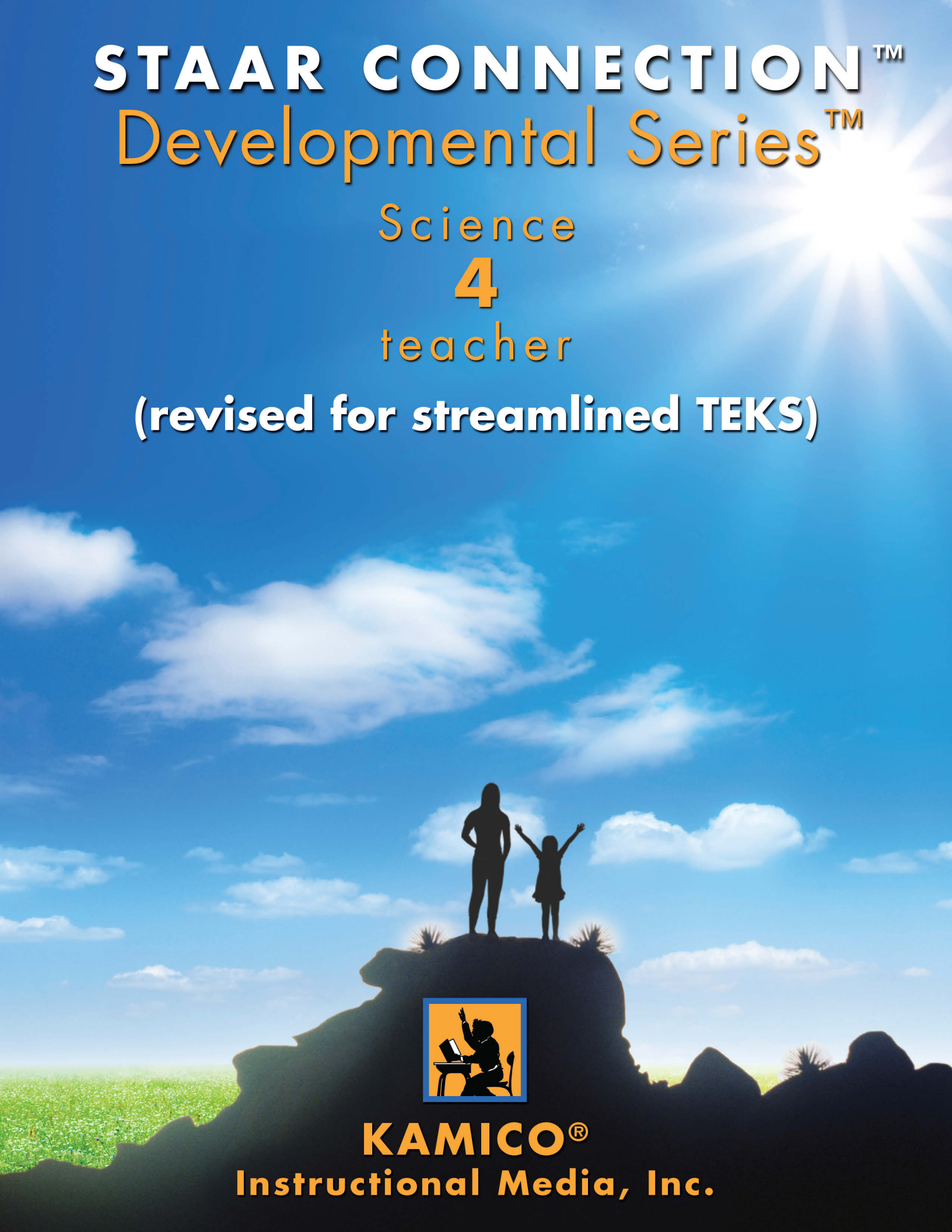
STAAR CONNECTION™
Developmental Series™

Science
4
teacher

(revised for streamlined TEKS)



KAMICO®
Instructional Media, Inc.

STAAR CONNECTION™

Science

4

teacher

Developmental Series™

XXXI/i/MMXVIII

Version 2

(revised for streamlined TEKS)

KAMICO®

Instructional Media, Inc.

