# SKILLSTUTOR



# BASIC MATHEMATICS

Classroom Guide

# TABLE OF CONTENTS

Getting Started	
Basic Skills Lessons	
Quizzes	2
Thinking Skills Lessons	
Tests	
Worksheets	
Basic Skills Lesson Summaries	
Number Concepts	7
Computation	
Word Problems	
Measurement and Geometry	
Thinking Skills Lesson Summaries	
About Thinking Skills	
Lesson Content	
Lesson Summaries	14
Thinking Skills Worksheets	17
Assignment Sheet	

© 2004 Achievement Technologies, Inc. All rights reserved. All trademarks are the property of their respective owners.

# GETTING STARTED

This product is a comprehensive resource for diagnosing and remediating students' basic *Basic Mathematics* skills.

The SkillsTutor management system (OTS) provides several important features:

- Tests students' skills, providing both pretests and posttests to make initial assessments and gauge student progress
- Makes assignments, based on students' pretest results
- Monitors student scores and completion of activities
- Produces reports for individual students
- Provides online documentation

This guide outlines the content and activities of *Basic Mathematics*. Information on the management system (OTS) is provided under separate cover in the *SkillsTutor* User's Guide.

#### BASIC SKILLS LESSONS

Each lesson begins with one or more screens that review a concept. Lessons continue with a number of multiple-choice questions to reinforce the student's understanding of the topic, as illustrated below.

These instructions will help the student take full advantage of the features of *SkillsTutor* lessons:

- Use the mouse to answer questions: click on the correct answer.
- Click **Hint** for help in answering a question.
- If a question is missed, the student will be told why the answer is wrong. The student should read the response carefully, and try again. The student cannot move to the next question until the current question is answered correctly, so reading and answering carefully will save time.
- The student may review the instructional material at any time during the lesson by clicking **Review**. After going through the review screens, the student returns to the question that was being answered before the review. The student may return to the question before completing the review by clicking **Resume**.
- There may be times when the student needs to exit the program before completing an activity. To end an activity, close the activity window.
- When the student finishes answering all of the questions in an activity, a score is displayed. The score, expressed as a percent, is the number of questions answered correctly out of all the questions attempted.

#### QUIZZES

Quizzes operate similarly to lessons. However, quizzes have no introductory instructional material, and they do not require you to answer each question correctly before moving to the next question. Detailed feedback is provided for all questions.

#### THINKING SKILLS LESSONS

Each Thinking Skills lesson begins with a scenario or story that presents a problem to solve. This is the theme that is carried through the entire lesson, and the problem is solved as the lesson progresses.

The opening scenario or story is followed by a discussion of the thinking skill needed to solve the problem. Step-by-step instructions and examples for using the thinking skill are provided on screen.

The problem is solved through a series of questions which require the student to use the steps

3 **2** 3

involved in the thinking skill. Some of the questions have only one right answer. Other questions have more than one correct answer.

For a question of this type, read carefully and select as many of the answers as seem appropriate. To select an answer, click the box next to it to place an X in the box. If a box is marked by mistake, click again to remove the X. Click the **Hint** button for help in answering a question. Click the **Check** button to see feedback for answers.

At the conclusion of the lesson, a summary screen highlights the thinking skill that was used and the problem that was solved in the lesson. Then the score for the lesson is presented. The score is based on points accumulated, rather than the number of questions answered.

#### TESTS

*SkillsTutor* offers content-area pretests and posttests modeled on standardized tests. Pretests and posttests have no introductory instructional material. Like the questions for quizzes, the test questions are presented in multiple-choice format to give students practice in answering standardized-test questions. After each test, students have the opportunity to review the questions they missed. Feedback is provided for each missed question.

#### WORKSHEETS

*SkillsTutor* contains reproducible worksheets for each Thinking Skills lesson. The worksheets may be used to extend the computer activity or as a homework assignment. They are provided in this documentation and may be printed from the online version of the documentation, or photocopied from the printed version.

## **4** 3

# BASIC SKILLS LESSON SUMMARIES

*Basic Mathematics* contains 74 lessons, 9 quizzes, and 8 tests in a hierarchical arrangement designed to continually reinforce the concepts presented. On the following pages, there is a description and example for each basic skills lesson. The lessons are arranged in the following content areas:

