

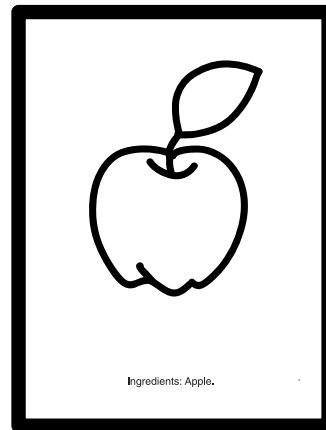
LETTER TO PARENTS

Cut here and paste onto school letterhead before making copies.

SCIENCE NEWS

Dear Parents,

Our class is beginning a new science unit using the **FOSS Food and Nutrition Module**. We will be investigating what food is, what it is made of, and how several nutrient groups contribute to good, healthful nutrition. Children will learn about fats, sugars, proteins, and vitamins and ways of testing for some of these nutrients in food. They will have an opportunity to use their knowledge about foods to plan lunch menus that conform to guidelines for total number of calories and for the number of calories contributed by different nutrients. And we'll become familiar with the labels on food and the kinds of information provided for the consumer.



Your child will be conducting experiments that use common foods. I may be asking you to send small samples of foods to school for this purpose. The foods might include items such as a handful of breakfast cereal, a spoonful of peanut butter, a piece of fruit, or a couple of cookies. We are also assembling a collection of empty food containers of all kinds. We are especially interested in the list of ingredients and nutritional information contained on the food packages. Please save a few containers for our “food market.”

Watch for the home/school connection sheets I will be sending home with your child. These suggest ways for the whole family to investigate interesting aspects of food and nutrition.

You might find as a result of our investigations in the **Food and Nutrition Module** that your family’s dinner conversation will actually focus on the meal! If you have any questions or comments, or have family and/or cultural traditions involving food that you would like to share with the class, please drop me a note or come in and visit our class. We are looking forward to many weeks of exciting investigations with food and nutrition.