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KAMICO® Instructional Media, Inc.
STAAR CONNECTION™
Introduction

KAMICO® Instructional Media's program is validated by scientifically based research. **STAAR CONNECTION™ Diagnostic Series™** and **Developmental Series™** can be used in tandem to ensure mastery of Texas reporting categories and TEKS. The *Diagnostic Series™* consists of a bank of assessments. Each assessment covers a mixture of reporting categories and TEKS. This research-based format provides continual reinforcement for and ensures retention of mastered concepts. To take full advantage of this series, administer an assessment to students. After they have completed the assessment, use it as an instructional tool. Go over each item with the class, discussing all correct and incorrect answers. Then, use the assessment as a diagnostic tool to determine a standard for which students need remediation. Find that standard in the *Developmental Series™*.

Each book in the *STAAR CONNECTION Developmental Series™* consists of isolated activities and assessments to allow for the development of specific TEKS. For every TEKS, there is at least one individual or group activity. The activities provide a fun, challenging, yet nonthreatening, way to develop mastery of the TEKS. In addition to these activities, each *Developmental Series™* book has assessments on isolated standards to be used to identify mastery or the need for further skill development or reinforcement. Continue to alternate between the *STAAR CONNECTION™ Diagnostic Series™* and the *Developmental Series™*.

KAMICO's **DATA CONNECTION®** software prints student answer sheets on plain paper using a standard laser printer, scans answer sheets using a TWAIN-compliant scanner, scores assessments, and disaggregates student academic data, showing which goals and objectives are mastered and which goals and objectives are in need of reinforcement. The software is preprogrammed to work with all KAMICO® assessments. It is easily customized to work with other instructional materials and assessments as well as teacher-, school-, district-, or state-created assessments. DATA CONNECTION® analyzes academic data from individual students, classes, grade levels, and demographic groups. Reports are presented in tabular and graphic form. Item analysis is provided to help determine the most effective method of instruction.

KAMICO® Instructional Media, Inc., supports efforts to ensure adequate yearly progress and eliminate surprises in high-stakes test results.

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Texas Essential Knowledge and Skills
Grade 4 Science

Scientific Investigation and Reasoning Skills

(4.1) **Scientific investigation and reasoning:** The student conducts classroom and outdoor investigations, following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to

(A) demonstrate safe practices and the use of safety equipment as described in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment, including safety goggles or chemical splash goggles, as appropriate, and gloves, as appropriate

(B) make informed choices in the use and conservation of natural resources and reusing and recycling of materials such as paper, aluminum, glass, cans, and plastic

(4.2) **Scientific investigation and reasoning:** The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to

(A) plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions

(B) collect and record data by observing and measuring, using the metric system, and using descriptive words and numerals such as labeled drawings, writing, and concept maps

(C) construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data

Reporting Category 1:
Matter and Energy

(4.5) **Matter and energy:** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to

(A) measure, compare, and contrast physical properties of matter, including mass, volume, states (solid, liquid, gas), temperature, magnetism, and the ability to sink or float

(B) compare and contrast a variety of mixtures, including solutions

Reporting Category 2:
Force, Motion, and Energy

(4.6) **Force, motion, and energy:** The student knows that energy exists in many forms and can be observed in cycles, patterns, and systems. The student is expected to

(A) differentiate among forms of energy, including mechanical, sound, electrical, light, and thermal

(B) differentiate between conductors and insulators of thermal and electrical energy

(C) demonstrate that electricity travels in a closed path, creating an electrical circuit

(D) design a descriptive investigation to explore the effect of force on an object such as a push or a pull, gravity, friction, or magnetism

Reporting Category 3:
Earth and Space

(4.7) **Earth and space:** The students know that Earth consists of useful resources and its surface is constantly changing. The student is expected to

(A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants

(B) observe and identify slow changes to Earth's surface caused by weathering, erosion, and deposition from water, wind, and ice

(C) identify and classify Earth's renewable resources, including air, plants, water, and animals, and nonrenewable resources, including coal, oil, and natural gas, and the importance of conservation

(4.8) **Earth and space:** The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to

(A) measure, record, and predict changes in weather

(B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process

(C) collect and analyze data to identify sequences and predict patterns of change in shadows, seasons, and the observable appearance of the Moon over time

Reporting Category 4:
Organisms and Environments

Scientific Investigation and Reasoning Skills
TEKS 4.1A

Demonstrate safe practices and the use of safety equipment as described in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment, including safety goggles or chemical splash goggles, as appropriate, and gloves, as appropriate.

