Building Computational Fluency, Grade 2
A Math Learning Center Publication

by Donna Burk and Allyn Fisher
illustrated by Tyson Smith

Bridges Breakout Units
Building Computational Fluency, Grade 5-6
Building Computational Fluency, Grade 4
Building Computational Fluency, Grade 3
Building Computational Fluency, Grade 1
Bridge Design & Construction: Data Collection & Analysis
Bugs Across the Curriculum
Crossing the Pond: A Probability Game
Exploring Money: Adding, Counting, Sorting and Patterning
Exploring Time: Hours, Minutes and Paper Clocks
Frogs Across the Curriculum
Geometry: Pattern Blocks, Polydrons and Paper Quilts (Grade 1)
Geometry: Shapes, Symmetry, Area and Number (Grade 2)
Math Buckets: Sorting and Patterning
Math with a Sock: Probability and Fractions
My Little Farm: Money, Place Value and Mapping
Penguins: Measuring, Sorting, Computation and More
Sea Creatures Across the Curriculum

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Building Computational Fluency,
Grade 2

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Building Computational Fluency, Grade 2  Overview

Building Computational Fluency, Grade 2 is a supplement designed to provide you with powerful and flexible tools to assess and support students in developing key computational skills and concepts. Organized into three sections, this supplement enables you to assess some or all of your students on computational skills throughout the school year and provide support to students who need extra help in key areas, including:

- developing and applying strategies for addition and subtraction facts to 20
- developing fluency with addition and subtraction facts to 20
- counting by 10’s and 1’s
- understanding place value
- double-digit addition and subtraction with and without regrouping
- counting by 5’s, 10’s, and 25’s using clocks and money
- computation with money

In Section 1, you’ll find a set of assessments designed to be administered at key points throughout the school year. These assessments serve as a useful complement to any second grade math program, and may also be helpful to third grade teachers seeking to diagnose specific skill deficits among students working below grade level. They also provide tools to check students’ proficiency with basic addition and subtraction facts on a regular basis. In Section 2, you’ll find a collection of Support Activities designed to help students who indicate needs in the specific areas assessed. The games in this section are based around visual models and strategies, and help students develop deep conceptual understandings as well as proficiency. They can be used as instructional resources with your entire group, or as tools to remediate targeted students. Section 3 is a Fact Fluency Supplement that provides the kind of systematic, strategy-based practice students need to master basic addition and subtraction facts. The worksheets and strategy booklets in this section can be used with selected students or with your entire class. Each section is described in more detail below.

Section 1  Assessments

The seven assessments in this collection are designed to help you gauge how your students are doing with key computational skills throughout the year. Assessment 1 is an individual interview intended for use at the beginning of the school year. While it may take a few weeks to interview each one of your students, the insights you’ll gain into your incoming second graders’ addition
and subtraction strategies, as well as their understandings of place value are well worth the time.

Assessments 3 and 5 are written tests of students' fluency with addition and subtraction facts to 20. Assessment 3 is designed to be conducted in the fall and Assessment 5 in the spring, but you can administer either one at the time best suited to your instructional schedule. Checklists are provided with both assessments to track students' proficiency with fact strategies such as counting on, counting backwards, adding and subtracting doubles and neighbors, adding and subtracting 10's, and others. You'll find a set of fact strategy booklets, worksheets, and activities in the third section of this packet designed to provide students with opportunities to learn and practice these strategies.

Assessments 2, 4, 6, and 7 are quarterly written checkups designed for use at the end of each grading period to support teachers in conferencing with parents and reporting on students' progress. Each of these assessments offers another look at students' proficiency with basic facts and a host of other key math skills typically taught in the fall, winter, and early as well as late spring of the second grade year. These assessments may also be useful to resource room teachers and others working with below-grade-level third graders.
Section 2  Support Activities

In the second section of this packet, you’ll find a set of 14 partner or small group games specifically designed to support the skills tested in the assessments described above. These games provide engaging practice with skills including addition and subtraction fact strategies, place value understandings, double-digit addition and subtraction with and without regrouping, and computation with money. Most of these games are based around visual models such as ten frames, ten strips, base 10 pieces, money value pieces, and hundreds grids, and are intended to help students develop conceptual understanding as well as proficiency.

