

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.

Group	Age	Daily Recommendation	Daily Minimum Requirement of whole grains
Children	2 to 3 years old	3 ounces	1½ ounces
	4 to 8 years old	4 to 5 ounces	2 to 2½ ounces
Girls	9 to 13 years old	5 ounces	3 ounces
	14 to 18 years old	6 ounces	3 ounces
Boys	9 to 13 years old	6 ounces	3 ounces
	14 to 18 years old	7 ounces	3½ ounces
Women	19 to 30 years old	6 ounces	3 ounces
	31 to 50 years old	6 ounces	3 ounces
	51+ years old	5 ounces	3 ounces
Men	19 to 30 years old	8 ounces	4 ounces
	31 to 50 years old	7 ounces	3½ ounces
	51+ years old	6 ounces	3 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

Serving Size 13 Crackers (30g)

Amount Per Serving

Calories 150 **Calories from Fat** 70

% Daily Value*

Total Fat 8g **12%**

Saturated Fat 2g **10%**

Trans Fat 0g

Polyunsaturated Fat 4g

Monounsaturated Fat 2g

Cholesterol 0mg **0%**

Sodium 230mg **10%**

Total Carbohydrate 17g **6%**

Dietary Fiber less than 1g **3%**

Sugars 0g

Protein 3g

Vitamin A 2% • Vitamin C 0%

Calcium 4% • Iron 6%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat. Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

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

INGREDIENTS: ENRICHED FLOUR (WHEAT FLOUR, NIACIN, REDUCED IRON, THIAMIN MONONITRATE [VITAMIN B₁], RIBOFLAVIN [VITAMIN B₂], FOLIC ACID), VEGETABLE OIL (SOYBEAN AND PALM OIL WITH TBHQ FOR FRESHNESS), CHEESE MADE WITH SKIM MILK (SKIM MILK, WHEY PROTEIN, CHEESE CULTURES, SALT, ENZYMES, ANNATTO EXTRACT FOR COLOR), CONTAINS TWO PERCENT OR LESS OF SALT, PAPRIKA, YEAST, PAPRIKA OLEORESIN FOR COLOR, SOY LECITHIN.

CONTAINS WHEAT, MILK AND SOY INGREDIENTS.

100% Whole Wheat Bread

Serving Size: 1 slice • 28g

Amount Per Serving

Calories 70 **Calories from Fat** 9

% DV

Total Fat 1g 2%

Saturated Fat 0g 0%

Polyunsaturated Fat 0g

Monounsaturated Fat 0g

Cholesterol 0mg 0%

Sodium 150mg 6%

Total Carbohydrate 12g 4%

Dietary Fiber 2g 8%

Sugars 1g

Protein 3g 6%

Vitamin A 0% • Vitamin C 0%

Calcium 4% • Iron 4%

Thiamine 6% • Riboflavin 2%

Niacin 6% • Folic Acid 6%

Unofficial Pts: 1 ©DietFacts.com

Percent of Calories from:

Fat: 12.9% Carb: 68.6% Protein: 17.1%

(Total may not equate 100% due to rounding.)

INGREDIENTS:

Stone ground whole wheat flour, water, corn syrup, wheat gluten, yeast, contains 2% or less of each of the following: honey, partially hydrogenated soybean oil, salt, dough conditioners (may contain one or more of each of the following: mono- and diglycerides, ethoxylated mono- and diglycerides, calcium and sodium stearoyl lactylates, calcium peroxide, calcium carbonate), whey, yeast nutrients (mono-calcium phosphate, calcium sulfate, ammonium sulfate), distilled vinegar, cornstarch.



Cinnamon Toasters Cereal

Nutrition Facts

Serving Size: 3/4 Cup (30g)

Servings Per Package: TBD

Amount Per Serving

Calories 130 **Calories from Fat** 30

% Daily Value**

Total Fat 3.5g* **5%** **6%**

Saturated Fat 0.5g **3%** **3%**

Trans Fat 0g

Polyunsaturated Fat 1g

Monounsaturated Fat 1g

Cholesterol 0mg **0%** **1%**

Sodium 140mg **6%** **8%**

Potassium 45mg **1%** **7%**

Total Carbohydrate 24g **8%** **10%**

Dietary Fiber 1g **4%** **4%**

Sugars 10g

Protein 1g

Vitamin A 10% 15%

Vitamin C 10% 10%

Calcium 10% 25%

Iron 50% 50%

Vitamin D 10% 25%

Thiamin 25% 30%

Riboflavin 25% 35%

Niacin 25% 25%

Vitamin B6 25% 25%

Folate (Folic Acid) 50% 50%

Vitamin B12 25% 35%

Phosphorus 8% 20%

Magnesium 2% 6%

Zinc 25% 30%

Copper 2% 2%

* Amount in cereal. One-half cup skim milk contributes an additional 65mg sodium, 6g total carbohydrate (6g sugars) and 4g protein.

** Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Potassium		3,500mg	3,500mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Ingredients: Whole Grain Wheat, Sugar, Rice Flour, Canola Oil and/or Partially Hydrogenated Soybean Oil, Fructose, Maltodextrin, Contains 2% or less of: Dextrose, Salt, Cinnamon, Soy Lecithin, Trisodium Phosphate, Annatto and Caramel Color, Natural Flavor. BHT (to preserve freshness).

Vitamins & Minerals: Vitamin B1 (thiamin mononitrate), Vitamin B2 (riboflavin), Niacin (niacinamide), Vitamin B6 (pyridoxine hydrochloride), Folic Acid, Vitamin B12, Vitamin A Palmitate, Vitamin C (sodium ascorbate), Vitamin D, Reduced Iron, Zinc (zinc oxide), Calcium Carbonate.

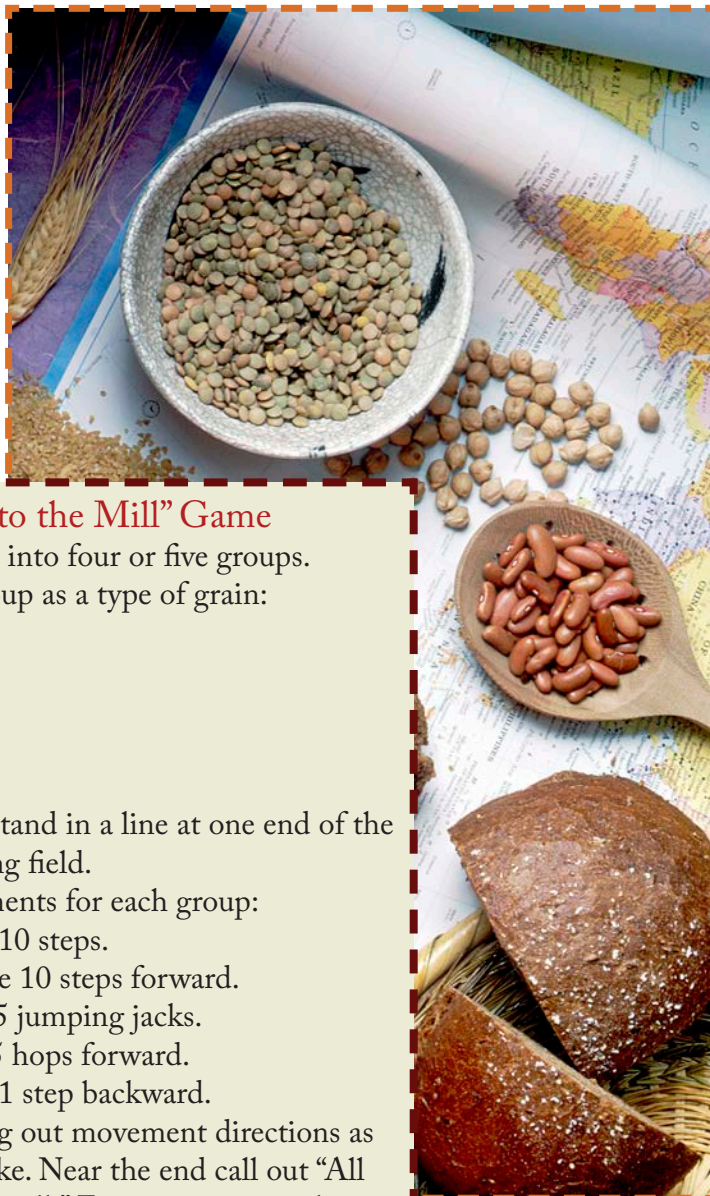
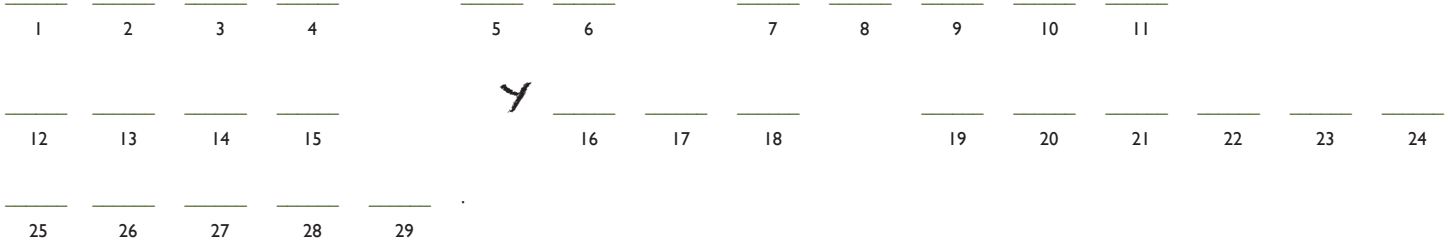
Contains Wheat and Soybean Ingredients.

