

Math Academy

Dining Out!

Explorations in Fractions, Decimals, & Percents



ADVANCING STUDENT ACHIEVEMENT.®

A program of THE ACTUARIAL FOUNDATION



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A Thank You to Our Corporate Sponsors

The Actuarial Foundation would like to thank the following sponsors for their generosity in funding the production of the Math Academy booklet.

By providing financial support for this project they are assisting The Actuarial Foundation in its pursuit of one of its many aspirations—to provide students with enriched learning opportunities that can help them succeed in their educational and professional endeavors.

The Actuarial Foundation and the companies listed below are collectively ensuring math education remains strong and enjoys a prosperous future.



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A Letter from the Author



Congratulations! You've just found your answer to the question, "What can I do to create real enthusiasm for mathematics in all my students?"

Created by teachers for teachers, the Math Academy tools and activities included in this booklet were designed to create hands-on activities and a fun learning environment for the teaching of mathematics to our students. On Math Academy days I often found that I couldn't make it from my car to my classroom without being stopped by enthusiastic students wanting to know every detail of the upcoming day's events. Math Academy days contributed to a positive school-wide attitude towards mathematics on our campus.

This booklet contains the *Math Academy – Dining Out! Explorations in Fractions, Decimals, and Percents*, which you can use to enhance your math instruction while staying true to the academic rigor required by the state standards framework.

This effort would not have been possible without support from The Actuarial Foundation. With the help of the Foundation's Advancing Student Achievement (ASA) grant program, which is committed to funding projects that enhance the teaching of mathematics, this Math Academy program came into being.

I sincerely hope that you enjoy implementing the *Dining Out! Math Academy* with your students. When you do, you will find that your students engage with mathematics on a whole new level. The Actuarial Foundation is truly a great partner in furthering mathematics education!

For the kids!

Kimberly Rimbey, M.Ed., NBCT (Math)

Mathematics Specialist

Phoenix, AZ

If you wish to find out more about my experiences with this and other Math Academies, feel free to contact me via e-mail at mathacademy@actfnd.org.



What is a Math Academy?

When the Math Academy concept was first developed, it was designed as a half-day or full-day event which allowed students to deepen their understanding of math while interacting with volunteers from the community (see page 24 for ideas on working with community volunteers). The activities we selected for these events were hands-on, standards-based lessons which applied mathematical principles in real-world scenarios. Each student experienced three to five activities during the course of the event.

Each Math Academy began with a brief school assembly featuring a guest speaker who represented that day's particular theme. Themes included math related to restaurants, sports, nature, shopping, fine arts and other topics, as well as focused on math-related careers. After the assembly, students rotated to different classrooms where they engaged in various activities related to mathematics and the day's coordinating theme.

Included in this booklet is the *Math Academy – Dining Out! Explorations in Fractions, Decimals, and Percents*, which has all the activities we used for the restaurant Math Academy. This Math Academy is designed to help students understand how to use fractions, decimals, and percents in the context of restaurants and money. In this day of credit and gift cards, children do not have as many real-life opportunities to count money and make change. These activities will keep those skills fresh, even with older students.

You may choose to implement a grade-level or school-wide Math Academy as we originally designed it, or you may prefer to implement these activities in your own classroom. Whichever format you use, keep in mind that the goal is to help your students see the relevance of mathematics in real-life contexts.

Getting Started

Math Academy Format

You may choose to conduct your Math Academy as a school-wide event, as a grade-level rotation, or as a single-classroom experience. If you will be holding your Math Academy for a single classroom, you may want to invite a guest speaker to speak with your class about how mathematics is used in his/her job (rather than putting on a school-wide or grade-level assembly as described below).

Math Academy Schedule

Schedule and times may vary depending on format being used.

- Opening assembly (optional) — 15 minutes
- Directions and Math Journals — 15 minutes
- Activity Rotations — 30–45 minutes per activity
- Assessment and Closure — 15 minutes

Opening Assembly/Directions

To build enthusiasm and to focus attention, have everyone participate in the *Math Academy Chant* (for younger students):

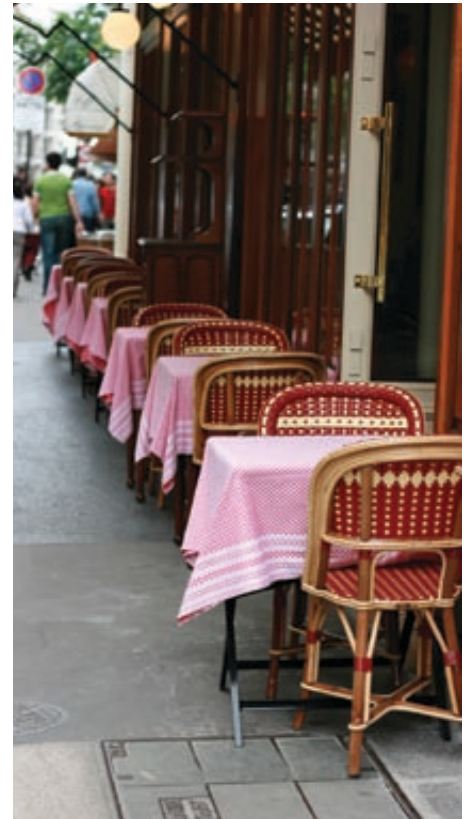
“You and me, we all agree —
Math is fun as you will see!
It makes us think, it makes us strong,
It helps us learn even when we’re wrong.
You and me, we all agree —
Math is fun at the Math Academy!”

