Math Can Take You Places

Lesson Plans

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MATH Can Take You Places

LESSON 1
"Sentence Match"
by Julie Morris

CONCEPT AREA Equivalency

GRADE LEVEL 5

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will be able to match problem situations with equations.

LESSON ACTIVITIES OVERVIEW Students practice creating word problems and matching them with the proper algebraic number sentence.

LEARNING OBJECTIVES Students will be able to:
- Use equivalent equations for problem-solving situations.
- Apply problem-solving skills to real-life situations.

MEDIA COMPONENTS Video: *Math Can Take You Places* #002 "Equivalency"

MATERIALS
- Index cards
- Construction paper
- Pencils
- Markers

PREP FOR TEACHERS ***Note***:
The concept of ***fact families*** will be covered during this lesson. Students may need to review the concept prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

Write some example scenarios to use for demonstration purposes. Also, go through any problem-solving resources (for example, textbooks) to find some story problems to use in the introduction. Emphasize that each word problem can have possibly more than one number sentence that matches.

Additional sample word problems:

1. Sheila has 100 grapes. She wants all 20 students in her class to be able to taste them. How many grapes would students receive if she divided them evenly among her classmates? Answer: 100/20 = C or C * 20 = 100 (C=5)
2. David got a bicycle and $200 in cash for his birthday. He used his money to buy a bicycle helmet for $25, a t-shirt for $17 and two video games for $38 each. How much money does David have left after his shopping?
   Answer: M = 200 - (25 + 17) - (2 * 38) or 200 = M + (25 +17) + (2 * 38) (M = 82)
3. Macy is trying to calculate her math test average. She has made a 91, a 98, an 87 and a 102. What is her math test average? Answer: (91 + 98 + 87 + 102) / 4 = A or (91 + 98 + 87 + 102) = A * 4
4. Kevin is calculating how many seats there are in his school's auditorium. There are 14 seats in each of the 33 rows. How many seats total are in the auditorium? Answer: 14 * 33 = S or S / 33 = 14 or S / 14 = 33

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MATH Can Take You Places

LESSON I
"Sentence Match"
by Julie Morris

INTRODUCTORY ACTIVITY: SETTING THE STAGE

Show students four equations that represent the same quantity. THIS WAY YOU CAN REARRANGE THEM TO SHOW EQUIVALENCE. Examine the equations one at a time and ask the students to develop a scenario that could match the equation. For example, "4 * 9 = N" could match "Four kids have 9 pieces of candy each, so what is the total number of pieces of candy for all four kids?" Discuss using variables to represent the parts of an equation. In earlier grades, students had blanks or boxes in equations instead of unknowns.

Sample equivalent equations:
4 * 9 = N 43 - N =36 N + 24 = 36 72 / 2 = N,
so 4 * 9 =72 / 2 43 - 7 = 12 + 24

All of these equations have numbers or variables that represent 36 on both sides of the equals sign.

LEARNING ACTIVITIES

Have the class work in groups to write problems to go with the four equations mentioned earlier. Keep these on a separate sheet of paper or index card for later use. In the meantime, observe students' work to make sure the equations are correct and appropriate. Have them solve their problems by using a pictorial representation before they write or match the equations. It may be helpful to assign each member of the group a specific task (writer, proofreader or spokesperson). Have students rotate jobs. They may work in pairs.

CULMINATING ACTIVITY

Use the KERA video, *Math Can Take You Places*, #002 "Equivalency" to show types of equations that can be used in calculating elapsed time. **Cue** video to approximately 19:224 when the teacher says, "We'll go around and discuss the number sentences you all got." Press **Play**. **Stop** after the teacher says, "… there are different ways to write this number sentence and still work the problems out." Discuss how the equations in the video compare to the equations we created.

Switch the scenarios and equations with other groups. Have the students match the equations with the scenarios. Monitor for student understanding.

CROSS-CURRICULAR EXTENSIONS

Use historical or scientific scenarios for the story problems.
Use newspaper articles to create current event story problems.

REAL-WORLD CONNECTIONS

Introduce the concept of Roman numerals. Let students create a "Roman Numeral" matching game with index cards. Write the numerals on one card and the equivalent numbers on another. Students can play the matching game individually or in groups.

ASSESSMENT

Use the student-created materials to make a matching game. All the students have a card with a story problem or an equation. The object of the game is to find the cards' matches. You may want to have the students look for their matches in rounds to avoid confusion.

LESSON I
"Sentence Match"
by Julie Morris

STUDENT HANDOUTS None

MATH Can Take You Places

LESSON 2

"Penny"

by Michael Torres

CONCEPT AREA Equivalency

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW In this lesson, students will find the decimal equivalents of fractions of a dollar.

LESSON ACTIVITIES OVERVIEW Students will use 100 pennies to show equivalency between fractions and decimals. Students will start by dividing the 100 pennies first into two equal groups, then into four equal groups, five equal groups and ten equal groups.

LEARNING OBJECTIVES Students will be able to:

- Convert halves, thirds, fourths, fifths, sixths, eighths and tenths to their decimal equivalent.
- Convert halves, thirds, fourths, fifths, sixths, eighths and tenths to their percent equivalent.

MEDIA COMPONENTS Video: *Math Can Take You Places* #002 "Equivalency"

Internet:

Mathcats.com, a Web site run by Wendy A. Petti, has a plethora of ideas for games, crafts, art projects, story problems and much, much more. http://www.mathcats.com

"The World of Math Online" is a Web site which includes a section of games that students will have fun playing. http://www.math.com

MATERIALS Per class:

- Pencil
- Candy bar
- Mechanical pencil
- 12-oz. can of soda

Per group of students:

- Bag of 100 pennies (Have students bring their own or use a substitute material.)
- Circular cut-outs that represent pennies to be divided into thirds, sixths and eighths

PREP FOR TEACHERS **Note:**

The following concepts will be covered during this lesson: **fraction**, **equivalency**, **percent**, **monetary equivalencies and decimals**. Students may need to review the concepts prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

- How you group your students will dictate how many pennies each student is responsible for bringing.
- It is very important that pennies are used at the onset of this activity instead of other monetary equivalencies.
- Fourth-grade teachers may want to show the decimal equivalent for thirds, sixths and eighths as extensions at a later date instead of as part of this activity.
- Make sure to reinforce the fraction equivalencies; i.e, 2/4 is equivalent of 1/2 and so on.

- This can be a good discovery activity if you are patient. Allow the students to flow with the lesson. A few might catch on quickly and want to move on, while others might struggle.
- Make sure that each group actually divides the pennies to reinforce parts of a whole.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

Watch the segment of the *Math Can Take You Places* equivalency video where Mrs. Garcia and her class write the equations for Central and Eastern time zones. Stop after the students on-screen offer the correct solutions to the sample problem. Begin discussing the term, "equivalency," and how it means that what's on the left side of the equals sign is the same as what's on the right side.

1. On a table at the front of the classroom, have four items with their costs indicated as a fraction of a dollar. The pencil should be marked as 1/10 of a dollar. The mechanical pencil should be marked as 1/2 of a dollar. The candy bar should be marked as 3/5 of a dollar. The can of soda should be marked as 3/4 of a dollar.

2. Ask students, "Would you know the cost of these four items if fractions were used instead of the dollar and cents signs that are normally used?

3. Most students will know that the mechanical pencil is worth fifty cents.

LEARNING ACTIVITIES

1. Ask one of the students to explain how (s)he would describe to a younger person that one half of a dollar is the same as fifty cents.

2. Depending on that student's explanation you can solicit another, if needed.

3. You want the student to convey that the denominator of the fraction determines that the 100 pennies would be divided into two equal groups. If a student is unable to clarify this situation, have the students then divide their pennies into two equal groups. How many pennies are in each group? Since the mechanical pencil is worth one out of two groups, then the pencil costs 50 cents.

4. Next, have the students divide the 100 pennies into ten equal groups. How many pennies are in each group? Since the pencil is 1/10 of a dollar, then the pencil costs ten cents, which is one of the ten groups. How many groups of pennies would be needed to make 50 cents? Reinforce that 5/10 is equivalent to 1/2. Ask the students if they can replace ten pennies with another monetary denomination?

5. Now have the students divide the 100 pennies into four equal groups. How many pennies are in each group? How many groups does it take to make 50 cents? Reinforce that 2/4 of a dollar is the same as 1/2 of a dollar. Since the soda's price shows that it is worth three out of the four groups of a dollar, then the soda costs 75 cents. Ask the students if they can replace the 25 pennies with another monetary denomination? They should respond that one could replace the pennies with a quarter.

6. Now say: "Can you now figure out how much the candy bar would cost if it were marked as 3/5 of a dollar?"

7. Have the students write down their steps for how they would go about finding the equivalent amount in pennies of 3/5 of a dollar. ** Give students approximately five minutes to write down this information and then have them exchange with another group.

8. Each group should follow the directions given by the other group. If the directions are not accurate, then have the students discuss how the directions should be changed.

CULMINATING ACTIVITY

Have students create fraction, decimal and percent equivalents. Also have each group write a number sentence describing the costs of the items using variables. For example, since the candy bar is equal to half of a dollar, a sample number sentence could be:
Half of a Dollar = 50 Pennies or 1/2D = 50P"

CROSS-CURRICULAR EXTENSIONS

Music
Ask the music teacher to speak to the class about how musicians use fractions to read music. Let the students work in groups to write their beats using musical time signatures.

REAL-WORLD CONNECTIONS

Discuss and define a "budget" and its uses. Help the students budget the average amount of money they receive each month. Use an Excel spreadsheet to display the data. Brainstorm ways to spend their money more wisely.

ASSESSMENT

Ask the students the following questions, instructing them to write their solutions for later grading:
1. What is 7/10 of a dollar? *($.70*)
2. Is 75 cents equal to 12/16 of a dollar? Explain your answer using words. (*Yes. 12/16 can be reduced to ¾. ¾ of a dollar is $.75*.)
3. Eighty cents is what fraction of a dollar? (*8/10 reduces to 4/5*.)
4. What is 4/4 of a dollar plus 4/5 of a dollar minus 6/8 or a dollar? (*$1.05*)

STUDENT HANDOUTS

None

MATH
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LESSON 3
"Just Cruising"
by Monica Abrams

CONCEPT AREA Equivalency

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW The students will complete activities that will give them experiences in equivalent number sentences.

LESSON ACTIVITIES OVERVIEW Use the data available to complete the task.
Find all the equivalent number sentences, fact families and fractions.

LEARNING OBJECTIVES Students will be able to :
- define equivalency.
- find equivalent number sentences for a given number/problem.

MEDIA COMPONENTS Video: *Math Can Take You Places* #002 "Equivalency"

MATERIALS One-inch graph paper

PREP FOR TEACHERS Cue the video to just past the opening.

Note:
The concept of ***arrays*** will be covered during this lesson. Students may need to review the concept prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE Introduce the *Math Can Take You Places* equivalency video. Ask class to focus on the student problem-solving segments as they watch the video.

LEARNING ACTIVITIES 1. Say: "You just saw how pilots use equivalency in their jobs. Now, we are going to use equivalency to help in a boat rescue. Pretend a luxury liner ran aground on an island. The passengers will need to be taken to the main island by rescue boats. The boats will each transport an equal number of passengers to safety."
2. Introduce the "Mansfield Luxury Liner" worksheet. Explain that in each scenario, all of the passengers must return to the mainland and each boat must have the same number of passengers. Work number one as a class.
3. Students will decide the number of passengers in each boat by division and give the equivalent number sentences, fact family and fraction that goes with each problem.
For example, 432 passengers are on the ship. There are 54 rescue boats to use. How many passengers will travel in each boat?

The fact families are: 54 x 8 = 432, etc.

Equivalent fractions are $\frac{1}{54} = \frac{8}{432}$

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4. Students work in pairs to complete the remainder of "Mansfield Luxury Liner."
5. Provide additional examples and assistance as needed.

CULMINATING ACTIVITY

1. Discuss the solutions from "Mansfield Luxury Liner."

2. Use the solutions students calculated during the rescues to make equivalent arrays on one-inch graph paper.

3. Allow the students to show the different ways of displaying each of their solutions using arrays.

CROSS-CURRICULAR EXTENSIONS

Language Arts/Social Studies: Pretend the shipwrecked passengers decided to stay on the deserted island and start their own town. Discuss and write the laws that will govern the newly created community.

REAL-WORLD CONNECTIONS

After watching the entire *Math Can Take You Places* equivalency video, students can research time zones. Students then share the information with the class, including the name of the time zone where the school is located.

ASSESSMENT

"Mansfield Island"
Students will need the following information to solve the returning to the island scenarios:

- The number of passengers that will be returning to the island.
- The number of boats that will make the return journey.
- The number of passengers that will travel on each boat.

The student will find two of these in each scenario. The student will need to discover the missing information, then complete the calculations to complete the task.

STUDENT HANDOUTS

"Mansfield Luxury Liner"
"Mansfield Island"

MATH Can Take You Places

LESSON 3
"Just Cruising"
by Monica Abrams

Mansfield Luxury Liner

The passengers on the Mansfield Luxury Liner were preparing to have the time of their lives. With no warning, the ship ran aground. What will happen to them? Will there be enough rescue boats to return all the passengers safely to the mainland?

In each scenario, all of the passengers must return to the mainland, and each rescue boat must have the same number of passengers. After completion of the task, record all the equivalent number sentences, fact families and fractions.

1. 432 passengers are on the ship. They have 54 rescue boats to use to return to the mainland. What number will travel in each boat?

2. 12 rescue boats are carrying 17 passengers each. How many passengers are being transferred to the mainland?

3. There are 464 passengers being transferred in 29 boats. How many are in each boat?

4. 38 boats are being used to transfer all the passengers from the ship. There are 23 in each boat. How many passengers were on the ship?

5. There are 1,431 passengers on the ship, and 53 were transferred on each rescue boat. What was the total number of rescue boats used?

Mansfield Luxury Liner
Answer Key

1. 8 passengers in each boat
   432 ÷ 8 = 54
   54 x 8 = 432
   432 ÷ 54 = 8

   $\frac{1}{54} = \frac{8}{432}$
   Boats Passengers

2. 204 passengers transferred to mainland
   12 x 17 = 204
   204 ÷17 = 12
   204 ÷ 12 = 17
   17 X 12 = 204

   $\frac{1}{12} = \frac{17}{204}$

3. 16
   16 X 29 = 464
   464 ÷ 20 = 16
   464 ÷ 16 = 29
   29 X 16 = 464

   $\frac{1}{29} = \frac{17}{464}$

4. 874
   38 X 23 = 814
   874 ÷ 38 = 22
   874 ÷ 22 = 38
   23 X 38 = 874

   $\frac{1}{38} = \frac{23}{879}$

5. 27
   27 X 53 = 1,431
   53 X 27 = 1,431
   1,431 ÷ 53 = 27
   1,431 ÷ 27 = 53

   $\frac{1}{38} = \frac{53}{879}$

Mansfield Island

After returning home, many of the passengers realized they missed the island and decided to return and build a community there. The same boat company was used to return the passengers to the island. The boats will each transport an equal number of passengers on their return voyage. To solve each scenario, you must have the following information:
1. The number of passengers returning to the island.
2. The number of boats that will make the return trip.
3. The number of passengers that will travel in each boat.

You will find these in each scenario. Record your information by writing a sentence for each fact. You will need to discover the missing information, write a sentence for that information and calculate the data to complete the task. You will then write all the equivalent number sentences, fact families and fractions that go with each problem.

1. Eight boats are carrying 12 passengers each to the island. All together, what is the total number of passengers returning to the island?

We know that:
A.
B.

We discovered that:
C.

Equivalent number sentences:

2. Fourteen passengers are in each boat, and the total number of passengers is 126. What is the number of boats making the journey?

We know that:
A.
B.

We discovered that:
C.

Equivalent number sentences:

3. 288 passengers are making the return trip to the island in 12 boats. What is the total number of passengers in each boat?

We know that:
A.
B.

We discovered that:
C.

Equivalent number sentences:

4. Seventeen boats are carrying 221 passengers to the island. Can you find the number of passengers in each boat?

We know that:
A.
B.

We discovered that:
C.

Equivalent number sentences:

5. 252 passengers are returning to the island. In each boat, there are 14 passengers. How many boats are returning?

We know that:
A.
B.

We discovered that:
C.

Equivalent number sentences:

Mansfield Island
Answer Key

1. A. Twelve passengers in each boat will be returning to the island.
   B. Eight boats will make the trip.
   C. Ninety-six people will be returning to the island.
   Equivalent number sentences:
   8 x 12 = 96 12 x 8 = 96 96 ÷ 12 = 8 96 ÷ 8 = 12 $\frac{1}{8} = \frac{12}{96}$

2. A. Fourteen passengers are in each boat.
   B. The total number of passengers is 126.
   C. Nine boats will be making the journey.
   Equivalent number sentences:
   9 x 14 = 126 14 x 9 = 126 126 ÷ 9 = 14 126 ÷ 14 = 9 $\frac{1}{12} = \frac{19}{126}$

3. A. Two hundred eighty-eight passengers are making the return trip to the island.
   B. Twelve boats will make the trip.
   C. Twenty-four passengers will be in each boat.
   Equivalent number sentences:
   12 x 24 = 288 24 x 12 = 288 288 ÷ 12 = 24 288 ÷ 24 = 12 $\frac{1}{12} = \frac{24}{288}$

4. A.Seventeen boats will make the trip back to the island.
   B. Two hundred twenty-one passengers will be returning to the island.
   C. Thirteen passengers will be in each boat.
   Equivalent number sentences:
   13 x 17 = 221 17 x 13 = 221 221 ÷ 17 = 13 221 ÷ 13 = 17 $\frac{1}{17} = \frac{13}{221}$

5. A. Two hundred fifty-two passengers will be returning to the island.
   B. Fourteen boats will carry the passengers.
   C. Eighteen passengers will be in each boat.
   Equivalent number sentences:
   18 x 14 = 252 14 x 18 = 252 252 ÷ 18 = 14 252 ÷ 14 = 18 $\frac{1}{18} = \frac{14}{252}$

MATH Can Take You Places
Te Lleva a Muchos Lugares

LECCIÓN 3
"Just Cruising"
Monica Abram

Nombre_____ Fecha_____

Mansfield Luxury Liner

Los pasajeros en el Mansfield Luxury Liner se estaban preparando para tener el día más feliz de sus vidas. Sin ningún aviso, el barco quedó varado. ¿Que les va a pasar a los pasajeros? ¿Habrá suficientes botes de rescate para llevarlos a tierra firme con seguridad?

En cada escenario, todos los pasajeros deben volver a tierra firme, y cada bote de rescate debe tener el mismo número de pasajeros. Después de completar la tarea, escribe todas las oraciones numéricas equivalentes, familias de factores y fracciones.

1. En el barco hay 432 pasajeros. Tienen 54 botes de rescate para volver a tierra firme. ¿Cuántos pasajeros viajarán en cada bote?

2. 12 botes de rescate llevan 17 pasajeros. ¿Cuántos pasajeros están siendo transportados a tierra firme?

3. Hay 456 pasajeros que están siendo transportados en 29 botes. ¿Cuántos hay en cada bote?

4. 38 botes están siendo usados para transportar todos los pasajeros del barco. Hay 23 en cada bote. ¿Cuántos pasajeros había en el barco?

5. Hay 1,431 pasajeros en el barco y 53 pasajeros fueron transportados en cada bote de rescate. ¿Cuál es el número total de botes de rescate?

Isla Mansfield

Después de llegar a casa, muchos de los pasajeros se dieron cuenta que extrañaban la isla y decidieron regresar y empezar una comunidad allí. La misma compañía de botes fue usada para regresar los pasajeros a la isla. Cada bote transportará el mismo número de pasajeros en su viaje de regreso. Para resolver cada escenario, debes tener la siguiente información:
1. El número de pasajeros que regresaron a casa.
2. El número de botes que harán el viaje de regreso.
3. El número de pasajeros que viajarán en cada bote.

Encontrarás esto en cada escenario. Registra tu información escribiendo una oración para cada hecho. Tendrás que descubrir la información que falta, escribir una oración para esa información y calcular los datos para completar la tarea. Entonces escribirás todas las oraciones numéricas equivalentes, familias de factores y fracciones que van con cada problema.

1. Cada uno de los ocho botes están llevando 12 pasajeros a la isla. En total, ¿cuál es el número total de pasajeros que regresan a la isla?

Sabemos que:
A.
B.

Descubrimos que:
C.

Oraciones numéricas equivalentes:

2. En cada bote hay catorce pasajeros, y el número total de pasajeros es 126. ¿Cuál es el número de botes que están haciendo el viaje?

Sabemos que:
A.
B.

Descubrimos que:
C.

Oraciones numéricas equivalentes:

3. 288 pasajeros están regresando a la isla en 12 botes. ¿Cuál es el número total de pasajeros en cada bote?

Sabemos que:
A.
B.

Descubrimos que:
C.

Oraciones numéricas equivalentes:

4. Diecisiete botes están llevando 221 pasajeros a la isla. ¿Puedes encontrar el número de pasajeros para cada bote?

Sabemos que:
A.
B.

Descubrimos que:
C.

Oraciones numéricas equivalentes:

5. 252 pasajeros están regresando a la isla. Hay 14 pasajeros en cada bote. ¿Cuántos botes están regresando?

Sabemos que:
A.
B.

Descubrimos que:
C.

Oraciones numéricas equivalentes:

MATH Can Take You Places

LESSON 4
"Identical Twins"
by Nancy Lachowicz

CONCEPT AREA Equivalency

GRADE LEVEL 6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will gain an understanding of equivalency by engaging in different activities. They will understand that the quantity or expression on the left side of the equal sign must equal or represent the same quantity that is on the right. Students will be introduced to variables, which represent an unknown quantity in an equation. They will also learn how to solve an equation for the value of the variable.

LESSON ACTIVITIES OVERVIEW Students will brainstorm different forms of equivalency, make a human equivalent problem, work in groups, play the game, "Identical Twins," create word problems to go with equation and do assessment and extension activities.

LEARNING OBJECTIVES Students will be able to:
- Formulate an equation from a problem situation.
- Use letters (variables) to represent an unknown in an equation.
- Generate equivalent forms of fractions, percents and decimals.
- Understand that equivalency is everywhere in "real-world" situations.

MEDIA COMPONENTS Video: *Math Can Take You Places* #002 "Equivalency"

MATERIALS Per Class:
- Twenty four 5" x 8" index cards
- Large "Equal" sign
- "Identical Twins" laminated cards

Per Pair:
- 2 dice or number cubes
- 2 different colored pencils or pens
- "Percent Tic-Tac-Toe" handout

PREP FOR TEACHERS
- Prepare classroom materials, including index cards.
- Cue video as needed for discussion.

Note:
The concept of ***fact families*** will be covered during this lesson. Students may need to review the concept prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE
1. Generate discussion by taking responses from students regarding the "equal sign" displayed on the front board. Call on three student volunteers to come to the front of the room. Place two students on the left of the equal sign and one on the right.

2. Ask the following guided questions:
   a. What have we created?

b. Is it balanced? Why or why not?
c. What needs to be done to demonstrate balance or equivalency? (*Take one student away on the left.*)
d. How could we write this as an equivalent expression? (2 - 1 = 1)
e. Explain that rational numbers come in all different forms. You can express them as fractions, decimals and percents.

Ex: $\frac{50}{100}$ = 0.50 or 50%

f. Think of everyday experiences where you have encountered fractions, decimals and/or percents (for example: in sports, newspapers, weather reports, etc.).

3. Explain that an integer is any whole number, its opposite and zero. Say that all integers are rational numbers. Rational comes from the term "ratio." A rational number can be written as the ratio $\frac{a}{b}$ where both *a* and *b* are integers and *b* 0.

The following numbers are all rational numbers as they can be expressed as a ratio in $\frac{a}{b}$ form:

5 and –21

5 = $\frac{5}{1}$ and -21 = $\frac{-21}{1}$

4. Explain the importance of comparing rational numbers using the following discussion threads:
a. Checking ratings, etc.
b. Comparing cost
c. Organizing information
d. Collecting and displaying data

5. "When we compare rational numbers, it is easier to compare them if they have something in common; i.e., a common denominator, decimal form, percent form, etc."

Examples would include .075 and $\frac{7}{10}$. We would change 0.75 to $\frac{75}{100}$ and change $\frac{7}{10}$ to its equivalency $\frac{70}{100}$. We could conclude that 0.75 is the greater of the two fractions because when the denominators are the same, we can easily compare the two numerators and see that 70 is more than 7.

6. We also know that 1 = 100%; therefore, 2 = 200%. To convert a rational number to a percent, multiply the number by 100.

To write the equivalent form of 4.3 as a percent, multiply by 100:
4.3 · 100 = 430 %

To write the equivalent form of a percent as a rational number, divide the percent by 100:
875% ÷ 100 = 8.75

LESSON 4
"Identical Twins"
by Nancy Lachowicz

LEARNING ACTIVITIES

1. Have students create a word problem that uses these two rational numbers and compares with the inequality sign to show which is larger or smaller.

Examples: Order 5 ¾, 5.8, and 550% from greatest to least:

Hint: Write each rational number in decimal form. Add zeros, so that all have the same number of decimal places. Compare by looking at place value. Order:

5 ¾ = 5.75
5.8 = 5.80
550% = 5.50

Answer: *5.8* > 5 ¾ > *550%*

2. Have students create real-life situations to compare their own rational numbers.

3. "Percent Tic-Tac-Toe" is the final activity, or it can be played on a separate day as a review.