Comments _____



Food and Nutrition Journal

Name _____

FOOD LABELS

Peanut butter

Cracker

Mustard

Walnut

Banana

Apple

Hot dog

Bread

Mayonnaise

Margarine

Potato chip

Cheese

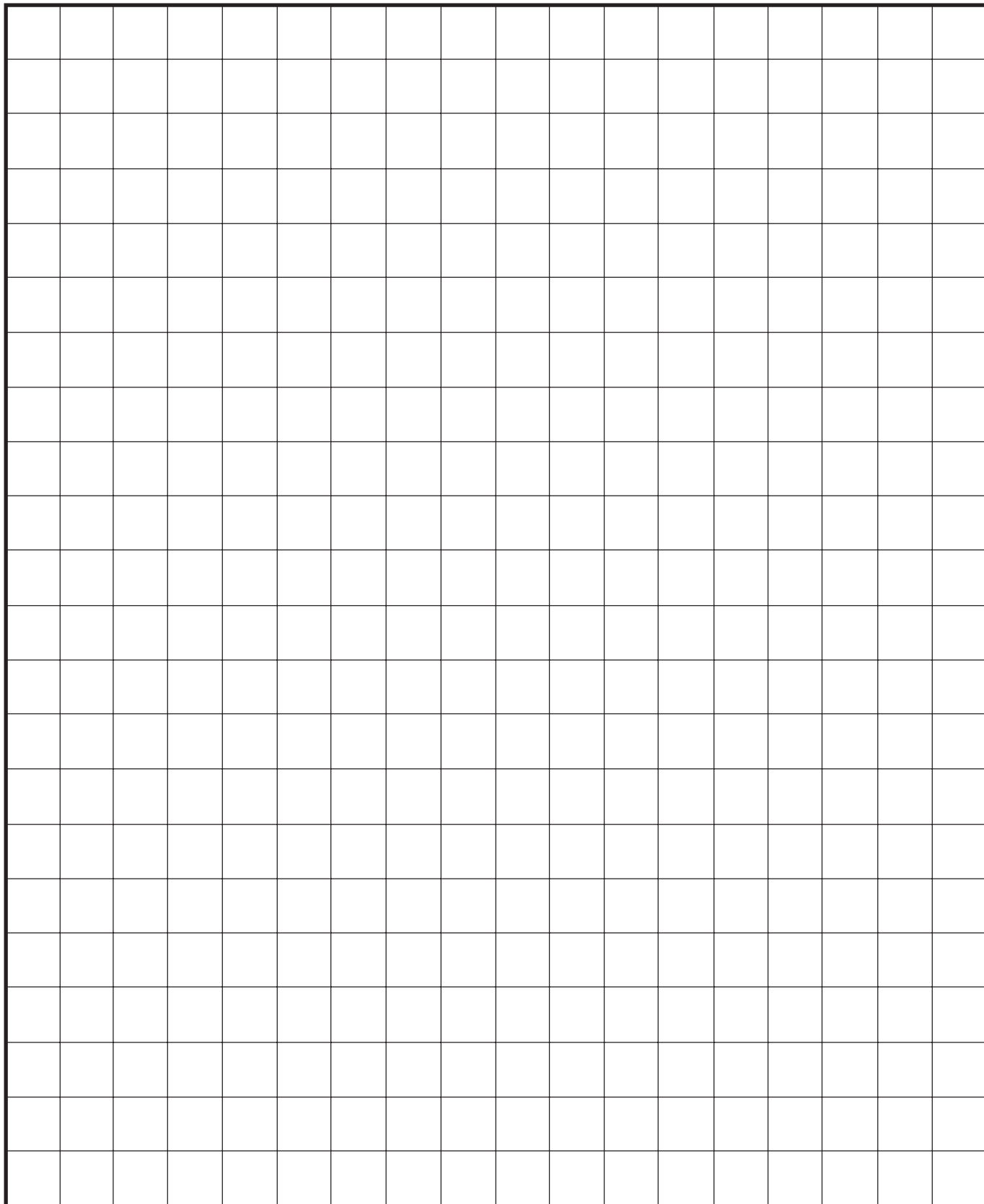
Catsup

Doughnut

Cookie

Jelly

CENTIMETER GRID



Name _____

Date _____

FAT TEST

.....

Record the size of your grease spots in cm².

Food tested	Size of grease spot

What is fat?

Fats are a group of nutritional chemicals in foods. Fats usually feel slippery. Fats are oils, greases, and animal fats.

Rank	Food tested	Size of grease spot
1	Cooking oil	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		

Name _____

Date _____

RESPONSE SHEET—THE FAT TEST

Neha and Arya pack their own lunches for school each day. Neha likes to pack her lunch the night before, so she doesn't have to think about it in the morning. Arya prefers to pack his lunch in the morning. They both pack their lunches in brown paper bags.

One day as they were getting ready to go to the cafeteria, Neha noticed a dark spot on her lunch bag. When Arya looked at his bag, he noticed a dark spot, too. When they compared the spots on their two bags, they saw that Neha's was about twice the size of Arya's.

When they looked in their bags, they saw that potato chips had caused the spot on Neha's bag and corn chips had caused the spot on Arya's bag.

Arya said, "I think potato chips have more fat in them than corn chips."

- a. Why do you think Arya said that potato chips have more fat? Do you agree with him? Why or why not?

