

## **Helping Hands** (60 minutes)

### **Section**

Your Safety, Diseases

### **Investigative Questions**

What health issues threaten a community after a natural disaster strikes? What agencies respond and what steps do they take to reduce the danger of disease?

### **Description of Content**

Students research the types of diseases and health crises that frequently arise in the wake of a natural disaster, with special focus on disasters in the United States that cause flooding. Then, they explore ways in which the Centers for Disease Control and Prevention (CDC), and other emergency agencies, work to mitigate the health dangers when a disaster occurs.

### **Relevant Standards**

This activity fulfills [science and health education standards](#).

### **Objectives**

Students will:

- Research and describe health issues that threaten a community after a natural disaster that causes flooding strikes
- Research and describe how the CDC and other agencies respond to mitigate the danger of disease following a natural disaster

### **Ideas and Behaviors Common Among Students**

This activity offers information from the literature on [ways students think and act when exposed to large-scale stress](#), such as natural disasters.

### **Materials**

- Student Reproducible 1: *Helping Hands*
- Access to online reference materials or newspapers, magazines, almanacs, and an encyclopedia
- Student Reproducible 2: *Planning for an Emergency*

### **Safety**

Normal classroom safety procedures should be observed.

## Teacher Background

While the odds of being the victim of a natural disaster are low, children who suffer such an experience are at risk for post-traumatic stress disorder. But even children who are exposed only to the pervasive coverage by the news media of natural disasters can be worried that the disaster will happen to them, and that they may be separated from their family and friends. Working with students so they accurately assess their risk, understand the nature of media coverage of these events, and develop an emergency preparedness plan can help them reframe the problem and reduce their stress. This activity, as well as another *BAM! Body and Mind™* activity entitled “Are You At Risk?” at [www.bam.gov/teachers/disasters\\_risk.html](http://www.bam.gov/teachers/disasters_risk.html), is designed to help you help your students better understand natural disasters, and overcome the anxiety associated with them.

One important task for teachers is to remind students that while the world is full of surprises, the really big ones don't happen very often and don't affect the vast majority of people. Terrible as hurricanes, floods, tsunamis (series of waves when water is rapidly displaced on a massive scale), blizzards, wild fires, and avalanches (large snow or rockslides) are, most people are *not* directly affected, except for the very real concern that they feel for other human beings.

When natural disasters do hit, the health concerns associated with them are manifold. After the rescue of survivors, the primary public health issues are clean drinking water, food, shelter, and medical care for injuries. Loss of shelter leaves people vulnerable to insect exposure, heat (or cold), and other environmental hazards. According to the CDC, over the long term, public health agencies must: monitor for environmental, infectious, and food-, water-, or insect-transmitted diseases; restore normal primary health services and water systems; advise on safe housing; and assist the community to recover mentally and socially when the crisis has subsided.

In areas where natural disasters have occurred one of the biggest problems is flooding. Not only does flooding impede the recovery and rebuilding process, but floodwaters also can pose serious health risks such as the contamination of water and food supplies and the rapid spread of disease. This activity focuses on the disasters associated with flooding that commonly strike the United States.

There is a great deal of easy-to-read information on natural disasters and how to prepare for them on the Web. The U.S. Department of Homeland Security hosts Ready.gov ([www.ready.gov/index.html](http://www.ready.gov/index.html)) with a special section on natural disasters at [www.ready.gov/america/natural\\_disasters.html](http://www.ready.gov/america/natural_disasters.html). From this page, you can access the Federal Emergency Management Agency (FEMA) fact sheets on natural disasters including earthquakes, hurricanes, floods, landslides, volcanoes, and others. Each of these fact sheets includes information on the areas within the United States most at risk for natural disasters, as well as the science behind why the disaster happens. FEMA is the first responder to all natural disasters in the United States.

