

# The Whole Grain Truth

## Learner Objectives

Participants will be able to:

- discuss the functions of grains in the body;
- discuss the differences between whole grains and refined grains;
- explain the benefits associated with whole grains; and
- identify one goal or action (individual or as a group) related to increasing whole grain intake.

## Materials

- Room to run around

## Discussion

### 1. Discuss the role of grains.

Provide energy for brain function and muscle contraction.

- B vitamins help cells produce energy.
- Folic acid helps protect against birth defects.

These vitamins reduce the risk of chronic diseases such as:

- heart disease,
- diabetes, and
- cancer.

### 2. Talk about the difference between whole grains and refined grains.

#### Whole grains

- contain the entire grain kernel — the bran, germ, and endosperm, which contain more nutrients.

Examples of whole grains include:

- whole-wheat flour,
- bulgar (cracked wheat),
- oatmeal,
- whole cornmeal, and
- brown rice.

#### Refined grains

- have bran and germ removed,
- lack dietary fiber, iron, and many B vitamins (unless fortified).

Examples of refined grains are:

- white flour,
- degermed cornmeal,
- white bread, and
- white rice.

### 3. Discuss the amount of grains needed each day.

#### MyPlate grain recommendations

Group	Age	Daily Recommendation	Daily Minimum Requirement of whole grains
Children	2 to 3 years old	3 to 5 ounces	1½ to 3 ounces
	4 to 8 years old	4 to 6 ounces	2 to 3 ounces
Girls	9 to 13 years old	5 to 7 ounces	2½ to 3½ ounces
	14 to 18 years old	6 to 8 ounces	3 to 4 ounces
Boys	9 to 13 years old	5 to 9 ounces	3 to 4½ ounces
	14 to 18 years old	6 to 10 ounces	3 to 5 ounces
Women	19 to 30 years old	6 to 8 ounces	3 to 4 ounces
	31 to 59 years old	5 to 7 ounces	3 to 3½ ounces
	60+ years old	5 to 7 ounces	3 to 3½ ounces
Men	19 to 30 years old	8 to 10 ounces	4 to 5 ounces
	31 to 59 years old	7 to 10 ounces	3½ to 5 ounces
	60+ years old	6 to 9 ounces	3 to 4½ ounces

**4. Talk about what equals a 1-ounce equivalent (provide examples).**

- 1 slice bread
- 1 cup ready-to-eat cereal
- ½ cup cooked rice or pasta
- ½ cup cooked cereal

**5. Discuss the importance of whole grains.**

Whole grains contain antioxidants not found in fruits and vegetables.

These contain:

- B vitamins — for heart health and the prevention of spinal defects in infants.
- Vitamin E — a major antioxidant.
- Magnesium — keep bones strong and heart healthy, and supports a strong immune system.
- Iron — an important part of red blood cell function, an antioxidant, and an immunity booster.
- Fiber — plays a major role in the prevention of colon and rectal cancer, and it helps prevent constipation. Other benefits include:
  - reduced risk of obesity, and
  - lower levels of cholesterol.



**6. Compare the nutrition labels.**

- Look at the three nutrition labels on the resource sheet.
- Have the students decide if the food products contain whole grains.
- Have the students compare the different grains in each product.



Words you may see on packages	What they mean
whole grain [name of grain] whole wheat whole [other grain] stone ground whole [grain] brown rice oats, oatmeal (including old-fashioned oatmeal, instant oatmeal) wheat berries	YES — Contains all parts of the grain, so you're getting all the nutrients of the whole grain.
wheat flour semolina durum wheat organic flour multigrain (may describe several whole grains or several refined grains, or a mix of both)	MAYBE — These words are accurate descriptions of the package contents, but because some parts of the grain MAY be missing, you are likely missing the benefits of whole grains.
enriched flour degerminated (on corn meal) bran wheat germ	NO — These words never describe whole grains.