- b. What would you do to compare the amount of fat in these two kinds of chips?

- c. If you wanted to find out the percentage of fat in corn chips, what would you do?

Name _____

Date _____

COOKIE LABELS

GRANNY'S RASPBERRY DREAM

Ingredients: Wheat flour, sugar, sweet chocolate, corn syrup, partially hydrogenated vegetable shortening, red raspberries, non-fat milk, cornstarch, invert syrup, vanilla, pectin, baking soda, salt, citric acid, caramel color.

Winners Brand

Choco-chunk Cookies

Ingredients: Unbleached wheat flour, sugar, milk chocolate, partially hydrogenated vegetable shortening, whole eggs, brown sugar, nonfat milk, butter, baking soda, egg whites, vanilla, salt.

Silly-Vanilly Snaps

Ingredients: Wheat flour, sugar, partially hydrogenated vegetable shortening, whole eggs, butter, high-fructose corn syrup, salt, vanilla, baking soda, whey.

(Package labels list the ingredients in order from the most plentiful ingredient to the least plentiful ingredient.)

What two ingredients are present in the greatest quantity in

Granny's Raspberry Dream cookies? _____

Winners Choco-chunk Cookies? _____

Silly-Vanilly Snaps? _____

What ingredients are in all three cookies? _____

What ingredients are unfamiliar to you? _____

Name _____

Date _____

SUGAR TEST

.....

Amount of _____

Food _____

Yeast _____

Water _____

Food tested	Amount of CO ₂ in 10 min.	Amount of CO ₂ in 20 min.

What is carbohydrate?