CULMINATING ACTIVITY

Say: "We are going to play 'Identical Twins'." After I shuffle the cards, you will each receive a laminated card. When I say 'go' you will look at your card and try to find your identical twin. Every player who finds his/her other twin is a winner."

CROSS-CURRICULAR EXTENSIONS

Math

When all matches are found, have each pair of students create a word problem using their sentence card and giving the answer. Divide the class into two groups and have a contest to see which team can solve the word problems correctly. Play "Percent Tic-Tac-Toe" game using dice or number cubes.

Language Arts

- Read *Shoeless Joe & Black Betsy*, by Phil Bildner, illustrated by D. F. Payne.
- Have students research former Olympic athletes and record their statistics using fractions, decimals and percents. Then, have students present their findings in an oral presentation.

REAL-WORLD CONNECTIONS

Use a newspaper to locate different forms of numbers that represent equivalency; for example: decimals, percents and fractions.

ASSESSMENT

Students will complete the Equivalency Assessment worksheet that is posted in the handouts.

STUDENT HANDOUTS

"Identical Twins" Playing Cards
Equivalency Assessment
"Percent Tic-Tac-Toe"

Identical Twins
Playing Cards
p.1

One number is six times another	x = 6y	The sum of three consecutive whole numbers is 15	x + (x+1) + (x + 2) = 15
One number is three less than another number	x = y - 3	One number is five more than another number	x = y + 5
Seven more than twice a number is 15	2x + 7 = 15	Double a number increased by 8 is 24	2x + 8 = 24
Triple a number decreased by 8 is 19	3x - 8 = 19	Forty increased by a number is four times the number	40 + x = 4x
Double a number increased by 4 is 20	2x + 4 = 20		

Identical Twins
Playing Cards
p.2

Seventeen is four more than x	17 = x + 4	Thirty-six is half of x.	x / 2 = 36
x decreased by seven is 23	X – 7 = 23	Two more than twice x is 18	2x + 2 = 18
Eighty-three is 12 less than x	83 = x – 12	The quotient of x divided by three is seven	$\frac{x}{3} = 7$
The product of seven and x is 42	7x = 42	The sum of x and 35 is 85	X + 35 = 83
The difference of x and 17 is 37	x – 17 = 37		

Name_____

Equivalency Assessment

1. Recently, a local newspaper reported that 5 out of 20 people watch television less than 2 hours a day. The rest of the people surveyed said they watch television between 2 and 5 hours per day. Which decimal represents the number of people who watch between 2 and 5 hours of television a day?

   A. 0.75
   B. 0.2
   C. 0.25
   D. 0.6

2. Mr. Jones distributed 64 sheets of graph paper to his geometry class. Each student received 2 sheets of graph paper. Which equation can be used to find s: the number of students in the class?

   A. s = 64 x 2
   B. s = 64 - 2
   C. s = 64 + 2
   D. s = 64 / 2

3. Order the following from least to greatest:
   1/2 0.25 3/5 75/100
   _____

4. On Friday, Lake Rock Middle School reported 25% of their student body absent. What fractional part of the student body was not absent?

   A. 1/4
   B. 2/5
   C. 1/5
   D. 3/4

5. One of the top professional basketball players scored the following points in the last five games: 36, 21, 18, 25, 30. Which equation could be used to determine the player's average?

   A. a = (36 + 21 + 18 + 25 + 30) / 5
   B. a = (36 + 21 + 18 + 25 + 30) x 5
   C. a = 2 (36 + 21 + 18 + 25 + 30)
   D. not here

Equivalency Assessment
Answer Key

1. A
2. D
3. 0.25, 1/2, 3/5, 75/100
4. D
5. A

PERCENT TIC-TAC-TOE

16%	100%	40%
50%	20%	25%
33%	75%	60%

80%	50%	25%
66%	83%	40%
33%	75%	20%

16%	25%	20%
40%	100%	75%
66%	50%	60%

16%	100%	40%
50%	20%	25%
33%	75%	60%

Materials: Two 1-6 number cubes (or dice), two different colored pens, calculator (optional)

Objective: Recognize equivalent fractions and percents

Directions: This game is played like Tic Tac Toe. Players take turns tossing the number cubes and arranging the numbers into a fraction. Each player determines the equivalent percent and circles it on the Tic Tac Toe grid. If the equivalent percent cannot be found, the player must pass. Players must calculate the equivalent percent and prove their reasoning. (They may use a calculator if the teacher chooses.) Play continues until someone gets 3 in a row, column or diagonal. If neither player gets a Tic Tac Toe, each equivalent percent matched is worth 5 points. Players add up their points to determine the winner of the game.

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 4

"Gemelos Idénticos"

by Nancy Lachowicz

Nombre_____ Fecha_____

Jugando a las Cartas

Un número es seis veces más que otro	$x = 6y$	La suma de tres números enteros consecutivos es 15	$x + (x+1) + (x + 2) = 15$
Un número es menos tres que otro número	$x = y - 3$	Un número es cinco más que otro número	$x = y + 5$
Siete más un número duplicado es 15	$2x + 7 = 15$	El doble de un número más 8 es 24	$2x + 8 = 24$
El triple de un número menos 8 es 19	$3x - 8 = 19$	Cuarenta más otro número es cuatro veces ese número	$40 + x = 4x$
El doble de un número más 4 es 20	$2x + 4 = 20$		

LECCIÓN 4
"Gemelos Idénticos"
by Nancy Lachowicz

Diecisiete es cuatro más que x	17 = x + 4	Treinta y seis es la mitad de x.	¿ Esto no debería ser x / 2 = 36?
x disminuído siete es23	X – 7 = 23	El doble de x más dos es 18	2x + 2 = 18
Ochenta y tres es x menos 12	83 = x – 12	El cociente de x dividido entre tres es siete	X ------- = 7 3
El producto de siete y x es 42	7x = 42	La suma de x y 35 es 85	X + 35 = 85
La diferencia de x y 17 es 37	x – 17 = 37		

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 4

"Gemelos Idénticos"

by Nancy Lachowicz

Nombre_____

Evaluación de la Equivalencia

1. Recientemente, un periódico local informó que 5 personas de cada 20 miran televisión menos de 2 horas por día. El resto de la gente en la encuesta dice que mira televisión entre 2 y 5 horas por día. ¿Cuál decimal representa el número de personas que miran televisión entre 2 y 5 horas por día?

   A. 0.75
   B. 0.2
   C. 0.25
   D. 0.6

2. El Sr. Jones distribuyó 64 hojas de papel para gráficos en su clase de geometría. Cada estudiante recibió 2 hojas para gráficos. ¿Cuál ecuación debe ser usada para encontrar el valor de s: el número de estudiantes en la clase?

   A. s = 64 x 2
   B. s = 64 - 2
   C. s = 64 + 2
   D. s = 64 / 2

3. Ordene lo siguiente de menos a mayor:
   1/2 0.25 3/5 75/100

_____

4. El viernes, la escuela intermedia Lake Rock informó que el 25% de sus estudiantes estuvo ausente. ¿Cuál es la parte fraccional del cuerpo estudiantil que no estuvo ausente?

   A. 1/4
   B. 2/5
   C. 1/5
   D. 3/4

5. Uno de los mejores jugadores de baloncesto profesional marcó los siguientes puntos en los últimos cinco juegos: 36, 21, 18, 25, 30. ¿Cuál ecuación puede ser usada para determinar el promedio del jugador?

   A. a = (36 + 21 + 18 + 25 + 30) / 5
   B. a = (36 + 21 + 18 + 25 + 30) x 5
   C. a = 2 (36 + 21 + 18 + 25 + 30)
   D. no está aquí

Evaluación de la Equivalencia
Clave de las Respuestas

1) A

2) D

3) 0.25, 1/2, 3/5, 75/100

4) D

5) A

MATH Can Take You Places

LESSON 5
"Right on Time"
by Rhonda Bailey

CONCEPT AREA Equivalency

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will use the differences between time zones to practice equivalency concepts.

LESSON ACTIVITIES OVERVIEW In this lesson, students solve equivalency problems related to time conversions for different areas.

LEARNING OBJECTIVES Students will be able to:
- Write equations to describe elapsed time.
- Apply problem-solving strategies, understand the problem, write a plan, solve the problem and check the solution for reasonableness.

MEDIA COMPONENTS Video: *Math Can Take You Places* #002 "Equivalency"
Internet:
Official U.S. Time Web site: http://www.time.gov/index.html
World Time Zone Web site: www.worldtimezone.com

MATERIALS
- World maps that shows time zones (see the Official U.S. Time Web site)
- Large clocks showing military time and/or World Time Zone Web site
- Student activity sheets
- Airplane stickers for the back of the clocks (optional)

PREP FOR TEACHERS
- Bookmark the Web sites.
- Cue video.
- Focus viewing.
- Gather the clocks.

Note:
The concepts of ***equivalency*** and ***fact families*** will be covered during this lesson. Students may need to review the concepts prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE 1. Introduce the lesson by having the students view the *Math Can Take You Places* video #002 "Equivalency." Follow with a discussion of the material presented in the video. Have the students think about New Year's Eve. Possibly have the class countdown from 5 and say "Happy New Year!"

2. **Pause** the video after Ms. Garcia asks, "Do you think everyone in the world will be counting down to midnight at the exact same time as we are?" Ask students to discuss the question. **Resume** the video for responses from the video class. **Stop** when Ms. Garcia says, "When it is 12:00 a.m. New Year's Day in Oklahoma City, what time will it be in Philadelphia, Pennsylvania? How do you know?" *Students should describe in their explanation that Oklahoma City (Central Time) and Philadelphia (Eastern Time) are in different time zones.*

3. Refer the students to the map with the time zones and discuss with them that Universal Time is based on the time at Greenwich, England. There are 24 time zones around the world and of those 24, seven time zones include the United States and the territories of Puerto Rico and American Samoa. Starting with the most eastern time zone, they are as follows:

Atlantic Time: Puerto Rico; Bermuda; Greenland; U. S. Virgin Islands; Nova Scotia, Canada; and Caracas, Venezuela
Eastern Time: New York City; Washington D.C.; Philadelphia, Pennsylvania; Hartford, Connecticut; Boston, Massachusetts; Indianapolis, Indiana; Chicago, Illinois; Atlanta, Georgia; and Miami, Florida
Central Time: New Orleans, Louisiana; St. Louis, Missouri; Omaha, Nebraska; Minneapolis, Minnesota; Green Bay, Wisconsin; Houston, San Antonio, Dallas, Fort Worth and Austin, Texas; and Mexico City, Mexico
Mountain Time: El Paso, Texas; Phoenix, Arizona; the Grand Canyon; Salt Lake City, Utah; Yellowstone National Park in Wyoming; and Alberta, Canada
Pacific Time: Hoover Dam in Nevada; Los Angeles, Hollywood and San Francisco, California; Portland, Oregon and Seattle, Washington
Alaska Time: Juno, Anchorage and Fairbanks, Alaska
Hawaii-Aleutian Time: Honolulu, Hawaii; the Aleutian Islands of Alaska; and New Zealand
Samoa Time: American Samoa, Midway Islands, and Samoa

4. Have students write equations to describe other time zones in terms of the Central Time Zone. Give this one example:

Central Time = Eastern Time – 1 hour, or Central Time + 1 hour = Eastern Time
Central Time = Samoa Time + 5 hours, or Central Time – 5 hours = Samoa Time

If we use the numbers in the time from the original problem, that means:
12:00 a.m. (Central Time) + 1 hour = 1:00 a.m. (Eastern Time).
5. Discuss why pilots use military time, which is based on a 24-hour clock. Share with students the military time conversion chart.

LEARNING ACTIVITIES

Cue the video to after the pilot says, "… make it feel in the cockpit like it does in the airplane." **Play** the video until Ms. Garcia says, "… begin working in your group to figure out the problem. **Stop** the video. Say: "Now, pretend you are the pilot flying a 777 airplane from Dallas, Texas to Los Angeles, California. One of your responsibilities is to use time zones to calculate the length of flights using time so you can let your passengers know what time they are landing."

*Problem: You are the captain flying a 777 airplane from Dallas to Los Angeles. If your flight is scheduled to leave DFW Airport at 5:53 p.m. (Central Time) and arrive at LAX Airport at 7:05 p.m. (Pacific Time), what was the actual length of your flight in hours and minutes? Be sure to write a number sentence to show how you got your solution.

Possible Solution: Change 5:53 p.m. (Central Time) to (Pacific Time):
Central Time – 2 hours = Pacific Time or Pacific Time + 2 hours = Central Time

5:53 p.m. (Central Time) – 2 hours = 3:53 p.m. (Pacific Time) for the time of departure

Time of Arrival – Time of Departure= Length of Flight
7:05 p.m. (Pacific Time) – 3:53 p.m. (Pacific Time)= 3 hrs 12 minutes
(* This problem is also number one on the "Follow Up Questions" handout.)
Ask students to explain how they arrived at their solution.

CULMINATING ACTIVITY

Allow students to complete the "Follow Up Questions" handout in groups of 3-4 students. Come back together as a class to discuss their solutions and any questions they may have.

"Follow Up Questions" handout key:

1. *See above; explanations may vary.*
2. *The Atlantic Time Zone is 6 hours ahead of the Hawaii-Aleutian Time Zone, so the time on the watch would be turned back 6 hours.*

The number 16:45 (military time) – 6 hours = 10:45 a.m.
10:45 a.m. + 6 hours = 4:45 p.m.

a. 2 hours and 21 minutes, traveling from the Mountain Time Zone to the Central Time Zone, you gain one hour.

b. 2 hours and 6 minutes, traveling from the Central Time Zone into the Eastern Time Zone, you gain another hour.

c. Answers will vary: 9:03 a.m. in Phoenix is 11:03 a.m. in Atlanta.
4:17 p.m. (16:17 military time) – 11:03 a.m. = 5 hours and 14 minutes

CROSS-CURRICULAR EXTENSIONS

Science

It is important that pilots understand weather conditions, so that they have safe flights. Research the different meteorological signs they see on the weather reports, and what the signs mean.

REAL-WORLD CONNECTIONS

Invite a local meteorologist to speak to the class.

ASSESSMENT

Show the students the video, *Math Can Take You Places* #002 "Equivalency". Pause the episode after the teacher gives the students in the classroom the time zone problem for the pilot. Allow students time to work the problem individually. Collect their written answers. Resume the tape, so that the students can see how the students in the video worked through the problem.

STUDENT HANDOUTS

"Follow Up Questions" worksheet
"Military Time" conversion chart

Name_____ **Date** _____

"Right On Time"
Follow Up Questions

1. You are the captain flying a 777 airplane from Dallas to Los Angeles. If your flight is scheduled to leave DFW Airport at 5:53 p.m. (Central Time) and arrive at LAX Airport at 7:05 p.m. (Pacific Time), what was the actual length of your flight in hours and minutes? Be sure to write a number sentence to show how you got your solution.

   Explain the process you used to solve this problem.

2. If you are flying from a location in the Atlantic Time Zone to a location in the Hawaii-Aleutian Time Zone, describe how you would change the time on your watch, so that it will reflect the right time when you arrive. Write a number sentence showing this change if it is 4:45 p.m. in the Atlantic Time Zone.

3. Suppose you board a plane in Phoenix, Arizona at 9:03 a.m. headed to Atlanta, Georgia. The flight is scheduled to arrive in Atlanta, Georgia at 4:17 p.m.

   a. First you must fly from Phoenix, Arizona to the Dallas/Ft. Worth or DFW Airport. Your departure time from Phoenix is 9:03 a.m. and your arrival time at DFW is 12:24 p.m. How long was your flight from Phoenix to DFW?

   b. Next, you will leave DFW to fly to Atlanta, Georgia. You depart from DFW at 1:11 p.m. and arrive in Atlanta at 4:17 p.m. What was your flight time?

   c. Write number sentences that describe the total flight time from Phoenix to Atlanta.

Military Time

This page is part of The Marine Corps Wives Website

Civilian Time	Marine Time
12:00 am	0000
1:00 am	0100
2:00 am	0200
3:00 am	0300
4:00 am	0400
5:00 am	0500
6:00 am	0600
7:00 am	0700
8:00 am	0800
9:00 am	0900
10:00 am	1000
11:00 am	1100
12:00 pm	1200
1:00 pm	1300
2:00 pm	1400
3:00 pm	1500
4:00 pm	1600
5:00 pm	1700
6:00 pm	1800
7:00 pm	1900
8:00 pm	2000
9:00 pm	2100
10:00 pm	2200
11:00 pm	2300

MATH Can Take You Places

Te Lleva a Muchos Lugares

LESSON 5

"Justo a Tiempo"

by Rhonda Bailey

Nombre_____ Fecha_____

Preguntas Para Reforzar

1. Eres el capitán de un vuelo en un avión 777 que va de Dallas a Los Angeles. Si el horario del vuelo para salir del aeropuerto DFW es a las 5:53 p.m. (Hora del Centro) y llegar al aeropuerto LAX a las 7:05 p.m. (Hora del Pacífico), ¿cuál fue la duración actual de tu vuelo en horas y minutos? No te olvides de escribir una oración numérica para demostrar cómo lograste tu solución.

   Explica el proceso que usaste para resolver el problema.

2. Si estás volando de una localidad en la zona con hora del Atlántico a una localidad en la zona con hora de Hawaii-Aleutian, explica cómo cambiarías la hora en tu reloj, para que pueda reflejar la hora correcta cuando llegas. Escribe una oración numérica para mostrar este cambio si son las 4:45 p.m. en la zona con Hora del Atlántico.

3. Vamos a suponer que subes a un avión en Fénix, Arizona a las 9:03 a.m. camino a Atlanta, Georgia. El horario de llegada a Atlanta, Georgia es 4:17 p.m.

   a. Primero tienes que volar de Fénix, Arizona al aeropuerto de Dallas/Fort Worth o Aeropuerto DFW. Tu hora de salida en Fénix es a las 9:03 a.m. y tu hora de llegada a DFW es 12:24 p.m. ¿Cuánto tiempo duró tu vuelo desde Fénix a DFW?

   b. Después, saldrás de DFW para volar a Atlanta, Georgia. Sales del DFW a la 1:11 p.m. y llegas a Atlanta a las 4:17 p.m. ¿Cuánto tiempo duró tu vuelo?

   c. Escribe oraciones numéricas que explican el total de horas de vuelo desde Fénix a Atlanta.

Hora Militar

Esta página es parte de The Marine Corps Wives Website

Hora civil	Hora Marina
12:00 am	0000
1:00 am	0100
2:00 am	0200
3:00 am	0300
4:00 am	0400
5:00 am	0500
6:00 am	0600
7:00 am	0700
8:00 am	0800
9:00 am	0900
10:00 am	1000
11:00 am	1100
12:00 pm	1200
1:00 pm	1300
2:00 pm	1400
3:00 pm	1500
4:00 pm	1600
5:00 pm	1700
6:00 pm	1800
7:00 pm	1900
8:00 pm	2000
9:00 pm	2100
10:00 pm	2200
11:00 pm	2300

Página elaborada por
hadduck Enterprises

MATH Can Take You Places

LESSON 6
"Figure This Out"
by Betty Lewis

CONCEPT AREA Measurement

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW The investigations will give the students an opportunity to apply and expand their measurement skills by taking their own measurements, as well as measuring items in the classroom. They will compare their measurements to the models presented in the classroom.

LESSON ACTIVITIES OVERVIEW The students will estimate to determine reasonable results, use logical reasoning to make sense of their world and solve problems involving proportional relationships.

LEARNING OBJECTIVES Students will be able to:

- Estimate and measure to solve problems involving length and width.
- Apply measurement concepts.
- Define measurement and investigate measurement.
- Estimate and compare the results of the measurements to the model measurements of several basketball players.

MEDIA COMPONENTS Video: *Math Can Take You Places* #001 "Measurement." Focus student viewing on the size of the players and what accommodations the trainer mentions the players may need because of their height.

Internet: www.nba.com for player statistics and information

MATERIALS Per group of students:

- Ruler
- Bathroom scale
- Measuring tape
- Yarn
- Pencils
- Notebook paper
- Desk, window sill, width of classroom door, length and width of textbook
- Silhouette of a basketball player (or, the teacher can make a 7-foot
- mark near the classroom doorway for student reference.)
- Construction paper
- Markers
- Scissors
- Handouts

PREP FOR TEACHERS

- Cue the videos
- Reference: Realistically, a 7-foot tall player would have a wingspan of around 7 ft., 6 inches and weigh between 200-230 pounds.
- If students are self-conscious about their weight, ask the nurse for an average weight for students in your classroom. Use that number instead of actually weighing the students.

- The teacher will inquire about measurement and about students' prior knowledge regarding their experience using measurement.

Note:
The following concepts will be covered during this lesson: **customary system of measurement**, **length**, **foot**, **inch and yard**. Students may need to review the concepts prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Say: "Pretend I have forgotten how to measure the length of an item. Can you give me step-by-step instructions for how to measure the length of this table?"

2. Allow students to walk aloud through the steps of how to properly measure.

3. Show the *Math Can Take You Places* #001 "Measurement" video. Ask students to listen closely and be able to list some of the things that tall basketball players may have to adjust in order to live comfortably.

4. Refer them to the basketball silhouette (or measured mark) near the doorway. Tell them that you will be using him as a reference during today's lesson. Do not tell them how tall the cutout actually is.

LEARNING ACTIVITIES

1. Divide students into pairs to complete the activity. (Teacher hint: To avoid confusion, you may want to group them in same-sex pairings.)

2. Refer the students to the "Measuring Station" handout. Before giving students permission to begin measuring, let them fill out the "estimate" column on the worksheet. Let them have contact with the objects if needed.

3. After the students have filled in their estimates, allow them to choose the measurement tool they think they would need to take the actual measurement of the items.

4. Allow students to work in pairs to complete the "Measuring Station" handout.

5. Monitor to ensure that the students are measuring correctly.

CULMINATING ACTIVITY

1. Bring the students back together and ask: "What strategy did you use to determine the measurement?" Say: "Now that we have our charts filled in, would anyone like to share their results?"

2. Ask students questions similar to the following: "Which estimate was the most accurate or the closest to the actual measurement? Which was the least accurate? How could we have made our estimates more accurate?"

3. Say: "Pretend this 7-foot-tall basketball player came to be a substitute teacher in your math class for a week. What items in the classroom would we need to change to accommodate him?"

LESSON 6
"Figure This Out"
by Betty Lewis

CROSS-CURRICULAR EXTENSIONS

Social Studies:
Encourage the students to research the origins of the game of basketball. Let them share the most interesting facts in a class presentation.

REAL-WORLD CONNECTIONS

The world is full of differently-shaped and differently-abled people. Have the students imagine if they were in a wheelchair. Ask them to write about what things would need to be changed for them to move around easily during a normal school day. Invite a person in a wheelchair to speak to the students about the special accommodations s/he uses throughout the day.

ASSESSMENT

Give each student a set of small classroom items (for example, markers, scissors, glue bottles, glue sticks, paperclips, etc.). Be sure to measure them beforehand. Have students measure their lengths. Check their work for accuracy.

STUDENT HANDOUTS

"Measuring Station" worksheet

Measuring Station

Object	Estimate measurements	Actual measurement	Difference in measurement	Estimate measurement basketball players	Actual measurement	Difference in measurement
Hand (wrist to longest finger)						
Arm span						
Height						
Foot length						
Door height						
Window sill length						
Textbook length and width						
Chalkboard length and width						
Desk top Length and width						

MATH Can Take You Places

Te Lleva a Muchos Lugares

LESSON 6

"Resuelve Esto"

by Betty Lewis

Estación de Medidas

Objeto	Medidas Calculadas	Medidas Reales	Diferencia en la medida	Medida calculada de los jugadores de baloncesto	Medida Real	Diferencia en la medida
Mano (de la muñeca al dedo más largo)						
Alcance del brazo						
Altura						
Largo del pié						
Altura de la puerta						
Umbral de ventana						
Largo y ancho del libro						
Largo y ancho de la pizarra						
Largo y ancho del escritorio						

MATH Can Take You Places

LESSON 7
"Don't Be A Square"
by Michael Torres

CONCEPT AREA Measurement

GRADE LEVEL 4-6

TIME ALLOTMENT Two 60-minute sessions

LESSON OVERVIEW Students will learn the relationship between the radius and diameter of a circle and the relationship of the diameter and the circumference of a circle. Students will also find the approximate circumference of a circle, given either the diameter or radius.

LESSON ACTIVITIES OVERVIEW After having the teacher read *Sir Cumference and the First Round Table* to the class, the students will measure the diameter of five different circular objects.

LEARNING OBJECTIVES Students will be able to:

- Identify the radius, diameter and circumference of a circle.
- Be able to obtain the diameter, given the radius, and vice versa.
- Find the approximate circumference of a circle, given either the radius or the diameter.
- Find the approximate diameter of a circle, given the radius.
- Measure the diameter and circumference of circular objects.
- Solve a problem situation using prior knowledge.
- Use a chart to organize data.

