

# Norman Borlaug- Hunger Fighter

## Grades 6-8

English Language Arts, Social Studies, Computer Science



### Objectives

Through classroom experiences, students will read about the research of Nobel Prize-winning plant breeder Norman Borlaug and conduct interviews with one another about the reading. Students will describe Norman Borlaug's influence in beginning the Green Revolution, and apply concepts to current local and world events.

### Vocabulary

**crop failure**—reduction in crop yield to a level that there is no marketable surplus or the nutritional needs of the community cannot be met

**developing nation**—a nation with a low level of material well-being

**dwarf**—an animal or plant much below normal size

**gene**—a part of DNA or RNA that is usually located on a chromosome and that contains chemical information needed to make a particular protein controlling or influencing an inherited bodily trait or activity or that influences or controls the activity of another gene or genes

**plant breeder**—someone who propagates plants sexually under controlled conditions

**resistant**—capable of withstanding the force or effect of a disease

**stalk**—a plant stem especially of a plant that is not woody

### Background

Norman Borlaug was a **plant breeder**. He used high-yield agriculture techniques to help people get more food from their land. For 50 years he worked in **developing nations** like Mexico, India, and Pakistan. Before he began his work, mass starvation had been predicted in many parts of the world. Since then, food production has expanded faster than human population in all parts of the world except sub-Saharan Africa. Borlaug received the Nobel Peace Prize in 1970, mostly for his work reversing food shortages in India and Pakistan during the 1960s.

Norman Borlaug was born in Cresco, Iowa, in 1914. When he was a young man, the Dust Bowl hit the Midwestern US. Some people blamed modern farming methods, but Borlaug believed just the opposite was true. He noticed that the effects of the Dust Bowl were not as bad in Iowa and other places where high-yield agriculture techniques were being tried. He decided that his life's work would be to help people grow more food in places where **crop failures** were regular facts of life.

Borlaug helped found the International Maize and Wheat improvement Center (CIMMYT) in Mexico. There he helped develop high-yielding semi- **dwarf** wheat varieties. Today this wheat feeds a large portion of the world's population.



**"Civilization as it is known today could not have evolved, nor can it survive, without an adequate food supply."**

**- Norman Borlaug**

## Norman Borlaug- Hunger Fighter

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Borlaug's leading research achievement was the development of dwarf spring wheat. He found many benefits to growing plants with shorter **stalks**. Nature favors **genes** for tall stalks because in nature, plants must compete for sunlight. Borlaug found that plants with stalks that were short and of equal length would receive equal amounts of sunlight when they did not have to compete with taller-stalked plants. In addition, dwarf wheat used more energy growing valuable grain rather than using its energy to grow tall stalks with no food value. Stout, short stalks also support wheat kernels better. Tall-stalked wheat may bend over at maturity, making it more difficult to harvest.

Borlaug also developed cereal grains that were day neutral (insensitive to the number of hours of light in a day) and could, therefore, be grown in many climates. He particularly favored growing wheat in countries where starvation was a concern because wheat grows in nearly all environments and is **resistant** to insects.

### Additional Reading

Bartoletti, Susan Campbell, *Black Potatoes: The Story of the Great Irish Famine, 1845-1850*, Houghton-Mifflin, 2001.

Hesser, Leon, *The Man Who Fed the World: Nobel Prize Laureate Norman Borlaug and His Battle to End World Hunger*, Righters Mill Press LLC, 2019.

Mann, Charles C., *The Wizard and the Prophet*, Penguin Random House, 2018

Smith, David J., *If the World Were a Village*, Kids Can, 2002

Vietmeyer, Noel, *Our Daily Bread; The Essential Norman Borlaug*, Bracing Books, 2012

### Websites

[https://www.worldfoodprize.org/en/dr\\_norman\\_e\\_borlaug/about\\_norman\\_borlaug/](https://www.worldfoodprize.org/en/dr_norman_e_borlaug/about_norman_borlaug/)

<https://allianceforscience.cornell.edu/blog/2020/04/norman-borlaug-legacy-documentary/>

<https://www.purdue.edu/discoverypark/food/programs/borlaug-fellows/norman-borlaug.php>

# Norman Borlaug- Hunger Fighter

Activity 1

Grades 6-8 Teacher Resources and Standards

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## Activity 1: Norman Borlaug Interview, (ELA, Computer Science)

1-2 50 minute class periods

Students will read about Norman Borlaug, write a narrative of an interview based on the reading, and develop a technology-based project related to Borlaug.