Carbohydrates are a group of nutritional chemicals in foods. Carbohydrates provide energy for organisms. Sugars are simple carbohydrates; starches are complex carbohydrates.

Flat Flakes

Nutrition Facts	
Serving Size 1 box (21g)	
Amount Per Serving	
Calories	80
Calories from Fat	0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 230mg	10%
Total carbohydrate 18g	6%
Dietary Fiber 1g	4%
Sugars 2g	
Protein 1g	
Vitamin A 10%	
Vitamin C 15%	
Calcium 0%	
Iron 30%	
Vitamin D 8%	
Thiamin 15%	
Riboflavin 15%	
Niacin 15%	
Vitamin B₆ 15%	
Folic Acid 15%	
Vitamin B₁₂ 15%	
Ingredients: Milled corn; sugar; salt; malt flavoring; high-fructose corn syrup; sodium ascorbate and ascorbic acid; reduced iron; niacinamide; pyridoxine hydrochloride; riboflavin; vitamin A palmitate; thiamin hydrochloride; folic acid; vitamin B ₁₂ ; vitamin D; BHT (preservative).	
<small>* Percent Daily Values are based on a 2000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.</small>	
Calories	2,000
Total Fat	Less than 65g
Sat Fat	Less than 20g
Cholesterol	Less than 300g
Sodium	Less than 2400mg
Potassium	3500mg
Total carbo	300g
Dietary Fiber	25g
Calories per gram:	
Fat 9	• Carbohydrate 4 • Protein 4

Colorful Circles

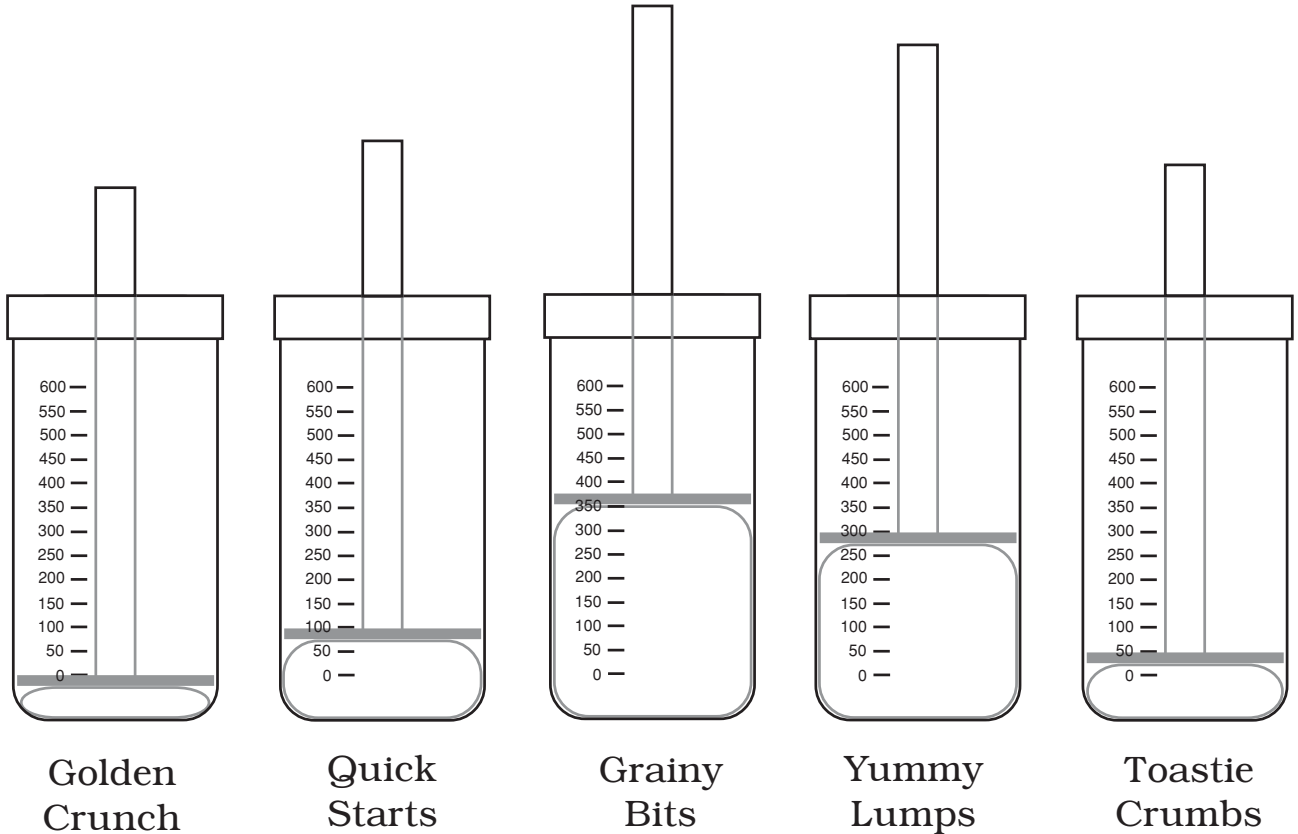
Nutrition Facts	
Serving Size 1 box (27g)	
Amount Per Serving	
Calories	100
Calories from Fat	5
% Daily Value*	
Total Fat 1.0g	2%
Saturated Fat 0.5g	3%
Cholesterol 0mg	0%
Sodium 125mg	5%
Total carbohydrate 24g	8%
Dietary Fiber 1g	3%
Sugars 13g	
Protein 1g	
Vitamin A 10%	
Vitamin C 20%	
Calcium 8%	
Iron 20%	
Vitamin D 10%	
Thiamin 20%	
Riboflavin 20%	
Niacin 20%	
Vitamin B₆ 20%	
Folic Acid 20%	
Vitamin B₁₂ 20%	
Zinc 20%	
Ingredients: Corn, wheat, and oat flour; sugar; partially hydrogenated vegetable oil (one or more of: coconut, cottonseed, and soybean); salt; sodium ascorbate and ascorbic acid; yellow #6; niacinamide; zinc oxide; reduced iron; natural orange, lemon, cherry, other natural flavors; red #40; turmeric color; annatto color; blue #2; pyridoxine hydrochloride; blue #1; riboflavin; vitamin A palmitate; thiamin hydrochloride; BHT; folic acid; vitamin B ₁₂ and vitamin D.	
<small>* Percent Daily Values are based on a 2000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.</small>	
Calories	2,000
Total Fat	Less than 65g
Sat Fat	Less than 20g
Cholesterol	Less than 300g
Sodium	Less than 2400mg
Potassium	3500mg
Total carbo	300g
Dietary Fiber	25g
Calories per gram:	
Fat 9	• Carbohydrate 4 • Protein 4