- Number Concepts
- Computation
- Word Problems
- Measurement and Geometry

## **6** 3

Lesson #	Lesson Title	Lesson Description	Example
Basic N	lathematics: Number C	Concepts	
1	Place Values of Digits	Students learn about the place values of digits in relation to place value charts for (a) numbers one and greater, and (b) numbers less than one.	In 23.5, the values of the digits are $2 \times 10 = 20$ , $3 \times 1 = 3$ , and $5 \times 0.1 = 0.5$ .
2	Expanded Notation	Students learn to write numbers in expanded notation. Forms of expanded notation include place value, powers of ten, and word names.	145 = 100 + 40 + 5 = (1 × 100) + (4 × 10) + (5 × 1) = (1 × 10 <sup>2</sup> ) + (4 × 10 <sup>1</sup> ) + (5 × 10 <sup>0</sup> ) = 1 hundred + 4 tens + 5 ones = one hundred forty-five
3	Number Lines	Students learn to read and use number lines. Number lines are included for whole numbers, fractional values, and integers. Number lines are also used to show the operations of addition and subtraction.	A point is shown on a number line. What is the number for point P?
4	Rounding	Students learn that they can reduce the com- plexity of numbers by rounding them, rounding down if the next digit to the right is less than 5, and rounding up if the next digit to the right is 5 or more.	Round 627 to the nearest hundred.
5	Estimating	Students estimate answers to addition, subtrac- tion, multiplication, and division problems by rounding.	Estimate the product of 53 × 287 by round- ing the factors.
6	Multiples and Factors	Students learn to identify multiples and factors of given numbers and also how to find all the factors of a given number.	Find all the factors of 9.
7	Even, Odd, and Prime Numbers	Students learn to identify even, odd, and prime numbers.	Which of these is prime? [9, <i>19</i> , 39, 99]
8	Prime Factorization	Students learn that all composite numbers can be written as the product of prime factors.	$300 = 10 \times 30$ = 2 × 5 × 5 × 6 = 2 × 5 × 5 × 2 × 3 $300 = 2 \times 2 \times 3 \times 5 \times 5$
9	The Greatest Common Factor	Students find the greatest common factor (GCF) of two and three numbers.	The factors of 8 are 1, 2, 4, 8. The factors of 12 are 1, 2, 3, 4, 6, 12. The largest factor that appears in both lists is 4. Therefore, 4 is the GCF of 8 and 12.
10	Least Common Multiple and Denominator	Students find the least common multiple (LCM) and least common denominator (LCD) of two and three numbers.	Multiples of 3 are 3, 6, 9, 12, Multiples of 2 are 2, 4, 6, 8, The smallest multiple that appears in both lists is 6. Therefore, 6 is the LCM of 2 and 3.

Lesson #	Lesson Title	Lesson Description	Example
11	Simplifying Fractions	Students simplify both proper and improper fractions. They learn to identify two fractions as equivalent if they have the same value in sim- plest form.	To simplify $\frac{3}{12}$ , divide both the numerator and the denominator by 3. $\frac{3}{12} \div \frac{3}{3} = \frac{1}{4}$ $\frac{1}{4}$ is the simplest form of $\frac{3}{12}$ . $\frac{1}{4}$ and $\frac{3}{12}$ are equivalent fractions.
12	Equations and Inequalities	Students learn about number sentences as equations and inequalities. They review the symbols for equality and inequality: $=, <, >, \leq, \geq$ , and $\neq$ .	What symbol belongs in the box? 8 - 3 $\Box$ 7 - 4
13	Finding the Missing Operations	Students find the missing sign of operation to make a number sentence true.	What symbol belongs in the box? $2 + 3 \Box 1 = 4$
14	Finding the Missing Numbers in Equations	Students find the missing number in a simple equation. The equations are basic number facts or other easily recognizable combinations.	What number belongs in the box? 7 $-\Box = 4$
15	Finding the Missing Numbers in Inequalities	Students review the symbols for inequality: =, <, >, $\leq$ , $\geq$ , and $\neq$ . They find the missing number in a simple inequality.	What number belongs in the box? $4 + \Box < 6$
16	Missing Numbers in Related Number Sentences	Students learn about inverse operations and related number sentences.	The number sentence $4 \times 2 = 8$ can be written as $8 \div 2 = 4$ , and as $8 \div 4 = 2$ .
17	The Commutative Property	Students learn that changing the order of the addends in addition, or the factors in multiplica- tion, does not change the result.	What number belongs in the box? 14 + $\Box$ = 37 + 14
18	The Associative Property	Students learn that regrouping the addends in addition, or the factors in multiplication, does not change the result.	What number belongs in the box? (2 × 3) × 5 = $\Box$ × (3 × 5)
19	The Distributive Property	Students learn that the product of a number and a sum can be written as the sum of two prod- ucts.	What number belongs in the box? $3 \times (14 + 17) = (3 \times 14) + (3 \times \Box)$
20	Identity Elements and Inverses	Students learn about the additive identity ele- ment (0), the multiplicative identity element (1), the additive inverse (opposite), the multiplica- tive inverse (reciprocal), and the zero property in multiplication.	What number belongs in the box? $3 \times \Box = 1$
Basic N	lathematics: Computa	tion	
1	Addition of Whole Numbers	Students learn the terms "addend" and "sum."	Find the sum:

1	Addition of Whole Numbers	Students learn the terms "addend" and "sum." They see addition in both vertical and horizontal form and learn to align addends by place value before adding.	Find the sum: 25 + 64 + 7 =

