Mathematics Strategies for Parents

K-2

A Resource for Helping Your Students at Home

We Value the Home/School Connection

EDUCATE ALL CHILDREN TO THEIR FULLEST POTENTIAL

Welcome Parent(s)/Guardian(s),

The South Windsor Public Schools utilize a mathematics curriculum which is fully aligned to the Common Core State Standards. This alignment is a result of South Windsor teachers, interventionists, and specialists examining the previous curriculum and updating when necessary. This is an ongoing project as we reflect on assessments and student learning. Our elementary schools use a variety of primary resources to implement the curriculum. These include Investigations in Number, Data and Space, Contexts for Learning units, as well as a complement of manipulative and on-line resources.
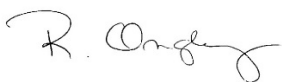
South Windsor Public School teachers are reporting that students are mastering standards earlier and have a greater ability to explain the how and the why of the math they are doing. In addition, students are retaining the information, are able to do more calculations without pencil and paper, and are applying this knowledge to new situations when appropriate.

Some of the methods of "doing" the math are different than the way you might have learned it. In an effort to bridge this gap, we have created this brochure which guides you through the methods being used to teach your child at the elementary level. Transitions to the use of algorithms occurs primarily in the middle school. The strategies and methods applied in the elementary classroom prepare students for this work at the middle school level. We welcome the partnership to work with you and your child. Please feel free to contact the elementary math interventionist in your building if you have questions or need additional assistance in working through the new methods.

Elementary School Math Interventionist/Coach Contacts:

Eli Terry – Nancy Bassilakis
Orchard Hill – Dawn Campbell
Pleasant Valley – Karrieann Noble
Philip R. Smith – Julie Ratajczak

Sincerely,

Robyn Ongley

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Math Strategies for Parents

Why is it important for my child to learn math?

Math skills are important to a child's success – both at school and in everyday life. Understanding math also builds confidence and opens the door to a range of career options.

In our everyday lives, understanding math enables us to:

- manage time and money, and handle everyday situations that involve numbers (for example, calculate how much time we need to get to work, how much food we need in order to feed our families, and how much money that food will cost);

- understand patterns in the world around us and make predictions based on patterns (for example, predict traffic patterns to decide on the best time to travel);

- solve problems and make sound decisions;

- explain how we solved a problem and why we made a particular decision;

- use technology (for example, calculators and computers) to help solve problems.

Knowing how to do math makes our day-to-day lives easier!

How will my child learn math?

Children learn math best through activities that encourage them to:

- explore;

- think about what they are exploring;

- solve problems using information they have gathered themselves;

- explain how they reached their solutions.

Children learn easily when they can connect math concepts and procedures to their own experience. By using common household objects (such as measuring cups and spoons in the kitchen) and observing everyday events (such as weather patterns over the course of a week), they can "see" the ideas that are being taught.

An important part of learning math is learning how to solve problems. Children are encouraged to use trial and error to develop their ability to reason and to learn how to go about problem solving. They learn that there may be more than one way to solve a problem and more than one answer. They also learn to express themselves clearly as they explain their solutions.

1

What tips can I use to help my child?

Be positive about math!

- Let your child know that **everyone** can learn math.

- Let your child know that **you** think math is important and fun.

- Point out the ways in which different family members use math in their jobs.

- Be positive about your own math abilities. Try to avoid saying "I was never good at math" or "I never liked math".

- Encourage your child to be persistent if a problem seems difficult.

- Praise your child when he or she makes an effort, and share in the excitement when he or she solves a problem or understands something for the first time.

Make math part of your child's day.

- Point out to your child the many ways in which math is used in everyday activities.

- Encourage your child to tell or show you how he or she uses math in everyday life.

- Include your child in everyday activities that involve math – making purchases, measuring ingredients, counting out plates and utensils for dinner.

- Play games and do puzzles with your child that involve math.
  They may focus on direction or time, logic and reasoning, sorting, or estimating.

- Do math problems with your child for fun.

- In addition to math tools, such as a ruler and a calculator, use handy household objects, such as a measuring cup and containers of various shapes and sizes, when doing math with your child.

Encourage your child to give explanations.

- When your child is trying to solve a problem, ask what he or she is thinking. If your child seems puzzled, ask him or her to tell you what doesn't make sense. (Talking about their ideas and how they reach solutions helps children learn to reason mathematically.)

- Suggest that your child act out a problem to solve it. Have your child show how he or she reached a conclusion by drawing pictures and moving objects as well as by using words.

- Treat errors as opportunities to help your child learn something new.

What math activities can I do with my child?

1. Understanding Numbers

Numbers are used to describe quantities, to count, and to add, subtract, multiply, and divide. Understanding numbers and knowing how to combine them to solve problems helps us in all areas of math.

- **Count everything!** Count toys, kitchen utensils, and items of clothing as they come out of the dryer. Help your child count by pointing to and moving the objects as you say each number out loud. Count forwards and backwards from different starting places. Use household items to practice adding, subtracting, multiplying, and dividing.

- **Sing counting songs and read counting books.** Every culture has counting songs, such as "One, Two, Buckle My Shoe" and "Ten Little Monkeys", which make learning to count – both forwards and backwards – fun for children. Counting books also capture children's imagination, by using pictures of interesting things to count and to add.

- **Discover the many ways in which numbers are used inside and outside your home.** Take your child on a "number hunt" in your home or neighborhood. Point out how numbers are used on the television set, the microwave, and the telephone. Spot numbers in books and newspapers. Look for numbers on signs in your neighborhood. Encourage your child to tell you whenever he or she discovers a new way in which numbers are used.

- **Ask your child to help you solve everyday number problems.** "We need six tomatoes to make our sauce for dinner, and we have only two. How many more do we need to buy?" "You have two pillows in your room and your sister has two pillows in her room. How many pillowcases do I need to wash?" "Two guests are coming to eat dinner with us. How many plates will we need?"

- **Practice "skip counting".** Together, count by 2's and 5's. Ask your child how far he or she can count by 10's. Roll two dice, one to determine a starting number and the other to determine the counting interval. Ask your child to try counting backwards from 10, 20, or even 100.

- **Make up games using dice and playing cards.** Try rolling dice and adding or multiplying the numbers that come up. Add up the totals until you reach a target number, like 100. Play the game backwards to practice subtraction.

- **Play "Broken Calculator".** Pretend that the number 8 key on the calculator is broken. Without it, how can you make the number 18 appear on the screen? (Sample answers: 20 – 2, 15 + 3). Ask other questions using different "broken" keys.

2. Understanding Measurements

We use measurements to determine the height, length, and width of objects, as well as the area they cover, the volume they hold, and other characteristics. We measure time and money. Developing the ability to estimate and to measure accurately takes time and practice.

- **Measure items found around the house.** Have your child find objects that are longer or shorter than a shoe or a string or a ruler. Together, use a shoe to measure the length of a floor mat. Fill different containers with sand in a sandbox or with water in the bath, and see which containers hold more and which hold less.

- **Estimate everything!** Estimate the number of steps from your front door to the edge of your yard, then walk with your child to find out how many there really are, counting steps as you go. Estimate how many bags of milk your family will need for the week. At the end of the week, count up the number of bags you actually used. Estimate the time needed for a trip. If the trip is expected to take 25 minutes, when do you have to leave? Have your child count the number of stars he or she can draw in a minute. Ask if the total is more or less than your child thought it would be.

- **Compare and organize household items.** Take cereal boxes or cans of vegetables from the cupboard and have your child line them up from tallest to shortest.