Name _____

Date _____

RESPONSE SHEET—THE SUGAR TEST

Darian and Denella had five breakfast cereals. They put 3 g of each cereal in a bag with 50 ml of water and 2 spoons of yeast. They put the five bags in warm water. After 20 minutes they put the five bags in measuring tubes. This is what they observed.



Fred Bassey is on a low-acid diet. Which cereals should he avoid and why? _____

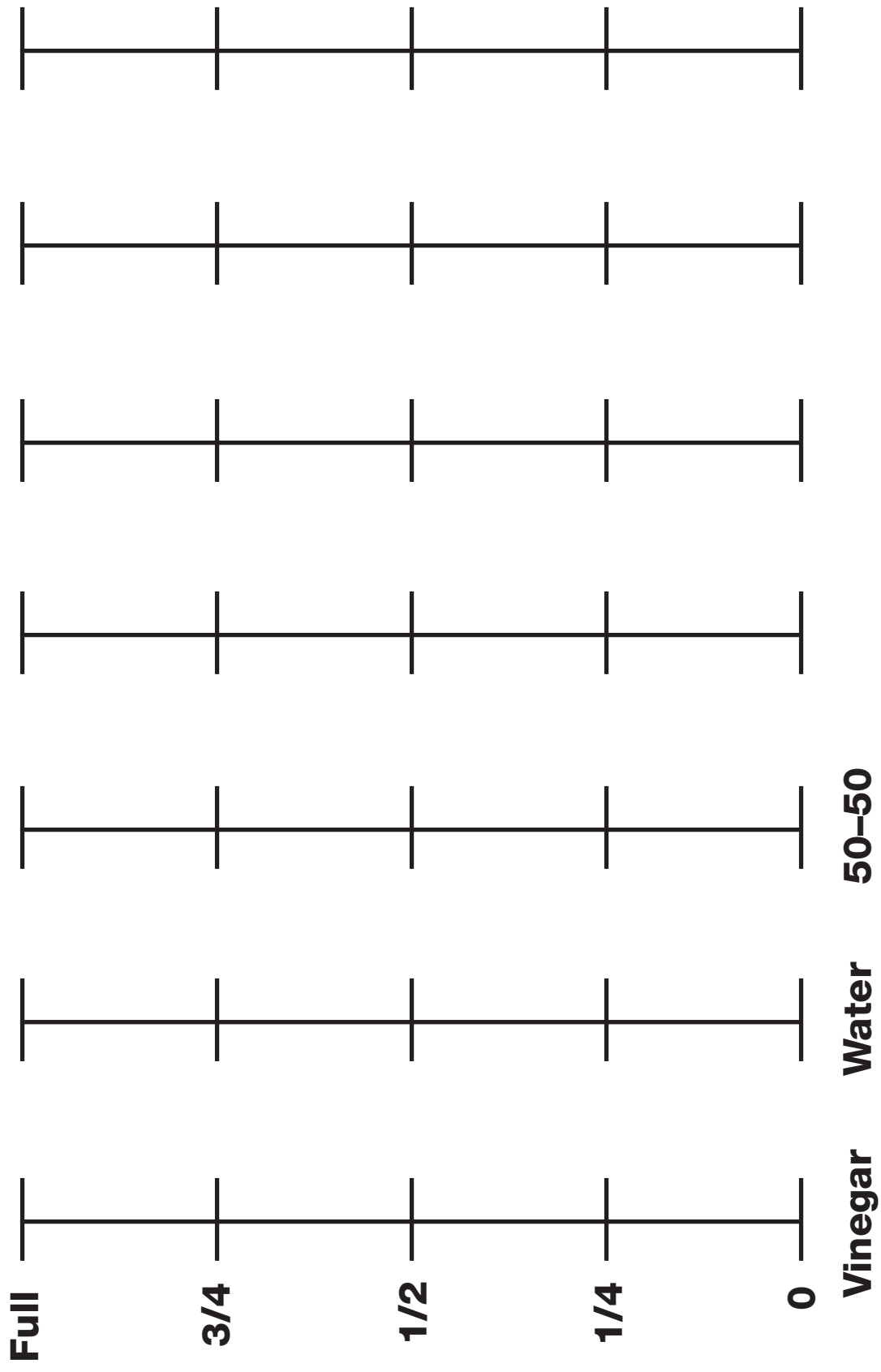
Rita Dulce is on a low-sugar diet. Which cereals should she avoid and why? _____

Bill Lardner is on a low-fat diet. Which cereals should he avoid and why? _____

Name _____

Date _____

ACID TEST



Name _____

Date _____

VITAMIN-C SCORE SHEET

.....

Source of vitamin C	Drops needed to clear 10 ml of indophenol

WHAT FOOD IS IT? (page 1)

1. Vinegar
 Mustard seed
 Salt
 Spices
 Turmeric

2. Wheat flour
 Vegetable shortening
 Graham flour
 Sugar
 Toasted whole wheat
 Sesame seeds
 Salt
 Malt
 Dehydrated onions
 Corn syrup
 Baking soda
 Whey
 Artificial color

3. Milk
 Nonfat milk
 Nonfat milk solids
 Vitamins A and D

4. Soybean oil
 Partially hydrogenated soybean oil
 Whole eggs
 Vinegar
 Water
 Egg yolks
 Salt
 Sugar
 Lemon juice
 Natural flavors
 Calcium disodium EDTA

5. Beef
 Pork
 Water
 Salt
 Corn syrup
 Dextrose
 Flavoring
 Sodium erythorbate
 Sodium nitrite

6. Carbonated water
 Caramel color
 Natural flavors
 Artificial flavors
 Aspartame
 Sodium benzoate
 Citric acid

7. Banana

8. Tomatoes
 Vinegar
 Corn syrup
 Salt
 Onion powder
 Spice
 Natural flavoring

9. Wheat flour
 Vegetable shortening
 Sugar
 Dextrose
 Skim milk
 Baking soda

10. Carrot

WHAT FOOD IS IT? (page 2)

11. Wheat flour
 Water
 High-fructose corn syrup
 Yeast
 Canola oil or soybean oil
 Wheat gluten
 Soya flour
 Salt
 Cornstarch
 Calcium sulfate
 Mono- and diglycerides
 Enzymes
 Calcium propionate

12. Milk
 Cream
 Cheese culture
 Salt
 Carob-bean gum

13. Sugar
 Gelatin
 Adipic acid
 Disodium phosphate
 Fumaric acid
 Artificial flavor
 Natural flavor
 BHA
 Artificial color