MEDIA COMPONENTS Drexel University runs this Web site. It contains various links to an array of subjects that encompass math. http://www.mathforum.org/teacher/

This is the Web site for Ivars Peterson, who has written two books, *Math Trek* and *Math Trek 2*. It also contains many other links, including MatheMUSEments, which contains links to articles written by Ivars Peterson for *Muse* magazine.
http://home.att.net/~mathtrek/

"The World of Math Online." This Web site includes a section with games that students will have fun playing. http://www.math.com/

MATERIALS

- *Sir Cumference and the First Round Table*
- *Sir Cumference and the Dragon of Pi*
- Diagram of Circle (in Student Handouts)

Per group of students:

- Two circular plastic lids (different sizes)
- One circular item (e.g., trash can)
- Ruler with metric units
- Two different colors of string
- One calculator
- Circles (one for each group) cut out of construction paper about eight inches in diameter

LESSON 7
"Don't Be A Square"
by Michael Torres

PREP FOR TEACHERS

- Students will measure lids as well as other circular items that are in the classroom. Make sure that you have at least one item (that is usually found in the classroom) per group. A circular trash can and some other items have different bases, so either base can be used, or have the group measure both bases [confusing].
- As a reward, order a cookie from the store in the mall for the second day. This is part of the culminating activity. However, it is not mandatory.

Note:
The following concepts will be covered during this lesson: **radius**, **circumference**, **diameter**, **pi**, **quotient**, **estimation and ratio**. Students may need to review the concepts prior to beginning the activities.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Read the book *Sir Cumference and the First Round Table: A Math Adventure*.

2. Review the vocabulary words for a circle with the students (radius, diameter, circumference, *pi*; See "Media Component" Web site number three for details).

3. Have the students go back to their stations and trace one of the lids on a clean sheet of paper. They will also label the three parts of a circle discussed in the book (radius, diameter and circumference). One way to find the center of the circle is to fold it in half to create the diameter. Then, fold a second diameter, so that the two diameters intersect. Where the two diameters intersect, mark the center point. Students can then proceed to draw and label the radius and circumference.

LEARNING ACTIVITIES

4. Use Diagram of Circle (in Student Handouts). Ask students if they notice a relationship between any of the three parts of the circle. Most should notice that the radius is half the size of the diameter. To lead students towards this observation, have them record the data as they measure in the chart like the one below. (cont next page)

	Object	Diameter (mm)	Radius (mm)	Circumference (mm)
1.				
2.				
3.				

To make the relationship between diameter and circumference easier to see, have the students graph the two sets of data. Use the diameter as the independent variable and the circumference as the dependent variable.

Have the students measure the diameter of each of the three items. The students should record the diameter of each item to the nearest millimeter and then figure the radius of the circle. Ask: "Is there another relationship besides the one between the radius and the diameter? How can we measure the circumference of the lids or of the trash can?"

Some might suggest using a string and then measuring the string.
Some might be familiar with a measuring tape used by carpenters.
Some might be familiar with a measuring tape used by a seamstress.

Have the students measure the diameter of each of their three items using one of the strings.

Using the other color string, have the students measure the circumference of the three items.

Allow the students to work for a while with the strings to see if they come up with a relationship between the diameter and the circumference of each item.

Give each group one of the construction paper circles and have the students record what they think the relationship between the diameter and the circumference is. Allow each group to report its findings to the class.

CULMINATING ACTIVITY

1. After discussing the findings with the class and getting a consensus as to what the relationship is, read *Sir Cumference and the Dragon of Pi* to the class. (If you purchased a cookie, this would be the time to share it with the class.)

2. Select one of your students to use the calculator to determine the quotient of the four items on page 21. Have another student record the findings on the chalkboard in a table format.

3. Discuss with the students that for now, they will round pi to 3 to get an estimate of the circumference of the items at their stations. (See: "Teacher's Note" below.)

4. Have the students create a table with four subheadings: "Item Name," "Diameter," "Pi," and "Circumference." Have the students record the diameter of each item they measured and then figure out the circumference by multiplying (using 3 as the estimate for pi). Remember to have them record the data as they measure.

5. Have the students create another table using the same information, but have the second column be the circumference and the last column be the diameter. Ask: "How will this table differ from the last? Are we going to do the same operation?"

6. Teacher's Note: The ratio of circumference to diameter will not be equal to 3.14; remember *pi* is an approximation because it is an irrational number. Be careful not to lead students into thinking that $\pi = 3.14$. This is not true since 3.14 is a terminating decimal and π, on the other hand, is irrational and never terminates. Make sure that students understand that the definition of *pi* is the ratio of the circumference of a circle to its diameter, $C / D = \pi$. The value 3.14 is only an approximation of *pi*. $\pi \approx 3.14$, *not equal to 3.14*. *Please stress this point!* When students physically measure items and find the ratio of the circumference to the diameter, they will probably not get the value 3.14; this is because there will always be error in measurement due the precision of the measurement tools. Rather they will get a value of 3…. something. Help students to feel secure knowing that the value of pi is a little more than three.

CROSS-CURRICULAR EXTENSIONS

Language Arts

Have students create their own one-page story that deals with mathematics. This can be as short or as long as you want it to be. Some students will be very creative with their ideas. Encourage this creativity as long as it is mathematically sound and they use the proper vocabulary and terminology.

Art

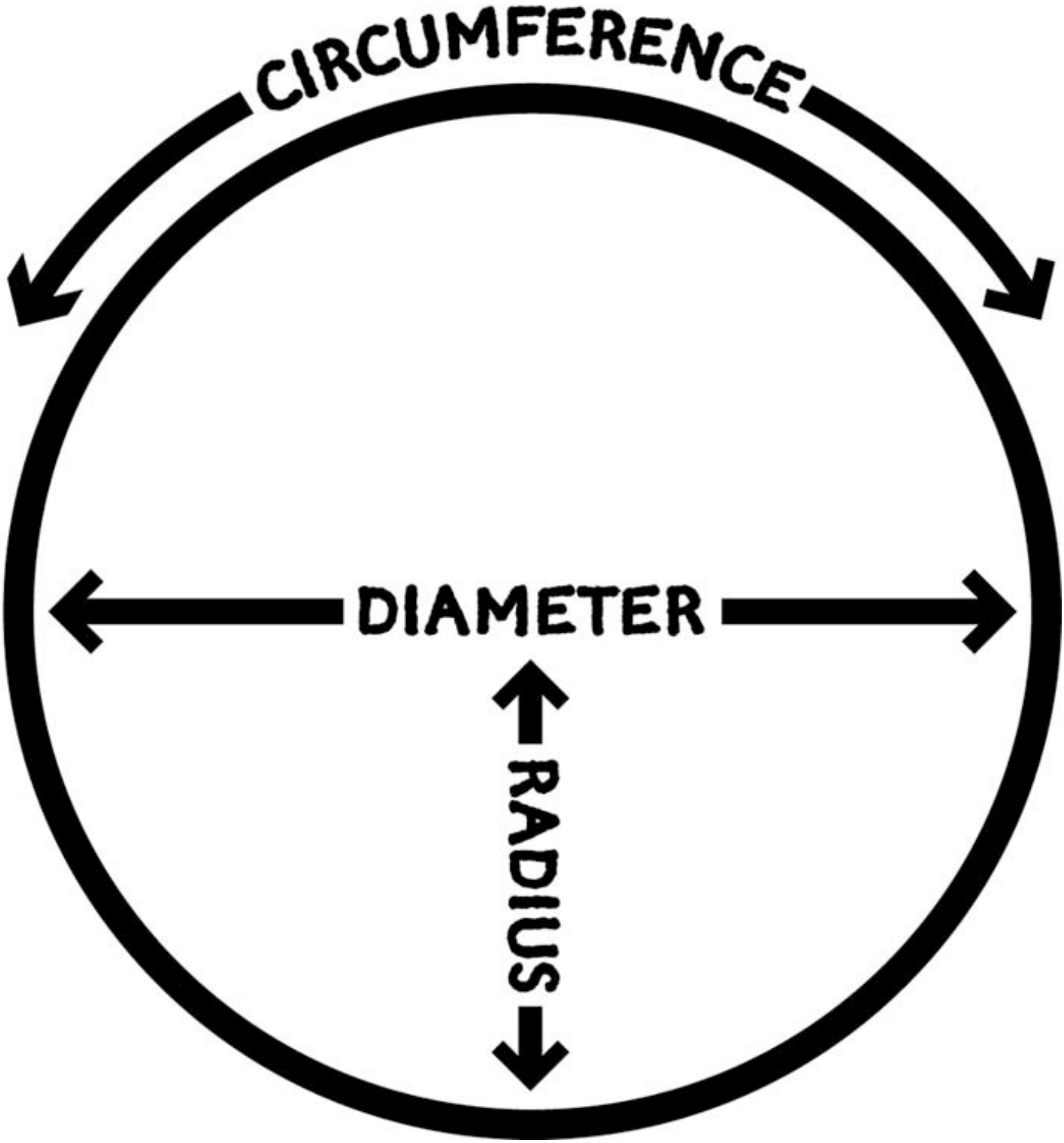
Using a plastic circle about 12 inches in diameter, have the students label the parts of a circle using yarn. Have the Art teacher demonstrate using a Hula hoop.

REAL-WORLD CONNECTIONS Have an architect visit the class to discuss how he/she uses the relationships found in a circle in his/her planning process.

ASSESSMENT Informally monitor students' responses for mathematical understanding.

STUDENT HANDOUTS Diagram of Circle

LESSON 7
"Don't Be A Square"
by Michael Torres



MATH Can Take You Places

LESSON 8
"Is There Mystery in Measurement?"
by Nancy Lachowicz

CONCEPT AREA Measurement

GRADE LEVEL 6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will explore perimeter and area of polygons and determine how changing the dimensions of a figure affects its perimeter and area. Students will estimate the area and perimeter of an irregular figure on grid paper. Finally students will be assessed by using an interactive Web site.

LESSON ACTIVITIES OVERVIEW Students will explore perimeter and area with index cards. They will use grid paper to create various rectangles and compare different dimensions and will trace their hand to estimate its area and perimeter.

LEARNING OBJECTIVES Students will be able to:
- Estimate measurements and evaluate reasonableness.
- Use appropriate formulas to calculate area and perimeter.
- Work cooperatively in pairs.
- Compare and contrast similarities and/or differences of area and perimeter.
- Use technology for self-assessment.

MEDIA COMPONENTS Video: *Math Can Take You Places* #001 "Measurement"

MATERIALS *Per Student*:
- Rulers (centimeter/customary)
- 3 x 5 index cards (3 per student)
- 5 x 8 index cards (3 per student) optional for extension activity
- Pencils
- 4 different colored pencils or crayons
- One-inch grid paper

PREP FOR TEACHERS
- Prepare materials and handouts for students.
- View Web site prior to teaching the lesson so you can choose appropriate level of assessment for each student.
- View video prior to lesson, cue for class discussion.

Note:
The following will be covered during this lesson: **length**, **width**, **area**, **perimeter and formula.** Students may need to review the concepts prior to beginning the activities.

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

MATH Can Take You Places

LESSON 8

"Is There Mystery in Measurement?"

by Nancy Lachowicz

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Pass three 3" x 5" index cards and a ruler to each student. Have students measure the length and width of one card and label all three (l = 5", w = 3")

Discuss the following vocabulary terms:
Length, width, perimeter, area, dimensions, formula

Lead the following discussion:
"What do you know about perimeter?" (*It is the distance around a polygon.*)
"What do you know about area?" (*It is the space within the perimeter of the polygon.*)

2. Lay your index cards end to end on your desk. What formula would you use to find the perimeter? Area? (Offer one-inch grid paper if students need extra help calculating area and perimeter.)
What is the perimeter? (*36 in.*) Area? (*45 sq. in.*)

3. Say: "Now I want you to lay your index cards length to length."

"Based on our previous findings, estimate what you think the perimeter is? (*28 in.*) Now use the appropriate formula to compute the perimeter. What do you notice? Why is the perimeter smaller than the first model?" (*The objects are the same only some of the sides are not edges. Now, they are on the interior of the shape.*)

"Use the formula for area to compute the area. (45 sq. in.) Why did the area stay the same?" (*The total area of the three cards, regardless of how they are arranged, will be the same.*)

4. Have students lay their index cards with two cards stacked length to length and the third card connecting width to width to the bottom card. How do you know the area will be the same? Write two different equations to prove your reasoning:
Students should write: A = (5 x 6) + (5 x 3)
A = (10 x 6) – (5 x 3)
What is the perimeter? (*32 in.*)

5. Point out that although two or more shapes have the same area they may not have the same perimeter.

LEARNING ACTIVITY/

1. Distribute one-inch grid paper to each student. Ask students to follow the instructions they are given. Ask, "Do shapes with the same perimeter have the same area?"
Draw a 4-inch square (4 x 4) and 3 rectangles with the following dimensions 1 x 7, 2 x 6 and 3 x 5. Determine each shape's perimeter. (*16 in.*)
Now compute the area of each. (*16 sq. in., 7 sq. in., 12 sq. in., 15 sq. in.*)

2. Allow students to create one square and three rectangles of their own with a given perimeter of 24 inches. Help students understand that although two or more shapes have the same perimeter, they may not have the same area.

MATH Can Take You Places

LESSON 8

"Is There Mystery in Measurement?"

by Nancy Lachowicz

CULMINATING ACTIVITY

Have the students trace their hands on grid paper. Explain how estimates are determined using area and perimeter. Instruct students to make a "key" for whole squares (one color), ¾ full squares (a second color), ½ full squares (a third color). Those squares that are barely included within the perimeter are not counted.

Students are to color their hands according to the key and then count the number of squares. Remember to discuss that two halves equal one whole. To calculate perimeter, students may use string and have a partner help them hold it down.

CROSS-CURRICULAR EXTENSIONS

Social Studies

Research the area of different continents. Arrange in order from greatest to least. Can you figure the perimeter of each continent?

REAL-WORLD CONNECTIONS

View video: *Math Can Take You Places*, #001 "Measurement". Ask students to observe the real-world application of area and perimeter in providing comfort for basketball players.

Invite various professionals (i.e., carpenters, homebuilders, land surveyors, architects, etc.) to share how they use measurement, stressing its importance.

ASSESSMENT

Allow students to create their own area and perimeter problems. Encourage them to focus their questions on real-life situations and to create answers. Review their questions and answers for accuracy in order to check for understanding. Use the questions written by the students to create a written assessment.

STUDENT HANDOUTS

None

MATH Can Take You Places

LESSON 9
"Mavericks and Measurement"
by Rhonda Bailey

CONCEPT AREA Measurement

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students use area and perimeter formulas within a real-life situation.

LESSON ACTIVITIES OVERVIEW Students will design the layout of a room by investigating the measurement concepts of perimeter and area.

LEARNING OBJECTIVES Students will be able to:
- Apply their knowledge of measurement concepts to solve problems, including the application of measurement formulas.
- Apply problem-solving strategies.

MEDIA COMPONENTS Video: *Math Can Take You Places* #001 "Measurement"

MATERIALS
- One-inch grid paper
- Snap cubes (or 1" x 1" tiles)
- Construction paper (for furniture cutouts)
- Rulers
- 7.5-foot-tall silhouette (or, teachers could also use a tape measure to mark near a doorway where a 7.5-foot-tall person would stand.)

PREP FOR TEACHERS

Note:
The following concepts will be covered during this lesson: **area**, **perimeter**, **length**, **width and floor plan**. Students may need to review the concepts prior to beginning the activities.

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

PREP FOR TEACHERS (cont)
- Work with your campus art teacher to help you construct a 7.5-foot-tall silhouette of a basketball player, so that students have a visual of exactly how tall 7.5 feet really is.
- Cue the videotape.
- Gather enough snap cubes for each group of four students to have 60 cubes. You may want to use colored tiles instead to make sure students understand that their problem relates to area, not volume. Be sure to count them out for each group in advance to avoid downtime.
- Cut out squares to represent the nightstand (approximately 2 inches by 2 inches), and rectangles to represent the dresser (approximately 2 inches by 3 1/2 inches). Each group will need one of each. Make sure they are a different color than the one-inch grid paper.
- Each group will also need a sheet of one-inch grid paper with an area of about 400 square inches. Try out the activity beforehand to make sure that the problem is the

right difficulty level for your students. If it seems too easy for them to solve, try making their hotel room grid paper smaller.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Spark students' interest by introducing the sports-team scenario. Say: "Professional sports teams take trips and stay in hotels quite often. No big deal, right? There are plenty of hotels in almost every city. (**Cue** *Math Can Take You Places* #001 "Measurement" to the basketball players getting off the bus. **Play the video until** the classroom teacher asks, "… How we can make a bed in the room more comfortable?"

Ask students, "What are some problems that this player may have trying to use a regular size hotel room?"

2. **Resume** showing the tape to set the stage. **Stop** when the teacher says, "… you are able to explain your answer." Ask students to explain the difference between the area and perimeter of a rectangle.

LEARNING ACTIVITIES

1. Students are to use what they know about area and perimeter to design a bed and arrange the furniture in the hotel room, so that their 7.5-foot-tall basketball player can fit comfortably.

2. The grid paper will represent the space they have in the hotel room. They are to use the cubes to make a bed that has an area no greater than 60 square feet and has the smallest perimeter possible. Then, they are to arrange their bed, dresser and the nightstand in the room, so that the player can move around easily. Instruct students that they should be able to explain the solution when they're done.

Solutions will vary. Solutions must have a bed that is to be at least 7.5 feet long, so an 8-foot by 6-foot bed would meet the criteria, with an area of 48 square feet. This bed would have a perimeter of 28 feet.

3. Students will record the measurement combinations on the Mavericks and Measurement student recording sheet and answer questions related to the problem.

CULMINATING ACTIVITY

Each group should share its findings. They should discuss the reasonableness of their findings.

1. Explain the difference between how a 6-foot-by-8-foot bed would look in the room versus an 8-foot-by-6-foot bed.
2. If a person is actually 7.5 feet tall, what other items around the house might he or she have trouble using?
Resume video from last pause point (after the teacher said, "… you are able to explain your answer.") **Stop** at end of equivalency video.

Have students compare the way they solved the problem with the ways the students in the film solved it.

As an extension, ask the students to use their models of the hotel room to create a floor plan, giving the area and perimeter of each piece of furniture in the room as well as the area of the floor space left for the basketball player to walk around in.

LESSON 9
"Mavericks and Measurement"
by Rhonda Bailey

CROSS-CURRICULAR EXTENSIONS

Science

People's heights are predetermined by a set of human codes called "genes." Students should use media resources to collect research on genes and, with the information collected, write reports to be presented to the class.

REAL-WORLD CONNECTIONS

Take a field trip to a home-improvement store. Let students speak to a flooring expert to see how he or she uses area and perimeter.

ASSESSMENT

Have students work individually to develop a word problem where the answer is, "The area equals 80 square feet," and another where the answer is, "The perimeter equals 40 feet." Monitor their work for understanding of the concepts.

STUDENT HANDOUTS

"Mavericks Measurement Student Recording Sheet"

Mavericks and Measurement
Student Recording Sheet

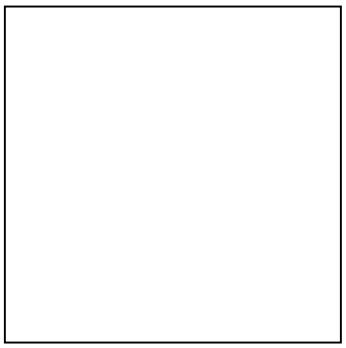
Length of bed	Width of bed	Sketch of the bed	Perimeter formula for the bed (feet)	Area formula for the bed (square feet)

1. Describe how you used the information in the problem to help you solve this problem.

2. What dimensions did you decide on for the design of the bed? Why did you choose these measurements?

3. Explain your plan for solving this problem.

4. Imagine that a bed measures 4 feet by 4 feet. Find the perimeter and the area. Are the perimeter and area of the bed the same? Why or why not? How would you explain the difference between the perimeter and the area?



5. Explain how the measurement units for perimeter and the measurement units for area are different.

6. Look at the following pairs of dimensions and the perimeter.

Length (meters)	Width (meters)	Perimeter Process $2 \cdot (l + w)$	Perimeter (meters)
1	14	2 · (1 + 14)	30
2	13	2 · (2 + 13)	30
3	12	2 · (3 + 12)	30
4	11	2 · (4 + 11)	30
5	10	2 · (5 + 10)	30
6	9	2 · (6 +9)	30

What pattern do you see between the dimensions of the bed and the perimeter? *Hint:* Look at the Process column.

Explain how using the formula for perimeter would help you in finding possible dimensions for a rectangle with a perimeter of 24 feet.

MATH Can Take You Places

Te Lleva a Muchos Lugares

LESSON 9

"Medidas y Mavericks"

by Rhonda Bailey

Medidas y Mavericks
Hoja de Anotaciones del Estudiante

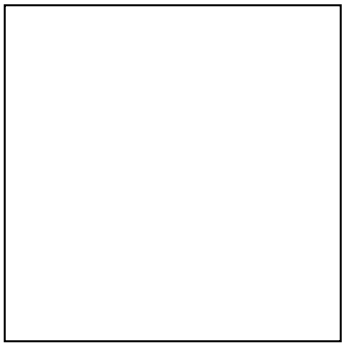
Largo de la cama	Ancho de la cama	Bosquejo de la cama	Fórmula del perímetro para la cama (en pies)	Fórmula del área para la cama (en pies cuadrados)

1. Explica cómo usaste la información del problema para ayudarte a resolverlo.

2. ¿En cuáles dimensiones te decidiste para el diseño de la cama? ¿Porqué elegiste estas medidas?

3. Explica tu plan para resolver este problema.

4. Imagina que una cama mide 4 pies por 4 pies. Encuentra el perímetro y el área. ¿Son iguales el perímetro y el área de la cama? ¿Porqué sí o porqué no? ¿Cómo explicarías la diferencia entre el perímetro y el área?



4 pies.

4 pies.

5. Explica la diferencia entre las unidades para medir el perímetro y las unidades para medir el área.

6. Mira a los siguientes pares de dimensiones y perímetros.

Largo (metros)	Ancho (metros)	Proceso del Perímetro $2 \cdot (l + w)$	Perímetro (metros)
1	14	$2 \cdot (1 + 14)$	30
2	13	$2 \cdot (2 + 13)$	30
3	12	$2 \cdot (3 + 12)$	30
4	11	$2 \cdot (4 + 11)$	30
5	10	$2 \cdot (5 + 10)$	30
6	9	$2 \cdot (6 + 9)$	30

¿Qué parecido hay entre las dimensiones de la cama y el perímetro? *Pista:* Mira en la columna Proceso.

Explica cómo el uso de la fórmula para perímetro te ayudaría a encontrar las posibles dimensiones para un rectángulo con un perímetro de 24 pies.

MATH Can Take You Places

LESSON 10
"Tile My Bathroom Floor"
by Sabrina McCullough

CONCEPT AREA Measurement

GRADE LEVEL 6

TIME ALLOTMENT Two 60-minute sessions

LESSON OVERVIEW Each student will be given a bathroom floor plan and will create his or her own design of floor tiles to cover a bathroom floor.

LESSON ACTIVITIES OVERVIEW Students will apply real-life problem-solving strategies to a tiling project, focusing on measurement, proportionality, estimation and area. Students will design floor tiles using centimeter graph paper.

LEARNING OBJECTIVES Students will be able to:

- Apply proportional reasoning unit analysis and measurement conversion throughout the problem-solving process.
- Estimate areas by applying problem-solving strategies.
- Determine the amount of tile that will be required to tile a specified area of a bathroom floor.
- Use problem-solving strategies to calculate the dimensions of the given floor plan, taking into account that there are areas in the bathroom that will not be tiled.
- Verify their estimate by tiling the floor plan using centimeter grid paper.

MEDIA COMPONENTS Video: *Math Can Take You Places* #001 "Measurement"

Internet:

Home Plans - Over 1,000 searchable floor plans.
http://www.homeandfamilynetwork.com/homeimprovement/plans.html

HGTV
The Home and Garden Network Web site has design information, floor plans, remodeling information and cool projects for kids.
http://www.hgtv.com/

Discovery Kids - "Trading Spaces for Kids"
Check out "Boys versus Girls" on "Trading Spaces for Kids," a popular remodeling show at Discovery Kids.
http://kids.discovery.com/fansites/tradingspaceskids/tradingspaceskids.html

MATERIALS Per class

- Books, magazines, photos of tiled bathroom floors
- Videos of home improvement shows

Per pair of students

- Original floor plan
- Construction paper

Per student

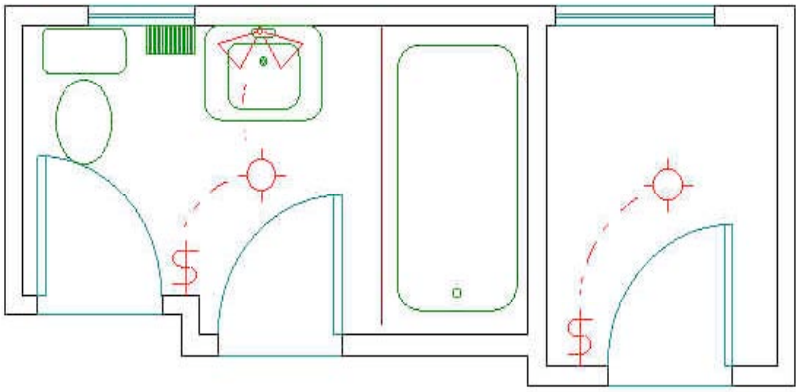
- Centimeter graph paper
- Rulers
- Floor plans (bathrooms)

LESSON 10
"Tile My Bathroom Floor"
by Sabrina McCullough

- Colored pencils/markers
- Glue sticks

PREP FOR TEACHERS

See example below. This example has a copyright.



