

UNIT 2: SIMPLE, AFFORDABLE, EFFECTIVE SOLUTIONS

Unit Overview:

In this Unit students will:

- Learn about the main causes of preventable deaths for children under five;
- Become familiar with readily available and low cost lifesaving solutions;
- Investigate the science behind some lifesaving measures;
- Examine some successful interventions in child survival efforts;
- Read and interpret tables, graphs, pie charts, and maps.

Lesson 1: In the opening activity, students are introduced to one of the major threats to child survival — malaria. From a UNICEF video, students learn about a low-cost effective solution, insecticide-treated bed nets. This is followed by a group activity that explores a number of low-cost effective solutions for a variety of threats to child survival. Students work together in groups of three to review a particular cause of child mortality and the available low-cost solution.

Lesson 2: This lesson continues to reinforce the solutions to child survival threats by focusing student attention on innovative programs in three countries: Kenya, Angola, and Turkmenistan. All three countries have made progress in child survival using low-cost solutions. Students will also have an opportunity to investigate and report on global immunization trends.

National Standards Unit 2

ENGLISH LANGUAGE ARTS — Grades K-12

Standard 1: Students read a wide range of print and non-print texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment.

Standard 7: Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.

Standard 8: Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

MATHEMATICS

Mathematics Standards — Grades 9-12

Standard 9: Connections

In Grades 9-12 all students should recognize and apply mathematics in contexts outside of mathematics.

Standard 10: Representation

In Grades 9-12 all students should formulate, create and use representations to organize, record, and communicate mathematical ideas.

HISTORY/SOCIAL STUDIES/GEOGRAPHY

World History Standards — Grades 5-12

Era 9: The 20th Century Since 1945 — Promises and Paradoxes:

Students will understand the search for community, stability, and peace in an interdependent world.

Social Studies Standards — Grades K-12

Strand III: People, Places, and Environments

Strand IX: Global Connections

Geography Standards — Grades K–12

The Geographically Informed person knows and understands

The World in Spatial Terms

Standard 1: how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective

Places and Regions

Standard 4: the physical and human characteristics of places

Human Systems

Standard 8: the characteristics, distribution, and complexity of Earth’s cultural mosaic

Standard 13: how the forces of cooperation and conflict among people influence the division and control of the Earth’s surface

Environment and Society

Standard 14: how human actions modify the physical environment

Standard 16: the changes that occur in the meaning, use, distribution, and importance of resources

SCIENCE

Science Content Standards — Grades 9–12

Content Standard E: Science and Technology

Students should develop an understanding of the potential of technological design.

HEALTH

Health Education Standards — Grades 9–12

Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.

Standard 2: Students will analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.

UNIT 2:

Lesson 1: Risks and Solutions

Suggested Class Time: 65 minutes

Objectives:

- Become familiar with the main causes of preventable deaths of children under five;
- Become aware of readily available and low-cost solutions;
- Understand how knowledge is translated into programs;
- Read and interpret tables, graphs, pie charts, and maps.

Session Plan:

- Opening Activity: Saving Lives with Bed Nets -15 minutes
- Group Activity: Problems, Explanations, Solutions - 50 minutes

Vocabulary:

Oral Rehydration Salts (ORS), Ready-to-Use Therapeutic Food

Materials Needed:

- Copies of the *Youth Report*, Chapter 2 and Glossary
- World map or globe (optional)
- Copies of Handouts 4 and 6 for the whole class.
- Copies of Handout 5 for students doing Extension Activity
- Equipment for showing video: computer with Internet connection or TV and DVD player
- Internet Access: Lesson Activities
UNICEF video:
Kenya http://www.unicef.org/sowc08/profiles/7_kenya.php
UNICEF: Voices of Youth, Be In the Know: Fact Sheet
http://www.unicef.org/voy/explore/sowc/explore_4107.html
- Internet Access: Extension Activities
UNICEF, *The State of the World's Children*, 1996; "ORS: the medical advance of the century"
<http://www.unicef.org/sowc96/joral.htm>
UNICEF "News Note: Improved formula for oral rehydration salts to save children's lives"
http://www.unicef.org/media/media_31825.html