Lesson #	Lesson Title	Lesson Description	Example
2	Subtraction of Whole Numbers	Students learn that subtraction is the opposite of addition. They see subtraction in both vertical and horizontal form and learn to align numbers by place value before subtract- ing.	Find the difference: 57 – 29 =
3	Multiplication of Whole Numbers	Students learn the terms "factor" and "product." They multiply by one-digit and two-digit multipli- ers.	Find the product: $12 \times 43 = $
4	Division of Whole Numbers	Students learn the terms divisor, dividend, and quotient. They divide by one-digit and two-digit divisors. Some quotients include a remainder.	Find the quotient: 156 ÷ 12 =
5	Addition of Decimals	Students learn that adding decimals is similar to adding whole numbers. They see addition in both vertical and horizontal form and learn to align addends by place value before adding.	Find the sum: 7.146 + 0.32 + 4 =
6	Subtraction of Decimals	Students learn that subtracting decimals is very similar to subtracting whole numbers. They see subtraction in both vertical and horizontal form and learn to align numbers by place value before subtracting.	Find the difference: 82.1 - 5.07 =
7	Multiplication of Decimals	Students apply what they have learned about multiplying whole numbers to multiplying deci- mals. They learn that the number of decimal places in the product must be the same as the total number of decimal places in the factors.	Find the product: 1.22 × 0.03 =
8	Division of Decimals	Students apply what they have learned about dividing whole numbers to dividing decimals. They divide by both whole number and decimal divisors. If the divisor is a decimal, they create an equivalent problem with a whole number divisor.	Find the quotient: 50.6 ÷ 0.11 =
9	Addition of Like Fractions	Students learn the terms "numerator" and "denominator," and the meaning of like frac- tions. They learn to add like fractions by adding their numerators, and to simplify the sum if pos- sible.	Find the sum: $\frac{3}{7} + \frac{1}{7} =$
10	Addition of Unlike Fractions	Students learn the meaning of "unlike fractions" and how to rewrite the fractions with a common denominator.	Find the sum: $\frac{1}{3} + \frac{1}{4} =$
11	Addition of Mixed Numerals	Students learn the meaning of "mixed numer- als." They learn to add the fractions first, then the whole numbers, and to simplify the sum if possible.	Find the sum: $4\frac{5}{8} + 2\frac{1}{4} = $
12	Subtraction of Like Fractions	Students learn to subtract like fractions by sub- tracting their numerators. They learn to simplify the difference if possible.	Find the difference: $\frac{3}{5} - \frac{2}{5} = $
13	Subtraction of Unlike Fractions	Students learn to rewrite fractions with a com- mon denominator and then subtract.	Find the difference: $\frac{5}{8} - \frac{1}{4} =$

Lesson #	Lesson Title	Lesson Description	Example
14	Subtraction of Mixed Numerals	Students learn to rewrite fractions with a com- mon denominator, rename the top number if necessary, and then subtract and simplify.	Find the difference: $3\frac{1}{2} - 2\frac{2}{3} = $
15	Multiplication of Fractions	Students learn to multiply the numerators and multiply the denominators. They are encouraged to find common factors before multiplying.	Find the product: $\frac{2}{3} \times \frac{3}{5} = $
16	Multiplication of Mixed Numerals	Students learn to change mixed numerals to improper fractions and then multiply the result-ing fractions. They are encouraged to find common factors before multiplying.	Find the product: $1\frac{3}{8} \times 1\frac{1}{3} = $
17	Division of Fractions	Students learn to use the reciprocal of the divi- sor and multiply. They are encouraged to find common factors before multiplying.	Find the quotient: $\frac{1}{5} \div \frac{4}{5} = $
18	Division of Mixed Numerals	Students learn to change mixed numerals to improper fractions and then multiply by the reciprocal of the divisor. They are encouraged to find common factors before multiplying.	Find the quotient: $1\frac{1}{3} \div 4 = $
19	Introduction to Ratio and Percent	Students learn the terms and ways of express- ing ratios and percents.	The ratio 50 to $100 = \frac{50}{100} = 50\%$
20	Interchanging Fractions and Decimals	Students learn to write fractions and mixed numerals in their decimal form by divid- ing the numerator of the fraction by the denomi- nator.	$3\frac{2}{5} = 3 + (2.0 \div 5) = 3 + 0.4 = 3.4$
21	Interchanging Percents and Decimals	Students learn to write a percent in its decimal form by dividing the percent by 100%. They learn that this does not change the value of the number since dividing by 100% is the same as dividing by 1.	240% = 240% ÷ 100% = 2.4
22	Interchanging Fractions and Percents	Students learn to change fractions to percents by multiplying by 100%. They learn to change percents to fractions by dividing by 100%.	$\frac{1}{5} = \frac{1}{5} \times 100\% = 20\%$ $35\% = 35\% \div 100\% = \frac{35}{100} = \frac{7}{20}$
23	Finding the Percent of a Number	Students learn to find the percent of a number by changing the percent to a decimal and multi- plying.	Find 20% of 12. 0.20 × 12 = 2.4

### **Basic Mathematics: Word Problems**

1	One-Step Addition Problems	Students learn a five-step procedure for solving word problems. They solve word problems involving addition of whole numbers, some of which have extraneous information.	Bob and John are each 8 years old. Susan is 9 years old. What is the sum of the ages of Bob and John?
2	One-Step Subtraction Problems	Students reinforce the five-step procedure learned in the previous lesson. They solve word problems involving subtraction of whole num- bers, some of which have extraneous informa- tion.	Last fall, Sandy found 82 shrubs and 16 trees in the park. If a winter freeze killed 20 shrubs, how many shrubs were left in the spring?