1 centimeter = 0.5 meter

Collect floor plans (of bathrooms) or create your own floor plans.
• Collect pictures, books and magazines that show floor plans.

A pair of students will have a bathroom floor plan. Students will use the scale given on the bottom of the floor plan to calculate the total area of the bathroom.

Note:
The following concepts will be covered during this lesson: ***centimeter***, ***meter***, ***area***, ***length*** and ***width***. Students may need to review the concepts prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE

Allow students 15-20 minutes to browse through magazines, books and photos to get some ideas of how bathrooms look with tiled floors. Students may also watch short clips from home improvement shows and/or browse the Internet.

LEARNING ACTIVITIES

1. Give each pair of students an assigned floor plan. The students will also see different types of tile arrangements that may include various colors and designs. Have students describe the patterns they see and how they think the arrangement was done.

2. Allow students time to analyze the bathroom floor plans and discuss strategies for estimating the area (in square centimeters and square meters) of the bathroom floor that will be tiled.

3. Students will apply problem-solving strategies to arrive at the most accurate estimate. Students will devise and write out a plan that describes how they and their

partner attacked the problem and determined the amount of tile needed to cover the bathroom floor.

4. Students should keep in mind that their solutions must be in both square centimeters and square meters.

5. Once the students have had an opportunity to devise their plans, pass out the centimeter grid paper and colored pencils, so they can begin using their creativity to tile the bathroom floor plan.

6. Students will verify the reasonableness of their estimates based on the number of centimeter squares that they cut out and paste to the tile floor plan.

7. Lastly, students will determine how far off they were from their estimate and the actual number of tiles used to tile the bathroom floor. If some groups had estimates that were much better than others, allow students to share the strategies they used that were more accurate.

CULMINATING ACTIVITY

1. Play the video, *Math Can Take You Places* #001 "Measurement". Students will observe another need for finding area and perimeter.

2. Students will display their problem-solving pages and tiled bathroom floor plans for a gallery walk. Allow students to present their work and share their problem-solving strategies and final tiled floor plans. They will compare their strategy with those demonstrated on the video.

2. Time to remodel. Students will rearrange the tiles to create a new design. Have students duplicate the tile colors and designs from their floor plan using the same colors, because now it's time to remodel the bathroom! Students will cut out the tiles and rearrange them to create a totally new bathroom floor plan using the same tiles. Allow students to determine the dimensions of the new bathroom, but remind them that the new design must have the same components as the original bathroom. Have students share their new designs.

CROSS-CURRICULAR EXTENSIONS

Social Studies

Have students create a tiled mural representing a cultural, historical or current event. Students will need to estimate the amount and cost of materials needed to create the mural by first calculating the area that will be covered. Students must work cooperatively to plan and create the tiled mural. The mural can be formally presented to the school and community. Invite the art teacher and parents to assist in creating the tiled mural.

REAL-WORLD CONNECTIONS

Invite a contractor, professional flooring/carpeting installation technician or interior designer to visit with your class and discuss how mathematics is applied in their professions.

Extend the lesson by pricing ceramic tiles and carpeting. Have students discuss the pros and cons of tiling the bathroom versus carpeting the bathroom.

LESSON 10
"Tile My Bathroom Floor"
by Sabrina McCullough

ASSESSMENT Informal assessment can be done to determine clarity and understanding. Observe the students as they work. Decide how well the students are doing based on the following rubric:

Complete understanding
If students are completing the project with ease and no questions.

Understanding
If students are asking minor questions to get them through the project.

Lack of understanding
If students are struggling and unable to work without guidance. Try peer tutoring and/or small pair instruction.

Once students have completed the project, decide on a participation grade as well as a completion grade.

STUDENT HANDOUTS None

MATH Can Take You Places

LESSON 11

"Courts of Measure"

by Yvonne Garcia

CONCEPT AREA Measurement

GRADE LEVEL 4-6

TIME ALLOTMENT One to two 60-minute sessions

LESSON OVERVIEW We all use area when we are trying to fit things into a particular space. For example, how many desks can we fit into a room and still allow students to get in and out of their desks? This lesson gives intermediate-aged students the chance to explore the area and perimeter of their school gym or a nearby school gym. They then transfer this knowledge into finding the actual areas and perimeters of other places games are played.

LESSON ACTIVITIES OVERVIEW After being shown the *Math Can Take You Places* measurement video, the students will focus on the way area was used in the video and how the trainer uses math in daily duties. Students should identify the different ways of finding perimeter and area after the completion of the video.

LEARNING OBJECTIVES Students will be able to:

- Physically measure an area and its perimeter
- Transfer the information learned into a model representation and also number sentences
- Use problem-solving strategies

MEDIA COMPONENTS Video: *Math Can Take You Places* #001 "Measurement": segment with Mavericks interview**.** This video deals with students setting up the area of a room for a seven-foot-tall basketball player. It also features a Mavericks head trainer and his responsibilities.

MATERIALS Per class:

- 4 to 5 yardsticks
- 4 to 5 calculators
- 4 to 5 sheets of chart paper
- 1 to 2 pictures of basketball and volleyball courts
- 20 to 25 geo boards
- 4 to 5 sheets of grid paper
- A large bucket of tiles or cubes (approximately 200 to 250)
- Class set of computers (computer lab)

PREP FOR TEACHERS

- Bookmark Web sites on the computers.
- Watch *Math Can Take You Places* and cue the videotape.
- Gather all materials needed for each group of students and hands-on elements of the lesson.

Note:
The following concepts will be covered during this lesson: **area**, **length**, **width**, **perimeter**, **model and scale**. Students may need to review the concepts prior to beginning the activities.

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

MATH Can Take You Places

LESSON 11

"Courts of Measure"

by Yvonne Garcia

INTRODUCTORY ACTIVITY: SETTING THE STAGE

Day Two

1. Ask: How many of the students have watched professional basketball? *(You should get mostly yeses.)*

2. Ask: Who has played volleyball or basketball in a PE class or little league sports? *(You should get all yeses.)*

3. Say: "There are people who line these courts. They have to know the correct areas and perimeters in order to keep within the rules of the game. Now let's discuss some vocabulary words before we start our video about a professional basketball team that relies on the use of math."

Vocabulary: area, perimeter, length, width

4. Ask: Has anyone ever seen a seven-foot-tall person in real life?

5. Watch the *Math Can Take You Places* video.

LEARNING ACTIVITIES

Day One

1. Ask: "How would you go about finding the area of your desk? What about the perimeter? Do you remember the basic concepts and formulas for area and perimeter?"

2. Now, model the two problems with rectangles and squares on the geo boards, showing one way to figure out the area and perimeter. Next, have the students do two to four problems on the geo boards as needed. Then, review how to find missing variables, such as $x + 7 = 29$ or $37 - x = 14$.

Formulas:

$A = L \times W$ (Area equals length times width) for a rectangle

$A = s^2$ (Area equals side squared) for a square

The formula for the perimeter of a rectangle is $P = 2(l + w)$ or $P = 2l + 2w$, and the formula for the area of a square is A4 S or 2 L + 2 W.

3. Culminating Activities

a. Group activity: measuring the gym and finding its perimeter and area

b. Web sites: Practice area and perimeter on each of the sites given.

The students will focus on the way area was used in the video and how the trainer uses math in daily duties. Students should identify the different ways of finding perimeter and area after the completion of the video.

4. Activity: Visit a junior high or high school gym (if one is within walking distance) or your own school gym. Divide the students into pairs and have them physically walk around and measure the court used for basketball and the court used for volleyball to the nearest inch using a yardstick. Then have them determine the perimeters and areas of both courts. Ask each set of partners to compare the areas and perimeters of the two courts they measured. Next, ask the students to write at least two different number sentences showing the area and two different number sentences showing the perimeter for each court (using all the basic math symbols: +, -, x, and ÷). Then return to class and use mini-cubes to show a model of the area of each court. (Remind them that they can make each cube worth a certain number. For example, 1 cube = 5.) Now have them

transfer the picture they made with cubes onto grid paper.
Example: Given a length of 30 feet and a width of 7 feet ….
Area:
Write a legend showing each mini-cube equaling 10 feet.
30 ft. x 7 ft. = 210 $ft.^2$
7 ft. x 30 ft. = 210 $ft.^2$
Perimeter: 30 ft. + 30 ft. + 7 ft. + 7 ft. = 74 ft.
(2 x 30 ft.) + (2 ·x 7 ft.) = 74 ft.
2 (30 ft. + 7 ft) = 74 ft.

5. Modifications:
a. Give the students extra practice by using a shape explorer http://www.shodor.org/interactivate/activities/perimeter/index.html
b. Extra practice with basketball perimeters is on http://www.scienceacademy.com/BI/.
c. Give each of the students a piece of grid paper with the legend marked on it. Then ask them to shade only the spaces the cubes covered. Next, have them write the area and perimeter.

6. Extension/Enrichment:
a) Have the students make up area and perimeter problems that have missing quantities.
b) Then ask them to make a short three- to four-slide PowerPoint presentation, showing how they would solve the problem.

CULMINATING ACTIVITY

Next, use these Web sites after the video and group activity to reinforce the concepts with immediate feedback.
http://www.shodor.org/interactivate/activities/perimeter/index.html
(perimeter) http://www.shodor.org/interactivate/activities/perm/index.html (area) and/or
http://www.scienceacademy.com/BI/ click on perimeter)
http://www.aaamath.com/B/geo78_x7.htm (perimeter)
http://www.aaamath.com/B/geo78_x3.htm (area)

CROSS-CURRICULAR EXTENSIONS

History
Research and compare this to the history of basketball players and their managers.

Writing
Use the elements discovered in the video and/or measuring of the gym to write about how they can be compared. Interview an architect about the ways s/he uses area and perimeter.

REAL-WORLD CONNECTIONS

Assign students exercises for finding the perimeter and areas. Examples: Find the area of the school library. Find the area of the teacher's desk. Find the area of a classroom window.

ASSESSMENT

Evaluate your students' success by asking the following questions in the form of a quiz.
Question types for perimeter and area
1. The coaches were going to buy a mat to fit into the weight room. They needed to know the mat's length and width to see if it would fit. If the shape is a square and the area measures 196 square inches, then how long is each side of the mat? (*14 ft.*)
2. The students in your classroom figured out the area and perimeter of the room they

were going to use to store collected canned foods for the holidays. They figured the area of this rectangular-shaped room to be 48 square feet with a perimeter of 32 feet. However, they forgot to write down the length and width of the room. Write a plan describing how the students can determine the dimensions of the room and then solve for the missing dimensions. (*12ft., 4 ft.*)
3. If a student wants to block off a square area on the basketball court to use for ball-handling drills and he/she needs it to be 256 square feet, then what would its length and width be? (*16 ft.*)

STUDENT HANDOUTS None

MATH Can Take You Places

LESSON 12
"Picture This"
by Sonya Cook

CONCEPT AREA Patterns

GRADE LEVEL 6

TIME ALLOTMENT Two 60-minute sessions

LESSON OVERVIEW Students will become employed at a photo shop and will have to learn how to enlarge or reduce photographs requested by customers.

LESSON ACTIVITIES OVERVIEW Students will use color tiles to represent the original length and width and repeat the pattern to find a new length and width. Students will also show the pattern on a ratio table.

LEARNING OBJECTIVES Students will be able to:
- Use ratios to compare length and width.
- Use original ratio to scale up or down.
- Use a table to show a proportionally-similar relationship.

MEDIA COMPONENTS Video: *Math Can Take You Places* #005 "Patterns"

MATERIALS
- Rulers
- Scissors
- Manila paper or construction paper
- Photographs of various sizes
- Color tiles
- Computer (if you want students to create tables on computer)

PREP FOR TEACHERS
- Gather materials
- Reproduce poem
- Bring in photographs
- Prepare practice problems for peer practice

Note:
The following concepts will be covered during this lesson: ***ratio***, ***proportion***, ***length*** and ***width***. Students may need to review the concepts prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE Begin by watching the *Math Can Take You Places* patterns video. Ask students to name one way Chef Koval uses patterns in his everyday working situations. Then, ask the students to think of other jobs that may use patterns. Lead them into the lesson by emphasizing that a photographer uses patterns.

1. Have students bring in photographs or magazine pictures from home and discuss enlarging and reducing.

2. Tell students they are beginning a new job working at a photo shop, and they will be responsible for enlarging and reducing customers' photographs.

3. Tell students that if they become experts at enlarging and reducing, they will be promoted to the framing department.

LEARNING ACTIVITIES

1. Tell students that on their first day of the job, they must attend training (as with any new job). Their boss will be conducting the training.

2. In the training, your boss teaches you a poem called, "Tables with Labels."

Making tables with labels is fun; can't you see,
It's as easy as 1, 2, 3.
First you find width, then you find length,
Your table is almost finished; what do you think?
Now you multiply, or you divide,
But that's all that goes inside.
Your picture is now larger, or it's smaller,
You're all done, so give me a holler.

3. Next, your boss shows you how to enlarge your first picture. "The customer brings in a photograph that has a length of five inches and a width of three inches. The customer wants one picture with the length and width two times the original, and one picture with the length and width three times the original."

4. Have students use rulers and scissors to cut out a five-by-three-inch rectangle. Next, have students use red and blue color tiles to show the original length and width. Let blue equal length and red equal width. Have students stack up five blue tiles and three red tiles. Next, have students repeat the pattern showing a second stack of five blue tiles and a second stack of three red tiles. Ask the students to provide the new length and width. Allow them to create a new rectangle with a length of 10 inches and a width of six inches. Have the students repeat the pattern a third time, showing a third stack of five blue tiles and a third stack of three red tiles. Ask students to provide the new length and width. Allow students to create a third rectangle with a length of 15 inches and a width of nine inches. Last, have the students transfer the information to a table.

Length	5	10	15
Width	3	6	9

Ask students what the stacks of tiles represent.

5. Have students repeat the process using a new photograph, which has a length of 8 inches and a width of 5 inches.

Length	8	16	24
Width	5	10	15

6. Allow students to work with partners to enlarge other photographs.

7. Say, "Next, your boss shows you how to reduce a picture for a customer. The first customer brings in a photograph with a length of eight inches and width of six inches." Allow students to create the picture and cut it out. The customer wants the photo reduced so that the length and width of the new photograph is half the length and width of the original. Have students use blue tiles to represent length and red tiles to represent width. Have students show eight blue tiles in a stack and six red tiles in a

stack. Next, have students split the stacks in half to create two stacks of four blues and two stacks of three blues. Ask students to provide the new length and width.

8. Students may cut out a new picture or fold the original in half vertically and horizontally. Last, have students transfer the information to a table.

Length	8	4
Width	6	3

9. Have students repeat the process using an original length of 12 inches and an original width of nine inches. This time the customer wants the original photograph's length and width to be three times as long as the new.

Length	12	4
Width	9	3

10. Allow the students to work with partners to create new reductions of photographs. Be sure to monitor students to make sure that they are working with measurements that can produce whole numbers when scaled down by a specific factor.

CULMINATING ACTIVITY

1. Tell students after a successful few weeks that they are promoted to the frame shop, where they will be enlarging and reducing photographs and framing them for the customer. They will have to find new lengths and widths and determine how much framing material will be used. (You may want to do a mini-lesson to review perimeter.) Give the students specific instructions about enlarging and reducing the photographs. You can also incorporate cost if you feel the students are ready.

2. Extension: Provide students with a price code for enlarging and reducing photographs and have them determine the cost. Example: The cost of enlarging a photograph is $3.00 to double the length and width and $5.00 to triple the length and width. Sarah took a picture to the photo shop and wants two $3.00 enlargements and four $5.00 enlargements. Write a number sentence to show how to determine the price and give the total before tax. (*2(3.00) + 4(5.00) = $26.00*)

CROSS-CURRICULAR EXTENSIONS

Art/Social Studies

Students study collage and create a class collage from photographs.

Students study famous artists and their works and determine the size of an original masterpiece. Students create prints of the original that are proportionally similar.

REAL-WORLD CONNECTIONS

Have a graphics designer visit the class to discuss how he/she uses proportions and ratios in everyday life.

ASSESSMENT

Observe students closely as they work in pairs to develop their own reduction scenarios. Check them closely to evaluate whether their understanding of the concepts and proper use of vocabulary.

STUDENT HANDOUTS

None

MATH Can Take You Places

LESSON 13
"Get on Board"
by Betty Lewis

CONCEPT AREA Patterns

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will make a table showing the relationship between the number of tickets that are needed for the basketball team to travel from Dallas/Fort Worth to New York City. In the process, students become familiar with developing and using number sentences.

LESSON ACTIVITIES OVERVIEW Students will:

- Create charts to display patterns relating to the number of passengers and cost of tickets for a bus ride, train ride and airfare.
- Develop a number sentence from the data they develop.
- Work an extension problem using a given number sentence.

LEARNING OBJECTIVES Students will be able to:

- Determine missing elements in a pattern.
- Select an appropriate operation and/or strategy to solve a problem and justify the solution.
- Use mathematical language to represent the relationships in a table.
- Discuss and elaborate upon the reasonableness of a solution.
- Recognize the pattern in the table.
- Extend the pattern and generalize.
- Understand and present the values in a table with the ordered pairs of numbers.
- Recognize mathematical symbols that represent relationships in a table.

MEDIA COMPONENTS Video: *Math Can Take You Places* #005 "Patterns"

Internet:

American Airlines:
www.aa.com

Amtrak Trains:
www.amtrak.com

General travel Web site:
www.travelocity.com

Buses:
www.greyhound.com

MATERIALS

- Calculators
- Overhead projector
- Overhead calculator (optional)
- Pencil and paper
- Internet access (optional)

PREP FOR TEACHERS Prior to teaching this lesson, preview the video.

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MATH Can Take You Places

LESSON 13
"Get on Board"
by Betty Lewis

Note:
The following concepts will be covered during this lesson: **patterns**, **number sentences**, **skip counting and function**. Students may need to review the concepts prior to beginning the activities.

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Have the students skip count aloud by fives. Remind students that skip counting is patterning. Stop and discuss how they determined the next number in the pattern. As a class, create the chart below to emphasize the concept:

Order the pattern (n)	Actual number (a)
1st	5
2nd	10
3rd	15

(Repeat activity with skip counting by 25s, etc., if needed.)

2. Inform them that mathematics is described as the science of patterns and order, and is especially useful when it helps to predict outcomes. Using number patterns will develop this skill. In later math classes, students will use patterning to solve functions.

3. Ask students to discuss some of the patterns they discovered while participating in the skip-counting activity. Develop an understanding that discovering a pattern requires them to look systematically at specific examples. Once the "rule" or function is discovered, it can be used to determine the remaining solutions to the problem.

4. Ask the students to describe how they would find the 50th number in the pattern. Discuss their suggestions. Work together to write a number sentence to state it mathematically (for example, 50 * 5 = n, n = 250). Then, work together to write a number sentence to describe how you would find any number in the pattern (Answer: n * 5 = a).

LEARNING ACTIVITIES

1. Give the students the following scenario: "The New York Yorkies are a pro basketball team that has traveled to Dallas by bus for a game. Unfortunately, their bus broke down, and they now need a way back to New York City. Help the Yorkies return home by researching the cost for traveling to New York City by airplane, train and bus. We do not know exactly how many players will be traveling, so we will need to use patterns to create three different charts to display our data."

2. Offer the students a set amount for each of the costs of one passenger's bus, airplane and train fare or use the Web sites listed under "Media Components" to calculate actual costs from a town near you to New York City. Students will use those figures to create different patterns for various tickets using various modes of transportation. Allow students to decide how their chart should look. Students should extend the pattern at least to five passengers.

3. The students' answers will vary. Students make tables showing the relationship between the number of bus tickets bought and the total cost. Students can record the relationship shown in the table as a set of ordered pairs:

For example, *(0, 0), (1, $312), (2, $624), (3, $936).*

CULMINATING ACTIVITY

1. Ask the students to use their charts to calculate the cost for 20 travelers by bus, airplane or train. Discuss the strategies that students used to calculate their totals. Students should respond with answers such as, "I multiplied the total for two tickets by ten" or "I multiplied the answer for four tickets by five."

2. Then, ask them to find the totals for harder multiples, such as 55, 72 or even 120 passengers. Ask students to develop as many different ways as possible to come up with the total number of passengers.

3. Ask students to write in words how they would find the ticket costs for any number of passengers on any of the different modes of transportation. Allow them to work alone to develop their sentence. Check students' work as they think through the question. Discuss the answers. Students' responses should say something similar to the following: The total cost of the tickets for any passengers is equal to the number of passengers times the cost of the ticket.

4. Allow students to brainstorm ways that patterns are used in everyday life (for example: counting money, buying grocery items such as eggs, etc.). Ask, "What if we were going to start a restaurant at our school? What are some ways that we would need to use patterns?" Record some of the student responses on the board. Watch the *Math Can Take You Places* video #005 "Patterns." Before the video begins, say: "The students in Ms. Garcia's class are actually going to plan a kids' café. Be able to discuss how they used patterns to help them with purchasing the food." Brainstorm with the students after the video is completed.

5. Write the equation that Mrs. Garcia's students developed in the video on the board:

Number of People / Number of Servings per Package = Number of Packages
Number of Packages x Cost per Package = Total Cost

Tell the students that they are going to work in groups to use the above equation to solve a problem. Tell them that one hot dog package costs $3.50 and serves ten people. Have students use the number sentences to calculate how many packages will be needed to serve 150 people, and how much the hot dogs will cost. (Answer: Number of packages needed 15; 15 packages cost $52.50)

6. If time permits, discuss how variables are helpful when you have long number sentences such as the one listed above. A letter can be used to stand for each of the different parts of the equation. For example, "P" could stand for the "Number of People," "C" could stand for the "Cost per Package." Rewrite the number sentence using variables.

CROSS-CURRICULAR EXTENSIONS

Art

Students can design the look and feel of their own pretend currency, then create it using markers, paint, construction paper, etc. (Also, see "Real-World Connections"). Create a chart that explains how their new currency relates to United States currency.

Language Arts

Have students investigate patterns in other disciplines, such as patterns in music, nature, sports or other areas of interest. Students can interview an expert or teacher in the area of interest to see how the person uses patterns in his/her work. Students would then write a short report of their findings and present it to the class.

REAL-WORLD CONNECTIONS

Invite a local banker to speak to the students about currency exchange rates. Ask students to create their own "currency." They can work in groups or individually to assign the different forms of their currency creative names and create a chart with specific values as compared to the dollar. Students share their currency charts with the class.

ASSESSMENT

Monitor student responses to the "Culminating Activity" number three to check for understanding of patterns.

STUDENT HANDOUTS

None

MATH Can Take You Places

LESSON 14
"On the Road Again"
by Elsie Sneed

CONCEPT AREA Patterns

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW In this lesson, students will learn about the responsibilities of the Head Trainer for an NBA team by viewing the *Math Can Take You Places* video #001 "Measurement" video. Students will then find similarities within sets of numbers, create a pattern and develop a general formula from the information they develop.

LESSON ACTIVITIES OVERVIEW Students will be responsible for purchasing uniforms and other equipment that was lost while the team was on a road trip. Students will use patterns to help them calculate the total cost of each item.

LEARNING OBJECTIVES Students will be able to:

- Use patterns in multiplication and division.
- Use organizational structures to analyze and describe patterns and relationships mathematically.
- Make generalizations based on observed mathematical patterns and relationships.
- Solve problems involving proportional relations.
- Use letters as variables in mathematical expressions and to represent unknowns in equations.

MEDIA COMPONENTS Video: *Math Can Take You Places* #001 "Measurement"

Internet:

Practice problems using patterns:
http://www.aaamath.com

National Basketball Association:
http://nba.com

American Airlines:
http://www.aa.com/

For shoe and warm-up suit pricing:
www.nike.com

For shoes, socks and uniform pricing:
www.reebok.com

MATERIALS

- Graph paper (optional)
- Pencils/paper
- Markers (optional)

PREP FOR TEACHERS

- Bookmark Web sites.
- Cue videotape.
- Prepare student materials.

- Review simple patterns using charts if needed.

Note:
The concepts of ***patterns*** and ***estimation*** will be covered during this lesson. Students may need to review the concepts prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Show students the video *Math Can Take You Places* #001 "Measurement" featuring Roger Hinds, Head Trainer for the Dallas Mavericks. Focus the viewing on the interview portions. Ask the students to pay close attention to what Mr. Hinds' job is, and to be able to discuss some of his responsibilities.

LEARNING ACTIVITIES

2. Ask students whether they remember from the video what Mr. Hinds does for the Mavericks. Discuss their findings. Say to the class: "He is also responsible for making sure that all of their equipment is ready to go on game days. Pretend the box with all of the Mavericks' uniforms has mysteriously disappeared. Your job is to use the Internet to find them new socks, shoes, uniforms and warm-up suits. You can find the total number of players for the team on the www.nba.com Web site. Once you have found the items online, use the "Patterns" worksheet to write the Web site address on the line given. Write down the actual costs of each of the items, then the estimated cost to the nearest dollar. Complete the chart using the estimated prices."

3. Divide the students into groups of two or three.

4. Students will move to the computers to obtain information on costs. (Teacher note: To save time, you can create a listing of the prices of the items for students to use with this activity instead of having them find the prices on the Internet.)

5. Students will place information on the "Patterns" charts, using their estimated prices to calculate the costs of different quantities of each item.