UNICEF Nutrition Newsline, May 28, 2008. "UNICEF readies for food crisis with unique basket of solutions for children at risk," Elizabeth Kiem, UNICEF Nutrition Newsline, May 28, 2008 (see p. 21)

http://www.unicef.org/nutrition/index_44186.html

"UNICEF Executive Director inaugurates Ethiopia's first Plumpy'nut factory"

http://www.unicef.org/infobycountry/ethiopia_38423.html

Background for Teachers

Malaria

Malaria is a serious disease spread through mosquito bites. Each year, there are 300 million to 500 million cases of malaria throughout the world resulting in about 1 million child deaths. In areas where malaria is common, it can be the leading cause of death and poor growth among young children.

Sleeping under a mosquito net treated with a recommended insecticide is the best way to prevent mosquito bites. All members of the community should be protected against mosquito bites, particularly young children and pregnant women, and especially between sunset and sunrise when mosquitoes are most active.

Mosquito nets, curtains, or mats dipped in a recommended insecticide kill mosquitoes that land on them. Special, permanently treated mats should be used, or nets, curtains, or mats that are dipped in insecticide regularly. Trained health workers can advise on safe insecticides and re-treatment schedules.

Babies and other small children should sleep under an insecticide treated mosquito net. If the nets are expensive, the family should buy at least one big net, which the small children can sleep under. Breastfed babies should sleep with their mothers under a net. Treated mosquito nets should be used throughout the year, even during times when there are fewer mosquitoes.

Opening Activity: Saving Lives with Bed Nets

Directions

1. Have the following questions on the board when students enter the classroom:
 - What is the biggest killer of children under five in Kenya?
 - What are two effective ways of controlling this disease?
 - How do these free or inexpensive methods affect a child's chances of surviving the disease?
2. Have someone locate Kenya on the world map.
3. Introduce the UNICEF video about malaria prevention in Kenya. Explain that students will find answers to the questions in the video.

4. Show the video and have volunteers answer the questions written on the board. What is the biggest killer of children under five in Kenya? (*malaria*) What are the two most effective ways of controlling malaria? (*insecticide treated bed nets and spraying*) How do free or inexpensive bed nets affect a child's chances of surviving malaria? (*Free bed nets give children protection from malaria.*)

Group Activity: Problems, Explanations, and Solutions

Directions

1. Have students turn to page 11 of the *Youth Report*, "Why Do Children Die Before Age Five." Use the following questions to facilitate a discussion of the graph:
 - Besides malaria, can any of the other causes of child mortality be prevented? (*Students may know that measles can be prevented by vaccination and undernutrition by a healthy diet.*) Point out that the measles vaccine and adequate diets are not always available. Explain that treatments for diarrhea and pneumonia can prevent these illnesses from being fatal, but that such treatment is not always available.
 - Why do you think undernutrition is an underlying cause in so many under-five deaths? (*Without proper nutrition the body is vulnerable to disease.*)
2. Reproduce Handout 4, which consists of three sets of seven "cards" (based on the three-column chart on page 12 of the *Youth Report*). Make extra cards as needed so every student has one.
3. Divide the class into three groups and distribute cards to form three groups: the "Problem" group; the "Explanation" group; and the "Solution" group.
4. Students in each group locate their two counterparts; each "Problem" is then matched with the appropriate Explanation and Solution.
5. Once the new groups of three form, have students learn more about their "Problem" by reading relevant sections of the *Youth Report*, Chapter 2, "Lifesaving Solutions," (beginning on page 13) and "Voices of Youth, Be in the Know: Fact Sheet" at http://www.unicef.org/voy/explore/sowc/explore_4107.html
6. Each small group will select one person to make a presentation explaining the group's problem and solution to the class. In the presentation, ask students to include an answer to this question: Why is this a more serious problem in developing countries than in industrialized countries?