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.

Grain Scramble!

LOHWE NARSIG			16						
MAOLATE		21							
ROBWYN RECI		18							
BEFIR	15								
NOIR		20							
PAAST			10						
LAREEC		4							
CNPORPO						23			
B TMIVSAIN				6			22		24
GRME	19	8							
RIEDEFN RISGAN									5
CNROAMEL		27					7		
NODSPEMRE								1	
LOWHETEWA	25			28			26		11
IANELMOS				14					
HERIECDN OLURF	29					12			
RAUTIINGLM							2		
NDADMERTIEGE								9	
RUMDU TAHWE		17							
REKNEL									
	3								
RBAN			13						



Anatomy of a Wheat Kernel

The Endosperm

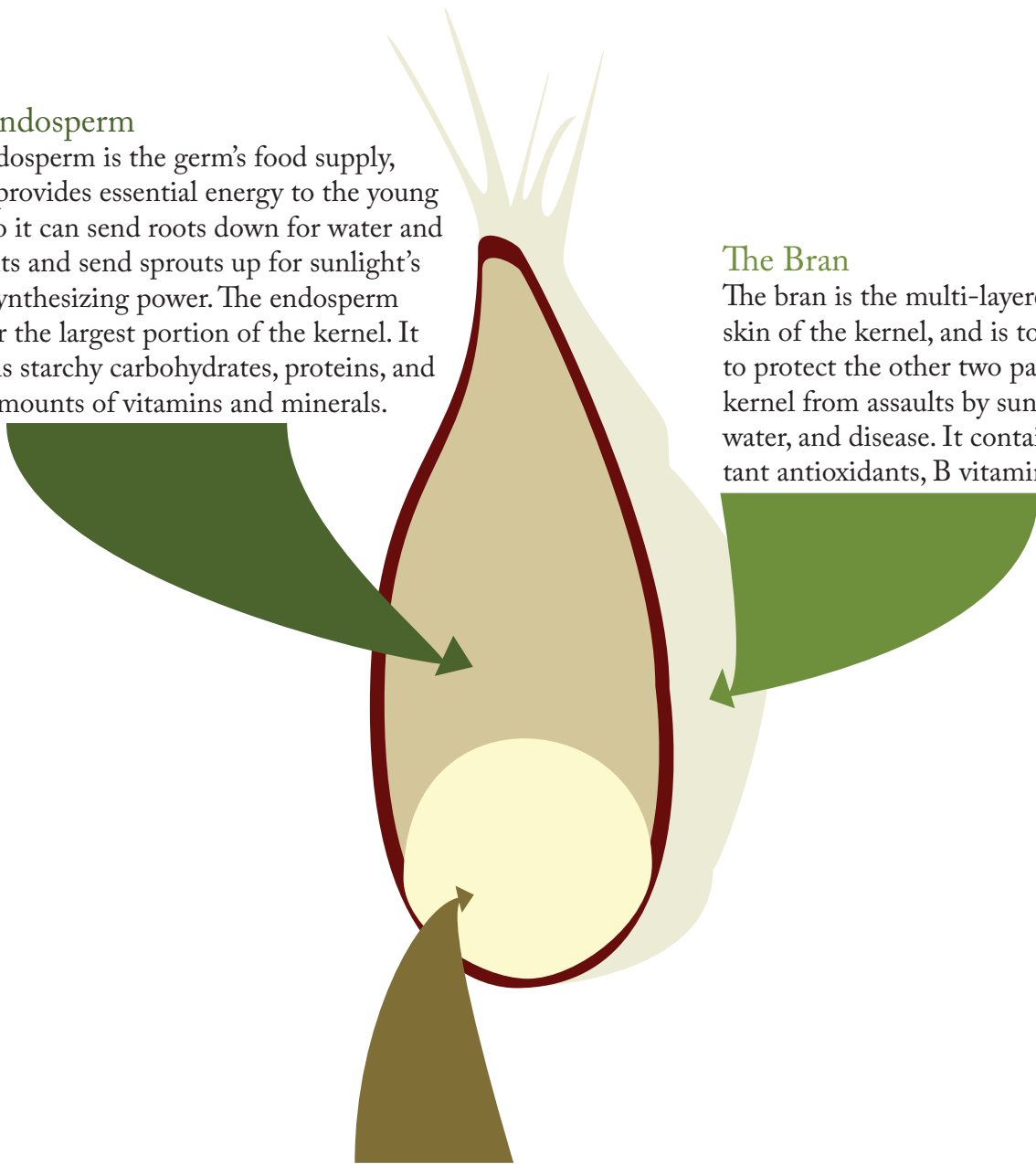
The endosperm is the germ's food supply, which provides essential energy to the young plant so it can send roots down for water and nutrients and send sprouts up for sunlight's photosynthesizing power. The endosperm is by far the largest portion of the kernel. It contains starchy carbohydrates, proteins, and small amounts of vitamins and minerals.