ACTIVITY
Is This Practice Safe?

Materials
List of classroom and outdoor investigations safety practices from outside resources such as textbooks, activity books, and the Texas Education Agency-approved safety standards

Is This Practice Safe? activity sheet for each student

Background
Hands-on science activities in the classroom and outdoors are exciting and engaging for most students. While the majority of textbook and activity book activities alert teachers and students to safety precautions specific to an exercise, all students must be aware of general safety rules. Before beginning any investigation, students must understand the investigation's procedures and rules. Questions relating to the investigation must be addressed. Students must follow safe practices before, during, and after each investigation.

Procedure
Review background information with students. Using information from textbooks and activity books, give examples of safe practices during classroom and outdoor investigations. Distribute the *Is This Practice Safe?* activity sheet to students, and instruct them to complete the activity sheets individually. The activity sheets describe different investigation practices, followed by a choice of yes or no responses. Students determine whether a description of an investigation practice is safe. If the response is *no*, students correct the description to make the practice safe. After students complete the activity sheets, hold a class discussion to review the answers.

Answer Key

1. Students handle hot glassware with their bare hands.
   Is this practice safe? *no*
   If you circled *no*, correct the practice to make it safe: *Students should wear heat-resistant gloves while handling hot glassware.*
2. Cracked glassware is taped before being used in an experiment.
   Is this practice safe? *no*
   If you circled *no*, correct the practice to make it safe: *Broken, chipped, or cracked glassware should be thrown away properly.*
3. Students wear goggles over their eyes before pouring vinegar into a bottle.
   Is this practice safe? *yes*
4. A student does not understand the experiment directions and asks his friend for help.
   Is this practice safe? *no*
   If you circled *no*, correct the practice to make it safe: *A student who does not understand the experiment directions should ask the teacher for help*.
5. An electrical hot plate is unplugged by pulling on its cord.
   Is this practice safe? *no*
   If you circled *no*, correct the practice to make it safe: *An electrical hot plate is unplugged by pulling its plug from its outlet*.
6. A student accidentally spills some chemicals on the table and tells the teacher about the spill to get directions for cleanup.
   Is this practice safe? *yes*
7. A student eats a snack during an experiment.
   Is this practice safe? *no*
   If you circled *no*, correct the practice to make it safe: *A student can eat a snack after the experiment and after washing up with soap and water.*
8. A student picks up an interesting snake off the ground to observe its behavior.
   Is this practice safe? *no*
   If you circled *no*, correct the practice to make it safe: *A student should avoid handling any kind of snake*.
9. A hungry student finds some wild berries and eats them during an outdoor activity.
   Is this practice safe? *no*
   If you circled *no*, correct the practice to make it safe: *Students should **not** pick or eat fruit from an unidentified plant. Students should pick and eat fruit from an identified plant only if they have their teacher's permission*.
10. Students stay with their class when on a science field trip.
    Is this practice safe? *yes*
11. A student wears shorts and sandals while on an outdoor investigation in tall grass.
    Is this practice safe? *no*
    If you circled *no*, correct the practice to make it safe: *A student wears long pants, socks, and sturdy shoes while on an outdoor investigation in tall grass*.

12. The teacher properly puts away or properly disposes of all materials used in an outdoor investigation.
    Is this practice safe? *yes*
13. A student wraps her hand in a handkerchief after touching a poisonous plant.
    Is this practice safe? *no*
    If you circled *no*, correct the practice to make it safe: *Students should always wash with soap and water immediately after touching poisonous plants.*

Name _____ Scientific Investigation and Reasoning Skills TEKS 4.1A

Is This Practice Safe? Activity Sheet

Background

Classroom and outdoor investigations can be both fun and educational. Learning about something by performing experiments or making observations helps you understand information found in textbooks. However, before beginning any investigation, you should always understand the investigation's steps and rules. Ask your teacher to explain something you do not understand about an investigation. Follow safe practices before, during, and after each investigation.