Although the Support Activities have been designed to complement the assessments in this packet, you can use them as a set of additional instructional resources for your classroom even if you choose not to conduct the assessments. The activities can be used by educational assistants, parent volunteers, resource or title teachers, as well as classroom teachers, and many of them also make effective homework assignments.
Each activity includes:
- instructional considerations
- playing instructions
- blacklines for game components if needed (spinners, gameboards, and/or cards)
- record sheet blacklines if needed

Section 3  Fact Fluency Supplement

The Fact Fluency Supplement is designed to be used in conjunction with the assessments in this packet, but also stands alone as a set of materials that can be used to supplement any second grade math program. This section includes 2 illustrated fact strategy booklets to be used with students at school or home, 23 pages of strategy-related fact practice, and three games and/or worksheets designed for students to take home for extra practice.
Assessment 2

Overview
This assessment can be used to test key math skills toward the end of the first reporting period.

Timing
Late October or early November, or any other time of year appropriate for your students

Skills & Concepts
- addition facts (+0's, +1's, doubles, and neighbors)
- subtraction facts (− 0's, 1's, halves, and neighbors)
- counting by 10’s and 1’s
- telling time to the minute
- counting coins to a dollar

You'll need
- Assessment 2 (Blacklines pages 15-16)
- Unifix cubes or other counters
- plastic or real coins (quarters, dimes, nickels, and pennies)

Conducting Assessment 2
You may find this assessment useful in assessing your students' skills in several different key areas before conferencing with parents or writing first quarter report cards. Run overhead copies of the assessment blacklines to preview the items with students, or simply give out copies of the assessment and review it with the class before students begin work. Once they understand what to do, spread children out around the classroom so they can work privately and give them as much time as they need to complete both pages. (Unlike some of the other assessments in this packet, this is not a timed test.) Make Unifix cubes or other counters and plastic or real coins available to those students who want to use them.

Support Activities
After reviewing students' responses to the items on this checkup, you can assign Support activities for children to work on at school or at home. Although there are 14 Support activities in the second section of this packet, the ones listed below are particularly relevant to the items you just tested.
**Support Activities**

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<tr>
<th>Activity</th>
<th>Name</th>
<th>Skills</th>
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<td>Make the Sum</td>
<td>Addition Facts to 10 &amp; Problem solving</td>
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<td>Activity 1</td>
<td>Doubles Spin</td>
<td>Basic Addition Facts: Doubles</td>
</tr>
<tr>
<td>Activity 5</td>
<td>Make Half</td>
<td>Basic Subtraction Facts: Half Facts</td>
</tr>
</tbody>
</table>

You may also want to use some of the addition and subtraction sheets in the Fact Fluency Supplement to give students more practice adding and subtracting 0’s, 1’s, 2’s, doubles, and neighbors.
Assessment 2

Add

\[
\begin{align*}
9 + 1 &= \_
\end{align*}
\]

\[
\begin{align*}
9 + 0 &= \_
\end{align*}
\]

\[
\begin{align*}
13 + 1 &= \_
\end{align*}
\]

\[
\begin{align*}
1 + 7 &= \_
\end{align*}
\]

\[
\begin{align*}
15 + 1 &= \_
\end{align*}
\]

\[
\begin{align*}
17 + 0 &= \_
\end{align*}
\]

\[
\begin{align*}
0 + 18 &= \_
\end{align*}
\]

\[
\begin{align*}
3 + 3 &= \_
\end{align*}
\]

\[
\begin{align*}
3 + 4 &= \_
\end{align*}
\]

\[
\begin{align*}
4 + 4 &= \_
\end{align*}
\]

\[
\begin{align*}
4 + 5 &= \_
\end{align*}
\]

\[
\begin{align*}
6 + 6 &= \_
\end{align*}
\]

\[
\begin{align*}
6 + 7 &= \_
\end{align*}
\]

\[
\begin{align*}
8 + 8 &= \_
\end{align*}
\]

\[
\begin{align*}
5 + 10 &= \_
\end{align*}
\]

\[
\begin{align*}
3 + 10 &= \_
\end{align*}
\]

\[
\begin{align*}
10 + 7 &= \_
\end{align*}
\]

\[
\begin{align*}
4 + 10 &= \_
\end{align*}
\]

\[
\begin{align*}
10 + 6 &= \_
\end{align*}
\]

\[
\begin{align*}
10 + 2 &= \_
\end{align*}
\]

\[
\begin{align*}
1 + 10 &= \_
\end{align*}
\]

\[
\begin{align*}
10 + 10 &= \_
\end{align*}
\]

