



## Hunger Hurts

### Description:

Students will go to [www.scienceheroes.com](http://www.scienceheroes.com) and read about scientists that have worked and made discoveries to prevent worldwide hunger. Students will describe how hunger and malnutrition are related, but not the same problems. They will recognize hunger as a global community issue and be challenged to investigate hunger in their own community.

**Grade Level: 9-12**

**Time: 2-4 class periods**

### National Science Education Standards: (Objectives)

As a result of this activity students will develop a greater understanding about scientific inquiry and the ability to do it.

**KEY INQUIRY SKILLS from National Content Standard G: Grades 9-12**

**History and Nature of Science**

**Science as a Human Endeavor**

- Scientists have ethical traditions. Scientists value peer reviews.



- Scientists are influenced by societal, cultural and personal beliefs and ways of viewing the world. Science is not separate from society but rather science is a part of society.

### **Nature of Science**

- Importance of experimentation and observational confirmation in testing and changing ideas in science.
- Normalcy of disagreement in areas of active research.

### **History of Science**

- Value of studying the contribution of others.
- Challenges for innovators from historical perspective.

### **KEY INQUIRY SKILLS from National Content Standard E: Grades 9-12**

#### **Science and Technology**

- Contributions to science and technology by many people and cultures.

### **KEY INQUIRY SKILLS from National Content Standard A: Grades 9-12**

#### **Science as Inquiry**

- Abilities necessary to do scientific inquiry.
- Understanding about scientific inquiry.

### **Materials:**

Computers with Internet access. One for each group of 3 or 4 students.

Student science journals

Student worksheet

Large pieces of chart paper

### **Procedures:**

#### **Engage:**

Read to students this quote from a famous scientist: “I think I’ve learned a primal rule of nature. You see, it wasn’t me at all. It was primitive, rudimentary. I can’t explain how hungry I was. I was starving, and I found out that a hungry man is worse than a hungry



beast.”

This statement was made by Norman Borlaug, when he was a collegiate wrestler, on what it felt like to lose weight for a match. He went on to do a lot in helping the people of the world not be hungry! Ask: Have you ever experienced hunger? How does it make you feel? (*Have a discussion about hunger.*) Do you think many people in our country experience hunger? Ask students to name some of the reasons why they think people go hungry and why hunger is still a problem in the world today. (*List as many ideas as they can think of on the board. There is no single cause of world hunger. It is a very complex issue with lots of geography and societal connections. Develop with the students a definition of hunger that speaks to long-term lack of food, starvation, and develop causes to include poverty, famine, unemployment, and poor nutrition.*)

## **Explore:**

### **Day 1**

Instruct students to work with a partner and go to the [www.scienceheroes.com](http://www.scienceheroes.com) website and read the biography of Norman Borlaug. Also read the quotes by and about him on the same website. Look for the “Table of Contents” section and click on “Key Insight” etc. to learn more about Borlaug. Then watch a two minute video of Penn and Teller: Is Norman Borlaug the "Greatest Person in history?"

<http://www.youtube.com/watch?v=dPosEhKx5vI>

Have students complete the worksheet on Norman Borlaug. (*may be a good place to end for the day.*)

### **Day 2**

Ask students to imagine that a friend or relative has said to them "It's such a pity that so many people are hungry in the world, but what can be done? It seems hopeless to me." Ask students to write statements they would make to this person. Their statements should describe some type of activities that may help alleviate world hunger.

Have students go to [www.scienceheroes.com](http://www.scienceheroes.com) and research and read the biography about Andre Briend. (*Briend revolutionized the treatment of malnourished children by developing Plumpy'nut, a peanut-based food.*)



Tell them to look under “Links” and watch the 60 minutes story on Plumpy’net.

Have a lively discussion about “Plumpy’nut” including how it came about, why it’s better than dry formula for a baby, cost, etc.

### Day 3

Using dictionaries or the internet, have students redefine or add to their definition of hunger. Place the definition on the board or on an overhead. Explain that we all feel hungry at times. Hunger is the way the body signals that it needs to eat. Ask the students to explain the difference between hunger and malnutrition. (*Malnutrition means a person’s body lacks the nutrients necessary to grow and stay healthy. The condition may result from an inadequate or an unbalanced diet. People who go hungry all the time and are malnourished and don’t develop normally. People suffer from hunger because they don’t get enough food, and hunger can lead to malnutrition over the long term. Starvation is a form of malnutrition.*)

Divide the class into five or six groups. Give each of the groups one of the scientists listed below to research (one or more of the groups will have the same scientist) on the [www.scienceheroes.com](http://www.scienceheroes.com) website. Scientists are: Alfred Sommer, Ancel Keys, and Andre Briend)

Ask the groups to read the biographies and also go to some of the additional links posted for their scientist on the website and summarize the information about hunger and its effects on a piece of chart paper. They should also include what their scientists have done to help prevent hunger and malnutrition Information. They might look for: location (where the scientist did their research), cause(s) of hunger/poverty, number of people affected, quotes from the scientists and others, etc. They should gather as much information as they can about their scientist. After the information is charted, post the charts in the room and allow the class to do a “walk about” to get a general impression of global hunger and what these scientists have done to help prevent it.