Procedure

Different investigation practices are described below. Read each description, and decide whether the practice is safe. Circle *yes* if the practice is safe or *no* if the practice is not safe. If you circle *no*, correct the description to make the practice safe on the lines provided.

Classroom Investigation Practices

1. Students handle hot glassware with their bare hands.
   Is this practice safe? yes/no
   If you circled *no*, correct the practice to make it safe: _____

   _____

   _____

2. Cracked glassware is taped before being used in an experiment.
   Is this practice safe? yes/no
   If you circled *no*, correct the practice to make it safe: _____

   _____

   _____

3. Students wear chemical splash goggles over their eyes before pouring vinegar into a bottle. Is this practice safe? yes/no
   If you circled *no*, correct the practice to make it safe: _____

   _____

   _____

4. A student does not understand the experiment directions and asks his friend for help.
   Is this practice safe? yes/no
   If you circled *no*, correct the practice to make it safe: _____

   _____

   _____

5. An electrical hot plate is unplugged by pulling on its cord.
   Is this practice safe? yes/no
   If you circled *no*, correct the practice to make it safe: _____

   _____

   _____

6. A student accidentally spills some chemicals on the table and tells the teacher about the spill to get directions for cleanup.
   Is this practice safe? yes/no
   If you circled *no*, correct the practice to make it safe: _____

   _____

   _____

7. A student eats a snack during an experiment.
   Is this practice safe? yes/no
   If you circled *no*, correct the practice to make it safe: _____

   _____

   _____

Outdoor Investigation Practices

8. A student picks up an interesting snake off the ground to observe its behavior.
   Is this practice safe? yes/no
   If you circled *no*, correct the practice to make it safe: _____

   _____

   _____

9. A hungry student finds some wild berries and eats them during an outdoor activity.
   Is this practice safe? yes/no
   If you circled *no*, correct the practice to make it safe: _____

   _____

   _____

10. Students stay with their class when on a science field trip.
    Is this practice safe? yes/no
    If you circled *no*, correct the practice to make it safe: _____

    _____

    _____

11. A student wears shorts and sandals while on an outdoor investigation in tall grass.
    Is this practice safe? yes/no
    If you circled *no*, correct the practice to make it safe: _____

    _____

    _____

12. The teacher properly puts away or properly disposes of all materials used in an outdoor investigation.
    Is this practice safe? yes/no
    If you circled *no*, correct the practice to make it safe: _____

    _____

    _____

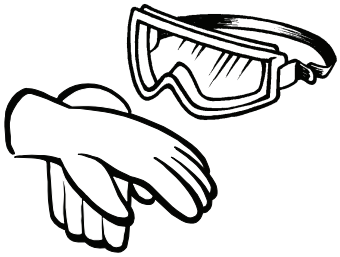
13. A student wraps her hand in a handkerchief after touching a poisonous plant.
    Is this practice safe? yes/no
    If you circled *no*, correct the practice to make it safe: _____

    _____

    _____

ACTIVITY 2
Safety First

Materials
Safety goggles for each group of 3 or 4 students
Disinfectant wipes for each group of 3 or 4 students
Heat-resistant gloves for each group of 3 or 4 students
Disposable gloves for each group of 3 or 4 students
Lab coat or apron for each group of 3 or 4 students
Paper cups—2 for each group of 3 or 4 students
Safety First activity sheet for each student



Background
In classroom and outdoor investigations, students and teachers should make safety a priority. Safety equipment should be specified in investigation plans, and students should use the equipment correctly to avoid accidents or injuries. Students are expected to demonstrate the correct use of varied safety equipment.