14. Wheat flour
 Sugar
 Vegetable shortening
 Eggs
 Butter
 High-fructose corn syrup
 Salt
 Vanilla
 Baking soda
 Whey

15. Oats
 Water
 Wheat flour
 Cracked wheat
 Whole wheat flour
 Ground raisins
 Honey
 Nonfat milk
 Wheat gluten
 Yeast
 Salt
 Soya
 Vinegar
 Whey
 Mono- and diglycerides
 Stearoyl lactylate

16. Carbonated water
 High-fructose corn syrup
 Sucrose
 Caramel color
 Phosphoric acid
 Natural flavors
 Caffeine

17. Corn

18. Cabbage
 Mayonnaise
 Milk
 Sugar
 Salt

19. Potatoes
 Vegetable oil
 Salt

20. Apple

Name _____

Date _____

LUNCH WORK SHEET

LUNCH MENU 1			
Lunch item	Protein	Carbohydrate	Fat
Total grams			
Calories per gram	× 4	× 4	× 9
Calories			
Total calories			

LUNCH MENU 2			
Lunch item	Protein	Carbohydrate	Fat
Total grams			
Calories per gram	× 4	× 4	× 9
Calories			
Total calories			

NUTRITIONAL INFORMATION (page 1)

<p>Doughnut</p> <p>Serving size 50 grams (1 doughnut) Protein 2 grams Carbohydrate 25 grams Fat 12 grams</p>	<p>Sesame crackers</p> <p>Serving size 28 grams (6 crackers) Protein 2 grams Carbohydrate 16 grams Fat 6 grams</p>
<p>Mayonnaise</p> <p>Serving size 14 grams Protein 0 grams Carbohydrate 0 grams Fat 11 grams</p>	<p>Oat-berry wheat bread</p> <p>Serving size 38 grams (2 slices) Protein 4 grams Carbohydrate 20 grams Fat 0 grams</p>
<p>Lowfat milk</p> <p>Serving size 300 grams (1 carton) Protein 13 grams Carbohydrate 17 grams Fat 7 grams</p>	<p>Hot dog</p> <p>Serving size 45 grams (1 dog) Protein 5 grams Carbohydrate 1 gram Fat 14 grams</p>
<p>Potato chips</p> <p>Serving size 56 grams (1 bag) Protein 4 grams Carbohydrate 30 grams Fat 20 grams</p>	<p>Hot-dog buns</p> <p>Serving size 38 grams (1 bun) Protein 3 grams Carbohydrate 19 grams Fat 2 grams</p>
<p>Cream cheese</p> <p>Serving size 28 grams Protein 2 grams Carbohydrate 1 gram Fat 10 grams</p>	<p>Gelatin</p> <p>Serving size 250 grams (1 bowl) Protein 1 gram Carbohydrate 10 grams Fat 0 grams</p>
<p>Diet cola</p> <p>Serving size 360 ml (1 can) Protein 0 grams Carbohydrate 0 grams Fat 0 grams</p>	<p>Vanilla cookies</p> <p>Serving size 56 grams (6 cookies) Protein 2 grams Carbohydrate 36 grams Fat 12 grams</p>

NUTRITIONAL INFORMATION (page 2)

<p>Mustard</p> <p>Serving size 5 grams Protein 0 grams Carbohydrate 1 gram Fat 0 grams</p>	<p>Cola</p> <p>Serving size 360 grams (1 can) Protein 0 grams Carbohydrate 36 grams Fat 0 grams</p>
<p>Catsup</p> <p>Serving size 10 grams Protein 1 gram Carbohydrate 3 grams Fat 0 grams</p>	<p>Popcorn</p> <p>Serving size 15 grams (1 bag) Protein 2 grams Carbohydrate 12 grams Fat 1 gram</p>
<p>Apple</p> <p>Serving size 200 grams (1 apple) Protein 1 gram Carbohydrate 27 grams Fat 1 gram</p>	<p>Carrot</p> <p>Serving size 70 grams (1 carrot) Protein 1 gram Carbohydrate 7 grams Fat 0 grams</p>
<p>Banana</p> <p>Serving size 120 grams (1 banana) Protein 1 gram Carbohydrate 26 grams Fat 1 gram</p>	<p>Coleslaw</p> <p>Serving size 60 grams (1 bowl) Protein 1 gram Carbohydrate 7 grams Fat 2 grams</p>

	Recommended calories per day*	Recommended calories at lunchtime (30% of total)	Recommended maximum calories from fats (30% of lunch)
Girls	2200	660	198
Boys	2600	780	234

* Calorie needs depend on your height, mass, frame, rate of growth, and level of physical activity. If you get a lot of exercise, you use up more energy and need more calories.

