Satellite Rescue—Measuring Pulse and Respiration

FAMILY INVOLVEMENT ACTIVITY

Introduction

This activity may be used when the mission is first introduced or near the end of the pre-mission activities. Students should have an idea of the role of each team during the mission.

Measure Respiration Rates

1. Measure respiration rates of each family member while seated. Try NOT to think about your breathing—just think about your counting. Try placing your hand in front of your mouth and counting the breaths. (You don't want to slow down and start taking deep breaths.) It usually helps to have one family member say, "One – Two – Three – GO!" and time everyone for 15 seconds as they count with their eyes closed. The timer calls "STOP!" when 15 seconds is up, and everyone records their count. Be careful, sometimes people start laughing if they look at someone else while counting their breaths.

2. Next, measure respiration rates again after doing 20 jumping jacks. You'll get a better postexercise measurement if you count for 15 seconds right after stopping, record the number, then multiply it by 4.

   Important! *If anyone in the family has leg problems, you can propose everyone do a different activity, such as 20 seconds of clapping or arm swings. If exercise is too difficult for a family member, that person could serve as a timer for everyone else and help to record the numbers.*

To calculate the percentage of increase in respiration rates:
The percentage increase is 100 times the difference between the two measurements divided by measurement at rest, or

$$\% = 100 \times \frac{\text{(Exercise Measurement-Rest Measurement)}}{\text{Rest Measurement}}$$

TABLE OF FAMILY RESPIRATION RATES AT REST AND AFTER EXERCISE

Family Member	**Respiration Rate at Rest**		**Respiration Rate After Exercise**		**Percentage Increase**
1=youngest	breaths/15 sec	breaths/min	breaths/15 sec	Breaths/min	%
Sample	*6*	*6 x 4 = 24*	*11*	*11 x 4 = 44*	*100 x (44-24) / 24 = 73*
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Questions

- Did everyone's respiration rate increase by the same percentage (or within 5 percent)?

- If not, can you think of any reasons why the rates might differ?

- Who in your family seems to be the most fit based on the percentage increase in after-exercise respirations (breaths)? Why?

Measure Pulse Rates

1. Measure pulse rates of each family member while seated. Then measure pulse rates again after doing 20 jumping jacks. You'll get a better postexercise measurement if you count for 15 seconds right after stopping, record the number, then multiply it by 4.

   Note: You will feel a strong, carotid artery pulse in your neck if you look up at the back corner of the room and move your fingers from the front of your neck toward the middle of the side of the neck. It's usually easy to find this point—on either side of your neck—where the thinner, harder trachea in the front meets the thicker neck muscle. It's even easier to find the carotid pulse after exercising. (The pulse is stronger when the heart is pumping harder.)

To calculate the percentage of increase in pulse rates:
The percentage increase is 100 times the difference between the two measurements divided by measurement at rest, or

$$\% = 100 \times \frac{\text{(Exercise Measurement-Rest Measurement)}}{\text{Rest Measurement}}$$

TABLE OF FAMILY PULSE RATES AT REST AND AFTER EXERCISE

Family Member	**Pulse Rate at Rest**		**Pulse Rate After Exercise**		**Percentage Increase**
1=youngest	beats/15 sec	beats/min	beats/15 sec	beats/min	%
Sample	*15*	*15 x 4 = 60*	*26*	*26 x 4 = 104*	*100 x (104-60) / 60 = 73*
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

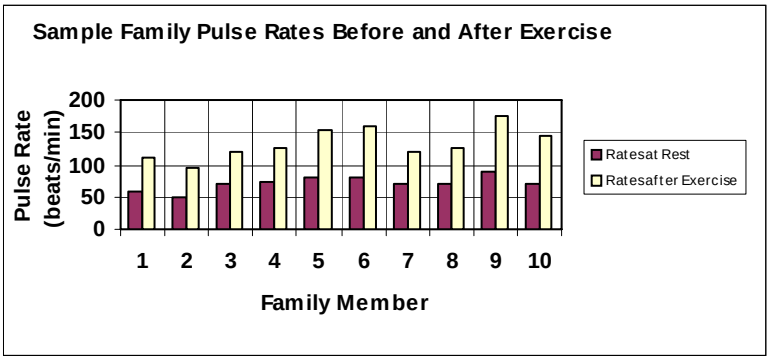
Questions

- Did everyone's pulse rate increase by the same percentage (or within 5 percent)?
- If not, can you think of any reasons why the rates might differ?
- Who in your family seems to be the most fit based on the percentage increase in after-exercise respirations (breaths)? Why?