Lesson #	Lesson Title	Lesson Description	Example
3	One-Step Multiplication Problems	Students reinforce the five-step procedure learned in the previous lessons. They solve word problems involving multiplication of whole numbers, some of which have extraneous infor- mation.	Derek and Terry each worked 5 days. Terry earned \$8.00 per day, and Derek earned \$8.50 per day. How much did Terry earn in 5 days?
4	One-Step Division Problems	Students reinforce the five-step procedure learned in the previous lessons. They solve word problems involving division of whole num- bers, some of which have extraneous informa- tion.	Tori has 72 insects to put in a scrapbook. How many pages of the scrapbook will she need if each page holds 6 insects?
5	Two-Step Problems for Addition and Subtraction	Students reinforce the five-step procedure learned in the previous lessons. They solve word problems involving both addition and sub- traction of whole numbers.	Neil had 10 baseball cards. He gave 4 away and got 8 more. How many did he have then?
6	Two-Step Problems Using Multiplication	Students reinforce the five-step procedure learned in the previous lessons. They solve word problems involving multiplication, along with addition or subtraction of whole numbers.	Matt had 4 boxes with 10 tennis balls in each box. He found 2 more tennis balls on the floor. How many did he have in all?
7	Two-Step Problems Using Division	Students reinforce the five-step procedure learned in the previous lessons. They solve word problems involving division, along with addition or subtraction of whole numbers.	A hotel manager bought 79 new chairs, but 4 of them were broken. If the manager divided the remaining chairs evenly among 5 rooms, how many chairs would be in each room?
8	Needed Operations	Students identify the operation needed to solve a word problem.	Wesley had 4 basketballs and 3 soccer balls. How can you find the total number of balls?
9	Needed Information	Students identify information that is missing from word problems.	Eric is 3 years older than his sister Jane. What more do you need to know to find Eric's age?
10	Word Problems About Money	Students solve word problems involving money. There is special emphasis on the use of cents and dollars combined.	Kim bought 8 cookies at 15¢ each, and 2 hot dogs at \$1 each. How much did she spend?
11	Menus and Price Lists	Students solve everyday problems that require interpreting the information on menus and price lists.	(A menu shows the prices of main courses and side dishes.) Based on the menu, how much will a hot dog and fries cost at lunch- time?
12	Averages	Students solve word problems that require the calculation of an average.	The ages of three children are 6, 2, and 4 years old. What is their average age?
13	Decimals and Fractions	Students solve word problems that require computation with fractions and decimals.	Channing has 15 pieces of candy. She gave her sister one-third of the pieces. How many pieces of candy did Channing give to her sister?
14	Standard Units of Measure	Students solve word problems that require com- putation with measurements. There is special emphasis on problems that require conversion between units.	Zach is 6 feet 2 inches tall. His sister is 5 feet 4 inches tall. How much taller is Zach than his sister?

Lesson #	Lesson Title	Lesson Description	Example
Basic N	lathematics: Measuren	nent and Geometry	
1	Reading a Ruler	Students read rulers marked in inches and cen- timeters. They identify the location of points marked on a ruler and determine the length of line segments shown above a ruler.	(Diagram of a ruler is shown with a line seg- ment from 1 cm to 4.5 cm.) How long is the line segment above this ruler?
2	Appropriate Units of Measure	Students use pictorial memory aids to help them develop a basic concept of the size of common English and metric units of length, weight, and capacity.	What is a reasonable height for a book- shelf? (6 ft., 6 mi., 6 cm, 6 in.)
3	Time and the Calendar	Students solve problems relating to time, including elapsed time, and the calendar.	If April 4 is a Tuesday, what day of the week is April 25?
4	Temperature	Students read thermometers marked in Celsius and Fahrenheit. Some of the thermom- eters show marks in one-degree units. Others show marks at intervals greater than or less than 1°.	(A thermometer is shown with a bar indicat- ing the temperature.) What temperature is this thermometer showing?
5	Money	Students solve problems relating to money and the value of coins.	What coins total 45¢? 1 quarter + 2 dimes = \$0.45 or 45¢
6	Roman Numerals	Students learn the values of the Roman numeral symbols. They also learn to convert between Arabic and Roman numerals.	What is the standard numeral for CCCXLII?
7	Fractional Part of a Set	Students learn the terms "numerator" and "denominator." They represent the shaded or indicated parts of a figure as a simple fraction, decimal, or percent.	(Diagram of a region divided into 12 sec- tions with 8 of the sections shaded.) What fraction of the blocks are shaded?
8	Terms in Geometry	Students learn the definitions of geometric terms such as point, line, line segment, ray, angle, plane, parallel lines, intersecting lines, polygon, triangle, quadrilateral, pentagon, and hexagon.	(Diagram of a polygon with 5 sides.) Which term best describes this figure?
9	Plane and Solid Figures	Students learn about plane and solid figures and the principle figures within each of these two classifications.	(Diagram of a parallelogram) Which term best describes this figure?
10	Perimeter of a Polygon	Students learn to calculate the perimeter of a polygon by adding the lengths of all the sides.	What is the perimeter of a rectangle that is 13 cm wide and 40 cm long?
11	Area and Volume	Students learn that area is the number of square units that fit inside a plane figure, and volume is the number of cubic units that fit inside a solid figure. They find the area of rect- angles and squares and the volume of rectan- gular prisms.	What is the area of a rectangle that is 9 inches long and 2 inches wide?

