Increasing Your Students' Mastery of

Addition and Subtraction Math Facts

Grades 1-3

PD RESOURCE KIT

BER
Bureau of Education & Research

Increasing Your Students' Mastery of Addition and Subtraction Math Facts, Grades 1-3

PD Resource Kit

RESOURCE GUIDE

By

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Thank you for your interest in *Increasing Your Students' Mastery of Addition and Subtraction Math Facts, Grades 1-3.*

The goal of math instruction is to help students become effective mathematicians. Increasing young children's automaticity with math facts provides them with a strong foundation so they can move on to master more complex math concepts and skills.

This video program demonstrates a wealth of highly engaging ways to develop young students' proficiency with math facts. Viewers will see how to enhance students' understanding of basic math concepts as well as increase students' learning of math facts through interactive lessons, hands-on materials and practical, easy to implement practice opportunities. The demonstrated strategies and techniques can easily be incorporated into any math program being used in primary classrooms.

This PD Resource Kit contains a comprehensive Resource Guide and DVD with video clips for use in PD sessions. We have designed each PD Resource Kit to be used by:

- PD facilitators to support PD sessions with groups of any size
- Individuals and small groups interested in self-study

The Resource Guide contains suggestions for utilizing the PD Resource Kit and a variety of print resources that may be reproduced for use by participants in their own classrooms.

Sincerely,

Mona Roach

Mona Roach, PhD
Media Training Director

ABOUT THE TRAINER...

SUE O'CONNELL is an experienced classroom teacher, nationally known instructional specialist, author and seminar leader. Her books and seminars are full of creative and practical ideas for implementing the NCTM standards and making mathematics meaningful and relevant to students. She is the author of several books on teaching math, including *Now I Get It: Strategies for Building Confident and Competent Mathematicians, K-6; Introduction to Problem Solving; Introduction to Communication;* the *Math – The Write Way Series:* and *Real World Math.* Her books are well known for their practical ideas and real world applications, as well as for their integration of mathematics and language arts skills. Sue has published articles in the NCTM Journal, is a frequent speaker at NCTM conferences, and works with teachers across North America to improve math instruction in K-8 classrooms.

For more information about Sue, please visit http://www.sueoconnell.com.

ABOUT THE BUREAU . . .

BUREAU OF EDUCATION & RESEARCH is North America's leading provider of PD events and resources for professional educators. Founded in 1976, the Bureau provides national and regional PD programs across the United States and Canada. The Bureau also offers additional high-quality PD resources:

- **PD Resource Kits** contain outstanding video clips and supporting print resources designed for schools and districts to use to conduct their own PD sessions
- **Online PD Courses** contain outstanding video clips and supporting print resources designed for individuals and groups of educators to learn at their own convenience
- **On-Site PD Services** enable schools and districts to bring outstanding BER Trainers to their own sites to facilitate customized professional development
- **National Train-the-Trainer Programs** on cutting-edge topics enable schools and districts to train their own staff members who then conduct site-based professional development sessions

For further information about Bureau PD programs and resources, please contact us: www.ber.org or toll free (800) 735-3503.

Increasing Your Students' Mastery of Addition and Subtraction Math Facts Grades 1-3

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PROGRAM GUIDE

Bureau of Education & Research

SUGGESTIONS FOR PD TRAINERS

This section of the *Resource Guide* is designed for those who will be presenting the material in a workshop format. If you are viewing the program by yourself or with a small group, please turn to page 9 for self-study suggestions.

Overview of the Program

Increasing Your Students' Mastery of Addition and Subtraction Math Facts, Grades 1-3 is a video program focused on increasing primary students' mastery of math facts.

Section One provides a quick overview of the important connection between developing students' understanding of math concepts and their mastery of math facts. *4:53*

In Section Two, you will see a number of ways to teach students strategies for learning and remembering addition and subtraction facts. *21:17*

Section Three demonstrates a variety of highly engaging practice activities that increase student automaticity with math facts. Also included are suggestions for assessing students' mastery of math facts. *13:21*

Different Ways to Use the Program

Good video footage is a powerful way to demonstrate effective classroom practices and generate discussion. This program offers facilitators a variety of options:

Show the Entire Program

Select PLAY ALL on the main DVD menu. This selection enables you to control the video playback for the entire program, pausing whenever you choose for questions, discussion, and time with the related print resources. The PLAY ALL option is also the most efficient way to preview the program.

Show Each Topic

Select the TOPIC MENU on the main DVD menu. You can then select a topic of choice. Some topics are divided into subtopics. The SUB-TOPIC MENU will allow you to navigate through each topic or you may select PLAY ALL to play the entire section. You can pause at any point for questions and discussion.

Review/Replay Specific Activities or Lessons

During the session, you may want to replay certain lessons or activities within a topic. The SUB-TOPIC MENUS will help you enter the topic at specific points. You can also use fast forward and fast reverse commands to navigate quickly within each topic area.

No Matter Which Option You Choose

As you guide participants through this program, the most effective strategy is to show a segment, then stop for discussion and/or an opportunity to read the related print resources.

Print Materials That Directly Support the Program

- Note-taking guides, pages 17-21

  The guides are video section outlines that participants can use to jot down specific information, thoughts and questions.

- Descriptions of strategies, supporting information and examples, pages 23-79

  The Print Resources section is devoted to describing and supporting the strategies included in the video program. Included are:

  * general information sheets
  * copies of math fact practice sheets and guidelines for the lessons and activities within the video program
  * related material that enhances viewers' understanding of the demonstrated strategies

- Resource information, pages 81-83

  The closing pages of the guide contain a list of resources, references, and a related BER PD Resource Kits.

Equipment/Materials Needed

DVD player, monitor

DVD

Print Resources

Chart paper or whiteboard, markers

The Sessions

Before Viewing the Program

Distribute the Anticipation Guide on page 23 in the Print Resources section. Give participants 5-10 minutes to read through and complete the guide. Remind participants to keep in mind the key characteristics listed on the guide as they view the activities, techniques and strategies demonstrated in the video program.

SECTION ONE: CONNECTION BETWEEN UNDERSTANDING MATH CONCEPTS AND MASTERY OF MATH FACTS *4:53*

Distribute the *Note-Taking Guide* for Section One, page 17.

Show participants the Introduction (1:45) and Section One.

Discussion Questions

- ✓ What is the relationship between building students' understanding of math concepts and their learning and retention of math facts?
- ✓ What sorts of lessons and activities promote students' mathematical thinking and reasoning?
- ✓ Why are teacher modeling and demonstrations critical to helping students develop a solid understanding of math concepts?
- ✓ In addition to the multi-media tools shown in this portion of the program, what are some other ways to engage whole groups of students in learning math concepts?

Supporting Print Materials for Introduction/Section One

Note-Taking Guide (page 17)
Topic outline that facilitates note taking

Anticipation Guide (page 23)
Key characteristics of effective math fact practice for primary students

Resources (pages 81-83)
List of print references, websites and resources for math activities, materials and manipulatives

SECTION TWO: TEACH STRATEGIES FOR LEARNING ADDITION AND SUBTRACTION FACTS *21:17*

Distribute the *Note-Taking Guide* for Section Two, page 19.

In this segment, participants will see how to enhance students' strategic approach to addition and subtraction math facts by focusing on five key attributes of numbers:

- Counting On *3:14*
- Commutative Property *2:26*
- Fact Families *5:13*
- Doubles *2:01*
- Making Tens *6:54*

After each segment, you may want to stop for a brief discussion and have participants share additional ideas.

