

INTRODUCTION TO SNAPS LABS

A SNAPS laboratory includes station activities designed to develop students' science skills with hands-on activities and thought-proving exercises. The labs require students to use science, math, literacy, problem-solving and engineering skills so to expand their understanding scientific ideas and apply scientific concepts to the real world.

Science Skills Station

Students explore a concept using science and math skills. The skills may be procedural that a student must physically do. The skills may be mathematical or require scientific thinking and reasoning.

Narrative Station

Students employ literacy skills important to understanding scientific text as well as illustrations, tables and graphs. In many labs, students will explore multimedia sources, such as videos, audio files or animations.

Assessment Station

Students answer multiple choice questions, short answer questions and/or open-ended, thought-provoking questions. The questions progressively get "harder" and require students to employ lower, mid and higher order thinking.

Problem-Solving Station

Students utilize the engineering design process and problem-solving skills so to identify problems, test solutions and/or make improvements to solutions.

Synthesis Station

Students compose a CER report as a lab conclusion so to relate the observations, data and other information gathered in the lab to the objective(s) of the lab.

Synthesis Project

Students complete an activity or project that helps summarize information studied and learned in the lab. This facilitates "bringing it all together" while getting students to think harder and deeper about a concept.

SNAPs LAB STATIONS ACTIVITY

The screenshot shows a PDF viewer displaying a multi-page lab activity titled "MS-PS-2-5 Electric Field Stations Lab". The document is divided into several sections:

- Science Skills Station:** Contains a "Directions" section with instructions for using a compass to draw electric field lines. It includes a "Materials" list (compass, pencil, paper) and an "Activity" section with numbered steps for drawing field lines around a positive charge.
- Narrative Station:** Includes a "Directions" section for drawing field lines around a negative charge. It contains a "Background Information" section about electric field lines and a "Challenge" section with a question about the direction of field lines.
- Assessment Station:** Features a "Directions" section for drawing field lines around two positive charges. It includes a "Background Information" section about electric field lines and a "Challenge" section with a question about the direction of field lines. Below this are several diagrams: "Question #1" (What is an electric field?), "Question #2" (What is electric field label on the diagram where arrows are 'tangent?'), "Question #3" (Compare and contrast the electric field lines that are shown around a positive charge in the electric field with the field around a negative charge), "Question #4" (Draw a picture showing electric field lines around positive and negative charges), "Question #5" (Does an electric field exist around a positive charge? Explain your answer.), "Question #6" (Does an electric field exist around a negative charge? Explain your answer.), "ANSWER QUESTION #1" (A glowing globe is shown that glows in the region around it. What is the glowing globe? Explain your answer.), and "ANSWER QUESTION #2" (Two negatively charged particles are shown. Draw the electric field lines around them).
- Problem Solving Station:** Includes a "Directions" section for drawing field lines around two positive charges. It contains a "Background Information" section about electric field lines and a "Challenge" section with a question about the direction of field lines. Below this is a table for recording data.
- Synthesis Station:** Includes a "Directions" section for drawing field lines around two positive charges. It contains a "Background Information" section about electric field lines and a "Challenge" section with a question about the direction of field lines. Below this is a table for recording data and a diagram of a light bulb.

Features:

- ✓ Connects Science, Math, ELA & Engineering (Problem-Solving) Skills
- ✓ Requires easy-to-get and inexpensive materials
- ✓ **Printable lab** for traditional classrooms included
- ✓ Student Recording Sheets, Teacher Guide and Answer Key included

Printable Lab downloaded as a PDF file. Teacher Guide and Key not shown.

DIGITAL SNAPs LAB STATIONS ACTIVITY

The screenshot displays a digital lab activity titled "MS-PS2-5 Electric Field Digital Lab". The interface is organized into 14 numbered stations, each containing text, diagrams, and tables. The top navigation bar includes options like Home, Insert, Draw, Design, Transitions, Animations, Slide Show, Review, View, Recording, Acrobat, and Tell Me. The bottom status bar shows "Slide 7 of 14" and "English (United States)".