# Sunshine Big Cheez-it Crackers

## Nutrition Facts

Servings Per Container About 11

Serving Size 14 Crackers (30 g)

Amount Per Serving		Cereal	
<b>Calories</b>		<b>150</b>	
	Amount/Serving	% Daily Value*	
<b>Total Fat</b>	8 g	10%	
Saturated Fat	1.5 g	8%	
Trans Fat	0 g		
Polyunsaturated Fat	4 g		
Monounsaturated Fat	2 g		
<b>Cholesterol</b>	0 mg	0%	
<b>Sodium</b>	230 mg	10%	
<b>Total Carbohydrate</b>	17 g	6%	
Dietary Fiber	<1 g	2%	
Total Sugars	0 g		
<b>Includes 0g Added Sugars</b>	0 g	0%	
<b>Protein</b>	3 g		
<b>Vitamin D</b>	0 mcg	0%	
<b>Calcium</b>	30 mg	2%	
<b>Iron</b>	1 mg	4%	
<b>Potassium</b>	30 mg	0%	

\*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

# 100% Whole Wheat Bread

## Nutrition Facts

22 Servings per container

Serving Size 1 slice (26 g)

Amount Per Serving			
<b>Calories</b>		<b>60</b>	
		% Daily Value*	
<b>Total Fat</b>	1 g	1%	
Saturated Fat	0g	0%	
Trans Fat	0 g	0%	
Polyunsaturated Fat	0 g		
Monounsaturated Fat	0 g		
<b>Cholesterol</b>	0 mg	0%	
<b>Sodium</b>	120 mg	5%	
<b>Total Carbohydrate</b>	12 g	4%	
Dietary Fiber	2 g	7%	
Total Sugars	1 g		
<b>Includes Added Sugars</b>	1 g	2%	
<b>Protein</b>	3 g		
<b>Vitamin D</b>	0 mcg	0%	
<b>Calcium</b>	30 mg	2%	
<b>Iron</b>	0.5 mg	4%	
<b>Potassium</b>	60 mg	0%	

\*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Calories per gram: Fat 9; Carbohydrate 4; Protein 4

# Cinnamon Toasters Cereal

## Nutrition Facts

Serving Size 1 Cup (41 g)

Amount Per Serving		Cereal	
<b>Calories</b>		<b>170 as packaged</b>	
Food component/nutrient	Amount as packaged	% Daily Value* as packaged	
<b>Total Fat</b>	4 g	5%	
Saturated Fat	0 g	0%	
Trans Fat	0 g		
Polyunsaturated Fat	1 g		
Monounsaturated Fat	2.5 g		
<b>Cholesterol</b>	0 mg	0%	
<b>Sodium</b>	230 mg	10%	
<b>Total Carbohydrate</b>	33 g	12%	
Dietary Fiber	3 g	11%	
Total Sugars	12 g		
<b>Includes Added Sugars</b>	12 g	24%	
<b>Protein</b>	2 g		
<b>Vitamin D</b>	4 mcg	20%	
<b>Calcium</b>	130 mg	10%	
<b>Iron</b>	3.6 mg	20%	
<b>Potassium</b>	0 mg	0%	
<b>Vitamin A</b>		10%	
<b>Vitamin C</b>		10%	
<b>Thiamin</b>		20%	
<b>Riboflavin</b>		10%	
<b>Niacin</b>		10%	
<b>Vitamin B6</b>		20%	
<b>Folate</b>		20%	
<b>Folic Acid</b>	45 mcg		
<b>Vitamin B12</b>		20%	
<b>Zinc</b>		20%	

\*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Ingredients: Whole Grain Wheat, Sugar, Rice Flour, Canola and/or Sunflower Oil, Fructose, Maltodextrin, Dextrose, Salt, Cinnamon, Trisodium Phosphate, Soy Lecithin, Caramel Color, Rosemary Extract. BHT Added to Preserve Freshness. Vitamins and Minerals: Calcium Carbonate, Vitamin C (sodium ascorbate), Iron and Zinc (mineral nutrients), A B Vitamin (niacinamide), Vitamin B6 (pyridoxine hydrochloride), Vitamin B1 (thiamin mononitrate), Vitamin A (palmitate), Vitamin B2 (riboflavin), A B Vitamin (folic acid), Vitamin B12, Vitamin D3.

CONTAINS WHEAT AND SOY INGREDIENTS.