Discussion Questions

- ✓ Why is linking math fact practice to key math concepts an effective way to develop students' proficiency with math facts?
- ✓ How do hands-on, interactive experiences help solidify number concepts and support students' learning of math facts?
- ✓ What are some ways teachers in the video differentiate the difficulty of math tasks so that all their students are able to work productively with the same number concept?
- ✓ What is the teacher's role during math fact practice activities?

Supporting Print Materials for Section Two

Note-Taking Guide (page 19)
Topic outline that facilitates note taking

Practice Activities for Learning Addition and Subtraction Facts, Section Two (pages 25-29)
Brief descriptions and lists of materials needed for fact practice activities in this portion of the program

Student Fact Practice Activity Sheets (pages 37-55)
Copies of student fact practice activity sheets used in Section Two of the video program:

Strategy Game: +1, +2

Strategy Game: -1, -2

Spinners for Counting On, Counting Off by 1's and 2's

Blank Spinners

What's My Number?

Find a Double

Using TENS to Add

My total is _____ (using tens frames)

Tens Frame Template

Make a Ten

Resources (pages 81-83)

List of print references, websites and resources for math activities, materials and manipulatives

SECTION THREE: INCREASE STUDENT AUTOMATICITY WITH MATH FACTS *13:21*

Distribute the *Note-Taking Guide* for Section Three, page 21.

In the left-hand column of the note-taking guide, there is a list of key characteristics to watch for in this section. Participants' observations can generate good discussion after viewing.

Show participants Section Three.

Discussion Questions

- ✓ Why are active, meaning-making practice activities essential to students' mastery of math facts?
- ✓ While flash cards are a tried and true practice technique, what are the benefits of using other types of fact practice activities?
- ✓ When timed tests are used to assess students' mastery of math facts, what are some ways to increase their effectiveness, especially for students who struggle?
- ✓ In what ways do teacher observations and student math practice recording sheets provide helpful information about students' understanding of math facts?
- ✓ What is the value of brief teacher/student math conferences, especially for struggling students? How might you incorporate these into your math instruction?

Supporting Print Materials for Section Three

Note-Taking Guide (page 21)

Topic outline that facilitates note taking

Practice Activities to Increase Student Automaticity with Math Facts, Section Three (pages 31-35)

Brief descriptions and lists of materials needed for fact practice activities in this portion of the program

Student Fact Practice Activity Sheets (pages 57-77)

Copies of student fact practice activity sheets used in Section Three of the video program:

Sunny Addition

Spin and Subtract

Spin and Subtract Spinners

Find the Sum

Find the Difference

Hop Back 2

Tossing Facts (Math Facts Table)

Number Puzzle 1

Number Puzzle 2

Magic Square 1

Magic Square 2

Assessing Students' Mastery of Addition and Subtraction Facts (page 79)

Suggestions for assessing students' mastery of math facts

Resources (pages 81-83)

List of print references, websites and resources for math activities, materials and manipulatives

After Viewing the Program

Ask participants to return to the Anticipation Guide they completed at the beginning of the session. The guide can be used to discuss:

- ways in which participants are currently implementing effective characteristics of math fact practice with their students
- new ideas participants gleaned from the video program
- questions or concerns about implementing math fact practice activities with their students

SUGGESTIONS FOR SELF-STUDY

This section of the *Resource Guide* is designed for individuals and small groups. If you are responsible for leading a group through this material, please turn back to *Suggestions for PD Trainers,* page 3.

Overview of the Program

> Video instruction provides a practical and efficient way to observe effective teaching strategies and engage in thoughtful reflection. We encourage you to watch a segment, stop the video, reflect, and take full advantage of the related print resources. You will find suggestions for making the most of your sessions in this portion of the *Resource Guide.*

Increasing Your Students' Mastery of Addition and Subtraction Math Facts, Grades 1-3 is a video program focused on increasing primary students' mastery of math facts.

Section One provides a quick overview of the important connection between developing students' understanding of math concepts and their mastery of math facts. *4:53*

In Section Two, you will see a number of ways to teach students strategies for learning and remembering addition and subtraction facts. *21:17*

Section Three demonstrates a variety of highly engaging practice activities that increase student automaticity with math facts. Also included are suggestions for assessing students' mastery of math facts. *13:21*

Scheduling Suggestion

Whether you choose to view the entire program in one session or view sections over two or more study sessions, **this program is not designed to be viewed straight through.** Your learning experience will be much richer if you take the time to stop the video after each section, reflect, and read the additional information contained in this *Resource Guide.*

Reflection Questions

Reflection questions are provided for your sessions. It is recommended that you view a section and then refer to the questions for thoughtful reflection. Please keep in mind that this guide contains print explanations of the strategies and activities as well as other related material that can inform and enrich your learning.

Note-Taking Guide

A note-taking guide for the entire program is located on pages 17-21. The divisions and headings match the graphics in the video.

Your Sessions

SECTION ONE: CONNECTION BETWEEN UNDERSTANDING MATH CONCEPTS AND MASTERY OF MATH FACTS *4:53*

Turn to the *Note-Taking Guide* for Section One, page 17.

View the Introduction (1:45) and Section One.

Reflection Questions

- ✓ What is the relationship between building students' understanding of math concepts and their learning and retention of math facts?
- ✓ What sorts of lessons and activities promote students' mathematical thinking and reasoning?
- ✓ Why are teacher modeling and demonstrations critical to helping students develop a solid understanding of math concepts?
- ✓ In addition to the multi-media tools shown in this portion of the program, what are some other ways to engage whole groups of students in learning math concepts?

Supporting Print Materials for Introduction/Section One

Note-Taking Guide (page 17)
Topic outline that facilitates note taking

Resources (pages 81-83)
List of print references, websites and resources for math activities, materials and manipulatives

SECTION TWO: TEACH STRATEGIES FOR LEARNING ADDITION AND SUBTRACTION FACTS *21:17*

Turn to the *Note-Taking Guide* for Section Two, page 19.

In this segment, you will see how to enhance students' strategic approach to addition and subtraction math facts by focusing on five key attributes of numbers:

- Counting On *3:14*
- Commutative Property *2:26*
- Fact Families *5:13*
- Doubles *2:01*
- Making Tens *6:54*

You may want to stop the video at the end of each segment to read the related print material.

Reflection Questions

- ✓ Why is linking math fact practice to key math concepts an effective way to develop students' proficiency with math facts?
- ✓ How do hands-on, interactive experiences help solidify number concepts and support students' learning of math facts?
- ✓ What are some ways teachers in the video differentiate the difficulty of math tasks so that all their students are able to work productively with the same number concept?
- ✓ What is the teacher's role during math fact practice activities?

Supporting Print Materials for Section Two

Note-Taking Guide (page 19)

Topic outline that facilitates note taking

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Brief descriptions and lists of materials needed for fact practice activities in this portion of the program

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Strategy Game: +1, +2

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Blank Spinners

What's My Number?

Find a Double

Using TENS to Add

My total is _____ (using tens frames)

Tens Frame Template

Make a Ten

Resources (pages 81-83)

List of print references, websites and resources for math activities, materials and manipulatives

SECTION THREE: INCREASE STUDENT AUTOMATICITY WITH MATH FACTS *13:21*

Turn to the *Note-Taking Guide* for Section Three, page 21.

In the left-hand column of the note-taking guide, there is a list of key characteristics to watch for in this section.

View Section Three.

Reflection Questions

- ✓ Why are active, meaning-making practice activities essential to students' mastery of math facts?
- ✓ While flash cards are a tried and true practice technique, what are the benefits of using other types of fact practice activities?
- ✓ When timed tests are used to assess students' mastery of math facts, what are some ways to increase their effectiveness, especially for students who struggle?
- ✓ In what ways do teacher observations and student math practice recording sheets provide helpful information about students' understanding of math facts?
- ✓ What is the value of brief teacher/student math conferences, especially for struggling students? How might you incorporate these into your math instruction?

