



Survival: The Human Body in Extreme Environments

Middle Level Lesson Plan

Topic Human body systems and how they respond to stressors

Grade Levels 7-8

Overview

As we human beings go about our day-to-day routines, we are generally unaware of all the activities and processes that take place in our bodies to maintain and monitor our well-being. All of us have undoubtedly shivered to keep warm on a frigid day, been drenched in sweat on a hot day, or experienced wobbly legs after a particularly intense athletic endeavor. These symptoms indicate that our bodies are in an unbalanced state of some sort, reacting to some type of systemic stress. Although our body systems have various “built-in” strategies to remedy imbalances, how far can those systems be pushed before there are detrimental or irreversible effects? This episode of *QUEST* – Survival: The Human Body in Extreme Environments – explores what science has taught us about our chances of survival. Why is it that some people manage to survive in the most extreme environments? What can others do to increase their chances of survival?

Introduction

In this teaching unit, students will learn about how the human body copes with stressors, whether physical or psychological. Some stressors can appear suddenly in the physical environment; the caveman’s fight-or-flight response, for example, was a reaction to this sort of stimulus. Other stressors can be less tangible and less unexpected; for example, taking a test would be a stressor for most people today. A stressor can actually be any change in the physical or mental environment.

At the end of this teaching unit, students will be able to:

- Name and describe the major systems that work together as a unit to monitor and regulate the human body as it goes about its business of securing the essential requirements for life.
- Identify specific human features and/or behaviors that enable people to monitor and maintain a healthy balance in their bodies.
- Describe warning signs of certain extreme physical stressors (e.g., signs of hypothermia, frostbite, heat exhaustion, etc.), and list prevention strategies for these conditions.
- Describe and give examples of positive effects on the body as a result of physical stressors.
- Describe the characteristics of certain “built-in” coping mechanisms that can help the human body deal handle stressors (e.g., the “fight-or-flight mechanism”).

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Time Allotment Four to six 45-minute class periods.

Accessing Prior Knowledge

This *QUEST* teaching unit would perhaps be most effective if it were to follow a unit of study on the structure and function of human body systems or as part of an interdisciplinary unit on survival. Before viewing this episode, students should have a firm understanding both of certain biological systems and their components (e.g., cells/tissues/organs/systems/body) and of how those systems work together. In particular, students should be aware of the connection between the circulatory and respiratory systems, since this will help them understand how the body handles stressors introduced under the extreme survival conditions depicted in the video.

Concepts to Clarify

Research cited in Benchmarks for Science Literacy indicates that students of all ages have difficulty understanding the interconnectedness of body systems. Keep this in mind as you facilitate and monitor student progress throughout this unit. Students will need to be reminded of these connections, and many will need direct support in order to see integrated relationships among the different body systems.

This *QUEST* program refers to fisherman's hands adapting to freezing conditions and mountain climbers' bodies producing more red blood cells in response to lower oxygen levels at higher elevations. It is important to make the distinction with students between the types of changes that can occur in a rather short amount of time (for example, in one lifetime or even within minutes) as the body tries to maintain homeostasis, and the types of evolutionary adaptations that happen over much longer time periods. Many students have the tendency to associate the term adaptation inaccurately with an organism's instantaneous reaction to an environmental condition by modifying its body structure or behaviors to survive. It is critical for students to understand that adaptation is an evolutionary process that happens to organisms over many generations; organisms cannot "will" changes to occur; adaptation is not a conscious decision.

As you implement these lessons and activities, avoid imparting too much biochemical detail to your students (e.g., biochemical feedback and homeostasis) that is best suited for the high-school curriculum. The focus here should be on getting students to understand how systems work together to regulate and maintain the human body at a macro level. Students should recognize that one of the reasons the body can regulate and maintain itself is because its systems are interconnected, constantly "talking to one another," which results in some bodily response.



