



Science Grade 08 Unit 01 Exemplar Lesson 01: Science Safety and Creating the Science Notebook

This lesson is one approach to teaching the State Standards associated with this unit. Districts are encouraged to customize this lesson by supplementing with district-approved resources, materials, and activities to best meet the needs of learners. The duration for this lesson is only a recommendation, and districts may modify the time frame to meet students' needs. To better understand how your district may be implementing CSCOPE lessons, please contact your child's teacher. (For your convenience, please find linked the TEA Commissioner's List of [State Board of Education Approved Instructional Resources](#) and [Midcycle State Adopted Instructional Materials](#).)

Lesson Synopsis

This lesson addresses science safety and safety equipment in the classroom as well as setting up the science notebook. Students need to know how to operate emergency safety equipment and how to use preventative equipment, as well as conducting investigations safely. Students will look at safety first then apply what they have learned to classroom rules. Other classroom organizational management tools and activities can also be introduced at this time.

TEKS

The Texas Essential Knowledge and Skills (TEKS) listed below are the standards adopted by the State Board of Education, which are required by Texas law. Any standard that has a strike-through (e.g. ~~sample phrase~~) indicates that portion of the standard is taught in a previous or subsequent unit. The TEKS are available on the Texas Education Agency website at <http://www.tea.state.tx.us/index2.aspx?id=6148>.

TEKS alignment coming soon.

Scientific Process TEKS

8.1 *Scientific investigation and reasoning. The student, for at least 40% of instructional time, conducts laboratory and field investigations following safety procedures and environmentally appropriate and ethical practices. The student is expected to:*

8.1A Demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards.

8.4 *Scientific investigation and reasoning. The student knows how to use a variety of tools and safety equipment to conduct science inquiry. The student is expected to:*

8.4A Use appropriate tools to collect, record, and analyze information, including lab journals/notebooks, ~~beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectrometers, timing devices,~~ and other equipment as needed to teach the curriculum.

8.4B Use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.

GETTING READY FOR INSTRUCTION

Performance Indicators

Grade 08 Science Unit 01 PI 01

Within the science notebook, demonstrate knowledge of how to operate emergency safety equipment, such as a fire extinguisher, fire blanket, and face/eyewash, by explaining in writing how to use the equipment.

Additionally, demonstrate knowledge of safe practices, including wearing safety goggles, washing hands and using materials appropriately, as well as use of other preventative equipment such as, aprons, gloves and chemical splash goggles by explaining, in writing, the class safety rules for investigations.

Standard(s): 8.1A , 8.4A , 8.4B

ELPS ELPS.c.3H , ELPS.c.5B , ELPS.c.5G

Key Understandings

- Science investigations conducted in a safe manner increase the quality of the investigation, decrease risk to the investigator, and lessen the negative impact on the environment.
 - Why is it important to conduct safety investigations in a safe manner?
- It is important to know how to use safety equipment in case of an accident during science investigations.
 - Why is it important to know how to operate safety equipment?

Vocabulary of Instruction

- procedures
- preventative safety equipment
- emergency safety equipment


Materials

- colored pencils (per student)
- glue or tape (glue stick or liquid, transparent, 1 per group)
- index cards (3"X5", 1 per group)
- science notebooks (to be used throughout the year, 1 per student)
- scissors (1 pair per student)
- STAAR Grade 8 Reference Materials (see Advance Preparation, 1 per student)

Attachments

All attachments associated with this lesson are referenced in the body of the lesson. Due to considerations for grading or student assessment, attachments that are connected with Performance Indicators or serve as answer keys are available in the district site and are not accessible on the public website.