- **Talk about time.** Ask your child to check the time on the clock when he or she goes to school, eats meals, and goes to bed. Together, look up the time of a television program your child wants to watch. Record on a calendar the time of your child's favorite away-from home activity.

3. Understanding Geometry

The ability to identify and describe shapes, sizes, positions, directions, and movement is important in many work situations, such as construction and design, as well as in creating and understanding art. Becoming familiar with shapes and spatial relationships in their environment will help children grasp the principles of geometry in later grades.

- **Identify shapes and sizes.** When playing with your child, identify things by their shape and size: "Pass me a sugar cube." "Take the largest cereal box out of the cupboard."

- **Build structures using blocks or old boxes.** Discuss the need to build a strong base. Ask your child which shapes stack easily, and why.

- **Hide a toy and use directional language to help your child find it.**
  Give clues using words and phrases such as *up*, *down*, *over*, *under*, *between*, *through*, and *on top of*.

- **Play "I spy", looking for different shapes.** "I spy something that is round." "I spy something that is rectangular." "I spy something that looks like a cone."

- **Ask your child to draw a picture of your street, neighborhood, or town.** Talk about where your home is in relation to a neighbor's home or the corner store. Use directional words and phrases like *beside* and *to the right of*.

- **Go on a "shape hunt".** Have your child look for as many circles, squares, triangles, and rectangles as he or she can find in the home or outside. Do the same with three dimensional objects like cubes, cones, spheres, and cylinders.

4. Understanding Patterns

We find patterns in nature, art, music, and literature. We also find them in numbers. Patterns are at the very heart of math.

- **Look for patterns in storybooks and songs.** Many children's books and songs repeat lines or passages in predictable ways, allowing children to recognize and predict the patterns.

- **Create patterns using your body.** Clap and stomp your foot in a particular sequence (clap, clap, stomp), have your child repeat the same sequence, then create variations of the pattern together. Teach your child simple dances that include repeated steps and movements.

- **Hunt for patterns around your house and your neighborhood.** Your child will find patterns in clothing, in wallpaper, in tiles, on toys, and among trees and flowers in the park. Encourage your child to describe the patterns found. Try to identify the features of the pattern that are repeated.

- **Use household items to create and extend patterns.** Lay down a row of spoons pointing in different directions in a particular pattern (up, up, down, up, up, down) and ask your child to extend the pattern.

- **Explore patterns created by numbers.** Write the numbers from 1 to 100 in rows of 10 (1 to 10 in the first row, 11 to 20 in the second row, and so on). Note the patterns that you see when you look up and down, across, or diagonally. Pick out all the numbers that contain a 2 or a 7.

5. Understanding and managing data

Every day we are presented with a vast amount of information, much of it involving numbers. Learning to collect, organize, and interpret data at an early age will help children develop the ability to manage information and make sound decisions in the future.

- **Sort household items.** As your child tidies up toys or clothing, discuss which items should go together and why. Show your child how you organize food items in the fridge – fruit together, vegetables together, drinks on one shelf, condiments on another. Encourage your child to sort other household items – crayons by color, cutlery by type or shape, coins by denomination.

- **Make a weather graph.** Have your child draw pictures on a calendar to record each day's weather. At the end of the month, make a picture graph showing how many sunny days, cloudy days, and rainy days there were in that month.

- **Make a food chart.** Create a chart to record the number of apples, oranges, bananas, and other fruit your family eats each day. At the end of the month, have your child count the number of pieces of each type of fruit eaten.

Adapted from "Math Strategies for Parents" by http://blogs.canby.k12.or.us/

Tips for Families - Homework Help

Math homework is due tomorrow—how can I help?

Homework causes trouble in many households. Relax—remember whose homework it is! Think of yourself as more of a guide than a teacher. Don't take over for your child. Doing that only encourages him or her to give up easily or to ask for help when a problem becomes difficult.

The best thing you can do is ask questions. Then listen to what your child says. Often, simply explaining something out loud can help your child figure out the problem. Encourage your child to show all work, complete with written descriptions of all thinking processes. This record will give your child something to look back on, either to review or to fix a mistake, and can also help the teacher understand how the problem was solved.

Asking the following kinds of questions can help you and your child tackle the challenges of math homework:

- What is the problem that you're working on?

- Are there instructions or directions? What do they say?

- Are there words in the directions or the problem that you do not understand?

- Where do you think you should begin?

- Is there anything that you already know that can help you work through the problem?

- What have you done so far?

- Can you find help in your textbook or notes?

- Do you have other problems like this one? Can we look at one of those together?

- Can you draw a picture or make a diagram to show how you solved a problem like this one?

- What is your teacher asking you to do? Can you explain it to me?

- Can you tell me where you are stuck?

    For more information, go to: http://www.nctm.org/resources/

What Families Can Do

Ideas to Help Your Child Succeed in and Enjoy Mathematics

1 Be positive!

If you have a negative attitude about mathematics, chances are your child will, too. Help your child have a "can do" attitude by praising your child's efforts as well as her accomplishments. Acknowledge the facts that mathematics can be challenging at times and that persistence and hard work are the keys to success. Relate mathematics learning to other endeavors that require hard work and persistence, such as playing a sport. Struggling at times in mathematics is normal and is actually necessary to, and valuable in, understanding mathematics.

2 Link mathematics with daily life

Every day, people face situations that involve mathematics, such as deciding whether one has enough money to purchase a list of items at the store, reading a map to find out where one is, building a budget, deciding on the shortest route to a destination, developing a schedule, or determining the price of an item on sale. Help your child realize that mathematics is a significant part of everyday life. Suggestions for discussing mathematics with your elementary, middle, or high school child during everyday activities are listed at the end of this section.

3 Make mathematics fun

Play board games, solve puzzles, and ponder brain teasers with your child. Your child enjoys these kinds of activities while enhancing his mathematical thinking. Point out the mathematics involved, and have your child discuss the strategies he used.

4 Learn about mathematics-related careers

Mathematics is foundational to a wide variety of interesting careers. Research different careers with your child, and find out what she should be doing now to prepare for these options. Help your child understand that the school courses she takes now and the grades she earns will affect her future. One source of information on the many career possibilities that involve mathematics is *Career Ideas for Kids Who Like Math*, by Diane Lindsey Reeves.

5 Have high expectations

Traditionally, in North America the belief that only some students are capable of learning mathematics has prevailed. For example, tracking has consistently disadvantaged groups of students through classes that concentrate on remediation and do not offer significant mathematical substance. Many students, especially those who are poor, nonnative speakers of English, disabled, female, or members of racial-minority groups, have become victims of low expectations. Today we are guided by a vision of mathematics for all. You would not expect your child not to read; similarly, you should not expect your child not to do mathematics. Your attitude and expectations are crucial to influencing the future opportunities for your child. Communicate high expectations to your child and his teachers, counselors, and administrators. Make sure that your child is getting the same opportunities in mathematics as everyone else, and is taking challenging mathematics classes each year, all the way through high school.

6 Support homework, don't do it!

Homework is an area that can cause trouble in most households. Relax, and remember whose homework it is. If you take over doing homework for your child, you encourage him to easily give up or seek help when working on a challenging problem. If you start to panic when you do not know how to do the mathematics, you may signal negative thoughts about mathematics to your child. Your child is not likely to be resourceful, persistent, or confident if you react in either of these ways.