CONNECTIONS TO THE STANDARDS

National Science Education Standards	Benchmarks for Science Literacy	Maine Learning Results	New Hampshire Curriculum Framework	Vermont Learning Standards
<p>Life Science (5-8)</p> <p>Structure and Function in Living Systems</p> <p>5. The human organism has systems for digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease. These systems interact with one another.</p> <p>Regulation and Behavior</p> <p>1. All organisms must be able to use resources, grow, reproduce, and maintain internal stable conditions while living in a constantly changing external environment.</p> <p>2. Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required to survive.</p>	<p>Chapter 6A: Human Identity (6-8)</p> <p>1. Like other animals, human beings have body systems for obtaining and providing energy, defense, reproduction, and the coordination of body functions.</p> <p>Chapter 6C: Basic Functions</p> <p>1. Organs and organ systems are composed of cells and help to provide all cells with basic needs.</p> <p>3. To burn food for the release of energy stored in it, oxygen must be supplied to the cells, and carbon dioxide removed. Lungs take in oxygen for the combustion of food and they eliminate the carbon dioxide produced. The urinary system disposes of dissolved waste molecules, the intestinal tract removes solid wastes, and the skin and lungs rid the body of heat energy. The circulatory system moves all these substances to or from cells where they are needed or produced, responding</p>	<p>C. Cells (5-8)</p> <ul style="list-style-type: none"> - Describe the structure and function of major organs in human systems. - Describe how body systems work together. <p>Physical Education (5-8)</p> <p>C. Personal and Social Interactions</p> <ul style="list-style-type: none"> - Apply decision-making process to the safety of themselves and others in activity settings. <p>Health (5-8)</p> <p>C. Health Promotion and Risk Reduction</p> <ul style="list-style-type: none"> - Develop injury prevention and response strategies for personal safety, including first aid. - Demonstrate ways to avoid or change situations that threaten personal safety. 	<p>Life Science</p> <p>3d. Curriculum Standard 5: (Grade 6)</p> <ul style="list-style-type: none"> - Describe/identify major organ systems of the human body, state their major functions, and describe some of their interactions, e.g., the heart and lungs working together in respiration. <p>Unifying Themes and Concepts</p> <p>6a. Curriculum Standards 1-3:</p> <ul style="list-style-type: none"> - Identify and describe the essential parts of any object or system. - Relate structure and function of parts of any object in a system to the system as a whole. - Describe the interrelationships among the parts of an object or system. 	<p>Systems (5-8)</p> <p>7.11.aa.</p> <p>Demonstrate understanding that systems are connected to other systems, and that one system affects how others work</p> <p>The Human Body (5-8)</p> <p>7.14.bb.</p> <p>Demonstrate an understanding of the human body systems for obtaining and providing energy, defense, reproduction, hormones, immunity, and coordination of physical functions.</p>



CONNECTIONS TO THE STANDARDS Continued

<p>3. Behavior is one kind of response an organism can make to an internal or environmental stimulus. A behavioral response requires coordination and communication at many levels, including cells, organ systems, and whole organisms. Behavioral response is a set of actions determined in part by heredity and in part from experience.</p>	<p>to changing demands.</p> <p>5. Interactions among the senses, nerves, and brain make possible the learning that enables human beings to cope with changes in their environment.</p> <p>Chapter 6F: Mental Health</p> <p>1. Individuals differ greatly in their ability to cope with stressful situations. Both external and internal conditions (chemistry, personal history, values) influence how people behave.</p>			
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Materials Needed

- TV with VCR
- QUEST *Survival* video
- Computers with Internet access for student or teacher use (to download articles)
- A variety of human body resources for Classroom use.
(Use resource section: non-fiction reference books, textbooks, etc.)
- Notebook (1 per student)
- Poster paper 22" by 28" (1 per group)
- 1 copy per student of each of the following reproducible activities:
 - Student Handout 1: Body Basics
 - Student Handout 2: Survival Issues
 - Student Handout 3: QUEST at Home: Play It Safe!



I. Introducing the Concepts

In the first activity, students will have an opportunity to review human body systems using a chart and available classroom resources. The activity is designed not only to remind students of the overall role the major body systems play in sustaining life, but to make them more aware of the regulatory role and monitoring capabilities of each of these systems.

Activity I: Body Basics

Step 1

Introduce students to the activity by explaining that, as they already know, the human body has a number of systems that help it obtain the essential requirements for life. Review with students the following facts about the systems of the human body:

- They have ways to obtain food and extract energy from it.
- They have ways to protect us from sickness and injury.
- They have mechanisms to coordinate internal and external movement.
- They have developed ways to keep our species going.

Step 2

Explain to students that, since they now know some details of various body systems, they will begin to focus more on the interactions among these systems. They will also consider what mechanisms the body has in place to coordinate all of these systems. Ask students, for example:

- How does the body “know” when it needs more oxygen?
- What body parts are involved in detecting this?
- What responses occur in the body?