6. Optional: Students can create a graph to illustrate the pattern for each of the items (Cost vs. Quantity).

CULMINATING ACTIVITY

1. Bring students back together as a group to discuss their results. Talk about the patterns that they see on each of the charts on their "Patterns" worksheet. Discuss how they arrived at the answers for the various quantities of items.

2. Ask, "Can you think of a way to find the cost of *any* number of basketball shoes? For example, what if Mr. Hinds needs to order a lot of pairs to replace the old ones as they wear out? What standard formula or set of steps could he take to figure out the total cost for any number of pairs of shoes?" Work with students to develop the formula (Total Cost = # of pairs needed * cost of one pair or C = n * p).

CROSS-CURRICULAR EXTENSIONS

Social Studies

Research the playing schedule for the NBA team nearest your school on www.nba.com. Determine the city in which the team will play its last away game. Use the Internet to find three interesting historic sites the players could visit in that city before their flight home.

LESSON 14
"On the Road Again"
by Elsie Sneed

REAL-WORLD CONNECTIONS Interview the trainer for the local high school football team. Use a Venn diagram to compare and contrast the high school trainers' responsibilities with Roger Hinds'.

ASSESSMENT Allow students to work individually to attempt to develop the formulas for the uniforms, warm-up suits and socks. Monitor for understanding as they share their answers.

STUDENT HANDOUTS "Patterns" worksheet

MATH Can Take You Places

LESSON 14
"On the Road Again"
by Elsie Sneed

Name_____ Date_____

Mavericks Equipment Patterns
Patterns

Pretend the box with all of the Mavericks' uniforms has mysteriously disappeared. Your job is to order them new socks, shoes, uniforms and warm-up suits. Estimate as a class or use the Internet to find the total number of players for the team. Write down the actual cost of each of the items, then the estimated cost to the nearest dollar. Complete the chart **using the estimated prices.**

Total number of players on the Mavericks: _____

1. Socks
   Actual cost of one pair_____

   Estimated cost of one pair (to the nearest dollar)_____

Number of pairs of socks	Total cost
1	
5	
10	
15	
20	
50	

2. Basketball shoes
   Actual cost of one pair_____

   Estimated cost of one pair (to the nearest dollar)_____

Number of pairs of shoes	Total cost
1	
5	
10	
15	
20	
50	

3. Uniforms

Actual cost of one uniform_____

Estimated cost of one uniform (to the nearest dollar)_____

Number of uniforms	Total cost
1	
5	
10	
15	
20	
50	

4. Warm-up suits

Actual cost of one suit_____

Estimated cost of one suit (to the nearest dollar)_____

Number of warm-up suits	Total cost
1	
5	
10	
15	
20	
50	

5. Can you think of a way to find the cost of *any* number of shoes? For example, what if Mr. Hinds needs to order a lot of pairs to replace the old ones as they wear out? What standard formula or set of steps could he take to figure out the total cost for any number of pairs of shoes? First write your answer using words. Then, use variables to stand for the words.

6. What formula could he use to find:

The cost of any number of basketball shoes? _____

The cost of any number of uniforms? _____

The cost of any number of warm-up suits? _____

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 14

"Otra Vez en el Camino"

Elsie Sneed

Nombre_____ Fecha_____

Patrones - Equipaje de los Mavericks

Patrones

Imagínate que la caja con todos los uniformes de los Mavericks ha desaparecido misteriosamente. Tu trabajo es ordenar nuevos calcetines, zapatos, uniformes y conjuntos de gimnasia para ellos. Como parte de la clase ó usa la Internet, haz una estimación para encontrar el número total de jugadores en el equipo. Escribe el costo actual de cada artículo, luego el costo estimado (al dólar más cercano). **Completa la tabla usando los precios estimados.**

Número total de jugadores de los Mavericks: _____

1. Calcetines

Costo actual de un par de calcetines _____

Costo estimado de un par de calcetines (al dólar más cercano) _____

Número de pares de calcetines	Costo total
1	
5	
15	
20	
50	

2. Zapatos para baloncesto

Costo actual de un par de zapatos para baloncesto _____

Costo estimado de un par de zapatos para baloncesto (al dólar más cercano) _____

Número de pares de zapatos para baloncesto	Costo total
1	
5	
15	
20	
50	

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MATH Can Take You Places

LECCIÓN 14
"Otra Vez en el Camino"
Elsie Sneed

Te Lleva a Muchos Lugares

3. Uniformes

Costo actual de un uniforme_____

Costo estimado de un uniforme (al dólar más cercano) _____

Número de uniformes	Costo total
1	
5	
15	
20	
50	

4. Conjuntos de gimnasia

Costo actual de un conjunto de gimnasia _____

Costo estimado de un conjunto de gimnasia (al dólar más cercano) _____

Número de conjuntos de gimnasia	Costo total
1	
5	
15	
20	
50	

5. ¿Podrías pensar en una manera de encontrar el costo de cualquier cantidad de pares de zapatos para baloncesto? ¿Por ejemplo, si el Sr. Hinds necesita ordenar muchos pares para reemplazar los viejos que ya están gastados? ¿Qué fórmula estándar ó qué pasos tomarías para saber el costo total de cualquier cantidad de pares de zapatos para baloncesto? Primero, escribe tu respuesta con palabras. Luego, usa variables para reemplazar a las palabras.

6. ¿Cuál fórmula podría usar él para encontrar:

¿El costo de cualquier cantidad de pares de zapatos para baloncesto? _____

¿El costo de cualquier cantidad de uniformes? _____

¿El costo de cualquier cantidad de conjuntos de gimnasia? _____

MATH Can Take You Places

LESSON 15
"Ranchers and Patterns"
by Julie Morris

CONCEPT AREA Patterns

GRADE LEVEL 5

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will be able to recognize patterns within sets of numbers and predict the next steps within a set.

LESSON ACTIVITIES OVERVIEW Students use problem solving and patterns to help a rancher buy enough land to feed his herd of cattle.

LEARNING OBJECTIVES Students will be able to:
- Identify patterns in a given set.
- Describe the process (or rule) for continuing a set.

MEDIA COMPONENTS Video: *Math Can Take You Places* #005 "Patterns"
Internet:
Cow Facts
http://www.goetzecandy.com/playarea/cowfacts.cfm

Cyberchase Patterns Lesson Plan for additional practice
http://pbskids.org/cyberchase/parentsteachers/lessonplans/lesson4.html

MATERIALS Chart paper

PREP FOR TEACHERS
- Cue the video.
- Encourage the class to pay close attention to the student problem-solving segments.

Note:
The concepts of ***patterns*** will be covered during this lesson. Students may need to review the concept prior to beginning the activities.

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

INTRODUCTORY ACTIVITY: SETTING THE STAGE
1. Present the class with a local rancher's problem of making sure the rancher has enough pastures for his or her herd of cattle.

2. The rancher explains to the class that at least 5 acres of land are needed for every cow. There are about 200 cattle. The rancher is negotiating land leases and needs to make sure that there will be enough land to sustain the herd.

3. Can you help this rancher? *Solution: At least 1,000 acres.*

MATH Can Take You Places

LESSON 15
"Ranchers and Patterns"
by Julie Morris

LEARNING ACTIVITIES

1. Set up a t-chart. Label one side "Number of cattle" and the other side "Number of acres." Get students started on entering the data on the chart by giving them two ordered pairs that fit the problem situation; for example, four cows would need how many acres? (*20 acres*) Then let the students continue entering data into the chart. Did the students agree on how much land the rancher needed to lease? *(1,000 acres*) Have them draw pictures to illustrate their answers, if necessary.

2. Have the class write an equation that represents a new problem situation. How much land would the rancher need if another 200 head of cattle are added to the herd? (*Multiply the 1,000 by 2 to get a solution of 2,000 acres.*)

3. Say: "Now let's explore some other data. We are planting a garden. Each student can plant three plants. How many plants do we need to purchase for the whole class (25) to participate?" *Solution: 75 plants.* "How many fewer plants would we need if only 17 students wanted to participate?" *Solution: 3 (25) – 3 (17) = 24 fewer plants.*

CULMINATING ACTIVITY

1. Watch video, *Math Can Take You Places* #005 "Patterns." Brainstorm other ways that patterns are used in the real world (for example, currency exchange, grocery shopping for things in bulk, etc.).

2. Allow students to develop and illustrate a problem using rates and ratios on their own, creating their own scenario. Have students exchange their problems and solve. Allow the class to vote for the most creative problem.

CROSS-CURRICULAR EXTENSIONS

Science

Compare weights in pounds on other planets. Ex: 1 pound on Earth equals 90 pounds on Venus. How much does 5 pounds on Venus weigh on the Earth?

Technology

Ask the technology instructor to teach students how to create a Microsoft Excel spreadsheet with formulas that automatically figures the amount of land needed for a set number of cows.

Language Arts

Use the "Cow Facts" link listed in Media Components section to create a trivia game.

REAL-WORLD CONNECTIONS

There are a number of real-world connections. For example, develop ratios for passengers to pieces of luggage, or carry-on luggage on an airplane to passengers. Plan a class camping trip where the students will sleep in cabins. There will be one adult chaperone to every 8 students. How many chaperones are needed if there are 74 students?

ASSESSMENT

For the final assessment, have students solve the following problem where students must apply problem-solving strategies:

A classroom needs 4 square feet per student. How big does the classroom need to be to accommodate 20 students (*80 sq. ft.)?* 28 students (*112 sq. ft.*)*?*

Possible lesson extensions would be to talk about the different dimensions (lengths and widths) that the room could be for the area needed to accommodate 20 students and 28 students

LESSON 15

"Ranchers and Patterns"

by Julie Morris

STUDENT HANDOUTS None

MATH Can Take You Places

LESSON 16
"The Snack Bar"
by Rhonda Bailey

CONCEPT AREA Patterns

GRADE LEVEL 6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will solve a real-life application problem involving proportional relationships. Students will work together to devise a problem-solving plan to analyze patterns and determine a reasonable solution to a consumer-related problem based on the restaurant industry.

LESSON ACTIVITIES OVERVIEW The lesson scenario is situated around a school snack bar that is organized and run by students. The students are responsible for ordering food and supplies based upon the different group sizes, such as a class with 25 students, a grade level with 100 students and the entire school body with 800 students. Students will also have to find the cost of purchasing the food and supplies and write equations that describe the totals.

LEARNING OBJECTIVES Students will be able to:

- Use ratios in a real-life problem-solving situation.
- Apply estimation skills to find reasonable results in a problem-solving situation.
- Write equations that describe a problem situation.
- Apply problem-solving strategies to determine the solution to a real-life problem-solving situation and effectively communicate their conclusions.

MEDIA COMPONENTS Video: *Math Can Take You Places* #005 "Patterns"

Internet:

Sample food label and explanation:
U.S. Food and Drug Administration http://vm.cfsan.fda.gov/~dms/foodlab.html

Student presentations:

Have students create a PowerPoint presentation of their snack bar's "Grand Opening," detailing the behind-the-scenes managerial story, such as ordering the supplies and the food.

Have students create spreadsheets and graphs of the data and write a group report of the problem scenario. Students can also insert the charts or graphs into the PowerPoint presentation.

MATERIALS

- Activity/Recording sheets
- Chart paper
- Markers
- Meter sticks or ruler
- Calculator (optional)

PREP FOR TEACHERS • Write serving or package sizes where they are visible to all students or bring in packages of each item and set up stations around the room.

- Hot dogs/franks
- Hot dog buns
- 2-liter soft drinks

- Styrofoam or paper cups
- Mustard (squeeze bottle)
- Ketchup
- Relish or other condiments
- Napkins
- Snacks
- Use pictures of the items listed or empty cleaned packages if the actual items are unavailable. The "Foods, Condiments, and Supplies Descriptions" list also has mock prices and serving sizes, if needed.

Situate students in groups of three to four. Distribute two sheets of chart paper, markers and a meter stick to each group.

Distribute two activity/recording sheets to each student. Each group will be assigned two items from the list on which to work; for example: hot dogs and bottle of ketchup.

Note:
The following concepts will be covered during this lesson: ***proportion***, ***fractions***, ***ratio*** and ***estimation***. Students may need to review the concepts prior to beginning the activities.

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Tell students that today they are going to prepare for the "Grand Opening" of a student-run snack bar for their school. Say, "Listen closely to the video as Mrs. Garcia explains what we are going to do today." **Play** the video *Math Can Take You Places* video #005 "Patterns" from the beginning. **Pause** after the blue chart graphic leaves the screen and before Chef Koval begins speaking.
2. Ask students to brainstorm some ideas on what information they will need to know before they buy the food for the snack bar. Then, ask the following questions:

   a. Why do you think we should open our snack bar with a limited number of items on the menu versus a large variety of items on the menu?
   b. Why do you think that it is important to have an estimate of the amount of food, condiments and supplies before you open the snack bar?
   c. What information would be helpful in determining an estimate of the amount of food, condiments and supplies that will be needed to open the snack bar?
   d. What information will help your group determine whether you should expand the number of items sold at the snack bar?

4. Students are responsible for ordering the food, condiments and supplies. The snack bar will open for business with limited items on the menu: hot dogs, drinks and various snacks. Their group is responsible for creating a purchase order for the food, condiments and supplies and presenting that information to the class. Students will organize and make projections for growth and the addition of new items to the menu.
5. Each group will create a name for the snack bar, then report to the class how it solved this problem. Additional time for this problem/lesson can be given if students are asked to create a PowerPoint presentation, spreadsheet or extended presentation.

MATH Can Take You Places

LESSON 16
"The Snack Bar"
by Rhonda Bailey

LEARNING ACTIVITIES

1. Work with your group to complete the purchase order for the "Grand Opening" of the school snack bar (on chart paper).

2. Write the ratios, as fractions, for the number of servings (food item, the condiments and the supplies) per package. Have students locate the suggested serving size on each of the condiments. It is important to remember that the package or serving size will vary for each item purchased**.**

Example: There are eight servings in one package of hot dog buns, so the ratio is 8:1.

3. Using the ratio for each item (food, condiments or supplies) complete each table that shows an estimate of the number of packages (bottles of mustard) of each item needed and the number of servings. Using the cost of each item, find the total cost for purchasing each item for the number of servings given.

Example: The hot dog buns are sold eight to one package, and let's say one package of buns costs $1.50.

Number of Servings	Process to find estimate (based on ratio)	Number of pkgs. or containers	Process to find the total cost	Total cost (dollars)
8	8:1	1	1 * 1.50	1.50
n				*t* =

4. Write an equation that describes the estimated number of packages of each item. In this equation, which quantity causes the other quantity to change? Explain your reasoning.

5. Write an equation that describes the cost of the items to be purchased. In this equation, which quantity causes the other quantity to change? How is this different from the situation in Question 3?

6. Explain the effect that the number of servings has on the total cost. Write an equation for each item that shows how you find the total cost given the number of servings.

CULMINATING ACTIVITY

Each group will use the information from Question 6 to write up its part of the purchase order for the two items that were assigned to the group. If two groups that were assigned the same items do not have the same solutions, the class must come to consensus about ordering the items. The class will combine the information of all the items to write one class purchase order.

CROSS-CURRICULAR EXTENSIONS

Health/Science

Students will investigate nutritional information about the food that will be sold in the snack bar. Have students make modifications to the menu to reflect a nutritionally-balanced menu.

Consumer Awareness

Have students do comparison shopping using newspaper/grocery store fliers.

LESSON 16
"The Snack Bar"
by Rhonda Bailey

REAL-WORLD CONNECTIONS Ask a restaurant manager or chef to visit the class and share how he/she uses mathematics in his/her profession. Have students write a proposal for a fund-raiser that includes information related to the lesson. Have students set a sales goal and discuss how they would decide on a selling price in order to reach that sales goal.

ASSESSMENT Look for the following evidence in the students' work:
1. Students should demonstrate an understanding of using ratios to describe a proportional situation and use that information to solve a real-life problem.
2. Students should be able to write an equation using a variable as an unknown that describes the problem situation.
3. The student should be able to effectively communicate his/her ideas about the problem situation.

STUDENT HANDOUTS
Snack Bar Activity Sheet
The Snack Bar Data Sheets
Foods, Condiments, and Supplies Sheet (optional)

The Snack Bar

1. Locate the serving or package size on each item. Write the ratio of serving or package size as a fraction.

2. Using the ratio for each item (food, condiments or supplies), complete the table that shows an estimate of the number of packages (bottles, etc.) of each item needed.

3. The unit cost of the item is _____ per _____.
   Using the unit cost of each item, find the total cost for purchasing each item for the number of servings given.

4. Write an equation that describes the estimated number of packages of each item. In this equation, which quantity causes the other quantity to change? Explain your reasoning.

5. Write an equation that describes the cost of the items to be purchased. In this equation, which quantity causes the other quantity to change? How is this different from the situation in Question 3?

6. Explain the effect that the number of servings has on the total cost. Write an equation for each item that shows how to find the total cost, given the number of servings.

Data Sheet: Hotdogs and Buns

Hotdogs: Cost per package_____
Servings per package_____
Ratio of servings in one package_____

Number of Packages	Number of Servings per Package	Number of People Serving	Total Cost of the Packages
1		5	
		40	
		120	
		560	
		Any number of people (n)	C =

Buns: Cost per package_____
Servings per package_____
Ratio of servings in one package_____

Number of Packages	Number of Servings per Package	Number of People Serving	Total Cost of the Packages
1			
		40	
		120	
		560	
		Any number of people (n)	C =

Data Sheet: Drinks/Cups/Plates

Drinks: Cost per container_____
Servings per package_____
Ratio of servings in one package_____

Number of Containers	Number of Servings per Container	Number of People Serving	Total Cost of the Containers
1			
		40	
		120	
		560	
		Any number of people (n)	C =

Cups: Cost per package_____
Servings per package_____
Ratio of servings in one package_____

Number of Packages	Number of Servings per Package	Number of People Serving	Total Cost of the Packages
1			
		40	
		120	
		560	
		Any number of people (n)	C =

Plates: Cost per package_____
Servings per package_____
Ratio of servings in one package_____

Number of Packages	Number of Servings per Package	Number of People Serving	Total Cost of the Packages
1			
		40	
		120	
		560	
		Any number of people (n)	C =

Data Sheet: Ketchup and Relish

Ketchup: Cost per bottle_____
Servings per package_____
Ratio of servings in one package_____

Number of Bottles	Number of Servings per Bottle	Number of People Serving	Total Cost of the Bottles
1			
		40	
		120	
		560	
		Any number of people (n)	C =

Relish: Cost per jar_____
Servings per package_____
Ratio of servings in one package_____

Number of Jars	Number of Servings per Jar	Number of People Serving	Total Cost of the Jars
1			
		40	
		120	
		560	
		Any number of people (n)	C =

Data Sheet: Cookies

Cookies #1: Cost per package_____
Servings per package_____
Ratio of servings in one package_____

Number of Packages	Number of Servings per Package	Number of People Serving	Total Cost of the Packages
1			
		40	
		120	
		560	
		Any number of people (n)	C =

Cookies #2: Cost per package_____
Servings per package_____
Ratio of servings in one package_____

Number of Packages	Number of Servings per Package	Number of People Serving	Total Cost of the Packages
1			
		40	
		120	
		560	
		Any number of people (n)	C =

The Snack Bar
Food, Condiments, and Supplies Descriptions

Item	Cost	Servings Per Package
Hot Dogs	$2.00	10
Buns	$1.68	8
Juice	$1.92	6
Cups	$1.87	50
Plates	$.94	40
Ketchup	$.92	23
Relish	$1.22	22
Cookies #1	$2.46	8
Cookies #2	$1.50	30

Purchase Order

Item	Quantity	Unit Cost	Total Cost
Hot dogs/franks			
Hot dog buns			
Bottles of ketchup			
Bottles of mustard			
Relish			
2-liter bottles of soft drinks			
Cups			
Napkins			
Snacks			
Total Order			

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 16

"El Kiosco de Meriendas"

by Rhonda Bailey

El Kiosco de Meriendas

1. Encuentra la porción o el tamaño del paquete de cada artículo. Escribe la razón de la porción ó el tamaño del paquete como una fracción.

2. Usando la razón para cada artículo (comida, condimentos u otros elementos necesarios), completa la tabla que muestra un estimado del número de paquetes (botellas, etc.) de cada artículo que se necesita.

3. El costo del artículo por unidad es _____ por _____. Usando el costo del artículo por unidad, encuentra el costo total de cada artículo de acuerdo con el número de porciones dadas.

4. Escribe una ecuación que describa el estimado del número de paquetes de cada artículo. En esta ecuación ¿Cual cantidad causa que cambie la otra cantidad? Explica tu razonamiento.

5. Escribe una ecuación que describa el costo de los artículos para comprar. En esta ecuación ¿Cual cantidad causa el que la otra cantidad cambie? ¿Cómo se diferencia esta situación a la de la situación en la Pregunta 3?

6. Explica el efecto que el número de porciones tiene en el costo total. Escribe una ecuación para cada artículo que muestra cómo encontrar el costo total, de acuerdo al número de porciones.

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 16

"El Kiosco de Meriendas"

by Rhonda Bailey

Orden de Compra

Artículo	Cantidad	Costo por Unidad	Costo Total
Salchichas/franks			
Pan para salchichas			
Botellas de ketchup			
Botellas de mostaza			
Condimento			
Refrescos en botellas de 2- litros			
Vasos			
Servilletas			
Bocadillos			
Total de la orden			

MATH Can Take You Places

LESSON 17
"Is Your Money Rolling Away"
by Debbie Miskiewicz

CONCEPT AREA Problem Solving

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will engage in problem-solving situations that make them more aware of their roles as consumers.

LESSON ACTIVITIES OVERVIEW Students will determine the best purchase price of a product in a problem-solving situation.

LEARNING OBJECTIVES Students will be able to:
- Determine the reason for solving the problem.
- Devise a plan for solving the problem.
- Utilize a variety of strategies to solve the problem.

MEDIA COMPONENTS Video: *Math Can Take You Places* #004 "Problem Solving"
Internet:

Consumer Reports 4 Kids http://www.zillions.org/

First Gov For Kids: Money and Finance http://www.kids.gov/k_money.htm

United States Mint H.I.P. Pocket Change
http://www.usmint.gov/kids/index.cfm?fileContents=teachers/nickelLessons.cfm

MATERIALS
- Graph
- Rulers
- Two colored pencils
- Variety of boxes of fruit rolls (chocolate candies for Spanish version)
- Calculators to check work
- Balance for measuring

PREP FOR TEACHERS Teachers will need to purchase any brand of fruit rolls of varying quantities.

Note:
The following concepts will be covered during this lesson: ***volume***, ***weight***, ***metric units of measurement*** and ***customary units of measurement***. Students may need to review the concepts prior to beginning the activities.

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities. They may also need to review how to read a ruler and a balance.

MATH Can Take You Places

LESSON 17

"Is Your Money Rolling Away"

by Debbie Miskiewicz

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Students enter the classroom. The teacher has placed an individually-wrapped fruit roll, a regular box and a family box of fruit rolls on the table at the front of the classroom.

2. A message is posted either on the chalkboard or overhead that reads, "Analyze these boxes and prices!" Students begin to write down their findings. How are the flavors of fruit rolls packaged? What is the number of fruit rolls in each box? Which purchase is the better buy? Students will also justify their reasoning to each question. The class will have a discussion about the fruit rolls.

LEARNING ACTIVITIES

Watch the video *Math Can Take You Places* #004 "Problem Solving". Ask students to listen closely and be able to name three problem-solving strategies. Stop the video after the students on screen list several strategies. Discuss as a class.

Students will solve a real-life problem.
1. Do you want to buy the fruit rolls in regular bulk, family bulk or individually? Help students think through this question by creating charts for each of the three different costs of the fruit rolls. For example, individually, the fruit rolls cost $.28. For a regular box of 10, the price is $2.56. For a family box of 24, the price is $4.98. For example, students may calculate the cost on each of the graphs of one fruit roll, five, 10, and so on.

Sample Chart (for the regular box):
Cost of the entire box: $2.56 – Number of rolls in the box: 10

Number of Fruit Rolls	Estimated Total Cost of These Fruit Rolls
1	$.26
5	$1.30
10	$2.60
25	$6.50

2. What is the unit price for a fruit roll from a family box? From a regular box?

3. You have a coupon for $0.25 off a fruit rolls family box or two regular boxes. How would you justify which use of the coupon gets the consumer the better buy?
4. If you need 63 fruit rolls for a grade-level party, what is the most cost-effective way to purchase this amount?

5. Students will use graph paper, colored pencils and a ruler to graph three different tables of data (total cost for those fruit rolls vs. the total cost for those fruit rolls), accounting for the three different unit prices.

CULMINATING ACTIVITY

1. Students will use grocery store fliers to compare prices of products sold at each store.

2. Students will verify all box measurements for accuracy. They will evaluate how the box was measured for volume and weight (standard or metric). The students will need balances to weigh fruit rolls.

LESSON 17
"Is Your Money Rolling Away"
by Debbie Miskiewicz

CROSS-CURRICULAR EXTENSIONS

Language/Writing
- (How to) How does a consumer make the best purchase?
- (Persuasive) Persuade your reader to buy a store brand or name brand box of fruit rolls.
- (Descriptive) Use each of your senses to describe a fruit roll.

Science
- Is the fruit roll a nutritional snack? What standard does the FDA set that determines whether a fruit roll is a nutritional snack or junk food?

REAL-WORLD CONNECTIONS

Have guest speakers, including retail buyers, grocery store managers, dieticians and parent experts, visit to speak to the class.

