

# Science Cooks!



## WHIP UP A HEALTHY GRANOLA SNACK THAT TASTES GREAT, TOO!

Good nutrition is an essential part of maintaining a healthy lifestyle. Nutrients provide energy and are the building blocks our bodies need to function. Learning to make sound choices about food is an important life skill, one that can be practiced by looking at and understanding Nutrition Facts labels.

Be aware of any food allergies among your group, especially nut allergies. Feel free to add, subtract, or use other ingredients, but try to provide at least two choices for each ingredient category.



**SMART START:** Ask girls to bring in their favorite prepackaged snack and use these labels to help start a discussion on nutrition for Step 1.

For each ingredient you use in this activity, you will need to find nutritional information and the typical serving size. You can either photocopy labels directly from prepackaged foods or find this information on the Web from places such as [whfoods.org/sitesearch.php](http://whfoods.org/sitesearch.php) and [livestrong.com](http://livestrong.com). Simply type the ingredient name in the search bar.

## You'll Need:

- ◆ prebaked plain granola
- ◆ sticky sweetener: honey, corn syrup, maple syrup, brown rice syrup, agave nectar, molasses, peanut butter, almond butter (For nut allergies, try sunflower seed butter.)
- ◆ spices: cinnamon, ginger, nutmeg, allspice, pumpkin spice
- ◆ dried fruits: raisins, cherries, blueberries, pineapple, apricots, mangoes, figs, dates, currants, cranberries, banana chips, coconut (If nut allergies are an issue, buy bulk dried fruit rather than prepackaged.)
- ◆ nuts: almonds, macadamias, pistachios, pecans, walnuts, cashews, hazelnuts, Brazil nuts, pine nuts
- ◆ legumes: peanuts, soy nuts
- ◆ seeds: sunflower, pumpkin, flax, sesame
- ◆ other: crispy, puffed, or popped grains such as rice, wheat, and popcorn, and dark or milk chocolate chips
- ◆ bowls
- ◆ measuring cups and spoons
- ◆ stirring spoons, spatulas
- ◆ wax paper
- ◆ paper and pencils
- ◆ optional: computer, calculators, and cookie cutters





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Here's how:

- 1. Introduce healthy nutrition.** Start a discussion by using the labels from the foods the girls brought in. <sup>2</sup> Have girls make a list of the nutrients they know. (fat, protein, vitamins, minerals, fiber, sugar) Can they think of anything else to consider when choosing foods to eat? (calorie content, sodium, cholesterol) What makes a food healthy? (high in fiber, contains "good" fats in moderation, high in protein, loaded with vitamins) How healthy is the snack they brought in? Girls can learn more about nutrients by visiting [kidshealth.org/kid/stay\\_healthy](http://kidshealth.org/kid/stay_healthy) and selecting "Fabulous Food."
- 2. Review nutrition labels.** Go over the main components of a Nutrition Facts label. (See below.) Or, for more in-depth information, visit The Kids Health website [kidshealth.org/kid/stay\\_healthy](http://kidshealth.org/kid/stay_healthy) and read "Figuring Out Food Labels" under "Fabulous Food."

- 3. Identify the problem.** Ask girls to break into small groups <sup>1</sup> and present the **SciGirls Challenge:** Create a healthy version of a granola bar using the ingredients provided and then create a nutrition label for it. Give each group a copy of the nutrition information for each ingredient.

**POINTER:** Ask girls to pretend they are food chemists, mixing their latest creation. They will need to develop a name for their product, test it, and produce a Nutrition Facts label so they can sell it to stores. <sup>2</sup>

- 4. Plan.** Have groups determine which ingredients to put into their recipe by looking at the Nutrition Facts labels you handed out and considering what nutritional characteristics they want their final granola bar to have. For instance, girls may want to focus on creating a bar that is: high in protein (add legumes and nuts); high in fiber (add flax seed or certain dried fruits); low in sugar (carefully choose their sweetener). <sup>3</sup>

- 5. Experiment.** Give each group *one serving* of granola. Girls may want to divide their granola in order to test multiple recipes. Before adding additional ingredients, girls must measure and record each item. This is an exercise in recording data and keeping an accurate science journal for future calculations.

Serving Size

Nutrition Facts	
Serving Size 1 cup (228g)	
Serving Per Container 2	
Amount Per Serving	
<b>Calories</b> 250	Calories from Fat 110
<b>% Daily Value*</b>	
<b>Total Fat</b> 12g	<b>18%</b>
Saturated Fat 3g	<b>15%</b>
<b>Cholesterol</b> 30mg	<b>10%</b>
<b>Sodium</b> 470mg	<b>20%</b>
<b>Total Carbohydrate</b> 31g	<b>10%</b>
Dietary Fiber 0g	<b>0%</b>
Sugars 5g	
<b>Protein</b> 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

Focus on only a few nutrients.