Think of yourself as more of a guide rather than your child's teacher. Your role is not only to support her but also to help her take responsibility for herself. You can facilitate your child's homework by asking questions and listening to your child. The simple act of having your child explain something out loud can often help her figure out the problem. Encourage your child to also show all her calculations or a description of her thinking process on paper to support the solution to a problem. This recording gives the student something to look back on, either for review or to spot and fix a mistake. It can also furnish the teacher with useful information related to the student's reasoning and understanding.

> 6 Every day, people face situations that involve mathematics. 9

Mathematics

Young children arrive in kindergarten with widely varying knowledge in math. By the end of the year, your child must have some important foundations in place. One of the most important skills your child should develop is the ability to add and subtract small numbers and use addition and subtraction to solve word problems. This will rely on gaining some fundamentals early in the year, such as counting objects to tell how many there are. Addition and subtraction will continue to be a very strong focus in math through 2nd grade.

A Sample of What Your Child Will Be Working on in Kindergarten

- Counting objects to tell how many there are

- Comparing two groups of objects to tell which group, if either, has more; comparing two written numbers to tell which is greater

- Acting out addition and subtraction word problems and drawing diagrams to represent them

- Adding with a sum of 10 or less; subtracting from a number 10 or less; and solving addition and subtraction word problems

- Adding and subtracting very small numbers quickly and accurately (e.g., 3 + 1)

- Correctly naming shapes regardless of orientation or size (e.g., a square oriented as a "diamond" is still a square)

Talking to Your Child's Teacher

Keeping the conversation focused.
When you talk to the teacher, do not worry about covering everything. Instead, keep the conversation focused on the most important topics. In kindergarten, these include:

- Counting to tell the number of objects (this will not be written work; ask the teacher for his or her observations of your child's progress in this area)

- Solving addition and subtraction word problems

Ask to see a sample of your child's work. Ask the teacher questions such as: Is this piece of work satisfactory? How could it be better? Is my child on track? How can I help my child improve or excel in this area? If my child needs extra support or wants to learn more about a subject, are there resources to help his or her learning outside the classroom?

Help Your Child Learn at Home

Learning does not end in the classroom. Children need help and support at home to succeed in their studies. Try to create a quiet place for your child to study, and carve out time *every day* when your child can concentrate on reading, writing, and math uninterrupted by friends, brothers or sisters, or other distractions.

You should also try and sit down with your child at least once a week for 15 to 30 minutes while he or she works on homework. This will keep you informed about what your child is working on, and it will help you be the first to know if your child needs help with specific topics. By taking these small steps, you will be helping your child become successful both in and outside the classroom.

Additionally, here are some activities you can do with your child to support learning at home:

English Language Arts & Literacy

■ Read with your child every day, books like *Are You My Mother* by P.D. Eastman or *Green Eggs and Ham* by Dr. Seuss. Ask your child to explain his or her favorite parts of the story. Share your own ideas. To find more books for your child to read, visit www.corestandards.org/assets/Appendix_B.pdf.

■ Encourage your child to tell you about his or her day at school. Keep paper, markers, or crayons around the house for your child to write letters or words or draw a picture about his or her day. Have your child describe the picture to you.

■ Play word games like *I Spy*, sing songs like *Itsy Bitsy Spider,* and make silly rhymes together.

Mathematics

Look for "word problems" in real life. Some kindergarten examples might include:

■ Play "Write the next number." You write a number, and your child writes the next number.

■ Ask your child questions that require counting as many as 20 things. For example, ask, "How many books do you have about wild animals?"

■ Ask your child questions that require comparing numbers. "Who is wearing more bracelets, you or your sister?" (Your child might use matching or counting to find the answer.)

For more information, the full standards are available at www.corestandards.org.

How Many of Each?

Here is a story problem.

I have 6 crayons.

Some are red. Some are blue.
How many of each could I have?
How many red? How many blue?

There are many solutions.
Here are some solutions.

4 red and 2 blue

5 red and 1 blue

1 red and 5 blue

Can you find other combinations of blue and red crayons?

Note to Teacher: *How Many Do You Have?* **Session 4.4.** Use this page to help students make sense of a new type of problem, called How Many of Each?, that they will solve in this Investigation and throughout first grade.

Solving a Story Problem About Books

Corey was looking for books in the library.
She saw 5 books on the table.
Corey took 2 of the books from the table to read.
How many books were left on the table?

These students acted out the story.

1, 2, 3

Manuel used cubes.

I put 5 cubes together.

1 2 3

1 2 3 4 5
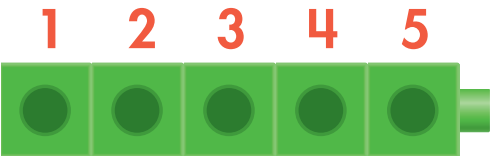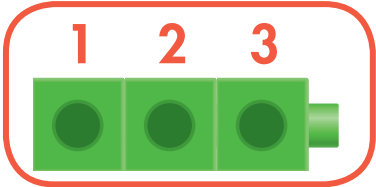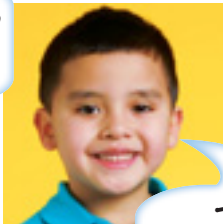
Then I took off 2 cubes and counted the cubes left.
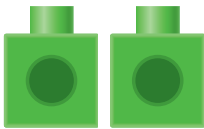
Cindy drew a picture.
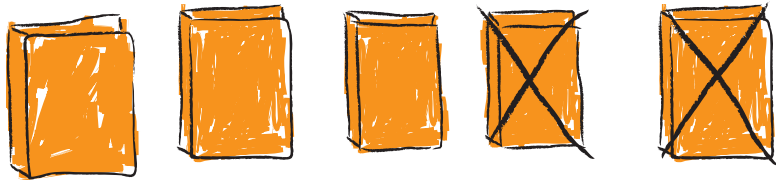
I drew 5 books. Then I crossed out 2 books and counted how many books were left.

How would you solve the problem?

Note to Teacher: *How Many Do You Have?,* **Sessions 3.3 and 3.5.** After reviewing this page and the previous three pages, ask students to visualize, act out, and solve these story problems, as well as the others you create.

Solving Story Problems

1. Listen to the story.

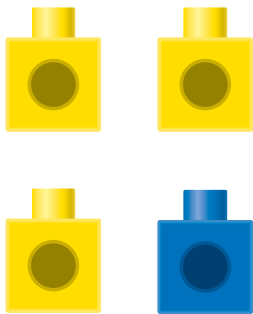**2. Tell the story in your own words.**
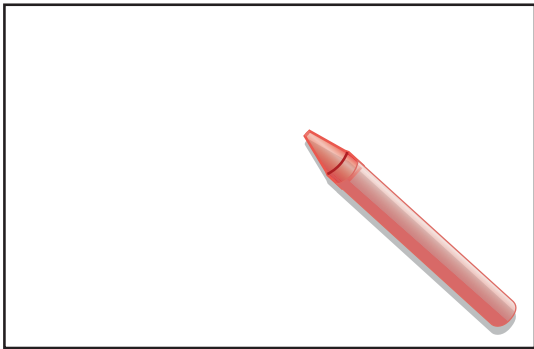

3. Solve the problem. You can:

Act it out

Draw pictures
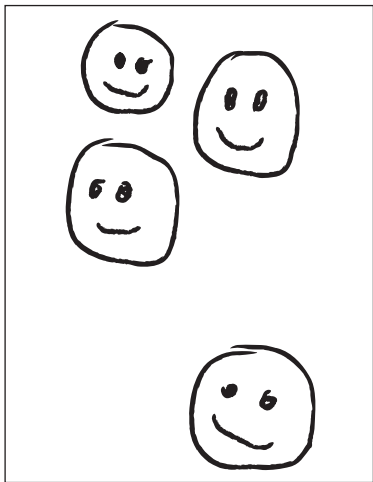
Use cubes

4. Show your solution.

Note to Teacher: *How Many Do You Have?,* **Session 2.5.** Encourage students to use this page in order to remember the steps for solving story problems.