The CDC assists in natural disasters taking place in the United States and around the world. After a natural disaster, teams from CDC and other emergency response groups

(governmental and private) work with local and state agencies to address public health issues. The CDC also has information on specific natural disasters at [www.bt.cdc.gov/disasters/](http://www.bt.cdc.gov/disasters/). For example, the hurricane site, which can be found at [www.bt.cdc.gov/disasters/hurricanes/](http://www.bt.cdc.gov/disasters/hurricanes/), contains useful information on emergency preparedness and response before, during, and after a hurricane, as well as key health issues that arise after hurricanes, such as flooding.

While this lesson specifically focuses on natural disasters, it is important to note that students' responses to stress from man-made disasters (such as violence) are similar to their responses to natural disasters. Many of the techniques that reduce stress from natural disasters are also effective in the event of a man-made disaster.

### **Procedure**

#### *Engagement (5 minutes)*

1. Ask students what they know about the health issues that affect communities after natural disasters. What are some of the problems that communities face after the tornado is over or the hurricane has subsided? List these responses on the board. (Answers will include treating injuries, restoring a clean water supply, providing food and shelter, and preventing the transmission of disease.)
2. Ask students if they know one of the simplest ways to reduce the spread of disease. (Answer: The most important thing that you can do to keep from getting sick is to wash your hands. By frequently washing your hands, you wash away germs picked up from other people, contaminated surfaces, or animals.) You may want to refer students to the hand washing section of the *BAM!* Web site, The Buzz on Scuzz, at [www.bam.gov/sub\\_yourbody/yourbody\\_buzz\\_how.html](http://www.bam.gov/sub_yourbody/yourbody_buzz_how.html). Students also can find information on the main CDC Web site at [www.cdc.gov/germstopper](http://www.cdc.gov/germstopper). It is important to note that some disaster areas are left without soap and clean water. In these cases, alcohol-based hand wipes or gels are the best way to clean hands.
3. Has your students' own community been through a natural disaster? What health hazards developed, if any? Why?

#### *Exploration (20 minutes)*

1. Have students work in groups. Distribute Student Reproducible 1: *Helping Hands*. Assign half the class pages 1 and 2 of the reproducible and the other half pages 3 and 4.
2. Using the CDC site below and other reference materials, ask students to research the diseases that threaten communities in the United States struck by natural disasters that cause flooding. What are the causes of each health threat? What are the treatments specific to each particular threat? (Answers: See answer page and [www.bt.cdc.gov/disasters/](http://www.bt.cdc.gov/disasters/).)

3. What steps do the CDC and other health workers take within the first weeks of a natural disaster that causes flooding to limit the spread of disease? (Answer: See answer page and [www.bt.cdc.gov/disasters/floods/](http://www.bt.cdc.gov/disasters/floods/).)
4. Once students have compiled the data, have them complete their group's pages of the *Helping Hands* reproducible.
5. After students have completed the chart, have them discuss the answers in their small groups, followed by a discussion led by you with the whole class.

*Explanation* (10 minutes)

1. Discuss with students the health problems caused by floods and flooding after a natural disaster occurs. Review the answers they researched from the completed *Helping Hands* reproducible. When natural disasters that cause flooding strike, such as hurricanes, medical and public health workers become concerned about diseases such as *Escherichia coli* (*E. coli*) and hepatitis A, which can be caused by infected food and water. Most often, diseases such as these occur when drinking water is contaminated by sewage, or when someone who has the virus or bacteria on their hands prepares food. Most people are fine if they get treatment, but in disaster zones, medical care may be limited. When water has been contaminated and can't be used for drinking or sanitation, and when sanitation facilities have been disrupted (sewage or other unhealthy material is discharged into the water supply), the risk of disease grows. Diseases caused by infected food and water can occur in any environment.

Similarly, people in disaster zones are at a higher risk for vector-borne diseases, which means disease is transmitted by an animal carrier, such as a mosquito. You can find more information on vector-borne diseases here: [www.cdc.gov/ncidod/eid/vol4no3/gubler.htm](http://www.cdc.gov/ncidod/eid/vol4no3/gubler.htm). These diseases include West Nile virus and rabies. These diseases are treatable but problems arise when medical care is limited following a natural disaster.