 [Handout: Give One, Get One \(1 per student\)](#)

 [Handout: Lab Classroom Scavenger Hunt \(1 per student\)](#)

 [Handout: Using Emergency Safety Equipment \(1 per student\)](#)

 [Teacher Resource: Evaluate Instructions PI \(1 for projection\)](#)

Resources

None Identified

Advance Preparation

1. Review the Teacher Resource: **Creating the Science Notebook: A Tool for Evaluating Student Work**,

- located in the Instructional Resources section, and decide which pages will need to be copied for your classes.
- Establish your classroom safety rules, and locate or create a safety contract for students to sign. A sample safety contract can be found in Appendix C of the Texas Safety Standards. Be sure to check with campus and/or district administration to check for locally adopted safety contracts. Print one copy for each student.
 - Download and print a STAAR Grade 8 Science Reference Materials chart for each student to include in their science notebooks. STAAR Grade 8 Science Reference Materials: <http://www.tea.state.tx.us/student.assessment/staar/science/> (Click on [Grade 8 Science Reference Materials.](#)).
 - Prepare attachment(s) as necessary.

Background Information

Safety

Students have been taught safety rules and safe use of grade appropriate equipment in every grade since Kindergarten. While it is a good idea to introduce and reinforce the importance of safety at the beginning of the course, safety is a concept that should be taught and reinforced every time the students work in the laboratory or field setting.

The safety rules, contract, and knowledge of emergency and preventative equipment are essential to all middle school grades. The scavenger hunt is repeated in the Grade 8 lesson because generally students are in different classrooms in each grade, and these rooms may be set up differently.

Notebooking

The science notebook plays a major role in documenting a scientist's thoughts, observations, and data collected during scientific research and investigations and is a recommended tool for use in the classroom. The design and format of science notebooks may vary considerably. Consider the type of format you would like to use and the minimum requirements for your students' science notebooks. Some educators suggest that a science notebook must have a defined structure; however, it is noteworthy to mention that research notebooks are not structured in this manner. More typically, a scientist's notebook is written as a diary, where all the information about the work is recorded as it is done. Throughout this course, the science notebook is viewed from this perspective. When a formal laboratory report is required, a recommended structure is provided specific to the type of investigation being conducted.

There are many websites with suggestions as to the different ways of setting up science notebooks and types of activities that might be included. Some things to keep in mind include: 1.) how often you plan to collect the science notebook for grading, 2.) how you will encourage the students to take ownership and responsibility for their science notebook, and 3.) how students will use their science notebook to document their science class experience. As the classroom teacher, you might consider how you want your students to document laboratory investigations and how you want them to organize and structure information from their daily lessons. Suggestions are provided throughout this course.

This lesson focuses on setting up the science notebook and serves as an introduction to safety in the laboratory.

STAAR Note:

These skills will not be listed under a separate reporting category. Instead, this and other process skills will be incorporated into at least 40% of the test questions from reporting categories 1–5 and will be identified along with content standards.

INSTRUCTIONAL PROCEDURES

Instructional Procedures ENGAGE – Give One, Get One	Notes for Teacher NOTE: 1 Day = 50 minutes Suggested Day 1
<ol style="list-style-type: none"> Distribute the Handout: Give One, Get One to each student. Instruct students to fill in the 'My Answers' side with as many items as they can remember about safety rules, procedures, or instructions on how to use or operate safety equipment. Allow two or three minutes for students to complete this portion of the handout. 	Attachments: <ul style="list-style-type: none"> Handout: Give One, Get One (1 per student)


3. After the allotted time, instruct students to find a partner. Students will review the items on each list.
4. Students will select an answer on their sheet to “give” to their partner. Each student will write the answer they “get” on his or her list along with the name of their partner. Students should not give a duplicate answer that is already on their partner’s paper.
5. Instruct each student to find another partner and repeat the process. You may wish to have shoulder partners do this first and then have students work with a partner across their table next. The object is to get as much information about safety rules, procedures, and instructions on how to use or operate safety equipment as possible by sharing answers with other students.
6. Facilitate a class discussion in which students share their findings with the class. In order to keep the discussion moving, ask students not to repeat those items that have already been shared. You may wish to direct the discussion by asking students to share any items from categories you have selected prior to class.

