

Online Learning Plan: Week 2

Course:	Grade 12 Physics (SPH 4U)
Teacher:	Mrs. Rath
Dates:	Monday, March 30 th – Friday, April 3 rd

Monday, March 30th – Day 4 Schedule

Lesson Summary:

This lesson will be exploring the concept of Electric Fields including the properties of electric fields and drawing electric field lines. We will start by reading an introduction to some of these new concepts, watching an introduction video on Electric Fields and working on a pHET lab simulation.

Learning Goals:

- ✓ I can describe properties of electric fields and solve problems related to electric fields.
- ✓ I can accurately draw electric field lines to model electric fields for one or more charges.

Lesson Instructions:

Activity	Time
Introduction Video: Week 1 of Online Learning At the beginning of each week, I will be sharing a video to help give you an overview of the expectations for the week. It will also contain any updates regarding our class. Start each week by watching this video.	5 minutes
Section 7.3 Introduction The learning of the new concepts for this lesson will be through textbook reading and a Crash Course video. It is important that you take notes on the key terms from the reading and video below to help you understand concepts. <ol style="list-style-type: none">1. Textbook Reading: page 334 – 3352. Crash Course Video: https://www.youtube.com/watch?v=mdulzEfQXDE&t=266s	30 minutes
pHET Lab Simulation <ol style="list-style-type: none">1. Print the “pHET Lab Student Handout” document that is posted on the homework board.2. Go to the pHET simulation using the following link: https://phet.colorado.edu/en/simulation/charges-and-fields3. Using the simulation to follow the instructions given on the handout and complete the handout. If you do not have a printer, copy the instructions and your answers on to a piece of paper and complete the simulation. <p>You will have some extra time tomorrow to complete this simulation. Then you will submit your work to be assessed.</p>	15 minutes
Wrap Up – Complete your learning log for this lesson and email jrath@ntcs.on.ca with any questions that came up during the lesson.	1 minute

Wednesday, April 1st – Day 2 Schedule

Lesson Summary:

This lesson will be a continuation of the lesson from Monday on Electric Fields. We will start by finishing the pHET simulation on Electric Fields that was started last class. Then we will on three practice problems based on determining electric fields using the new formulas introduced for electric fields.

Learning Goals:

- ✓ I can describe properties of electric fields and solve problems related to electric fields.
- ✓ I can accurately draw electric field lines to model electric fields for one or more charges.

Lesson Instructions:

Activity	Time
Warm-up: Start off the lesson by answering the following warm-up question. 1. What is the definition of an electric field? 2. How is an electric field similar and different from the electric force?	5 minutes
pHET Simulation Continued . . . Complete the pHET Simulation that was started last class. Here is the instructions for the activity: 1. Print the “pHET Lab Student Handout” document that is posted on the homework board. 2. Go to the pHET simulation using the following link: https://phet.colorado.edu/en/simulation/charges-and-fields 3. Using the simulation to follow the instructions given on the handout and complete the handout. If you do not have a printer, copy the instructions and your answers on to a piece of paper and complete the simulation.	20 minutes
Section 7.3 – Determining Electric Fields Tutorial #1 Carefully look through the two sample problems given on page 336 and page 337. Then work through the following questions from the textbook. Show all your work. Pg. 337 #1-3	25 minutes
Assessment – Teacher Assessment Scan your work (as a pdf) on the pHET Lab Handout and email your completed handout scan to jrath@ntcs.on.ca by Wednesday, April 1st by 3pm . If you need extra time to complete, I will accept submission up until Thursday, April 2 nd by 10am.	1 minute
Wrap Up – Complete your learning log for this lesson and email jrath@ntcs.on.ca with any math questions that came up during the lesson.	1 minute

Thursday, April 2nd – Day 3 Schedule

Lesson Summary:

This lesson will be exploring the concept of electric field lines, electric dipoles, uniform electric fields and the earth's electric field.

Learning Goals:

- ✓ I can accurately draw electric field lines to model electric fields for one or more charges.
- ✓ I can describe the concept of an electric dipole and relate it to electric fields.
- ✓ I can explain how to create a uniform electric field using conducting plates.
- ✓ I can discuss Earth's electric field and how it changes.