Introduction

Announce to the students that today they will be working with menus, money, and discounts. Everyone loves to eat out, and knowing how to figure tips, tax, and discounts is part of the experience — especially when it means you’ll save money! Explain to them that during this Math Academy, they will be visiting four different restaurants, and at each one, they will use the menus to complete the activities. The skills of using fractions, decimals, and percents will be very important throughout all of these “dining out” experiences.

Guest Speaker Presentation (optional)

Beforehand, arrange for someone in the restaurant business to talk to the students about the mathematics found in a restaurant (they may or may not connect to fractions, decimals, and percents, but encourage them to do so). Possible guest speakers may include a chef, a waiter, a restaurant owner, or a culinary instructor. One school had a chef do a cooking demonstration for 300 students – and he brought samples for everyone! Although this guest speaker will primarily be focused on the restaurant aspect of this Math Academy theme, you may want to work with him/her ahead of time to assist with including mathematical ideas in the talk.



Theme

Dining Out: Understanding Fractions, Decimals, and Percents When Eating Out

Objective

Understand and apply concepts of fractions, decimals, and percents to count money, make change, figure tax/tips, and participate in other restaurant-related activities

Getting Started (continued)

▶ TEACHER TIPS

- We asked our students to use graphic organizers to record their thoughts and findings in their math journals. This creates a great connection to our language arts curriculum.
- The best results are achieved when 45 minutes are allowed in each classroom – about 30 minutes for the activity and 15 minutes for clean-up and reflection. The students can use their math journals to record their findings during the activities and write reflections on the journal’s blank pages.
- Following the fractions, decimals, and percents activities in this booklet, you will find a student quiz as well as sample surveys for students and teachers so that you can evaluate the success of your Math Academy. The Actuarial Foundation would love to hear all about your success and will send a \$50 Gift Certificate to the first 100 teachers who implement these activities and submit the results. For more information and to download the evaluation form, go to www.actuarialfoundation.org/grant/mathacademy.html.

Use of Math Journals

Students record their findings in their “Math Journals” during each activity. These journals should contain all recording sheets for the activities as well as blank paper for the extension activities. Before beginning the Activities Rotation, students should spend about 10 minutes writing in their math journals, including their reflections from the assembly as well as briefly describing what they already know about fractions, decimals, and percents.

Activities Rotation

If multiple classes are participating in the Math Academy, each classroom should host a different activity so students will rotate from classroom to classroom in order to complete each activity. If only one class is participating, the students may rotate from one activity to the next around the room, or they may do each activity as a whole class, one game after the other. Activities begin on page 7. For best results, plan on three to five activities for your Math Academy.

Note: There are no teacher answer keys in this particular booklet since all activities are open-ended and answers will vary

Closure and Assessment

Once all activities are completed, the students may return to their homeroom classes for final reflections and assessment. See pages 21 and 22 for sample post quiz and survey.

Key Vocabulary

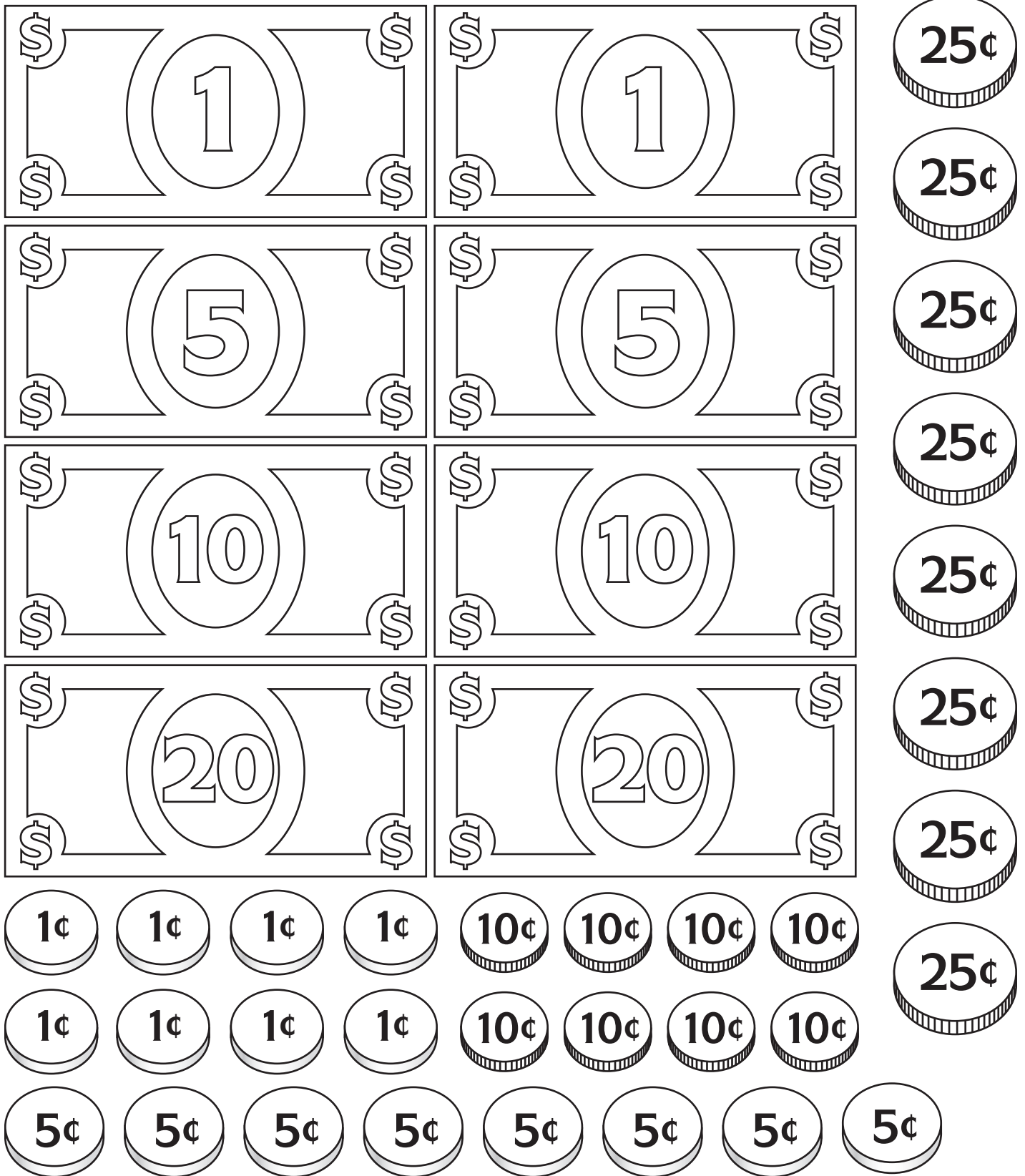
- | | | |
|---------------|------------|--------------|
| • Fractions | • Decimal | • Tenths |
| • Numerator | • Sales | • Hundredths |
| • Denominator | • Tax | • Percent |
| • Equivalent | • Gratuity | |