Mathematics

In 1st grade, your child will build on last year's work and gain important new skills. One of the most important outcomes for the year is to improve speed and accuracy adding with a sum of 20 or less and subtracting from a number 20 or less (e.g., $17 - 8$). Another important goal in 1st grade is adding with a sum of 100 or less; this will rely on understanding what the digits mean in a number such as 63 (namely, 63 is six tens and three ones). Working with multi-digit addition this year will set the stage for 2nd grade, when your child will be working with three-digit numbers and adding and subtracting with larger numbers.

A Sample of What Your Child Will Be Working on in 1st Grade

- Solving addition and subtraction word problems in situations of adding to, taking from, putting together, taking apart, and comparing (e.g., a taking from situation would be: "Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat?")

- Adding with a sum of 20 or less, and subtracting from a number 20 or less, for example by using strategies based around the number 10 (e.g., to solve $13 - 4$, one can start with 13, subtract 3 to reach 10, and then subtract 1 more to reach 9)

- Quickly and accurately adding with a sum of 10 or less, and quickly and accurately subtracting from a number 10 or less (e.g., $2 + 5$, $7 - 5$)

- Understanding what the digits mean in two-digit numbers (*place value*)

- Using understanding of place value to add and subtract (e.g., $38 + 5$, $29 + 20$, $64 + 27$, $80 - 50$)

- Measuring lengths of objects by using a shorter object as a unit of length

- Making composite shapes by joining shapes together, and dividing circles and rectangles into halves or fourths

Keeping the conversation focused.

When you talk to the teacher, do not worry about covering everything. Instead, keep the conversation focused on the most important topics. In 1st grade, these include:

- Adding with a sum of 20 or less and subtracting from a number 20 or less (this will not be written work; ask the teacher for his or her observations of your child's progress in this area)

- Using understanding of place value to add and subtract

- Solving addition and subtraction word problems

Ask to see a sample of your child's work. Ask the teacher questions such as: Is this piece of work satisfactory? How could it be better? Is my child on track? How can I help my child improve or excel in this area? If my child needs extra support or wants to learn more about a subject, are there resources to help his or her learning outside the classroom?

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Additionally, here are some activities you can do with your child to support learning at home:

English Language Arts & Literacy

- Encourage your child to read to you books such as *Little Bear* by Else Holmelund Minarik. Help him or her sound out difficult words. To find more books for your child to read, visit www.corestandards.org/assets/Appendix_B.pdf.

- Act out stories together from books, television, or your child's imagination.

- Pick a "word of the day" each day starting with a different letter. Have your child write the word and look for other things beginning with the same letter.

- Visit the library with your child every week. Have your child sign up for a library card.

Mathematics

Look for "word problems" in real life. Some 1st grade examples might include:

- If you open a new carton of a dozen eggs, and you use four eggs to cook dinner, close the carton and ask your child how many eggs are left.

- While putting away toys into bins, count the number of toys in two bins and ask your child how many more are in one bin compared to the other.

- Play the "I'm thinking of a number" game. For example, "I'm thinking of a number that makes 11 when added to 8. What is my number?"
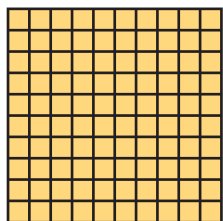
For more information, the full standards are available at www.corestandards.org.

Place Value: Representing Stickers

In class, we use stickers to represent 100s, 10s, and 1s.

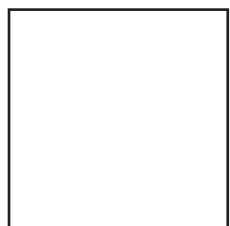Sheet of 100   Strip of 10   1 Single

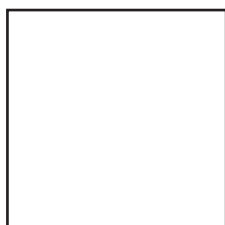When we record, we use a quick way to show stickers.

100   10   1
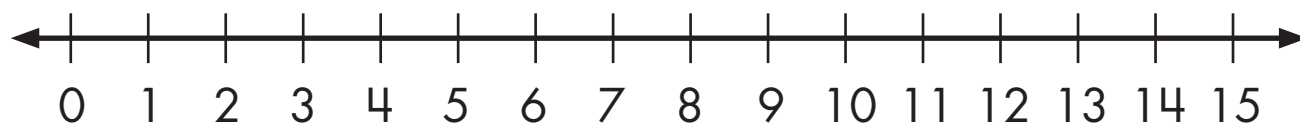
Look at this representation of 132 stickers.

equation: 100   +   30   +   2   =   132

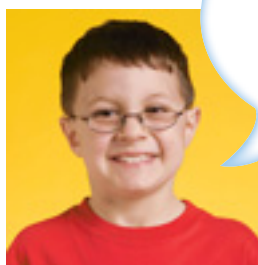**How would you show 76 stickers?**
How would you show 125 stickers?
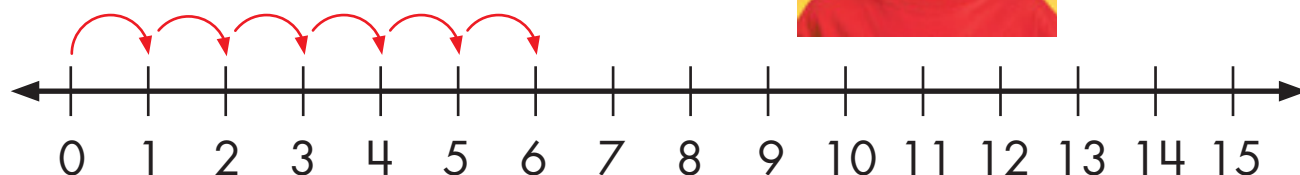
16

Number Line

A number line is a tool. It shows numbers in order.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

You can use it to count forward or back.

When we count forward, the numbers go up.

1, 2, 3, 4, 5, 6.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

When we count back, the numbers go down.

5, 4, 3, 2, 1, 0.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
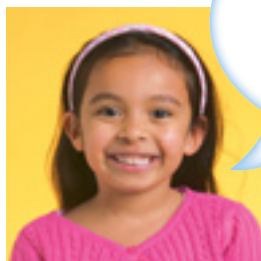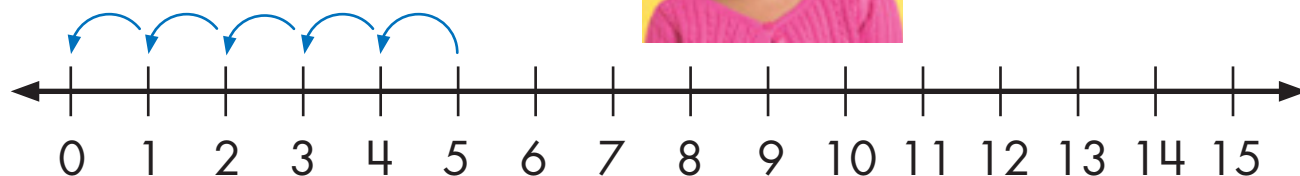
Start with 0 and count to 15.
Start with 12 and count to 0.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
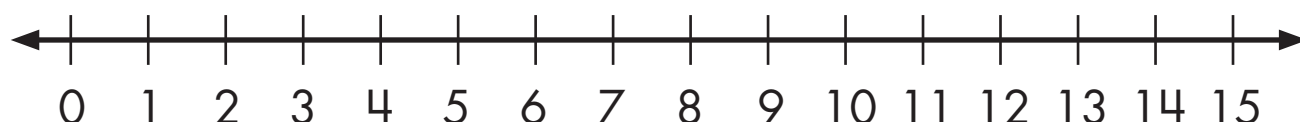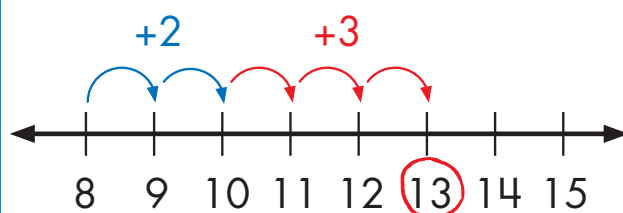
Solving Addition Problems (page 5 of 5)