Supporting Print Materials for Section Three

Note-Taking Guide (page 21)

Topic outline that facilitates note taking

Practice Activities to Increase Student Automaticity with Math Facts, Section Three (pages 31-35)

Brief descriptions and lists of materials needed for fact practice activities in this portion of the program

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Copies of student fact practice activity sheets used in Section Three of the video program:

Sunny Addition

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Hop Back 2

Tossing Facts (Math Facts Table)

Number Puzzle 1

Number Puzzle 2

Magic Square 1

Magic Square 2

Assessing Students' Mastery of Addition and Subtraction Facts (page 79)

Suggestions for assessing students' mastery of math facts

Resources (page 81-83)

List of print references, websites and resources for math activities, materials and manipulatives

After Viewing the Program

Consider the following options:

- Implement several of the math fact practice activities from the program.
- Find opportunities in your daily schedule to increase math fact practice for your students.
- For a wealth of information on additional math fact practice activities, browse through the websites listed on page 81.

PRINT RESOURCES

Bureau of Education & Research

Note-Taking Guide
Section One: Connection Between Understanding Math Concepts and Mastery of Math Facts

Increasing Your Students' Mastery of Addition and Subtraction Math Facts
Grades 1-3

Posing Problems

Teacher Demonstrations

Note-Taking Guide
Section Two: Teach Strategies for Learning Addition and Subtraction Facts

Increasing Your Students' Mastery of Addition and Subtraction Math Facts
Grades 1-3

Key Attributes of Number System	Math Fact Practice Activities
Counting On	Strategy Game: +1, +2 Jumping Jack Math Walk the Line
Commutative Property	Behind My Back
Fact Families	Addition Chains What's My Number? Behind My Back Paper Bag Math
Doubles	Domino Doubles Find a Double
Making Tens	What's My Total? Using Tens Frames to Add Making Ten Go Fish! Bead Counters

Note-Taking Guide
Section Three: Increase Student Automaticity with Math Facts

Increasing Your Students' Mastery of Addition and Subtraction Math Facts
Grades 1-3

Key Characteristics of Effective Fact Practice	Math Fact Practice Activities
Repeated Practice & Reinforcement	Addition Memory
	Subtraction Memory
Variety of Settings	
Clarify Expectations	
Short Practice Sessions	Picture Puzzles
	Sunny Addition
Manipulatives & Kinesthetic Elements	Bean Bag Toss
	Spin and Subtract
	Hop Back Subtraction
	Math Facts Table (Tossing Facts)
Appropriate Level of Difficulty	Number Tile Puzzle
	Magic Square
	Find the Difference
Assessing Students' Mastery of Math Facts	

Anticipation Guide

Before viewing the video, circle the number on the scale that represents, for your classroom, the current implementation level of each practice characteristic. Keep these characteristics in mind as you watch the video training program.

Characteristics of Effective Math Fact Practice	Implementing Effective Math Fact Practice
A. Math fact practice is connected to students' understanding of math concepts.	In place and working well — Trying it out — Not working OR not yet 10 9 8 7 6 5 4 3 2 1
B. Math fact practice occurs in a variety of settings. (individuals, pairs, small groups, whole class, centers)	In place and working well — Trying it out — Not working OR not yet 10 9 8 7 6 5 4 3 2 1
C. Short practice sessions over time increase students' learning and retention of math facts.	In place and working well — Trying it out — Not working OR not yet 10 9 8 7 6 5 4 3 2 1
D. Directions for practice activities and expectations for student participation are clear and well defined.	In place and working well — Trying it out — Not working OR not yet 10 9 8 7 6 5 4 3 2 1
E. Math fact practice activities include manipulatives, incorporate kinesthetic elements, and engage students at different levels of difficulty.	In place and working well — Trying it out — Not working OR not yet 10 9 8 7 6 5 4 3 2 1
F. Practice activities promote positive feelings about math and decrease anxiety about learning math facts.	In place and working well — Trying it out — Not working OR not yet 10 9 8 7 6 5 4 3 2 1

Practice Activities for Learning Addition and Subtraction Facts, Section Two

JUMPING JACK MATH

Facts: addition

Materials: whiteboard or chart paper; markers

Description: This activity works best for counting on by 1's or 2's. Students perform any number of jumping jacks then add one or two more. Saying and writing the number sentence enhances students' learning of addition facts.

STRATEGY GAMES: +1, +2 AND -1, -2

Facts: addition, subtraction

Materials: student worksheets (pages 37-39); dot cards (playing cards or dominoes are other options); number cubes; spinners (pages 41-43)

Description: Students choose a card from stack of dot cards. They count the dots on the card and record the number on their worksheet. Next, students roll a number cube or spin a spinner for a number to add or subtract. Students write the complete number sentence on the worksheet. In the video program, students are using +1, +2 number cubes and spinners. To practice subtraction facts using the "counting down" strategy, children can use -1, -2 cubes and spinners.

WALK THE LINE

Facts: addition, subtraction

Materials: Number cards 1-10; floor number line with numbers 1-20; sheet of paper; pencil or marker

Description: Students work in pairs. One student turns over a card and his/her partner steps on that number on the number line. Then another card is turned over and the partner takes that many steps to find the sum of the two numbers. Students record each number sentence on the paper.

BEHIND MY BACK

Facts: addition, subtraction

Materials: Unifix cubes, number line (optional)

Description: Students work in pairs. Teacher gives each pair of students a stack of Unifix cubes. After counting the total number of cubes, one student puts the stack behind his/her back, breaks off some cubes and shows them to the partner. The partner's job is to determine how many cubes are left behind the first student's back. Students count the cubes to verify their answers.

PAPER BAG MATH

Facts: addition, subtraction

Materials: Small paper bags numbered from 5-20; chips or markers

Description: Students work in pairs. Teacher gives each pair of students a paper bag with a number on it that represents how many plastic chips or markers are inside. One student takes out some of the chips and shows them to the partner. The partner's job is to determine how many chips are left in the bag. Students count the chips to verify their answers.

ADDITION CHAINS

Facts: addition

Materials: pocket charts; strips with related math facts

Description: Use 4-5 related math fact strips. Start with a math fact and ask students to solve it. Then place another math fact in the pocket chart. Ask students to think of how they can use the first math fact to solve this one. Encourage students to explain their thinking. Continue until all the math fact strips are in the pocket chart.

WHAT'S MY NUMBER?

Facts: addition, subtraction

Materials: student worksheet (page 45); number cards

Description: Students can either select a number card or the teacher can assign a number. Students write that number in the square at the top of the worksheet. Students work individually or in pairs to think of different addition and subtraction facts that result in that number.

DOMINO DOUBLES

Materials: dominoes; two paper plates, one labeled *Doubles* and one labeled *Not Doubles*

Description: Students pick a domino, determine if it is a double or not a double, and place it on the appropriate paper plate.

FIND A DOUBLE

Facts: addition

Materials: number cubes; student worksheet (page 47)

Description: Students roll number cubes and look for doubles. They record all doubles facts with answers on the worksheet.

WHAT'S MY TOTAL?

Facts: addition

Materials: tens frame cards with varying numbers of dots

Description: This is a whole class activity. Each student has a tens frame card and teams up with a partner to ask the following questions:

- What's my total?
- How many more do I need to make ten?
- How do you know?

After the partners answer each other's questions, they choose new partners and repeat the process.