Subtract

\[
\begin{align*}
4 - 1 &= \_
\end{align*}
\]

\[
\begin{align*}
12 - 1 &= \_
\end{align*}
\]

\[
\begin{align*}
6 - 0 &= \_
\end{align*}
\]

\[
\begin{align*}
17 - 0 &= \_
\end{align*}
\]

\[
\begin{align*}
11 - 1 &= \_
\end{align*}
\]

\[
\begin{align*}
19 - 1 &= \_
\end{align*}
\]

\[
\begin{align*}
16 - 0 &= \_
\end{align*}
\]

\[
\begin{align*}
4 - 2 &= \_
\end{align*}
\]

\[
\begin{align*}
2 - 1 &= \_
\end{align*}
\]

\[
\begin{align*}
6 - 3 &= \_
\end{align*}
\]

\[
\begin{align*}
4 - 3 &= \_
\end{align*}
\]

\[
\begin{align*}
10 - 5 &= \_
\end{align*}
\]

\[
\begin{align*}
6 - 5 &= \_
\end{align*}
\]

\[
\begin{align*}
16 - 8 &= \_
\end{align*}
\]

Write the number to show how many Unifix cubes there are, in each of the four sections below.
Finish writing the time for each clock.

1. ________  
2. ________  
3. ________

Count the money in each box.

<table>
<thead>
<tr>
<th>Coin Type</th>
<th>Number of Coins</th>
<th>Total Cent Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dime</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Penny</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Quarter</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Nickel</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Penny</td>
<td>4</td>
<td>40</td>
</tr>
</tbody>
</table>

Draw 2 different ways to make 26¢ with coins.

26¢

26¢
support activities
Support Activities

The Support Activities are listed by skill in the table below, and are designed to supplement any second grade math program. There are 14 games in the collection. Most are intended for partners or small groups, although some can be adapted for use with an entire class. Most involve the use of visual models and strategies, and will help students develop conceptual understandings as they gain increased fluency. As you look through the collection, you may find some games you want to use to help teach key computational skills to your whole class. Some teachers also run the game components on cardstock and laminate them to make a durable set of “learning stations” available for use by students during free time or to check out for home use.

| STRATEGIES FOR BASIC ADDITION FACTS |
|------------------|------------------|------------------|
| Activity         | Name             | Support Blackline Page |
| Support Activity 12 | Make the Sum     | 113 – 115         |
| Support Activity 1  | Doubles Spin     | 51 – 58           |
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| STRATEGIES FOR BASIC SUBTRACTION FACTS |
|------------------|------------------|------------------|
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| PLACE VALUE UNDERSTANDING |
|------------------|------------------|------------------|
| Activity         | Name             | Support Blackline Pages |
| Support Activity 13 | Place Value War  | 117 – 121         |
| Support Activity 14 | Base 10 Triple Spin | 123 – 129        |

| MULTI-DIGIT ADDITION |
|------------------|------------------|------------------|
| Activity         | Name             | Support Blackline Pages |
| Support Activity 7  | Make 100         | 85 – 91           |
| Support Activity 8  | Race to 100 & Back | 92 – 98          |

| MULTI-DIGIT SUBTRACTION |
|------------------|------------------|------------------|
| Activity         | Name             | Support Blackline Number |
| Support Activity 8  | Race to 100 & Back | 92 – 98          |
| Support Activity 11 | Count Down 400   |                  |
If you plan to use the activities for remediation rather than instructional purposes, you’ll find that they’re most effective when used with targeted students by an educational assistant, parent volunteer, or title/resource teacher. Based on students’ performance on the Building Computational Fluency assessments, you’ll be able to determine which individuals would benefit from a particular Support Activity and can assign them to work with an adult on that activity. You can also send specific activities home with students for extra practice with their families. In order to prepare the Support Activities for use by other adults, we recommend creating a packet that contains the instructional considerations, game instructions, and all the game materials. That way, you can provide an instructional assistant or volunteer with the packet and ask him or her to conduct specific activities with individuals or small groups in need of help in one or more areas.