To help illustrate these concepts, you may want to suggest a sample scenario of running a mile. Ask students to describe what they’ve experienced firsthand during this type of activity. Try to elicit responses from students indicating that somehow, as they were running, their bodies sensed the need for more oxygen and reacted accordingly. Tell the class, “This means that our bodies have ways to monitor and regulate themselves as a whole.”

Step 3

Distribute copies of Student Handout I: Body Basics. Instruct students to work in pairs to complete the chart using the available classroom resources. (See suggestions in the Resources section at the end of this teacher guide.) Explain to students that in the “Signs of Stress” column they should list (visible) symptoms/shifts that occur once a system has been overloaded or stressed. In the column labeled “Regulatory Role,” students are to list ways in which this system specifically contributes to the overall monitoring of the body.



Step 4

Circulate as students work to complete their charts, clarifying as needed and assisting them in locating information.

Step 5

When everyone has completed the assignment, have pairs of students share their findings with other student pairs. This will allow them to add data and/or clarify the information they have already entered in their charts.

Step 6

Reconvene in a large group and ask students if there were parts of the chart they had difficulty filling in. Have student volunteers help fill in any remaining trouble spots and/or brainstorm possibilities as a group; then discuss how this information could be verified. **Note:** Direct students to save Student Handout 1 for future activities.

2. Exploring the Concepts

In the next activity, students will create an analogy that compares and contrasts how (at least) two body systems work together to monitor and regulate the processes necessary for life.

Activity 2: Examining Analogies

Step 1

Begin this activity by making certain that students grasp the concept of an analogy. Provide examples of analogies to help them understand the goal of the assignment. (See Resources section for suggested analogy examples.)

Step 2

Brainstorm a list of things that could be used in students' analogies to body feedback systems. Ideas might include: household thermostat, short-order cook at a restaurant, basement sump pump, baseball or softball players caught in a game of "pickle," water pressure (pump) in a house, cafeteria staff serving students in the hot lunch line, car cruise control, refrigerator/freezer, melting chocolate on a stove without burning it, etc. Try to help students select items that are self-monitoring in some way – items that provide feedback and adjust themselves accordingly.

Step 3

Now arrange the class into groups of four. Direct each group to work on creating an analogy. Explain that each group's analogy should describe how at least two human body systems work together. Each analogy should make a comparison that incorporates one of the items in the brainstormed list from Step 2 above. Key to the success of this project will be students' knowledge of how the selected body



systems work together and an understanding of the inner workings of the item they have selected from the brainstormed list.

Encourage students to use their Body Basics charts on Student Handout 1 as a guide. Also suggest that they may wish to find out more about the inner workings of the item they have chosen to use in their analogy by doing additional research. Tell the class that each group's final product should consist of a written description accompanied by a visual aid which details the similarities between the two human systems in question and the item being used in the analogy. Set a reasonable due date for the product to be completed.

Step 4

Display completed projects around the classroom or on student tables. Explain to students that analogies are a type of model. Discuss the purpose of using models, and elicit the idea that while models can help us understand concepts, models have limitations and are not perfect (nor are they meant to be).

Step 5

Now have students visit the various projects set up around the room. Encourage them to keep in mind the prior discussion of models. Have students work individually to jot down how each project is both like and unlike the body systems the group selected to model. Ask students to cite specific reasons for their opinions, particularly focusing on the positive aspects of why each analogy works well to illustrate the system the group chose.

Step 6

Conclude this activity by having the whole class share the notes they made as they circulated through the room. Be certain to discuss where the analogies worked well and where they did not. As the sharing of opinions progresses, stress the regulatory/feedback/monitoring aspects of the analogous systems described.

Step 7

Save the analogies from this activity for use later in this teaching unit. Pique students' curiosity by posing the question, "What would happen if . . .," introducing a specific stressor to each group's analogy. At this point, you should not be looking for an "answer" as to what would actually happen, but simply setting the stage for the next lessons.

3. Developing the Concepts

In the next activity, students will view the *QUEST: Survival* video to learn firsthand about the experiences of a few New England people who have survived the harsh conditions of certain extreme environments. This activity helps students to further develop their ideas about limits and gets them thinking about the effects of such extreme conditions on the human body. The video also introduces students to the physiological signs of stress and some key elements of survival.