Features:

- ✓ **Digital lab** for distance learning and paper-free classrooms included
- ✓ Fillable slides (pptx file) compatible with both Microsoft PP and Google Slides
- ✓ Assessment station available as self-grading Google Form (via force copy link)

EDITABLE SNAPs LAB STATIONS ACTIVITY

AutoSave OFF Home Insert Draw Design Layout References Mailings Review View Grammarly Acrobat Tell me Comments Editing Share

MS-PS2-5 Electric Field Editable Lab Stations

Name: _____ **Date:** _____

Electric Field Lab Overview

Objectives

- Verify that an invisible electrical field surrounds an electrically charged particle or object.
- Describe the electric field around and between electrically charged particles with electric field lines.
- Explain how the strength of electric fields changes as distance from an electrically charged object increases.

MS Science and Engineering Practices

MS Science Skills Station

Assessment Station

Question Bank Station

Electric Field Pre Lab Assignment

Directions

- Read through the Lab Overview.
- Create a new entry for Electric Force in the table of contents in your lab journal and determine the page of your lab entry. Complete the following steps on the pre-lab page of the entry.
- Define the following terms in your lab journal:
 - Electric force
 - Electric field
 - Electricity
- Write a 4-5 sentence summary about what you will do in this laboratory.

Materials Required

- Plasma globe
- Fluorescent light bulb
- Ruler

Activity

Directions: Follow the steps below. Then answer the questions.

- Watch the following video to learn more about plasma globes.
 - YouTube: "TV Like" <https://www.youtube.com/watch?v=UW1111111111>
- Observe the plasma globe. Touch the glass of the plasma globe with your finger!
- Observe the fluorescent light bulb. Do NOT touch the fluorescent light bulb.
- Bring the light bulb close to the plasma globe. Observe what happens to the bulb. Record your observations on your recording sheet.
- Draw a picture of the light bulb in relation to the plasma globe. Observe what happens to the bulb. Record your observations on your recording sheet.
- Measure the distance between the plasma globe and the light bulb using the ruler. Make five measurements at different locations around the globe. Record your measurements in the table on your recording sheet.
- Answer the summary questions.

Questions

- According to the video, what produces the "streamers" of light that extend from the electrode inside the plasma ball?
- On your observation support or when the idea that an electric field extends invisibly into space around a charged object.
- What happens to the brightness of the lightbulb as you move the lightbulb away from the plasma globe? What does this tell you about the strength of the electric field?
- Calculate the average maximum distance which the light bulb would glow.
- Draw a picture of the plasma globe and its electric field. Label the portion of the electric field that you can visualize and the electric field you cannot visualize.

Remote Station

Objectives

- Locate the relationship between electric force, electric field, and electricity.
- Illustrate the relationship of the electric field around a charged particle and between charged particles.

Activity 1B

Directions: Read the passage. Then answer the questions.

ELECTRIC FORCE, ELECTRIC FIELD & ELECTRICITY

Directions: An invisible force produced by an electrically charged particle or object. An electrically charged particle for object can attract or repel other electrically charged particles (or objects). This attraction and repulsion is an electric force.

The area of the electric force around a charged particle or object is called the **electric field**. Other charged particles or objects are affected by a particle's (or object's) electric field if it is electric force.

A particle or object with more electric charge produces a stronger and larger electric field. The strength of electric force, and thus electric field, decreases as you move away from the charged particle or object.

Energy is transferred within an electric field. **Energy** is the ability to do work. It can mean things or provide power to make things happen. The energy in an electric field is labeled electrical energy. Electrical energy is also called **electricity**.

Questions

- What is an electric field?
- What is the relationship between electric force, electric field and electricity?
- What happens to the strength of a charged object's electric field as you move away from that object?

Activity 1B

Directions: Read the passage. Then answer the questions.


ELECTRIC FIELD LINES

Electric field lines are lines that help illustrate the electric field of a charged particle. We draw electric field lines around and between positive and negative charges to show the electric field. They show us where and how an electric field extends from and between charged particles or objects.