Also, it is important to remember that injury often takes place as a result of floods from natural disasters. Physical injuries such as animal and insect bites, untreated wounds, and the risk of electrical shock from downed power lines and exposed electrical wires near flooded areas and in and around people's homes are all serious issues that can be avoided if the necessary precautions are taken. The CDC Web site has information on how victims of natural disasters can protect themselves from harm after a disaster strikes: [www.bt.cdc.gov/disaster/hurricanes/injury.asp](http://www.bt.cdc.gov/disaster/hurricanes/injury.asp).

Climate also can affect the health of survivors, as extreme heat or cold can impact an individual's recovery. For example, individuals may be at risk of heat fatigue, heat rash, fainting, heat cramps, heat exhaustion, and heat stroke in addition to the other diseases mentioned above.

For more information on the spread of infectious diseases, see the *BAM!* Infectious Disease Epidemiology educational activities.

2. You may take the time to explain to students that natural disasters such as hurricanes can be caused by heat energy carried by ocean currents. This energy has a strong influence on climate around the world. Also, climates have sometimes changed abruptly in the past as a result of changes in the earth's crust, such as volcanic eruptions or impacts of huge rocks from space.

*Elaboration* (30 minutes)

1. Have students visit an article on tsunamis on the *BAM!* Web site at [www.bam.gov/sub\\_yoursafety/yoursafety\\_tsunami.html](http://www.bam.gov/sub_yoursafety/yoursafety_tsunami.html) and “News You Can Use” at [www.bam.gov/sub\\_yourlife/yourlife\\_newsyoucanuse.html](http://www.bam.gov/sub_yourlife/yourlife_newsyoucanuse.html) to learn more about preparing for natural disasters. If you do not have enough computers for students to do this easily, you can print out the information at this site. In addition, this CDC site has extensive information about disaster planning: [www.bt.cdc.gov/disasters](http://www.bt.cdc.gov/disasters). Another helpful resource is an emergency preparedness checklist on the FEMA Web site at [www.fema.gov/pdf/library/epc.pdf](http://www.fema.gov/pdf/library/epc.pdf).
2. Discuss the kinds of help a disaster zone needs immediately following a disaster. (Besides treating injuries and disease, the population will need shelter, food, and clothing.)
3. Discuss the kind of help that is needed in the months that follow a flooded disaster area. These include:
  - surveying and monitoring for infectious diseases (especially food-, water-, or insect-transmitted)
  - diverting medical supplies from non-affected areas to meet the needs of the affected regions
  - restoring normal primary health services, water systems, housing, and employment
  - assisting the community to recover mentally and socially when the crisis has subsided, including helping people cope with stress and grief
4. Discuss the emotional responses survivors might have following a disaster. The Web site [www.mentalhealth.samhsa.gov/publications/allpubs/KEN-01-0093/default.asp](http://www.mentalhealth.samhsa.gov/publications/allpubs/KEN-01-0093/default.asp) is very helpful. Point out that reactions to trauma are individualized and may develop immediately or months after the disaster.

## Evaluation

### Performance Descriptors

On each of the criteria below, rate students from 0 to 3, with 0 being the lowest possible score and 3 being the highest.

Scoring Rubric: Helping Hands				
Performance Descriptor	Rating			
Student actively participated in the discussion of health issues that affect communities after natural disasters.	3	2	1	0
Student used the Internet and other reference materials to research the diseases that threaten flooded communities as a result of natural disasters.	3	2	1	0
Student researched how CDC and other agencies responded to mitigate the danger of disease following a natural disaster.	3	2	1	0