ASSESSMENT

Assessments are ongoing through student activities. Teachers will need to design their own rubric for grading.

STUDENT HANDOUTS

"Is Your Money Rolling Away" Activity Sheet

MATH Can Take You Places

LESSON 17

"Is Your Money Rolling Away"

by Debbie Miskiewicz

Name_____ Date _____

Activity Sheet

1. Fill in the chart below using information for an individual fruit roll.

Cost of an individual fruit roll: _____

Number of Fruit Rolls	Estimated Total Cost of These Fruit Rolls
1	
5	
10	
25	

2. Create charts like the one above for the regular box and the family-sized box of fruit rolls. Be sure to write down the cost of each type of box and the number of fruit rolls in each.

3. What is the unit price for a fruit roll from a family box?

   From a regular box?

4. You have a coupon for $0.25 off a fruit rolls family box or two regular boxes. How would you justify which use of the coupon gets the consumer the better buy?

5. If you need 63 fruit rolls for a grade-level party, what is the most cost-effective way to purchase this amount?

6. Use words to describe how you would find the cost of 100 individually-wrapped fruit rolls.

7. Write a number sentence to explain how you could calculate the cost of an unknown number of fruit rolls at an unknown cost.

MATH Can Take You Places

LECCIÓN 17

"¿Está Tu Dinero Rodando De Tus Manos?"

by Debbie Miskiewicz

Te Lleva a Muchos Lugares

Nombre_____ Fecha _____

1. Completa la tabla de abajo usando la información de un dulce de chocolate individual.

Costo de un dulce de chocolate individual

Numero de Dulces de Chocolate	Costo Total Estimado de Estos Dulces
1	
5	
10	
25	

2. Crea tablas como la de aquí arriba para una caja regular y una caja familiar de dulces de chocolate. Asegúrate que escribas el costo de cada tipo de caja y el número de dulces de chocolates que hay en cada una.

3. ¿Cuál es el precio por unidad de cada caja familiar de dulces de chocolates?

   ¿De una caja regular?

4. Tú tienes un cupón de $0.25 de descuento para una caja familiar de dulces de chocolates ó dos cajas regulares. ¿Cómo justificarías cual uso del cupón le será al consumidor la mejor compra?

5. Si tú necesitas 63 cajas de chocolates para una fiesta en tu aula, ¿cuál es la manera más ahorrativa para comprar esta cantidad?

6. Usa palabras para describir como tu podrás calcular el costo de 100 dulces de chocolates individuales.

7. Escribe una oración numérica que explica como tú podrás calcular un número desconocido de dulces de chocolates con un precio desconocido.

MATH Can Take You Places

LESSON 18
"Math Game Night"
by Monica Abrams

CONCEPT AREA Problem Solving

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Plan the room arrangement for Family Game Night.

LESSON ACTIVITIES OVERVIEW Students will find out how many games and tables will be used at Family Game Night and then use that information to make a diagram of the room. They will use base-ten blocks to show arrangement and evaluate the arrangement.

LEARNING OBJECTIVES Students will be able to:
- Use a problem-solving model to complete the problem.
- Draw and make a diagram to show completion of the problem.
- Evaluate arrangement.

MEDIA COMPONENTS Video: *Math Can Take You Places* #004 "Problem Solving"

MATERIALS
- Tens from base-ten blocks
- Paper for diagram

PREP FOR TEACHERS
- Decide which room could be used for Family Game Night.
- Have an idea of how many tables are in the room and how many games will be played.

Note:
If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Say, "The principal has asked this class to help plan the room arrangements for a Family Game Night."

2. Take the class on a tour of the room in which Game Night will be held. Let the students brainstorm to decide what games they would like to play.

3. Ask, "Now that we've compiled a list of games we may want to include in our Game Night, what else will we need to know to be able to arrange the room?" Talk about tables, the number of games that will be played and other things the students need in order to arrange the tables.

LEARNING ACTIVITIES

1. Students need to find out how many classes there are and how many games each class or grade level will have. Tell the students how many tables will be available to use that night. With this information, divide the students into groups. Each group will take the information and decide the best way to solve the problem of how to arrange the tables.

2. **Cue** the *Math Can Take You Places* video #004 "Problem Solving" to when Ms. Garcia says, "On our map, we have …" and walks towards the map on the board. Ask students to listen carefully to the problem-solving strategies that the students suggest. **Play** the video until Laura Stanforth says, "OK, never mind. Now, I've got it. Thanks." Ask students whether any of the strategies listed could possibly help them solve their room arrangement problem. Guide them to select the problem-solving model of making and drawing a diagram or picture to complete this problem. Give each group base-ten blocks, the same number of tens as tables. Use the tens of the base-ten blocks to show the arrangement of the room. This needs to be done on the desks.

3. Have the group members walk around to look at other groups' arrangements to evaluate which one would be the most useful. Using that group's arrangement, draw a diagram showing the arrangement. Then decide on the number of games that will be on each table.

4. Will this arrangement still work with this number of games? If not, work on another arrangement that may work.

CULMINATING ACTIVITY

1. Have a Family Game Night and use the arrangement the class developed.

2. As an extension, have students use yardsticks to measure the area of the intended Game Night room. Use one-inch grid paper, where one square inch equals one square foot. Also, allow students to measure the area of the tables they will be using. Use one-inch color tiles to represent the area of the tables. Work with students to create a scale model of the game-room area.

CROSS-CURRICULAR EXTENSIONS

Language Arts/Art
Make advertisements for Family Game Night.

Encourage students to use the library and the Internet to research the origins of different games that students are familiar with, such as video games and pinball machines. Have students present their findings to the class.

REAL-WORLD CONNECTIONS

Using the class's arrangement for Family Game Night.

ASSESSMENT

Did the arrangement work with the dimensions of the room and the number of games used? Was there enough room to walk around and play all of the games? How many people were able to walk around and play the games?

STUDENT HANDOUTS

None

MATH Can Take You Places

LESSON 19
"Party Time"
by Elsie Sneed

CONCEPT AREA Problem Solving

GRADE LEVEL 4-6

TIME ALLOTMENT Two or three 60-minute sessions

LESSON OVERVIEW In this lesson, students will plan an end-of-the-school-year party at the Adolphus Hotel.

LESSON ACTIVITIES OVERVIEW Students will create a survey to solicit responses from the students in their grade to help them plan a party. Students will determine the favorite menu, music, theme and party favors, then develop a step-by-step party-planning guide.

LEARNING OBJECTIVES Students will be able to decide the problem-solving model that is appropriate for developing a successful and fun event.

MEDIA COMPONENTS Video: *Math Can Take You Places* #004 "Problem Solving"

MATERIALS

- Large poster or 1" graph paper
- Pencils
- Sticky notes 4" x 4"
- Markers
- Scissors
- Tape
- Graph paper 8 ½" x 11"

PREP FOR TEACHERS

- Prepare survey sheets
- Cue video

Note:
The concept of ***ratio*** will be covered during this lesson. Students may need to review the concept prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Students will survey the class to find out what type of party theme, music, food and party favors they want most. Take suggestions from the students, and have them vote for the top three for each category. If other classes in the same grade are available, please make them a part of your survey.

2. As a class, use the one-inch graph paper to make a bar graph to display the results of the survey.

LEARNING ACTIVITIES

1. Say: "Now that we know what type of party the students want, there is a lot of planning to be done. We will divide into four different Party Committees to make the plans for the event. Each group will come up with a plan for providing each of our four items: party theme/decorations, music, food and party favors. As you are planning, make sure to keep in mind that we don't have a lot of money, so try to spend as little as possible."

2. Divide the students into four groups. Give them about 10 minutes to brainstorm what their very first steps should be. Share those answers aloud.

3. Once each group has some idea of where to start, let the students in the group begin to work to devise their plans. Provide catalogs or Internet access for students to use to be able to determine prices of items needed. Walk around and facilitate the planning among the groups. To make the problem solving more difficult, give each group a specific dollar amount as a spending limit. For example, the decorations group may have a budget of $50.

CULMINATING ACTIVITY

1. After students have completed their plans, discuss them briefly as a class.

2. Have groups discuss and list what steps they had to take to come up with their plans.

3. Say: "You now have a detailed list of steps that you took to plan what you are going to do for our class party. All of the groups have discussed what they've done to make sure the party will be a success. Imagine your little brother's class wants to plan a party, too. Let's come up with some general steps his class can follow from what we've learned."

4. List all of the ideas the students have, as they are suggested. Discuss what we could have done differently to make the planning go smoother, so we can offer the next group some helpful hints.

5. Have a party!

CROSS-CURRICULAR EXTENSIONS

Language Arts
Create a "Party Planning" book with the general steps in the front, the individual steps listed in different sections and the helpful hints throughout. Let students illustrate.

REAL-WORLD CONNECTIONS

Students assist in planning an actual party at school.

Watch the video, *Math Can Take You Places* #004 "Problem Solving" with Laura Stanforth. Discuss how she uses problem solving in her job. Brainstorm other ways problem solving is used in other familiar occupations.

ASSESSMENT

Party Time Quiz

STUDENT HANDOUTS

Party Survey sheet
Problem-solving sheets

Party Survey

Favorite Music	Number	Ratio
a.		
b.		
c.		
d.		

Party Survey

Favorite Foods	Number	Ratio
a.		
b.		
c.		
d.		

Party Survey

Favorite Theme	Number	Ratio
a.		
b.		
c.		
d.		

Party Survey

Favorite Transportation	Number	Ratio
a.		
b.		
c.		
d.		

MATH Can Take You Places

LESSON 19
"Party Time"
by Elsie Sneed

Name_____ Date_____

Party Time Quiz!

1. The students would like to have plenty of room to do their favorite dancing. The room is 50 ft. x 50 ft., but there are tables in a 20 ft. x 30 ft. area. The students need 1,500 square feet for dancing. Will there be enough room? Please explain your answer and show your work!

2. Chartering a bus for the party will cost $85.00 for the first three hours and $25.00 for each additional hour. The bus will arrive at the school at 6 p.m. to take the students to the Adolphus Hotel and will return to the school at 10:30 p.m. The party committee has allotted $140.00 to pay for the bus. Did it allow enough money to pay for the bus? Please explain your answer.

3. The principal would like to have an adult chaperone for every ten students attending the party. If 167 students will be attending the party, how many adult chaperones will the principal need? Please solve this problem two different ways.

4. The beverage for the party is a special mixture of juices and a fruit concentrate. One pint of the concentrate will make two gallons of the beverage. How many pints of the concentrate will be needed to make 20 gallons of the beverage?

Party Time Quiz
Answer Key

1. There will be enough room for dancing because the room is 2500 square feet. and the area for tables is 600 square feet, so 2500 – 600 = 1900 square feet available for dancing.

2. Yes. The bus trip will take 4 and ½ hours, so it will cost either $135 or $122.50, depending upon whether the bus company charges $25 for the last half-hour or $12.50 for it.

3. 17

4. 10 pints

MATH Can Take You Places
Te Lleva a Muchos Lugares

LESSON 19
"La Fiesta"
by Elsie Sneed

Encuesta de la Fiesta

Música Favorita	Número	Relación
a.		
b.		
c.		
d.		

Encuesta de la Fiesta

Comidas Favoritas	Número	Relación
a.		
b.		
c.		
d.		

LESSON 19
"La Fiesta"
by Elsie Sneed

Encuesta de la Fiesta

Tema Favorito	Número	Proporción
a.		
b.		
c.		
d.		

Encuesta de la Fiesta

Transporte Favorito	Número	Relación
a.		
b.		
c.		
d.		

MATH Can Take You Places
Te Lleva a Muchos Lugares

LESSON 19
"La Fiesta"
by Elsie Sneed

Nombre_____ Fecha_____

¡Preguntas sobre la Fiesta!

1. A los estudiantes les gustaría tener mucho espacio para su baile favorito. El salón tiene 50 pies x 50 pies, pero las mesas ocupan un área de 20 pies x 30 pies. Los estudiantes necesitan 1,500 pies cuadrados para bailar. ¿Habrá suficiente espacio en el salón? Por favor explica tu respuesta y muestra tu trabajo.

2. El alquiler de un ómnibus cuesta $85.00 por las primeras tres horas y $25.00 por cada hora extra. El ómnibus llegará a la escuela a las 6 p.m. para llevar a los estudiantes al Hotel Adolphus y regresará a la escuela a las 10:30 p.m. El comité para la fiesta ha destinado $140.00 para pagar por el ómnibus. ¿Hay suficiente dinero para pagar por el ómnibus? Por favor explica tu respuesta.

3. Al director le gustaría tener un adulto por cada diez estudiantes que vayan a la fiesta. ¿Si 167 estudiantes van a ir a la fiesta, cuántos adultos chaperones necesita el director? Por favor resuelve este problema de dos maneras diferentes.

4. La bebida para la fiesta es una mezcla especial de jugos y un concentrado de fruta. Un octavo de galón del concentrado sirve para hacer dos galones de bebida. ¿Cuántos octavos de concentrado se necesitarán para hacer 20 galones de bebida?

MATH Can Take You Places

LESSON 20
"How Much . . .?"
by Sabrina McCullough

CONCEPT AREA Problem Solving

GRADE LEVEL 5

TIME ALLOTMENT Three to five 60-minute sessions

LESSON OVERVIEW A soccer team would like to purchase warm-up suits for each player on the team. In order to do so, the team must raise money. The students will sell food to raise money. Students will decide how much food to purchase and how much charge for it. When the fund-raiser is over, the students will determine whether they made enough money to purchase the suits for each player.

LESSON ACTIVITIES OVERVIEW Students will generate a list of food items and take a field trip to a wholesale retailer.

LEARNING OBJECTIVES Students will be able to:

- Decide and create a list of items to sell.
- Determine how much of each item should be purchased.
- Determine how much to sell each item for.
- Calculate earnings.
- Evaluate the cost per player.
- Determine if enough money has been raised to buy warm-up suits.

MEDIA COMPONENTS Video: *Math Can Take You Places* #004 "Problem Solving"

Websites for warm-up suit prices:
http://www.recreational-products.com/Warm-Up_Suits/Warm-Up_Jacket_.html

http://www.school-uniforms-store.com/cheerleader-warrunsuitbr.html

http://thestore.adidas.com/cgi-bin/adilive/b2c/index.w?location=b2c/browse.w%3Ftype%3Ddag%26code%3DAM%26silht%3DA0006%26promo%3Doverstor

MATERIALS Per class:

- Literature book: *How the Second Grade Got $8,205.50 to Visit the Statue of Liberty*, by Nathan Zimelman.
- Bus (for the field trip)

Per group of four:

- Calculators
- Pencil and paper

Per student:

- Calculators
- Activity sheets (1, 2 and 3)

MATH Can Take You Places

LESSON 20
"How Much . . .?"
by Sabrina McCullough

PREP FOR TEACHERS

- Call ahead or use the websites listed under "Media Components" to find the cost per suit.
- Make arrangements for the field trip (optional).
- Modification: Visit a wholesale retailer before conducting the lesson and compile a list of possible food items. Give the students a copy of the list without the prices and quantities, so that they may make their choices based solely on preference. See if any of their choices change after they are shown the prices and quantities.
- Make copies of worksheets 1, 2 and 3 for each student.
- Purchase or check out the literature book.

Note:
The following concepts will be covered during this lesson: **profit**, **wholesale price**, **retail price**, **quantity and profit**. Be prepared to discuss and review the concepts during the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Read the book, ***How the Second Grade Got $8,205.50 to Visit the Statue of Liberty*, by Nathan Zimelman,** and write down all new vocabulary words.
2. Discuss the terms and check for understanding of each word.

LEARNING ACTIVITIES

Day One

1. After reading the story, ask the students the following questions:
   a. What is the main idea of the story?
   b. What is the problem in the story?
   c. What is the solution to the problem?

It is very important to ask the right kinds of questions in order to get students to think and respond in a productive way. Once discussion has taken place, write down all vocabulary words and the meanings (using context clues).

2. Divide students into groups of three to four. Say, "The students in the story were trying to raise money, and so are we. Pretend that our school soccer team of 15 students needs money to purchase new warm-up suits. We want to create a concession stand and sell food to raise the money. Discuss in your groups what food items you think we should sell." Probe the students to start a list within their groups first. Give the students 7 to 10 minutes. Once each group has completed its list, come together as a class to make a general class list for all to copy. The general list will be used on the field trip to gather prices and determine the cost.

3. Have students take notes as you briefly discuss "profit," "wholesale price," "retail price" and "quantity." Explain to students that the "profit" is the difference between how much we paid for the item and how much we sell the item for. The "wholesale price" is basically how much we actually pay for the items, and "retail" is what we charge people to buy the items. "Quantity" means "how many." In this case, it is the number of items that we get for the cost. Help the students understand that we want to sell the items that give us the biggest profit.

Day Two

4. During the field trip, spend a few minutes explaining to students how to read the item price markers. Point out that the price, the name of the product and the number of servings (or the quantity in the package) are all listed. Allow students to separate into groups to locate the items. (Teacher's Note: Make sure that the students are adequately chaperoned at all times.) Students can work from the list of items they created to get them started, but allow them to add other items they come across that they think may be good to sell. Students will write in up to ten items on the "Items, Costs and Quantities" worksheet. Give them a time limit to gather their item information while in the store (for example, 30 minutes). Fill in the chart with items, their costs and quantity per unit. To keep it simple, do not include sales tax.

5. If time permits, come back together as a class when the item search is completed. Allow the groups to share any new discoveries or surprises.

CULMINATING ACTIVITY

Day Three

6. Students will work in their groups during class to complete the remainder of the chart items, using a calculator to answer the questions. Work the sample item at the top of the "Items, Costs and Quantities" sheet with the students before they begin. Complete additional examples if further clarification is needed. Monitor students closely as they work, making sure to answer any questions and intervene when necessary.

7. After the groups have filled in their charts, ask them to move on to answering the "Wrap Up Questions" on the worksheet. Discuss the answers as a class. Compile a listof the class's top five highest moneymaking items.

CROSS-CURRICULAR EXTENSIONS

Language Arts

- The students will use context clues to determine meaning of words.
- The students will describe the main idea, the problem in the story and the solution.
- Encourage the students to write and illustrate their own stories about how they would raise money for the soccer team, incorporating their experiences with this activity.

REAL-WORLD CONNECTIONS

The students will take a field trip to a wholesale retail store. Actually allow the class to open a concession stand to help raise money for a class field trip. Conclude the activity with the following open-ended questions:

1. What was the total amount of time spent working the concession stand?
2. How much money was raised working the concession stand?
3. On the average, about how much money was raised per hour?
4. How much was spent on purchasing the items for the concession stand?
5. What is the total cost of the suits and bags for the entire team?
6. Was there enough money to make the purchase? How do you know? Show all work and explain.

ASSESSMENT

Quiz students on the definitions of the four vocabulary words defined in "Learning Activities" #3. Ask them for examples as well as the definitions.

LESSON 20

"How Much . . .?"

by Sabrina McCullough

STUDENT HANDOUTS
Soccer Concession Stand "Items, Costs and Quantities"
Soccer Concession Stand "Wrap Up Questions"

MATH Can Take You Places

LESSON 20

"How Much . . .?"

by Sabrina McCullough

Name_____ Date_____

Soccer Concession Stand

Items, Costs and Quantities

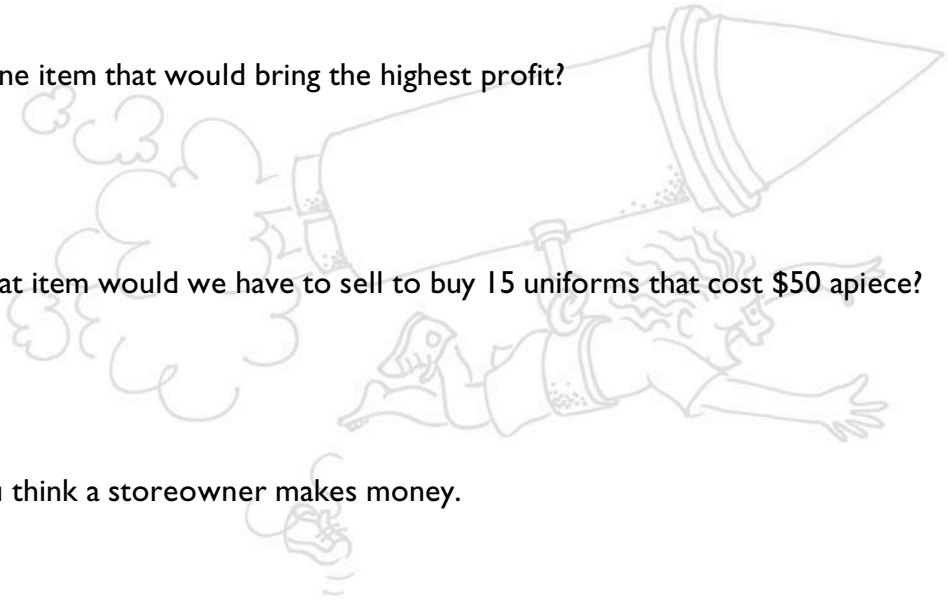
A. Item	**B. Cost**	**C. Quantity** (How many of each item comes in a package?)	**D. What is the cost per item?** ("B" divided by "C")	**E. Retail Price** (How much would you sell each item for?)	**F. Profit For Each Item Sold** ("E" minus "D")
Sample: Cupcakes	$4.75	10	$4.75 / 10 = about .48	$1.00	1.00 - .48 = **.52**
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Name_____ Date_____

Soccer Concession Stand
Wrap-Up Questions

1. According to your data, which five items would create the highest profit?

2. What was the one item that would bring the highest profit?



3. How many of that item would we have to sell to buy 15 uniforms that cost $50 apiece?

4. Explain how you think a storeowner makes money.

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 20

"¿Cuánto Cuesta . . .?"

by Sabrina McCullough

Nombre_____ Fecha_____

Concesionaria del Fútbol

Productos, Precios y Cantidades

A. Producto	B. Precio	C. Cantidad (¿Cuántos unidades del producto vienen por paquete?)	D. ¿Cuánto cuesta cada unidad? ("B" dividido por "C")	E. Precio al Público (¿A cuánto venderías cada unidad?)	F. Ganancia por cada producto vendido ("E" menos "D")
Muestra: Pastelitos	$4.75	10	$4.75 / 10 = cerca de .48	$1.00	1.00 - .48 = .52
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 20

"¿Cuánto Cuesta . . .?"

by Sabrina McCullough

Nombre_____ Fecha_____

Puesto en la cancha de Fútbol

Preguntas para Resumir

1. ¿De acuerdo a tus datos, cuáles son los cinco productos que darán más ganancia?

2. ¿Cuál es el producto que daría la ganancia más alta?

3. ¿Cuántos productos como éste tendríamos que vender para comprar 15 uniformes que cuestan $50 cada uno?

4. Explica cómo piensas que el dueño de un negocio hace dinero.

MATH Can Take You Places

LESSON 21
"A Scheduling Dilemma"
by Rhonda Bailey

CONCEPT AREA Problem Solving

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will investigate a real-life problem situation involving an Amtrak Train.

LESSON ACTIVITIES OVERVIEW Groups of students will work together on a train-scheduling problem in which the Amtrak Train agent has only 3 seats available to sell, but has 4 passengers who need reservations to 4 different destinations. The students will use the Amtrak Route Map, Seat Map and Train Schedule to come up with a solution that will allow all 4 passengers to get to their destinations.

LEARNING OBJECTIVES Students will be able to:

- Use the four-step problem-solving model to solve a real-life application problem
- Use an appropriate problem-solving strategy to solve the problem
- Write a solution to the problem situation, justifying why their solution is reasonable

Students must use correct labels and units throughout the problem-solving process, which includes the solution.

MEDIA COMPONENTS Video: *Math Can Take You Places* #004 "Problem Solving"

Internet:

An extensive list of links to websites containing rubrics can be found at www.rubrician.com.

Let students investigate 3 x 3 "Magic Squares" problems or other puzzle problems involving arrangements.
http://mathforum.org/alejandre/magic.square/loshu1.html\

You can find interesting mathematics problems for various grade levels at Grace Church School's ABACUS International Math Challenge at
http://www.gcschool.org/pages/program/Abacus.html.

For Amtrak scheduling information or to order booklets containing schedules
http://www.amtrak.com/plan/timetables.html

For Amtrak route maps
http://www.amtrak.com/destinations/index.html

MATERIALS

- Amtrak Seat Map (optional)
- Amtrak Route Map (optional)
- Amtrak Train schedule
- Color tiles to represent the 4 passengers
- "A Scheduling Dilemma" student activity sheet system

LESSON 21
"A Scheduling Dilemma"
by Rhonda Bailey

PREP FOR TEACHERS

- Arrange students in groups of 3 or 4 and distribute sets of materials to each group.
- Each student should have his or her own activity sheet.

Note:
If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Discuss with students how it might be possible to sell two train tickets for the same seat on a train.

2. Ask students to look at the Amtrak Route Map and Train schedule. Ask students to discuss how they might use the Route Map and Train schedule when planning to ride the train.

3. Make sure that students understand they must use the four-step problem-solving process. It may be necessary to review this process.
   a. Understanding the problem
   b. Making a plan
   c. Carrying out the plan
   d. Evaluating the solution for reasonableness

LEARNING ACTIVITIES

Students will work with their group to complete the "Scheduling Dilemma" activity sheet.

CULMINATING ACTIVITY

1. Students will present their scheduling solution to the class.
2. Student groups must show evidence of the problem-solving process in finding their solutions.

