Grade 4

Grade 4

Finding Fiber

Math Objectives

1.02 Develop fluency with multiplication and division.

1.04 Develop fluency with addition and subtraction of non-negative rational numbers with like denominators, including decimal fractions through hundredths.

English Language Arts Objectives

1.05 Use reference materials (e.g. glossary, dictionary, thesaurus) to identify and comprehend unknown words.

2.01 Interact with the text before, during and after reading, listening and viewing by locating relevant information and making connections with previous experiences, information and ideas.

Materials Needed

- Poster of MyPyramid for Kids
- Small can of orange juice
- 1 whole orange
- Top of a Bic Pen
- Paper clips (3 of various sizes)

Teacher Resources

- *What foods are in the fruit group?*
- *What foods are in the vegetable group?*
- *Fruit and Veggie Nutrients*
- *Fruit and Veggie Colors*
- *MyPyramid for Kids*
- *Anatomy of MyPyramid*
- *Teaching MyPyramid*

Handouts

- *Finding Fiber*
- *Finding Fiber Word Problems*
- *Vegetable Orders*
- *Fruit and Vegetable Identification*

Focus

Show the students a can of orange juice and a whole orange. Tell them that both are fruits and both of them are healthy choices. Ask them which one is better and why. Both have vitamin C but the whole orange has more fiber than the juice – about 3 grams compared to 0.5 grams. Fiber is known as your body's broom because it helps keep your digestive tract healthy. Fiber is only found in plant-based foods like fruits, veggies and whole-grain cereals and breads. Animal

products like milk, meat and cheese contain no fiber. Eating fruits and veggies is a great way to get your fiber every day.

Teacher Input

Using the teacher resources *What foods are in the fruit group?*, *What foods are in the vegetable group?* and all three MyPyramid resources, discuss with students how fruits and veggies fit into their daily diet.
Talking points:

- In MyPyramid, each band of color shows different types of foods we can eat each day to help us grow and play.
- The green band is for veggies and the red is for fruits.
- The green and red bands are wider than the purple band, for example, because a large part of our daily diet needs to be made up of fruits and veggies in order to stay healthy.
- It is especially important to choose veggies that are dark green, like broccoli, spinach and dark green lettuce, and veggies that are orange, such as sweet potatoes and carrots.
- Fruits do not always need to be fresh, but also can be canned, frozen or dried. Students can expand their knowledge by providing the class with examples of these different forms.
- MyPyramid for Kids suggests that fourth graders eat 1½ to 2 cups of fruits and 2 to 2½ cups of veggies every day.

Using the teacher resources *What foods are in the fruit group?*, *What foods are in the vegetable group?*, *Fruit and Veggie Nutrients*, and *Fruit and Veggie Colors*, discuss with students how fruits and veggies help them stay healthy, specifically pointing out the role fiber plays.
Talking points:

- Eating plenty of different fruits and veggies helps protect us from getting sick.
- Fruits and veggies are good sources of essential vitamins, minerals and fiber.
- Fiber is found in other foods, like whole grain breads, cereals and legumes.
- Fiber is measured in grams. A gram is a unit of measure. The number of grams of fiber kids need can be found by adding 5 to the child's age. As a basis for comparison, a plastic cap of a Bic pen weighs about 1 gram and a paper clip can weigh between 0.5 to 1.5 grams.
- Instruct students to calculate how many grams of fiber they need each day.

Practice and Assessment

Distribute the *Finding Fiber* handout. Instruct students to find the fruit or veggie that has the most fiber, a sweet potato. Tell the students that sweet potatoes are a good source of vitamins A and C as well as a good source of fiber. Instruct students to circle any fruits and veggies in the list that they have eaten as part of the USDA Fresh Fruit and Vegetable Program. Instruct students to pick three to five fruits and veggies that would give them the total grams of fiber they need for the day.

Distribute the *Finding Fiber Word Problems* handout and instruct students to complete it.