PROJECT IDEAS

.....

- Research who discovered vitamin C and what was learned about it.
- Find a test for starch in foods and use it to analyze a product.
- Who was the first scientist to discover that a substance in food could affect people's health?
- Determine the percentage of sugar in a product.
- Why did parents have their children take cod-liver oil?
- Why do athletes "carbo load" before a competition?
- Will eating carrots help you see in the dark?
- What foods do astronauts eat in space and how do they prepare them?
- What is the food pyramid and how can it be used to guide our food choices?
- Do vegetarians meet all their nutritional needs without eating any meat?
- Does chocolate have nutritional value?
- Pick a favorite fast-food restaurant and decide if you think their food is healthy.
- Pick a country and research its customs surrounding food and eating.
- Research breads around the world. Find out about the history of bread and the use of yeast in bread making.
- Pick a favorite food and research how it was first introduced into the American diet.
- Find out the most popular foods in America and analyze their nutritional value.
- Find out more about what the Native Americans taught the Pilgrims about food.
- Research traditions surrounding food, like why certain foods are served on certain holidays or special family gatherings in your family.
- Select a food to test for fat, sugar, acid, and vitamin C.
- Find out what happens to vitamin C with heat, exposure to air, or exposure to cold.

Name _____

Date _____

PROJECT PROPOSAL

.....

1. What is the question or the project that you are proposing?

2. What materials or references will you need to complete the project?

3. What steps will you follow to complete the project?

Name _____

Date _____

PRESENTATION GUIDELINES

.....

You will have exactly 3 minutes to present your project to the class. In those 3 minutes you should answer these questions.

- What were you trying to find out (your question)?
- What materials or references did you need to do your project?
- What procedure did you follow to complete your project?
- What did you learn from doing your project?

When you begin speaking, you will see the *green card* held up for 2 1/2 minutes. When you see the *yellow card*, you have 30 seconds left. When you see the *red card*, it means you can finish your sentence, but you must stop within the next few seconds.

Practice your presentation so you will be sure it is at least 2 1/2 minutes long, but not more than 3 minutes long. Be sure you have included all of the information asked for above.

Name _____

Date _____

PRESENTATION GUIDELINES

.....

You will have exactly 3 minutes to present your project to the class. In those 3 minutes you should answer these questions.

- What were you trying to find out (your question)?
- What materials or references did you need to do your project?
- What procedure did you follow to complete your project?
- What did you learn from doing your project?

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Practice your presentation so you will be sure it is at least 2 1/2 minutes long, but not more than 3 minutes long. Be sure you have included all of the information asked for above.

MATH EXTENSION—PROBLEM OF THE WEEK**INVESTIGATION 1: FAT TEST**

Ms. Cote’s class conducted the fat test using 3-g samples of ten foods. After 2 days they measured the size of the grease spots. Here are the results.

Food tested	Size of grease spot		
Potato chips	60 cm ²	100%	300 cm ²
Peanut butter	53 cm ²	90%	270 cm ²
Crackers	21 cm ²	80%	240 cm ²
Walnut	30 cm ²	70%	210 cm ²
Cream cheese	15 cm ²	60%	180 cm ²
Jelly	3 cm ²	50%	150 cm ²
Margarine	102 cm ²	40%	120 cm ²
Hot dog	22 cm ²	30%	90 cm ²
Mayonnaise	165 cm ²	20%	60 cm ²
Banana	2 cm ²	10%	30 cm ²

For comparison the class did a fat test with 3 g of pure fat. After 2 days the grease spot was 300 cm².

Calculate the percentage of fat in each of the ten foods. Show all your work. Use the back of this paper if you need more room to record your percentages.

HINT: You can use the percentage bar above to help you figure out the fat percentages. For instance, a food that produced a grease spot of 150 cm² would be 50% fat.

Name _____

Date _____

MATH EXTENSION—PROBLEM OF THE WEEK

INVESTIGATION 2: THE SUGAR TEST

A Fair Share

Carol invited seven of her girlfriends to a party. She had 12 brownies. How many brownies did each girl get if everyone got a fair share?

Later Carol's mother brought 9 more brownies to the party. The girls shared these equally, too. This time how many brownies did each person get?

How many brownies did each person eat altogether?