Electric field lines are drawn with arrows because electric field has direction. Electric field has direction because electric force has direction. Electric force is directed away from a positive charge and toward a negative charge.

When drawing electric field lines for an individual charge, the lines point away from the center of a positive charge or toward the center of a negative charge. When drawing electric field lines between a positive and negative charge, draw electric field lines from the positive charge to the negative charge. Additionally, electric field lines never cross.

To the left is a positively charged particle. Electric field extends outward and away from the positive charge. The arrows on field lines the direction of the electric field (and electric force). The field lines do not cross each other.



Questions

- What is an electric field line?
- What do the arrows represent in the diagram of the positive charge's electric field?
- Draw a picture of the electric field around a negative charge.
- Using the information in the reading, draw a picture of the electric field that would exist between a positive and negative charge.
- BONUS QUESTION: What would electric field lines look like between two positive charges? Remember, they charge repel each other.

Assessment Station

Objectives

Recall concepts, terms and ideas relating to electric force, electric field and electricity.

Skills Utilized

- Define key terms
- Observe
- Compare and contrast
- Illustrate

Assessment Directions


- Answer the following questions. Write down your answers on the recording sheet.
- There are two bonus questions. If you allow, try to answer these questions.

Question #1

What is an **electric field**?

Question #2

What is **electricity**? Label on the diagram where electricity is "borned".



Question #3

What is the relationship between electric force and electric field?

Question #4


Does an electrically charged particle's electric field extend indefinitely into space? Explain what happens to a charged particle's electric field as you move away from that particle.

Question #5

Compare and contrast the electric field lines that are drawn around a positive charge to the electric field lines that are drawn around a negative charge.

Question #6

Draw a picture show how electric field lines extend between a positive and negative charge.




Question #7

A plasma globe is a device that allows you to "visualize" the electric field around an electrically charged object (an electrode). What do you think would happen to the plasma globe's electric field if you increase the power supply to the electrode?

Question #8

Two negatively charged particles are placed near each other. Draw the electric field lines that would surround each charged particle. Draw electric field lines between the particles as well.



Problem Solving Station

Objective

Apply scientific ideas and concepts to evaluate engineering solutions that manipulate electric fields.

Background Information

Scientists and engineers have developed ways to manipulate electric fields to solve everyday problems. For example, engineers have designed filters - known as **electrostatic precipitators** - to clean air with electrostatic precipitators, or passed through a negatively charged filter. The filter becomes electrically charged (positively, negatively, charged) when hooked up to a power supply. Because the filter is charged, it attracts an electric field. When air passes through the filter, particles in the air become negatively charged due to its electric field. The particles are then trapped in a filter or screen that is positively charged.

Watch a 3 minute video in which a scientist creates a homemade electrostatic precipitator. Then follow the directions and answer the questions.

Video Link: [YouTube TV Link: https://www.youtube.com/watch?v=UW1111111111](https://www.youtube.com/watch?v=UW1111111111)

Original YouTube Video: <https://www.youtube.com/watch?v=UW1111111111>

Activity:

- Explain how the scientist exploits electric force and its attraction.
- Evaluate the practicality of the electrostatic precipitator.
- Evaluate the benefits and limitations of this electrostatic precipitator.
- How could the scientist improve the homemade electrostatic precipitator?
- Traditional air filters mechanically separate dust and other particles from the air. What questions would you want to ask the investigator in order to compare a traditional air filter to an electrostatic precipitator?

Assessing:

Reasoning is the logical explanation that connects the claim and the evidence. It establishes how and why the evidence supports the claim. The reasoning should include scientific principles or ideas that are important to the claim and evidence.

Claim: **Electric field lines extend between charged particles or objects extending from one to the other even though the particles or objects are not in contact.**

Evidence:

- On the template, cite evidence from the science skills, narrative and/or problem solving station that supports the claim above. You can under point the above.
- On the template, cite logical evidence and scientific principles that explain how and why the evidence supports the claim above. You can under point the above.
- Write a one paragraph CER report. Write in complete sentences. The CER report is the conclusion of the lab. It should include the claim, **logic**, and reasoning.

