

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 image displays a grid of 24 lab station pages for the 'MS-ESS1-1 Seasons and Earth's Tilt Stations Lab.pdf'. The pages are organized into a 4x6 grid. Each page contains a station title, objectives, materials, and instructions. The stations include:

- Axial Tilt Station:** Focuses on Earth's axial tilt and its effect on seasons. Includes a diagram of Earth's tilt and a table of data.
- Seasonal Station:** Explains the four seasons and their characteristics. Includes a diagram of Earth's tilt and a table of data.
- Narrative Station:** Asks students to write a story about the seasons. Includes a diagram of Earth's tilt and a table of data.
- Assessment Station:** Contains multiple-choice and short-answer questions about seasons. Includes a diagram of Earth's tilt and a table of data.
- Problem Solving Station:** Presents a problem about the seasons and asks students to solve it. Includes a diagram of Earth's tilt and a table of data.

The PDF viewer interface shows the file name 'file:///Users/stephanieelkowitz/Desktop/MS-ESS1-1 Seasons and Earth's Tilt Stations Lab.pdf', page number '1 of 21', and zoom level '20%'.

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 interface titled "MS-ESS1-1 Seasons and Earth's Tilt Digital Lab — Saved to my Mac". The interface features a top navigation bar with options like Home, Insert, Draw, Design, Transitions, Animations, Slide Show, Review, View, Recording, Acrobat, and Tell me. Below this is a grid of 18 station cards, each numbered 1 through 18. Each card contains a mix of text, diagrams, tables, and interactive elements like checkboxes and input fields. Station 10 is highlighted with a red border. The bottom of the interface shows a status bar with "Slide 18 of 18", "English (United States)", "Accessibility: Investigate", and a zoom level of "60%".

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 MS-ESS-1 Seasons and Earth's Tilt Editable Lab Stations

Home Insert Draw Design Layout References Mailings Review View Grammarly Acrobat Tell me

Comments Share

Science Skills Station

Objectives:

1. Observe how the solar elevation of the Sun changes for a location over the year.
2. Determine the relationship between solar elevation and temperature.
3. Explain how direct and indirect sunlight to an area impacts the area's temperature.

Overview:

The amount of the Sun's rays that change throughout the year. This occurs due to Earth's tilt. As Earth revolves around the Sun, the way Earth's tilt changes the Sun's rays. This impacts the amount of solar radiation that Earth receives. The angle of the Sun's rays is called solar elevation. It is the angle between the horizon and the center of Earth's disk. The maximum solar elevation for a location on Earth is the angle. The lowest solar elevation for any location is Earth's solar angle.

Activity:

1. Mark the month during which summer, fall, winter and spring begin. Mark the start of each season on the graph and write a few sentences.

2. How does the solar elevation of the Sun change throughout the year?
3. How does the average monthly temperature change throughout the year?
4. Compare how solar elevation and temperature change over the year. Summarize the trends. How do they change from season to season? Is there a relationship between solar elevation and temperature?
5. Why would measuring solar elevation and temperature at another location be important? Describe a method to determine solar elevation and temperature at another location. How would you compare the results to the ones you collected?
6. Compare the solar elevation and temperature in March and September. What would account for any seasonal temperature differences?
7. Does the amount of solar radiation change?
 - a. A location north of Denver (Denver is the North Pole)?

Narrative Station

Objectives:

1. Observe how the tilt of the Sun impacts the angle of sunlight that hits Earth's surface.
2. Explain how the position of the Earth changes as it revolves around the Sun.

Overview: Read the passage of Earth's tilt. Answer the questions.

SNAPS 1.1

The Earth revolves around the Sun in a circle. They have the Earth tilted off-center and the Sun with its North and South poles being straight up and down. Instead, it travels with its axis always tilted 23.5° to the plane directly.

The Earth is responsible for how the sunlight hits Earth's surface. This is important because the angle at which sunlight hits Earth affects how the Sun warms the land. Sunlight that hits Earth's surface straight on is said to hit Earth **directly**. Sunlight that hits Earth's surface across Earth's surface because the light has to come across your area. Sunlight that hits Earth's surface at an angle is said to hit Earth **indirectly**. Sunlight that hits Earth's surface does not warm Earth as well because the light has to travel a longer way. The greater the angle between the light and Earth's surface, the more the rays are spread and the less they warm Earth.

Sunlight hits Earth differently at different latitudes:

1. Sunlight warms the Earth directly because the "angle of direct" (23.5 degrees) directly from the Sun. Regions closer to the equator are warmer.
2. Sunlight that hits Earth's surface indirectly at latitudes above the Tropic of Cancer (30 degrees) and below the Tropic of Capricorn (30 degrees) is the most direct sunlight that Earth receives.
3. Regions between 23.5 degrees and 66.5 degrees of the equator are the warmest. When the Sun is low, these regions receive more direct sunlight and are the warmest.
4. Regions near the North and South Poles receive the least direct sunlight and are the coldest.