USING TENS FRAMES TO ADD

Facts: addition

Materials: student worksheets (pages 49-55); two-color counters; math fact cards; number cubes

Description: Various activities that engage students in making tens as an addition strategy.

GO FISH!

Facts: addition

Materials: tens frame cards with varying numbers of dots

Description: Student partners take turns asking for tens frame cards that will create card pairs totalling ten.

BEAD COUNTERS

Facts: addition, subtraction

Materials: pipe cleaners; mini-clothespins; 2 colors of beads

Description: Teachers guide students to make bead counters. Students use the bead counters to find different ways to make ten. These are excellent manipulatives to use with story problems.

Practice Activities to Increase Student Automaticity with Math Facts, Section Three

PICTURE PUZZLES

Facts: addition, subtraction

Materials: number sentence strips; strips with pictures that represent each number sentence

Description: Students work in pairs, taking turns matching a number sentence to the correct picture strip. To make the activity more challenging, students can turn the strips face down and take turns turning over strips to find a match.

ADDITION/SUBTRACTION MEMORY

Facts: addition, subtraction

Materials: 10-24 math fact cards and answer cards

Description: Students lay the cards face down. Working in pairs, students take turns turning over two cards, trying to match a math fact to the correct answer. If the cards don't match, they are turned over and the other student takes a turn. If the two cards match, the student keeps those cards. After all cards have been matched, each student counts his/her matches. The student with more matches wins.

SUNNY ADDITION

Facts: addition, subtraction

Materials: colored chips; number cubes; student worksheet (page 57)

Description: Students take turns rolling two number cubes and placing a colored marker on the sun that contains the correct sum (or difference). Game continues until all suns are covered. Different worksheets can be created with different shapes and with different numbers.

BEAN BAG TOSS

Facts: addition, subtraction

Materials: shower curtain or large sturdy chart sectioned into large squares, each containing a number; bean bags; paper for recording number sentences; marker or pencil

Description: Students work in pairs. One student tosses two bean bags. The partner records the two numbers on which the bean bags land, then adds or subtracts the numbers, depending upon the teacher's directions. Students take turns tossing the bean bags and writing the number sentences.

SPIN AND SUBTRACT

Facts: subtraction

Materials: spinner sheet (page 61) and student worksheet (page 59)

Description: Students work in pairs. Each student spins both spinners to identify two numbers. Each student records the numbers on his/her worksheet and finds the difference. Students compare their answers, and the student with the larger difference circles the answer and wins that turn. Students continue to spin and subtract, comparing answers after each turn.

FIND THE SUM, FIND THE DIFFERENCE

Facts: addition, subtraction

Materials: number cubes, student worksheets (pages 63-65)

Description: Students play in partners, roll number cubes, and record the resulting addition or subtraction equation. Student with the larger sum or difference wins the round.

HOP BACK 2 SUBTRACTION

Facts: subtraction, addition

Materials: student worksheet with spinner (page 67); sheet of paper for recording number sentences; pencil or colored marker

Description: Students work in pairs. One student spins the spinner, reads the number, subtracts 2, and places a marker on the number line. The other student writes the number sentence on a piece of paper. The goal is to cover all the numbers on the line. This activity is easily adapted for a variety of subtraction and addition fact practice.

TOSSING FACTS

Facts: addition

Materials: 2 number cubes or dice, numbers 1-6; student worksheet (page 69)

Description: Students work individually or in pairs. Students roll dice or number cubes, find the sum and write it in the correct place on the table. The object is to fill in the fact table.

NUMBER TILE PUZZLES

Facts: addition, subtraction

Materials: number tiles; number puzzles (examples on pages 71-73)

Description: Students use number tiles to fill in empty squares in equations. Using number tiles adds a tactile element and enables puzzle sheets to be re-used. If teachers laminate the puzzle sheets, students can either use tiles or erasable markers to fill in the numbers.

MAGIC SQUARE

Facts: addition

Materials: magic squares (examples on pages 75-77)

Description: Students can work individually or in pairs to fill in the empty squares. Each number can be used only once and all rows, columns and diagonals must equal the same sum.

The following website is an excellent resource for printable magic squares: http://www.dr-mikes-math-games-for-kids.com

Name: ____________________________

Strategy Game: +1, +2

Directions

1. Pick a dot card.
2. Write the number.
3. Roll the +1, +2 cube or use a +1, +2 spinner.
4. Use a strategy to solve the problem.
5. Write the number sentence on the recording sheet.

____ ◯ ____ = ____	____ ◯ ____ = ____
____ ◯ ____ = ____	____ ◯ ____ = ____
____ ◯ ____ = ____	____ ◯ ____ = ____
____ ◯ ____ = ____	____ ◯ ____ = ____
____ ◯ ____ = ____	____ ◯ ____ = ____
____ ◯ ____ = ____	____ ◯ ____ = ____
____ ◯ ____ = ____	____ ◯ ____ = ____
____ ◯ ____ = ____	____ ◯ ____ = ____
____ ◯ ____ = ____	____ ◯ ____ = ____
____ ◯ ____ = ____	____ ◯ ____ = ____

