



THE SCIENCE OF  
**Food**

# THE MATH LINK

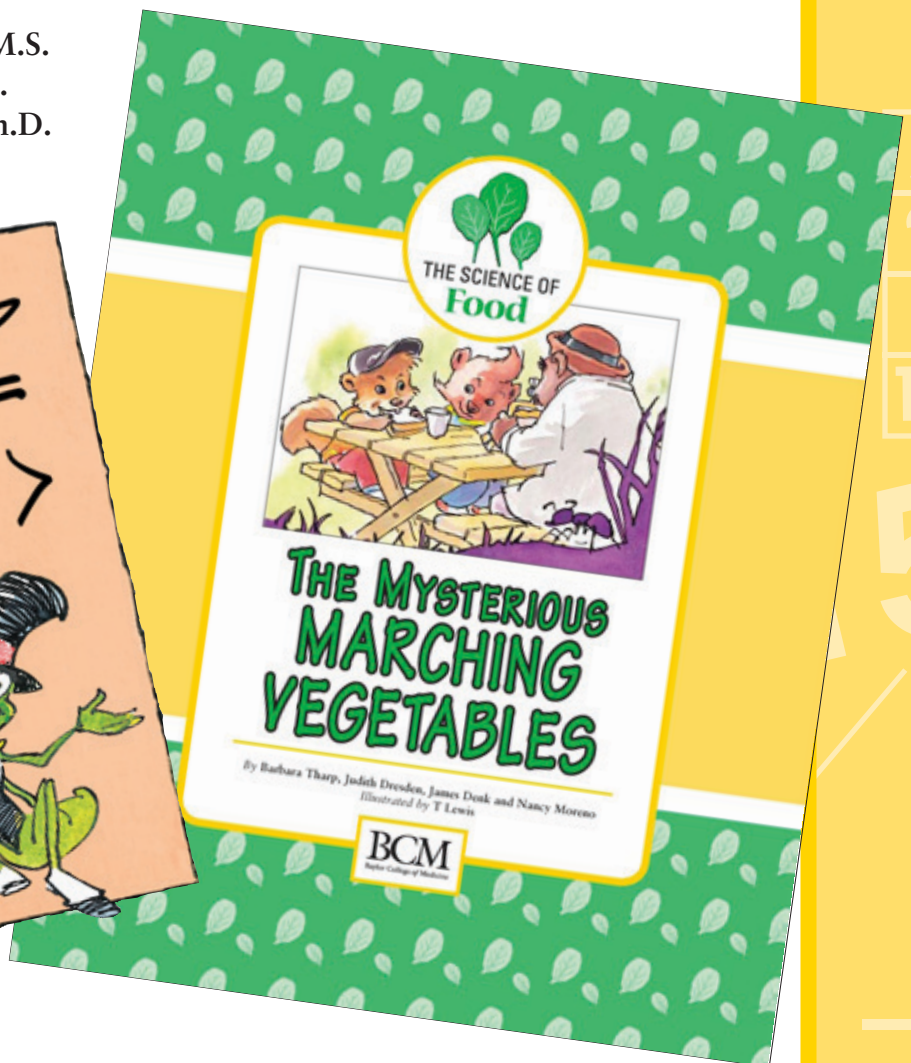
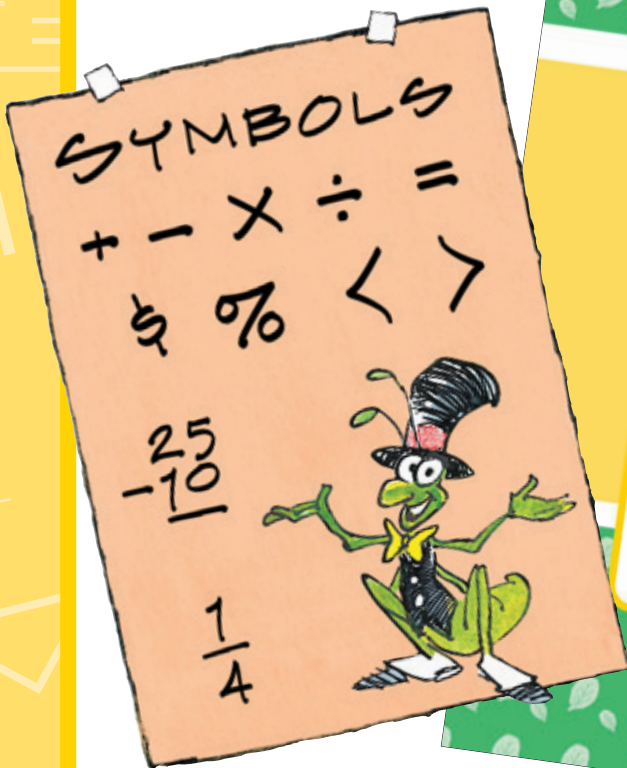
for *The Science of Food Teacher's Guide* and *The Mysterious Marching Vegetables*

Written by

Barbara Z. Tharp, M.S.

