

TSOKOS READING ACTIVITY
Section 5-1

1. Essential Idea: When charges move an electric current is created.
2. Nature Of Science:
 - a. Modelling:
 - i. Electrical theory demonstrates the scientific thought involved in the development of a microscopic model (behaviour of charge carriers) from macroscopic observation.
 - ii. The historical development and refinement of these scientific ideas when the microscopic properties were unknown and unobservable is testament to the deep thinking shown by the scientists of the time.
3. International-Mindedness: Electricity and its benefits have an unparalleled power to transform society
4. Theory Of Knowledge:
 - a. Early scientists identified positive charges as the charge carriers in metals; however, the discovery of the electron led to the introduction of “conventional” current direction.
 - b. Was this a suitable solution to a major shift in thinking?
 - c. What role do paradigm shifts play in the progression of scientific knowledge?
5. Understandings:
 - a. Charge
 - b. Electric field
 - c. Coulomb’s law
 - d. Electric current
 - e. Direct current (dc)
 - f. Potential difference
6. Applications And Skills:
 - a. Identifying two forms of charge and the direction of the forces between them
 - b. Solving problems involving electric fields and Coulomb’s law
 - c. Calculating work done in an electric field in both joules and electronvolts
 - d. Identifying sign and nature of charge carriers in a metal
 - e. Identifying drift speed of charge carriers
 - f. Solving problems using the drift speed equation
 - g. Solving problems involving current, potential difference and charge
7. Guidance: Students will be expected to apply Coulomb’s law for a range of permittivity values

8. Data Booklet Reference:

a. $I = \frac{\Delta q}{\Delta t}$

b. $F = k \frac{q_1 q_2}{r^2}$

c. $k = \frac{1}{4\pi\epsilon_0}$

d. $V = \frac{W}{q}$

e. $E = \frac{F}{q}$

f. $I = nAvq$

9. Utilization:

- Transferring energy from one place to another (see Chemistry option C and Physics topic 11)
- Impact on the environment from electricity generation (see Physics topic 8 and Chemistry option sub-topic C2)
- The comparison between the treatment of electric fields and gravitational fields (see Physics topic 10)

10. Aims:

- Aim 2: electrical theory lies at the heart of much modern science and engineering
- Aim 3: advances in electrical theory have brought immense change to all societies
- Aim 6: experiments could include (but are not limited to): demonstrations showing the effect of an electric field (eg. using semolina); simulations involving the placement of one or more point charges and determining the resultant field
- Aim 7: use of computer simulations would enable students to measure microscopic interactions that are typically very difficult in a school laboratory situation

11. Read section 5-1, pg. 196-205, in your textbook.

12. Choose one of the following activities and apply it to each of the terms listed in #13 below:

- Write a definition for each of the terms listed below.
- Take notes on the section using the Cornell Notetaking system. You must cover all the terms and concepts listed below.
- Develop a quiz of at least 10 questions, **with answers**, covering the most important topics in the required reading. They can be multiple choice, true/false, short answer, fill-in-the blank, essay, or any combination of the previous. Creative or thought-provoking questions are encouraged. Numerous questions are also encouraged, BUT are accepted only in ADDITION TO the 10 serious ones. Secondary skills I would also *like* you to work on include:
 - Use of Microsoft Equations to write equations.
 - Use of the outline functions of MS Word to make sequentially numbered questions and sub-questions.
 - Diagrams or shapes to accompany your quiz questions for clarification. Use of MS Shapes function or Insert Clipart is highly encouraged.

- iv. Using underlining in conjunction with the tab functions to make fill-in-the blank questions.
 - v. Use of textboxes to create an area for name, date and period.
 - vi. Creating a boxed heading using the border function.
 - vii. Creating a logo of your own design (Devil Physics is already taken) with a picture or clipart and creative font.
 - viii. Items a-g above are not required for your grade, but offer an excellent opportunity to improve your computer skills for use in future assignments/projects/activities.
- d. Draw a picture that adequately explains each term listed below to someone who is learning English as a second language.
 - e. Write a question regarding some aspect or characteristic of each of the terms listed below. The questions must start with either the word “How” or “Why”.
 - f. Describe a situation for each term listed below in which you personally experienced the term in action.
 - g. Write a story that accurately incorporates the terms listed below as they are used in your reading. The story may be fictional. Circle or highlight the terms as you use them in your story.
 - h. Write a poem that incorporates all of the terms listed below in a meaningful way. Extra credit for haiku or iambic pentameter.
 - i. For each term listed below, explain whether or not it would work differently on the moon and if so, why.
 - j. Describe a scenario using all of the terms listed below.
 - k. Create a diagram showing how the terms listed below are related to each other.
 - l. Use the attached Frayer Model worksheets to explore the terms assigned to you.
 - m. Choreograph an interpretive dance explaining the terms listed below.
 - n. Create an entire meal using dishes that portray the characteristics of the terms below.
 - o. Use all the terms below in a Rap Battle with a partner. The pair must battle over each term. Champion advances to future rounds.
13. Terms:
- a. Charge
 - b. Electric field
 - c. Coulomb’s law
 - d. Electric current
 - e. Direct current (dc)
 - f. Potential difference
14. This assignment may be typed or neatly printed. Drawings may be freehand, but try to make use of the ‘Shapes’ or ‘Insert Clipart’ functions of MS Word. If you submit this assignment electronically, the filename must be in the following format, “LastnameFirstinitialPerXReadActX-X”. You do not need include a copy of these instructions with the assignment you hand in.

<u>Definition</u>	<u>Characteristics</u>
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<u>Definition</u>	<u>Characteristics</u>
<u>Examples</u>	<u>Non-examples</u>

WORD

<u>Definition</u>	<u>Characteristics</u>
<p><u>WORD</u></p> <hr/>	
<u>Examples</u>	<u>Non-examples</u>

<u>Definition</u>	<u>Characteristics</u>
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