Activity 3: QUEST: Survival Video

Step 1

Set the stage for viewing the video by explaining to students that this episode of *QUEST* tells the story of three individuals from the New England area who have survived some amazing circumstances. Before playing the video, instruct students to think about the conditions these individuals were exposed to, and tell them to make note of how the people's bodies responded. It may be helpful for students to have their Body Basics charts (Student Handout 1) as they view the program.

Step 2

Play the video. (This may need to be done over two class periods, depending on the structure of your instructional time.)

Step 3

Using chart paper or the classroom board, generate a list of "survival issues" with students after viewing the video. Save this list for the activity that follows.

4. Synthesizing and Applying the Concepts

In Activity 4, students will be given a survival issue to further research. Using information from the video and additional resources, they will note the effects of these stressors on the body systems they included in their earlier analogies. Students will then be asked to think of a way to introduce a survival issue to their existing analogies.

Activity 4: Survival Issues

Step 1

Explain to students that the next activity will help them rethink their analogies with respect to an added "player" – a survival challenge. Help the class use the list they started in Activity 3 to create a master list of conditions that can threaten human survival. The list can include situations that are not mentioned in the video (e.g., exposure to heat, exposure to cold, lack of food, lack of water, high altitude [low pressure], being underwater [high pressure], being in space [new pressures and gravity issues], etc.).

Step 2

Have students reconvene in their working groups of four. Instruct each group to select a condition from the master list and find out how it impacts the systems they investigated in their initial analogy. Support students as they conduct research using available classroom resources. (See the Resources section below for suggested Web links. **Note:** You may wish to preview these sites and add or delete sites to tailor the list more closely to your students needs. Some sites are most appropriate for teacher use, other sites are appropriate for students.)



Step 3

When all groups have completed their research, instruct them to introduce their chosen survival condition into their earlier analogies. Have each group adapt their analogy to reflect the effects of their survival issue on the body systems involved. They should edit their initial written description and use sticky notes in key places on their visual aid to demonstrate this impact. Circulate among the groups as they are working, pose questions, and offer support and guidance.

Step 4

Have students post their drawings on the board and on classroom walls. Then hold a “gallery walk,” providing each student with one or two sticky notes that they can use to post questions that they might have about particular features on other students’ drawings.

Facilitate the wrap-up by synthesizing the results: point out key adaptations, request explanations of drawings that have received multiple sticky-note questions.

Distribute copies of Student Handout 2: Survival Issues. Have groups present their revised analogies to the class. Direct students in the audience to make notes about the different survival conditions presented. They should use the chart on Student Handout 2 to help them organize their notes. At the close of each group presentation, review with the class to make sure that all key points have been adequately captured.

Step 5

Ask students the following series of questions:

- What can we humans do to better equip ourselves to cope with and to survive extreme environments?
- Are there things we can do to better increase our chances of survival?
- Are there some things that are simply out of our (conscious) control?

In this closing discussion, recap some of the ideas presented by the survivors in the video. Be sure to reinforce the following key concepts:

- There are certain things we can do to help us survive stressful situations – like planning, preparation, and training.
- On the other hand, there are many other automatic and reflexive responses that human beings have great difficulty anticipating -- for example, the “fight-or-flight” reaction that kicks into gear when we feel threatened. This is a natural response due to a release of hormones (adrenaline). Students have undoubtedly experienced this in their lives already – perhaps just before taking a big test, or while participating in some type of sporting event.

Review with students some of the reasons given by the people in the video for why they believe they survived their ordeals (beyond just being lucky!). Reasons include the following: (1) preparation and training (mental and physical conditioning); (2) sheer will (mental stamina to believe in survival, reason to survive); (3) the ability to suppress the “fight-or-flight” response (individual stayed calm, didn’t panic, and could still think clearly).



5. Extending the Concepts

Activity 5: QUEST at Home

Many of the individuals profiled in the *QUEST* video were participating in a recreational activity. In preparing for their trips, they had gathered the necessary equipment for their adventure, had experience and proper training, had planned the route and timing of their outing, and checked conditions before venturing out. In the next activity, students will work with their families to develop a plan for a safe recreational activity.

Step 1

Distribute copies of *QUEST* at Home: Play It Safe! Review the handout with the class to make sure that everyone understands the assignment.

Step 2

Set a realistic deadline for students to return to class with their completed work. Provide assistance and encouragement along the way as needed.