EXPLORE/EXPLAIN – Safety Scavenger Hunt	Suggested Day 1 (continued)
--	------------------------------------


1. Divide the class into groups of three students.
2. Distribute a copy of the Handout: **Lab Classroom Scavenger Hunt** to each student.
3. Inform students that they have 10 minutes to silently walk around the room or science lab and fill in the handout with the safety equipment in the room. You may wish to point out locations of any safety equipment located outside of the science lab, in the hallway, or in storage areas.
4. Instruct students to return to their seats. Ask students to raise their hands in response to the following questions:
 - **Who found five safety items on their hunt?**
 - **Who found more than five safety items on their hunt?**
5. Facilitate a discussion in which students discuss the use and location of preventative safety equipment, including chemical splash goggles, aprons, gloves, and emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher. Students will have some prior knowledge about these items so conducting a discussion will help to point out misconceptions and gaps in student understanding.
6. Select a student to describe one of the pieces of safety equipment. They should point out the location and purpose of the equipment and why it is important. Carefully add to or correct any misconceptions acknowledging prior knowledge and effort given.
7. Students should label the equipment demonstrated on their Lab Classroom Scavenger Hunt as either *Emergency* or *Preventative*.
8. Continue student descriptions and **ensure all safety issues are addressed including:** fire blanket and eye wash station locations, emergency exits, and the need to wear chemical splash

Suggested Day 1 (continued)

- Attachments:**
- Handout: **Lab Classroom Scavenger Hunt** (1 per student)

 **Safety Notes:**
 Any grocery or household compounds that are used for a purpose other than which they were intended are to be considered chemicals. An MSDS must be on file for those items. Some commonly used items that are used in investigations are vinegar, baking soda, sugar, salt, food coloring, etc.

Instructional Notes:
 There are many types of aprons, gloves, and goggles available. Refer to the Texas Education Agency – *Texas Safety Standards: Kindergarten through Grade 12, 2nd Edition*:
<http://www.tea.state.tx.us/index2.aspx?id=5483> (look under Documents).

 **Misconception:**

- Students may think everyday substances and chemicals are not dangerous.

 **STAAR Notes:**

goggles, aprons, and gloves. The information on how to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher, are discussed in the next Explore/Explain section.

9. Instruct students to revise their scavenger lists as they consider the following questions:
 - **Can you name some chemicals you may have in your house?** Answers may vary. *Some common household chemicals may be baking soda, baking powder, vinegar, rubbing alcohol, salt, etc.*
 - **If we were to use some of these chemicals in class, how do you think they would feel in your eyes?** *Probably irritate them, hurt, etc.*
10. Using an exit ticket strategy, instruct students to answer the following two questions on the back of the Scavenger Hunt page:
 - **Why is it important to know where to find and how to operate the safety equipment in the lab?** *So there is not any lost time in dealing with a safety issue or emergency, etc.*
 - **Why is it important to wear safety goggles and/or gloves while working with chemicals during class?** *(To protect eyes, face, and skin)*

These skills will not be listed under a separate reporting category. Instead, this and other process skills will be incorporated into at least 40% of the test questions from reporting categories 1–5 and will be identified along with content standards.



Check For Understanding:

The exit ticket is an opportunity for formative assessment.



Science Notebooks:

Return the **Scavenger Hunt** to students so it can be affixed in their science notebooks later in the lesson. It serves as a reminder of the emergency and preventative equipment that they will be using throughout the year.

EXPLORE/EXPLAIN – Setting up the Science Notebook

1. Ensure each group has all materials assembled at their table before beginning.
2. Introduce and distribute handouts you have selected for inclusion in the science notebook (see Advance Preparation). Instruct students to affix all pages in their notebooks and record them in the Table of Contents.
3. Explain any other elements you have chosen to require, such as label on the outside front cover, numbering of pages, glossary, etc.
4. Distribute the STAAR Grade 8 Science Reference Materials to each student. Instruct students to affix all pages in their notebooks and record them in the Table of Contents.
5. Distribute your choice of a safety contract to each student and review (see Advance Preparation). You may wish to use a district or campus mandated contract, or your own.
6. This information should be read aloud to the students to ensure that all students have heard the information.
7. Instruct students to sign the safety contract and take the safety contract home to read and discuss with their parent or guardian.
8. After their parent or guardian has read the safety contract, it should be signed and returned to school. Once returned, instruct students to affix the contract in their notebooks and record it in the Table of Contents.
9. Instruct students to glue or tape the Handout: **Lab Classroom Scavenger Hunt** (previously distributed) in their science