A Sticky Problem

Laura has three kinds of candy in her bag for a total of 19 pieces of candy. The three kinds are gummy squirrels, mints, and chocolate drops. She has twice as many gummy squirrels as mints. She has three more chocolate drops than mints. She has one gummy squirrel more than the number of chocolate drops. How many of each kind of candy does Laura have?

Name _____

Date _____

MATH EXTENSION—PROBLEM OF THE WEEK**INVESTIGATION 3: THE ACID TEST**

Jason's class was testing fruit drinks for vitamin C. They found out how many drops of each drink were needed to neutralize 10 ml of indophenol indicator.

Orange drink	Drops	Percentage of RDA
Standard vitamin C	20 drops	
Instant orange drink	49 drops	
Canned orange drink	5 drops	
Frozen orange juice	7 drops	
Orange soda	50 drops	
Fresh orange juice	9 drops	

They wanted to figure out what percentage of their vitamin-C RDA (recommended daily allowance) each drink provided. They knew that 175 ml of standard vitamin-C solution provided exactly one RDA. When they tested the standard vitamin-C solution with indophenol, they found that 20 drops neutralized 10 ml of indophenol indicator.

Calculate (or estimate) the percentage of RDA in one serving of the fruit drinks that were tested in Jason's class.

HINT: If an orange drink requires only half as many drops as the standard vitamin-C solution to turn the indicator clear, that drink has twice as much vitamin C, or 200% of the RDA in one serving.

Figure out the percentages for the fruit drinks Jason's class tested.

Name _____

Date _____

MATH EXTENSION—PROBLEM OF THE WEEK**INVESTIGATION 4: FREE LUNCH**

Hannah and Emma were in the school environmental studies club. They were in charge of trail snacks for the Saturday field trip. They knew the hike was fairly strenuous, so they wanted to get as much energy as possible out of the snacks. Energy = calories, so they made a scouting trip to the store and copied nutritional information from five products that looked pretty good. Below is the information they came home with.

Product	Grams of carbohydrate	Grams of protein	Grams of fat	Cost of package
Rock-Hard Trail Bar (50 g)	44	4	2	\$0.75
Peanut-Butter Yums (400 g)	240	80	80	\$2.50
ChocoChip Cookies (300 g)	240	20	40	\$2.50
Gritty Grain Bar (30 g)	20	4	6	\$0.40
Granny's Oat Cookies (450 g)	430	8	12	\$2.75

Which snack product should they buy in order to get the most calories for their money? Put the snacks in order from best calorie value to the worst calorie value.

REMEMBER: 1 g of carbohydrate = 4 calories

1 g of protein = 4 calories

1 g of fat = 9 calories

Name _____

Date _____

HOME/SCHOOL CONNECTION

INVESTIGATION 1: THE FAT TEST

How much fat was in your dinner?

Materials

- Brown paper bag
 - Waxed paper
 - Tape
- a. Cut a brown paper bag into about 7-cm squares.
 - b. Label each square with the name of one of the foods you had for dinner.
 - c. Take a very small sample of each food that was served. Rub or squash it on the paper square with its name. If it's a liquid, put a few drops on the square.
 - d. Put the food papers on waxed paper. Let the squares stand for a couple of days.
 - e. Hold each square up to a light and show your family.

Discuss with your family the fat content of the meal. Write down if you think your meal contained a healthy amount of fat or if it contained too much fat. If you think your meal contained too much fat, discuss how you might adjust the meal to lower the fat content.

Name _____

Date _____

HOME/SCHOOL CONNECTION

INVESTIGATION 2: SUGAR TEST

Here's a sugar test for you and your family to try at home. This test will give you a chance to feel one effect of sugar.

You need a partner and a pinch of sugar.

Stand with your arms at your sides, palms of your hands facing out. The backs of your hands should be resting against your legs.

Have your partner take hold of your wrists and pull your arms away from your body. You should try to prevent your arms from being lifted up. It may or may not be possible for your partner to pull your arms up. Try this now. Did you notice how you were able to tighten up your muscles and resist the pull?

Now do the same thing again. But first, put a small pinch of sugar on your tongue and swallow it. Have your partner pull up on your arms again. What happened? Were you able to produce more resistance? Less resistance? About the same resistance? It's an experiment to help you judge your ability to use those upper-arm muscles with and without a little blast of sugar. Explain, or at least describe, the results below.

Try this sugar-charged experiment with another family member or friend who is stronger than you are, someone whose arm you couldn't possibly pull away. See if you can do it when they've put that pinch of sugar on their tongue. Write down what happened below.

