

Activity 3.1.2: The Rule of Threes (Optional)

Introduction

With each breath, we take in oxygen that feeds our cells and fuels the production of energy. Water nourishes our tissues and helps regulate the level of chemicals in the body. The carbohydrates, proteins and fats that we ingest in food supply energy, as well as build materials the body uses for growth and maintenance. Each of these resources is vital to human survival. But how long can the body last when one of these resources reaches a critical low?

In Activity 3.1.1, you read the incredible story of Mauro Prosperi. Somehow, he beat the odds and managed to survive under unimaginable conditions. The human body has the ability to adapt to internal and external changes and to conserve valuable resources. In this activity, you will continue your exploration of fuel and power in the body and debate the validity of a survival rule: The Rule of Threes. You will discuss how factors unique to the person or the environment may help that person survive in the absence of vital resources or, sadly, push him/her closer to the edge. You will continue to add information to the chart you started in Activity 3.1.1.

Equipment

* *Powering the Human Body* chart from Activity 3.1.1
* Laboratory journal
* Computer with Internet access
* Discovery Channel *Human Body: Pushing the Limits* DVD or Internet clip

Procedure

Many survival guidebooks reference the *Rule of Threes*, rough estimates for how long a person can last without key resources. This rule states that a human can live:

* 3 minutes without air
* 3 days without water
* 3 weeks without food
1. With your team of four, discuss how the *Rule of Threes* compares to the estimates you came up with in Activity 3.1.1. Discuss why these rules may not apply to every person in every environmental situation.
2. Work with your partner to brainstorm factors in the environment that may speed up or slow down this “time to empty.” Add these factors to the chart. Think back to the story of Mauro Prosperi. Did the high temperature of the desert impact his body’s key resources?
3. Brainstorm factors unique to the individual that may speed up or slow down these estimates. For example, Mauro was 39 years old. Do you think he would have lasted as long as he did if he were in his 60s? Add these factors to the chart.
4. Share your findings with the class.
5. Update the chart in your laboratory journal.
6. In your laboratory notebook, write the “Rule of Threes.” Compose a “disclaimer” to go under the rule. What would a sports enthusiast or a traveler need to know about the factors that can affect how long the body can last in an energy crisis?
7. Visit the Discovery Channel – Human Body: Pushing the Limits website at <http://dsc.discovery.com/tv/human-body/explorer/explorer.html>. If your teacher shows the clip on the DVD, skip to Step 10.
8. Click the bottom tab that says, “Strength.”
9. Choose video number “3” on the right side of the screen and watch the clip about managing your fuel reserves.
10. Answer the conclusion questions.

Conclusion

1. How did the swimmer in the video prepare for the energy demands he was about to place on his body?
2. How did his body manage his fuel reserves? What macromolecules did his body look to first for energy? What did his body do when this resource ran out?
3. List the body systems that were affected during Mauro Prosperi’s journey across the desert. Describe how you think he was able to last as long as he did. Think about how his body would deal with his environment and how Mauro could work to conserve his energy resources.
4. What type of meal would a long distance runner or swimmer want to eat the night before a grueling race? Explain your choices.