## THINKING SKILLS Lesson Summaries

#### ABOUT THINKING SKILLS

To complement the efforts of teachers and programs focused on incorporating thinking skills (or skills labeled as "higher order thinking," "critical thinking," "creative thinking," "reasoning," or "problem-solving"), *Basic Mathematics* includes thinking skills lessons as an integral part of its instruction. Each Thinking Skills lesson provides students with direct instruction in a specific thinking skill. Several different thinking skills are addressed and are repeated across different content areas. The lessons instruct students in a step-by-step thinking process they can use each time they are faced with a problem that requires them to use that thinking skill. We have chosen to group the *Basic Mathematics* thinking skills in two broad categories:

- *1. Extending Knowledge* Comparison Classification
- 2. Drawing Conclusions Induction Error Analysis Problem Solving Decision Making

#### LESSON CONTENT

Each lesson begins by placing one of the thinking skills in the context of a problem or scenario that ties the lesson together. After instruction in the thinking skill, students answer questions related to the opening scenario that combine the targeted thinking skill as well as basic skills learned in previous lessons. By the end of each lesson, students have practiced basic skills content and a thinking skill while solving a "real life" problem.

As you introduce your students to these lessons, you might find it helpful to point out the following features:

- 1. After the title screen, a problem or scenario is presented. This is the theme of the entire lesson and is solved as the lesson progresses.
- 2. The opening problem is followed by direct instruction in a specific thinking skill. A step-bystep process is presented to help students focus on the thinking skill that will be used to respond to the opening problem. If students wish to reread any part of the scenario or steps, they can return to these screens from any of the questions by selecting **Review**.

- 3. A set of questions walks the students through the steps of the thinking process introduced in the instruction. Through this sequence of questions, students apply their basic skills knowl-edge to solve the opening problem. Unlike the rest of the *SkillsTutor* lessons, many of the questions in these lessons have more than one correct response to a multiple-choice question. Students should read carefully and mark as many of the boxes as seem appropriate to answer each question.
- 4. At the conclusion of the questions, a summary screen highlights again the thinking skill that was used and the problem that was solved in the lesson. Students then see their score for the lesson, based on points accumulated rather than just the number of questions answered. This scoring procedure tallies a point for each correct response given to a single question.

#### LESSON SUMMARIES

On the following pages you will find a lesson summary and strategy or example for each of the *Basic Mathematics* Thinking Skills lessons. For teachers who want to focus on a particular thinking skill with one or more students, this chart makes it easy to locate related lessons. Group discussion is always encouraged as a means of improving metacognition, or getting students to think about their thinking processes.

You will find a reproducible worksheet for each Thinking Skills lesson. The worksheet may be used by students at the completion of the computer lesson or as a homework assignment. Each worksheet concludes with a "Write Idea" which is a suggested writing activity that should help students think through the process learned in the lesson and apply it to a new situation. Answer keys are not provided for the worksheets since many of the activities are open-ended and do not lend themselves to single "correct" answers. Encourage students to verbalize the thinking processes they use on these worksheet questions. You might also have students discuss their worksheet answers in small groups and correct each other's papers.