Distribute the *Vegetable Orders* handout to students and allow the students to work in pairs. Challenge students to read the clues about ordering veggies in order to solve the puzzle.

Additional Activity (additional handouts and/or materials needed)

Distribute the *Fruit and Vegetable Identification* handout. Direct students to see how many of the fruits and veggies they can identify. Instruct students to use the dictionary if they are not sure of the spelling. If you do not have a color copy of the *Fruit and Vegetable Identification* handout, you may need to tell the students the colors of some of the fruits and veggies.

Finding Fiber in Fruits and Veggies

Fiber is important for a healthy diet. Fiber has no calories. It helps to keep your digestive tract healthy. Fiber is only found in plant-based foods like fruits, veggies and whole-grain breads and cereals. Animal products like milk, meat and cheese do not have fiber. Eating fruits and veggies is a great way to get your fiber every day.

Fruit or Veggie	Serving Size	Dietary Fiber (in grams)
Apple	1 medium apple	3.3
Asparagus	5 medium stalks	1.7
Avocado	1/5 medium avocado	2.4
Banana	1 medium banana	3.1
Bell pepper	½ medium pepper	1.0
Blueberry	1 cup blueberries	3.5
Broccoli	½ cup raw or steamed broccoli	1.1
Cabbage	1 cup chopped cabbage	2.0
Cantaloupe	1 cup cubed melon	1.4
Carrot	1 medium or 8 baby carrots	1.7
Cherry	15 cherries	2.1
Corn	½ cup cooked corn	2.4
Grape	17 grapes	0.4
Green Bean	½ cup raw or steamed beans	1.9
Iceberg Lettuce	1 cup chopped lettuce	0.9
Kiwifruit	1 medium kiwifruit	2.6
Mango	½ mango	1.5
Orange	1 medium orange	3.1
Peach	1 medium peach	1.5
Pineapple	½ cup cubed pineapple	1.1
Potato	1 potato baked with skin	3.6
Raisins	¼ cup raisins	1.5
Strawberry	8 medium berries	1.9
Sweet potato	1 medium sweet potato	3.8
Tangerine	1 medium tangerine	1.5
Tomatoes	1 medium tomato	1.6
Watermelon	1 cup cubed melon	0.6

Name_____

Finding Fiber Word Problems

1. Which has more fiber?

☐	½ cup of broccoli	OR	☐	5 spears of asparagus
☐	1 banana	OR	☐	17 grapes
☐	½ medium mango	OR	☐	1 cup of cantaloupe
☐	1 medium sweet potato	OR	☐	½ cup corn
☐	1 baked potato	OR	☐	1 cup of blueberries

2. Tameka would like to eat more fiber. What five fruits could she eat that would give her the most fiber? How many grams of fiber would she get from the five fruits?

3. What five veggies would give Tameka the most fiber? How many grams of fiber would she get from the five veggies?

4. Cindy is nine years old. In one week, she ate all of the fruits and veggies listed on the chart below. How much fiber did Cindy eat that week? Fill in the chart to find out how much fiber Cindy ate for the week.

Fruit or Veggie	Number of Servings	Grams of Fiber for One Serving	Total Grams of Fiber
apples	5		
blueberries	4 cups		
cabbage	2 cups		
carrots	6		
kiwi	5		
sweet potatoes	3		

Cindy's Total Grams of Fiber for the Week _____

5. What was Cindy's average fiber intake for each day of the week?

6. How much fiber does Cindy need each day for her age?

7. Was Cindy's average fiber intake enough to meet her total daily fiber needs for her age?

8. If not, how much more fiber does she need to get each day from foods such as legumes and whole grain breads and cereals?