Judith Dresden, M.S.

Nancy P. Moreno Ph.D.



BioEd Teacher Resources from the Center for Educational Outreach

© 2011 Baylor College of Medicine

**BCM**  
Baylor College of Medicine

This Math Link contains ready-to-use mathematics activities that are aligned with The Science of Food integrated unit. It is not intended to represent a comprehensive mathematics program. The activities are related to mathematics objectives common to many curricula and cover a range of grade and ability levels. Teachers may wish to select from these activities those that are most appropriate for their own students.

# BioEd<sup>SM</sup>

Teacher Resources from the Center for Educational Outreach at Baylor College of Medicine.

© 2011 by Baylor College of Medicine  
All rights reserved. Printed in the United States of America

No part of this book may be reproduced by any mechanical, photographic or electronic process, or in the form of an audio recording, nor may it be stored in a retrieval system, transmitted, or otherwise copied for public or private use without prior written permission of the publisher. Black-line masters reproduced for classroom use are excepted.

The activities described in this book are intended for school-age children under direct supervision of adults. The authors, Baylor College of Medicine and the publisher cannot be responsible for any accidents or injuries that may result from conduct of the activities, from not specifically following directions, or from ignoring cautions contained in the text.

Development of The Science of Food: The Math Link, originally published as a My Health My World<sup>®</sup> component, was supported by grant number R25 ES10698 from the National Institutes of Health, National Institute of Environmental Health Sciences. The opinions, findings and conclusions expressed in this publication are solely those of the authors and do not necessarily reflect the views of Baylor College of Medicine, the sponsoring agency or the publisher.

The mark “BioEd” is a service mark of Baylor College of Medicine. The mark “My Health My World” are trademarks of Baylor College of Medicine.

---

Authors: Barbara Z. Tharp, M.S., Paula H. Cutler, B.S., and Nancy P. Moreno, Ph.D.

Editor: James P. Denk

Design: Martha S. Young

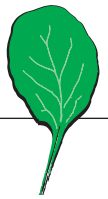
Illustrations: T Lewis and Martha S. Young



Center for Educational Outreach  
Baylor College of Medicine  
One Baylor Plaza, BCM411  
Houston, Texas 77030  
713-798-8200 / 800-798-8244  
[www.bioedinline.org](http://www.bioedinline.org) | [www.k8science.org](http://www.k8science.org) | [www.bcm.edu/edoutreach](http://www.bcm.edu/edoutreach)



# Problem Solving



Answer each question in the space below. Circle your answer.

1. Riff left Grandma's house with 3 dozen cookies in a box. When he arrived at Rosie's house, he only had 1 dozen left. How many cookies did Riff eat?

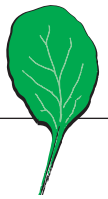
2. Rosie ate half of the cookies that Riff left in the box. Afterwards, how many cookies were in the box?

3. It takes 45 minutes to make a batch of cookies. Riff and Rosie want to have their batch of cookies ready by 11:30 in the morning. By what time must they start making the cookies?



4. Riff and Rosie made 48 cookies. They gave Mr. Slaptail 2 dozen cookies. How many cookies do they have left?

5. After Riff and Rosie gave Mr. Slaptail the cookies, they all had vegetable sandwiches for lunch. Mr. Slaptail had 2 sandwiches. Riff had 3 sandwiches and Rosie had only 1. Each sandwich used 2 pieces of bread. How many pieces of bread did they use to make all of the sandwiches?  
(Draw a picture to help you find the answer.)



**CHOCO-CRUNCH COOKIES**

1 cup sunflower seeds  
1 cup raisins, chopped  
1 cup mini-chocolate chips or large chips, chopped in blender  
 $\frac{1}{4}$  cup rice crispies  
 $\frac{3}{4}$  cup peanut butter topping  
 $\frac{1}{2}$  cup powdered sugar or 1 cup coconut

Mix all ingredients together. Form into 1-inch balls by pressing the mixture firmly together with clean hands.

