SI Biology - Full Discipline Demo

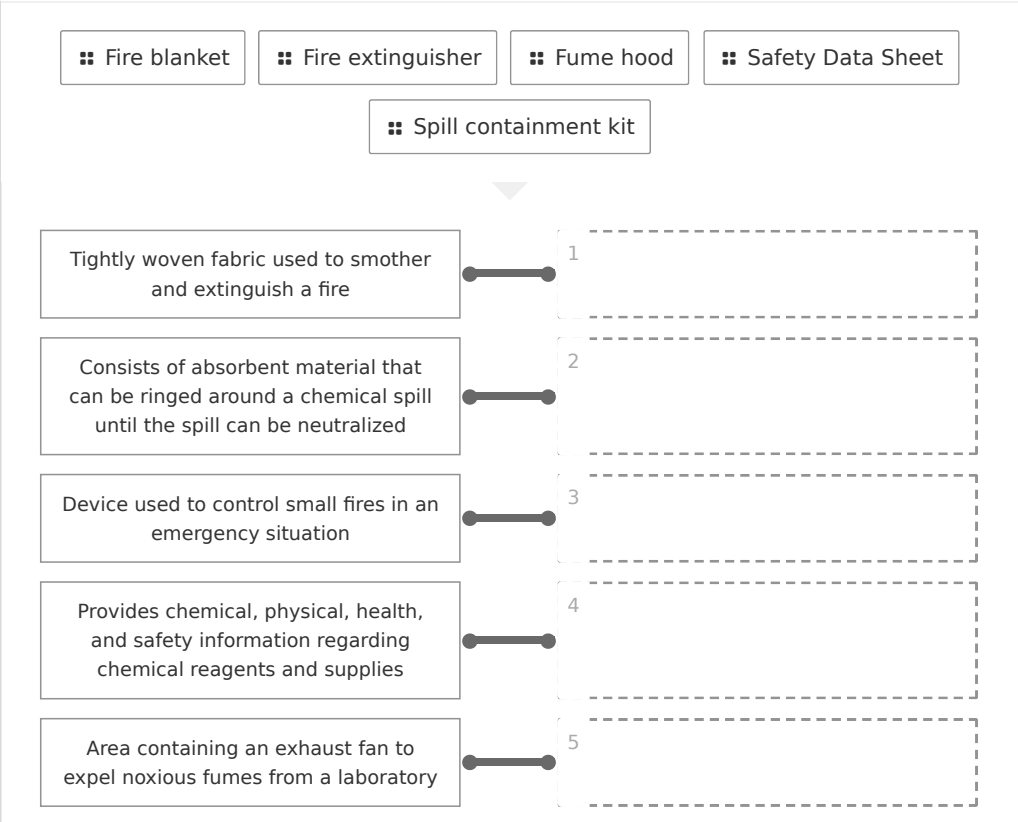
Lab Safety

Final Report - Answer Guide

Institution	Science Interactive University
Session	SI Biology - Full Discipline Demo
Course	SI Biology - Full Discipline Demo
Instructor	Sales SI Demo

Test Your Knowledge

Match each term with the best description.

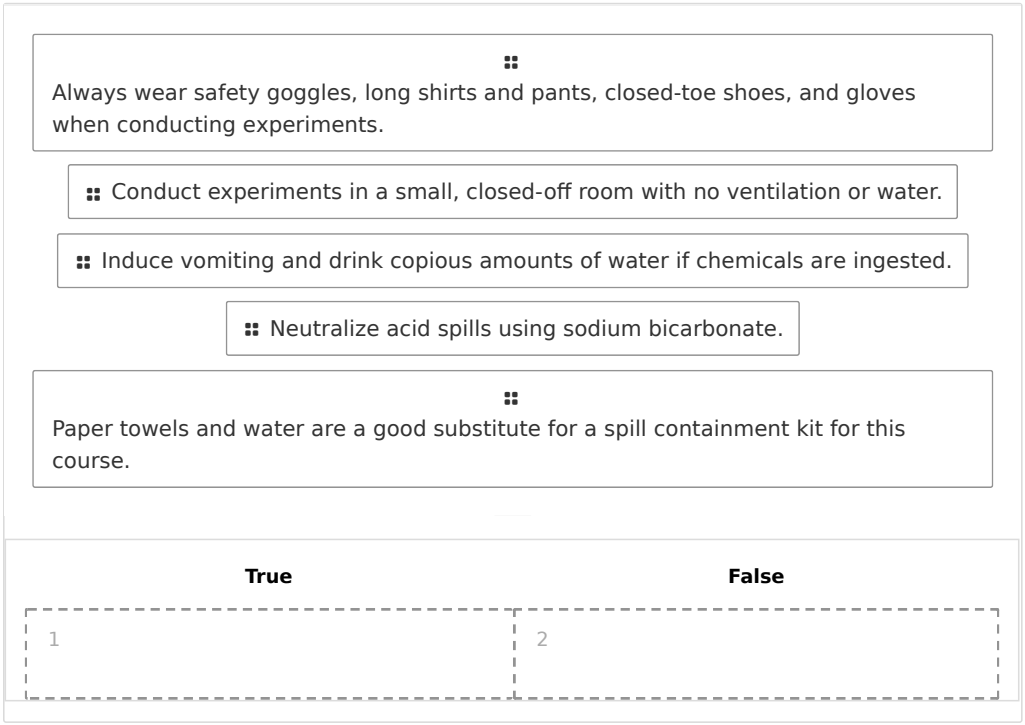


Correct answers:

1 Fire blanket 2 Spill containment kit 3 Fire extinguisher

4 Safety Data Sheet 5 Fume hood

Categorize each statement as true or false.



Correct answers:

1

Always wear safety goggles, long shirts and pants, closed-toe shoes, and gloves when conducting experiments.

Neutralize acid spills using sodium bicarbonate.

Paper towels and water are a good substitute for a spill containment kit for this course.

2

Conduct experiments in a small, closed-off room with no ventilation or water.

Induce vomiting and drink copious amounts of water if chemicals are ingested.

Exploration

Your laboratory kit may contain _____.

- small items that can be choking hazards
- chemicals that can cause burns
- sharp objects that can cause cuts
- All of the above ✔

Eating, drinking, or smoking during an experiment is never allowed.

- True ✔
- False

At home, a _____ is the best substitute for a laboratory safety shower.

- watering can
- bottle of water
- kitchen faucet
- bathroom shower ✔

A Safety Data Sheet contains information about first-aid procedures, required protective equipment, and health effects.

- True ✔
- False

To test the smell of a substance, partially fill your lungs with air and, while standing slightly back from the fumes, use your hand to waft the odors gently toward your nose.

- True ✔
- False

Exercise 1

Which safety items are you currently lacking in your planned work area? What is your plan for acquiring these items before using your kit?

What location have you selected for conducting science experiments in your home? What, if any changes do you plan to make to the location before using your kit?

Data Table 1: Lab Safety Equipment Alternatives
(SAMPLE ANSWER BELOW)

Item	Function	Substitution
Fire extinguisher	Device used to control small fires in an emergency situation	No Substitute
Spill containment kit	Consists of absorbent material that can be ringed around a chemical spill until the spill can be neutralized	Paper towles, kitty litter or sand
Eyewash station	Sink with two faucets directed at eyes	Shower or sink
Safety goggles	Eye protection	No Substitute
Laboratory shower	Shower head in the lab	Shower or sink
Fume hood	Area containing an exhaust fan to expel noxious fumes from a laboratory	Open doors or windows, microwave or exhaust hood that vents outside
First aid kit	Kit containing bandages and other supplies	No Substitute

Exercise 2

Identify three potential hazards in your planned work area for performing Science Interactive experiments and describe the safe practices associated with each potential hazard.

Describe how you plan to secure your work area and lab kit from children and pets.

Data Table 2: Lab Safety Interactive
(SAMPLE ANSWER BELOW)

	Safety Hazard	Correct lab safety procedure
1	There is a bag on the floor of the lab causing a tripping hazard.	All walkways and floor space in the lab area should be clear.
2	The scientist in this picture does not have their long hair and beard tied up.	All loose and long hair should be tied up to avoid flames, chemicals and microorganisms used in experiments.
3	A chemical has been spilled and left unattended on the lab floor.	All chemical spills should be cleaned up immediately using proper neutralizing and disposal techniques.
4	Papers have been left under an open flame.	When an open flame is being used the workspace should be cleared of flammable materials.
5	A drink is sitting on the lab bench next to a computer.	There should not be any food or drink in the lab.
6	A container of flammable liquid has spilled and been left on the lab bench next to open flames.	When open flames are in use all flammable chemicals should be removed from the lab space to a safe area.
7	A broken test tube has been left unattended on the lab bench.	All broken glass should be swept up and disposed of in a place/container that is safe and will prevent others from accidentally harming themselves.
8	A scientist is eating a sandwich over their experiment in the lab.	Food and drinks should not be brought into the lab space.
9	An open flame has been left unattended.	Experiments and open flames should never be left unattended.
10	A scientist is holding a cat in the lab space.	All experiments should be performed in a space away from pets and children.
11	A scientist is directly smelling a chemical from an Erlenmeyer flask.	Proper wafting technique should be used at all times when determining odor of a chemical or solution.

12	A scientist is performing an experiment without proper eye protection.	PPE should be worn in the lab while performing experiments.

Exercise 3

Describe three sources for SDS related to chemicals provided in Science Interactive lab kits.

How can you determine the proper disposal protocols for remaining chemicals in your kit?