 **Tip:** Instead of using the following activity as an Extension Activity, assign some students to work on it at the same time as others engage in the Group Activity.

Science Extension Activity: Two Low-Cost Solutions — How Do They Work?

Directions

1. Invite interested students to investigate and report on the science involved in two low-cost solutions to child survival threats: Oral Rehydration Therapy and Ready-to-Use Therapeutic Foods.
2. Distribute Handout 5. As students answer the questions on Handout 5, they will need Internet access to locate information.

Resources: Oral Rehydration Therapy

“ORS: the medical advance of the century” UNICEF, *The State of the World’s Children*, 1996:

<http://www.unicef.org/sowc96/joral.htm>

“News Note: Improved formula for oral rehydration salts to save children’s lives,”

http://www.unicef.org/media/media_31825.html

Resources: Ready-to-Use Therapeutic Foods

“UNICEF readies for food crisis with unique basket of solutions for children at risk,

” Elizabeth Kiem, UNICEF Nutrition Newslines, May 28, 2008

http://www.unicef.org/nutrition/index_44186.html

“UNICEF Executive Director inaugurates Ethiopia’s first Plumpy’nut factory”

http://www.unicef.org/infobycountry/ethiopia_38423.html

3. Students can then present information about their topic to the class. In their presentations, students should answer the questions on Handout 6.

Problem, Explanation and Solution Cards

1 PROBLEM: Undernutrition

Undernutrition is caused by a lack of nutritious food to maintain health and growth. Many children get enough food but are underweight or stunted because their diet is not nutritious. Undernutrition is linked to nearly half of all deaths of children under the age of five.

2 PROBLEM: Major preventable diseases

Polio, measles, diphtheria, pertussis (whooping cough), and tetanus are the major preventable diseases. Millions of children die every year from these diseases, which can be prevented by vaccines.

3 PROBLEM: Diarrhea

Diarrhea kills over 1 million children every year through dehydration and malnutrition. Children are more likely than adults to die from diarrhea because they become dehydrated more quickly. About 1 in every 200 children who contract diarrhea will die from the illness.

4 PROBLEM: Malaria

Malaria is a serious disease spread through mosquito bites. Each year, there are 300 million to 500 million cases of malaria throughout the world and about 1 million child deaths. The death toll is higher in tropical and subtropical regions.

5 PROBLEM: Lack of micronutrients

Many children are missing vitamins and minerals, such as vitamin A and iodine, in their diets. Vitamin A helps children resist illness and prevents night blindness. Iodine is needed to promote growth and prevent learning disabilities.

6 PROBLEM: Pneumonia

Pneumonia, a serious disease of the lungs, causes the most child deaths around the world—about 2 million children each year.

7 PROBLEM: Lack of Safe Drinking Water and Sanitation

Unsafe drinking water, lack of sanitation, and poor hygiene contribute to diarrhea, pneumonia, newborn disorders, and undernutrition — four of the major causes of child deaths.

Problem, Explanation and Solution Cards

1 EXPLANATION: Undernutrition

Undernutrition weakens the body's resistance to illness and deprives a young child's body and mind of the nutrients needed for growth and development. Children who receive good nutrition are less vulnerable to many illnesses.

2 EXPLANATION: Major preventable diseases

Measles and pertussis (whooping cough), both preventable diseases, can lead to other serious illnesses such as pneumonia and tuberculosis. Half of all deaths from whooping cough, a third of all cases of polio, and a quarter of all deaths from measles occur in children under one year old.

3 EXPLANATION: Diarrhea

Poor sanitation and hygiene practices and a lack of clean water are sources of the germs that cause diarrhea. Diarrhea kills children by draining vital fluids from the body. Children with diarrhea often have other diseases.