9. What fruits and veggies have you eaten at school from the Fresh Fruit and Vegetable Program?

10. What is your favorite fruit and veggie?

11. How many grams of fiber does your favorite fruit and veggie have?

Name: Answer Key

Finding Fiber Word Problems

1. Which has more fiber?

☐	½ cup of broccoli	OR	■	5 spears of asparagus
■	1 banana	OR	☐	17 grapes
■	½ medium mango	OR	☐	1 cup of cantaloupe
■	1 medium sweet potato	OR	☐	½ cup corn
■	1 baked potato	OR	☐	1 cup of blueberries

2. Tameka would like to eat more fiber. What five fruits could she eat that would give her the most fiber? How many grams of fiber would she get from the five fruits?

1 cup blueberries	**3.5 grams**
1 apple	**3.3 grams**
1 banana	**3.1 grams**
1 orange	**3.1 grams**
1 kiwifruit	**2.6 grams**
Total	**15.6 grams**

3. What five veggies would give Tameka the most fiber? How many grams of fiber would she get from the five veggies?

1 medium sweet potato	**3.8 grams**
1 baked potato with skin	**3.6 grams**
½ cup corn	**2.4 grams**
1 cup chopped cabbage	**2.0 grams**
½ cup green beans	**1.9 grams**
Total	**13.7 grams**

4. Cindy is nine years old. In one week, she ate all of the fruits and veggies listed on the chart below. How much fiber did Cindy eat that week? Fill in the chart to find out how much fiber Cindy ate for the week.

Fruit or Veggie	Number of Servings	Grams of Fiber for One Serving	Total Grams of Fiber
apples	5	**3.3**	**16.5**
blueberries	4 cups	**3.5**	**14**
cabbage	2 cups	**2.0**	**4**
carrots	6	**1.6**	**9.6**
kiwi	5	**2.6**	**13**
sweet potatoes	3	**3.8**	**11.4**

Cindy's Total Grams of Fiber for the Week **68.5**

5. What was Cindy's average fiber intake for each day of the week?
   68.5 grams/7 = 9.78 grams

6. How much fiber does Cindy need each day for her age?
   9 years old + 5 = 14 grams

7. Was Cindy's average fiber intake enough to meet her total daily fiber needs for her age?
   No

8. If not, how much more fiber does she need to get each day from foods such as legumes and whole grain breads and cereals?
   4.22 grams

9. What fruits and veggies have you eaten at school from the Fresh Fruit and Vegetable Program?
   Answers will vary

10. What is your favorite fruit and veggie?
    Answers will vary

11. How many grams of fiber does your favorite fruit and veggie have?
    Answers will vary

Name_____

Vegetable Orders

Directions: Jane, Beverly, Michael and Joseph went to a restaurant. Each person had **two** vegetables as a part of their meal. Read the clue to match the person with their vegetable choices. Each vegetable can only be chosen by **one** person. If a choice can be eliminated by reading the clues, write NO in the space on the chart. Write YES in the correct place on the chart to identify the two vegetables chosen by each person.

	Peas $.49	**Cabbage $.49**	**Potato $.99**	**Broccoli $.85**	**Greens $.75**	**Carrots $.59**	**Corn $.75**	**Celery $.30**
Jane								
Beverly								
Michael								
Joseph								

CLUES

- Michael chose one vegetable that cost $.75.
- Each of Jane's vegetables cost less than $.75.
- Beverly did not choose a vegetable that cost $.49.
- Jane did not choose cabbage.
- Michael's friend chose celery.
- Jane did not order a vegetable that cost $.75.
- One of Michael's vegetables was a green vegetable.
- Joseph sat next to his friend who chose peas.
- Beverly did not order the most expensive vegetable on the menu.
- One of Beverly's vegetables cost more than corn.
- Michael sat next to his friend who ordered cabbage.
- Joseph did not choose a vegetable that cost more than $.50.
- Michael sat next to his friend who chose peas.
- Beverly's total cost for her two vegetables was $1.60.
- Beverly's friend chose celery.
- Jane did not choose a vegetable that cost more than $.85.
- Joseph chose two green vegetables.
- One of Beverly's choices was not greens.
- Beverly chose one green vegetable and one yellow vegetable.
- Beverly did not choose a vegetable that cost $.59.
- Joseph's total cost for his two vegetables was less than $1.00.
- Michael sat next to his friend who ordered corn.
- One of Jane's vegetable choices was not the least expensive on the menu.
- One of Jane's vegetable choices cost less than corn but more than cabbage.
- Michael bought one vegetable that cost more than broccoli.