## Extension

1. Have the group research and make a poster of the types of health professionals that rush to a flooded disaster zone. What do they do? How do they help? Remind your students that health professionals are not only doctors and nurses, they also may include epidemiologists, public health professionals, mental health workers, engineers who help assess the stability of physical structures, experts on disposing hazardous materials, and others.
3. Have the group make a list of government organizations and voluntary agencies that support relief efforts. Consider having the class organize a benefit to raise money for relief efforts.
4. If you have not already completed the “Are You At Risk” activity at [www.bam.gov/teachers/disasters\\_risk.html](http://www.bam.gov/teachers/disasters_risk.html) with your class, have students complete Student Reproducible 2: *Planning for an Emergency*. Students can work in pairs or alone. They can visit the “News You Can Use” article at [www.bam.gov/sub\\_yourlife/yourlife\\_newsyoucanuse.html](http://www.bam.gov/sub_yourlife/yourlife_newsyoucanuse.html) on the *BAM!* site to learn more about preparing for natural disasters. Students also may visit the CDC site at [www.bt.cdc.gov/disasters](http://www.bt.cdc.gov/disasters) and FEMA’s Emergency Preparedness Checklist at [www.fema.gov/pdf/library/epc.pdf](http://www.fema.gov/pdf/library/epc.pdf).

## Web Resources

Centers for Disease Control and Prevention: [www.cdc.gov](http://www.cdc.gov)  
Emergency Preparedness and Response: [www.bt.cdc.gov](http://www.bt.cdc.gov)

The Natural Disaster and Severe Weather section of this Web site includes a comprehensive section on emergency preparedness for natural disasters, including information about the health effects of everything from floods to hurricanes to volcanoes.

CDC *BAM! Body and Mind*<sup>TM</sup>: [www.cdc.gov/bam](http://www.cdc.gov/bam) or [www.bam.gov](http://www.bam.gov)

*BAM! Body and Mind* is brought to you by the Centers for Disease Control and Prevention (CDC), an agency of the U.S. Department of Health and Human Services (DHHS). *BAM!* was created to answer kids' questions on health issues and recommend ways to make their bodies and minds healthier, stronger, and safer. *BAM!* also serves as an aid to teachers, providing them with interactive activities to support their health and science curriculums that are educational and fun.

American Hospice Foundation: [www.americanhospice.org](http://www.americanhospice.org)

After the Tsunami: What to Tell the Children?:  
[www.americanhospice.org/articles/tsunami.htm](http://www.americanhospice.org/articles/tsunami.htm)

Practical advice for parents and other caregivers on ways to help children deal with the aftermath of natural disasters. Most of the tips would be equally applicable for any natural disaster.

American Red Cross: [www.redcross.org](http://www.redcross.org)

Facing Fear: [www.redcross.org/disaster/masters/facingfear/start68.html](http://www.redcross.org/disaster/masters/facingfear/start68.html)

A comprehensive curriculum that meets national education standards in health, social studies, and language arts, and consists of age-appropriate, ready-to-go lesson plans for K-12 grade levels. The lesson plans contain preparedness information addressing tragic events, natural disasters, and other human-caused tragedies, including war and terrorism. It was developed within weeks after the September 11 terrorist attacks.

Burton, Jadis, "Dealing with Catastrophic Events": [www.talhk.com/topics.htm](http://www.talhk.com/topics.htm)

Written in 2005 shortly after the Asian tsunami, this paper helps parents and other adults assist children as they struggle to deal with catastrophic events in the world.

National Association of School Psychologists: [www.nasponline.org](http://www.nasponline.org)

Lazarus, P.J., Jimerson, S.R., & Brock, S.E. (2002). Best practices in school crisis prevention and intervention:  
[www.nasponline.org/NEAT/naturaldisaster\\_teams\\_ho.html](http://www.nasponline.org/NEAT/naturaldisaster_teams_ho.html)

A thorough literature review of the unique crisis issues related to coping with natural disasters. Written primarily for educators, this publication also includes helpful information for any adult on dealing with children following a natural disaster.

National Institute of Mental Health (NIMH): [www.nimh.nih.gov/](http://www.nimh.nih.gov/)  
“Helping children and adolescents cope with violence and disasters”:  
[www.nimh.nih.gov/publicat/NIMHviolence.pdf](http://www.nimh.nih.gov/publicat/NIMHviolence.pdf)

This online fact sheet collects research on how violence and disasters affect the mental health of children and teenagers. Many of the suggestions are applicable either for violence or for natural disasters, and are based on ongoing NIMH research projects.