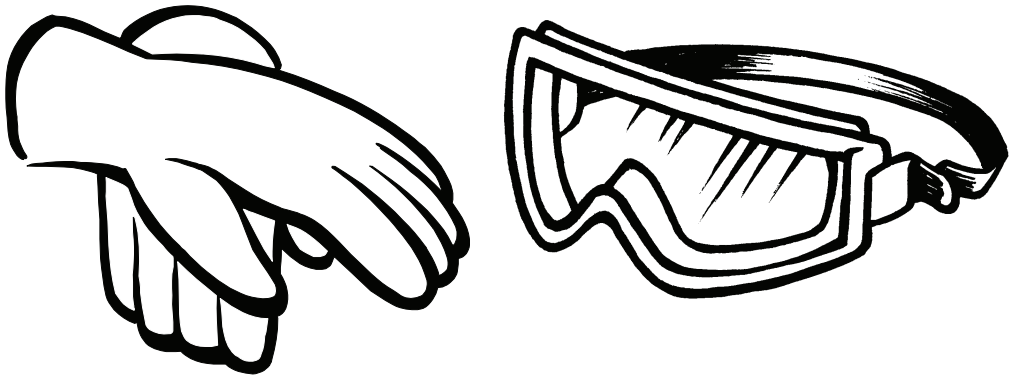
Preparation
If any student has a known or suspected latex allergy, do not use disposable latex gloves. Use a latex-free material if student allergies are present or unknown.

Procedure
Divide the class into lab groups of three or four students. Distribute lab materials to each group and the *Safety First* activity sheet to each student. Demonstrate the proper way to wear the safety goggles, the heat-resistant gloves, and the lab coat or apron. Answer any questions that may arise.

Allow time for each student in a lab group to perform the activity for each piece of safety equipment, as described on the activity sheet. Students answer the questions on the activity sheet as they complete each activity.

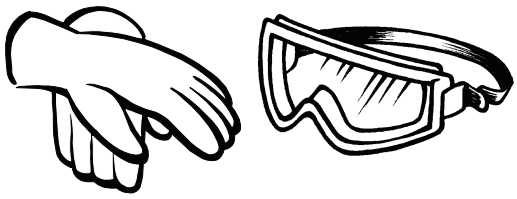
Answer Key
1. What accident can happen as you pour liquids from one container into another container?
   Some of the liquids could splash out of the container.
2. Describe how goggles can protect your eyes during science experiments.
   Goggles help shield your eyes if liquids splash out of a container. They prevent liquids from entering your eyes.

3. You "peeled" the disposable gloves off your hands instead of pulling them off by the fingers. Why should you remove your disposable gloves by peeling them off, wrist-end first?
   The outside of the gloves, which may be contaminated, remains covered by the inside of the gloves, which is clean. Anyone accidentally coming into contact with the used gloves will touch only the clean side of the gloves instead of the contaminated side of the gloves.
4. Why is it necessary to wash your hands after an experiment, even if you wear disposable gloves?
   Your hands may still be contaminated if your gloves have small holes or tears that you cannot see.
5. Why should you pick up the cup using both hands instead of only one hand when wearing heat-resistant gloves?
   Heat-resistant gloves do not fit tightly around your hands and can feel loose or thick. It may be difficult to hold a cup with one hand if the glove does not fit well. Holding a cup with two hands will reduce the possibility of accidentally dropping or spilling the contents of the cup.



Name _____ Scientific Investigation and Reasoning Skills TEKS 4.1A

Safety First



Background

It is necessary to properly select and use safety equipment, such as safety goggles, gloves, and lab coats or aprons. This equipment helps to protect students and teachers in the classroom and in the field. Safety goggles help keep harmful materials out of your eyes. Disposable gloves protect your hands from chemicals. Heat-resistant gloves protect your hands from burns. Lab coats and lab aprons protect your clothing and skin from splashes and spills.

Procedure

Complete the activity for each piece of safety equipment as described. Record your data or observations on this activity sheet. Answer the questions about each piece of equipment as you complete its activity.

Safety Goggles, Lab Apron or Coat, and Disposable Gloves

Look at a pair of disposable gloves, and notice how the gloves look similar to your hand, with a thumb on one side and the pinkie on the other. Put the gloves on, making sure that your thumbs go inside the gloves' thumbs. Pick up the pair of safety goggles. Place the goggles over your eyes, and move the elastic behind your head. Adjust the fit of the goggles to be sure that the goggles fit snugly but not too tightly.