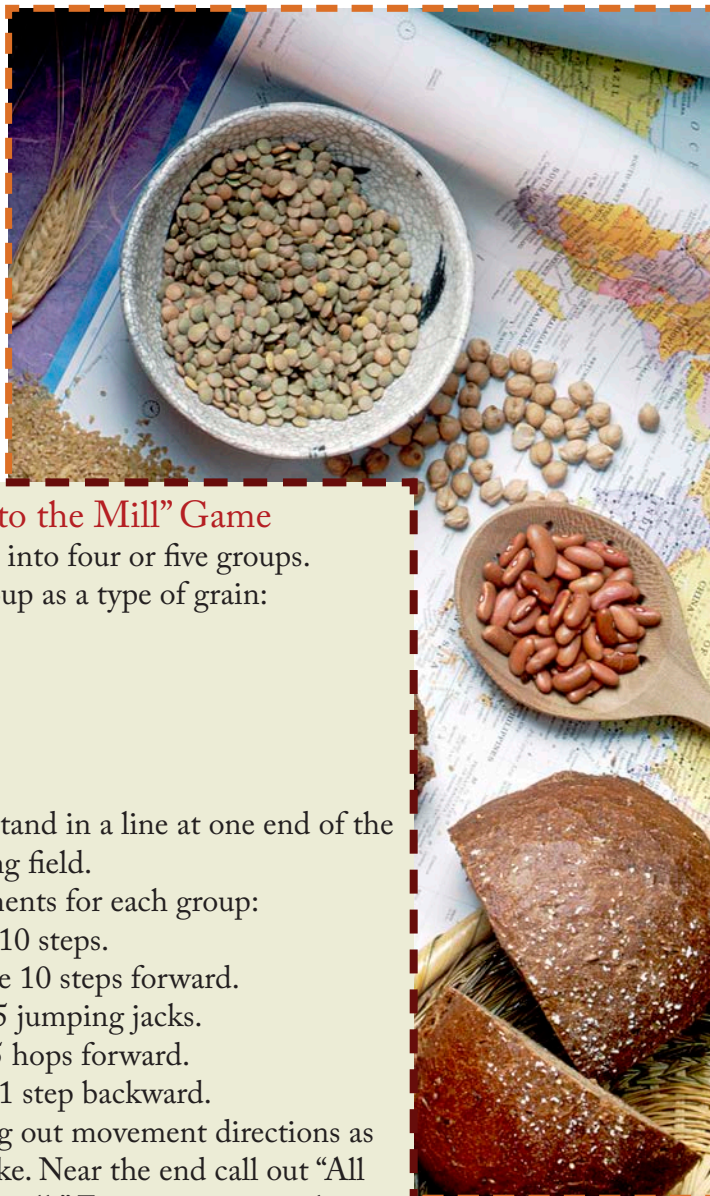
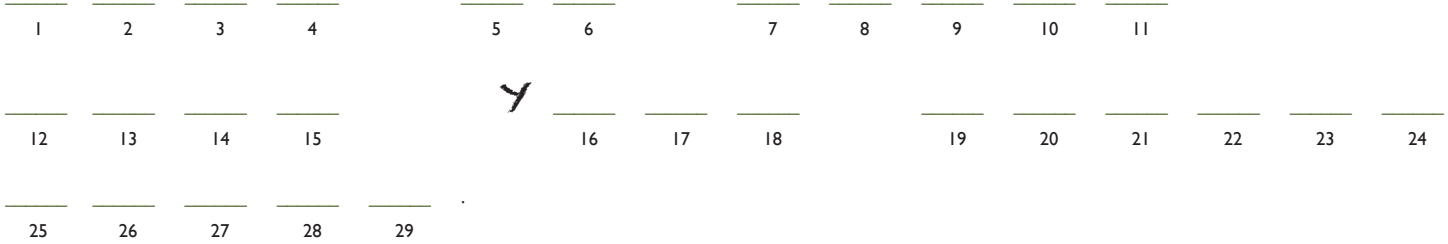


# Activities

## Grain Scramble!

Unscramble each of the clue words on the next page.