The Bran

The bran is the multi-layered outer skin of the kernel, and is tough enough to protect the other two parts of the kernel from assaults by sunlight, pests, water, and disease. It contains important antioxidants, B vitamins, and fiber.

The Germ

The germ is the embryo which, if fertilized by pollen, will sprout into a new plant. It contains many B vitamins, some protein, minerals, and healthy fats.



Worksheet

1

What is the largest part of a wheat kernel?

2

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

What vitamins and minerals does the bran contain?

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?

4

5

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

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

6

Kansas School Wellness Policy Model Guideline — Nutrition Education

Classroom: Middle-High School

Requirements achieved in this lesson:	Basic	Advanced	Exemplary
Basic, Advanced, and Exemplary	At least 25 percent of nutrition education involves hands-on activities that engage students in enjoyable, developmentally appropriate, culturally relevant, participatory activities.	At least 50 percent of nutrition education instruction involves hands-on activities that engage students in enjoyable, developmentally-appropriate, culturally relevant, participatory activities.	
Topic	Basic nutrient requirements for grains.		

Kansas School Wellness Policy Model Guideline — Physical Activity

Physical Activity Throughout the Day

Requirements achieved in this lesson:	Basic	Advanced	Exemplary
Basic, Advanced, and Exemplary	Classroom health reinforces the knowledge and self-management skills needed to maintain a physically active lifestyle and reduce time spent on sedentary activities, such as watching television.	When circumstances call for students to remain indoors and inactive for two or more hours, the students are given periodic breaks during which they are encouraged to stand and be moderately active.	Classroom teachers provide short physical activity breaks between lessons or classes, as appropriate. Opportunities for physical activity are regularly incorporated into other subject areas. (e.g., science, health).

References

Bell Institute of Health and Nutrition: <http://www.bellinstitute.com/>

Choose My Plate: <http://www.choosemyplate.gov/>

Complete Food and Nutrition Guide, 3rd Edition, 2006, R.L. Duyff

K.N.A.C.K. Online

Whole Grain Council: <http://www.wholegrainscouncil.org/>

Nutrition Labels sources

Cheez-it crackers — www.cheez-it.com/cgi-bin/brandpages/fileBlob.pl?md5=81fd36f5feed9290f0b18e69f7cb2ad4

Whole wheat bread — www.dietfacts.com/html/nutrition-facts/grants-farm-100percent-whole-wheat-bread-6347.htm

Cinnamon Toasters cereal — <http://www.malt-o-meal.com/cold-cereals/cinnamon-toasters/>

Answer Key

Grain Scramble (p. 4): Make at least half your grains whole

1. The endosperm
2. Whole grains have more vitamins and minerals and fiber than refined grains that lack those nutrients
3. B vitamins, antioxidants

4. 5 (1 ounce = ½ cup rice, 1 slice of bread, or ½ cup pasta)

5. Girls ages 9 to 13 years old need 5 ounces and a minimum of 3 ounces per day. Boys ages 9 to 13 years old need 6 ounces and a minimum of 3 ounces per day.

6. Answers vary.

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