Name: ____________________________________

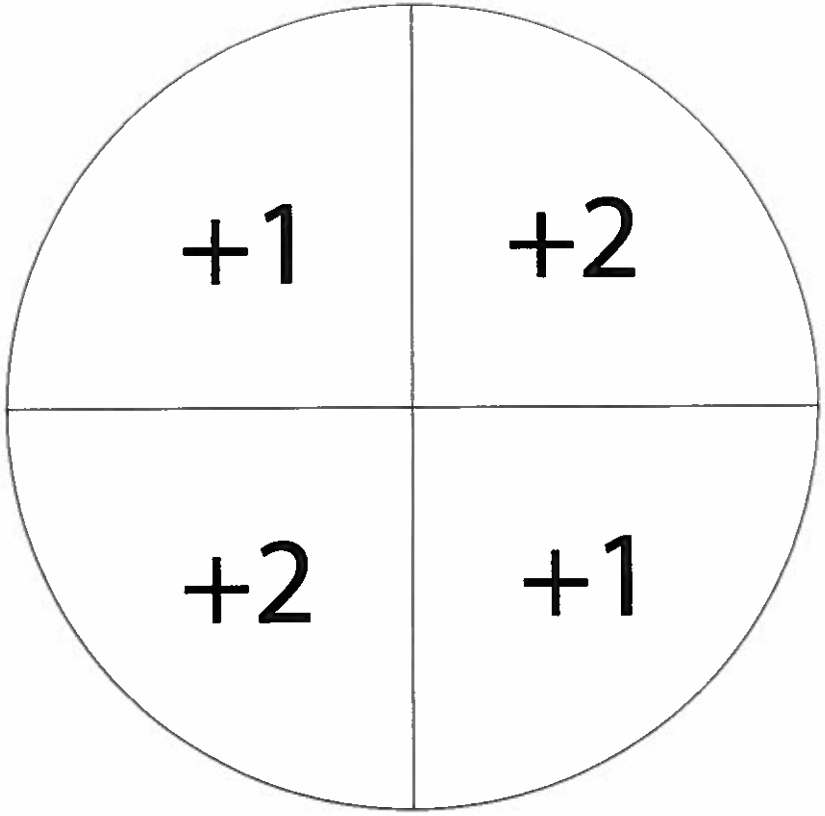
Strategy Game: -1, -2

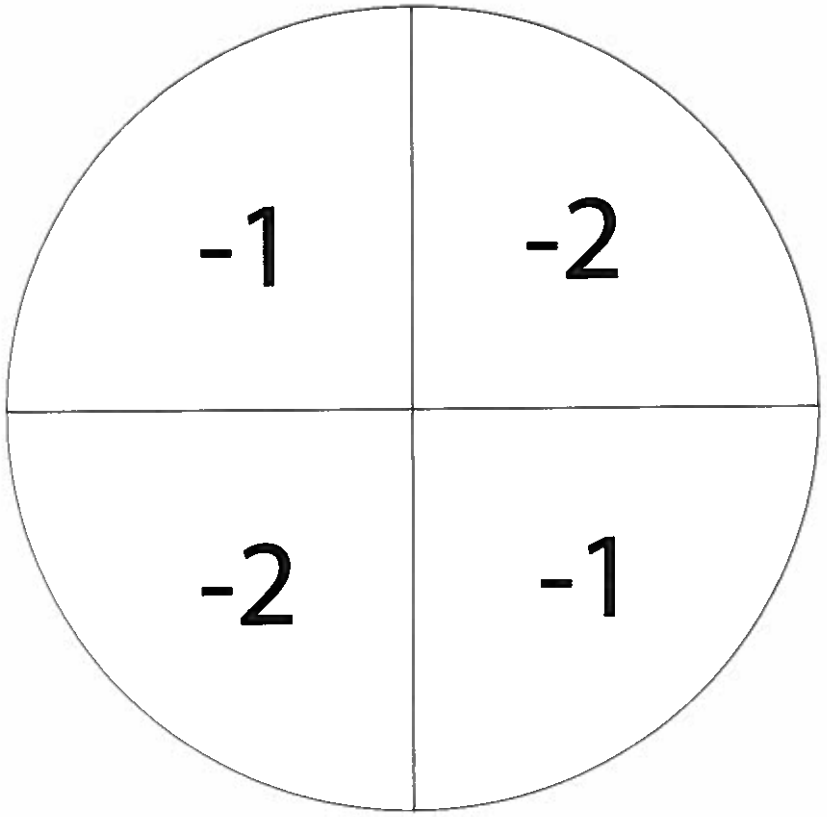
Directions

1. Pick a dot card.
2. Write the number.
3. Roll the -1, -2 cube or use a -1, -2 spinner.
4. Use a strategy to solve the problem.
5. Write the number sentence on the recording sheet.

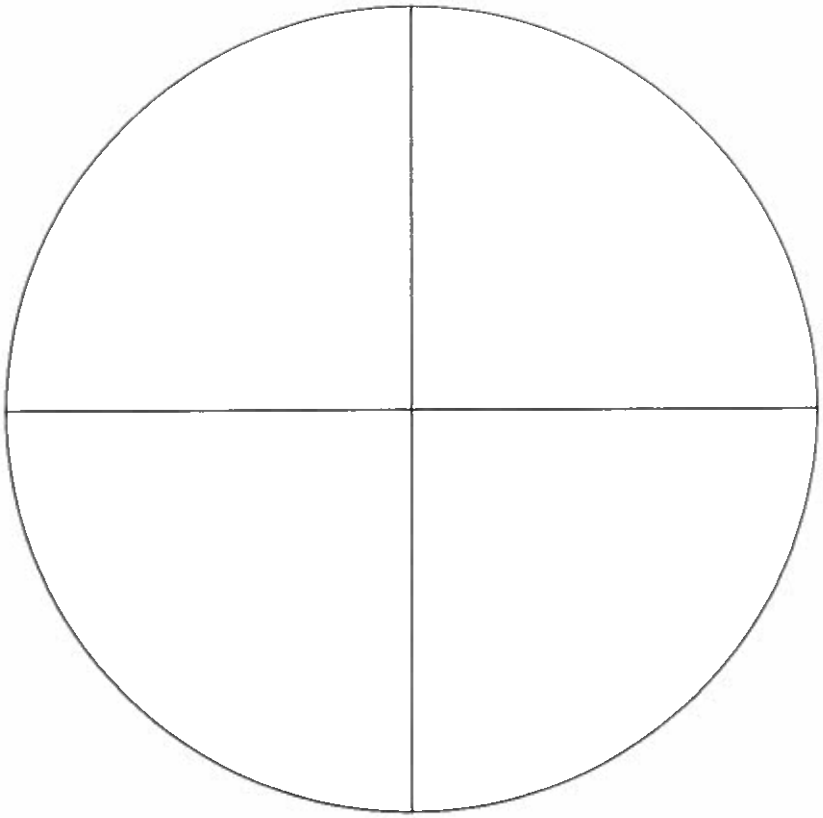
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____

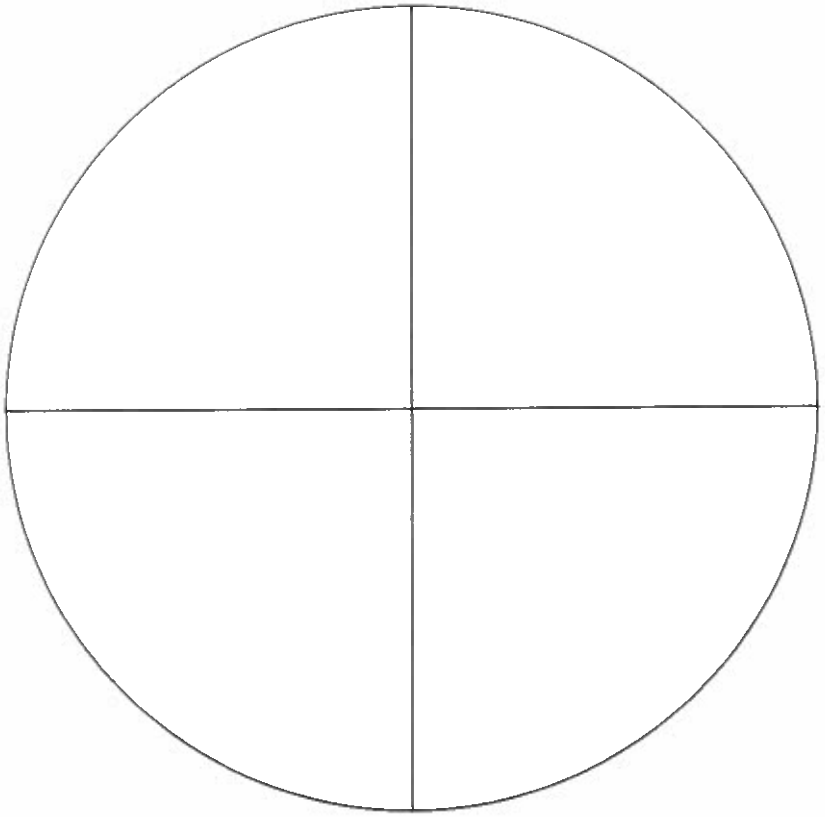
SPINNERS





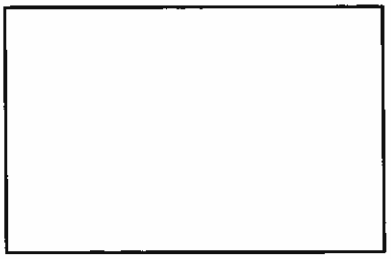
BLANK SPINNERS





Name: _____

What's My Number?

