Scientific Method
Science Safety Rules

Name _____

Answer Key:

SpongeBob, Patrick, and Gary were thrilled when Mr. Krabbs gave their teacher a chemistry set! Mr. Krabbs warned them to be careful and reminded them to follow the safety rules they had learned in science class. The teacher passed out the materials and provided each person with an experiment book.

SpongeBob and Gary flipped through the book and decided to test the properties of a mystery substance. Since the teacher did not tell them to wear the safety goggles, they left them on the table[1]. SpongeBob lit the Bunsen burner and then reached across the flame[2] to get a test tube from Gary. In the process, he knocked over a bottle of the mystery substance and a little bit splashed on Gary[3]. SpongeBob poured some of the substance into a test tube and began to heat it. When it started to bubble he looked into the test tube[4] to see what was happening and pointed it towards Gary[5] so he could see. Gary thought it smelled weird so he took a deep whiff of it[6]. He didn't think it smelled poisonous and tasted a little bit of the substance[7]. They were worried about running out of time, so they left the test tube and materials on the table[8] and moved to a different station to try another experiment.

Patrick didn't want to waste any time reading the directions[9], so he put on some safety goggles and picked a couple different substances. He tested them with vinegar (a weak acid) to see what would happen even though he didn't have permission to experiment on his own[10]. He noticed that one of the substances did not do anything, but the other one fizzed. He also mixed two substances together to see what would happen[11], but didn't notice anything. He saw SpongeBob and Gary heating something in a test tube and decided to do that test. He ran over to that station[12] and knocked over a couple bottles that SpongeBob had left open[13]. After cleaning up the spills, he read the directions and found the materials he needed. The only test tube he could find had a small crack in it, but he decided to use it anyway[14]. He lit the Bunsen burner and used tongs to hold the test tube over the flame. He forgot to move his notebook away from the flame[15] and almost caught it on fire.

Before they could do another experiment, the bell rang and they rushed to put everything away. Since they didn't have much time, Patrick didn't clean out his test tube before putting it in the cabinet[16]. SpongeBob noticed that he had a small cut on his finger, but decided he didn't have time to tell the teacher about it[17]. Since they were late, they skipped washing their hands[18] and hurried to the next class.

Safety Rules:

1 - Always wear safety goggles whenever you are working with chemicals or other substances that might get into your eyes.
2 - Never reach across a flame.
3 - Immediately notify your teacher if any chemical gets on your skin or clothing to find out what to do to clean it off.
4 - Never look directly into a test tube when mixing or heating chemicals.
5 - Always point a test tube away from you and others when heating it over a flame or other heat source.
6 - Never smell a chemical directly from the container. Wave your hand over the opening of the container and "waft" the fumes towards your nose.
7 - Never taste a chemical unless you are instructed by your teacher to do so.
8 - Always clean up your work area and equipment after an experiment is completed. Equipment must be returned to its proper place.
9 - Read and follow all directions exactly as they are written. If in doubt, ask your teacher for help!
10 - Never mix chemicals (or perform tests) without your teacher's permission.
11 - Never mix chemicals without your teacher's permission.
12 - Never run (or push someone else) in the lab. (I let the kids know this rule applies at all times!)
13 - Keep lids on bottles and containers when not in use.
14 - Never use broken or chipped glassware.
15 - Keep your work area clean and keep all materials (clothing, hair, papers, etc.) away from a flame or heat source.
16 - Always clean up your work area and equipment after an experiment is completed Equipment must be returned to its proper place.
17 - Immediately notify your teacher if you get cut or have another injury when performing an experiment.
18 - Wash your hands before and after each experiment.

Scientific Method
Bikini Bottom Experiments

Answer Key

(1) Flower Power

SpongeBob loves to garden and wants to grow lots of pink flowers for his pal Sandy. He bought a special Flower Power fertilizer to see if will help plants produce more flowers. He plants two plants of the same size in separate containers with the same amount of potting soil. He places one plant in a sunny window and waters it every day with fertilized water. He places the other plant on a shelf in a closet and waters it with plain water every other day.

What did SpongeBob do wrong in this experiment? Explain.

SpongeBob did not provide both plants with the same amount of water and sunshine. In order to test the fertilizer correctly, both plants should have been placed in the sunny window and watered every day with the same amount of water. The only difference between the two plants should have been the fertilizer - one plant would be watered with the water with fertilizer and the other would be watered with plain water.

(What should SpongeBob do to test the effectiveness of Flower Power fertilizer? Write an experiment.

Answers will vary. Experiments should address the problems in SpongeBob's experiment.

(2) Super Snails

Gary is not the smartest snail in Bikini Bottom and believes he can improve his brain power by eating Super Snail Snacks. In order to test his hypothesis, he recruits SpongeBob and several snail friends to help him with the experiment. The snails ate one snack with each meal every day for three weeks. SpongeBob created a test and gave it to the snails before they started eating the snacks as well as after three weeks. Analyze the data in the chart and determine whether or not the Super Snail Snacks created smarter snails!

Based on the data provided, do the Super Snail Snacks work? Explain your answer.

The Super Snail Snacks appear to have worked for Gary and Barry. Both of them increased their test results after eating the snacks for three weeks. Larry did not show any improvement and Terry scored lower on his second test. However, it is difficult to determine if the Super Snail Snacks are an effective way to increase a snail's brain power based on this experiment alone as all the snails ate the snacks (no control group). The gains shown by Gary and Barry may have been due to the Super Snail Snacks, but further testing would be needed to make sure the results were not due to other factors.