4 EXPLANATION: Malaria

Spread by the bite of an infected mosquito, malaria causes fever and the loss of body fluids through sweating. Malnutrition and dehydration can result when malaria is untreated. Frequent malarial infection can slow children's growth and brain development and is likely to cause anemia.

5 EXPLANATION: Lack of micronutrients

Micronutrients are essential to keeping children healthy; without this type of nourishment, children are vulnerable to diseases such as diarrhea, measles, and malaria.

6 EXPLANATION: Pneumonia

Undernourished children are at a high risk of developing pneumonia. Many children die of pneumonia at home because their families do not recognize the symptoms of the illness and delay getting medical care.

7 EXPLANATION: Lack of Safe Drinking Water and Sanitation

More than half of all illnesses and deaths among young children are caused by germs that get into their mouths through food, or water, or dirty hands.

Problem, Explanation and Solution Cards

1 SOLUTION: Undernutrition

Breastfeeding during the first six months of life and ready-to-use therapeutic foods provide lifesaving nutrition to children who are undernourished.

2 SOLUTION: Major preventable diseases

Immunization is one of the most important and cost-effective ways of protecting children from these diseases. A child is immunized by vaccines, which build up defenses against disease. Immunization only works if given before the child has the disease.

3 SOLUTION: Diarrhea

Breastfeeding can reduce the severity and frequency of diarrhea. Another low-cost treatment is Oral Rehydration Salts (ORS).

4 SOLUTION: Malaria

Prevention and early treatment of malaria saves lives. Sleeping under bed nets treated with insecticide can reduce deaths of children from malaria by 20 percent. Treated bed nets protect sleeping children from infected mosquitoes that swarm at night.

5 SOLUTION: Lack of micronutrients

Supplementing children's diets with micronutrients (vitamins and minerals) is essential for growth and development. Iodized salt used in food prevents brain damage; vitamin A capsules can boost the immune system and prevent blindness.

6 SOLUTION: Pneumonia

Good nutrition, clean air, and immunization protect children from pneumonia. Antibiotics (medicines that kill disease-causing bacteria) are used in cases of severe pneumonia. With the help of community health workers, parents can be taught to recognize symptoms and treat pneumonia at home.

7 SOLUTION: Lack of Safe Drinking Water and Sanitation

Community awareness, political action, and international commitment are crucial to providing safe drinking water and proper sanitation for all people. Community health workers teach the importance of hand washing and safe water for drinking and cooking. Families with clean water, free of germs, have fewer illnesses.

HANDOUT 5

Oral Rehydration Salts and Ready-to-Use Therapeutic Foods

Directions: Answer the following questions about Oral Rehydration Salts and Ready-to-Use Therapeutic Foods on a separate sheet of paper. Your teacher will suggest online resources for you to use.

ORAL REHYDRATION

1. What do “hydration” and “rehydration” mean?
2. How much of the human body is water?
3. How much clean water is required for human health each day?
4. Why is diarrhea such a deadly disease for young children?
5. How do oral rehydration salts save lives?

READY-TO-USE THERAPEUTIC FOODS

1. What are Ready-to-Use Therapeutic Foods?
2. What problem do Ready-to-Use Therapeutic Foods solve?
3. What are some of the ingredients in Ready-to-Use Therapeutic Foods?
4. Why are Ready-to-Use Therapeutic Foods such a practical solution?
5. Explain why the use of Ready-to-Use Therapeutic Foods is or is not a good long-term solution to the problem of undernutrition?

UNIT 2:

Lesson 2: Low-Cost Solutions in Action

Suggested Class Time: 60 minutes

Objectives:

- Become aware of successful child survival efforts against measles, iodine deficiency disorders (IDD), and malaria;
- Explain how the global trend in immunization saves children's lives;
- Read and interpret tables, graphs, pie charts, and maps.