Ready.gov, Natural Disasters: [www.ready.gov/america/natural\\_disasters.html](http://www.ready.gov/america/natural_disasters.html)

A Web site developed by the Department of Homeland Security that covers natural disasters. You can access the Federal Emergency Management Agency (FEMA) fact sheets on natural disasters including earthquakes, hurricanes, floods, landslides, volcanoes, and more. Each of these fact sheets includes information on the parts of the United States that are most at risk for the natural disaster, as well as the science behind why the disaster happens. This site also links to an emergency preparedness checklist at [www.fema.gov/pdf/library/epc.pdf](http://www.fema.gov/pdf/library/epc.pdf).

### **Text Correlations**

Glencoe, *Science Voyages*, Level Blue, Chapter 8: Earthquakes; Chapter 9, Volcanoes

Glencoe, *Teen Health Course 1*, Chapter 10, Safety and the Environment

Glencoe, *Teen Health Course 2*, Chapter 14, Personal Safety and Injury Prevention

Glencoe, *Teen Health Course 3*, Chapter 19, Safety and Emergencies

### **Relevant Standards**

*National Science Education Standards*

#### Content Standard D, Grades 5-8

Earth and Space Science:

- The solid earth is layered with a lithosphere; hot, convecting mantle; and dense, metallic core.
- Lithospheric plates on the scales of continents and oceans constantly move at rates of centimeters per year in response to movements in the mantle. Major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions.
- Land forms are the result of a combination of constructive and destructive forces. Constructive forces include crustal deformation, volcanic eruption, and deposition of sediment, while destructive forces include weathering and erosion.

#### Content Standard F, Grades 5-8

Natural Hazards:

- Internal and external processes of the earth system cause natural hazards, events that change or destroy human and wildlife habitats, damage property, and harm or kill humans. Natural hazards include earthquakes, landslides, wildfires, volcanic eruptions, floods, storms, and even possible impacts of asteroids. [See Content Standard D (grades 5-8)]
- Human activities also can induce hazards through resource acquisition, urban growth, land-use decisions, and waste disposal. Such activities can accelerate many natural changes.
- Natural hazards can present personal and societal challenges because misidentifying the change or incorrectly estimating the rate and scale of change may result in either too little attention and significant human costs or too much cost for unneeded preventive measures.

Students should understand the risks associated with natural hazards (fires, floods, tornadoes, hurricanes, earthquakes, and volcanic eruptions), with chemical hazards (pollutants in air, water, soil, and food), with biological hazards (pollen, viruses, bacterial, and parasites), social hazards (occupational safety and transportation), and with personal hazards (smoking, dieting, and drinking).

- 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.

### *Benchmarks for Science Literacy*

#### Chapter 4, Benchmark B, Grades 6-8: The Earth

By the end of 8<sup>th</sup> grade, students should know that:

- Climates have sometimes changed abruptly in the past as a result of changes in the earth's crust, such as volcanic eruptions or impacts of huge rocks from space. Even relatively small changes in atmospheric or ocean content can have widespread effects on climate if the change lasts long enough.
- Heat energy carried by ocean currents has a strong influence on climate around the world.

### Chapter 6, Benchmark F, Grades 6-8: Mental Health

By the end of the 8th grade, students should know that:

- Individuals differ greatly in their ability to cope with stressful situations. Both external and internal conditions (chemistry, personal history, values) influence how people behave.
- Often people react to mental distress by denying that they have any problem. Sometimes they don't know why they feel the way they do, but with help they can sometimes uncover the reasons.

### Chapter 7, Benchmark C, Grades 6-8: Human Society, Social Change

Middle-school students can imagine themselves in situations different from their own. Interviews with senior citizens, literary and media accounts of life in times past, simulations, and role-playing all provide raw material for discussions about social change. Students can be helped to see that cultural patterns change because of technological innovations, scientific discoveries, and population changes. They can identify social changes that happen gradually as well as those that happen quickly because of natural disasters and wars. Students should also begin to identify aspects of family and community life that have remained relatively constant over generations.