Match the letters in the numbered dashes to the puzzle below to decode a secret message.



### Word List:

- popcorn
- B vitamins
- bran
- pasta
- degerminated
- durum wheat
- kernel
- germ
- whole grains
- oatmeal
- multigrain
- cereal
- refined grains
- cornmeal
- endosperm
- whole wheat
- enriched flour
- brown rice
- fiber
- semolina
- iron

### Play "Grains to the Mill" Game

Divide students into four or five groups.

Assign each group as a type of grain:

- wheat
- oats
- rice
- corn
- barley

Have students stand in a line at one end of the gym or playing field.

Call out movements for each group:

- Oats: walk 10 steps.
- Wheat: take 10 steps forward.
- Barley: do 5 jumping jacks.
- Rice: take 5 hops forward.
- Corn: take 1 step backward.

Continue calling out movement directions as long as you like. Near the end call out "All grains go the mill." Everyone runs to the opposite end of the field and back. The first group to reach the starting line wins.



## Anatomy of a Wheat Kernel

### The Endosperm

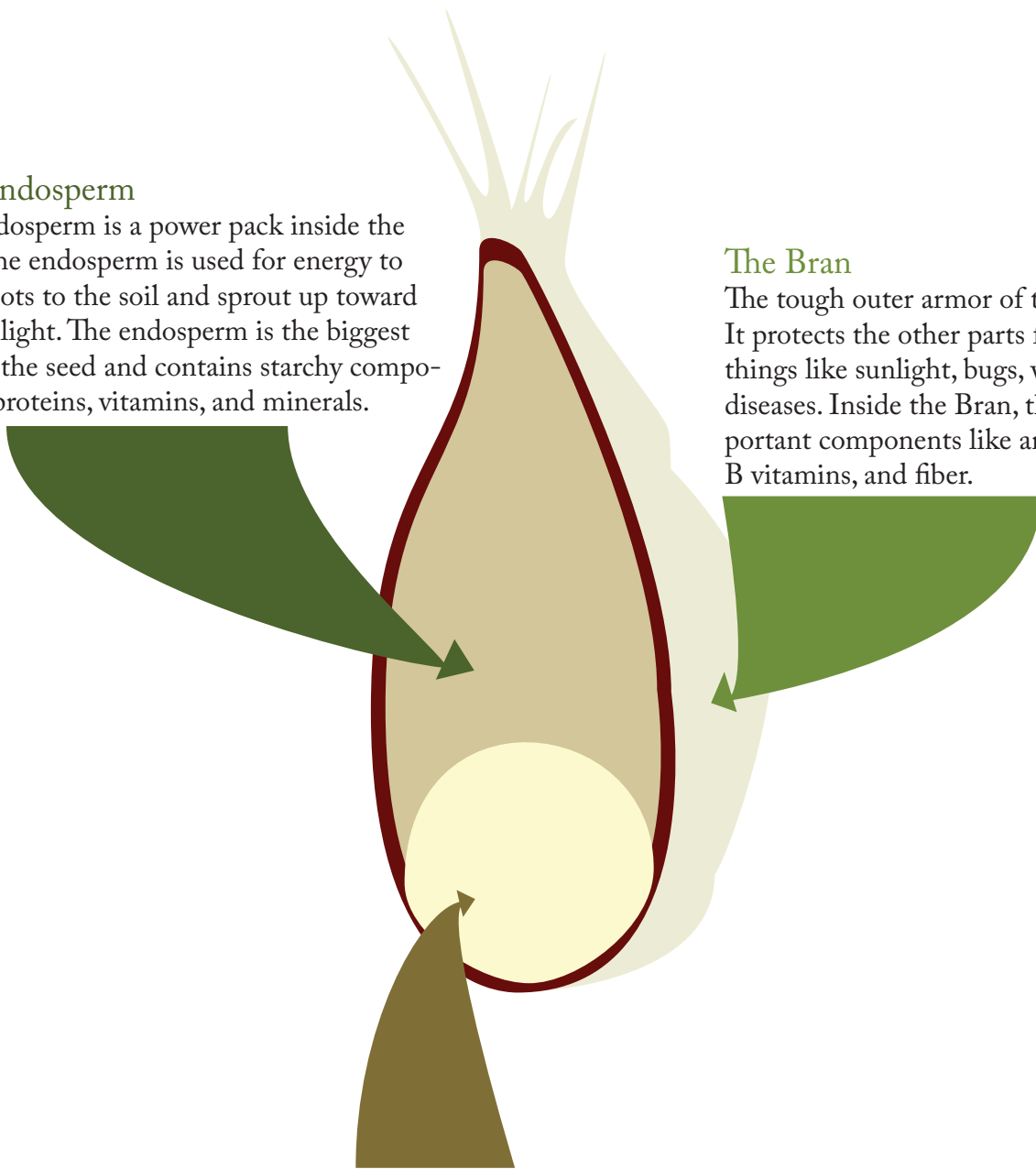
The endosperm is a power pack inside the seed. The endosperm is used for energy to send roots to the soil and sprout up toward the sunlight. The endosperm is the biggest part of the seed and contains starchy components, proteins, vitamins, and minerals.