Data Table 3: Sodium Hydroxide SDS information
(SAMPLE ANSWER BELOW)

Items	SDS Information
Physical State	Odorless liquid
Route of Exposure & Symptoms	Inhalation, eye contact, skin contact, ingestion: may cause eye redness, tearing, and burns, skin redness and burns, coughing, and burns to the GI and respiratory tracts, nausea, vomiting, and diarrhea
Protective Equipment	Safety goggles or face shield, rubber or neoprene gloves, long-sleeved shirt, and if respiratory irritation occurs then respirator should be worn.
First Aid Procedures	Call poison control center immediately for treatment advice. Eye Contact - Hold eye open and rinse slowly and gently with water for 15-20 minutes, remove contact lenses after the first 5 minutes and continue rinsing. Skin Contact – Take off contaminated clothing and rinse skin with water for 15-20 minutes. Inhalation – Move to fresh air and call doctor if breathing is affected. Ingestion – sip a glassful of water if able to swallow. Do not induce vomiting unless told to do so by poison control center.
Fire-fighting Measures	Use extinguishing methods appropriate to local circumstances and surrounding environment. Do not use water spray to fight fire.
Chemical Reactivity	Reactive with other household chemicals including toilet bowl cleaners, rust removers, acids, or products containing ammonia to produce hazardous irritating gases, such as chlorine and chlorinated compounds.
Safe Storage	Store away from children and pets, reclose cap tightly, store in upright, cool, dry area away from direct sunlight.

Safe Disposal	Dispose in accordance with federal, state, and local regulations. Do not contaminate food or feed by disposal of this product.
Environmental/ Ecotoxicity	Very toxic to aquatic life with long lasting effects. Do not allow product to enter groundwater, storm drains, lakes, or streams.
Spill Cleanup Procedures	Absorb and containerize. Wash residual down to sanitary sewer after contacting sanitary treatment facility to determine ability to process washed-down material.

Exercise 4

Data Table 4: Part 1 and Part 2 of the Safety Contract
(SAMPLE ANSWER BELOW)

Part	Agreement
Part 1: It is impossible to control students' use of Science Interactive products, related kits, and students' work environments. The author(s) of Science Interactive digital content, the instructors and institutions that adopt it, and Science Interactive, Inc. - the publisher and producer of Science Interactive- authorize the use of these educational products only on the express condition that the purchasers and users accept full and complete responsibility for all and any liability related to their use of same. Please review this document several times until you are certain you understand and will fully abide by its terms.	I agree:Student initials
Part 2: I am a responsible adult who has read, understands, and agrees to fully abide by all safety precautions prescribed in Science Interactive labs for laboratory work and for the use of Science Interactive kits. Accordingly, I recognize the inherent hazards associated with science experimentation; I will always experiment in a safe and prudent manner; and I unconditionally accept full and complete responsibility for any and all liability related to my purchase and/or use of a science Science Interactive kit or any other science products or materials provided by Science Interactive, INC.	I agree:Student initials

Competency Review

Chemicals in a lab kit may potentially cause _____ if mishandled or consumed.

- burns
- serious illness
- death
- All of the above ✔

When conducting experiments that include vigorous exercise, consult a physician first or ask a partner to assist in participating if you are unable to do so.

- True ✔
- False

The _____ should be contacted immediately if you or anyone accidentally consumes or comes in contact with a potentially toxic substance.

- National Chemical Toxicity Center
- National Poison Control Center ✔
- American Poison Chemical Society
- American Toxic Chemical Center

When working with acids, always _____ to avoid chemical splattering.

- add acid to water ✔
- add water to acid

Acid spills can be neutralized by adding _____.

- water
- baking soda ✔
- more acid
- distilled water
- All of the above

A _____ can be used to douse a fire.

- fire extinguisher
- safety shower
- fire blanket
- fire blanket and fire extinguisher
- All of the above ✔

Normal eyeglasses may be worn to substitute for safety goggles.

- True
- False ✔

A _____ expels noxious fumes from a laboratory.

- fire blanket
- fume hood ✔
- spill containment kit
- All of the above

A sink faucet or hand-held shower wand are appropriate substitutes for an eyewash station.

- True ✔
- False

A Safety Data Sheet provides basic information about _____.

- health effects
- toxicity
- physical data
- safe disposal
- health effects and toxicity
- All of the above ✔

What action(s) should you take if you accidentally break an empty test tube during an experiment?

- Dispose of the glass in the trash can.
- Dispose of the glass in a protective container, and then place it in the trash can. ✔
- Pick up the glass and throw it away.
- Place the broken glass in the sink.

Extension Questions

1. A student taking an online lab course is only able to perform their Science Interactive kit experiments in their workplace, an office building. Apply your knowledge of lab safety and proper workspace characteristics to suggest a location within the office for the student to conduct their experiments.

(SAMPLE ANSWER BELOW)

Student answers may vary, however, this is a good question to check in and make sure students do not have concerns about lab safety and their home or non-traditional lab space.