Gently roll in either powdered sugar or coconut. Cover and refrigerate any leftovers.

Use the information from the recipe to answer each question.

1. How many cups of raisins would Riff and Rosie need to double the recipe?

---

2. How many cups of raisins would they use if they made half the recipe?

---

3. How much peanut butter would they use if they wanted to double the recipe?

---

4. How much of the sunflowers seeds would they use if they wanted to halve the recipe?

---

5. Which ingredients do they use the most?

---

**Bonus:**

6. Why would anyone want to double a recipe?

---

---

---

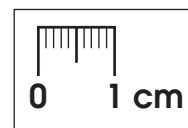
# Estimation with Centimeters



Mr. Slaptail's garden has many vegetables and flowers of different sizes. Read the problems below and fill in the circle beside your best estimate.



1. Some of the pumpkins in Mr. Slaptail's garden are about as big around as your head. How big do you think one pumpkin might be? Shade in the circle for your estimate, then use a tape measure to measure around the largest part of your head (circumference) in centimeters.



- 35 cm                       55 cm                       80 cm

Actual measurement of your head = \_\_\_\_\_ cm

2. The sunflowers are taller than the gate at Mr. Slaptail's house. About how tall might the sunflowers be?

- 25 cm                       250 cm                       2500 cm

3. Each head of lettuce is about as wide across (diameter) as a dinner plate. About how wide is one head of lettuce?

- 10 cm                       25 cm                       100 cm

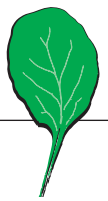
4. On average, the cucumbers in Mr. Slaptail's garden are about as long as your hand. About how long is one cucumber?

- 5 cm                       15 cm                       25 cm

5. The corn plants are the tallest plants in the garden. They are even taller than the sunflowers! About how tall are the corn plants?

- 50 cm                       200 cm                       400 cm

# Problem Solving Strategies



To answer each question below, you may want to use a problem solving strategy and work on a separate sheet of paper. For example, draw a picture, make a list, work backwards or guess and check.



1. There are 12 giant sunflowers in Mr. Slaptail's garden. Half of the flowers have only one bee on them,  $\frac{1}{4}$  of the flowers have 2 bees each and the remainder of the flowers have 3 bees each. How many bees are there on all the sunflowers?

---

2. There are 5 lines of ants marching toward the garden and 10 ants in each line. How many ants are marching toward the garden?

---

3. Riff, Rosie and Mr. Slaptail plan to hide in the garden at 9:30 p.m. and to leave the garden when the sun rises at 6:30 a.m. How many hours will they spend in the garden?

---



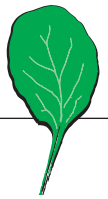
4. Rosie and Riff harvested 300 potatoes. Rosie dug up twice as many potatoes as Riff. How many potatoes did each dig up?

---

5. Riff and Oscar put 10 small tables together in a row to make one large table for a picnic. Three chairs fit on either side of each small table. How many neighbors can sit down for lunch?

---

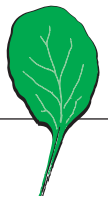
# Problem Solving with Combinations



To answer the question below, you may want to use a problem solving strategy and work in the space provided below.

After lunch, Riff and Rosie want to play games while they eat dessert. They can play bingo, twister, scrabble or squirrelopoly. For dessert, they can have broccoli ice cream, green tomato pie, acorn nut cake or corn pudding. What are all the different combinations of games and desserts that Riff and Rosie can make after lunch?





Mr. Slaptail, Riff and Rosie all know how important it is to eat vegetables. They each prefer a different vegetable. The vegetables are spinach, broccoli and asparagus. To discover which vegetable is each character's favorite, complete the chart below.

1. Write the characters' names on the left side of the chart. Write the vegetables' names across the top of the chart.
2. Read each clue in the list below. Put an **X** in the box for each vegetable that is **NOT** the character's favorite.
  - a. Riff likes to eat the leaves and flowers of plants.
  - b. Mr. Slaptail likes vegetables with 7 letters in their names.
  - c. Rosie likes to eat only the stems of plants.
  - d. Riff won't eat any vegetable that starts with the letter "S."
3. According to the chart, who likes broccoli? \_\_\_\_\_



Mr. Slaptail

---



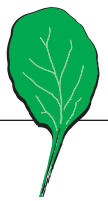
---



---

spinach			





Rosie and Riff know that they can save money by growing their own fruits and vegetables. But it takes time for fruits and vegetables to grow. They also know that they can buy fresh produce at the grocery store. Use the “Veggies of the Day!” list to answer the following questions.