There are many ways to solve this problem.
This is what some children did:

Paul drew and counted each shell.

Isabel counted on from 8 on a number line.

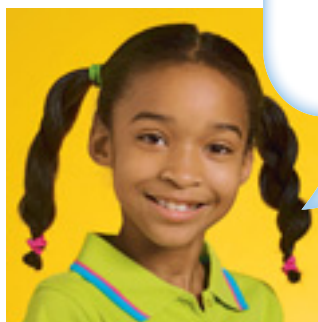
Vic used a combination of 10.

$8 + 2 = 10$

Then he counted on.

11, 12, 13

I know that
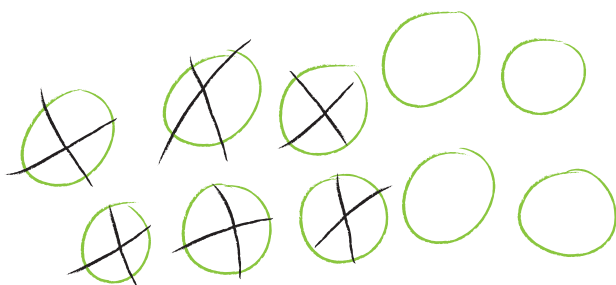2 + 3 = 5.
Then, I count on
6, 7, 8, 9, 10,
11, 12, 13.

How would you solve the problem?
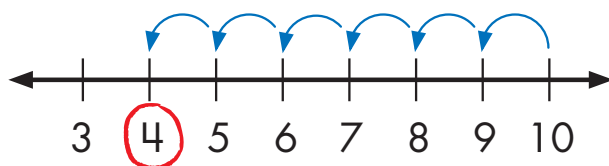
Solving Subtraction Problems (page 2 of 5)

There are many ways to solve this problem.
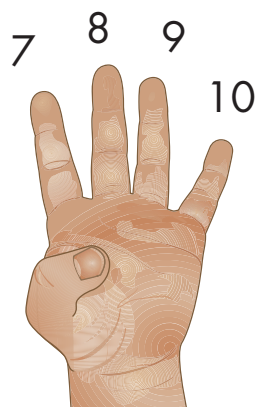This is what some children did.

Kim drew 10 circles and crossed out 6. Then she counted how many were left.

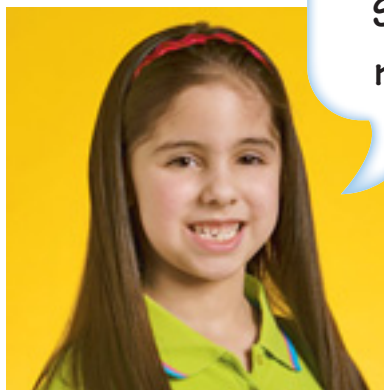Vic counted back 6 on a number line.

Max counted up from 6 to 10.

7 8 9
10

Then he counted his fingers:
1, 2, 3, 4

Rosa used what she knew about addition combinations.

I know that 4 + 6 = 10. So, 10 − 6 must be 4.

? **How would you solve the problem?**
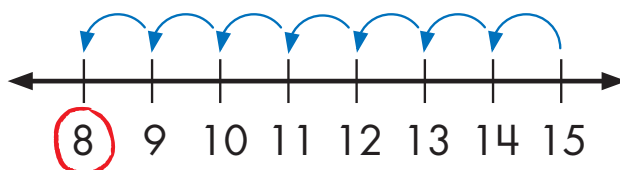
Solving Subtraction Problems (page 5 of 5)

Max had 15 pennies in his piggy bank.
He took out 7 pennies to buy a pencil.
How many pennies are still in his piggy bank?

There are many ways to solve this problem.
This is what some children did.
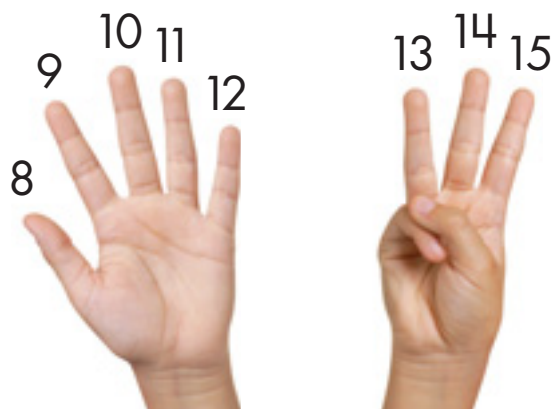
Tina counted out 15 and took 7 away. Then she counted how many were left.	Stacy used a number line and counted back.
Leah counted up from 7 to 15. It was 8.	Paul used what he knew about addition combinations.

8 9 10 11 12 13 14 15

9 10 11 12 13 14 15

If 7 + 7 = 14, then 7 + 8 = 15. So, 15 − 7 = 8.

How would you solve the problem?

Mathematics

In 2nd grade, your child will build on last year's work and gain important new skills. One of the most important outcomes for the year is to add and subtract two-digit numbers quickly and accurately (e.g., 77 – 28). Another important goal in 2nd grade is to understand what the digits mean in a three-digit number such as 463 (namely, 463 is four hundreds, six tens, and three ones). Your child also will build expertise with solving addition and subtraction word problems. Mastering addition and subtraction at the 2nd grade level is important so that your child will not have to review and repeat this material in 3rd grade, when the study of multiplication, division, and fractions will start.

A Sample of What Your Child Will Be Working on in 2nd Grade

- Solving challenging addition and subtraction word problems with one or two steps (e.g., a "one-step" problem would be: "Lucy has 23 fewer apples than Julie. Julie has 47 apples. How many apples does Lucy have?")

- Quickly and accurately adding with a sum of 20 or less (e.g., 11 + 8); quickly and accurately subtracting from a number 20 or less (e.g., 16 – 9); and knowing all sums of one-digit numbers from memory by the end of the year

- Understanding what the digits mean in three-digit numbers (*place value*)

- Using understanding of place value to add and subtract three-digit numbers (e.g., 811 – 367); adding and subtracting two-digit numbers quickly and accurately (e.g., 77 – 28)

- Measuring and estimating length in standard units

- Solving addition and subtraction word problems involving length (e.g., "The pen is 2 cm longer than the pencil. If the pencil is 7 cm long, how long is the pen?")

- Building, drawing, and analyzing 2-D and 3-D shapes to develop foundations for area, volume, and geometry in later grades

Keeping the conversation focused.