Session Plan:

Opening Activity: Salt Plus — 10 minutes

Group Activity: Lifesaving Interventions — 50 minutes

Vocabulary:

Metabolism, polio, sub-tropical, tropical

Materials Needed:

- Copies of the *Youth Report*, Chapter 2 and Glossary
- World map or globe
- Copies of Handout 6 (3 pages) for the three groups of students
- Internet Access: Lesson Activities
UNICEF *The State of the World's Children 2008*
<http://www.unicef.org/sowc08/docs/sowc08.pdf>
- Internet Access: Extension Activities
UNICEF: Immunization
The challenge: **http://www.childinfo.org/immunization_challenge.html**
Current status: **http://www.childinfo.org/immunization_status.html**
Trends: **http://www.childinfo.org/immunization_trends.html**
World Health Organization: Global Immunization Data
http://www.who.int/immunization/newsroom/global_immunization_data_december2008.pdf
Smithsonian Institution, "Whatever Happened to Polio? The Virus and the vaccine"
<http://americanhistory.si.edu/polio/>

Background for Teachers

Small amounts of iodine are essential for a child's growth and development. If a child does not receive enough iodine, or if his or her mother is iodine-deficient during pregnancy, the child is likely to be born with a mental, hearing, or speech disability, or may have delayed physical or mental development. Goiter, an enlargement of the thyroid gland, is one sign of a shortage of iodine in the diet. A pregnant woman with goiter is at high risk of miscarriage or stillbirth, or of giving birth to a child with brain damage.

Using iodized salt instead of ordinary salt provides pregnant women and children with as much iodine as they need. If iodized salt is not available, women and children should receive iodine supplements from a health worker or health care facility.

(Find out more at Facts for Life, <http://www.unicef.org/ffl/pdf/factsforlife-en-part6.pdf>)

Opening Activity: Salt Plus

Directions

1. On the board write: "Iodized Salt: This salt supplies iodide, a necessary nutrient."
2. Elicit or provide a definition of *nutrient*, an ingredient in food that promotes growth in humans, animals, and plants. (*Youth Report*, page 39) Point out that iodide is a compound of iodine.
3. Ask: What are the health benefits of iodized salt? (*Some students may know iodized salt prevents goiter but may not know its beneficial effects on child development.*)
4. Read aloud the following information from UNICEF, Facts for Life: "Iodized salt is essential to prevent iodine deficiency disorders (IDD), which lead to brain damage, learning disabilities, and delayed development in children." Point out that salt iodization is an inexpensive solution to a problem that threatens children in many parts of the world. Explain that students will now explore other similar lifesaving interventions.

Group Activity: Lifesaving Interventions

Directions

1. Assign students to one of three groups to investigate and report on lifesaving interventions against malaria (example: Kenya), IDD (example: Turkmenistan), and measles (example: Angola).

 **Tip:** Because members of the Kenya group will have previously watched and discussed a video, you may want to ask this group to investigate additional sources of new information about malaria.

2. Invite all students to locate Kenya, Turkmenistan, and Angola on a world map or globe.

3. Distribute the appropriate page of Handout 6 to each group. Explain that they will complete the Handout using information in the *Youth Report* and online.
4. Invite each of the three groups to present information about the lifesaving intervention they investigated.

Extension Activity 1: Global Trends in Immunization Rates

Directions

1. Provide students with the following questions:
 - What diseases are children immunized against?
 - How do experts explain the rapid increase in global immunization during the 1980s (as shown on the graph on page 16 of the *Youth Report*)?
 - What are some of the current challenges in global immunization efforts?
2. Challenge students to find and report on answers to the questions using these resources:
Youth Report, Chapter 2, pages 16 (graph) and 17; Timeline, page 18 (1974, 1982)