Apples	\$0.50 each
Avocados	2 for \$1.00
Beets	\$0.40 each
Cabbage	\$1.25 per head
Carrots	\$1.00 per package
Cucumbers	5 for \$0.99
Garlic	\$0.25 per bulb
Lettuce	\$1.00 per head
Potatoes	\$0.40 each
Radishes	\$0.25 per bundle
Squash	\$0.49 each
Tomatoes	\$0.55 each
Turnips	\$0.25 each

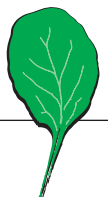
1. Riff and Rosie wanted to make soup for their friends. Rosie made a shopping list of ingredients they would need. They took the list with them when they went to the grocery store.

### Rosie's Shopping List

3 packages of carrots	10 potatoes
10 tomatoes	4 turnips
1 head of cabbage	

2. If Riff and Rosie bought everything on the list and put it all in the soup, how much money would they have to spend to make vegetable soup?

# Calculating with Money (continued)



2. On the way to the store, Riff and Rosie ran into Mr. Slaptail and showed him their shopping list. He offered to give them the cabbage and some turnips from his garden. They accepted his offer.



a. How much money would they save? \_\_\_\_\_

b. Now, how much would the vegetable soup cost? \_\_\_\_\_

3. Rosie’s mom sent Riff and Rosie back to the store for more groceries. On the list, she marked the cost of items that were not on sale. Study the list below. Compare it with the “Veggies of the Day!” list on page 9 and record your answers.

### Mom’s Shopping List

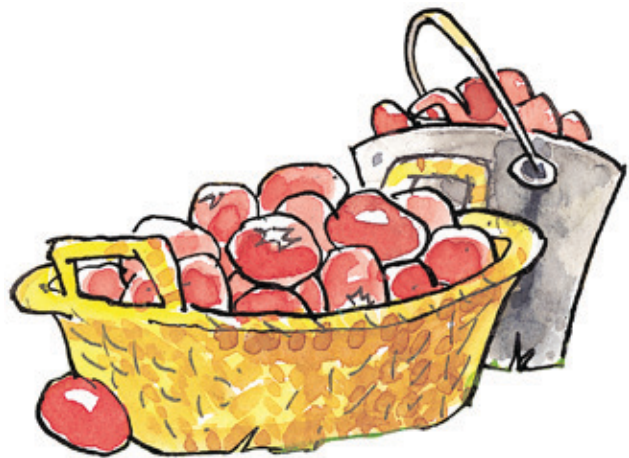
- 2 loaves of bread at \$1.25 each
- 1 package of swiss cheese for \$2.59
- 6 peaches at \$0.50 each
- 5 apples
- 2 avocados
- 1 head of lettuce

a. What do you think Rosie’s mom is making for lunch?

\_\_\_\_\_

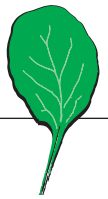
\_\_\_\_\_

\_\_\_\_\_



b. How much money would Rosie and Riff need to buy all the groceries on Mom’s Shopping List?

\_\_\_\_\_



The residents of Bright Water Corners had a picnic. How did they share the food? Circle the correct answer.

- Mr. Slaptail cut a tomato into 3 equal pieces. He gave 1 piece to Riff and 1 to Ricardo Raccoon. He ate the other piece. What fraction of the tomato did Riff get?

$$\frac{1}{2} \quad \frac{1}{3} \quad \frac{1}{4} \quad \frac{1}{5} \quad \frac{1}{6} \quad \frac{1}{10}$$



- Wanda Rabbit cut 1 carrot into equal pieces for her 7 children. What fraction of the carrot did each baby rabbit get?

$$\frac{1}{2} \quad \frac{1}{3} \quad \frac{1}{4} \quad \frac{1}{5} \quad \frac{1}{6} \quad \frac{1}{7} \quad \frac{1}{8}$$

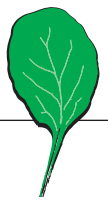
- Brenda Blackduck brought a head of lettuce. She gave 1 lettuce leaf to each of her 6 children and ate 1 leaf herself. What fraction of lettuce leaves did each duck receive?

$$\frac{1}{2} \quad \frac{1}{3} \quad \frac{1}{4} \quad \frac{1}{5} \quad \frac{1}{6} \quad \frac{1}{7} \quad \frac{1}{8}$$