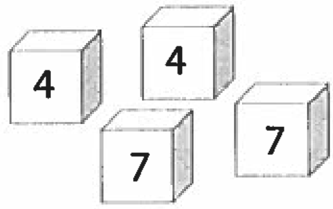


Name: ____________________________________

Find a Double

Materials:

1. 4 number cubes
2. Recording sheet
3. Pencil

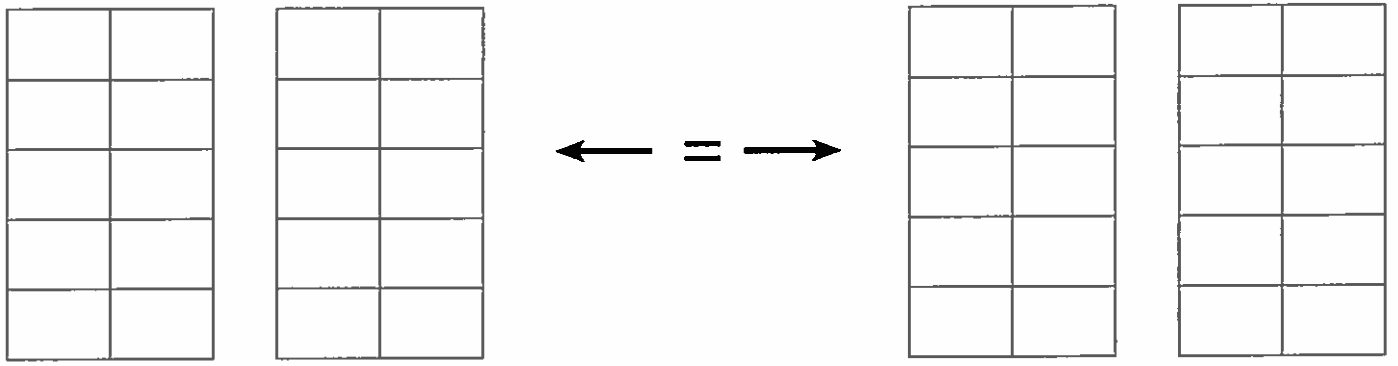


Directions:

1. Toss the 4 cubes.
2. If you find a double, record it on your sheet. Write **all** the double facts you make.

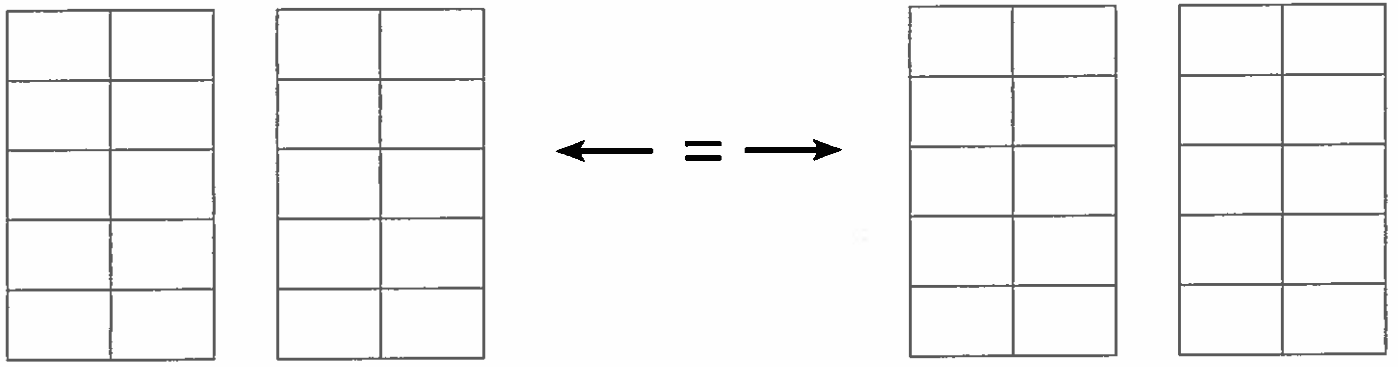
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____
____ ○ ____ = ____	____ ○ ____ = ____

Using TENS to Add



_____ + _____ = _____ _____ + _____ = _____

Using TENS to Add



_____ + _____ = _____ _____ + _____ = _____

☺ ______________________________

My total is ______

Directions:

Version A: **My total is 10**

1. Shake and spill 10 two-sided counters.
2. Separate the colors and set one counter in each section of your Tens Frame.
3. Record the number sentence below.

Version B: **My total is 20**

1. Shake and spill 20 two-sided counters.
2. Separate the colors and set one counter in each section of two Tens Frames.
3. Record the number sentence below.

______ + ______ = ______ red part yellow part **total**	______ + ______ = ______ red part yellow part **total**
______ + ______ = ______ red part yellow part **total**	______ + ______ = ______ red part yellow part **total**
______ + ______ = ______ red part yellow part **total**	______ + ______ = ______ red part yellow part **total**
______ + ______ = ______ red part yellow part **total**	______ + ______ = ______ red part yellow part **total**
______ + ______ = ______ red part yellow part **total**	______ + ______ = ______ red part yellow part **total**
______ + ______ = ______ red part yellow part **total**	______ + ______ = ______ red part yellow part **total**
______ + ______ = ______ red part yellow part **total**	______ + ______ = ______ red part yellow part **total**

Created by Josepha Robles

Make a Ten

Directions:

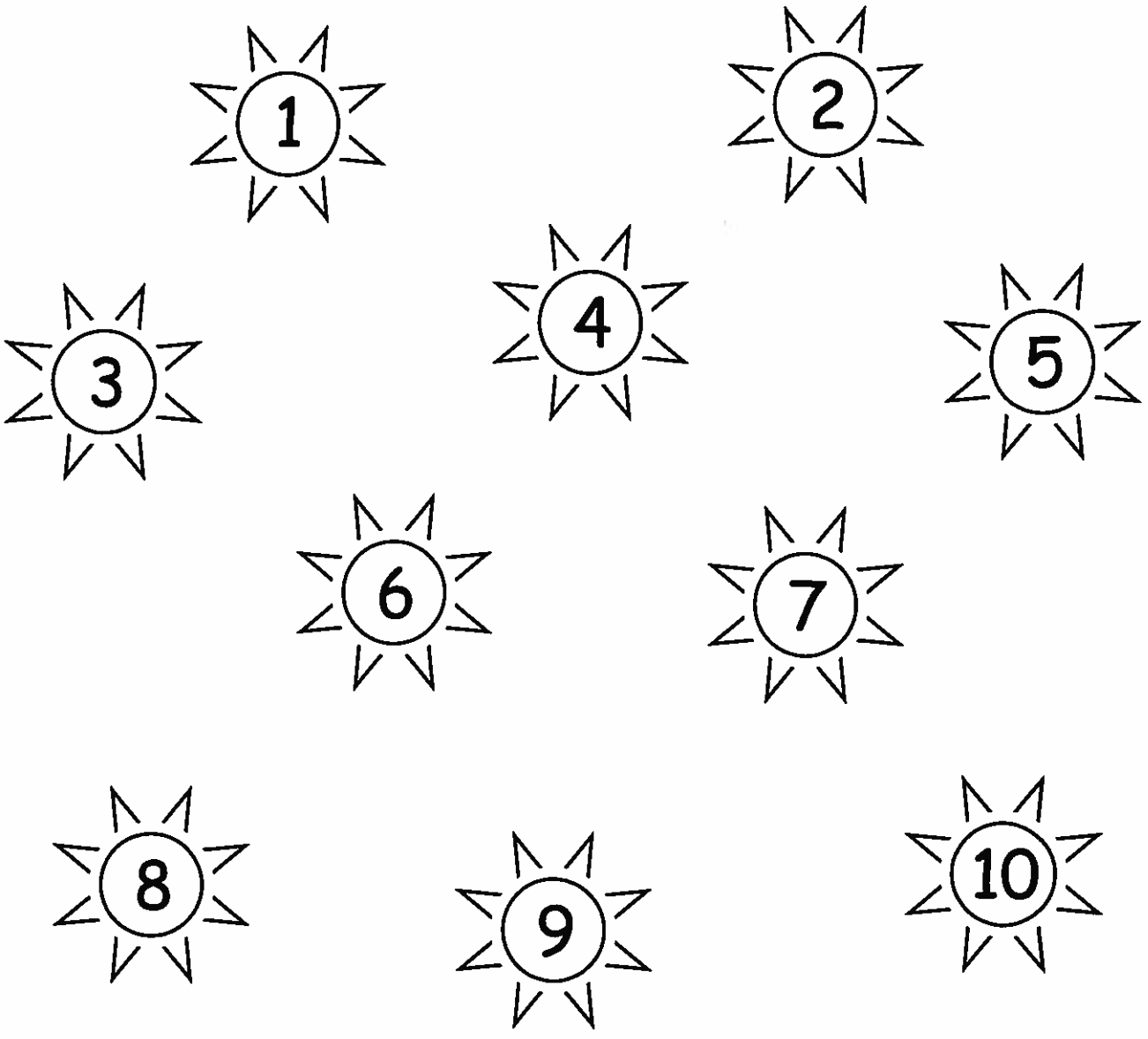
1. Toss 4 number cubes.
2. Find sums that make 10. You may find more than one way or use more than two addends (2 + 5 + 3 = 10).
3. Write the equation on the recording sheet.