Relate grams to something girls know (a dollar bill weighs about 1g).

Some labels say "less than 1g." If so, round down to zero.

Visit [pbskidsgo.org/scigirls](http://pbskidsgo.org/scigirls) for videos and projects.

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**POINTER:** Using simple proportions relative to servings—such as halves, fourths, thirds—will make calculations easier.

**6. Calculate servings for each ingredient.** Girls must first figure out how much of a serving they used for each ingredient. Feel free to ignore spices, since they offer little nutritional value and add unnecessary complication.

$$\frac{\text{amount in final recipe}}{\text{serving size}} = \text{how much of a serving we used}$$

## Servings per Ingredient

Ingredients	Amount in Final Recipe		Serving Size (on package)	=	How Much of a Serving We Used
Granola	½ cup	÷	½ cup	=	1
Dried cranberries	¼ cup	÷	½ cup	=	½ (0.5)
Almonds	¾ cup	÷	½ cup	=	1 ½ (1.5)
Maple syrup	3 tbsp.	÷	1 tbsp.	=	3

**POINTER:** If girls are struggling, try using a **think aloud**. Ask girls to explain out loud to others how they solved a problem. When groups share their work, everyone sees there are multiple ways to solve a problem. Think alouds are also good ways to catch misunderstandings.

**7. Get cooking!** Mix dry ingredients in the bowl and add sweetener to bind everything together. Once evenly coated, spread the

mixture onto wax paper. Girls can shape their granola into bars, roll balls, or use cookie cutters. Be creative! <sup>4</sup>

**8. Calculate nutritional information for each ingredient.** We recommend focusing on no more than three items on the Nutrition Facts label (e.g., protein, fat, and carbohydrates).

**Example:** Here is the nutritional information for dry roasted almonds taken from [whfoods.org/sitesearch.php](http://whfoods.org/sitesearch.php), found by scrolling down and clicking on the in-depth nutritional profile (grams have been rounded to the nearest tenth).

**Dry roasted almonds** (serving size: ¼ cup)  
protein: 7.6 g  
fat (total): 18.2 g  
carbohydrates (total): 1.7 g

The sample recipe from Step 6 uses ¾ cup almonds, which equals 1.5 servings. Use this to determine the amount of each nutrient in the final recipe.

## Nutrients from Almonds

Nutrient	Amount in 1 Serving		How Much of a Serving We Used	=	Amount in Final Recipe
Protein	7.6 g	×	1.5	=	11.4 g
Fat	18.2 g	×	1.5	=	27.3 g
Carbohydrates	1.7 g	×	1.5	=	2.6 g

Create a similar table for each of your ingredients.



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**9. Calculate total nutrients.** To find the total protein, fat, and carbohydrates in the granola bar recipe, add the numbers from each ingredient (found from the tables created in Step 8).

## Total Nutrients

Ingredient	Protein (g)	Fat (g)	Carbohydrates (g)
Granola	4.5	7.5	16
Dried cranberries	1	0	12
Almonds	11.4	27.3	2.6
Maple syrup	0	0	10
<b>TOTALS</b>	<b>16.9</b>	<b>34.8</b>	<b>40.6</b>

**10. Find the nutrition facts per serving.**

To find the nutrition facts for one serving, divide the total for each nutrient by the number of servings (i.e., bars, balls, or bites) the girls made. Round to the nearest tenth.

## Nutrition Facts per Serving

	Total		# of bars	=	Amount per Serving
Protein	16.9 g	÷	10	=	1.7 g
Fat	34.8 g	÷	10	=	3.5 g
Carbohydrates	40.6 g	÷	10	=	4.1 g

**POINTER:** For younger girls, set up a spreadsheet where they can input the information or go to [nutritiondata.self.com](http://nutritiondata.self.com) (free login required) and input each ingredient. Then click on “analyze recipe” to make a Nutrition Facts label for the product.



**11. Share.** Have each group present their final product, name, and nutritional data to the entire room and explain their reasoning. Have girls compare their calculated Nutrition Facts label to a label from their favorite prepackaged snack. Is their granola “healthier?” Why or why not? What would they change? Conduct a taste test or compile all the recipes and create a recipe book! <sup>4</sup>

Watch Emily discuss how to choose fruits and veggies on the *SciGirls Live Healthy* DVD. (Select Science Cooks!: Mentor Moment.) <sup>7</sup>



**Mentor Moment** Emily Noble received her bachelor’s degree in chemistry, but found herself putting a food focus on all of her papers and projects! So she set sail to work as a cook on a tall ship. Now Emily is a graduate student studying nutrition science at the University of Minnesota. She loves mentoring youth in healthy ways to prepare meals from fresh fruits and veggies.