Topic	Lesson Title	Lesson Summary	Example/Strategy
Comparison	Students determine similarities and differences among items.		
Proportion & Percent	Movie House Management	Students compare costs and profit for operating a movie theater with varying ticket prices and crowd sizes.	Students create a table to organize the information and compare the profits.
Classification	Students determine the attributes.	attributes of items and then group them into ca	tegories according to these
Number Concepts	A Trip to Numberland	Students take an imaginary trip to Numberland where they look for common features in groups of numbers and determine appropriate rules for membership in various groups.	Students use Venn diagrams to group and classify numbers.
Prediction	Students determine path in a new situation.	terns in known information and apply those pat	terns to predict what might happen
Introduction to Algebra	Number Sequence Puzzles	Students help Max the Magician analyze the patterns in number sequences to predict missing information.	Students make general statements to describe patterns they observe in number sequences.
			[-15°C, -11°C, -7°C, -3°C, +1°C]
Problem Solving	Students identify a goal problem.	and limiting conditions. Then they identify and	l evaluate possible solutions to the
Computation	Planning a Pizza Party	Students modify a pizza recipe from 8 servings to 12 servings, identifying revised amounts and deciding whether or not they need to buy more ingredients.	Students construct a table to organize the recipe ingredients and calculate the amounts needed for the revised recipe.
Measurement and Geometry	Designing a Playground	Students compare the areas of various designs for a playground to find one that gives the largest area and meets the playground specifications.	Students construct a table to organize and calculate information about the perimeters and areas of various squares and rectangles.
Decision Making	Students identify the choices related to an unresolved issue. They evaluate their choices and reach an appropriate decision.		
Computation	A Job at the Ballpark	Students compare the total earnings generated by a fixed weekly salary, an hourly wage plus overtime, and a straight 5% commission in order to decide which method of payment will provide the most income.	Students use decimal and percent computation skills to decide which of three payment methods generate the most income.

Name: Date: **Student Activity** Number Concepts: Thinking Skills Lesson 1 **Classification:** A Trip to Numberland STEPS: 1. Identify the items you want to classify. Look for common features and group items that are 2. alike. 3. State the rule that determines membership in the group. 4. Place items in the group. If necessary, repeat steps 2 and 3 to form new groups until all items are classified. Here is the problem that appeared in the lesson: Your job in Numberland was to put numbers together that belong to the same family. This lesson taught you how to use classification skills to organize each number family. **Directions:** If you were in another region of Numberland, you might see these numbers gathered together. Look for common features among the numbers. Decide on rules for classification. Then pick the numbers that belong together, according to your rules. Draw Venn Fences to show your classification. 50%  $\frac{1}{4}$ 1 0.25  $\overline{2}$  $\frac{3}{12}$ 1 25%  $\overline{3}$ Write Idea: Libraries often use numbers to classify books. Imagine that you have a job at the library. Part of your job is to return books to the shelves. How would you use your classification skills to help you do this? Write two paragraphs.

Name:	me: Date:		
Number Concepts: Thinking Skills Lesson 2	2 Student	t Activity	
Induction:	A Treasure Hunt		
<ul> <li>STEPS: 1. Examine the</li> <li>2. Look for pa</li> <li>3. Make a gen explains pat</li> <li>4. Make more holds up.</li> </ul>	he available information. patterns in the information you examined. neral statement or conclusion that atterns you observed. re observations to see if your conclusion		
In this lesson, you used induction to apply num hidden treasures.	nber properties to clues. The clues helped you unl	ock	
<i>Directions</i> : Use your inductive thinking skills	s to solve this number puzzle.		
<ol> <li>Examine the first few equation</li> <li>Find a pattern to the equations</li> <li>Find the missing numbers.</li> <li>Use the pattern to show at leas</li> <li>Do you think the pattern you constructed a general statement that</li> </ol>	ons. s. ast four more equations at the end of the series. observe will be repeated indefinitely? at describes the pattern in these statements.		
1	= 1 × 1		
1 + 3	= 2 × 2		
1 + 3 + 5	= 3 × 3		
1 + 3 + 5 + 7	= 🗆 × 🗆		
1 + 3 + 5 + 7 + 🗆			
<b>Write Idea</b> : You just used induction to apply r to discover mathematical properties. Choose or tive, associative, distributive, or inverse operation about how a mathematician might have used in	number properties to clues. Mathematicians use i one of the properties that you just leaned about: co tions. Think about the steps of induction. Write a p	nduction mmuta- aragraph	

 Name:
 Date:

 Computation: Thinking Skills Lesson 1
 Student Activity

 Comparison: Renting a Car
 Student Activity

 STEPS:
 1. Identify the items you will compare.

 2. List features of the items you are comparing.
 3. Decide how the items are similar or different for each feature.

 4. Summarize what you have learned. State your decision about the items compared.
 Here is the problem that appeared in the lesson:

You need to rent cars for two trips. In order to get the best rates, you compare the rates from Agency A with those from Agency B. To make your comparison, you look at each agency's mileage charges, plus its daily rental fee.

*Directions*: Add Agency C to your comparison. Complete the Agency C column in the table below using the following information:

Agency C offers a daily rate of \$19.95 and charges \$0.15 a mile for every mile above 100. (If you drive 100 miles or fewer there is no mileage charge.)

Trip 1: You will be driving a total of 450 miles and will need a car for three days. Trip 2: You need a car for a one-day meeting in a town just 24 miles away.

Features	Agency A	Agency B	Agency C
Daily rental fee	\$16.95	\$27.95	
Fee per mile	\$ 0.17	\$ 0.00	

Among the three agencies, which should you now use for each of your two trips? Provide statements to support your decisions.