Activity 1B

Directions: Read the passage. Then answer the questions.

Electric Field Post Lab Reflection

Directions

- Write a 4-5 sentence summary about what you learned in this lab.
- Write a 4-5 sentence post-lab self-assessment. Answer at least two of the questions below in your reflection.
 - How well did you participate today?
 - What do you know now that you didn't know before?
 - What questions do you have about things you don't understand?
 - What do you need to do better understand what you studied in lab today?
 - How did you do well today? What are you doing better?
 - Rate your performance today on a scale from 1 to 5.
 - Rate your understanding of what you learned on a scale from 1 to 5.
 - Do you notice any patterns when you learn better? Do you notice any patterns when you struggle with topics?
 - Could you use what you learned today to help you with something else?

MS-PS2-5 CER: Instead of writing formally, you can decide to do open bullet points or make a diagram to complete the last part of this post-lab reflection.



Features:

- ✓ **100% Editable** stations downloaded as a docx file
- ✓ Necessary diagrams, tables and graphs included
- ✓ Illustrative graphics and clipart NOT included

TEACHER GUIDE

PRINTABLE LAB SETUP AND PREPARATION

Each “traditional PDF file” includes directions and questions for each station. Print one copy of these materials for each station. Place copies of the letter-sized directions questions in sheet protectors or use self-laminating sheets to protect the documents. Position the materials at each station with the general supplies of that station.

TEACHING DURATION

Most SNAPs lab activities require **two class periods** or **90 to 120 minutes**. However, the time needed to require one lab can vary with grade level, student autonomy and difficulty of content. Allowing two class periods allows ample time – regardless of these factors – for students to finish the four in-class stations.

Suggestions for shortening the lab:

1. Assign the Narrative Station as pre-lab work. By doing this, you ensure your students have first-order knowledge of the concepts and ideas explored in the lab. If you are using this lab to introduce new concepts, using the narrative station as a pre-lab will increase student success at the other lab stations.
2. Assign the Assessment Station as post-lab work. By doing this, you ensure your students are evaluated on the concepts and ideas in this lab after completing ALL stations.

DOCUMENT DISTRIBUTION

1. Distribute student copies of the lab overview and pre-lab assignment the night before the laboratory. The pre-lab is a ½ page assignment. Staple the pre-lab to the lab overview before distributing these documents.
2. Distribute student copies of the recording sheet at the beginning of the laboratory.
3. Distribute copies of the post-lab, synthesis station and synthesis project at the end of the lab. The post-lab is a ½ page assignment. Staple the post-lab to the synthesis station and project before distributing these documents.
4. Assign a due date for the synthesis project. The post-lab reflection is a formative assessment and should not require a formal “due date.”

TEACHER GUIDE

DIGITAL VERSION OF SNAPs LAB ACTIVITIES

This download includes a digital lab/fillable slides that allow students to complete the laboratory on a computer or tablet. This file was created to work with a variety of online platforms and secure file-sharing platforms. The digital lab has been modified so students record answers directly following questions rather than in a student packet.

Important Notes

- The answer key is removed from the digital lab.
- The answer key is included in the traditional PDF file.
- The digital laboratory CANNOT be edited; only fillable areas can be manipulated.
- When applicable, videos are included to help students create digital graphs.

The digital laboratory can be used a variety of ways:

- Distribute paper-free laboratories as part of regular instruction
- Use to assign at-home work as part of a remote or distance learning plan
- Send work to acutely or chronically absent students
- Support tutoring or at-home instruction for homebound students

How can you distribute and share the digital laboratory with your students?

- The laboratory CAN be distributed directly to students through email.
- The laboratory CAN be distributed or assigned with Google Classrooms, Microsoft Teams, Blackboard, Canvas, Schoology and other like platforms that are password-protected or require a code to enroll.
- The laboratory CAN be distributed with secure file sharing platforms like Google Drive, OneDrive and DropBox that are password-protected or shared only with students with their email or student account.
- Printable SNAPs labs can be shared or distributed just like the digital labs.