▶ TEACHER TIPS: CUSTOMIZING THESE ACTIVITIES

- Use the “Procedures” section in each activity as a skeleton for the lesson.
- Look through the “Suggestions for Customizing This Activity” section.
- Select the suggestion(s) which best fits with the concepts on which you want your students to focus.

Math Academy Manipulatives: *Money*

The activities in this booklet recommend the use of plastic coins and paper bills for counting money and making change. If plastic coins and paper bills are not readily available, the pieces below may be photocopied and cut apart for classroom use.



Math Academy Manipulatives: *Coupons*

Copy the coupons below. Cut apart to be used with the Activities

20%
off

entire order

20%
off

entire order

20%
off

entire order

20%
off

entire order

25%
off

entire order

25%
off

entire order

25%
off

entire order

25%
off

entire order

1/3
off

entire order

1/3
off

entire order

1/3
off

entire order

1/3
off

entire order

50%
off

entire order

50%
off

entire order

50%
off

entire order

50%
off

entire order

Math Academy Activity 1: *Joe's Place*

Objective Younger students will select items from a menu and count out the total amount needed using the fewest bills & coins possible. Older students will determine fractions, decimals, and percents of the items ordered and/or figure percent/fraction discounts based on coupons. Older students may use the optional “fraction” menu as well, which will encourage them to connect fractions and decimals in the context of money.

Materials

- Menu (photocopy page 10)
- Money trays
- Play Money (see page 7)
- Order Form (photocopy page 11)
- Optional: Coupons (see page 8)

Procedures

1. Students use the menu to determine what they will be “ordering”. They should write down their food choices and the cost, on the appropriate order form.
2. Students determine the total amount to pay and record on the order form.
3. Students pay for the meal using the least number of bills & coins possible.

Suggestions for Customizing This Activity

Younger Students:

- Ask students to record how they would pay for their meals using the fewest number of bills/coins (record on money combination form).
- Have students use the order form that does not include tax or tip.
- After students determine their individual totals and count out the bills/coins, have students combine their totals by putting all of their bills/coins together. Next, have students “trade” bills/coins to be sure they have the fewest bills/coins possible while maintaining the correct total.

All Students:

- Ask students to select their items and determine the total as individuals or as a group.
- Ask students to use the second menu as a unique way for them to determine the relationship between fractions and money.
- Give the students coupons to use after they have determined the total cost of their meals. These coupons may be for 20%, 25%, $\frac{1}{3}$, or 50% off the total cost of the meal. Of course, they will have to re-figure the tax and tip if that was part of their assignment.



Math Academy Activity 1: *Joe's Place*



Suggestions for Customizing This Activity (cont'd)

Older Students:

- Ask students to determine the total order including 10% tax and 15% tip
- Ask students to determine the total order including the tax and tip structures for the city/state where they live.
- Ask students to determine the total for a catered party. For this option, they must decide upon a menu and then multiply the cost of each item times the number of guests they expect. This option must also include tax and gratuity (gratuity is typically 20%).
- Ask students to use mental math strategies to figure tax, tips, and/or coupon discounts.

Joe's Place — Menu #1

Hamburger	\$4.75
Chicken Sandwich	\$4.75
Caesar Salad	\$5.50
Cheese Crisp.	\$3.25
Soup	\$3.10
French Fries	\$1.90
Onion Rings	\$2.25
Fruit Plate.	\$2.50
Fresh Vegetables.	\$2.50
Soda	\$1.50
Iced Tea	\$1.50
Coffee	\$.75
Latte	\$3.80
Milk Shake	\$3.25
Sundae.	\$4.25
Pie.	\$3.75

Joe's Place — Menu #2

Hamburger.	\$4 ³ / ₄
Chicken Sandwich	\$4 ³ / ₄
Caesar Salad	\$5 ¹ / ₂
Cheese Crisp.	\$3 ¹ / ₄
Soup	\$3 ¹ / ₁₀
French Fries	\$1 ⁹ / ₁₀
Onion Rings	\$2 ¹ / ₄
Fruit Plate.	\$2 ¹ / ₂
Fresh Vegetables.	\$2 ¹ / ₂
Soda	\$1 ⁵ / ₁₀
Iced Tea	\$1 ¹ / ₂
Coffee	\$ ³ / ₄
Latte	\$3 ⁴ / ₅
Milk Shake	\$3 ¹ / ₄
Sundae.	\$4 ¹ / ₅
Pie.	\$3 ³ / ₄

Math Academy Activity 1: *Joe's Place*

Joe's Place — Order Form #1

#	Item(s)	Item Cost	Total Cost
Total:			

Joe's Place — Order Form #2

#	Item(s)	Item Cost	Total Cost
Sub-Total:			
Tax:			
Tip:			
TOTAL:			

Joe's Place — Money Combination Form

How did you make your total amount using the fewest coins and bills possible?