While you can run game cards and spinners on cardstock, you’ll find that paper copies of the game components work nearly as well for short-term use. Students are generally instructed to use a paperclip and pencil arrangement in lieu of more involved spinner arrows, and we encourage you to have the children cut out their own game cards. Because these games have been designed for use at home as well as school, very few of them involve concrete manipulatives. Those that do include blacklines for making the manipulatives (i.e., base 10 pieces or money value pieces), and you may want to run these sheets on cardstock. A few of the activities call for game markers, but beans, pieces of macaroni, or other small objects will also work.
Support Activity 1 ★ Instructional Considerations

SUPPORT ACTIVITY

Doubles Spin

Overview
Players take turns spinning a number from 1 to 10. They double the number and cover it on their half of the game board. The first player to cover all the doubles sums from 2 to 20 wins.

Skills & Concepts
★ using models for doubles addition facts with sums from 2 to 20
★ fluency with the doubles strategy in addition

You’ll need
★ Doubles Spin & Make Half Game Board (Blacklines, pages 53-54, 1 copy of each, taped together, per pair of players)
★ Doubles & Halves Spinner (Blackline page 55, 1 copy for every 2 pairs of players)
★ Ten-Strips (Blackline page 56, 1 copy per student, optional)
★ 10 game markers per player
★ paperclip and a pencil to use as a spinner (one set per pair of players)

Note If you are not familiar with the ten-strip model or the addition strategies used in Building Computational Fluency, please review Blacklines page 57 and 58 before playing this game with students.

The doubles strategy for addition is key to fluency with neighbors facts and leftover facts as well. If you have students who are really struggling with doubling numbers, encourage them to build each double using game markers on the ten-strips.

Students may recall that doubles sums are always even, and they might notice that the numbers on the game board increase by 2 each time. These are big ideas that involve algebraic thinking and promote computational fluency. You'll want them to come from the students, though, so don't push it if they're not making these generalizations yet.
Support Activity 1

Doubles Spin

You’ll need

- Doubles Spin & Make Half Game Board (Blacklines pages 53 and 54, 1 copy of each, taped together, per pair of players)
- Doubles & Halves Spinner (Blackline page 55, 1 copy for every 2 pairs of players)
- Ten-Strips (Blackline page 56, 1 copy per student, optional)
- 10 game markers per player
- paperclip and a pencil to use as a spinner (one set per pair of players)

Instructions for Doubles Spin

1. Get a partner and sit on opposite sides of the game board.

2. You’ll need to use a pencil and paperclip to create a spinner as shown below.

3. If you get a sum that is already covered, you’ll have to pass.

4. The player who covers all ten numbers on his or her side first is the winner.

Take turns spinning the spinner. Double the number you got and cover the sum. For instance, if you got a 2, you’ll say, “Two plus two equals four,” and cover the 4 on your side of the game board with a marker.
Doubles Spin & Make Half Game Board

Doubles  Make

12  14  16  18  20

4  6  8  10  2

Run 1 copy each of Blacklines p. 53 & 54 and tape together for each pair of players.
Run 1 copy each of Blacklines p. 53 & 54 and tape together for each pair of players.
Doubles & Halves Spinner

Doubles & Halves Spinner
The Ten-Strips Model

You’ll notice that each pair of ten-strips has two columns of 10 squares. Both columns are cut in half with a horizontal bar. This model is an effective way to encourage students to think in chunks of 5’s and 2’s and to use 10 as a landmark number.

In the support games for addition, students may find it helpful to show their thinking on the ten-strips, using colored game markers to add numbers.

*Erica*  
Hmm, 7 plus 4? I can put 7 red markers down and then I’ll add 3 more blue ones. That’s 10. Then 1 more blue marker makes 11. See?
Addition Strategies

Many of the Support Activities encourage students to identify the specific strategies they can use to solve addition facts. Ask students to explain strategies to you as they work, and consult this table to refresh your memory.

Most of the strategies are self-explanatory, and the examples on the table should provide some insight about them. The make ten facts are simply combinations whose sum is 10. The fast tens are fast, because when you add 10 to any single-digit number, you get a teen number, as in $10 + 6 = 16$. The fast nines are a little trickier for some second graders, but once they know their fast tens, adding 9 becomes faster. For example, when you know that 10 plus 7 is 17, you can see quickly that 9 plus 7 must be 16, because it’s just 1 less than 10 plus 7.