TEACHER GUIDE

To use the digital laboratory with Microsoft Teams:

1. Upload an assignment to your One Drive.
2. Create a new assignment. Add the file as a "resource."
3. Assign to the appropriate class or students.

To use the digital laboratory with Google Classrooms:

1. Upload the assignment to your Google Drive. Add the file using the upload tool in a web browser or drag and drop the file into your Drive. Watch a demonstration of the process: <https://safesha.re/3h6n>
2. Create a new assignment and add the digital lab to it. Make a copy for each student.
3. Assign to the appropriate class or students.

GOOGLE FORM ASSESSMENT

To better support digital classrooms, I created a Google Form version of the assessment station. There are two ways the Google Form assessment station can be used:

1. If using the digital lab, you can remove slides for the assessment station and use the Google Form assessment station instead. This makes the assessment station "more formal" since it is separate from the rest of the lab station activities.
2. If looking for a way to shorten the in-class lab, remove the assessment station – including the assessment station student recording pages – and assign the Google Form assessment station as an at-home assessment. Alternatively, you can use the Google Form assessment station as an in-class quiz if students have their own digital personal learning device.

TEACHER GUIDE

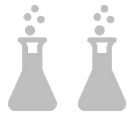
DISTANCE – INDEPENDENT LEARNING COMPATIBILITY

SNAPs lab activities are rated for their ease with distance – independent learning. Some lab activities are very hands-on and require a lot of materials whereas other lab activities are more thought-provoking and require minimal – or no – additional materials.

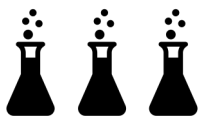
This lab has been rated the following:



The lab requires no modification to the required materials for distance – independent learning. All materials important to the lab are included in the digital lab. A calculator, colored pencils or a ruler may be needed.



The lab requires some modification to the required materials for distance – independent learning. Students can use household items, if needed, to complete hands-on activities.



The lab requires significant modification. Teacher should demonstrate or perform activities in a live session or prerecorded video and/or provide materials needed for the science skills or problem-solving station.

Suggestions

- This lab includes a hands-on activity at the science skills station that requires students to make observations and measurements. The activity stations should be performed by the teacher in a pre-recorded video or in a live teaching session.

TEACHER GUIDE

EDITABLE COMPONENTS OF SNAPs LAB ACTIVITIES

This download includes an editable word document of all lab components. The stations are available as fully editable DOCX files., Diagrams, illustrations, tables and/or graphs that are essential to lab activities are included in the editable document. Illustrative clipart is NOT included in the editable document.

Some labs have a directed synthesis project. When applicable, the directed synthesis project is available as an editable word document as well. Editable documents and rubrics important to standard synthesis projects are included in the [SNAPs Lab Stations Setup Guide](#).

There are three important reasons for creating editable versions of these stations:

1. Most lab station activities utilize five or more stations with relatively simple and short activities. However, my SNAPs lab activities include four comprehensive stations. The science skills station and problem-solving station could be used independently as single class period laboratories. To better allow for this option, I have made these stations editable. Teachers can use the narrative station as "pre-lab" work and the assessment station as "post-lab" work.
2. The science skills and problem-solving stations are the only stations that will require materials other than computers or calculators. By providing these stations in an editable format, you can manipulate the materials required and/or the directions so the activities work for your classroom.
3. By making the science and problem-solving station editable, you can alter the scope of the activities to suit your students' needs. You can also edit the questions so to evaluate your students in a manner that is best for you and your classroom.

MAKE SURE YOU DOWNLOAD the FREE [SNAPs Lab Stations Setup Guide](#) for SIGNAGE, BEST PRACTICES & EDITABLE DOCUMENTS (<https://www.teacherspayteachers.com/Product/SNAPs-Lab-Stations-Guide-2953726>)