- Migration, conquest, and natural disasters have been major factors in causing social and cultural change.

### Chapter 12, Benchmark D, (6-8): Communication Skills

By the end of the 8th grade, students should be able to:

- Organize information in simple tables and graphs and identify relationships they reveal.
- Read simple tables and graphs produced by others and describe in words what they show.
- Locate information in reference books, back issues of newspapers and magazines, compact disks, and computer databases.
- Understand writing that incorporates circle charts, bar and line graphs, two-way data tables, diagrams, and symbols.
- Find and describe locations on maps with rectangular and polar coordinates.

## *National Health Education Standards*

### Standard 3

Students will demonstrate the ability to practice health-enhancing behaviors and reduce health risks.

- Explain the importance of assuming responsibility for personal health behaviors.
- Analyze a personal health assessment to determine health strengths and risks.
- Distinguish between safe and risky or harmful behaviors in relationships.
- Demonstrate strategies to improve or maintain personal and family health.
- Demonstrate ways to avoid and reduce threatening situations.
- Demonstrate strategies to manage stress.

### **Ideas and Behaviors Common Among Students**

- Among children who experienced a natural disaster, the more they perceived their parents to be upset about the disaster, the less successful the children were at coping (Huzziff & Ronan, 1999).
- Children who feel in control of their stressful situation are more successful at coping with the effects of a disaster. Those without a similar feeling of control, who blame their situation on outside sources such as fate or luck, have a more difficult time coping (Chandler, 1985).
- When dealing with the effects of general violence in their neighborhoods, boys are more likely than girls to be more confrontational in their coping strategies (Rasmussen, Aber, & Bhana, 2004).
- When asked about the effects of the September 11<sup>th</sup> tragedy 2 to 5 months later, adolescents from areas 3,000 miles from the disaster sites still viewed themselves as having been affected significantly by the events (Whalen, Henker, & King, 2004).
- Middle school girls appear more likely to rate traumatic events as more stressful than boys, while those from socially disadvantaged areas rate everyday events as more stressful than children from more affluent backgrounds (Muldoon, 2003).
- Reports in the media of a disaster focus on the intensity of the event and may cause students to believe it was much more widespread than it really was (American Red Cross, 2001).
- In the months following a hurricane, the noises associated with the storm—roaring winds likened to a freight train—induced acute startle reactions in some survivors. Subsequent storms triggered panic reactions, even when no hurricane was forecasted (Brock, Lazarus, & Jimerson, 2002).

- While hurricane forecasts permit families time to gather supplies and prepare their homes and children, these activities in and of themselves may generate fear and anxiety (Zenere & Lazarus, 1999).
- Unexpected messages or images on television following a tragic event can cause stress-related problems. Those watching the disaster coverage can become a "secondary victim" and suffer emotional and physical problems (American Red Cross, 2001).
- Loss of trust in adults, and concern about a specific disaster reoccurring, are responses seen among youths exposed to traumatic events (National Institute of Mental Health, 2001).
- Following Hurricane Andrew, boys tended to externalize their reactions, while girls tended to internalize theirs (Shaw, Applegate, & Schorr, 1996).

## References

American Red Cross. *Facing Fear*. Available online [www.redcross.org/disaster/masters/facingfear/start68.html](http://www.redcross.org/disaster/masters/facingfear/start68.html). Accessed September 1, 2005.

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Chandler, LA (1985). *Children under stress: Understanding emotional adjustment reactions*. Springfield, IL: Charles C. Thomas Publishers, Ltd.

Huzziff, C.A., & Ronan, K.R. (1999). Prediction of children's coping following a natural disaster—the Mount Ruapehu eruptions: A prospective study. *The Australasian Journal of Disaster and Trauma Studies*, 1, 1-21.

