one of the two foci**
- For any point on the ellipse, the sum of the point's distances to the two foci (A + B) remain the same



Videos embedded directly into the slides. One-click access.

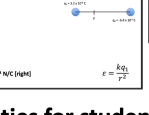
Check Your Understanding

Two charges, one of $3.2 \times 10^{-17} \text{ C}$, the other of $-4.8 \times 10^{-17} \text{ C}$, are 42 cm apart. Calculate the net electric field at a point P 14 cm to the left of the positive charge, on the line connecting the charges.



Check Your Understanding

Two charges, one of $3.2 \times 10^{-17} \text{ C}$, the other of $-4.8 \times 10^{-17} \text{ C}$, are 42 cm apart. Calculate the net electric field at a point P 14 cm to the left of the positive charge, on the line connecting the charges.



Answer: $2.1 \times 10^4 \text{ N/C}$ [right]

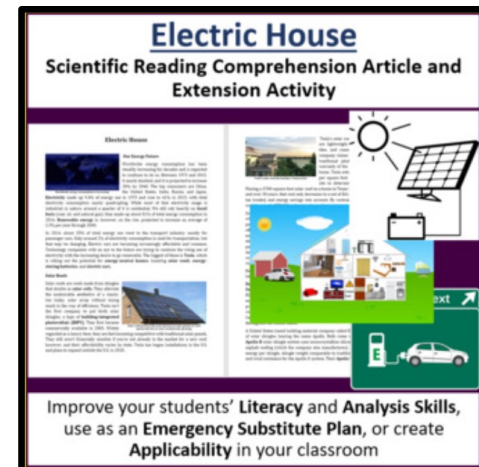
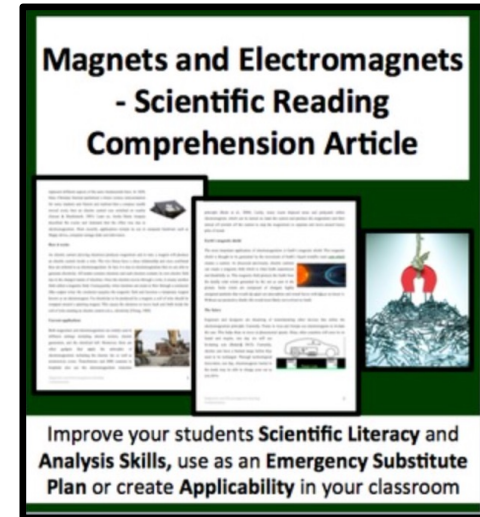
$E = \frac{kq}{r^2}$

Opportunities for students to check their understanding with answer key

Thank You For Your Interest

Inside the Unit

- 1 Unit Test with Answer Key
- 3 Quizzes with Answer Key
- 1 Lab Station Activities
- 1 Unit Project
- 2 Reading Activities



Thank you for your interest

The following lessons are included.

Lesson 1 - [Gravitational Fields, Orbits, and Kepler's Laws](#)

Lesson 2 - [Electric Charge and the Electrical Structure of Matter](#)

Lesson 3 - [Electric Forces and Coulomb's Law](#)

Lesson 4 - [Electric Fields](#)

Lesson 5 - [Electric Potential Difference](#)

Lesson 6 - [Millikan's Experiment - Determining the Elementary Charge](#)

Lesson 7 - [Particle Motion in Electric Fields](#)

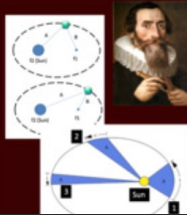
Lesson 8 - [Magnetism and Electromagnetism](#)

8 Lessons Included

Gravitational Fields, Orbits and Kepler's Laws

Lesson Topics Include:

- Gravitational Fields
- Calculating the Gravitational Field strength
- Kepler's Three Laws of Planetary Motion
- The Constant of



Electric Charge and the Electrical Structure of Matter

Lesson Topics Include:

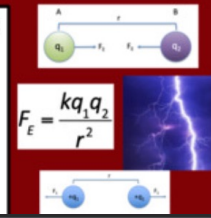
- Atomic Structure Review
- Law of Electric Charges
- Static Electricity and the Electrostatic Series
- Lightning
- Charging Objects – Friction, Contact, and Induction



Electric Force and Coulomb's Law

Lesson Topics Include:

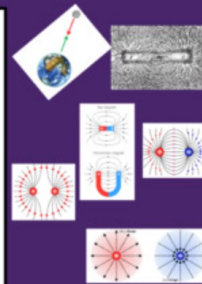
- Electric Force
- Coulombs
- Electric Force vs. Gravitation Force
- Newton's 3rd Law



Electric Fields

Lesson Topics Include:

- Key Terms
- Visualizing Fields of Force Gravitational
- Visualizing Fields of Force Magnetic
- Visualizing Fields of Force Electric
- Rules for Fields
- Electric Fields
- Common Electric Field Diagrams



SENIOR PHYSICS

Electric Potential

Lesson Topics Include:

- Force of Gravity and Gravitational Potential Energy
- Electric Force and Electric Potential Energy
- Electric Potential Difference (Voltage)
- Electric Field
- Application – Lightning
- Application – Nerve Conduction
- Application – Heartbeat
- Application – Batteries

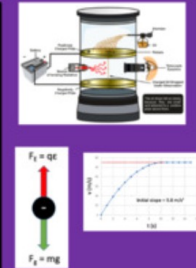


SENIOR PHYSICS

Millikan's Experiment Determining the Elementary Charge

Lesson Topics Include:

- Robert Millikan
- Millikan's Experiment
- Voltage and the Electric Field
- Solving for Charge (q)
- The Charge on the Electron
- The Mass of an Electron
- Calculating the Number of Electrons
- Check Your Understanding

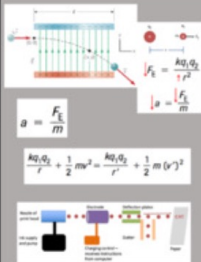


SENIOR PHYSICS

Particle Motion in Electric Fields

Lesson Topics Include:

- Electric Force and the Acceleration of a Particle
- Conservation of Energy
- Uniform Electric Fields and Particle Acceleration
- Work Done in Electric Fields
- Application – Inkjet Printers

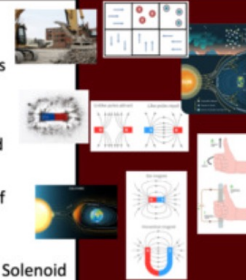


SENIOR PHYSICS

Magnetism and Electromagnetism

Lesson Topics Include:

- Magnetism
- Law of Magnetic Poles
- Magnet Fields
- Iron Filings
- Earth's Magnetic Field
- The Auroras
- The Domain Theory of Magnetism
- Electromagnetism
- Right-Hand Rule for a Solenoid
- Magnetic Force on a Charge



SENIOR PHYSICS