UNICEF: Immunization

The challenge: http://www.childinfo.org/Immunization_challenge.html

Current status: http://www.childinfo.org/Immunization_status.html

Trends: http://www.childinfo.org/Immunization_trends.html

World Health Organization: Global Immunization Data

http://www.who.int/immunization/newsroom/global_immunization_data_december2008.pdf

Extension Activity 2: Investigate Polio in the United States

Directions

1. Assign four or more students to research the history of polio in the U.S..” Direct students to the information at the Smithsonian Institution’s web site, “Whatever Happened to Polio? The virus and the vaccine” <http://americanhistory.si.edu/polio/> and *Polio: An American Story* by David M. Oshinsky.
2. If feasible, students can also interview older family members and friends about their memories of polio in early to mid-twentieth century. Questions might include: Did you or anyone you knew have polio? How did it affect you or them? Did you receive a polio vaccine and, if so, how old were you?
3. The group can report its findings to the class, answering the question — Whatever happened to polio in the U.S.?— through a poster, PowerPoint presentation, or other means.

Call to Action:

Create a public service announcement for radio or TV

Create a video or a public service announcement using UNICEF's reports from and about children around the world (www.unicef.org). Focus on the Child Survival Revolution: what has been achieved and what is left to do. You might also use online social networking tools to inform others about child survival and community-based programs.

MALARIA: KENYA

Directions: Find answers to the following questions using the *Youth Report* and the online resources listed below. Then follow your teacher's directions.

- What is malaria?
- How is malaria transmitted?
- Describe UNICEF's campaign against malaria in Kenya.
- Why is malaria especially harmful to children under five years of age?
- How do insecticide treated bed nets prevent malaria deaths?

Resources:

UNICEF Video: Kenya — A campaign against malaria
http://www.unicef.org/sowc08/profiles/7_kenya.php

UNICEF: Health, Malaria
http://www.unicef.org/health/index_malaria.html

UNICEF, *Malaria and Children Report*, "Background on Malaria" (scroll down to page 9, and then scroll down to "Insecticide-treated nets")
[http://www.unicef.org/health/files/Malaria_Oct6_for_web\(1\).pdf](http://www.unicef.org/health/files/Malaria_Oct6_for_web(1).pdf)

IDD (Iodine Deficiency Disorders): TURKMENISTAN

Directions: Find answers to the following questions using the resources listed below. Then follow your teacher's directions.

- What is IDD?
- Why is IDD especially harmful in children?
- How is IDD prevented?
- Why is Turkmenistan's effort against IDD considered a "success story"?
- What are the some of the strategies UNICEF has used/advocated for preventing IDD?

Resources:

Youth Report: Chapter 2

UNICEF Video: National salt iodization gives children a head start

http://www.unicef.org/sowc08/profiles/1_turkmenistan.php

UNICEF: Press release, "UNICEF issues major report on Iodine Deficiency highlighting principles for success"

http://www.unicef.org/media/media_44632.html

UNICEF: *Progress for Children*, No. 6, 2007, p.8

http://www.unicef.org/publications/files/Progress_for_Children_No_6_revised.pdf

MEASLES: ANGOLA

Directions: Find answers to the following questions using the resources listed below. Then follow your teacher's directions.

- **What is measles?**

- **How is measles transmitted?**

- **Why is measles especially harmful to children under five years of age?**

- **How was the measles vaccine administered in Angola in 2006?**

- **What are some of the strategies UNICEF proposed for eradicating measles?**

- **What is the status of the fight against measles in 2008?**

Resources:

Youth Report: Chapter 2

SOWC 2008: "The Measles Initiative," page 28

<http://www.unicef.org/sowc08/docs/sowc08.pdf>

U.S. Fund for UNICEF: "The Measles Initiative"

http://fieldnotes.unicefusa.org/2008/12/the_measles_initiative.html

UNICEF: *Measles Reduction and Elimination: Strategic Plan 2001-2005*, Executive Summary, page vi.

http://www.unicef.org/spanish/health/files/measles_strategy_2001_2005.pdf