**Write Idea:** You probably have been in situations where you had to make a choice between two or more things. Maybe you had to choose which class to take or which jacket to buy. Think of a situation where you have to make a choice between two or more things. Build a table to compare their features. Then state your decision about them.

 Name:
 Date:

 Computation: Thinking Skills Lesson 2
 Student Activity

 Problem Solving: Planning a Pizza Party
 Identify use goal.

 STEPS:
 1. Identify your goal.

 2. Identify limiting conditions.
 3. Identify and try possible solutions.

 4. Identify and try possible solutions.
 5. Evaluate your possible solutions.

 5. Evaluate your possible solutions.
 5. Evaluate your possible solutions.

You've decided to have a party. Eleven people will be coming, so you look through the cookbook for a recipe. The recipe you find is for two large pizzas that serve eight people. In order to serve twelve people, you need three pizzas. In the lesson, you revised the quantities in the recipe so that you could serve pizza to twelve people.

*Directions*: In addition to pizza, you have decided to make a cake for dessert. The recipe is for 10 servings. Use the following chart to modify the recipe and identify what you need to buy at the store. Remember that you want to serve 12 people.

Ingredients	Original Recipe	Revised Amount	Have in Kitchen	Need to Buy
flour	$3\frac{1}{2}$ cups		3 cups	
baking powder	1 tablespoon		none	
eggs	4 medium		6 medium	
milk	$\frac{3}{4}$ cup		1 cup	
chocolate	3 squares		2 squares	
sugar	$\frac{1}{2}$ cup		2 cups	
butter	$\frac{1}{4}$ stick		$\frac{1}{3}$ stick	

**Write Idea**: Think of a project you've been wanting to start. It could be painting a room, building a shelf, or working on a science experiment. What limiting conditions does your project have? Write three possible solutions. Explain the steps you would use to solve the problem.

#### Name:

**Computation: Thinking Skills Lesson 3** 

**Student Activity** 

# **Decision Making: A Job at the Ballpark**

**STEPS:** 1. Identify the decision to be made.

- 2. Identify the choices available to you.
- **3.** Identify the important information that you must consider when making your decision.
- Determine the outcome of each choice.
- Determine the outcome of each choice.
   Evaluate your choices and summarize what you
- have learned. Then, make your decision.

# Here is the problem that appeared in the lesson:

You have an important decision to make. You have been offered a job selling hot dogs at Hank's Hot Franks at the ballpark next summer. Hank will let you decide how you would like to be paid: a fixed weekly salary, an hourly wage, or a straight 5% commission.

This summer, Hank had three employees. Each decided on a different method of pay. Here's how each was paid:

- Kirby decided to be paid a fixed weekly salary of \$50 for 12 weeks.
- Lena decided to be paid an hourly wage of \$5.50, for 108 regular hours, plus 1<sup>1</sup>/<sub>2</sub> times her hourly wage for overtime of 11 hours.
- Joel decided to be paid 5% commission on each hot dog he sold. His sales totaled \$17,100.

You know that your goal is to make the most money possible. Now you must decide how you want Hank to pay you next summer so you can meet your goal. *Directions*: Use the additional information about another employee to re-evaluate your decision:

#### **Additional Information**

Marcus, another one of Hank's employees, chose to be paid a base salary of \$35.00 per week plus 2% commission. Marcus had hot dog sales of \$16,300 during the 12-week summer season that he worked.

What do you need to know to find Marcus's total earnings? Do the calculations.

Who earned the most money: Kirby, Lena, Joel, or Marcus?

Now that you have another choice, do you want to change your decision about how you want to be paid next summer? Why or why not?

**Write Idea**: You have \$500 and want to open a checking account. There are two kinds of accounts to choose from: 2% interest and no per check charge, or 4% interest plus a 50¢ per check charge. You usually write 15 checks per month. Using the decision-making process you have just learned, which type of account will you open?

Word Problems: Thinking Skills Lesson 2

#### **Student Activity**

# **Comparison: Pondering Puddings**

**STEPS:** 1. Identify the items you are comparing.

- 2. List the features of the items you are comparing.
- **3.** See how the items are similar or different for each feature.
- 4. Summarize what you have learned.

#### Here is the problem that appeared in the lesson:

Wanda and Noah Moore are two senior citizens you are helping. They are planning a special meal to celebrate their 49th wedding anniversary. Both of them enjoy chocolate pudding very much. Noah is limited to 150 calories and 85 mg (milligrams) of sodium in his pudding. Wanda can have 175 calories. In the lesson, you compared two puddings and picked the one that came closest to meeting the needs of both Wanda and Noah. Wanda and Noah now want to consider two other puddings. The new puddings are the following:

**Grandma's Creamy Pudding**. When milk is added to the mix, the pudding has 1120 calories and 650 mg of sodium. One package makes eight servings.