Coins	How Many?	Amount
Pennies		
Nickels		
Dimes		
Quarters		
One-dollar bills		
Five-dollar bills		
Ten-dollar bills		
Twenty-dollar bills		
Total:		

Math Academy Activity 2: *The Snack Shop*



Objective Younger students will count out the total amount of money needed to purchase trail mix using the fewest number of bills/coins possible. Older students will determine fractions, decimals, and percents of the items ordered and/or figure percent/fraction discounts based on coupons.

Materials

- Play Money (see page 7)
- Money trays
- Dice
- The Snack Shop Recording sheet (photocopy page 13)
- **Optional:** Trail Mix food, bowls, spoons, ziplock bags

Procedures

1. Show students the Trail Mix menu and explain that they will be going through The Snack Shop to make trail mix.
2. Students may take a total of 5 scoops — Each student rolls a die five times to determine which items and how many scoops of each to take. Students determine the total cost of the selections and fill out the recording sheet accordingly.
3. Students must pay for the Trail Mix using exact change in the least number of bills/coins possible.
4. **Optional:** Students scoop real trail mix into ziplock bags, mix, and eat.

Suggestions for Customizing This Activity

All Students:

- Change the value of the scoops as needed.
- Change the number of scoops they may take (especially for older students who may be figuring the fractions, decimals, and percents for each item).
- Have the children determine the change they would receive if they paid with a \$20 bill.

Older Students:

- Ask the students to determine the fraction, decimal, and percent equivalents for each item they included.
- Require students to make a circle graph and record the percent for each item they selected for their trail mix.
- Hand out coupons and have students figure out the actual price after taking off the coupon amount (20%, 25%, $\frac{1}{3}$ or 50% off – see page 8).
- Have students use mental math strategies to figure percents.
- Have students determine the tax based on their state/city tax scale; or have them estimate tax with a round number (e.g., 5% or 10%).

Math Academy Activity 2: *The Snack Shop*

The Snack Shop Recording Sheet

Today you are making Trail Mix at The Snack Shop. Use the menu to find out how much each scoop costs. Record your data below.

Item	Cost
Total Cost:	

How can you make that amount using the fewest number of coins/bills possible?

Coins	How Many?	Amount
Pennies		
Nickels		
Dimes		
Quarters		
One-dollar bills		
Five-dollar bills		
Total:		

Trail Mix Menu

-  Raisins (1 scoop) \$0.88
-  Peanuts (1 scoop) . . . \$1.25
-  M & M's (1 scoop) . . . \$1.49
-  Goldfish (1 scoop) . . . \$0.95
-  Pretzels (1 scoop) . . . \$1.09
-  Your choice (any item above)

Math Academy Activity 3: *The Corner Diner*



Objective The students will count mixed bills/coins and record correctly using the symbols “¢” or “\$”. Older students will use mental math strategies to add bill/coin values and to determine percentages.

Materials

- Play Money (see page 7)
- Money trays
- The Corner Diner Recording Sheet (photocopy page 15)

Procedures

1. Explain to students that in *The Corner Diner*, the value of each food item will be determined by the letters in the name of that food.
2. Go over the “What’s the Value” chart which explains that vowels = 25¢, consonants b – n = 5¢, and consonants p – z = 10¢ (or whatever value structure you choose to use – see customizing options below).
3. Distribute the “menu” and have students use bills & coins to determine the cost of each menu item.
4. Students should record the value of each item as well as draw the bills/coins.
5. The last 2 spaces are for the students to select their own menu items. If time permits, they can add to their menus on the back side.
6. **Optional:** Students can trade bills/coins to make the value using the least number of bills/coins possible (e.g., trade 4 quarters for a dollar, trade 2 nickels for a dime, trade 2 dimes & a nickel for a quarter, etc.)

Suggestions for Customizing This Activity

All Students:

- Rather than using the value sheet included on the next page, ask the students to determine prices based on the following structure: A = 1¢, B = 2¢, C = 3¢, D = 4¢, and so on.

Older Students:

- Ask students to use mental math rather than using bills/coins.
- After finding the value of each item on the menu, ask students to convert the menu into a “fraction menu” as found in the first activity in this booklet (*Joe’s Place*, Menu #2). All fractions should be listed in lowest terms.
- Ask students to create “discount menus” or “profit menus” after finding the value of each item.
 - Discount Menu: What would the menu prices be if each price were reduced by 25% (or any percent) in order to draw in more customers?
 - Profit Menu: What would the menu prices be if each price were increased by 50% (or any percent) in order to increase profits?

Math Academy Activity 3: *The Corner Diner*

The Corner Diner Recording Sheet

Hamburger	Cheeseburger	What's the Value? Menu Vowels = 25¢ (a, e, i, o, u) Consonants: b - n = 5¢ (b, c, d, f, g, h, j, k, l, m, n) p - z = 10¢ (p, q, r, s, t, v, w, x, y, z)
Pizza	French Fries	
Pie	Cake	

Math Academy Activity 4:

The Menu Game at The Terribly Terrific Taco



Objective The students will figure discounts and/or profit increases for various food totals. Students will add decimals to \$100.