= 10	= 10
= 10	= 10
= 10	= 10
= 10	= 10
= 10	= 10
= 10	= 10
= 10	= 10

Sunny Addition

How to play:

1. Roll 2 number cubes.
2. Use a marker to cover the sum of the 2 numbers.
3. If you cannot cover a number, roll again.
4. Keep playing until all of the suns are covered.

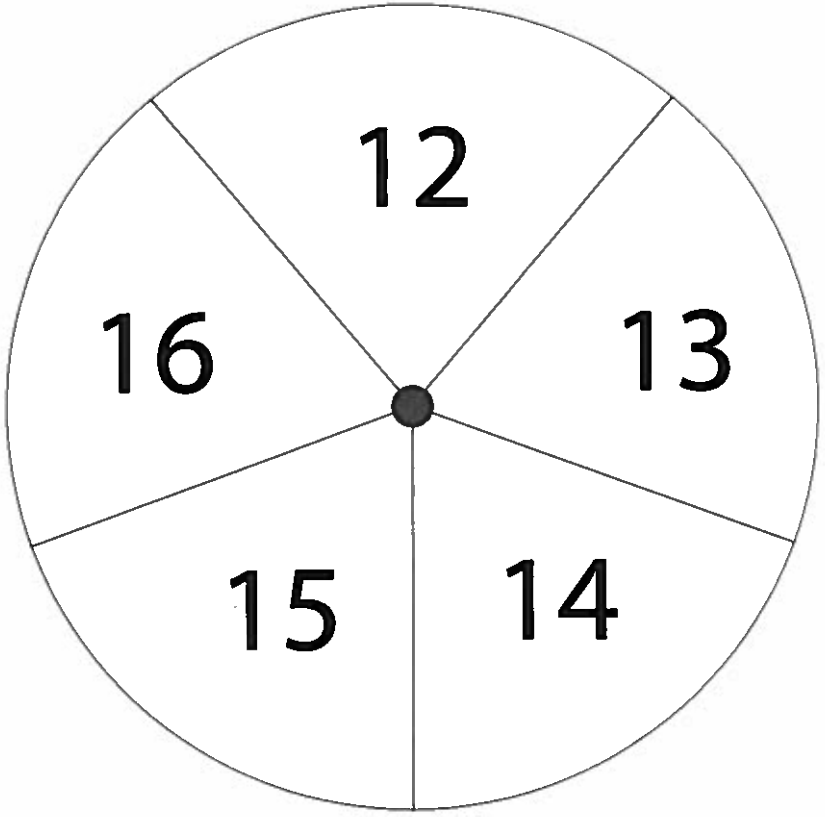


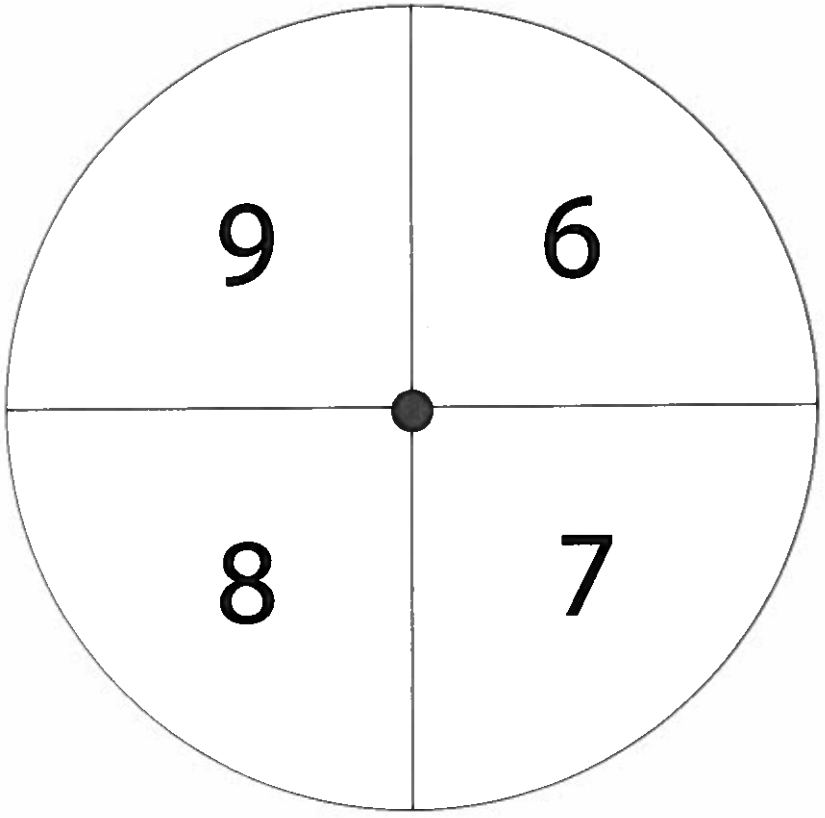
Spin and Subtract

Spin both spinners. Record the subtraction number sentence.
Which difference is greater? Circle it.

Name:	Name:
_____ – _____ = _____	_____ – _____ = _____
_____ – _____ = _____	_____ – _____ = _____
_____ – _____ = _____	_____ – _____ = _____
_____ – _____ = _____	_____ – _____ = _____
_____ – _____ = _____	_____ – _____ = _____
_____ – _____ = _____	_____ – _____ = _____
_____ – _____ = _____	_____ – _____ = _____
_____ – _____ = _____	_____ – _____ = _____

Spin and Subtract



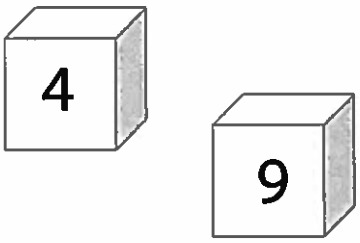


Name: _____

Find the SUM (+)

Materials:

1. 2 number cubes
2. Recording sheet
3. Pencil



Directions:

1. Choose 2 cubes from the bag. Toss the 2 cubes.
2. Find the sum of the two numbers on the cubes. Write an equation.

Name:	Name:
_____ + _____ = _____	_____ + _____ = _____
_____ + _____ = _____	_____ + _____ = _____
_____ + _____ = _____	_____ + _____ = _____
_____ + _____ = _____	_____ + _____ = _____
_____ + _____ = _____	_____ + _____ = _____
_____ + _____ = _____	_____ + _____ = _____
_____ + _____ = _____	_____ + _____ = _____
_____ + _____ = _____	_____ + _____ = _____
_____ + _____ = _____	_____ + _____ = _____
_____ + _____ = _____	_____ + _____ = _____

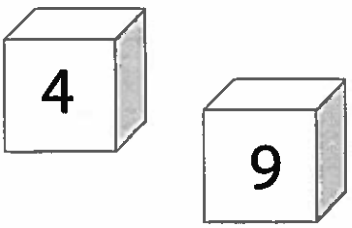
Created by Josepha Robles

Name: _____

Find the DIFFERENCE (-)

Materials:

1. 2 number cubes
2. Recording sheet
3. Pencil



Directions:

1. Choose 2 cubes from the bag. Toss the 2 cubes.
2. Find the difference between the two numbers on the cubes. Write an equation.