Name: Answer Key

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	Peas $.49	**Cabbage $.49**	**Potato $.99**	**Broccoli $.85**	**Greens $.75**	**Carrots $.59**	**Corn $.75**	**Celery $.30**
Jane	**YES**	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**
Beverly	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	**YES**	**NO**
Michael	**NO**	**NO**	**YES**	**NO**	**YES**	**NO**	**NO**	**NO**
Joseph	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**	**YES**

CLUES

- Michael chose one vegetable that cost $.75.
- Each of Jane's vegetables cost less than $.75.
- Beverly did not choose a vegetable that cost $.49.
- Jane did not choose cabbage.
- Michael's friend chose celery.
- Jane did not order a vegetable that cost $.75.
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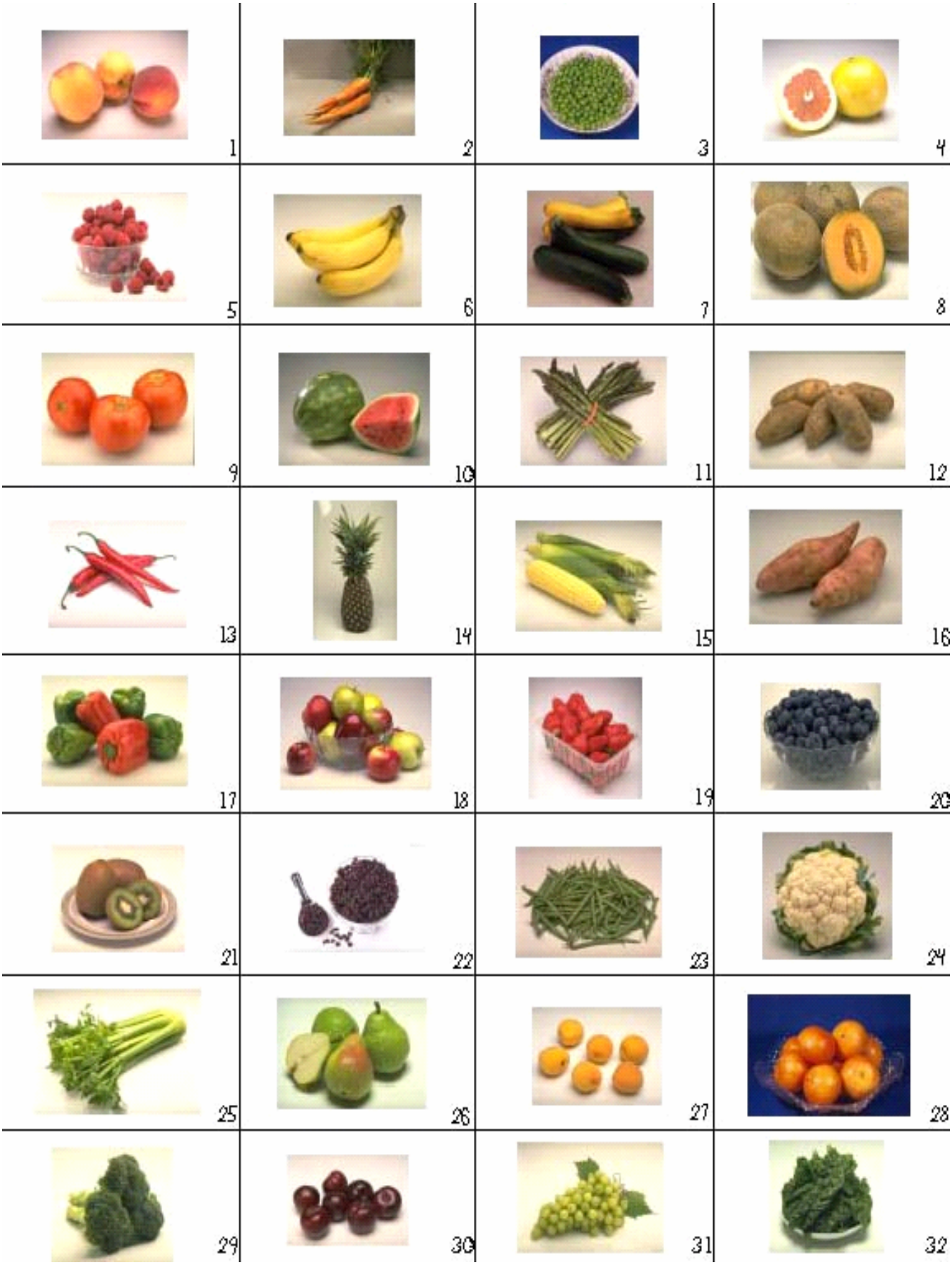
- One of Jane's vegetable choices was not the least expensive on the menu.
- One of Jane's vegetable choices cost less than corn but more than cabbage.
- Michael bought one vegetable that cost more than broccoli.