<table>
<thead>
<tr>
<th>ADDITION STRATEGIES</th>
<th>Examples</th>
</tr>
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<tr>
<td><strong>Zero Facts (+0)</strong></td>
<td>7 + 0 = 7</td>
</tr>
<tr>
<td></td>
<td>0 + 14 = 14</td>
</tr>
<tr>
<td><strong>Counting On</strong></td>
<td>6 + 1 = 7</td>
</tr>
<tr>
<td>(+1, +2, +3)</td>
<td>4 + 2 = 6</td>
</tr>
<tr>
<td></td>
<td>9 + 3 = 12</td>
</tr>
<tr>
<td><strong>Doubles</strong></td>
<td>7 + 7 = 14</td>
</tr>
<tr>
<td></td>
<td>3 + 3 = 6</td>
</tr>
<tr>
<td><strong>Neighbors</strong></td>
<td>3 + 4 = 7</td>
</tr>
<tr>
<td>(also called Doubles +1)</td>
<td>8 + 7 = 15</td>
</tr>
<tr>
<td><strong>Make Ten (=10)</strong></td>
<td>7 + 3 = 10</td>
</tr>
<tr>
<td></td>
<td>6 + 4 = 10</td>
</tr>
<tr>
<td><strong>Fast Tens (+10)</strong></td>
<td>10 + 5 = 15</td>
</tr>
<tr>
<td></td>
<td>8 + 10 = 18</td>
</tr>
<tr>
<td><strong>Fast Nines (+9)</strong></td>
<td>9 + 5 = 14</td>
</tr>
<tr>
<td></td>
<td>7 + 9 = 16</td>
</tr>
</tbody>
</table>
Support Activity 5 ★ Instructional Considerations

SUPPORT ACTIVITY

Make Half

Overview
Players take turns spinning a number from 1 to 10. They determine what number that number is half of and then uncover that number on their side of the game board. The first player to uncover all the even numbers from 2 to 20 wins.

Skills & Concepts
★ using models for subtraction combinations
★ fluency with the subtraction half facts

You'll need
★ Doubles Spin & Make Half Game Board (Blacklines pages 53-54, 1 copy of each, taped together, per pair of players)
★ Doubles & Halves Spinner (Blackline page 55, 1 copy for every 2 pairs of players)
★ 10 game markers per player
★ paperclip and a pencil to use as a spinner (one set per pair of players)

Students' fluency with half facts relies on their understanding of doubles. If you find this game frustrating for students, have them go back to Doubles Roll for a warm-up.
Support Activity 5

Make Half

You’ll need

★ Doubles Spin & Make Half Game Board (Blacklines pages 53-54, 1 copy of each, taped together, per pair of players)
★ Doubles & Halves Spinner (Blackline page 55, 1 copy for every 2 pairs of players)
★ 10 game markers per player
★ paperclip and a pencil to use as a spinner (one set per pair of players)

Instructions for Make Half

1 Get a partner and sit on opposite sides of the game board. Put a marker on each number on your side of the game board.

2 Take turns spinning the spinner. Identify the number as half of one of the numbers on your game board, and take the marker off that number. If the number is already uncovered, you’ll have to pass.

3 The player who uncovers all of his or her numbers first is the winner.

For example, if you got a 2, you’d say, “Two is half of four,” and uncover the 4 on your side of the game board. If you had already removed the marker from the 4, you would pass, and your partner would get his or her turn.
fact fluency
Fact Fluency Supplement  Addition and Subtraction

There is a considerable body of research to support the idea that teaching basic fact strategies helps students move from less to more efficient methods and is more effective than asking children to memorize facts by rote. In a seminal article written for *Teaching Children Mathematics* magazine (Vol.5 Number 9, May 1999, p.508 – 515) researchers Andrew C. Isaacs and William M. Carroll suggest that teachers propose and model basic fact strategies as well as asking students to share their own. Teachers are also encouraged to supplement class discussions with games and exercises designed to facilitate more sophisticated strategies.

The materials in this supplement are designed to help you do just that. The fact strategy booklets, worksheets, and take-home activities are built around the following strategies for addition and subtraction facts:

### ADDITION STRATEGIES

<table>
<thead>
<tr>
<th>Name of Strategy</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero Facts (+0)</td>
<td>7 + 0 = 7</td>
</tr>
<tr>
<td></td>
<td>0 + 14 = 14</td>
</tr>
<tr>
<td>Counting On (+1, +2, +3)</td>
<td>6 + 1 = 7</td>
</tr>
<tr>
<td></td>
<td>4 + 2 = 6</td>
</tr>
<tr>
<td></td>
<td>3 + 8 = 11</td>
</tr>
<tr>
<td>Doubles</td>
<td>7 + 7 = 14</td>
</tr>
<tr>
<td></td>
<td>3 + 3 = 6</td>
</tr>
<tr>
<td>Neighbors (also called Doubles +1)</td>
<td>3 + 4 = 7</td>
</tr>
<tr>
<td></td>
<td>7 + 8 = 15</td>
</tr>
<tr>
<td>Make Ten (=10)</td>
<td>7 + 3 = 10</td>
</tr>
<tr>
<td></td>
<td>6 + 4 = 10</td>
</tr>
<tr>
<td>Fast Tens (=10)</td>
<td>10 + 5 = 15</td>
</tr>
<tr>
<td></td>
<td>8 + 10 = 18</td>
</tr>
<tr>
<td>Fast Nines (=9)</td>
<td>9 + 5 = 14</td>
</tr>
<tr>
<td></td>
<td>7 + 9 = 16</td>
</tr>
</tbody>
</table>

### ADDITION STRATEGIES

<table>
<thead>
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<tbody>
<tr>
<td>Zero Facts (–0)</td>
<td>7 – 0 = 7</td>
</tr>
<tr>
<td></td>
<td>15 – 0 = 15</td>
</tr>
<tr>
<td>Counting Back (–1, –2, –3)</td>
<td>6 – 1 = 5</td>
</tr>
<tr>
<td></td>
<td>9 – 2 = 7</td>
</tr>
<tr>
<td></td>
<td>15 – 3 = 12</td>
</tr>
<tr>
<td>Doubles</td>
<td>7 – 7 = 0</td>
</tr>
<tr>
<td></td>
<td>12 – 12 = 0</td>
</tr>
<tr>
<td>Neighbors (1 or 2 apart)</td>
<td>4 – 3 = 1</td>
</tr>
<tr>
<td></td>
<td>8 – 6 = 2</td>
</tr>
<tr>
<td>Halves</td>
<td>10 – 5 = 5</td>
</tr>
<tr>
<td></td>
<td>16 – 8 = 8</td>
</tr>
<tr>
<td>Take Away Tens (–10)</td>
<td>19 – 10 = 9</td>
</tr>
<tr>
<td></td>
<td>14 – 10 = 4</td>
</tr>
<tr>
<td>Run Away Ones</td>
<td>19 – 9 = 10</td>
</tr>
<tr>
<td></td>
<td>14 – 4 = 10</td>
</tr>
<tr>
<td>Up to Ten</td>
<td>15 – 8 = 7</td>
</tr>
<tr>
<td></td>
<td>17 – 9 = 8</td>
</tr>
<tr>
<td></td>
<td>13 – 5 = 8</td>
</tr>
<tr>
<td></td>
<td>12 – 7 = 5</td>
</tr>
</tbody>
</table>

Once children have started to use the strategies listed above, there aren’t many facts left to learn. If you examine all the addition facts for numbers through 20, for instance, you’ll find that there are only 16 combinations that aren’t covered by one of these strategies, and 8 of them are reverse of the others (3 + 5, 3 + 6, 3 + 8, 4 + 7, 4 + 8, 5 + 7, 5 + 8, 6 + 8, and their reverses). The picture is slightly more complex for subtraction, but the strategies above
Fact Fluency Supplement  Addition and Subtraction (cont.)

cover most of the facts to 20 and also help students understand the relationship between addition and subtraction.

The Fact Fluency Supplement includes two fact strategy booklets, Solving Addition Facts, and Solving Subtraction Facts. You can use these at school or send them home for students to share with their families at any time of the year that best suits your instructional needs. Each booklet describes the strategies listed above, gives examples, and asks students to both solve and pose their own related story problems. If you choose to send these booklets home, you’ll find a letter to accompany each one on page 145 and 159. There are also 20 practice worksheets in which students are asked to identify the strategies they can apply before solving the problems. Like all the rest of the materials in the Building Computational Fluency packet, you can use these with some or all of your students at your discretion. Finally, there are two games and related worksheets designed for use at home, one that involves addition strategies and the other subtraction strategies. Each is accompanied by a note of explanation to families if you choose to use them as homework assignments.

Section 3  Fact Fluency Supplement

Follow copy instructions on blacklines to run as needed.