When you talk to the teacher, do not worry about covering everything. Instead, keep the conversation focused on the most important topics. In 2nd grade, these include:

- Using understanding of place value to add and subtract

- Solving more challenging addition and subtraction word problems

- Measuring lengths, and solving word problems involving addition and subtraction of lengths

Ask to see a sample of your child's work. Ask the teacher questions such as: Is this piece of work satisfactory? How could it be better? Is my child on track? How can I help my child improve or excel in this area? If my child needs extra support or wants to learn more about a subject, are there resources to help his or her learning outside the classroom?

Talking to Your Child's Teacher

Help Your Child Learn at Home

Learning does not end in the classroom. Children need help and support at home to succeed in their studies. Try to create a quiet place for your child to study, and carve out time *every day* when your child can concentrate on reading, writing, and math uninterrupted by friends, brothers or sisters, or other distractions.

You should also try and sit down with your child at least once a week for 15 to 30 minutes while he or she works on homework. This will keep you informed about what your child is working on, and it will help you be the first to know if your child needs help with specific topics. By taking these small steps, you will be helping your child become successful both in and outside the classroom.

Additionally, here are some activities you can do with your child to support learning at home:

English Language Arts & Literacy

- Read at home every day and assist your child by reading every other paragraph. Encourage your child to read to younger siblings, cousins, or other children you know. To find recommendations of books for your child to read, visit www.corestandards.org/assets/Appendix_B.pdf.

- Have your child write a thank you note or letter to family members or friends.

- Ask your librarian to suggest books about people or places that are important to your child or family that you can read together. Encourage your child to explain what he or she has just read.

Mathematics

Look for "word problems" in real life. Some 2nd grade examples might include:

- When saving for a purchase, compare the cost of the item to the amount of money you have; then ask your child to determine how much more money he or she needs to buy the item.

- When measuring your child's height, ask how many inches he or she has grown since the very first measurement.

- Play "draw the shape." For example, ask your child to draw a hexagon with one side longer than the others, or ask him or her to shade in a quarter of a rectangle.

For more information, the full standards are available at www.corestandards.org.

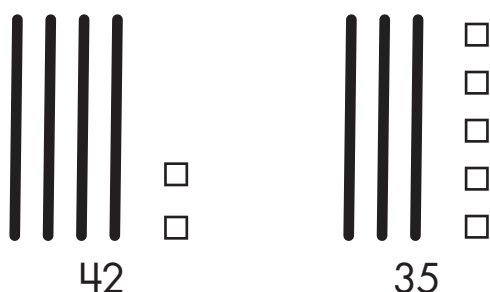# Solving Another Addition Story Problem (page 1 of 2)

Here is the story.

Sally went to Sticker Station. She bought 42 moon stickers and 35 star stickers. How many stickers did Sally buy?

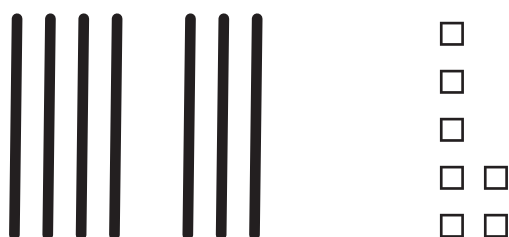There are many ways to solve this problem.

Some children think about tens and ones.

Chen used strips and singles to show the stickers Sally bought.

$$42 + 35 = \underline{}$$

42   35

He put the tens together and the ones together.

7 strips of 10 is 70.   7 singles is 7.

Then he added. 70 + 7 = 77.
Sally bought 77 stickers.

Holly and Simon broke both numbers into tens and ones. They added the tens first, and then the ones.

Holly recorded like this:

$$35 + 42 = \underline{}$$
$$30 + 40 = 70$$
$$5 + 2 = 7$$
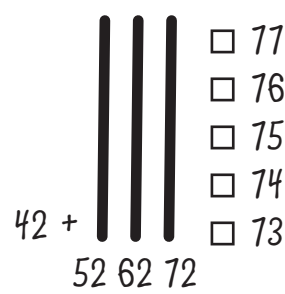$$70 + 7 = 77$$

Simon recorded like this:

$$\begin{array}{r} 35 \\ + 42 \\ \hline 70 \\ + 7 \\ \hline 77 \end{array}$$
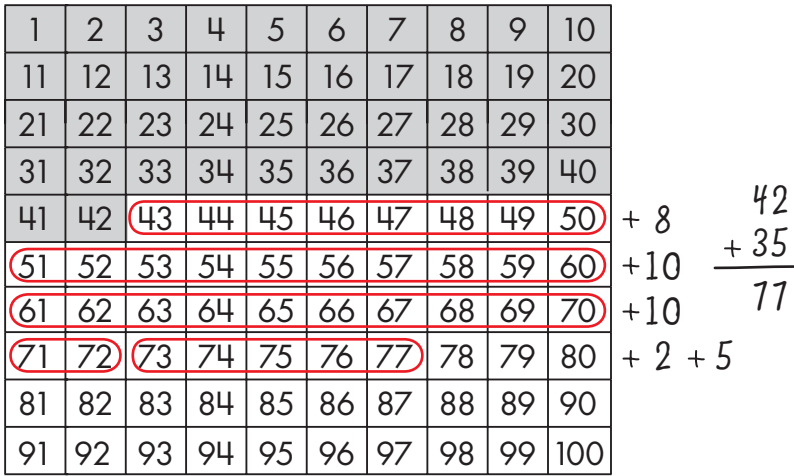
3

Solving Another Addition Story Problem (page 2 of 2)

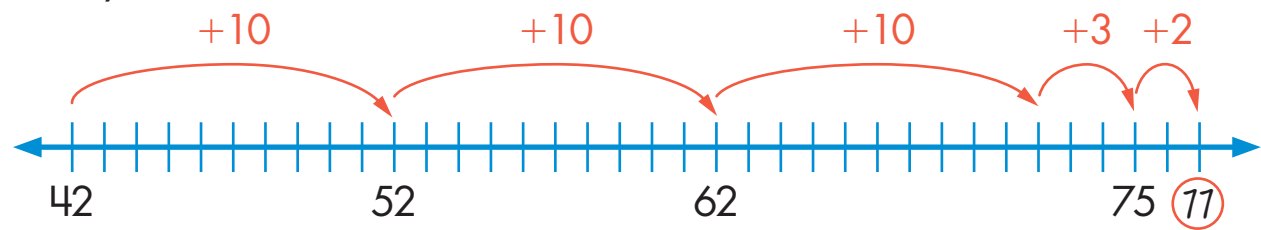Other children keep one number whole and add the other number on in parts.

Henry thought about stickers.

$42 + $ ||||
☐ 77
☐ 76
☐ 75
☐ 74
☐ 73
52 62 72

Carla used the 100 chart. She added 35 stickers onto the 42 Sally already had.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

+ 8
+10
+10
+ 2 + 5

$$\begin{array}{r} 42 \\ + 35 \\ \hline 77 \end{array}$$

Jeffrey started at 42 and added on 35 on the number line.

+10   +10   +10   +3 +2

42   52   62   75 (77)

Simon broke 35 into 30 and 5 to add it onto 42.

42 + 35 = ___
42 + 30 = 72
72 + 5 = 77
77 stickers

Leo kept the 35 whole. He added the 42 by adding 40 and then 2 more.