### Oklahoma Academic Standards

#### Activity 1: Norman Borlaug Interview (ELA, Computer Science)

- 6.1.W.1 Students will give formal and informal presentation in a group or individually, organizing information and determining appropriate content and purpose for audience.
- 7.1.W.1 Students will give formal and informal presentations in a group or individually,  
8.1.W.1 providing evidence to support a main idea.
- 6.IC.SI.01 Individually and collaboratively develop and conduct an online survey that seeks input from a broad audience. Describe and use safe, appropriate, and responsible practices (netiquette) when participating in online communities (e.g., discussion groups, blogs, social networking sites).
- 7.IC.SI.01 Individually and collaboratively use advanced tools to design and create online content (e.g., digital portfolio, multimedia, blog, web page). Describe and use safe, appropriate, and responsible practices (netiquette) when participating in online communities (e.g., discussion groups, blogs, social networking sites).
- 8.IC.SI.01 Communicate and publish key ideas and details individually or collaboratively in a way that informs, persuades, and/or entertains using a variety of digital tools and media-rich resources. Describe and use safe, appropriate, and responsible practices (netiquette) when participating in online communities (e.g., discussion groups, blogs, social networking sites).

#### Materials:

- Activity 1 “**Norman Borlaug Reading Page**”
- Activity 1 Worksheet 1 “**Interview Script**”
- Computer/Laptop

#### Procedures

1. Students will pair up to read about Norman Borlaug from the “**Reading Page**”.
2. Students will write a narrative of an interview with Norman Borlaug, based on the reading. — See “**Interview Script**”
3. Students will use the interviews to individually and collaboratively develop and conduct an online survey that seeks input from a broad audience; use advanced tools to design and create online content (e.g., digital portfolio, multimedia, blog, web page); and/or communicate and publish key ideas and details in a way that informs, persuades, and/or entertains using a variety of digital tools and media-rich resources. Whichever project they develop, the information should be related to Norman Borlaug.

Norman Borlaug was born in Cresco, Iowa, in 1914. When he was a young man, the Dust Bowl hit the Midwestern United States. Some people blamed modern farming methods, but Borlaug noticed that the effects of the Dust Bowl were not as bad in Iowa and other places where high-yield farming practices were being tried. He decided that his life's work would be to help people grow more food in places where **crop failures** usually happened.



**"Civilization as it is known today could not have evolved, nor can it survive, without an adequate food supply."**

**- Norman Borlaug**

Norman Borlaug became a **plant breeder**. He used high-yield agriculture practices to help people get more food from their land. For 50 years he worked in **developing nations** like Mexico, India, and Pakistan. Before he began his work, mass hunger had been predicted in many parts of the world. Due to his research,

food production expanded faster than the human population in all parts of the world except sub-Saharan Africa. Borlaug received the Nobel Peace Prize in 1970, mostly for his work reversing food shortages in India and Pakistan during the 1960s.

Borlaug helped found the International Maize and Wheat Improvement Center (CIMMYT) in Mexico. There Borlaug's leading research was the development of dwarf spring wheat. He found many benefits to growing plants with shorter stalks. Nature favors genes for tall stalks because in nature, plants must compete for sunlight. Borlaug found that plants with stalks that were short and of equal length would receive equal amounts of sunlight when they did not have to compete with taller-stalked plants. In addition, dwarf wheat grew more grain, which could be eaten, rather than growing tall stalks with no food value. Stout, short stalks also support wheat kernels better. Tall-stalked wheat may bend over at maturity, making it more difficult to harvest. Today this dwarf wheat feeds a large portion of the world's population.

Borlaug also developed cereal grains that needed fewer hours of light each day and could be grown in many climates. He favored growing wheat in countries where starvation was a concern. This is because wheat grows in nearly all environments and is **resistant** to insects.