### The Bran

The tough outer armor of the seed. It protects the other parts from outer things like sunlight, bugs, water, and diseases. Inside the Bran, there are important components like antioxidants, B vitamins, and fiber.

### The Germ

The germ is the plant's heart inside the seed. If the germ gets fertilized, it sprouts into a new plant. Inside the germ, there are B vitamins, some protein, minerals, and healthy fats.



# Worksheet

1

What is the largest part of a wheat kernel?

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2

What are some benefits of eating whole grains instead of refined grains??

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What vitamins and minerals does the bran contain?

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3

If you have 1 cup of rice, 2 slices of bread, and  $\frac{1}{2}$  cup pasta, how many ounce equivalents have you consumed?

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4

5

How many ounces of grain do you need each day? What is the minimum amount of whole grains you need each day?

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What is one thing you can do today to increase the amount of whole grains you eat?

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6

**Kansas School Wellness Policy Model Guideline — Nutrition Education**

**Classroom: Middle-High School**

Requirements achieved in this lesson:	Implementing	Transitioning	Modeling
	All students in grades K-12 will have the opportunity to participate in culturally relevant activities, as appropriate, and a variety of learning experiences that support development of healthful eating habits that are based on the most recent Dietary Guidelines for Americans and evidence-based information.	District administrators inform teachers and other school personnel about opportunities to participate in professional development on nutrition and on teaching nutrition.	The wellness committee, teachers and other school personnel participate in nutrition education-related professional development at least once a year.
<b>Topic</b>	Basic nutrient requirements for grains.		

**Kansas School Wellness Policy Model Guideline — Physical Activity**

Requirements achieved in this lesson:	Implementing	Transitioning	Modeling
	Elementary school students have at least 15 minutes a day of supervised recess (not including time spent getting to and from the playground), preferably outdoors. Supervisory staff encourage moderate to vigorous physical activity.	Elementary school students have two supervised recess periods per day (not including time spent getting to and from the playground), totaling at least 20 minutes. Supervisory staff encourage moderate to vigorous physical activity.	Elementary school students have two supervised recess periods per day, totaling at least 30 minutes (not including time spent getting to and from the playground), with one being offered in the morning. Supervisory staff encourage moderate to vigorous physical activity.

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## Answer Key

- Grain Scramble (p. 4): Make at least half your grains whole
- The endosperm
  - Whole grains have more vitamins and minerals and fiber than refined grains that lack those nutrients
  - B vitamins, antioxidants
  - 5 (1 ounce = ½ cup rice, 1 slice of bread, or ½ cup pasta)
  - Girls ages 9 to 13 years old need 5-7 ounces and a minimum of 2.5 ounces per day. Boys ages 9 to 13 years old need 5-9 ounces and a minimum of 3 ounces per day.
  - Answers vary.

Revised by Priscilla Brenes, MPH, Ph.D., Extension Assistant Professor/State Extension Specialist, Department of Food, Nutrition, Dietetics, and Health, Kansas State University

Malak Alsaati, Graduate Research Assistant in Food, Nutrition, Dietetics, and Health, Kansas State University

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