Materials

- *The Terribly Terrific Taco* Menus (photocopy page 17)
- Game board (photocopy pages 18–19)
- Game cards (photocopy page 20)
- Game spinner and paper clip for each team (photocopy page 17)
- Game pieces (one for each player)
- Scratch paper
- **Optional:** plastic or paper coins and paper bills (see page 7 if using photocopies)

Procedures

1. All players place game pieces on “START”. Place cards, face down, in the center of the game board.
2. Player 1 spins the paper clip on the spinner and moves that many spaces in either direction.
3. Player 1 takes the top card and reads it out loud.
4. All players find the total on the card and apply the discount/increase on the game board to the order on the card. This total belongs to Player 1, but all players do the operation to check his/her work.
5. Player 1 records his/her total on scratch paper.
6. Players take turns repeating steps 2 – 5.
7. On subsequent turns, players roll the die and move that many spaces in either direction, beginning at the space they landed on for the previous turn. Then they add the new total to the previous total. The first player to reach \$50 wins the game. (**Note:** If a player lands on “Start” again, s/he simply records the total from the game card s/he draws.)

Suggestions for Customizing This Activity

Younger Students:

- Have students use game board 1.
- Alter the game board so that fractions, decimals, and/or percents fit the level of the students.
- Alter the winning amount to shorten or lengthen game time.
- Ask student to use coins and bills to determine amounts.

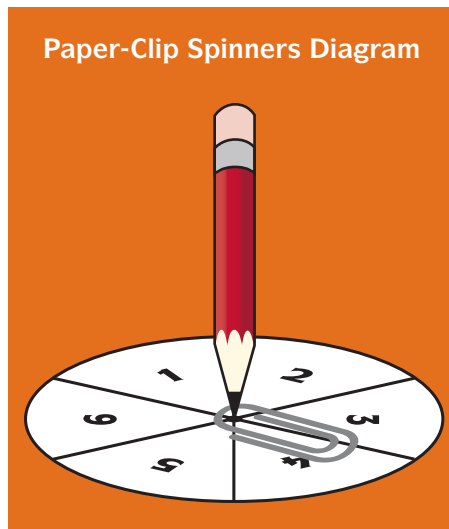
Math Academy Activity 4:

The Menu Game at The Terribly Terrific Taco

Suggestions for Customizing This Activity

Older Students:

- Have students use game board 2 (advanced).
- Ask students to do mental math rather than use coins and bills.
- Ask students to figure tax and/or tip to determine the total for each turn (provide the percentages you want them to use – e.g., 15% for tip and 10% for tax if using mental math; also, tell them beforehand if they are to add the tax and tip before or after the game board operation is applied).
- Alter the menu prices to fit with the skill-level of your students.
- Allow students to use calculators if working on technology objectives.



The Terribly Terrific Taco Menu

Ala Carte Menu

Tostada	\$1.50
Taco	\$1.50
Enchilada	\$2.00
Burrito	\$4.00
Soda	\$1.50
Ice Cream	\$2.25

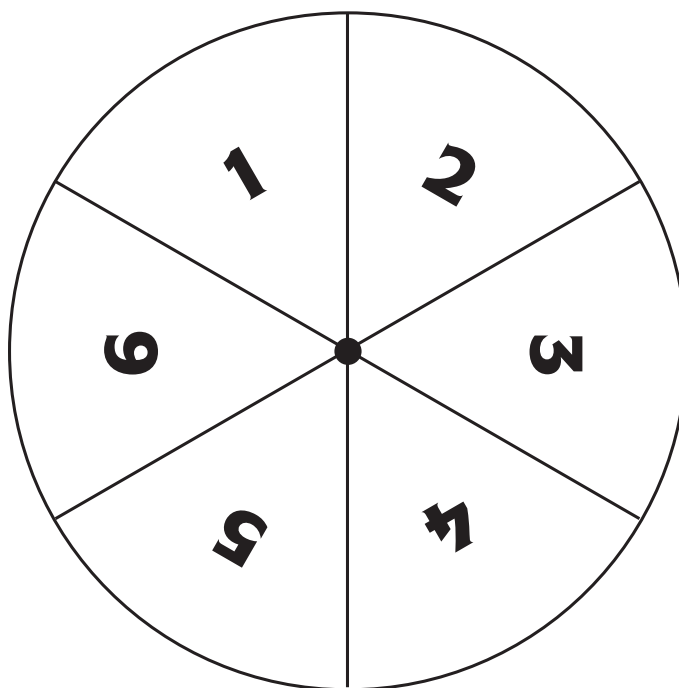
Value Menu

#1 – 1 Tostada, 1 Taco, 1 Soda	\$4.25
#2 – 2 Enchiladas, 1 Soda	\$5.25
#3 – 1 Tostada, 1 Burrito, 1 Soda	\$7.50