Fruit and Veggie Identification



Source: Fruits and Veggies the Original Fast Foods

Fruit and Veggie Identification

Answer Key

1. peaches
2. carrots
3. peas
4. grapefruit
5. raspberries
6. banana
7. zucchini
8. cantaloupe
9. tomatoes
10. watermelon
11. asparagus
12. potatoes
13. chili peppers
14. pineapple
15. corn
16. sweet potatoes
17. bell peppers
18. apples
19. strawberries
20. blueberries
21. kiwifruit
22. raisins
23. green beans
24. cauliflower
25. celery
26. pears
27. apricots
28. oranges
29. broccoli
30. plums
31. grapes
32. spinach

Grade 4

The Sweet, Sweet Potato

Math Objectives

1.02 Develop fluency with multiplication and division (larger numbers with calculators).
1.04 Develop fluency with addition and subtraction of non-negative rational numbers with like dominators, including decimal fractions through hundredths (larger numbers with calculator).
4.01 Collect, organize and display data (including line graphs and bar graphs) to solve problems.

English Language Arts Objectives

5.02 Demonstrate understanding in speaking and writing.
5.03 Elaborate information and ideas in writing and speaking.
5.04 Compose multiple paragraphs.

Materials Needed

- Calculators

Teacher Resources

- *Home Sweet Home, Sweet Potato*
- *Fruit and Veggie Nutrients*
- *Making Sense of Fruit and Veggie Nutrients*
- *Dietary Reference Intakes*

Handouts

- *Sweet Potato Math Puzzle*
- *Eating Smart with Sweet Potatoes*
- *Sweet Potato Graph*
- *Grow a Sweet Potato House Plant*

Focus

Distribute the *Sweet Potato Math Puzzle* handout. Direct student to answer the questions. Review the answers and discuss these sweet potato facts. Even though we call the sweet potato a potato, it is not in the potato family. Potatoes are tubers and sweet potatoes are roots. Vitamin A is found in orange and yellow veggies, such as sweet potatoes, yellow squash, carrots, pumpkins and cantaloupe. Sweet potatoes are one of the best sources of vitamin A. Vitamin A helps us to see better and fights infections in the body.

Teacher Input

Using the teacher resource *Home Sweet Home, Sweet Potato*, discuss with students the historical significance of sweet potatoes in the United States and, specifically, in North Carolina.

Talking points:

- Native Americans were the first to grow sweet potatoes in the U.S.
- Sweet potatoes have been growing in the south for more than 300 years.
- North Carolina produces almost half of the sweet potatoes in the U.S.
- Sweet potatoes are often part of the Thanksgiving meal.
- The sweet potato is the official vegetable of North Carolina. It became the state vegetable in 1995 because of fourth graders! The fourth grade students of Elvie Street School in Wilson, NC campaigned for two years to make the sweet potato the state vegetable.