**Kiwi Chocolate Pudding**. When milk is added to the mix, the pudding has 840 calories and 630 mg of sodium. One package makes six servings.

*Directions*: Create a table to compare the two new puddings. Which one would be best for BOTH Wanda and Noah?

Features	

**Write Idea**: Describe a situation where you must choose between two or more similar items (e.g., telephones, cars, bicycles, CD players, classes to take, movies to see, job possibilities). List the features that are most important to you. Complete a table of the items to be compared and their important features. Then select the one that is best for you. In a paragraph, explain the reasons for your decision.



This appendix contains an assignment sheet for all the activities in *Basic Mathematics*. The assignment sheet lists the available lessons and tests. The *SkillsTutor* management system will track the lessons and tests your students complete. However, it may be helpful to photocopy an assignment sheet to help you plan lesson assignments or to help your students keep track of the lessons and tests they complete.

Activity		Date Assigned	Date Completed	Score/Progress	
Number		~~~ <b>!</b> ~	•		
Number	r Con				1
	•	Pretest on Number Concepts			
	1	Place Values of Digits			
	2	Expanded Notation			
	3	Number Lines			
	4	Rounding			
	5	Estimating			
	6	Multiples and Factors			
	7	Even, Odd, and Prime Numbers			
	8	Prime Factorization			
	9	The Greatest Common Factor			
	10	Least Common Multiple and Denominator			
	11	Simplifying Fractions			
	Q1	Quiz on Lessons 1 through 11			
	TS	Classification: A Trip to Numberland			
	12	Equations and Inequalities			
	13	Finding the Missing Operations			
	14	Finding the Missing Numbers in Equations			
	15	Finding the Missing Numbers in Inequalities			
	16	Missing Numbers in Related Number Sentences			
	17	The Commutative Property			
	18	The Associative Property			
	19	The Distributive Property			
	20	Identity Elements and Inverses			
	Q2	Quiz on Lessons 12 through 20			
	TS	Induction: A Treasure Hunt			
	•	Posttest on Number Concepts			

Activity		Date Assigned	Date Completed	Score/Progress	
Computation					
	•	Pretest on Computation			
	1	Addition of Whole Numbers			
	2	Subtraction of Whole Numbers			
	3	Multiplication of Whole Numbers			
	4	Division of Whole Numbers			
	5	Addition of Decimals			
	6	Subtraction of Decimals			
	7	Multiplication of Decimals			
	8	Division of Decimals			
	Q1	Quiz on Lessons 1 through 8			
	TS	Comparison: Renting a Car			
	9	Addition of Like Fractions			
	10	Addition of Unlike Fractions			
	11	Addition of Mixed Numerals			
	12	Subtraction of Like Fractions			
	13	Subtraction of Unlike Fractions			
	14	Subtraction of Mixed Numerals			
	15	Multiplication of Fractions			
	16	Multiplication of Mixed Numerals			
	17	Division of Fractions			
	18	Division of Mixed Numerals			
	Q2	Quiz on Lessons 9 through 18			
	TS	Problem Solving: Planning a Pizza Party			
	19	Introduction to Ratio and Percent			
	20	Interchanging Fractions and Decimals			
	21	Interchanging Percents and Decimals			
	22	Interchanging Fractions and Percents			
	23	Finding the Percent of a Number			
	Q3	Quiz on Lessons 19 through 23			
	TS	Decision Making: A Job at the Ballpark			
	•	Posttest on Computation			

Activity		Date Assigned	Date Completed	Score/Progress
Word Proble	ems			
•	Pretest on Word Problems			
1	One-Step Addition Problems			
2	One-Step Subtraction Problems			
3	One-Step Multiplication Problems			
4	One-Step Division Problems			
5	Two-Step Problems for Addition and Subtraction			
6	Two-Step Problems Using Multiplication			
7	Two-Step Problems Using Division			
8	Needed Operations			
9	Needed Information			
Q1	Quiz on Lessons 1 through 9			
10	Word Problems About Money			
11	Menus and Price Lists			
12	Averages			
13	Decimals and Fractions			
14	Standard Units of Measurement			
Q2	Quiz on Lessons 10 through 14			
TS	Comparison: Pondering Puddings			
•	Posttest on Word Problems			

Activity		Date Assigned	Date Completed	Score/Progress		
Measu	uremer	nt and Geometry				
	•	Pretest on Measurement and Geometry				
	1	Reading a Ruler				
	2	Appropriate Units of Measure				
	3	Time and the Calendar				
	4	Temperature				
	5	Money				
	6	Roman Numerals				
	7	Fractional Part of a Set				
	Q1	Quiz on Lessons 1 through 7				
	8	Terms in Geometry				
	9	Plane and Solid Figures				
	10	Perimeter of a Polygon				
	11	Area and Volume				
	Q2	Quiz on Lessons 8 through 11				
	TS	Problem Solving: Designing a Playground				
	•	Posttest on Measurement and Geometry				