Suggested Days 2 and 3



Materials:

- science notebooks (to be used throughout the year, 1 per student)
- scissors (1 pair per student)
- colored pencils (per student)
- glue (glue stick or liquid, 1 per group)
- STAAR Grade 8 Science Reference Materials (see Advance Preparation, 1 per student)
- safety contract (see Advance Preparation, 1 per student)
- copies of teacher-selected handouts from the Teacher Resource: **Creating the Science Notebook: A Tool for Evaluating Student Work** (see Advance Preparation)

Attachments:

- Handout: **Lab Classroom Scavenger Hunt** (from previous activity)

Instructional Note:

Consider contacting your local fire department, and ask to have a fire fighter demonstrate how to use a

notebooks.

fire extinguisher.

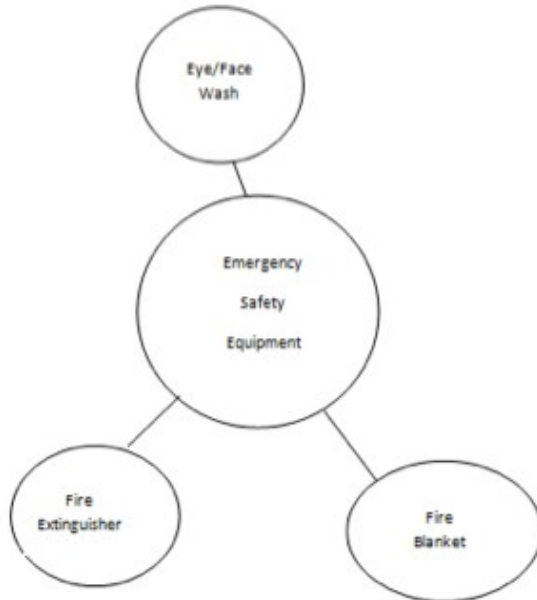


Science Notebooks:

Students set up notebooks to be used throughout the year.

EXPLORE/EXPLAIN – Emergency Safety Equipment **Suggested Day 4**

1. Distribute a copy of the Handout: **Using Emergency Safety Equipment** to each student.
2. Facilitate a discussion of the Handout: **Using Emergency Safety Equipment** with students. If possible, have students demonstrate how to operate the eye/face wash station, and model how to hold and place the fire blanket and operate the fire extinguisher.
3. Instruct students to draw a mind or concept map in their science notebooks.
 - Draw a circle in the center of a sheet of paper. Label the circle “Emergency Safety Equipment”.
 - Draw three lines out from the main circle, and add a circle to the end of each line.
 - Label the circles: “Fire Extinguisher”, “Fire Blanket”, and “Eye/Face Wash”.
 - Draw lines off these circles, and have students paraphrase the specifics on how to operate each piece of emergency equipment.



Attachments:

- Handout: **Using Emergency Safety Equipment** (1 per student)

Instructional Note:

After completing the mind map or concept map, instruct students to pair with a partner and orally share their work.

ELABORATE – Classroom and Safety Rules **Suggested Day 4 (continued)**

1. Review classroom rules and procedures by posing the following questions:
 - **What rules do you think we should follow when conducting labs in the classroom?** Answers may vary.



Materials:

- index cards (3”X5”, 1 per group)

2. Instruct students discuss how classroom rules are different and similar to the lab safety rules.
3. Divide the class in half. Within each half of the classroom, create groups of three students. Explain the following:
 - **In your group, you will be creating a situation to demonstrate a scenario you might encounter while participating in a science activity.**
 - **Half of the class will describe a “safe” scenario, and the other half of the class will describe the “unsafe” scenario.**
4. Distribute a 3”X5” index card to each group, and assign a safety rule for which they will describe a scenario.
5. Groups should have about 15–20 minutes to complete the task. A facilitated discussion will follow.
6. Collect the scenario cards from the groups. (Mix the cards up so all of the safe or unsafe scenarios are not together.)
7. Explain the following:
 - **I will choose a student to read the scenario card. In your group, you will decide if the scenario is describing a safe or an unsafe situation.**
 - **When I give the signal, you will show me a thumbs-up (safe scenario) or a thumbs-down (unsafe scenario).**
 - **If your group indicates a “thumbs-down” (unsafe scenario), you may be called on to explain how to improve the scenario to make it safe.**
8. Using an exit ticket strategy, instruct students to describe one of the safety rules not covered in the scenario activity and explain why it is important.