Using the teacher resources *Fruit and Veggie Nutrients, Making Sense of Fruit and Veggie Nutrients* and *Dietary Reference Intakes*, talk to students about the nutritional importance of sweet potatoes.
Talking points:

- Sweet potatoes are a good source of Vitamin A.
- Vitamin A helps us to see better and protects the body from infections.
- Sweet potatoes provide us with many other vitamins and minerals.
- Every day we need a certain amount of vitamins and minerals. The amounts that we need are called Dietary Reference Intakes, or DRIs.

Practice and Assessment

Instruct students to write a story about the sweet potato. Suggested topics include: *Why is the sweet potato called sweet?* or *How does the sweet potato feel at Thanksgiving?*, etc. Remind them to make sure the story has a beginning, middle and end, to write in complete sentences, and to use correct grammar, spelling, punctuation and capitalization.

Distribute *Eating Smart with Sweet Potatoes* handout. Review the directions with the students. After the students have completed the exercise, provide them with the *Sweet Potato Graph* handout and instruct them to draw a bar graph showing the percentages of nutrient that are provided by eating one medium baked sweet potato with skin.

Additional Activity (additional handouts and/or materials needed)

Use the *Grow a Sweet Potato House Plant* handout to grow a plant. This activity can be done in the classroom or at home.

Name: _____

Sweet Potato Math Puzzle

Sweet potatoes deliver a knock out punch of vitamin A. Vitamin A helps us see better and fight infections.

Find out how many cups of broccoli it takes to equal the amount of vitamin A in just one sweet potato. Do the following math problems and write your answers down as you go.

1. Start with the number of pounds in a ton. _____

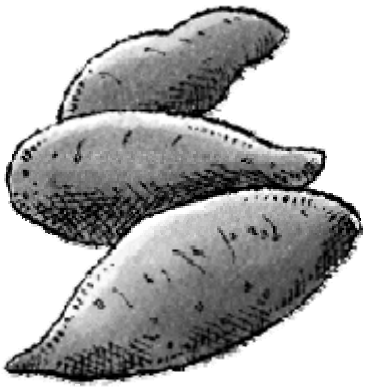
2. Divide that by the number of years in a century. _____

3. Multiply that by the number of fingers on one hand (including the thumb). _____

4. Now subtract from that number the number that is 9/10ths of the lowest positive three-digit number. _____

5. Lastly, add to that number the number that is considered “bad luck”, especially on Fridays. Now enter the final magic number in the box!

This is the number of cups of broccoli it takes to equal the vitamin A content in just one sweet potato!



Source: North Carolina Sweet Potato Commission

Name: Answer Key

Sweet Potato Math Puzzle

Sweet potatoes deliver a knock out punch of vitamin A. Vitamin A helps us see better and fight infections.

Find out how many cups of broccoli it takes to equal the amount of vitamin A in just one sweet potato. Do the following math problems and write your answers down as you go.

1. Start with the number of pounds in a ton. **2000**

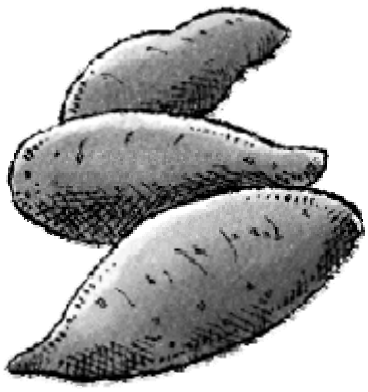
2. Divide that by the number of years in a century. (100) **20**

3. Multiply that by the number of fingers on one hand (including the thumb). (5) **100**

4. Now subtract from that number the number that is 9/10ths of the lowest positive three-digit number. (90) **10**

5. Lastly, add to that number the number that is considered "bad luck", especially on Fridays. (13) Now enter the final magic number in the box! **23**

This is the number of cups of broccoli it takes to equal the vitamin A content in just one sweet potato!