Fact Fluency Supplement: Addition and Subtraction  page 131-132
Solving Addition Facts  page 133-144
Note to Families: Instructions for Solving Addition Facts Booklet  page 145
Solving Subtraction Facts  page 147-158
Note to Families: Instructions for Solving Subtraction Facts Booklet  page 159
Scout Them Out Addition and Subtraction Worksheets  page 161-170
2’s to the Rescue!  page 171
Double It!  page 172-173
Adding & Subtracting 10’s  page 174
Cutting Numbers in Half  page 175
Double It or Cut It in half  page 176
Leapfrog Subtraction  page 177-178
Addition Facts Challenge: A Take-Home Activity  page 179-185
Subtraction Facts: A Take-Home Activity  page 187
Up to Ten: A Take-Home Activity  page 188-195
Solving Leftovers

How do you solve the leftovers? Can you show your thinking on the ten-strips? Can you show your thinking with a number sentence or two? Can you make a story problem about a leftover fact?

What Are Ten-Strips?

Ten-strips are models we use to see numbers. They help us see groups, instead of counting one by one. Where do you see groups of 2 in the ten-strips? How about groups of 5 or 10?
Solving Leftovers

Using the Ten-strips

How do you solve the leftovers? Can you show your thinking on the ten-strips? Can you show your thinking with a number sentence? Can you make a story problem about a leftover fact?

How many dots do you see on each pair of ten-strips? How are they the same? How are they different?

How do you solve the leftovers? Can you show your thinking on the ten-strips? Can you make a story problem about a leftover fact?
**Leftovers**

We call these facts leftovers. These last ten facts can be solved in many ways. Knowing doubles, neighbors, and make ten facts can really help.

\[
\begin{align*}
7 + 4 &= 11 & 4 + 7 &= 11 \\
7 + 5 &= 12 & 5 + 7 &= 12 \\
8 + 4 &= 12 & 4 + 8 &= 12 \\
8 + 5 &= 13 & 5 + 8 &= 13 \\
8 + 6 &= 14 & 6 + 8 &= 14
\end{align*}
\]

For \(7 + 5\), some people might think, “7 plus 3 is 10. Then 10 plus 2 is 12.” Someone else might think, “5 plus 5 is 10, and then 2 more is 12.” How do you think about some of these facts?

**Using the Ten-Strips**

Choose a number to show on these ten-strips. Can you show the number in more than one way?

Using the ten-strips, students can represent the equations visually.

\[
\begin{align*}
7 + 3 &= 10 \\
+ 3 &= 10 \\
10 + 2 &= 12
\end{align*}
\]
**Zero Facts**

When you add 0 to any number, the sum is always that number.

This works with larger numbers too!

\[
26 + 0 = 26 \\
0 + 387 = 387
\]

**Zero Facts Story Problems**

1. If you had 7 cookies and someone gave you 0 cookies, how many cookies would you have in all?
2. If you had 0 cookies and someone gave you 6 cookies, how many cookies would you have in all?

**Your Fast Nines**

What are some other fast nine facts you know?

Can you draw them and/or show them using number sentences?

Can you make a story problem about a fast nine fact?

This works with larger numbers too!

\[
7 + 0 = 7 \\
0 + 7 = 7
\]

When you add 0 to any number, the sum (the answer) is always that number.
Fast Nines

When you know how to make ten and do fast tens, adding 9 is a snap! If the fact is $9 + 4$, you can think about making ten ($9 + 1 = 10$) and then adding 3 more. $9 + 4$ is the same as $10 + 3$. Where do you see the make tens and fast tens on the ten-strips below?

Do you ever use fast nines with larger numbers? If so, can you think of some examples and explain how?

Fast Nine Story Problems

1. If you had 9 pencils in your case, and got 5 more, how many pencils would you have in all?

2. If you had 7 pencils in your case and got 9 more, how many pencils would you have in all?

Your Zero Facts

What are some other zero facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a zero fact?
Counting On

You can count on when you add just 1, 2, or 3 to another number. Start with the larger number and count up.

No matter how big the number, if you add 1, 2, or 3, it’s fast to count up!

1. If you had 4 cookies and someone gave you 2 cookies, how many would you have in all?

   Counting On Story Problems

1. If you had 4 cookies and someone gave you 2 cookies, how many would you have in all?

   3 cookies, how many would you have in all?

   2. If you had 3 cookies and someone gave you 2 cookies, how many would you have in all?

Your Fast Tens

What are some other fast ten facts you know?