Muldoon, O.T. (2003). Perceptions of stressful life events in Northern Irish school children: A longitudinal study. *Journal of Child Psychology and Psychiatry*, 44(2), 193-201.

National Institute of Mental Health. *Helping children and adolescents cope with violence and disasters*. Available online [www.nimh.nih.gov/publicat/NIMHviolence.pdf](http://www.nimh.nih.gov/publicat/NIMHviolence.pdf). Accessed September 1, 2005.

Rasmussen, A., Aber, M.S., & Bhana, A. (2004). Adolescent coping and neighborhood violence: Perceptions, exposure, and urban youths' efforts to deal with danger. *American Journal of Community Psychology*, 33(1-2), 61-75.

Shaw, J.A., Applegate, B., & Schorr, C. (1996). Twenty-one-month follow-up study of school-aged children exposed to Hurricane Andrew. *Journal of the American Academy of Child & Adolescent Psychiatry*, 35(3):359-366.

Whalen, C. K., Henker, B., & King, P. S. (2004). Adolescents react to the events of September 11, 2001: Focused versus ambient impact. *Journal of Abnormal Child Psychology*, 32(1), 1-11.

Zenere, F. J., & Lazarus, P.J. (1999). Winds of terror. Children's responses to hurricane and tornado disasters. In A. S. Canter & S. A. Carroll (Eds.), *Crisis prevention and response: A collection of NASP resources* (pp. 223-229). Bethesda, MD: National Association of School Psychologists.

Student Reproducible 1:

## Helping Hands

Using information found online or in the reference materials in the classroom, complete the following chart on the health risks of a flood zone in the United States.

DISEASE	METHOD OF TRANSMISSION	SYMPTOMS	TREATMENT	HEALTH PROFESSIONAL ACTIONS
<i>Escherichia coli</i> ( <i>E.coli</i> )				
Hepatitis A				

DISEASE	METHOD OF TRANSMISSION	SYMPTOMS	TREATMENT	HEALTH PROFESSIONAL ACTIONS
Hepatitis B				
Methicillin-Resistant <i>Staph aureus</i> (MRSA)				

DISEASE	METHOD OF TRANSMISSION	SYMPTOMS	TREATMENT	HEALTH PROFESSIONAL ACTIONS
Mold				
Pneumonia				

DISEASE	METHOD OF TRANSMISSION	SYMPTOMS	TREATMENT	HEALTH PROFESSIONAL ACTIONS
Tetanus				
West Nile Virus (WNV)				

Answers for Chart:

DISEASE	METHOD OF TRANSMISSION	SYMPTOMS	TREATMENT	HEALTH PROFESSIONAL ACTIONS
<i>Escherichia coli</i> ( <i>E.coli</i> )	Consumption of infected meat that has not been properly treated to remove presence of <i>E. coli</i> . Bacteria present in diarrheal stools also can be passed from person to person if proper hand washing is not maintained.	Severe abdominal cramps/pain, bloody/or non-bloody diarrhea.	No proven treatments for disease. Recovery without antibiotics usually occurs within 5 to 10 days of initial infection. Antidiarrheal agents should be avoided.	Health professionals may monitor hospitalized cases and support patients through management of pain during recovery.  Epidemiologists track source of infection. Others prevent infected beef from being produced and sold.
Hepatitis A	Found in the stool of an infected person and spread from person to person by putting something in the mouth, even if it looks clean, that has been contaminated with that stool.	Jaundice, fatigue, abdominal pain, loss of appetite, nausea, diarrhea, fever.	Hepatitis A vaccine is the best protection; short-term protection available from immune globulin, if given before and within two weeks of exposure.	Health professionals vaccinate people against hepatitis A.
Hepatitis B	Health professionals are most at risk for exposure. Bacteria predominately spreads to health personnel through blood or other body fluids while they treat those	Thirty percent of those infected show no symptoms. Those who do experience jaundice, fatigue, abdominal pain, loss of appetite, joint pain, and	Hepatitis B vaccine is the best protection and may be administered to infants and adults.	Health professionals vaccinate people against hepatitis B.  Health personnel take appropriate cautions to ensure hepatitis B exposure is