CROSS-CURRICULAR EXTENSIONS

Social Studies

Have students plan a train trip using the Amtrak Route Map. Students will compile a journal about the interesting places they visited during their train trip. Let students use the Internet to find photographs of the places they visited and incorporate the photos into their stories.

English Language Arts

Have students write a narrative describing a trip they would like to take on the Amtrak train, detailing why they have selected the particular train route and describing some of the destinations they will visit along the way.

REAL-WORLD CONNECTIONS

Students can investigate other situations that might involve scheduling dilemmas, such as scheduling employees to work in a store that is open from 9 a.m. to 9 p.m.

Have students talk about situations where putting objects in a specific order would be important (locker combinations or class schedules) versus situations where the specific order does not matter (putting coins into a vending machine).

LESSON 21
"A Scheduling Dilemma"
by Rhonda Bailey

ASSESSMENT Students will complete an individual assessment and show evidence of proficiency using the following criteria:

1. Students use the four-step problem-solving model to solve an application problem.
2. Students use an appropriate problem-solving strategy to solve the problem.
3. Students write a solution to the problem situation, which includes the correct use of labels and units, justifying why their solutions are reasonable.

Use or modify a rubric found at www.rubician.com to evaluate students' levels of proficiency in each area.

STUDENT HANDOUTS "A Scheduling Dilemma" student activity sheet
Wrap-Up Question

"A Scheduling Dilemma"
Activity Sheet

Schedule for Amtrak Train 2158		
Departure Time	Train Station Abbreviations	Departure City
9:00 AM	WAS	WASHINGTON, DISTRICT OF COLUMBIA
9:35 AM	BAL	BALTIMORE (PENN STATION), MARYLAND
10:17 AM	WIL	WILMINGTON, DELAWARE
10:38 AM	PHL	PHILADELPHIA (30TH ST), PENNSYLVANIA
11:31 AM	NWK	NEWARK (PENN STATION), NEW JERSEY
12:03 PM	NYP	NEW YORK (PENN STATION), NEW YORK
2:54 PM	PVD	PROVIDENCE, RHODE ISLAND
3:18 PM	RTE	ROUTE 128, WESTWOOD, MASSACHUSETTS
3:27 PM	BBY	BOSTON (BACK BAY), MASSACHUSETTS
3:33 PM	BOS	BOSTON (SOUTH STATION), MASSACHUSETTS

Train 2158 is completely full, except for three seats. There is a large group traveling from Washington, DC to Boston (South Station), Massachusetts.
The seats that are still available are: 2A, 4B, 5D.

The following passengers want to travel:

Passenger Number	From	To
1	WAS Washington, DC	NWK Newark (Penn Station), NJ
2	PHL Philadelphia (30th St.), PA	PVD Providence, RI
3	NYP New York (Penn Station), NY	BOS Boston (South Station), MA
4	BAL Baltimore (Penn Station), MD	BBY Boston (Back Bay), MA

You must determine the best seat assignment for the next four passengers that call for reservations. Work with your group to solve this scheduling dilemma. Use the problem-solving process to find your solution.

- Understanding the problem
- Creating a plan
- Solving the problem
- Checking the reasonableness of your solution

Wrap Up Questions

1. How did your group determine which information was important to solve this problem? Was there any information that you decided was not important?

2. Describe an alternate problem-solving strategy that your group could have used to solve this problem.

3. Is there more than one solution to this problem? How do you know?

4. Describe how the problem would change if 5 passengers had to share 4 seats.

MATH Can Take You Places

Te Lleva a Muchos Lugares

LESSON 21

"Un Dilema del Horario"

by Rhonda Bailey

Página de Actividad

Horario para el Tren Amtrak 2158		
Hora de Salida	Abreviaciones de las Estaciones de Tren	Ciudad de Salida
9:00AM	WAS	WASHINGTON, DISTRITO OF COLUMBIA
9:35AM	BAL	BALTIMORE (ESTACIÓN PENN), MARYLAND
10:17AM	WIL	WILMINGTON, DELAWARE
10:38AM	PHL	PHILADELPHIA (CALLE 30), PENNSYLVANIA
11:31AM	NWK	NEWARK (ESTACIÓN PENN), NEW JERSEY
12:03PM	NYP	NEW YORK(ESTACIÓN PENN), NEW YORK
2:54PM	PVD	PROVIDENCE, RHODE ISLAND
3:18PM	RTE	RUTA 128, WESTWOOD, MASSACHUSETTS
3:27PM	BBY	BOSTON (BACK BAY), MASSACHUSETTS
3:33PM	BOS	BOSTON ((ESTACIÓN SUR), MASSACHUSETTS

El tren 2158 está completamente lleno, excepto por tres asientos. Hay un grupo grande que viaja desde Washington, DC a Boston (Estación Sur), Massachusetts.
Los asientos que están disponibles son: 2A , 4B , 5D.

Los siguientes pasajeros quieren viajar:

Número del Pasajero	Desde	A
1	WAS Washington, DC	NWK, Newark (Estación Penn) , NJ
2	PHL Philadelphia (Calle 30), PA	PVD Providence, RI
3	NYP New York (Estación Penn), NY	BOS, Boston (Estación Sur), MA
4	BAL Baltimore (Estación Penn), MD	BBY Boston (Back Bay), MA

MATH Can Take You Places

Te Lleva a Muchos Lugares

LESSON 21
"Un Dilema del Horario"
by Rhonda Bailey

Debes decidir y asignar los mejores asientos a los cuatro pasajeros siguientes que llamen por reservaciones. Trabaja con tu grupo para resolver este dilema del horario. Para encontrar la solución, usa el proceso para resolver problemas.

- Entender el problema
- Crear un plan
- Solucionar el problema
- Revisar para ver si la solución es razonable

LESSON 21
"Un Dilema del Horario"
by Rhonda Bailey

Preguntas para Resumir

1. ¿Cómo decidió tu grupo cuál era la información importante para resolver el problema? ¿Hubo alguna información que ustedes decidieron que no era importante?

2. Describe si hubo una segunda estrategia de solución del problema que tu grupo podría haber usado para resolver este problema.

3. ¿Hay más de una solución a este problema? ¿Cómo lo sabes?

4. Describe cómo el problema cambiaría si cinco pasajeros tuvieran que compartir 4 asientos. `

MATH Can Take You Places

LESSON 22
"Real-World Reasonableness"
by Debbie Miskiewicz

CONCEPT AREA Domain/Range/Reasonableness

GRADE LEVEL 4-6

TIME ALLOTMENT Two 60-minute sessions

LESSON OVERVIEW Students will recognize math in everyday situations. Students will connect reasonableness to everyday situations that they encounter.

LESSON ACTIVITIES OVERVIEW After reading *Math Curse*, by Jon Scieszka and Lane Smith, students will work in pairs to write a sequel to the book using problems that they create. In the sequel, the "math curse" continues as the character in the book goes on a class field trip. Students will incorporate estimation and travel as they develop their problems and illustrate.

LEARNING OBJECTIVES Students will be able to:
- Make a plan to solve a problem.
- Evaluate strategies to solve problems for reasonableness.
- Carry out a plan effectively to solve a problem.

MEDIA COMPONENTS Investigate fractals, which are artwork made with mathematics at "Cool Math 4 Kids" http://www.coolmath4kids.com/fractals.html.

Create tessellations with pattern blocks http://ejad.best.vwh.net/java/patterns/patterns_j.shtml.

MATERIALS
- *Math Curse*, by Jon Scieszka and Lane Smith
- Colored construction paper
- Markers/crayons
- Index cards (optional)

PREP FOR TEACHERS Teachers will need to be familiar with the book *Math Curse*, by Jon Scieszka and Lane Smith.

Note:
The following concepts will be covered during this lesson: **time**, **arrays**, **fractions**, **patterns**, **monetary value and estimation**. Students may need to review the concepts prior to beginning the activities.

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Teacher and students will brainstorm and make a list of how math is used every day.

2. Students will then take the list and classify each item under a topic of mathematics (for example, geometry, fractions, arithmetic).

3. The teacher will read the book *Math Curse*, by Jon Scieszka and Lane Smith. Ask students to pay close attention because they will be writing the sequel to the book.

MATH Can Take You Places

LESSON 22
"Real-World Reasonableness"
by Debbie Miskiewicz

LEARNING ACTIVITIES

1. Tell students that they will be writing the sequel to *Math Curse* where the character in the book wakes up the next day and still has "the curse" that makes her see mathematics in every situation. Her class will be taking an overnight field trip, and the students will be able to decide the activities of her day.

2. Divide the class into pairs or sets of threes. Each group will be assigned one of the major mathematic concepts mentioned in the book (1. Time, 2. Measurement, 3. Months of the year, 4. Arrays, 5. Fractions, 6. Geography, 7. Sports, 8. Patterns and 9. Money). You may want to put each topic and its number an index card and allow students to draw from the deck of cards.

3. Brainstorm aloud some locations where the character may be going on the field trip. Choose the most popular attraction among the students as the destination for our character.

4. The task for the students is to develop one or more questions that relate to their assigned topic, incorporate estimation if possible and integrate it with the story that the class is developing as a whole. Students will have to communicate with the groups before and after them as they develop their problems. For example, if my group is assigned "2. Measurement," then we must talk to the "1. Time" group and the "3. Months of the year" group to make sure that every part of the story makes sense. The students can refer back to the book if needed, but cannot copy verbatim.

5. Let the students know that they will be graded using the following rubric:
- Is the problem creative and funny? (15 points)
- Are the illustrations neat? (15 points)
- Are their math problems correct? (40 points)
- Does the page work well with the pages before and after it? (15 points)
- Did they incorporate estimation? (15 points)

6. Allow students to work in their groups and with other groups to develop their rough draft of the problem and the illustration. When the groups are done, they should exchange their page with the group that is numerically ahead and behind. Students then use the rubric to grade the rough draft and give suggestions for improvement.

CULMINATING ACTIVITY

1. After all of the suggestions have been gathered for improvement, students will then create the final draft of their problem on construction paper. Make sure that students put the answers on the back of their final versions.

2. Have a representative from each group stand and hold his or her work up facing the class while the teacher reads the story aloud. Later, assign grades using the scoring rubric.

Extension:
Let students visit other math classes and read their creations.

LESSON 22
"Real-World Reasonableness"
by Debbie Miskiewicz

CROSS-CURRICULAR EXTENSIONS

Art

Allow students to do Internet research on the artistic style of collage. Allow students to share the examples they find as well as the biographies of famous artists who used the style (such as Romare Bearden). Students should use magazines to create collages of their own.

REAL-WORLD CONNECTIONS

Ask your school principal to speak to the class. Ask him/her to describe how (s)he uses math in the principal's job within the school.

ASSESSMENT

Use the "Estimation" *Math Curse* Scoring Rubric to assign grades to each group of students. The teacher may also want to collect the rubrics done by the students, and incorporate some of the applicable comments into the grading.

STUDENT HANDOUTS

"Estimation" *Math Curse* Scoring Rubric

"Estimation" *Math Curse*

Scoring Rubric

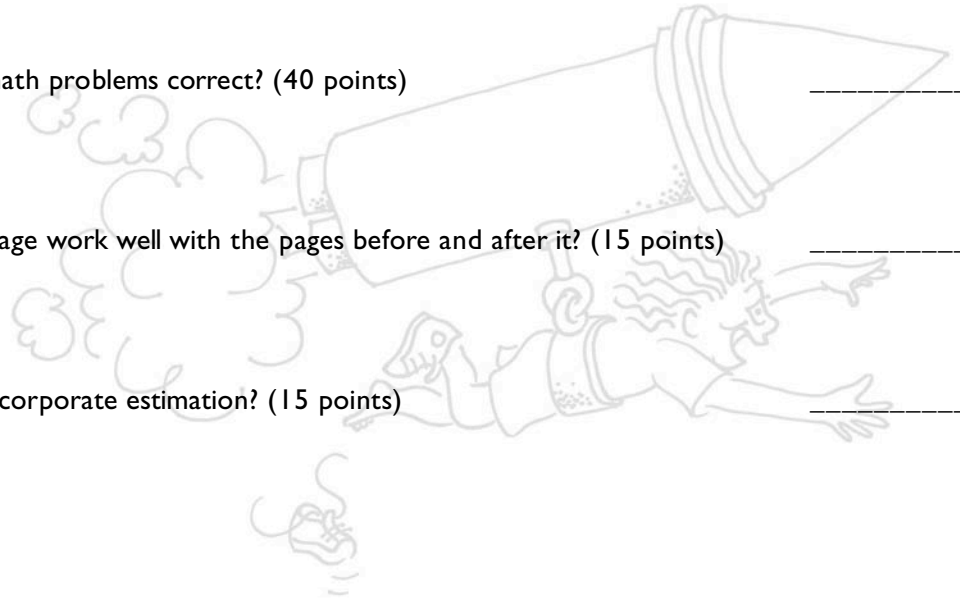
- Is the problem creative and funny? (15 points) _____
Comments:

- Are the illustrations neat? (15 points) _____
Comments:

- Are their math problems correct? (40 points) _____
Comments:

- Does the page work well with the pages before and after it? (15 points) _____
Comments:

- Did they incorporate estimation? (15 points) _____
Comments:



MATH Can Take You Places

LESSON 23
"Away We Go"
by Rhonda Bailey

CONCEPT AREA Domain/Range Reasonableness

GRADE LEVEL 4-6

TIME ALLOTMENT 60 minutes

LESSON OVERVIEW Students will engage in using mathematics to solve a real-life problem. Students will use estimation skills to calculate the cost of a trip to Six Flags amusement park.

LESSON ACTIVITIES OVERVIEW Students calculate the maximum and minimum amount of money they would need for a family trip to an amusement park.

LEARNING OBJECTIVES Students will be able to:
- Devise and execute a plan for problem solving.
- Estimate within a given situation.
- Discuss practical real-world problem-solving applications using mathematics.

MEDIA COMPONENTS Video: *Math Can Take You Places* #003 "Domain/Range/Reasonableness"
Internet:
Travelocity, www.travelocity.com

MATERIALS Items from Six Flags (optional)
- Calculators
- Group activity sheet
- Group banners
- Price sheets from Travelocity.com for a trip from Portland, Oregon to DFW
- Chart paper
- Marker

PREP FOR TEACHERS
- Divide students into at least four groups of three to four people.
- Closely review the assignments of each of the four groups, so that assistance can easily be offered.

Note:
The concepts of ***range*** and ***estimation*** will be covered during this lesson. Students may need to review the concepts prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Open the lesson by sharing this scenario with your students:
   The items you see on your desk are from Six Flags. You are going to figure out about how much money it would cost a family of seven to go to Six Flags for the entire day. Grandma and Grandpa are planning to fly in from Portland, Oregon to go to Six Flags with the family for the day; they will need round-trip tickets. The family includes you, a fourth- (fifth- or sixth-) grader, two parents, a little sister who is two years old and an older brother who is 16. About how much is it going to cost the family to go to Six Flags? Be sure to include the cost to fly the grandparents in from Portland. Use the price information you have to find a range, so we can calculate the least possible amount of money we may spend and the greatest amount we could possibly spend.

travelocity

KERA UNLIMITED

2. Let students take a few minutes to analyze the price list. Have each group write an estimate of what it thinks the total trip to Six Flags will cost, including the cost of the round-trip airline tickets for Grandma and Grandpa.

3. **Start** *Math Can Take You Places* video #003 "Domain/Range Reasonableness" after the facilitator from Six Flags Over Texas says, "… we want people to know what Six Flags is all about." **Pause** when the problem text appears on screen, "… least amount of money we may spend and the greatest amount that we may spend."

LEARNING ACTIVITIES

1. There are four basic parts of the trip that each group will need to calculate.
   a. Group 1 is going to calculate the least amount and the greatest amount of money the family could spend on tickets.
   b. Group 2 is going to figure out the least amount and the greatest amount of money the family could spend on food.
   c. Group 3 is going to calculate the least amount and the greatest amount of money that the family would spend on souvenirs.
   d. Group 4 needs to calculate the cost of airplane tickets for Grandma and Grandpa to fly round-trip to Dallas from Portland, Oregon.

2. Students should write up their plans and conclusions on the chart paper and be ready to share with the class. When each group is finished reporting, the entire class will work together to get a total for the least amount the family might spend on the trip and the greatest amount the family could spend.

Group assignments:

Group 1:
Tickets to Six Flag
Adults: $29.99
Kids under 48 inches tall: $17.99

You have coupons for $12 off adult admission that are only good if used during the week. You may or may not be able to use the coupons depending on what day your mom can get off work.

Calculate the greatest and least amounts of money the family might spend on tickets.

Group 2:
Food
MENU FOR SAL'S SANDWICH SHACK
Combo Meals (includes a regular drink and fries)

Triple Cheeseburger Meal.....	$7.99
Chicken Strip Meal.....	$6.15
Fish Sandwich Meal.....	$6.75
Kid's Meal.....	$4.15 (children 12 and under)
Salad	$3.25
Drinks.....	$1.35 (regular) $2.85 (large)
Chips	$1.00
Ice Cream Bars.....	$1.75

Use the menu to calculate the approximate amount that the family will spend on food at Six Flags for the entire day. Include snacks and drinks. Calculate a reasonable amount that the family will spend on food, not to exceed $300. Be able to explain your answer.

Group 3:
Souvenirs/Games
PRICE LIST FOR TERRI'S TERRIFIC T-SHIRTS AND MORE

T-Shirts	$26.15 (adults) $18.80 (kids' sizes)
Hats	$9.35
Mugs	$6.15
Sunglasses	$4.75
Stuffed Animals	$35.10 (large)
Pencils	$1.89

The family does not want to spend more than $250 on souvenirs and games.

Group 4:
Airplane tickets for Grandma (60 years old) and Grandpa (65 years old)

Use the Web site Travelocity.com to calculate the most and the least amount that might be spent on the airline tickets.

CULMINATING ACTIVITY

1. All four groups will share their final results. Each group should include both minimum and maximum values as a part of its solution.

2. Let each group write its final results on the board. Ask students if they would like to modify their original estimate of the cost for the day at Six Flags. If students change their estimates, they must explain why and give evidence of their new choices.

3. Use a calculator to get the range of the least amount of money the family could spend on the entire trip as well as the most money it could spend.

4. **Cue** video after Sandra Daniel says, "We had about 100 million visitors to Six Flags Over Texas." Press **Play**. Have students compare their findings with those on the video. **Stop** at "That's why we're here."

CROSS-CURRICULAR EXTENSIONS

Science
Research the construction of roller coasters and how it relates to physics.

Art
Design your own perfect amusement park on construction paper using markers and household items.

LESSON 23
"Away We Go"
by Rhonda Bailey

REAL-WORLD CONNECTIONS Take a field trip to a local amusement park. Have students complete a scavenger hunt to find the most expensive and the least expensive food items and souvenirs for each individual shop. As a group, decide which shops have the best buys for consumers.

ASSESSMENT Informally monitor students as they solve the problem to assess understanding.

STUDENT HANDOUTS Group Assignments sheets

Group Assignments
Park Tickets

Group 1:
You are going to figure out about how much money it would cost a family of seven to go to Six Flags for the entire day. The family includes you, a fourth- (fifth- or sixth-) grader, two parents, a little sister who is two years old, an older brother who is 16, and your two grandparents. Group 1 is going to calculate the least amount and the greatest amount of money the family could spend on tickets.

Tickets to Six Flag
Adults: $29.99
Kids under 48 inches tall: $17.99
Senior Citizens: $15.00 (Tuesdays only)

You have coupons for $12 off adult admission that are only good if used during the week. You may or may not be able to use the coupons depending on what day your mom can get off work. You and your older brother both earned free passes through a summer reading program that can only be used after May.

Calculate the greatest and least amounts of money the family might spend on tickets.

Group Assignments
Food

Group 2:
You are going to figure out about how much money it would cost a family of seven to go to Six Flags for the entire day. The family includes you, a fourth- (fifth- or sixth-) grader, two parents, a little sister who is two years old, an older brother who is 16, and your two grandparents. Group 2 is going to figure out the least amount and the greatest amount of money the family could spend on food.

MENU FOR *SAL'S SANDWICH SHACK*
Combo Meals (includes a regular drink and fries)
Triple Cheeseburger Meal.....$7.99
Chicken Strip Meal.....$6.15
Fish Sandwich Meal.....$6.75
Kid's Meal .....$4.15 (children 12 and under)

Barbecue Sandwich.....$4.75
Catfish Fillets $5.95
Junior Burger.....$1.25
Salad $3.25
Drinks .....$1.35 (regular) $2.85 (large)
Chips $1.00
Ice Cream Bars $1.75

Use the menu to calculate the approximate amount that the family will spend on food at Six Flags for the entire day. Include snacks and drinks. Calculate a reasonable amount that the family will spend on food, not to exceed $300. Be able to explain your answer.

Group Assignments
Souvenirs/Games

Group 3:
You are going to figure out about how much money it would cost a family of seven to go to Six Flags for the entire day. The family includes you, a fourth- (fifth- or sixth-) grader, two parents, a little sister who is two years old, an older brother who is 16, and your two grandparents. Group 3 is going to calculate the least amount and the greatest amount of money that the family would spend on souvenirs.

Souvenirs/Games
PRICE LIST FOR *TERRI'S TERRIFIC T-SHIRTS AND MORE*
T-Shirts ..... $26.15 (adults) $18.80 (kids' sizes)
Hats $9.35
Mugs $6.15
Sunglasses $4.75
Stuffed Animals ..... $35.10 (large)
Pencils $1.89

Also, each of the kids may want to buy souvenirs for one of each of their friends. Plus, Grandma and Grandpa may want to take some souvenirs home to a couple of their friends in Oregon. Mom and Dad may pass on souvenirs all together since they've been to the park several times.

The family does not want to spend more than $250 on souvenirs and games.

Group Assignments
Airplane Tickets

Group 4:
You are going to figure out about how much money it would cost a family of seven to go to Six Flags for the entire day. The family includes you, a fourth- (fifth- or sixth-) grader, two parents, a little sister who is two years old, an older brother who is 16, and your two grandparents. Group 4 needs to calculate the cost of airplane tickets for Grandma and Grandpa to fly round-trip to Dallas from Portland, Oregon.

Find airplane tickets for Grandma (60 years old) and Grandpa (65 years old). They plan to stay at least two days, but they may be able to stay up to five days. Your house is being renovated, so they may have to stay in a hotel during their visit. Also, Grandma and Grandpa may need to rent a car so that they can visit old friends and do some antiques shopping.

Use the Web site Travelocity.com to calculate the most and the least amount that might be spent on the airline tickets.

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 23

"Y Nos Vamos"

Rhonda Bailey

Asignaciones de Grupos
Boletos de Entrada al Parque

Grupo 1:

Tú vas a calcular cuanto dinero cuesta para llevar una familia de siete al parque de Six Flags por un día entero. En la familia incluyes tú, un estudiante de cuarto (quinto ó sexto) grado, tus padres, una hermana pequeña que tiene dos años de edad, un hermano mayor que tiene 16 años de edad, y tus dos abuelitos. Grupo 1 calculara la menor y mayor cantidad de dinero que la familia gastaría para comprar los boletos de entrada al parque.

Boletos de entrada para Six Flags
Adultos: $29.99
Niños (menos de 48 pulgadas de altura): $17.99
Ancianos: $15.00 (los martes solamente)

Tienes cupones de $12 de rebaja para adultos que son buenos solamente durante la semana. Es posible que puedas usarlos ó no, depende del día que tu mamá pueda tomar tiempo libre de su trabajo. Tú y tu hermano mayor pueden obtener la entrada gratis por medio del programa de lectura cual se pueden usar solamente después del mes de mayo.

Calcula la menor y mayor cantidad de dinero que tu familia podría gastar en comprando los boletos.

Asignaciones de Grupos
Comida

Grupo 2:

Tú vas a calcular cuanto dinero cuesta para llevar una familia de siete al parque de Six Flags por un día entero. En la familia incluyes tú, un estudiante de cuarto (quinto ó sexto) grado, tus padres, una hermana pequeña que tiene dos años de edad, un hermano mayor que tiene 16 años de edad, y tus dos abuelitos. Grupo 2 calculara la menor y mayor cantidad de dinero que la familia gastaría para la comida.

MENÚ DE SAL'S SÁNDWICH SHACK
Platos Combinados (incluye una bebida regular y papas fritas)
Hamburguesa Triple con queso..... $7.99
Tiras de pollo $6.15
Sándwiches de pescado.....$6.75
Platos para niños.....$4.15 (niños de 12 años y menores)
Sándwiches de Barbeque. $4.75
Filetes de pescado $5.95
Hamburguesa Júnior $1.25
Ensaladas.....$3.25
Bebidas..... $1.35 (regular) $2.85 (grande)
Chips $1.00
Barras heladas $1.75

Usa el menú para calcular la cantidad aproximada que la familia gastará en comida por todo el día en Six Flags. Incluye bocadillos y bebidas. Calcula una cantidad razonable que la familia gastará en comida sin sobrepasar los $300. Prepárate para explicar tu respuesta.

Asignaciones de Grupos
Recuerdos

Grupo 3:

Tú vas a calcular cuanto dinero cuesta para llevar una familia de siete al parque de Six Flags por un día entero. En la familia incluyes tú, un estudiante de cuarto (quinto ó sexto) grado, tus padres, una hermana pequeña que tiene dos años de edad, un hermano mayor que tiene 16 años de edad, y tus dos abuelitos. Grupo 3 calculara la menor y mayor cantidad de dinero que la familia gastaría en recuerdos.