- Rosie decided to slice up a cucumber to share with Riff and Mr. Slaptail. She cut the cucumber into 15 slices. If each one of them received the same number of slices, what fraction of the cucumber did each receive?

$$\frac{1}{2} \quad \frac{1}{3} \quad \frac{1}{4} \quad \frac{1}{5} \quad \frac{1}{6} \quad \frac{1}{15} \quad \frac{1}{30}$$

# Fractions (continued)



5. Delores Deer's family ate  $\frac{1}{3}$  of the 36 bushels of corn harvested from Mr. Slaptail's garden. How many bushels of corn did they eat?

- 3      6      9      12      15      18

6. Oscar Otterbee prepared veggie-stuffed green peppers for his neighbors at the picnic. He cut each whole pepper in half to make 2 stuffed pepper halves. There were 45 neighbors at the picnic. How many peppers did Oscar need to prepare the dish?

- 10      17      22      23



### Bonus:

7. Rosie and Riff picked all the tomatoes in the garden. Riff picked 28 tomatoes and Rosie picked 22. What fraction of the tomatoes did each pick? Reduce each fraction to its lowest terms. Represent as a percentage.

a. Rosie picked:  $\frac{\square}{\square} = \frac{\square}{\square} = \underline{\hspace{2cm}}\%$

b. Riff picked:  $\frac{\square}{\square} = \frac{\square}{\square} = \underline{\hspace{2cm}}\%$

# Addition



1. Using the number values assigned to the letters of the alphabet, find out how much each word below is worth. Work on a separate sheet of paper. Write your answer as a number sentence.

a - 1	h - 8	n - 14	u - 21
b - 2	i - 9	o - 15	v - 22
c - 3	j - 10	p - 16	w - 23
d - 4	k - 11	q - 17	x - 24
e - 5	l - 12	r - 18	y - 25
f - 6	m - 13	s - 19	z - 26
g - 7		t - 20	

a. pea =

b. me =

c. Riff =

d. Rosie =

e. onion =

f. tomato =

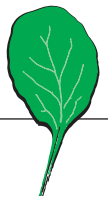
g. broccoli =

h. Slaptail =

i. ape =



# Addition (continued)



j. ants =

k. water =

l. food =

m. vegetables =

n. fruit =

o. picnic =

## Bonus:

p. supercalifragilisticexpialidocious =

2. Use your number sentences to answer the following questions.

a. Do any of the words above have the same value? \_\_\_\_\_

b. If so, how could that happen? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

c. Which word is worth the most? \_\_\_\_\_

d. Which word is worth the least? \_\_\_\_\_

e. What is your name worth? \_\_\_\_\_

f. On a separate sheet of paper, rewrite the words from above, in order of their value, from least to greatest.



## Addition "Cross Number"



Riff likes to solve number puzzles that use addition. Help him find the number sequence that will make true number sentences in the puzzle below. Start working from left to right across each row. Then work from top to bottom down each column. Circle each true number sentence you find. The first one is circled for you. There are 14 more number sequences.

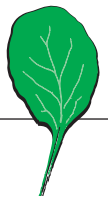


Example:

$$5 + 4 = 9$$

8	5	4	9	7	6	2	5	8	1
7	2	8	1	9	4	3	6	0	2
3	4	6	4	7	1	8	3	7	5
5	7	5	4	5	0	1	9	2	1
8	1	4	5	1	3	8	7	9	0
4	1	2	7	2	6	2	8	2	3
2	3	8	4	5	9	8	7	4	1
6	4	7	9	7	3	2	2	9	7
1	7	2	9	8	4	1	8	7	6

# Subtraction “Cross Number”



Rosie prefers to solve number puzzles that use subtraction. Help her find the number sentences that are hidden in the number sequences of the puzzle below. Start working from left to right across each row. Then work from top to bottom down each column. Circle each true number sentence you find. The first one is circled for you. There are 13 more number sequences.



Example:

$$9 - 3 = 6$$

7	5	4	0	8	2	1	9	3	6
0	4	3	1	5	7	8	4	1	2
8	1	0	1	9	6	6	2	4	1
3	1	2	9	2	4	7	5	8	1
7	8	0	5	5	1	7	6	2	3
5	6	9	8	8	4	0	3	1	1
3	2	9	7	3	2	6	4	7	9
4	3	1	2	5	7	5	3	2	7
2	6	9	8	2	0	1	0	9	8