	who are infected.	nausea/vomiting.		limited.
Methicillin-Resistant <i>Staph aureus</i> (MRSA)	Bacteria spread from person to person via hands, skin, and objects containing the germ, specifically with close skin-to-skin contact, openings in the skin such as cuts or abrasions, or poor hygiene.	Red, swollen, or painful skin infections resembling boils or pimples that may give off discharge or pus. More serious infections cause pneumonia or bloodstream infections.	Cover open wounds with clean, dry, and sterile bandages to prevent further spreading of the infection. Non-resistant antibiotics are best treatment, and in severe cases antibiotics may be given intravenously.	Health professionals treat those infected with the disease with non-beta-lactam antibiotics.
Mold	Mold spores attach to dust particles in the air and are inhaled into the lungs.	Stuffy nose or wheezing. Those allergic to mold may have difficulty breathing. People with weakened immune systems may develop mold infections in their lungs. Prolonged exposure may result in upper and lower respiratory infections.	Dispose of all items containing mold or clean with bleach solution and ventilate affected area. Antibiotics may be used to treat symptoms associated with mold exposure.	Health professionals prescribe antibiotics to treat bacterial infection, if applicable.  Other relief workers work to clean or destroy areas where mold is present.
Pneumonia	Usually triggered when immune system is already compromised. Illness is spread through bacteria that is inhaled, or a virus that enters the body through the bloodstream.	Develops abruptly and includes fever, chest pain, coughing (sometimes the coughing up of blood or pus), shortness of breath, and	Oral antibiotics (only if bacterial infection present). Other pain relieving medicines until recovery. More severe	Health professionals prescribe antibiotics, if appropriate.

		abdominal pain.	cases require hospitalization.	
Tetanus	Contracted through an open wound or break in the skin when bacteria enter the body.	Early symptoms include lockjaw, stiffness in the abdomen and neck, and difficulty swallowing. Later symptoms include fever, elevated blood pressure, and severe muscle spasms. Death possible in older people.	Tetanus vaccine can prevent illness, however, all wounds should be thoroughly cleaned. If patient has not been previously immunized, a tetanus immune globulin may be given. If more than 10 years has elapsed between boosters, patient should receive booster shot of toxoid.	Health professionals administer vaccine periodically throughout a patient's life to prevent illness.  Epidemiologists work towards prompt recognition of tetanus and tetanus-prone areas.
West Nile Virus (WNV)	Spread by the bite of an infected mosquito. Mosquitoes feed on infected birds and become carriers of the virus. Infected mosquitoes can then spread WNV to humans and other animals when they bite.	Range from mild to severe and include fever, headache, body aches, nausea, vomiting, high fever, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness, and paralysis.	No specific treatment of virus. Serious cases need hospital care and require intravenous fluids, nursing care, and help with breathing, if necessary.	Health professionals provide support for those infected through continued hospital care.  Other relief workers locate and eradicate mosquito-breeding places.

Student Reproducible 2:

## **Planning for an Emergency**

If you do live in an area that is at risk for natural disasters, having a plan to deal with an emergency helps to ease stress.

Do you already have a plan developed for when a natural disaster might happen?

List some measures families should take to prepare for an emergency.

- 1.
- 2.
- 3.
- 4.

List the supplies you should keep in your home to have in case of emergency. Check out these sites for some suggestions:

- *BAM!* News You Can Use: [www.bam.gov/sub\\_yourlife/yourlife\\_newsyoucanuse.html](http://www.bam.gov/sub_yourlife/yourlife_newsyoucanuse.html)
- CDC Disaster Preparedness: [www.bt.cdc.gov/disasters](http://www.bt.cdc.gov/disasters)
- FEMA Emergency Preparedness Checklist: [www.fema.gov/pdf/library/epc.pdf](http://www.fema.gov/pdf/library/epc.pdf)