THOSE WHO HAVE COME BEFORE ME

Student Section Student Name _____

This lesson demonstrates the benefits of learning from the experiences of past explorations.

During this lesson, you will

- collect data through careful observations.
- create a map based upon observations collected during exploration.
- develop a conclusion based upon the results of this activity.

Problem

How can I learn from past explorations?

Observation

Explorers are the people who, through trial and error, create new ways of doing things and going places. Sometimes explorers fail during their journeys, but, they learn through their mistakes, so that those who come after them will not make the same errors. Whether they are searching the ocean, the rain forest, a desert, or space, exploration ties them all together.

Materials

Per group

- section to explore (assigned by your teacher)
  - There will be five hidden items marked 1-5 in your section.
- 1 envelope
- 4 sheets of blank paper
- colored pencils or markers
- stopwatch, watch or clock

Safety

- Review classroom rules.
- Review lab safety rules.
  - Stay in authorized area.

Explorers expand our world. Portugal's Vasco da Gama succeeded in reaching India and returned with jewels and spices. Ferdinand Magellan, another Portuguese explorer, was the first to sail around the globe. In the name of Spain, the Italian explorer Christopher Columbus was the first to sail to the "New World". While searching for the "Fountain of Youth" the Spanish explorer, Juan Ponce de Leon reached Florida. Years later, Alvar Núñez Cabeza de Vaca landed on the west coast of Florida, claiming that land for Spain. His travels then took him across what are now Texas, New Mexico, and Arizona.

In our exploration into space, we have made many discoveries and we have learned many things. Even though we have only been traveling in space for a short time, our technology, our knowledge, and our world have improved drastically. Sending men and women into space does more than just explore the unknown; it brings a new understanding to our world and society.

> "This cause of exploration and discovery is not an option we choose; it is a desire written in the human heart. We are that part of creation which seeks to understand all creation."
>
> – U.S. President George W. Bush

In 1969, Apollo 11 astronauts Neil Armstrong and Buzz Aldrin earned their place on the roll of explorers when they became the first men to set foot on the moon. Today, crews of the space shuttle and the International Space Station are learning to live the unfamiliar environment of space. Soon, NASA will once again be sending explorers into uncharted territory as the United States Space Exploration Policy sends humans back to the moon, on to Mars, and beyond.

In this activity, your group will be required to finish an exploration as quickly and efficiently as possible. You will also leave information so that those who follow you will complete the journey faster and not make the same mistakes that you might have made.

Brainstorm: Make a list of people that you think are explorers. What traits do these explorers share?

Use the first column of this KWL chart to organize your observations about exploration. Brainstorm with your group what you want to know about exploration, then list in the second column of this KWL chart.

KNOW	WANT TO KNOW	LEARNED

Hypothesis

Based on your observations, write a sentence that will answer the "problem question" with your best guess about what will happen. (How can I learn from past explorations?) Your hypothesis should be written as a statement.

My hypothesis: _____

Test

1. As a group, go to your assigned exploration section for instructions.
2. Decide on a group name. Write the group name on the back of your envelope. This envelope will stay in this starting section.
3. Your teacher will assign each group member a role to play in the exploration. Roles include map maker, time keeper, recorder, and lead explorer.
4. The map maker will draw a map of your section. Your map should include a compass rose, a scale and a legend. Draw the large items in the section and include them in the legend, for example: chairs, computers, tables, etc.
5. Title your map "Exploration 1".
6. The time keeper will use the stopwatch to time the exploration.
7. You and your group members are on an exploration for 5 hidden items. These items are numbered 1-5.
    - The lead explorer must find the items in the correct number order. If the lead explorer finds an item out of order, your group cannot count it as "found" until the lead explorer has found the items numbered before it. For instance, the lead explorer can not count item #3 as "found" until he/she finds #1 and then #2.
    - When an item is "found" in order, leave it in its location and have the recorder mark it on your map.

8. During the exploration, the recorder will mark the exploration route on your map drawn by the map maker.
    - The recorder will draw on the map with a colored pencil or marker to show the route that was taken to find the items. The map should reflect the route of the lead explorer.
    - Draw one continuous line to show the exploration "path" making sure there are no breaks in your line "path".
    - Mark the following places on the map.
        - Starting point
        - Where each item was found.
        - Ending point.
    - All "wrong turns" should be tracked on the map. This means your map may be a bit messy.
9. Once all 5 items have been found in order and recorded, the recorder should write on the front of the envelope the time your group took to complete the exploration.
10. On the front of the envelope, beside your recorded time, have the recorder write one sentence from the group. This sentence will give the next group a clue for completing the next exploration more quickly.
11. Fold the map your group created and put it inside the envelope.
12. Leave the envelope in your section for viewing at the end of all the explorations.
13. Your teacher will have your group trade sections with another group.
14. Everyone in your group should choose a new role to play for each exploration.
15. Read the clue written on the envelope from the group before you. This clue may help you find the hidden objects more easily.
16. Do not look at the map inside the envelope.
17. Repeat steps 3-14 in order.
18. Your group will complete four explorations. Be sure to title each map with the correct exploration number 1-4.
19. When all 4 explorations are complete, go back to your starting section and retrieve the envelope with which your group started.
20. **Record the data** from all four explorations from the front of the envelope onto your Exploration Data Sheet.
21. With your group, compare the maps that were placed inside your envelope.

Study Data

After collecting the data on the Exploration Data Sheet, study the data by answering the following questions.

1. What was the most difficult part of your first exploration? Was this still a problem for you and your team when you started your last exploration?

2. Compare the maps inside the envelope. What changes do you see from one map to another?

3. How could we use “clues and maps” when exploring space?

4. Did your group perform the last exploration more efficiently than the first? Explain how you could have improved your time.

5. Why are maps of previous space explorations important to future explorers?

6. Explain how maps improve over time.

Conclusion

- Update the LEARNED column in your KWL chart.
- Restate your hypothesis and explain how the results do, or do not, support your hypothesis.

Exploration Data Sheet

Group Name:	
Student Name:	

This section should be filled in with the data from the outside of your group envelope.

Exploration	Time
1st Exploration	
2nd Exploration	
3rd Exploration	
4th Exploration	

Scientific Investigation Rubric

Activity: THOSE WHO HAVE COME BEFORE ME

Student Name _____ Date _____

Performance Indicator	0	1	2	3	4
The student developed a clear and complete hypothesis.					
The student followed all lab safety rules and directions.					
The student followed the scientific method.					
The student recorded all data and drew a conclusion based on the data.					
The student asked engaging questions related to the study.					
The student can explain the importance of correct recording of findings for future exploration.					
Point Total					

Point total from above: _____ / (24 possible)

Grade for this investigation _____

Grading Scale:

A = 22 - 24 points

B = 19 - 21 points

C = 16 - 18 points

D = 13 - 15 points

F = 0 - 12 points