Community Connections

Consider one or more of the following suggestions as a way to make the concepts taught in these lessons more meaningful to your students.

- What emergency rescue services are available in your community? What personnel, equipment, and procedures are in place to assist humans in emergencies such as those mentioned in the video? Are there individuals in the community who have specialized training in mountain or sea rescue, for example?
- In many communities, scouting, hunter safety, and Outward Bound-style programs include survival education as a component of their training. Get involved to find out more!
- Are there people living in your community who participate in recreational activities or who work in extreme conditions like the ones described in this *QUEST* episode? If possible, find out first hand from people who have experienced situations, such as what is it like to go to work on the top of Mt. Washington, in Antarctica, or out at sea on fishing expeditions.

Career Opportunities

A number of careers are associated with human survival. Here are a few you may want to encourage your students to explore:

- Wilderness guides, such as Maine Guides, who are specially trained and certified to assist individuals and groups on recreational adventures.
- Search and Rescue teams, such as the Coast Guard.
- Manufacturers and retailers specializing in recreational equipment (e.g., L. L. Bean).
- Chemical engineers and other technicians who develop new materials for clothing, shelters, and gear. These professionals work with new materials used to help people “extend and protect” their natural abilities to survive (like makers of performance clothing such as fleece, survival suits, etc.).
- Doctors, nurses, and other health-care professionals.
- Trainers and therapists involved in conditioning and rehabilitation following an emergency.
- Scientists, like Dr. Kenefick, who work in physiology labs to understand the biomechanics of the exercising human body. Other scientists might include astrobiologists, who work on understanding the body in space, or biochemical researchers.



Resources

The following two books were written by people showcased in the *QUEST* video:

Snow in the Kingdom: My Storm Years on Everest, by Ed Webster (2000)
Published by Mountain Imagery, PO Box 35, South Freeport, ME 04078.

Blind Corners: Adventures on Everest and the World's Tallest Peaks, by Geoffrey Tabin (2002) Published by The Lyons Press, Guilford, CT (Globe Pequot Press).

The following book, which Ed Webster mentions reading at age 11 and which inspired his climb, is unfortunately out of print. However, copies can be found on the Web:

Everest Diary: Based on the Personal Diary of Lute Jerstad, One of the First Five Americans to Conquer Mount Everest, by John D. McCallum, Foreword by James Ramsey Ullman. (1966) Originally published by Follett Publishing Company, Chicago and New York.

OTHER PRINT PUBLICATIONS

The Way Life Works by Mahlon Hoagland and Bert Dodson (1995) Published by Times Books, New York. (Chapter 8, on feedback, is especially helpful as background information for teachers. This book also contains a number of analogies to help explain complex biological concepts.)

Young-Adult Literature:

Lost on a Mountain in Maine by Donn Fendler, as told by Joseph B. Egan.
This is a classic survival tale; every Maine student should read it!

Island of the Blue Dolphins by Scott O'Dell
According to an annotation from Barnes & Noble: "Left alone on a beautiful but isolated island off the coast of California, a young Indian girl spends eighteen years, not only merely surviving through her enormous courage and self-reliance, but also finding a measure of happiness in her solitary life."

Hatchet by Gary Paulsen
According to an annotation from Barnes & Noble: "After a plane crash, thirteen-year-old Brian spends fifty-four days in the Canadian wilderness, learning to survive with only the aid of a hatchet given him by his mother, and learning also to survive his parents' divorce."

CD-ROM

The Ultimate Human Body 2.0 by Dorling Kindersley

GAME

The Worst Case Scenario Survival Game by University Games
This game, based on the book series, presents players with various survival situations. Get it right and you



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move ahead. Get it wrong and your opponent moves ahead -- and you are left to cope in the wilderness. Situations presented are challenging and may prompt students to find out more!

WEB SITES

Human Body Systems:

<http://www.bbc.co.uk/science/humanbody/body>

This site was designed to support BBC programming called In Human Body & Mind. The site includes engaging graphics and solid, easy-to-understand written information. Portions of the site are interactive. It contains information on coordination of some body systems and much information on body organs.

http://kidshealth.org/teen/your_body

Developed by the Nemours Foundation (Nemours Center for Children's Health Media), this site is doctor-approved. Designed for teens, the information on this site is understandable, accurate, and interesting to read. The Body Basics Library contains solid information about a number of human body systems.