Put the lab apron or lab coat on. Wearing the disposable gloves, lab apron or coat, and goggles, fill one paper cup half-full with water. Pour the water carefully from the cup into the other cup and then back again to the first cup. Be sure not to let the water splash or spill out of the cups. Place the cups down on the table away from the table's edge.

Remove the lab apron or coat, and hang it from a hook or on a hanger. Remove the goggles from your eyes by looking downwards as you lift the strap off the back of your head. Remove a disposable glove from one hand by slowly pulling the bottom of the glove from your wrist and "peeling" the glove off your hand so that the glove is inside out. Hold the removed glove with your second hand. Remove the second glove in the same way with your first hand. As you peel the glove off your second hand, the first glove will fit inside the second glove. Throw both gloves away in the trash can. Use a disinfectant wipe to clean the goggles, and throw the wipe away in the trash can. Wash your hands with soap and water.

1. What accident can happen as you pour liquids from one container into another container?

_____

_____

2. Describe how goggles can protect your eyes during science experiments.

_____

_____

3. You "peeled" the disposable gloves off your hands instead of pulling them off by the fingers. Why should you remove your disposable gloves by peeling them off, wrist-end first?

_____

_____

4. Why is it necessary to wash your hands after an experiment, even if you wear disposable gloves?

_____

_____

Heat-Resistant Gloves

Look at a pair of heat-resistant gloves, and notice how the gloves look similar to your hands. Each glove has a thumb, just as you have a thumb on each hand. Some heat-resistant gloves also have fingers; however, many have only a thumb and a section, similar to a mitten, for the rest of your fingers. Put on the gloves, matching the gloves' thumbs with your thumbs.

With the gloves on your hands, pick up the cup filled with water with both hands. Move to the other side of your table, and put the cup down. Again, pick up the cup filled with water, and return the cup to its first position.

5. Why should you pick up the cup using both hands instead of only one hand when wearing heat-resistant gloves?

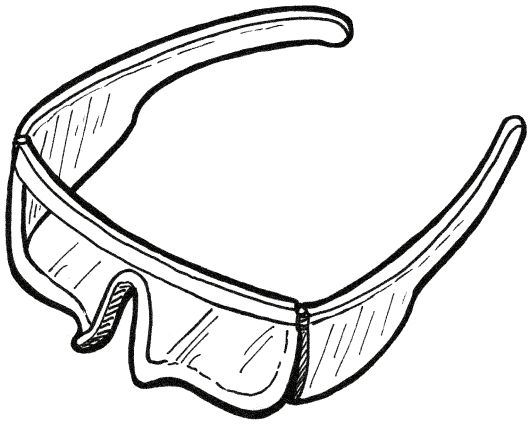
_____

_____

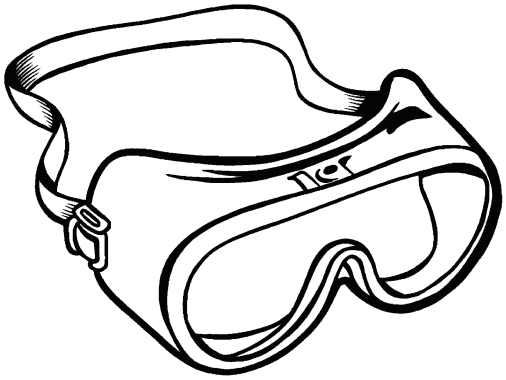
Name _____ Scientific Investigation and Reasoning Skills TEKS 4.1A

Demonstrate safe practices and the use of safety equipment as described in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment, including safety goggles or chemical splash goggles, as appropriate, and gloves, as appropriate.

1 Look at the drawings of a pair of safety glasses and a pair of chemical splash goggles.



Safety Glasses



Chemical Splash Goggles

Safety glasses and chemical splash goggles are both designed to protect the eyes. Which statement correctly identifies an experiment in which a student could use the safety glasses instead of the chemical splash goggles?