35 + 42 = ___

$$\begin{array}{r} 35 \\ + 40 \\ \hline 75 \\ + 2 \\ \hline 77 \end{array}$$

? **Tia solved this problem by adding 40 + 37. What did she do? Why does that work?**

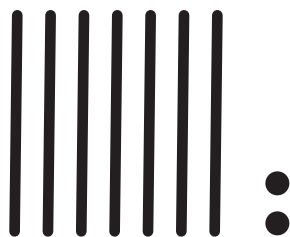# Solving a Subtraction Problem

(page 1 of 3)

Here is another problem. $72 - 38 = \underline{}$
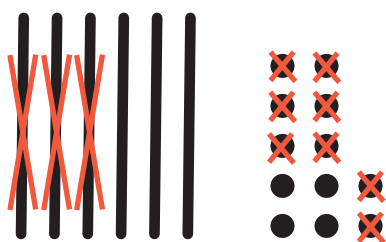
$$\begin{array}{r} 72 \\ -\ 38 \\ \hline \end{array}$$

There are many ways to solve this problem.

Some children show 72 stickers. Then they remove or cross out 38 of them, and count how many are left.

Amaya drew 72 stickers.

To cross out 38, she had to change one strip to singles.

She counted how many were left. "10, 20, 30, and 4 more is 34."

Carla used the 100 chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

$$\begin{array}{r} +\ 2 \\ +10 \\ +10 \\ +10 \\ +\ 2 \\ \hline 34 \end{array}$$

$72 - 38 = 34$

Henry thought:

> You can break 72 into 40 + 30 + 2. If you take the 38 away from the 40, there's 2 left. 2 + 30 + 2 = 34.
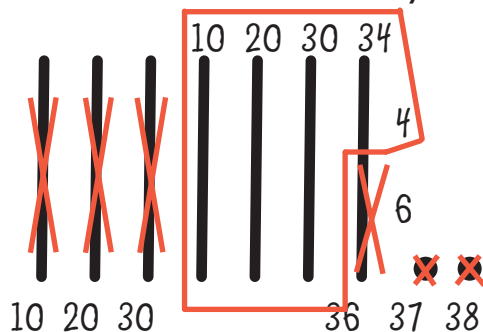

Roshaun drew 72 stickers, crossed out 38, and counted how many were left.


10 20 30 34

4

6

10 20 30   36 37 38

25

Solving a Subtraction Problem

(page 2 of 3)

Other children subtract 38 from 72 in parts.

Tia used the 100 chart. She started at 72 and counted back 38. She subtracted 2 first, then 30, then 6 more. 34 were left.
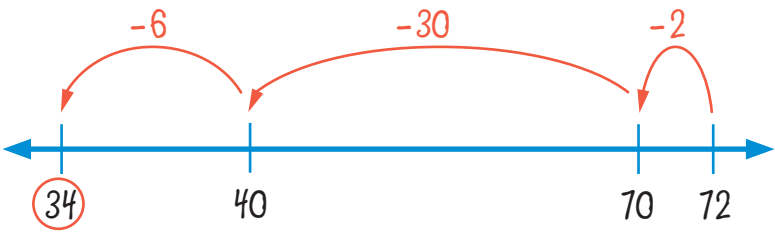
$72 - 38 = 34$

-6

-30

-2

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
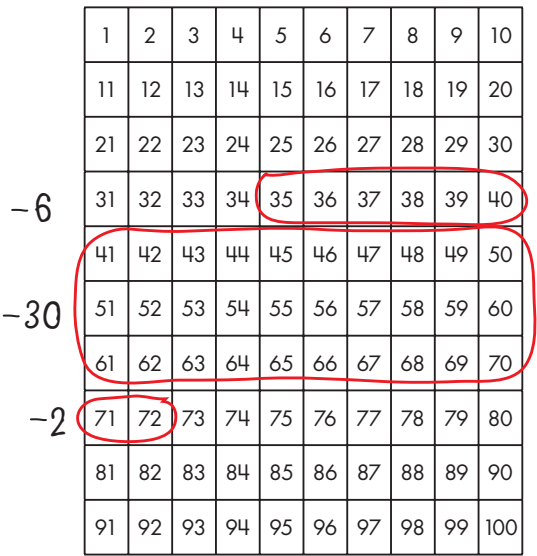
Melissa used the same strategy as Tia, but she used the number line to subtract in parts. She subtracted 2 first, then 30, then 6 more.

$72 - 38 = $ ___

$72 - 2 = 70$

$70 - 30 = 40$

$40 - 6 = 34$

-6 -30 -2

34   40   70   72

Alberto broke 38 into 30 and 8. First he subtracted the 30. Then he subtracted the 8.

$$72 - 30 = 42$$
$$42 - 8 = 34$$
$$72 - 38 = \underline{34}$$

Solving a Subtraction Problem
(page 3 of 3)

Solve 72 − 38, other children think, "38 + ___ = 72." They think about how much they have to add to 38 to get to 72.

Anita used the 100 chart to add up.

$10 + 10 + 10 + 4 = 34$

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	**38**	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Henry kept adding 10 until he got close to 72.

$$38 + 10 = 48$$
$$48 + 10 = 58$$
$$58 + 10 = 68$$
$$68 + 4 = 72$$

$10 + 10 + 10 + 4 = 34$

Lonzell used the number line to add up.

30

2   2

$30 + 2 + 2 = 34$

38   68 70 72
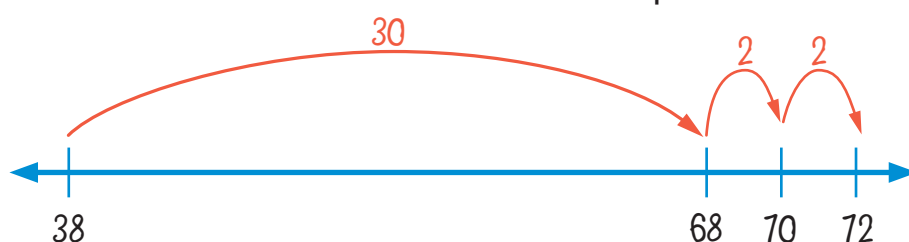
Double Digit Addition Strategies

Splitting Tens and Ones:

$$36 + 55 = 91$$

30 + 6 50 + 5

80 + 11 = 91

Split the 36 into 30 + 6
Split the 55 into 50 + 5
Add 30 + 50 = 80
Add 6 + 5 = 11
Add 80 + 11 to get your sum of 91

Add Friendly Numbers:

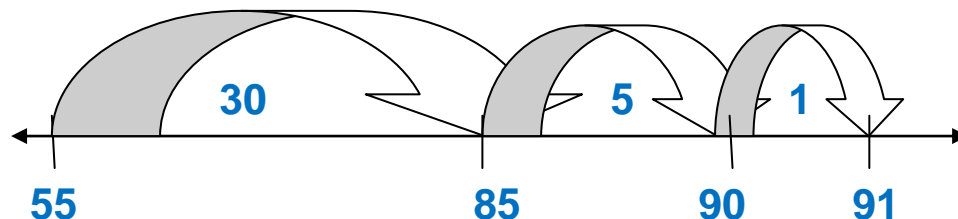Using 30 instead of 36 makes 30 a friendly number because it ends in zero.

$$36 + 55 = 91$$
$$30 + 55 = 85$$
$$85 + 6 = 91$$

Using the Open Number Line

*Students are encouraged to only make hops on the number line that they can mentally compute.

$$36 + 55 = 91$$

Students are also encouraged to start adding on the number line with the largest addend.