Assessment Station

Objectives:

1. Apply concepts, terms and ideas relating to the seasons and Earth's tilt as it travels around the Sun.

Skills Identified:

- Critical thinking
- Diagrams
- Compare and contrast a concept
- Compare and contrast
- Make predictions

Assessment Questions:

1. Answer the following questions. Write clear and accurate answers on the provided sheet.
2. There are two bonus questions. If time allows, try to answer these questions.

Question #1

Label the two defining characteristics of Earth's revolution on the diagram. Indirect sunlight on the diagram.

Question #2

What is the difference between direct and indirect sunlight? How does direct and indirect sunlight warm Earth differently?

Question #3

How does solar elevation impact the temperature of a location? Explain in terms of direct and indirect sunlight.

Question #4

Why would measuring solar elevation and temperature at another location be important? Describe a method to determine solar elevation and temperature at another location. How would you compare the results to the ones you collected?

BONUS Question #5

The Northern Hemisphere is tilted further towards the Sun in the July. But the warmest days in the Northern Hemisphere are usually in July. Why? What is the main reason of the year on the first day of summer?

BONUS Question #6

What factors, other than the angle at which the Sun hits Earth's surface, would impact the temperature of a region?

Problem-Solving Station

Objectives:

1. Construct a model that represents the revolution of Earth around the Sun and the Earth's rotation on the Sun at the spring equinox, summer solstice, fall equinox and winter solstice.

Overview:

The Earth revolves around the Sun with its axis on a tilt. It is always tilted in the same direction. This causes the angles of Earth's tilted axis to change as it orbits around the Sun. The Earth's axis always points towards the North Star.

Directions: At this station, you will design and build a three-dimensional model that depicts Earth's relative position to the Sun at the spring equinox, summer solstice, fall equinox and winter solstice. Your model should address the following:

- The Earth's rotation on its axis
- The Earth's axis and how it is tilted
- The Earth's position in its orbit around the Sun
- The Earth's North and South Poles and how they are positioned on the structure of Earth.

Use your answer sheet to help you prepare. Draw an illustration of your model on the answer sheet. Identify the variables you used. Answer the summary questions.

Summary Questions:

1. Does this model help you better appreciate how the Earth revolves around the Sun?
2. According to the data below, your model must be larger! Prepare your model!

Year	Earth
2000-2001	4,500 miles
2002-2003	4,500 miles
2004-2005	4,500 miles
2006-2007	4,500 miles

3. How could you improve your model? What would you add or take away?

Lab Station

Objectives:

1. Compare a 2D satellite image with evidence and reasoning to summarize how the observations, data and information collected in the observation support a claim.

Background Information:

Students will compare a 2D satellite image with evidence and reasoning to summarize how the observations, data and information collected in the observation support a claim.

Directions: At this station, you will design and build a three-dimensional model that depicts Earth's relative position to the Sun at the spring equinox, summer solstice, fall equinox and winter solstice. Your model should address the following:

- The Earth's rotation on its axis
- The Earth's axis and how it is tilted
- The Earth's position in its orbit around the Sun
- The Earth's North and South Poles and how they are positioned on the structure of Earth.

Use your answer sheet to help you prepare. Draw an illustration of your model on the answer sheet. Identify the variables you used. Answer the summary questions.

Summary Questions:

1. Does this model help you better appreciate how the Earth revolves around the Sun?
2. According to the data below, your model must be larger! Prepare your model!

Assessment Station

Objectives:

1. Apply concepts, terms and ideas relating to the seasons and Earth's tilt as it travels around the Sun.

Skills Identified:

- Critical thinking
- Diagrams
- Compare and contrast a concept
- Compare and contrast
- Make predictions

Assessment Questions:

1. Answer the following questions. Write clear and accurate answers on the provided sheet.
2. There are two bonus questions. If time allows, try to answer these questions.

Question #1

Label the two defining characteristics of Earth's revolution on the diagram. Indirect sunlight on the diagram.

Question #2

What is the difference between direct and indirect sunlight? How does direct and indirect sunlight warm Earth differently?

Question #3

How does solar elevation impact the temperature of a location? Explain in terms of direct and indirect sunlight.

Question #4

Why would measuring solar elevation and temperature at another location be important? Describe a method to determine solar elevation and temperature at another location. How would you compare the results to the ones you collected?

BONUS Question #5

The Northern Hemisphere is tilted further towards the Sun in the July. But the warmest days in the Northern Hemisphere are usually in July. Why? What is the main reason of the year on the first day of summer?

BONUS Question #6

What factors, other than the angle at which the Sun hits Earth's surface, would impact the temperature of a region?

Page 13 of 13 2647 words English (United States) Accessibility: Investigate

Focus 35%

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

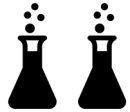
DISTANCE – INDEPENDENT LEARNING COMPATIBILITY

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

- Students are instructed to build a physical model at the problem-solving station. The model should illustrate the position of the Earth relative to the sun on the first day of spring, summer, fall and winter. If using this lab in a purely digital – distance learning setting, students can build a physical model using materials available in their homes or they can create illustrations of the position of the Earth relative to the sun or by digitally drawings in the slides.

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>)