Recuerdos y Juegos
LISTA DE PRECIOS: "TERRI'S CAMISETAS Y ALGO MÁS"
Camisetas.....$26.15 (para adultos) $18.80 (para niños)
Gorras/Cachuchas/Sombreros.....$9.35
Tazas.....$6.15
Anteojos para el sol.....$4.75
Animales de peluche.....$35.10 (grandes)
Lápices.....$1.89

Tambien, cada hijo/a querrá comprarle un recuerdo a cada uno de sus amiga/os. Además, abuelito y abuelita querrán llevarse recuerdos a casa para dos amistades en Oregon. Mama y papa quizás no compraran recuerdos como ellos ya han visitado el parque varias veces.

La familia no quiere gastar más de $250 en recuerdos.

Asignaciones de Grupos
Pasajes de Avión

Grupo 4:

Tú vas a calcular cuanto dinero cuesta para llevar una familia de siete al parque de Six Flags por un día entero. En la familia incluyes tú, un estudiante de cuarto (quinto ó sexto) grado, tus padres, una hermana pequeña quien tiene dos años de edad, un hermano mayor quien tiene 16 años de edad, y tus dos abuelitos. Grupo 4 calculara el costo de los pasajes de avión de ir y vuelta desde Pórtland, Oregon a Dallas para abuelita y abuelito.

Busca pasajes de avión para abuelita (60 años de edad) y abuelito (65 años de edad). Ellos se piensan quedar por los menos dos dias, pero quizás podrán quedarse hasta cinco dias. Están remodernizando tu casa quizás tendrán que quedarse en un hotel durante su visita. Tambien, tus abuelitos tendrán que rentar un carro para poder ir a visitar sus amistades viejas e ir de compras de antigüedades.

Usa la Internet: Travelocity.com para calcular la mayor o la menor cantidad de dinero que se podrá gastar en los pasajes de avión.

MATH Can Take You Places

LESSON 24
"Courts and Bounds"

Yvonne Garcia

CONCEPT AREA Domain/Range/Reasonableness

GRADE LEVEL 4-5

TIME ALLOTMENT 90 minutes

LESSON OVERVIEW We use ranges to estimate all the time. The students will relate what they know about boundaries on sports courts, such as basketball or volleyball. They will project possible answers that are within a certain range, create a table, and then determine if the answers are reasonable for the questions asked. This lesson allows intermediate-aged students to explore the range of space needed for games that will be placed in a new local game room.

LESSON ACTIVITIES OVERVIEW Students should identify tables to be used as algebraic functions to find ranges. The students will work in groups to figure out the space they will need to fit all new game equipment into the area provided at the new game center. They should be able to explain the smallest and largest numbers in their range.

LEARNING OBJECTIVES Students will be able to:

- Identify numbers needed to calculate the ranges and determine reasonable answers using the ranges they find.
- Use the problem-solving strategy of making a table.

MEDIA COMPONENTS Video: *Math Can Take You Places* #003 "Domain/Range/Reasonableness"
Internet: Six Flags Over Texas information http://www.sixflags.com

MATERIALS Per class:

- 20-25 calculators
- Pictures from magazines, books or the Internet of soccer, basketball and baseball playing areas
- 20-25 dry erase boards
- Markers
- Pictures of indoor games, such as bumper cars and simulators
- Sports equipment, if available
- 4-5 sheets of chart paper for each group
- 2-5 books about basketball, volleyball, soccer and baseball from the library
- 1-3 Web sites on any sports data
- 1-2 pictures or a Web site showing Six Flags

PREP FOR TEACHERS

- Teachers need to bookmark Web sites on the computers.
- Watch *Math Can Take You Places* and cue the videotape.
- Gather all materials needed for each group of students' hands-on elements of the lesson. Set up pictures and books of sports and Six Flags to get the students interested.
- Prior knowledge: The students need to have a knowledge of problem-solving strategies, such as organized lists, drawing pictures and making tables. Vocabulary: range

Note:
The concept of ***range*** will be covered during this lesson. Students may need to review

the concepts prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Discuss the following with the students: Sports are played at many different levels (little league, high school and professional). Most students have watched sports at some time in their lives or played sports in a PE class at school. Each sport has boundary lines. For example, at a major league or high school baseball field, the diamond is set at a 90-ft. by 90-ft. field. A little league baseball field is set at a 60-ft. by 60-ft. field.

When you go out of bounds in most sports, there is some type of penalty. Just like at school, there is a penalty for going outside the boundary of the rules.

- In basketball and soccer, the other team gets the ball.
- In softball or baseball, you might hear the umpire say "foul ball."
- At school, you may lose recess time or a special party privilege if you step over the boundaries.

But when you stay within these boundary lines, there is a large RANGE of possibilities. Staying within the boundaries of the rules at school allows a chance for students to win awards or special treats. When you investigate problems asking for ranges, think of the problem as discovering and determining reasonable boundary lines. You will need to use multiplication as you find the upper and lower amounts based on the fixed amount of times asked in the problem.

2. Work the following example with the students. Emphasize using the chart to make it easier to find the low and high number in the range.

Example:

If the fewest number of math problems given as homework is four and the largest number of problems that would be given number is nine, then about how many problems would be given in five nights?

Input	Process (times 5 nights)	Output
4	4 * 5	20
9	9 * 5	45

Solution: The students could be given anywhere between 20 to 45 homework problems over five nights. It can be written mathematically as "20-45." Explain that each boundary line is the largest or smallest possible answer for that problem, but any number in between will work.

Discussion: Ask the students to name strategies they use to solve difficult problems; i.e., problem-solving strategies, such as organizing lists, drawing pictures and making tables.

LEARNING ACTIVITIES

1. Say: "A new game center is getting ready to open. First, the owners of the game center need to determine how many of each game they can fit in the building. They must determine a range of space needed inside the building for each type of game since some require more space than others. The main games they need to situate are the following: ski simulators, bumper cars, motorcycles, basketball goals and baseball batting cages. The amount of space needed for each game is listed below. What are the possible ranges for the space needed to fit each of the games?

2. The students will work in small groups to determine the possible range of space for specific sections of the game center. Each group will be given two different games of which to find the range. Each group will be instructed to:

a. Draw a triangle-shaped field and write a boundary on the sidelines.
b. Work the problem out on chart paper showing the problem in a table format as in the example above.
c. Write an equation that defines the situation.

When the groups are finished calculating, have them explain their steps, the number sentences/equations they used and what the reasonable range would be for the amount of room needed for their game.

For example: The number of ski simulators is y=21x where x is the number of simulators. The range is {1, 2, and 3}. Therefore the reasonable range for this is between (1· 21) = 21 and (3 · 21) = 63 sq. ft.

The chart includes the following: games, the least and greatest numbers of each game that might be put in the game room and the area needed for each one.

	Least#	Most#	Space needed
Ski simulators:	1	3	21 sq. ft each
Bumper cars:	6	10	18 sq. ft each
Motorcycles:	3	6	12 sq. ft each
Baseball batting cages:	1	4	43 sq. ft each
Basketball goals	3	5	35 sq. ft each
Skee-Ball:	4	6	15 sq. ft each
Air hockey:	2	4	7 sq. ft each
Foosball:	2	7	6 sq. ft each

Groups:
Ski Simulators/ Foosball
Bumper cars/ Air Hockey
Motorcycles/ Basketball Goals
Baseball Batting Cages/ Skee-Ball

Answers:
Ski Simulators: 21 to 63 sq. ft.
Bumper Cars: 108 to 180 sq. ft.
Motorcycles: 36 to 72 sq. ft.
Baseball Batting Cages: 43 to 172 sq. ft.
Basketball Goals: 105 to 175 sq. ft.
Skee-Ball: 60 to 90 sq. ft.
Air Hockey: 14 to 28 sq. ft.
Foosball: 12 to 42 sq. ft.

CULMINATING ACTIVITY As a group, discuss the possible answers. Have the students write in words the steps used to calculate a range, given a set of data.

LESSON 24
"Courts and Bounds"
Yvonne Garcia

CROSS-CURRICULAR EXTENSIONS

Art

Illustrate what the game room might look like using construction paper and markers.

Science

Conduct an experiment testing the temperature ranges of different liquids. For example, take the temperature of water. Then, add ice. Later, heat the water. Make a chart that lists the low and high temperatures. Test other safe liquids to see if they react in the same way.

REAL-WORLD CONNECTIONS

Students can do projects where they interview managers of businesses, such as department stores and fast-food places, to find the ranges that they use to predict how much inventory to purchase for certain holidays.

ASSESSMENT

Students will be evaluated using the "Range Assessment" handout. The solutions are listed below.

1) 144 to 270
2) 504 to 1008
3) $6 to $17
4) $10.20 to $17.10
5) 420 to 980
6) $6.80 to $11.96
7) $6 to $63.92
8) B) between 10 hours and 17 hours The range is from 10 hours 30 minutes to 17 hours 30 minutes

STUDENT HANDOUTS

"Range Assessment"

Name_____ Date_____

Range Assessment

1) Bryce shoots baskets after school each day. Bryce normally shoots 30 shots a day, and at least makes 16 baskets each day. What is a reasonable range of the number of baskets Bryce will make in 9 days?

2) Jennifer is making chocolate chip cookies to bring for the school-wide end-of-the-year party. Each day she makes 3 dozen cookies. She decided that she would either bake for 2 weeks or 4 weeks. What is a reasonable range of the amounts of cookies she will make in these amounts of time?

3) Logan went to the store to buy some stickers. He saw that some fishing stickers were on sale for $1.50 a pack. But there were others that were big and had a lot of glitter and they cost $4.25 a pack. If he wanted to buy 4 packs to share with his friends at school, then what is the range of money he would need to save?

4) A new ice cream shop opened in town. Valerie was there on the first day. She wanted to buy 6 sundaes to share with friends. She saw that 1 scoop would only cost $1.70, but 3 scoops would cost $2. 85. What is the range of the amount of money she will need to pay for everyone if she does not know which one they will want?

5) Every day at practice Jared throws a football. The least amount Jared has ever thrown in a practice is 30 times. The most Jared has ever thrown is 70 times. What is the most reasonable range of times he would throw in 14 days of practice?

6) Brooke wanted to give one soda to each person in her class at the Christmas party. Her mother said that she would need to know a range of the amount of money she would need to give Brooke. There were 24 students in the class. When Brooke was at the store, she saw that the generic brand was 6 for $1.70, and the name brands were 6 for $2.99. What range should she give her mom?

7) When looking on the Internet, Jared saw that posters of professional football and soccer athletes were on sale. The small ones cost $0.75 each and the large ones cost $7.99. Since he just received his birthday money, he wanted to buy 8 posters. What is the range of the amount of money he needs to have when purchasing the 8 posters?

8) Each day Shannon and her mom spend from 30 to 50 minutes making cards for Valentine's Day. After 3 weeks, what is a reasonable total of the amount of hours they will spend making cards?

A) Between 5 hours and 9 hours
B) Between 10 hours and 17 hours
C) Between 500 minutes and 900 minutes
D) Between 630 minutes and 1,050 minutes

Range Assessment
Answer Key

1. 144 to 270
2. 504 to 1008
3. $6 to $17
4. $10.20 to $17.10
5. 420 to 980
6. $6.80 to $11.96
7. $6 to $63.92
8. B) between 10 hours and 17 hours The range is from 10 hours 30 minutes to 17 hours 30 minutes

MATH Can Take You Places

Te Lleva a Muchos Lugares

LESSON 24

"El Campo y los Límites"

by Yvonne Garcia

Nombre_____ Fecha_____

Evaluación de los Límites

1. Bryce tira al cesto después de la escuela todos los días. Normalmente, Bryce tira 30 cestos por día, y por lo menos hace 16 cestos por día. ¿Cuáles serían los límites de canastas razonables que Bryce haría en 9 días?

2. Jennifer está preparando galletitas de chocolate para llevar a la fiesta de fin de año de la escuela. Cada día prepara 3 docenas de galletitas. Ella decidió prepararlas en 2 ó 4 semanas. ¿Cuál sería la escala razonable de galletitas, para un tiempo de 2 ó 4 semanas?

3. Logan fue a la tienda para comprar figuritas adhesivas. Vio algunas de peces en oferta por $1.50 el paquete. Pero había otros que eran grandes con mucho brillo que costaban $4.25 el paquete. ¿Si él quisiera comprar 4 paquetes para compartir con sus amigos en la escuela, cuáles serían los límites de ahorro de dinero que necesita hacer?

4. Una nueva heladería se abrió en la ciudad. Valerie estuvo allí el primer día. Quería comprar 6 helados para compartir con sus amigas. Vio que con una bola sola costaban solamente $1.70, pero con 3 bolas costaban $2. 85. ¿Cuáles son los límites de dinero que ella necesitará para pagar por todos si ella no sabe lo que ellos van a elegir?

5. Todos los días de práctica Jared hace un tiro de pelota de fútbol. La menor cantidad de tiros que Jared ha hecho en una práctica es 30 veces. La mayor cantidad que Jared ha tirado es 70 veces. ¿Cuáles serían los límites de tiros razonables que tiraría en 14 días de práctica?

6. En la fiesta de Navidad, Brooke quería dar una soda a cada persona de su clase. Su mamá, para darle el dinero, le dijo que necesitaba tener una escala del dinero que necesitaría. Había 24 estudiantes en la clase. Cuando Brooke estuvo en la tienda, vió que la marca genérica costaba $1.70 por 6 botellas, y que las de nombres de marca costaban $2.99. ¿Qué límites de dinero debe darle a su mamá?

7. Cuando Jared estaba mirando en la Internet, vio que los carteles de los jugadores profesionales de fútbol americano y los atletas de fútbol Sudamericano (soccer) estaban en oferta. Los pequeños costaban $0.75 cada uno y los grandes $7.99. Como justamente había recibido dinero en su cumpleaños, quería comprar 8 carteles. ¿Cuáles son los límites de dinero que necesita tener para comprar 8 carteles?

8. Todos los días Shannon y su mamá pasan juntas de 30 a 50 minutos haciendo tarjetas para el Día de San Valentine. Después de 3 semanas, ¿cuál sería el total de horas razonable que pasarían juntas haciendo tarjetas?

   A) Entre 5 horas y 9 horas
   B) Entre 10 horas y 17 horas
   C) Entre 500 minutos y 900 minutos
   D) Entre 630 y 1,050 minutos

MATH Can Take You Places

LESSON 25
"Out to Lunch"
by Sonya Cook

CONCEPT AREA Domain/Range/Reasonableness

GRADE LEVEL 6

TIME ALLOTMENT Two 60-minute sessions

LESSON OVERVIEW Students will plan family outings to several local restaurants and estimate the cost of feeding families of various sizes.

LESSON ACTIVITIES OVERVIEW Students will work in groups using menus from different restaurants to determine a reasonable cost for ordering an appetizer, an entrée for each adult, a kids' meal for each child, a dessert and drinks. The groups will then compare prices of the cost of the meal with other groups.

LEARNING OBJECTIVES Students will be able to:

- Demonstrate how mean, median and mode are used to describe what is "typical" in a set of data.
- Demonstrate how a reasonable total can be determined by using mean, median or mode.
- Use range to determine how much money can be saved by choosing the least expensive meal compared to the most expensive meal.

MEDIA COMPONENTS Video: *Math Can Take You Places* #005 "Patterns"
Internet:

Sample restaurant menus:
American favorites
www.chilis.com

Mexican food
www.ontheboarder.com

Italian food
www.olivegarden.com

Indian food
www.claypit.com

Chinese food
http://www.pfchangs.com/cuisine/menu/pfChangsMenu.pdf

MATERIALS

- Restaurant menus
- Pencil
- Paper
- Calculators

PREP FOR TEACHERS

- Organize groups
- Gather menus
- Determine necessary modifications, such as omitting some items on the menus to reduce the number of choices

Note:
The following concepts will be covered during this lesson: ***mean***, ***median***, ***mode*** and ***range***. Students may need to review the concepts prior to beginning the activities.

travelocity

KERA UNLIMITED

If your class includes students who are acquiring English as a second language (ESL), you may also need to brainstorm problem-solving strategies or offer a list of possible strategies for students to refer to while completing the activities.

INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. Students will look at the arrangement of a menu from a restaurant and locate the appetizers, main entrées, desserts and drinks.

2. Discuss with students what a family must think about before going out to a restaurant. They should say the family must make sure it has enough money to pay for the meal.

LEARNING ACTIVITIES

1. Students use the "Food List" handout to make a list of the prices of the appetizers and decide how to determine a "typical cost" for an appetizer. Students should use mean, median or mode to describe a "typical cost" for the appetizer.

2. Students make a list of the prices of the main entrées and decide how to determine a "typical cost" for a main entrée. Students should use mean, median or mode to describe a "typical cost" for the main entrées. Students will need to include an entrée for each adult.

3. Students will make a list of the prices of the kid's meal to determine a "typical cost" for the kid's meals. Students should use mean, median or mode to describe a "typical cost" for the kid's meal. Students will need to include a kid's meal for each child.

4. Students will make a list of the prices of the drinks to determine a "typical cost" for drinks. Students should use mean, median or mode to describe a "typical cost" for drinks. Students should include a drink for every person at the table unless it is included in the kid's meal.

5. Students will make a list of the prices of the desserts to determine a "typical cost" for desserts. Students should use mean, median or mode to describe a "typical cost" for a dessert.

6. Students write a number sentence to show how the cost of the meal could be determined.

- Groups share their totals and discuss which restaurant is most expensive for the family and which restaurant is least expensive, as well as how they arrived at their solutions.
- Students write a number sentence to figure how much money would be saved by eating at the least expensive restaurant compared to the most expensive restaurant.

CULMINATING ACTIVITY

1. Introduce the culminating activity by watching *Math Can Take You Places* video #005 "Patterns." **Cue** the video from right before Chef Koval asks, "How much is the eight-ounce piece of beef going to cost me?" right after the blue chart leaves the screen. Ask students to listen closely to Chef Koval, and to be able to name at least one thing that he mentions that they should consider when creating a menu. **Play** the video, stopping when Chef Koval says, "Your math has to be right or you'll be losing money." One of the responses should refer to how expensive the ingredients are and how that would affect the cost of an entrée. If you would like, allow students to use grocery store Web sites to check the prices of key ingredients for their entrées to help determine pricing. For example, they can search by keyword on www.albertsons.com under "Browse our online store."

2. Students create their own restaurant menus; including appetizers, main entrées, kids' meals, desserts and drinks. The teacher must set a maximum and minimum number of items for each category.

2. Students determine a reasonable cost for feeding families of varying sizes (seen on student handout). Students write a number sentence to determine a reasonable cost for feeding the family.

3. Students determine the most expensive and least expensive costs for feeding families of varying sizes (seen on student handout). Students write a number sentence to determine how much money they would save by ordering the least expensive meal.

CROSS-CURRICULAR EXTENSIONS

Social Studies

Students read *Everybody Cooks Rice* by Norah Dooley. Students research foods consumed in different cultures and prepare a sample menu of foods from a restaurant that serves foreign cuisine.

Language Arts

Students do recipe writing including a how-to paper on cooking their favorite meal. Students include the price of the ingredients necessary to prepare the food and determine a price they would put on the menu in a restaurant.

REAL-WORLD CONNECTIONS

Watch the video, *Math Can Take You Places* "Patterns", featuring an interview with Chef William Koval at the Adolphus Hotel. Focus on the interview segments. As a class, list all of the different ways a chef would use mathematics.

ASSESSMENT

Have students use the menus they created to calculate the least and most a family of two parents and three kids could spend on a meal. Observe closely for proper use of vocabulary and strategies.

STUDENT HANDOUTS

- "What's On the Menu?" worksheet
- "Food List" handout

"What's on the Menu?"

You will create a menu for a new restaurant you are opening in town. You may want to survey friends and family members to find out what kinds of foods they enjoy eating at a restaurant. Also determine what they consider to be the "typical" price of that item. Record that information, as you will later calculate the mean, median and mode of those prices to determine what is considered the "typical" price. You can also use the Internet to research menu prices. This may help you decide what items to put on the menu of your new restaurant.

Working with your group, set up the problem by first creating a menu that includes at least four appetizers, five main entrées, three kid's meals, four desserts and three drinks. Each menu item must reflect the price that best describes the typical cost of the item, which will be the mean, median or mode. Your group must determine the price of each item on the menu and create the menu. (Point Value – 30)

Next, your group will determine the typical cost for feeding a family of five. The family includes three adults and two children under age 12. Each person will order an entrée or kids' meal and a drink. The table will share an appetizer and a dessert. Applying problem-solving strategies, show two different approaches to solve this problem. Include proper units and label[s?] on your solution.
(Point Value – 40)

Determine the most expensive and least expensive costs for feeding this family. Write a number sentence that shows each cost. (Point Value – 20)

Determine how much money you will save by ordering the least expensive meals. Write a number sentence that shows how this can be determined. (Point Value – 10)

Food Lists
Appetizers

Item	Nachos				
Price 1	$5.75				
Price 2	$6.00				
Price 3	$4.50				
Price 4	$6.00				
Price 5					
Price 6					
Price 7					
Price 8					
Mean					
Median					
Mode					
Typical price					

Entrées

Item					
Price 1					
Price 2					
Price 3					
Price 4					
Price 5					
Price 6					
Price 7					
Price 8					
Mean					
Median					
Mode					
Typical price					

Kid's Meals

Item					
Price 1					
Price 2					
Price 3					
Price 4					
Price 5					
Price 6					
Price 7					
Price 8					
Mean					
Median					
Mode					
Typical price					

Desserts

Item					
Price 1					
Price 2					
Price 3					
Price 4					
Price 5					
Price 6					
Price 7					
Price 8					
Mean					
Median					
Mode					
Typical price					

Drinks

Item					
Price 1					
Price 2					
Price 3					
Price 4					
Price 5					
Price 6					
Price 7					
Price 8					
Mean					
Median					
Mode					
Typical price					

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 25

"Salir a Almorzar"

by Sonya Cook

Nombre_____ Fecha_____

"¿Qué Hay en el Menú?"

Vas a crear un menú para un restaurante nuevo que estás abriendo en la ciudad. Pregúntales a tus amigos y a miembros de tu familia qué clase de comida les gusta comer cuando van a un restaurante. También pregúntales lo que ellos consideran un precio "típico" para esas comidas. Registra la información para que más tarde calcules el promedio, la mediana y el valor más frecuente o modo de esos precios para determinar lo que se considera un precio "típico". También puedes usar la Internet para investigar los precios de los menús. Esto te podría ayudar a decidir qué comidas poner en el menú de tu nuevo restaurante.

Trabajando con tu grupo, establece el problema creando primero un menú que incluya por lo menos cuatro aperitivos, cinco entradas principales, tres comidas para niños, cuatro postres y tres bebidas. Cada menú debe reflejar el precio que mejor se adapta al costo típico de ese producto, que serán el precio promedio, la mediana y el valor más frecuente o modo. Tu grupo debe fijar el precio para cada producto en el menú y debe crear el menú. (Valor en puntos – 30)

Luego, tu grupo debe determinar el precio típico para alimentar a una familia de cinco. La familia incluye tres adultos y dos niños menores de 12 años. Cada persona ordenará una entrada o un plato para niños y una bebida. La mesa compartirá un aperitivo y un postre. Aplicando las estrategias de resolución de problemas, muestra dos maneras diferentes de resolver este problema. Incluye etiquetas y unidades apropiados en tu solución.
(Valor en puntos – 40)

Determina la manera más cara y la más barata de alimentar a esta familia. Escribe una oración numérica para mostrar cada gasto. (Valor en puntos – 20)

Determina cuánto dinero ahorrarás ordenando las comidas más baratas. Escribe una oración numérica que muestre cómo puedes determinar esto. (Valor en puntos – 10

Listas de Comida
Aperitivos

Producto	Nachos				
Precio 1	$5.75				
Precio 2	$6.00				
Precio 3	$4.50				
Precio 4	$6.00				
Precio 5					
Precio 6					
Precio 7					
Precio 8					
Costo Promedio					
Media					
Modo					
Precio típico					

MATH Can Take You Places

Te Lleva a Muchos Lugares

LECCIÓN 25

"Salir a Almorzar"

by Sonya Cook

Entradas

Producto					
Precio 1					
Precio 2					
Precio 3					
Precio 4					
Precio 5					
Precio 6					
Precio 7					
Precio 8					
Costo Promedio					
Media					
Modo					
Precio típico					

LECCIÓN 25
"Salir a Almorzar"
by Sonya Cook

Comidas para Niños

Producto					
Precio 1					
Precio 2					
Precio 3					
Precio 4					
Precio 5					
Precio 6					
Precio 7					
Precio 8					
Costo Promedio					
Media					
Modo					
Precio típico					

LECCIÓN 25
"Salir a Almorzar"
by Sonya Cook

Postres

Producto					
Precio 1					
Precio 2					
Precio 3					
Precio 4					
Precio 5					
Precio 6					
Precio 7					
Precio 8					
Costo Promedio					
Media					
Modo					
Precio típico					

LECCIÓN 25
"Salir a Almorzar"
by Sonya Cook

Bebidas

Producto					
Precio 1					
Precio 2					
Precio 3					
Precio 4					
Precio 5					
Precio 6					
Precio 7					
Precio 8					
Costo Promedio					
Media					
Modo					
Precio típico					