Iem about a fast ten fact? number sentence. Can you make a story problem? Can you draw them and/or show them using

Your Fast Tens

4 + 2 = 6
3 + 5 = 8

Counting On

391 + 1 = 392
27 + 2 = 29
8 + 95 = 98

or 3, it’s fast to count up!

No matter how big the number, if you add 1, 2, 3.

You can count on when you add just 1, 2, or 3.
Fast Tens

It's fast to add 10 to any single-digit number. You'll always get a teen number!

\[
\begin{align*}
10 + 2 &= 12 \\
8 + 10 &= 18
\end{align*}
\]

You can apply fast tens to larger numbers too.

\[
\begin{align*}
29 + 10 &= 39 \\
247 + 10 &= 257
\end{align*}
\]

Fast Tens Story Problems

1. If I have 10 playing cards and you give me 4 more, how many will I have in all?

2. If you have 9 playing cards and I give you 10 more, how many will you have in all?

Your Counting On Facts

What are some other counting on facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a counting on fact?
Doubles

When you add a number to itself, it's a double! Doubles are always even. Can you see why?

Doubles can work with larger numbers like these. Maybe you can think of some more doubles with large numbers.

400 + 400 = 800
30 + 30 = 60

When you look at the ten-strips below, can you see why doubles are always even? Can you see why doubles with large numbers can work?

Doubles Story Problems

1. If you had 6 eggs and someone gave you 6 more, how many eggs would you have in all?

2. If you had 9 bouncy balls and someone gave you 9 more, how many would you have in all?

Page 8

Your Make Ten Facts

What are some other make ten facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a make ten fact?

Page 13
Make Ten Facts

These pairs of numbers make ten: 9 + 1, 8 + 2, 7 + 3, 6 + 4, and 5 + 5. These are important facts because they help us think in groups of 10. What do you notice when you see make ten facts on the ten-strips?

When we work with larger numbers, make tens can help. For example 20 + 80 = 100. That’s a make 100 fact! And 300 + 700 = 1000. What would you call that fact?

Make Ten Story Problems

1. If I had 8 cookies and you gave me 2 more, how many would I have in all?
2. If you had 3 cookies and I gave you 7 more, how many would you have in all?
Neighbors

When two numbers are right next to each other, we call them neighbors. When you know the doubles, neighbors are easy. Just double the smaller number and add 1 more. Or double the larger number and take 1 away.

Your Neighbors

What are some other neighbors facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a neighbors fact?

Neighbors Story Problems

1. If I had 4 cookies and you gave me 5 more, how many would I have in all?

2. If you had 7 flowers and I gave you 8 more, how many would I have in all?

3. If I had 4 cookies and you gave me 5 more, how many would I have in all?

4. 30 + 40 = 70

5. 500 + 400 = 900

Neighborhoods are easy when you understand place value.

Neighborhoods like these can be easy when you understand place value.

5 + 4 = 9

7 + 8 = 15

6 + 9 = 15

Large number and take 1 away.

Smaller number and add 1 more. Or double the doubles, neighbors are easy. Just double the other, we call them neighbors. When you know other neighbors, when you know

Bridges Breakouts

Neighbors like these can be easy when you understand place value.
Fact Fluency Addition

FACT FLUENCY ADDITION – NOTE TO FAMILIES

As a classroom teacher, I appreciate the role families play in their children’s success at school. When you take the time to review your child’s schoolwork, talk about your child’s day, and practice concepts and skills, you play a very important part in your child’s education.

Please read with your child the book he or she brought home called Solving Addition Facts. This book is about some different ways to solve basic addition facts. Many of us learned our addition facts by memorizing them and then practicing them while playing card games and board games with dice. Over the past 20 years or so, research has found that many students do better when they see pictures of the facts and think about specific ways to solve them. Your child may have already mastered these addition facts or have other ways of thinking about them. In that case, thinking about new ways to solve the facts helps your child be flexible. These ways of adding numbers can also help children work with larger numbers.

Please keep this book in a safe place in your home so that you can refer to it in the coming weeks. If you have any questions, please contact me at school.

Instructions for Solving Addition Facts Book

Please read the book Solving Addition Facts with your child. The book invites you and your child to think of addition facts and draw them or write word problems about them. These activities are meant to get you and your child involved and talking with each other about mathematics. Please sign and return this sheet when you have read the book.

Sign here:_______________________________    Date:________________