# Norman Borlaug- Hunger Fighter

## Activity 1 Worksheet 1: Interview Script



Name: \_\_\_\_\_ Date: \_\_\_\_\_

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Directions: Interview your partner using the following questions. Create two questions of your own based on the readings. Record your partner's answers, which should come from the reading page. After interviewing, you and your partner will work individually and collaboratively to develop, create, and conduct either: an online survey about Norman Borlaug; digital portfolio, multimedia, blog, or web page about Norman Borlaug; and/or communicate and publish key ideas and details in a way that informs, persuades, and/or entertains.

1. When did Borlaug win the Nobel Peace Prize? What was his motivation?
2. Why did he win the Nobel Peace Prize? Do you believe his work was worthy of the Nobel Peace Prize?
3. How did he become interested in his work on high-yield agriculture?
4. What difference did his work make in the world? Do you think his work has impacted your life?
- 5.
- 6.



# Norman Borlaug- Hunger Fighter

## Activity 1 Worksheet 1: Interview Script

### ANSWER KEY



Name: \_\_\_\_\_ Date: \_\_\_\_\_

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Directions: Interview your partner using the following questions. Create two questions of your own based on the readings. Record your partner's answers, which should come from the reading page. After interviewing, you and your partner will work individually and collaboratively to develop, create, and conduct either: an online survey about Norman Borlaug; digital portfolio, multimedia, blog, or web page about Norman Borlaug; and/or communicate and publish key ideas and details in a way that informs, persuades, and/or entertains.

1. When did Borlaug win the Nobel Peace Prize? What was his motivation?

**ANSWERS WILL VARY BUT SHOULD INCLUDE:** Borlaug received the Nobel Peace Prize in 1970. He decided that his life's work would be to help people grow more food in places where crop failures were regular facts of life.

2. Why did he win the Nobel Peace Prize? Do you believe his work was worthy of the Nobel Peace Prize?

**ANSWERS WILL VARY BUT SHOULD INCLUDE:** He won mostly for his work reversing food shortages in India and Pakistan during the 1960s.

3. How did he become interested in his work on high-yield agriculture?

**ANSWERS WILL VARY BUT SHOULD INCLUDE:** He noticed that the effects of the Dust Bowl were not as bad in Iowa and other places where high-yield agriculture techniques were being tried.

4. What difference did his work make in the world? Do you think his work has impacted your life?

**ANSWERS WILL VARY BUT SHOULD INCLUDE:** Borlaug found that dwarf wheat used more energy growing valuable grain rather than using its energy to grow tall stalks with no food value. Borlaug also developed cereal grains that could be grown in many climates. He particularly favored growing wheat in countries where starvation was a concern, because wheat grows in nearly all environments and is resistant to insects.

5. ANSWERS WILL VARY

6. ANSWERS WILL VARY

# Norman Borlaug- Hunger Fighter

Activity 2

Grades 6-8 Teacher Resources and Standards

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## Activity 2: Library Research, (ELA, Social Studies) 3 50 minute class periods

Students will conduct research and share their findings with the class on a related topic.

### Oklahoma Academic Standards

#### Activity 2: Library Research (ELA, Social Studies)

- 6.6.W.2 Students will refine and formulate a viable research question and/or topic from initial findings.
- 7.6.W.2 Students will refine and formulate a viable research question and report findings clearly  
8.6.W.2 and concisely, using a thesis statement.
- 6.4.2.SS Evaluate the effects of human modification on the natural environment through  
7.SS.4.4 transformation caused by subsistence and commercial agriculture, industry, demand for energy, and urbanization.

#### Materials:

- Activity 2 Worksheet 1 “MS Research Graphic Organizer”
- Computer/Laptop

#### Procedures

1. Students will use online or library resources to conduct research on one of the following topics.
  - Norman Borlaug
  - Green Revolution
  - Nobel Peace Prize
  - International Maize and Wheat Center High-Yield Agriculture
  - Plant Breeding
  - World Hunger
2. See “MS Research Graphic Organizer”.
3. Students will report to the class on the results of their research.

# Norman Borlaug- Hunger Fighter

## Activity 2 Worksheet 1: MS Research Graphic Organizer



Name: \_\_\_\_\_ Date: \_\_\_\_\_

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Conduct research on one of the following topics: Norman Borlaug; Green Revolution; Nobel Peace Prize; International Maize and Wheat Center High-Yield Agriculture; Plant Breeding; or World Hunger. Use the Graphic Organizer to record the main ideas from your research, add more boxes if needed. Use the information to write a research paper with a clear thesis statement.