A an experiment that requires the student to pour marbles into a jar

B an experiment that requires the student to mix baking soda with vinegar

C an experiment that requires the student to heat a test tube filled with saltwater

D an experiment that requires the student to fill a container with smoke

2 A student finds a flowering plant during an outdoor investigation. Which method of observation can the student safely use to collect data about the plant's flowers?

F Sniff a flower to describe the flower's smell.

G Touch the flowers' petals to determine the smoothness of the petals.

H Look at the flowers to determine the flowers' color and shape.

J Pick off the petals to count the number of petals on a flower.

3 While working on an experiment in the classroom, Celeste accidentally knocks over a container, spilling some of the powdered chemical on top of her table. What is the first step in safely cleaning the spilled chemical?

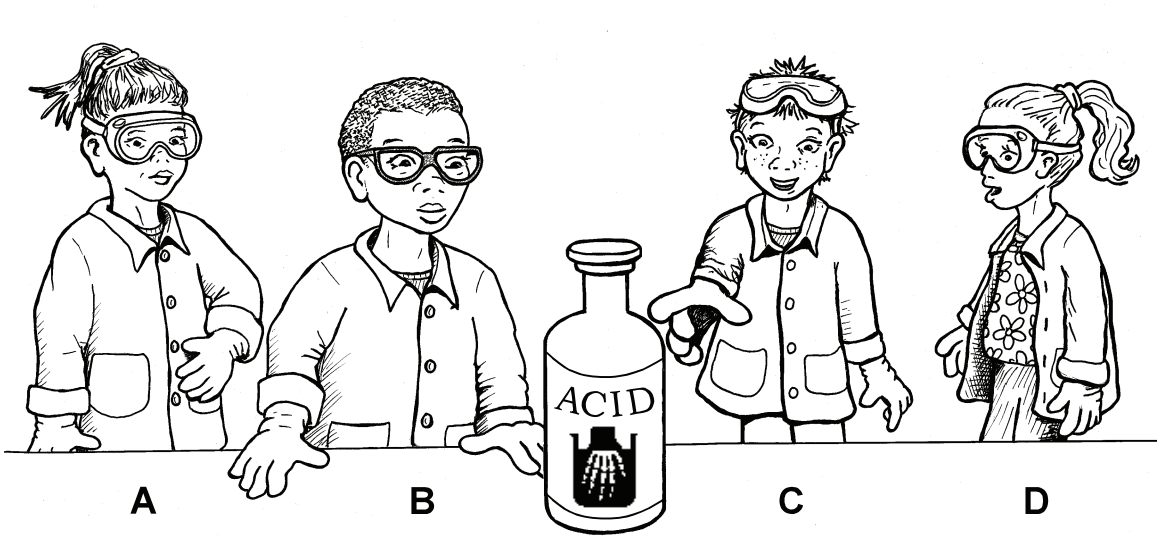
A Dissolve the powder with water so that the spill can be wiped clean with a paper towel.

B Tell the teacher about the spill to get instructions for cleaning the spill.

C Using a brush, sweep the powder into a dustpan.

D Use a handheld vacuum cleaner to suck up the powder.

4 Four students are conducting an experiment that requires the use of an acid.



Which student has the correct safety equipment and is wearing it correctly?

F Student A

G Student B

H Student C

J Student D

5 Collin places a beaker filled with water on a hot plate. He turns on the hot plate, brings the water to a boil, and then turns off the hot plate. What steps should Collin take to safely unplug the hot plate to prevent receiving an electrical shock?

A He should put on heat-resistant gloves and unplug the hot plate by pulling on its cord.

B He should dry his hands and unplug the hot plate by pulling the plug from the outlet.

C He should dry his hands and unplug the hot plate by pulling on its cord.

D He should put on heat-resistant gloves and unplug the hot plate by pulling the cord from the outlet.

6 Which of the following procedures describes the safest way for you to look under a large rock to observe and identify insects that live there?

F Using gloved hands, pick up one end of the rock and flip it over.

G Get a lab partner to hold up one end of the rock with gloved hands while you take photographs of the insects found beneath the rock.

H Use a shovel to flip over the rock so that you do not need to touch it.

J Wear closed-toe shoes, and push the rock out of the way with your feet.