Family Value Menu

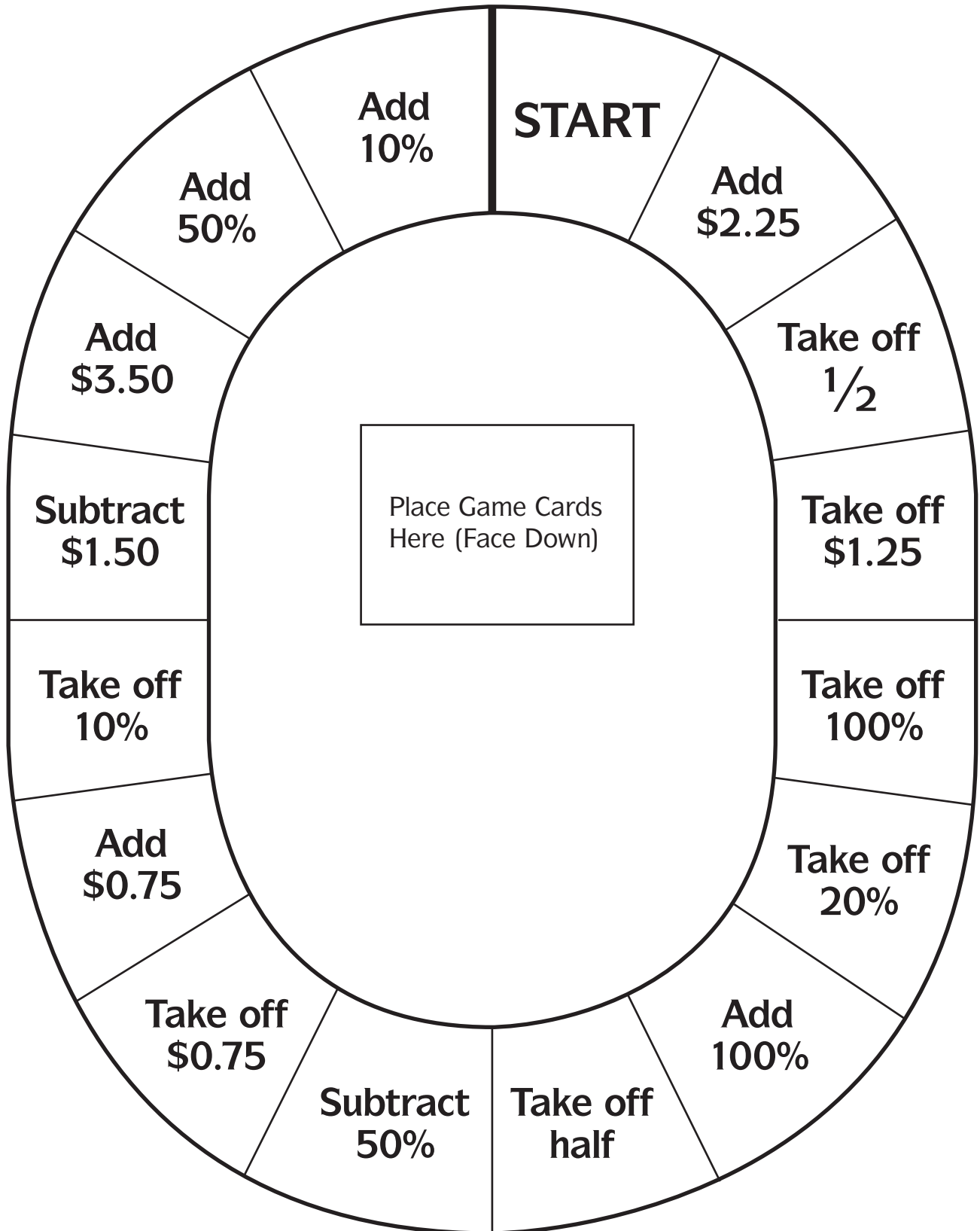
4 Burritos, 4 Tacos, 4 Sodas	\$25.00
--	---------

Game Spinner



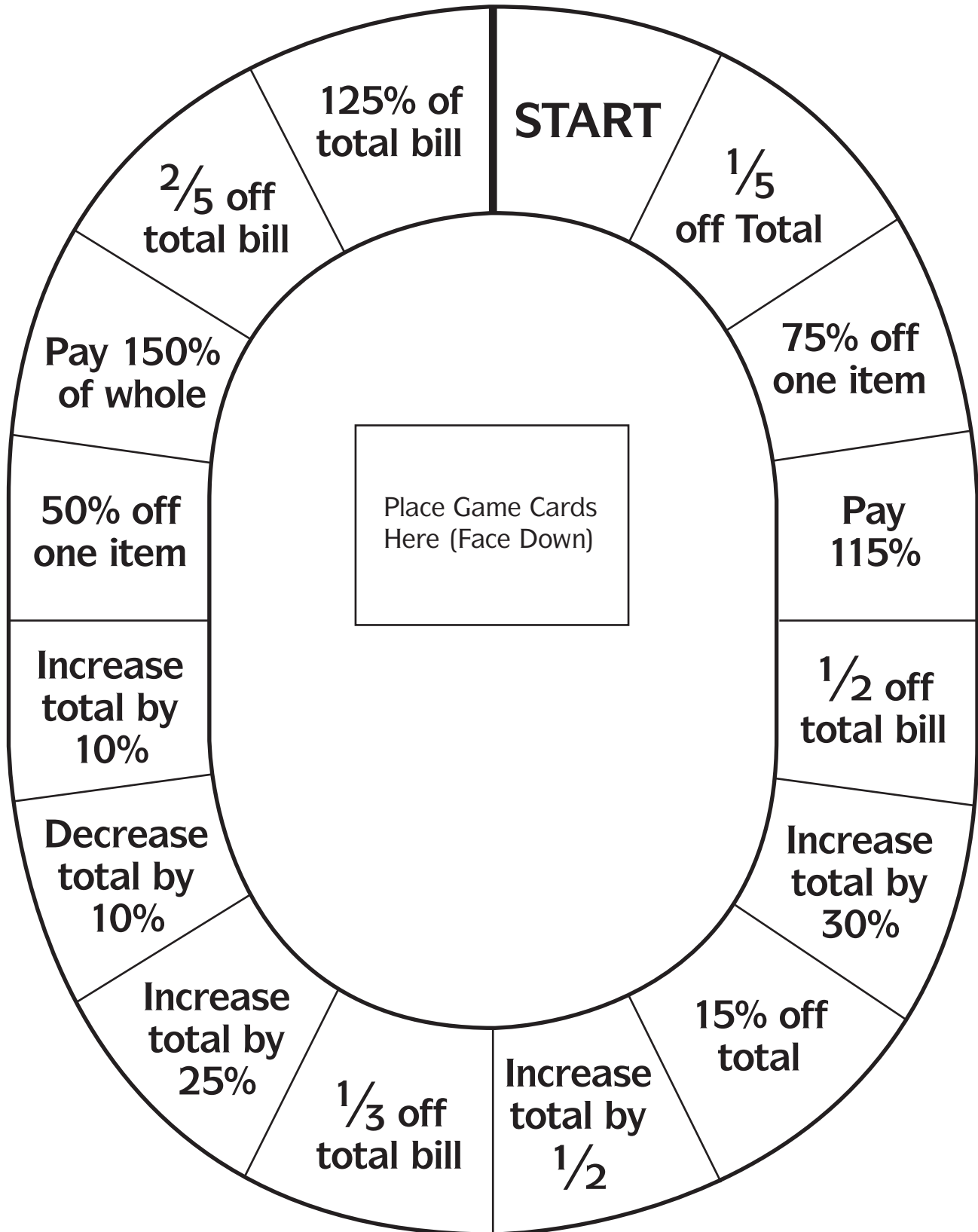
Math Academy Activity 4:

The Terribly Terrific Taco Game Board 1



Math Academy Activity 4:

The Terribly Terrific Taco Game Board 2—Advanced



Math Academy Activity 4:

The Terribly Terrific Taco Game Cards

You ordered: Value Meal #2 Value Meal #3	Total Bill: \$8.53	Total Bill: \$7.87	You ordered: Family Value Meal
You ordered: 1 Tostada 1 Taco	Total Bill: \$5.05	Total Bill: \$17.29	You ordered: 1 Soda 1 Burrito
Total Bill: \$10.51	You ordered: Value Meal #1 1 Tostada	You ordered: 1 Burrito 1 Enchilada	Total Bill: \$11.98
You ordered: Value Meal #2 2 Sodas	Total Bill: \$9.99	You ordered: 1 Taco 1 Burrito	Total Bill: \$2.75
Total Bill: \$8.63	You ordered: Family Value Meal	You ordered: Value Meal #3 Ice Cream	Total Bill: \$14.75
You ordered: Value Meal #1 Ice Cream	Total Bill: \$11.42	Total Bill: \$9.57	You ordered: Value Meal #1 1 Enchilada 1 Soda

Sample Quiz

Name _____

1. Draw a picture to show the fewest number of bills and coins you would need to pay for a restaurant bill of \$19.87.

2. Complete the chart below to show the equivalent fractions and decimals for each amount.

Money in Decimals	Money in Fractions
\$2.50	
\$3.75	
	\$5 $\frac{9}{10}$
\$7.40	
	\$3 $\frac{1}{2}$

3. Complete the chart below to show what the price would be for each discount/price increase.

Price	20% off	50% off	125% of price
\$20.00	\$16.00	\$10.00	
\$35.00			
\$50.00			
\$64.00			

4. Using the value sheet from The Snack Bar (vowels = 25¢, consonants b-n = 5¢, consonants p-z = 10¢), what would be the price for each item listed below? (Bonus: draw a picture for each amount showing the fewest coins possible.)

Apple pie =

Ice Cream =

Tostada =

Sample Student Survey

1. What job would you like to have when you grow up?

2. What kind of math skills do you think you will need to do that job?

3. Rank each of these statements on a scale of 1 to 5 (1 being lowest rank):

• I like math in school.	1	2	3	4	5
• I use math outside of school.	1	2	3	4	5
• The math I learn at school is helpful.	1	2	3	4	5
• I am good at math.	1	2	3	4	5
• I liked participating in the <i>Dining Out!</i> Math Academy	1	2	3	4	5
• I learned a lot about math during the Math Academy.	1	2	3	4	5
• I would like to participate in Math Academies again in the future.	1	2	3	4	5

4. The best thing about the Math Academy was:

5. The worst thing about the Math Academy was:

6. Do you know what an actuary is?

Sample Teacher Survey

1. What format did you use for this Math Academy?
 classroom all classrooms in grade level school-wide to all grade levels

2. What grade-level(s) used this Math Academy lesson? _____

3. Which Math Academy activities did you utilize with your students? 1 2 3 4

4. For the following two questions, please use a ranking scale of 1 through 5
(5 = great; 3 = mediocre; 1 = poor).

_____ Overall, how would you rank this Math Academy?

_____ How would you rank the activities you presented/taught?

5. Would you recommend these activities be used again?

Yes No

Comments: _____

6. Do you think your students now have a better understanding of fractions, decimals, and percents?

Yes No

Comments: _____

7. Would you like to participate in another Math Academy?

Yes No

Comments: _____

8. Please let us know how well your Math Academy went.

9. Comments, ideas, suggestions:

Community Involvement

WHAT IS AN ACTUARY?

An *actuary* is an expert who deals with numbers and percentages, also known as statistics. Actuaries provide advice to businesses, governments, and organizations to help answer questions about what to expect in planning for the future.