If a child cannot jump the initial "30", they should jump by 10's.
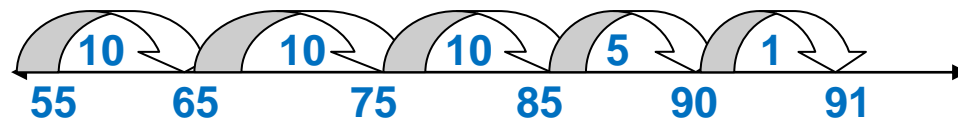
Triple Digit Addition Strategies

Splitting Hundreds, Tens, and Ones:

$$125 \quad + \quad 112 = 237$$

$$100 + 20 + 5 \quad 100 + 10 + 2$$

$$200 \quad + 30 \quad + 7 = 237$$

**Students will add the hundreds,
Add the tens,
Add the ones**

We also encourage students to write equations as they go:

**100 + 100= 200
20 + 10 = 30
5 + 2 = 7**

$$200 + 30 + 7 = 237$$

Using the Open Number Line

125 + 112 = 237

| 100 | 10 | 2 |

125   225   235   237
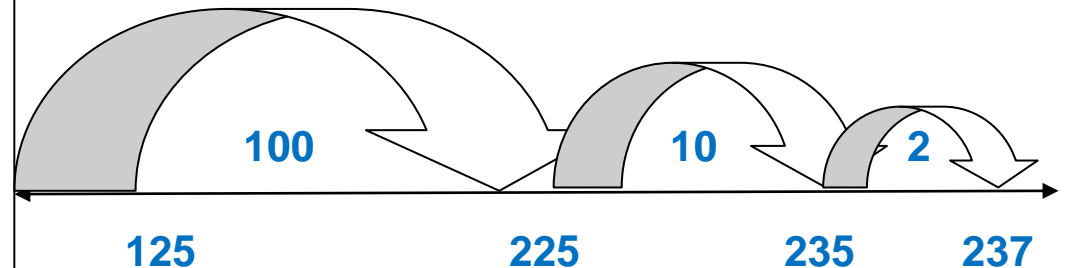
Place Value Representation:
(Sticker Notation)

By Grade 2 students are expected to draw pictures that represent their work. This is a representation of our base ten system that is referred to as "sticker notation" in the Investigations program.
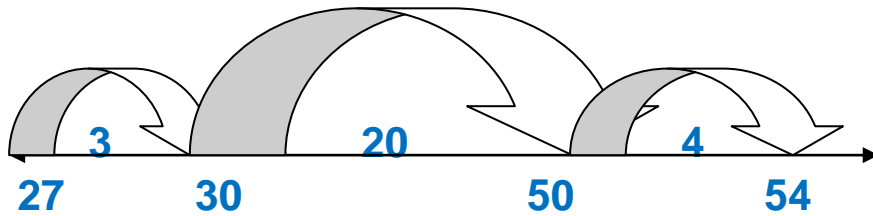**125 + 112 = 237**
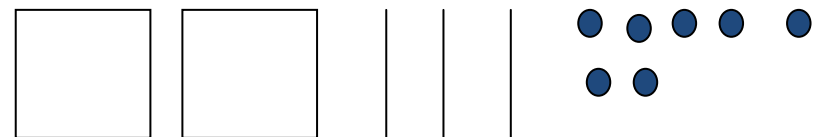
Double Digit Subtraction Strategies

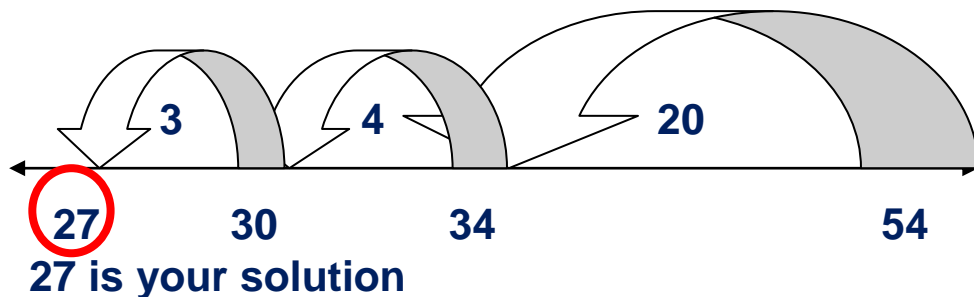## Count up on the Open Number Line:

54 – 27 = 27

Students then count their hops to find their solution:
3 + 20 + 4 = 27

Hopping 3 first helps the students get to the friendly number 30 before continuing their work.

Count Back on the Open Number Line:

27 is your solution

Use Number Sentences (Equations): Subtract in Parts

$$54 - 27 = 27$$

$$54 - 4 = 50$$
$$50 - 3 = 47$$
$$47 - 20 = 27$$
$$27$$

Check with Addition:

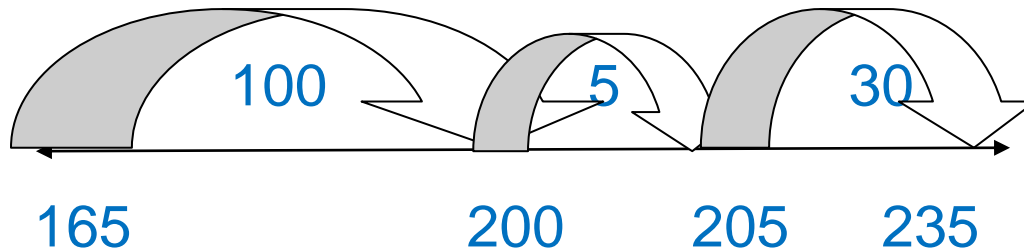$$27 + \underline{\hspace{1cm}} = 54$$

$$27 + 20 = 47$$
$$47 + 3 = 50$$
$$50 + 4 = 54$$

Now add up 20 + 3 + 4 = 27
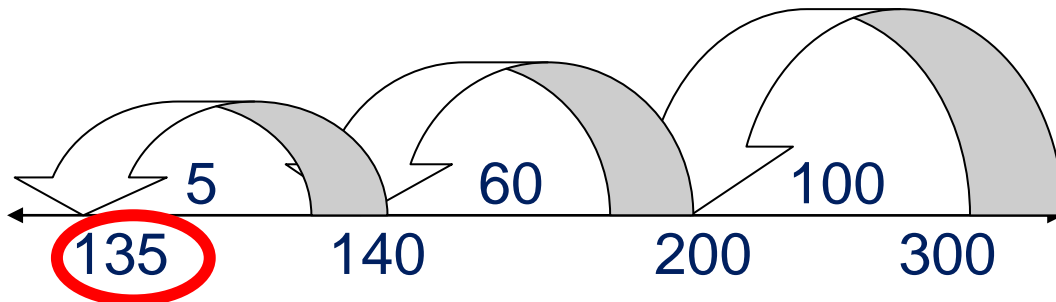
Triple Digit Subtraction Strategies:

Count Up on the Open Number Line:

$$300 - 165 = 135$$
$$165 + \_\_\_\_ = 300$$

Students count their hops to find their solution:
100 + 5 + 30 = 135

Count Back on the Open Number Line:

135 is your solution

Use Number Sentences (Equations):
Subtract in Parts

$$300 - 165$$

$$300 - 100 = 200$$
$$200 - 60 = 140$$
$$140 - 5 = 135$$
$$165$$

Check with Addition:

$$165 + \_\_\_\_ = 300$$

$$165 + 100 = 265$$
$$265 + 5 = 270$$
$$270 + 30 = 300$$

Now add up 100 + 5 + 30= 135