Instructional Notes:

Lab safety rules should address the following issues:

- appropriate dress including safety goggles
- appropriate behavior
- being prepared

Ensure that a variety of students are chosen to read the scenario cards and explain how to improve the unsafe scenario to make it safe. If classroom clickers are available, they could be used to ensure total classroom participation.

EVALUATE – Demonstrating Safe Practices in the Science Classroom

Suggested Day 5

Grade 08 Science Unit 01 PI 01

Within the science notebook, demonstrate knowledge of how to operate emergency safety equipment, such as a fire extinguisher, fire blanket, and face/eyewash, by explaining in writing how to use the equipment. Additionally, demonstrate knowledge of safe practices, including wearing safety goggles, washing hands and using materials appropriately, as well as use of other preventative equipment such as, aprons, gloves and chemical splash goggles by explaining, in writing, the class safety rules for investigations.

Standard(s): [8.1A](#) , [8.4A](#) , [8.4B](#)

ELPS [ELPS.c.3H](#) , [ELPS.c.5B](#) , [ELPS.c.5G](#)

1. Refer to the Teacher Resource: **Evaluate Instructions PI** for information on administering the performance assessment.

Attachments:

- Teacher Resource: **Evaluate Instructions PI** (1 for projection)



Science Notebooks:

Don't forget to instruct students to affix the signed safety contracts in their science notebooks if this was not done earlier in the lesson.

Lab Classroom Scavenger Hunt

Equipment Name	Location of Equipment in the Classroom	Purpose of Equipment	Emergency or Preventative?

Using Emergency Safety Equipment

Fire Extinguisher

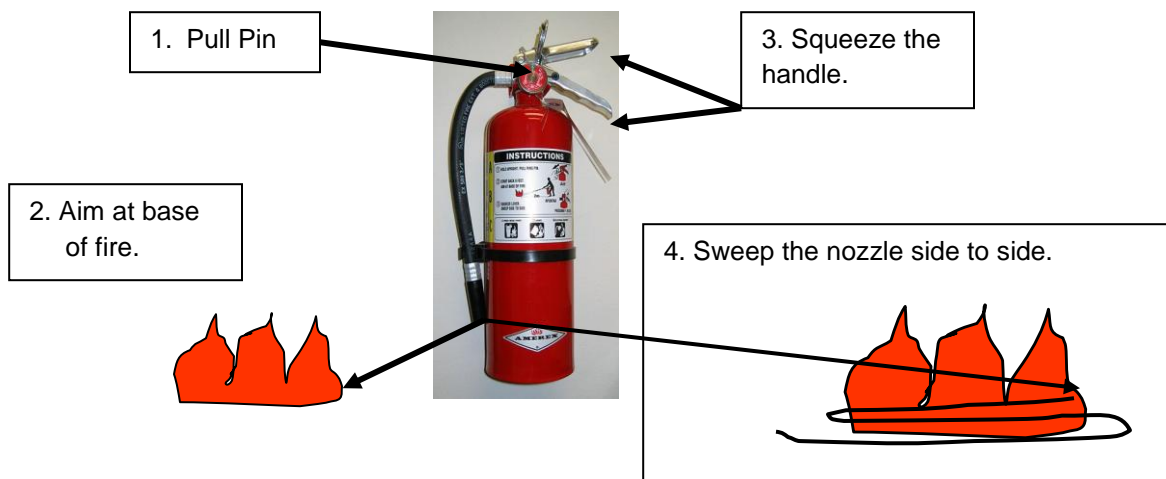
P – PULL
A – AIM
S – SQUEEZE
S – SWEEP

The acronym **PASS** will help you remember how to use a fire extinguisher: **PULL**, **AIM**, **SQUEEZE**, and **SWEEP**.