Source: North Carolina Sweet Potato Commission

Name: _____

Eating Smart with Sweet Potatoes

Directions (use a calculator): In **Table 1** you see how many calories you need each day to stay strong and have energy. You also see the how much of some nutrients you need each day to stay healthy. In **Table 2**, you see the same information for one baked sweet potato with skin. The numbers in both tables have units after them. Work out how much you get if you eat one sweet potato.

1. Divide each number in **Table 2** by each matching number in **Table 1** (round your answers). For example, **Table 2** shows that there are 2.3 grams of protein in a sweet potato. Then, in **Table 1** you see that you need 34 grams of protein each day. Divide 2.3 by 34. You will get the answer 0.068. That rounds up to 0.07.
2. Now, multiply by 100 to get the percent. For example, 0.07 x 100 = 7%. In other words, a sweet potato gives you 7% of the protein you need in a day.
3. Fill in the rest of the answers on **Table 3** below.
4. Graph your answers on the **Sweet Potato Graph**.

Table 1: How much you need each day (For children 8 to10 years old)

Calories	Protein	Vitamin E	Vitamin A	Vitamin C	Thiamin	Riboflavin	Niacin	Calcium	Phosphorus	Iron
2,100	34 g	11 mg	600 µg	45 mg	0.9 mg	0.9 mg	12 mg	1300 mg	1250 mg	8 mg

Table 2: How much there is in one baked sweet potato with skin

Calories	Protein	Vitamin E	Vitamin A	Vitamin C	Thiamin	Riboflavin	Niacin	Calcium	Phosphorus	Iron
103	2.3 g	0.8 mg	1096 µg	22.3 mg	0.1 mg	0.1 mg	1.7 mg	43 mg	62 mg	0.8 mg

Table 3: The percent you get when you eat one sweet potato

Calories	Protein	Vitamin E	Vitamin A	Vitamin C	Thiamin	Riboflavin	Niacin	Calcium	Phosphorus	Iron
	7%									

Source: United States Department of Agriculture at www.usda.gov

Name: Answer Key

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Table 3: The percent you get when you eat one sweet potato

Calories	Protein	Vitamin E	Vitamin A	Vitamin C	Thiamin	Riboflavin	Niacin	Calcium	Phosphorus	Iron
5%	**7%**	**7%**	**183%**	**50%**	**11%**	**11%**	**14%**	**3%**	**5%**	**10%**