<http://yucky.kids.discovery.com/noflash/body/pg000133.html>

From the Discovery Channel – “The Yuckiest Site on the Internet,” this very kid-friendly site is appropriate for middle-level students. Use the pull-down menu to select a body system to investigate.

<http://www.ama-assn.org/ama/pub/category/7140.html>

The American Medical Association's “Atlas of the Human Body” contains images and facts about human body systems.

<http://www.campusprogram.com/reference/en/wikipedia/h/ho/homeostasis.html>

This is an excellent source of background information for teachers on homeostasis, including homeostasis in the human body.

Analogies:

<http://www.coe.uga.edu/edpsych/faculty/glynn/twa.html>

This site provides examples of analogies that are appropriate for middle-school students. It includes background information, procedures, and cautions for using analogies in the classroom.

http://agpa.uakron.edu/k12/best_practices/using_analogies.html

Here is an excellent source for teacher background on using analogies to teach science concepts. It includes a narrated video clip of the strategy in action.

Survival Issues:

<http://www.princeton.edu/~oasafety/>

This site offers a comprehensive guide to outdoor safety and first aid. It contains information best used by teachers to develop background knowledge.

Frostnip, Frostbite, and Hypothermia:

http://www.coolantarctica.com/Antarctica%20fact%20file/science/cold_humans.htm

This site was developed by a teacher to share his extensive experience and knowledge gained while working in Antarctica. The site is user-friendly, interesting, practical, and informative. There are references to “adapting” to the cold.

<http://www.skylarkmedicalclinic.com/warm.html>

Developed by Skylark Sports & Medical Travel organization, this site lists signs and symptoms of stress, prevention tips, and effects on the body.

<http://www.osha.gov/Publications/OSHA3156.pdf>

An OSHA (Occupational Safety and Health Administration) document, this cites potential conditions for hypothermia, its effects on body, what should be done as a response to hypothermia, etc.

Heat Exposure (Overheating):

<http://www.skylarkmedicalclinic.com/cool.html>

This is another link from the Skylark Sports & Medical Travel organization.

Altitude Sickness:

<http://www.high-altitude-medicine.com/AMS.html>

From the International Society for Mountain Medicine, this site has information on signs and symptoms of this condition, effects on the body, how to avoid getting sick, and what to do if altitude sickness occurs. The site is perhaps best for teacher background; some parts could be suitable for middle-school students.

<http://www.americanheart.org/presenter.jhtml?identifier=4618>

From the American Heart Association, the Web site lists symptoms, what causes altitude sickness, and prevention suggestions.

Decompression Syndrome (“the Bends”):

<http://health.discovery.com/encyclopedias/3220.html>

This site, from Discovery Health Channel, lists signs and symptoms, causes and risks, and prevention strategies for avoiding decompression syndrome. It includes a pop-up diagram of the respiratory system.

Extension: How Does the Human Body Maintain Homeostasis in Space?

http://www.nasaexplores.com/show2_5_8a.php?id=04-010&gl=58

This site contains an article written for middle-school students describing how the body maintains homeostasis in outer space. It could be used as an extension or follow-up reading at the end of this teaching unit.



Body Basics

Directions: Using the resources available in your classroom, complete the following chart.

Body System	Components <i>(Organs, tissues, specialized cells)</i>	Signs of Stress	Regulatory Role
Respiratory			
Circulatory			
Digestive			
Nervous			
Endocrine			
Muscular			
Skeletal			



Survival Issues

Directions: Use the chart below to help you organize your notes during group presentations.

Survival Issue	Warning Signs	Specific Effects on Body System



Play It Safe!
You're on a Quest!



Imagine that you and your family are planning an extended or multi-day recreational activity – such as a boating trip, hiking expedition, or winter camping trip. With your family, plan what equipment and supplies you would need to take along.

Consider what type of training and preparation you could do as you plan for the activity. Be sure to keep in mind the abilities and ages of your family members as they relate to the conditions you are likely to face.

1. Describe where you would go and what you would do: _____

2. With your family, discuss survival issues and how they impact the human body, using information that you learned from the QUEST episode. Would your family be prepared for an emergency during this activity?

With your family, make a “survival kit” that could be used in the event of a wilderness/aquatic emergency. What items would you include? Why? Which item(s) do you think would be the most valuable, and why? What else would you need to think about in preparation for your outing? _____