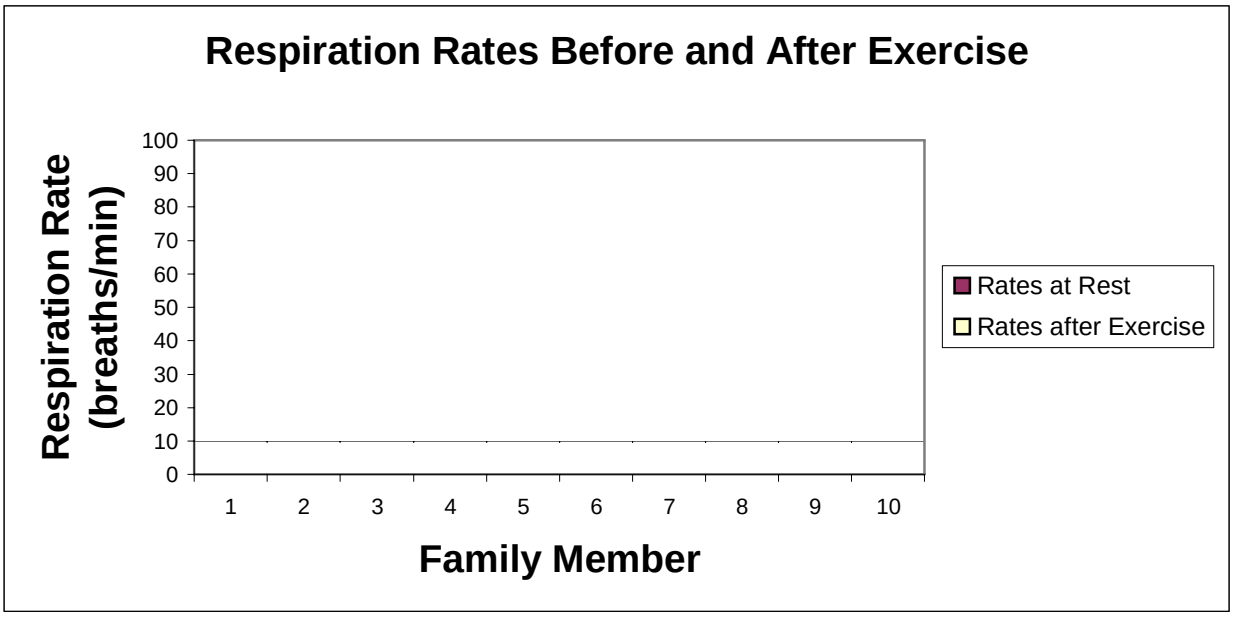
Make a Respiration Rate Bar Graph

After you have multiplied any rates taken in 15 seconds by 4 to calculate the respiration rates per minute, make a bar graph including the resting bar with the after-exercise bar to its right for each family member. See the sample graph. Write the respiration rate number above each bar.

SAMPLE BAR GRAPH OF FAMILY PULSE RATES AT REST AND AFTER EXERCISE



BAR GRAPH OF FAMILY- RESPIRATION RATES AT REST AND AFTER EXERCISE



Make a Pulse Rate Bar Graph

After you have multiplied any rates taken in 15 seconds by 4 to calculate the pulse rates per minute, make a bar graph including the resting bar with the after-exercise bar to its right for each family member. See the sample graph. Write the pulse rate number above each bar.

BAR GRAPH OF FAMILY PULSE RATES AT REST AND AFTER EXERCISE