Use the information students gathered to generate a discussion about hunger in the world and the scientists that have helped to eliminate some of it. Questions could include the following:

- What are some of the causes of hunger?



- Why does hunger exist when the world produces enough food to feed the population?
- What is the connection between hunger and poverty?
- Connect human diseases to hunger and poverty.
- Discuss the relationship of geography to hunger and major natural changes/floods, drought.

### **Explain:**

Worldwide, half of all child deaths are caused by malnutrition, and nearly 20 million children under the age of 5 are severely malnourished. In countries such as Bangladesh and Sierra Leone, the mortality rate for these children is 20 percent or more, and among those who survive, recovery rates are low. Malnourished children are prone to infection and disease; many never achieve normal growth.

The number of hungry and malnourished people in the world continues to grow.

The problem is not that some nations are over-populated; it is that some nations have inadequate food production.

Most people in the United States do not know hunger as "ceaseless discomfort, weakness, and pain"; people in developing countries do know hunger in those ways.

### **Elaborate and Connect:**

#### **Day 4**

Have students go to [www.scienceheroes.com](http://www.scienceheroes.com) and read about the controversy surrounding Fritz Haber and Carl Bosch. Have students research these two scientists on at least two other web sites and then vote on the science heroes' website and tell why or why not these men should be included on the science heroes website.

*(Their Haber-Bosch process has often been called the most important invention of the 20th century (e.g., V. Smil, Nature, July 29 1999, p 415) as it "detonated the population explosion," driving the world's population from 1.6 billion in 1900 to 6 billion in 2000 by making it possible to grow more food.*



*The 70 million deaths of World War I and World War II almost vanish next to these numbers. But Haber, a patriotic German Jew, shared some responsibility for those as well: his work helped Germany to significantly prolong WW I, and also to develop the Zyklon B poison gas used in WW II's Holocaust. Haber's almost paradoxical biography affected more lives and deaths than anybody else's.)*

- Working in small groups of two or three on the Internet, have the learners research the organizations in their community that address hunger. Have each learner identify the services offered by an organization being researched by sharing information with the class.
- Invite a nutritionist to speak to the class about daily nutritional needs of children to be successful in school.
- Ask learners if the family did not have enough money to eat healthy foods from the grocery store such as vegetables, what other method could be used to obtain those foods? (This question may prompt the idea of growing your own vegetables in season.)
- Ask students whose family does plant a vegetable garden, what they plant and estimate the yield their family gets.
- Ask the students to list all the places in their community that provide food for those in need. Compile the list on the chalkboard.

### **Evaluate:**

A teacher may use any or all of the ways below to evaluate.

- Teacher observation.
- Class participation in discussions.
- Responses to worksheet on Norman Borlaug
- Group work about their scientist
- Or additionally, a report on an issue relating to poverty: diseases directly associated with hunger in today's world such as Afghanistan or Somalia but not limited to those two areas.



## Worksheet About Norman Borlaug

Write your answers in your science journals.

1. Why is Borlaug considered the “father of the Green Revolution”?
2. Norman Borlaug is the only agricultural scientist to win the Nobel Prize. What do you think his discoveries increasing wheat production has to do with peace?
3. After reading all of the information about Borlaug on [www.scienceheroes.com](http://www.scienceheroes.com) do you consider Borlaug to be “one of the greatest people in history”? Why or why not?
4. In your own words describe the way Borlaug conducted his research. What was the question he started with? How did he collect data? Did he discover anything along the way that he wasn't expecting? What other parts of the “scientific method” did he use?



This lesson plan was written by Catherine Hesseldenz of Lexington, KY. She is a retired science teacher with over 33 years of experience at every grade level ranging from kindergarten to college seniors. Holding a Masters degree, she has also worked as the County Science Resource Teacher for the Fayette County Public Schools (50 schools) for 11 years, including organizing the county science fair and developing teaching materials for middle school programs through the University of KY.