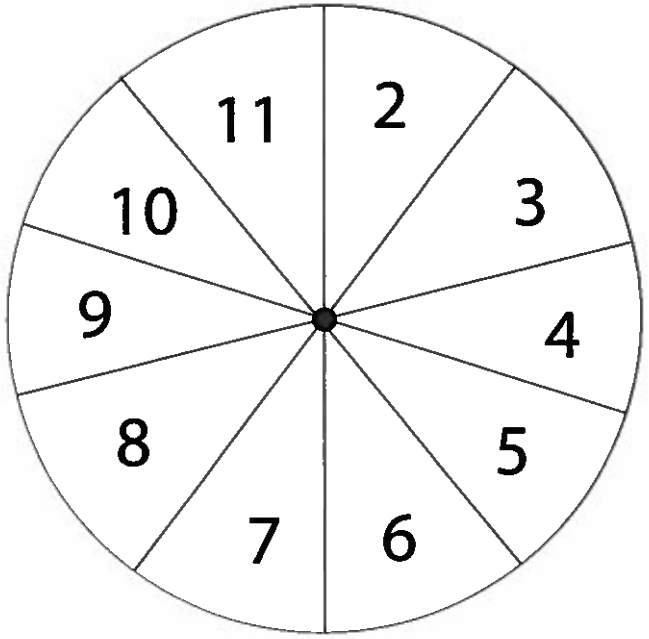
Name:	Name:
_____ - _____ = _____	_____ - _____ = _____
_____ - _____ = _____	_____ - _____ = _____
_____ - _____ = _____	_____ - _____ = _____
_____ - _____ = _____	_____ - _____ = _____
_____ - _____ = _____	_____ - _____ = _____
_____ - _____ = _____	_____ - _____ = _____
_____ - _____ = _____	_____ - _____ = _____
_____ - _____ = _____	_____ - _____ = _____
_____ - _____ = _____	_____ - _____ = _____
_____ - _____ = _____	_____ - _____ = _____

Hop Back 2

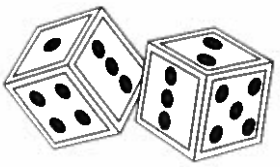
Rita Rabbit likes to hop back. Help Rita hop to the right spot on the number line.

How to play:

1. Spin the spinner.
2. Tell the number you land on and then count back 2.
3. Use a marker to cover the answer on the number line.
4. Rita is already covering numbers 10 and 11. Can you cover all of the other numbers?



Tossing Facts



How to play:

1. Roll 2 number cubes.
2. Find the sum.
3. Record the sum in one place on the table.
4. Take turns with a partner. Try to fill in as many squares as you can!

+	1	2	3	5	6
1					
2					
3					
4					
5					
6					

Number Puzzle 1

$9 + \square = 12$

$6 + \square = 10$

$5 + 3 = \square$

$3 + 6 = \square$

$6 + \square = 7$

$7 + \square = 14$

$7 + \square = 12$

$10 + \square = 10$

$3 + 3 = \square$

$9 + \square = 11$

Number Puzzle 2

$5 + \square = 9$

$7 + \square = 13$

$5 + \square = 14$

$\square + 6 = 11$

$12 - \square = 11$

$7 + \square = 7$

$\square + 2 = 9$

$9 + \square = 17$

$11 - 8 = \square$

$10 - \square = 8$

Magic Square 1

1. Find the missing numbers.
2. The sum of each row, column, and diagonal is 15.

8		6
3		
	9	

Magic Square 1

1. Find the missing numbers.
2. The sum of each row, column, and diagonal is 15.

8		6
3		
	9	

Magic Square 2

1. Find the missing numbers.
2. The sum of each row, column, and diagonal is 15.

2		4
		3

Magic Square 2

1. Find the missing numbers.
2. The sum of each row, column, and diagonal is 15.

2		4
		3

Assessing Students' Mastery of Addition and Subtraction Facts

Teachers can assess students' mastery of basic facts in a number of ways.

Observations

As students participate in different practice activities, teachers can observe how quickly students are able to answer facts, which students are using number lines, their fingers or other manipulatives to find answers, and which children need teacher support.

Student Work

Many practice tasks include student recording sheets that provide teachers with information about students' accuracy with math facts and computation skills.

Timed Fact Tests

Timed tests are commonly used to assess students' proficiency with math facts. Teachers can maximize the effectiveness of timed tests by having students track their own progress.

Math Conferences

As the rest of the class is working on mathematics tasks, teachers can briefly talk with individual students. Teacher and student identify specific math facts for extra practice and write them on flash cards. Students can take the cards home as well as refer to them throughout the day for additional, focused practice to increase their math fact automaticity.

Resources

BOOKS

Bloomer, Anne and Phyllis Carlson. 1992. *Activity Math: Using Manipulatives in the Classroom.* Dale Seymour Publications (now part of Pearson Education Group). This book is available at http://www.amazon.com.

Marzano, Robert, Debra Pickering, and Jane Pollock. 2001. *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement.* Alexandria, VA: ASCD.

O'Connell, Susan. 2005. *Now I Get It: Strategies for Building Confident and Competent Mathematicians, K-6.* Portsmouth, NH: Heinemann.

MATH WEBSITES

http://www.sueoconnell.com – Contains teaching strategies, links to math websites and information about Sue O'Connell's consulting services

http://www.etacuisenaire.com – Rich source of math teaching materials, games, and manipulatives

http://www.lakeshorelearning.com – Great source for math games, activities and manipulatives for addition and subtraction fact practice

http://www.learningresources.com – Excellent source for math games and manipulatives, including two-color counters, Unifix cubes, and dice

http://www.dr-mikes-math-games-for-kids.com – Comprehensive resource for math games and puzzles, including Magic Squares

http://www.interventioncentral.org – A very useful resource for math and reading instruction and interventions. Also has links to other math websites for free templates, flash cards and student worksheets.

www.illuminations.nctm.org – A *National Council of Teachers of Mathematics* website, includes lesson plans and activity ideas at all grade levels

www.mathforum.org – K-12 math resources and activities

www.mathsolutions.com – Offers a free online newsletter that has activity ideas for elementary teachers

www.aimsedu.org – Allows you to download some free sample lessons and provides resources for purchasing a variety of engaging and interactive math activities

RESOURCES USED IN THIS VIDEO

Interactive whiteboards are excellent tools for math instruction and practice activities. InfoComm International provides a comprehensive resource list of audio visual product providers. Go to http://www.infocomm.org. Click on the quick links to view products and vendor information for your area.

RELATED BER PD RESOURCE KITS

Using Vocabulary and Writing Strategies to Enhance Math Learning, Grades 1 and 2
Presented by Sue O'Connell

This video program demonstrates a variety of ways to create language-rich math learning environments that engage students in thinking, talking and writing as crucial components of primary level math instruction.