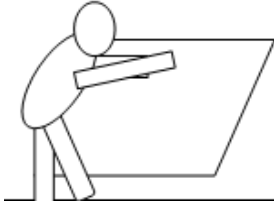
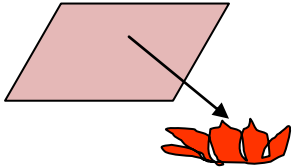

Step 1 – PULL the pin on the handle. This allows the handle to work. Stand 8' to 10' away from the fire.

Step 2 – AIM the nozzle at the base of the fire to attack the fuel. Aiming at the top of the flame is not helpful, as the chemical will pass through the flames. **Step 3 – SQUEEZE** the top lever or handle. This allows the contents of the extinguisher to be released.

Step 4 – SWEEP the nozzle from side to side until the fire is completely out.



Fire Blanket

Step 1	Remove fire blanket from its container.	
Step 2	Shield your face, arms, and hands with the blanket by wrapping the outside of the blanket around your arms.	
Step 3	PLACE , do not throw, the fire blanket on the burning material. No air should be getting to the flames.	
Step 4	If it is safe, turn off the heat source causing the fire.	
Step 5	Leave the blanket on the burning material at least 30 minutes. Do not remove the blanket until it is cool.	

Note: If you are trying to smother a clothing fire, tightly wrap the blanket around the person whose clothes are on fire and roll them on the floor in the blanket.

Using Emergency Safety Equipment

Face/Eyewash

Step 1 – Guide injured student to the eyewash station. Because the first few seconds after exposure to a chemical are critical, eyewash/face wash must be within 10 or fewer seconds of anywhere in the room.



Step 2 – Use your hands to hold the eyes open while using the eyewash to ensure water reaches the eyes.

Step 3 – Flush the skin or eyes with tepid water (60°– 90° F) for at least 15 minutes.
DO NOT RUB!

Step 4 – Get medical assistance immediately.

Image Credits:

Alighieri, D. (Photographer). (2005). *Fire extinguisher abc*. [Print Photo]. Retrieved from <http://commons.wikimedia.org/wiki/File:FireExtinguisherABC.jpg>
Jérôme. (Photographer). (2007). *Salle-blanche-rince-oeil-rot*. [Print Photo]. Retrieved from <http://commons.wikimedia.org/wiki/File:Salle-blanche-rince-oeil-rot.jpg>
Lamb, J. (Photographer). (2006). *Fire-blanket-on-display*. [Print Photo]. Retrieved from <http://commons.wikimedia.org/wiki/File:Fire-blanket-on-display.jpg>
Microsoft. (Designer). (2010). *Clip art* [Web Graphic]. Retrieved from <http://office.microsoft.com/en-us/images/>

Evaluate Instructions PI

Performance Indicator

- Within the science notebook, demonstrate knowledge of how to operate emergency safety equipment, such as a fire extinguisher, fire blanket, and face/eyewash, by explaining, in writing, how to use the equipment.

Additionally, demonstrate knowledge of safe practices, including wearing safety goggles, washing hands, and using materials appropriately, as well as use of other preventative equipment, such as, aprons, gloves and chemical splash goggles, by explaining, in writing, the class safety rules for investigations. (8.1A; 8.4A, 8.4B)

ELPS 3H; 5B, 5G

1. Instruct students to create a T-chart or other graphic organizer in their science notebooks to:
 - List the safety rules and procedures.
 - Explain the importance of the rules and procedures.
 - Identify the potential risks in a science laboratory or classroom and the appropriate preventative and emergency equipment that should be used.
2. Share the Performance Indicator rubric or expectations with students prior to students beginning the assessment.
3. Answer any questions students may have regarding the assessment.
4. Support emergent writers or students, with limited English proficiency, by providing sentence stems to assist with explanations for the procedures for operating the emergency equipment.
5. Students should also have the opportunity to demonstrate how to appropriately wear safety goggles and aprons and the hand washing procedures.