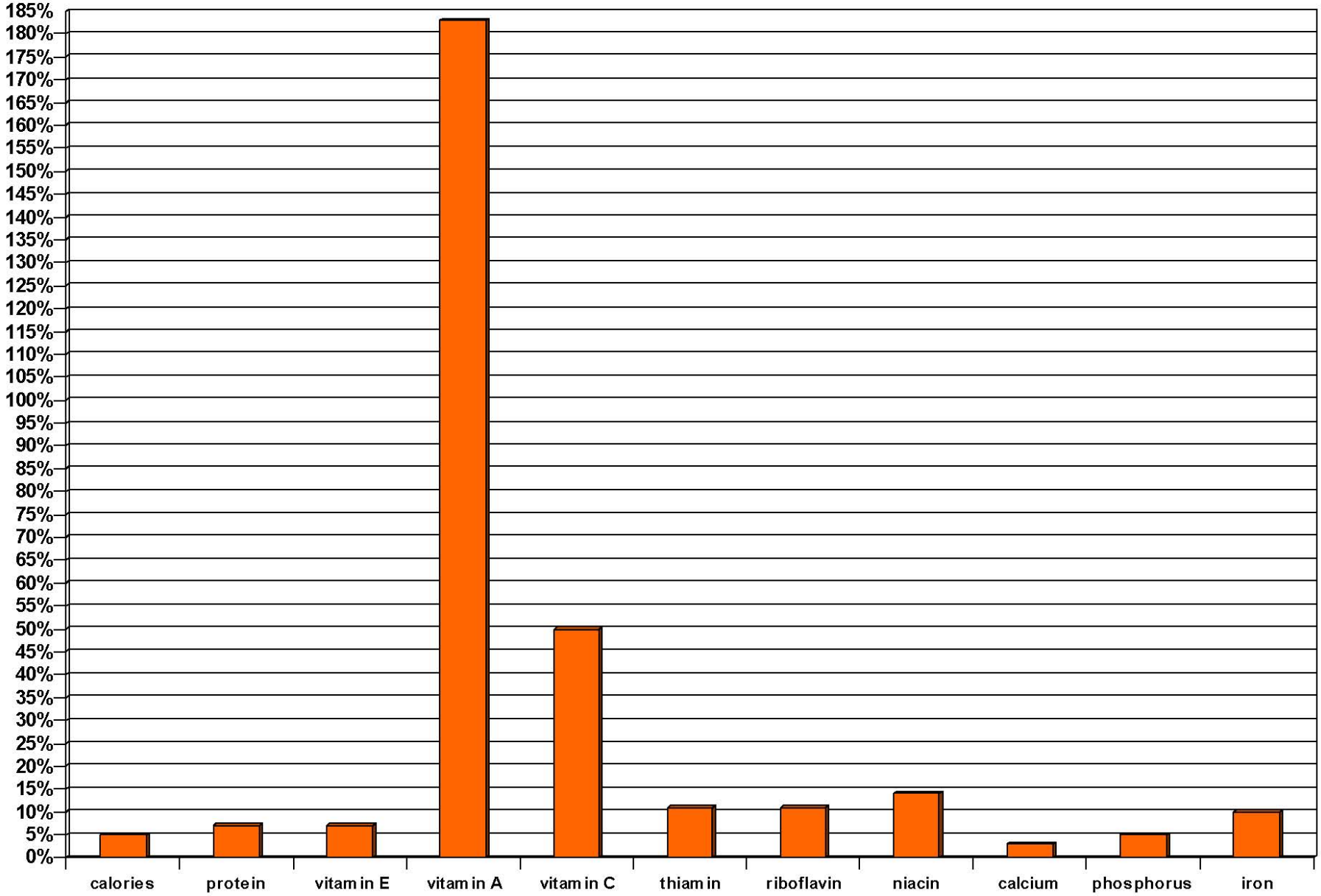
Source: United States Department of Agriculture at www.usda.gov

The Sweet Potato DRI Graph

Name_____

The Sweet Potato DRI Graph

Name: Answer Key



Grow a Sweet Potato House Plant

Materials

- Sweet potato
- Toothpicks
- Jar or glass
- Water (non-chlorinated)

Methods

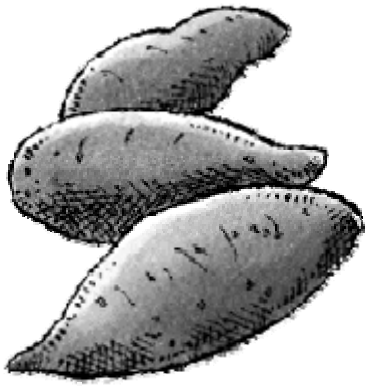
- Wash sweet potato thoroughly.
- Insert toothpicks into the sides of the sweet potato about one-third of the way down.
- Place the sweet potato into the jar.
- Fill the jar with water.

Results

- In about 10 to 15 days the sweet potato will begin to bud.
- For the next 3 to 6 months vines will grow from the sweet potato.
- You can train the vines to climb up or around whatever you choose.

Keeping It Green

- Always keep the jar filled with non-chlorinated water.
- Keep the sweet potato plant in full to moderate sunlight.
- Keep the sweet potato plant at a room temperature at or above 65º F.



Source: North Carolina Sweet Potato Commission