Lesson Instructions:

Activity	Time
<p>Warm-up: Start off the lesson by answering the following warm-up question.</p> <p>Explain what electric field lines represent. How do you make sure to draw electric field lines properly?</p>	5 minutes
<p>Electric Field Lines</p> <ol style="list-style-type: none">In order to review electric field lines, read through page 338 from the textbook.After your reading, go to the following website and scroll to the bottom to the “Check Your Understanding” Section shown in the screen shot below. Complete those questions to see if you understand electric field lines. <p>Link: https://www.physicsclassroom.com/class/estatics/Lesson-4/Electric-Field-Lines</p> <p style="text-align: center;">Check Your Understanding</p> <p>Use your understanding to answer the following questions. When finished, click the button to view the answers.</p> <p>1. Several electric field line patterns are shown in the diagrams below. Which of these patterns are incorrect? _____ Explain what is wrong with all incorrect diagrams.</p> <div style="text-align: center;"><p>Diagram A Diagram B Diagram C Diagram D Diagram E</p><p style="text-align: center;">See Answer</p></div>	20 minutes
<p>Electric Dipoles & Uniform Electric Fields Reading</p> <p>Read through the following three pages from the textbook to learn more about Electric Dipoles and Uniform Electric Fields.</p> <p>Pages 339 - 341</p>	20 minutes

<p>Electric Dipoles & Uniform Electric Fields Reflection Questions: Answer the following questions in your notebook to make sure that you understood the reading and could answer concept questions related to these topics.</p> <ol style="list-style-type: none"> 1. What is an electric dipole? 2. What happens to the electric field lines when a positive charge and a negative charge are in close proximity to each other? Draw a sketch. 3. Why do the electric fields of two identical charges start to look like the field of a single charge at far distances? 4. How could you make a uniform electric field? <p>Write the answers to these questions neatly in your notebook. If you would like to submit them for feedback, email your questions to jrath@ntcs.on.ca so that I can check them.</p>	15 minutes
<p>Wrap Up – Complete your learning log for this lesson and email jrath@ntcs.on.ca with any questions that came up during the lesson.</p>	1 minute

Friday, April 3rd – Day 4 Schedule

Lesson Summary:

This lesson will be finishing the main topics from Section 7.3 and then working on a mini Research Assignment on electric fields.

Learning Goals:

- ✓ I can describe the Earth’s Electric field and how it changes.
- ✓ I can explain how an electrostatic precipitator works and how it relates to the applications of electric fields.
- ✓ I can research an animal that uses electric fields in nature and effectively communicate my understanding of this topic in a written report.

Lesson Instructions:

Activity	Time
<p>Warm-up: Start off the lesson by answering the following warm-up question.</p> <p style="text-align: center;">What do you know about Earth’s Electric Field?</p>	1 minute
<p>Earth’s Global Electric Circuit Video Watch the following video start off our lesson for today. https://www.youtube.com/watch?v=X7-0YRiln7E</p> <p>If you want to read more about Sprites, Elves & Blue Jets, check out these descriptions. https://www.canada.ca/en/environment-climate-change/services/lightning/learn-more/phenomena-sprites-elves-blue-jets.html</p>	5 minutes
<p>Earth’s Electric Field & Electrostatic Precipitators Reading Read about Earth’s electric field and Electrostatic Precipitators on the following pages: Summarize what you learn from these two pages as point form notes in your notebook. Page 342 – 343</p>	15 minutes

<p>Researching Fish & Electric Fields</p> <p>You will research and write a report on a fish that uses electric fields based on the instructions given below taken from the textbook page 344.</p> <p><u>“Research This” (pg 344) from the Textbook</u></p> <p>Many fish use electric fields to detect or stun their prey or to ward off predators. Some examples are electric eels, electric catfish, elephant fish, Nile knifefish and torpedo fish.</p> <ol style="list-style-type: none"> 1. Research one of these fish on the Internet and determine how it detects or uses electric fields. 2. Type up a brief report (1-2 paragraphs) of your findings that include the answers to the following questions: <ol style="list-style-type: none"> A. What types of behaviours that are related to electric fields are typical for the organism you chose? B. Describe the key ideas that you discovered about your chosen fish and how it uses electric fields. C. Why are fish that stun prey with electric fields typically are freshwater species? D. Many fish are able to detect weak electric fields from prey that live in rivers with large amount of silt and soil suspended in the water. Why would an adaption such as electrical-field detection be beneficial for these fish? 3. Provide a list of your references used to write your report. 4. Email your report to jrath@ntcs.on.ca when completed. 	30 minutes
<p>Assessment – Teacher Assessment</p> <ol style="list-style-type: none"> 1. Email your report to jrath@ntcs.on.ca by Friday, April 3rd at 3pm. If extra time is needed to complete this assignment, the latest you can submit is Saturday, April 4th at 10am. 	1 minute
<p>Wrap Up – Complete your learning log for this lesson and email jrath@ntcs.on.ca with any math questions that came up during the lesson.</p>	1 minute