To find out more about the actuarial profession visit www.BeAnActuary.org.

One of the most beneficial aspects of our Math Academy program is the actuarial mentors/volunteers who interact with our students during each Math Academy activity. Our actuarial mentors take time away from their usual work responsibilities on the days of our events so they can help out in the classrooms. Please take the time to contact The Actuarial Foundation at mathacademy@actfnd.org to find out if actuaries are available in your area.

If you do not have actuaries available in your community, you may want to consider requesting the assistance of parents, community members, or business partners who would be willing to work with the students during the activities.

After securing your mentors/volunteers, it is critical to identify a Lead Mentor who will serve as the liaison between you and the other mentors. The Lead should e-mail all communications from the teachers to the mentors, set up schedules, send reminders before each event, etc.

Mentor Training Session

- Distribute the Math Academy schedule.
- Distribute copies of the Math Academy activities.
- **Pedagogy** – Discuss some simple teaching techniques.
- **Management** – Assure mentors that the teachers will handle all discipline. Discuss preventative management techniques such as proximity and having activities well-prepared to avoid student down-time.
- **Brainstorm** – Allow some time during your training to take any ideas or suggestions from your mentors. Allow time for questions and answers.
- **Assigning mentors** – Assigning mentors to the same classroom throughout the year will help build stronger relationships with the students and teachers.
- **E-mail exchange** – Collect everyone’s e-mail addresses for easy communication between mentors and teachers.
- **School tour** – End your training with a school tour. Be sure your mentors know the key locations of your school including the sign-in book (and procedures), restrooms, principal’s office, and classrooms. If possible, include a map in their take-home materials so they can find their teachers’ classrooms once they receive their assignments.

▶ TEACHER TIPS

- The number of volunteer mentors you have will depend upon the format and number of students involved in the program. Although you don’t need volunteer mentors at the classroom level, students find these volunteer mentors to be fun.

Alignment with Standards

The unit included in this *Dining Out!* booklet takes into account all of the process standards outlined in NCTM's *Principles and Standards for School Mathematics* (NCTM, 2000), including communication, connections, problem solving, reasoning and proof, and representation. References to those types of processes should be made throughout the activities. As for the content standards, the primary concentration is on the fraction, decimal, and percent objectives found in the *Number and Operations* standard. The performance objectives for each of these areas include the following:

Instructional programs from pre-kindergarten through grade 12 should enable all students to —

- understand numbers, ways of representing numbers, relationships among numbers, and number systems; understand meanings of operations and how they relate to one another;
- compute fluently and make reasonable estimates.

Grades 3–5

- recognize and generate equivalent forms of commonly used fractions, decimals, and percents;
- develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience;
- select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools.

Grades 6–8

- work flexibly with fractions, decimals, and percents to solve problems;
- develop meaning for percents greater than 100 and less than 1;
- understand the meaning and effects of arithmetic operations with fractions, decimals, and integers;
- select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods;
- develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results.

You will want to check with your own state framework to select performance objectives which are specific to your students.



More Resources from The Actuarial Foundation



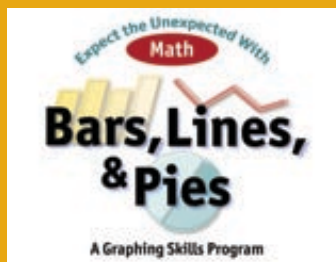
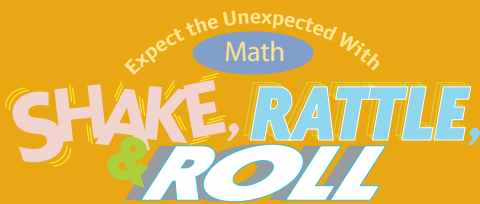
ADVANCING STUDENT ACHIEVEMENT
A program of THE ACTUARIAL FOUNDATION

Advancing Student Achievement Grants

Advancing Student Achievement helps support your efforts in the classroom by integrating hands-on, practical mathematics skills brought to life by practicing professionals into your everyday curriculum.

As part of that program, The Actuarial Foundation offers funding of mentoring programs that involve actuaries in supporting your school's teaching of mathematics.

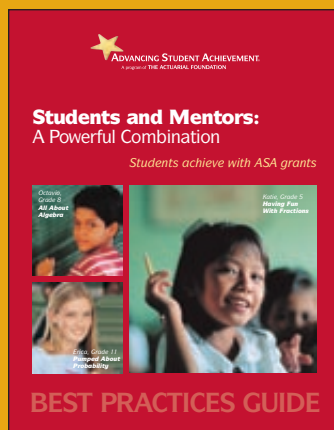
For information on this program and to find out how you can apply for an ASA grant, visit www.actuarialfoundation.org/grant/.



Expect the Unexpected with Math

Shake, Rattle, & Roll and *Bars, Lines, & Pies*, educational programs funded by the Foundation and developed and distributed by Scholastic, the global children's publishing education and media company, are designed to provide teachers and students with math literacy-based materials that meet national standards and are in alignment with core school curriculum. These skill-building programs provide lesson plans, activities and other teaching resources while incorporating and applying actuaries' natural mathematics expertise in real world situations.

To learn more about the program, or to download a copy, visit www.actuarialfoundation.org/grant/index.html.



Best Practices Guide

This guide features a compilation of research on the value of mentoring, combined with 15 case histories of programs funded by the Foundation, each of which includes information on program design and results.

To request a hard copy of the Best Practices Guide, send an e-mail to asa@actfnd.org or to download a copy, visit www.actuarialfoundation.org/grant/bestpractices.html.

