

Inspiring Your Child to Learn and Love Math

Implementation Guide



Inspiring Your Child to Learn and Love Math

Workshop Introduction

These guided workshops have been designed to provide the tools and materials to plan and host parent education sessions. Each workshop is self-contained and includes a template for sharing practical, age-specific strategies and resources to encourage mathematics learning at home. The materials for each module include an invitation letter and flyer, an annotated agenda, and Blackline (photocopy) masters for all activities (including solutions).

These workshops have been created to complement each of the five modules in the *Inspiring Your Child to Learn and Love Math Tool Kit*. The workshops require no prior knowledge of mathematics or specialized content—they can be implemented by anyone who has an interest in learning and sharing.

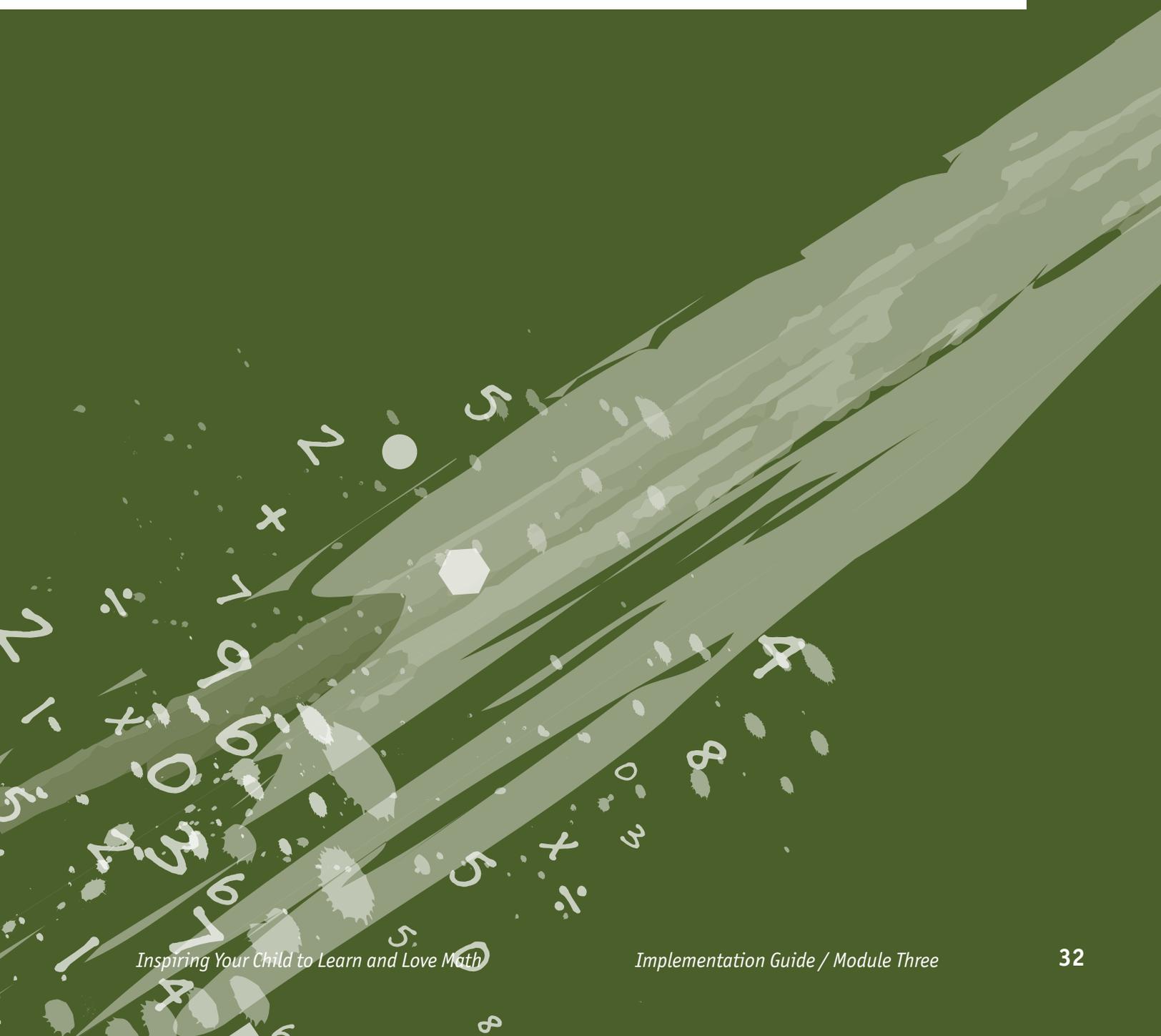
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Module Three



Primary (Grades 1, 2, and 3)

Making it Count



5:45–6:00 p.m.

Welcome

Warmly welcome parents, guardians, and caregivers as they arrive at the door.

Some parents may be nervous about attending a math workshop. Greeting them will help put them at ease!

Introduce yourself and briefly explain your role in the workshop.

Invite parents to help themselves to coffee and to explore the math resources, books, and games on the resource table.

6:00–6:15 p.m.

Introduction

Welcome parents and thank them for taking the time to come.

Congratulate them for taking the first step towards enriching and improving their child's math education by attending this workshop.

Thank organizers and other key members of the implementation team.

Introduce parents to the C.O.D.E. *"Inspiring Your Child to Learn and Love Math"* and tell them how to get a copy.

Purpose

Explain that the purpose of this workshop is to:

- * Reinforce what parents are already doing at home to support their children in math.
- * Outline routines and strategies that will help children avoid math anxiety and be more productive in math class.
- * Remind parents that they are their child's most important role model and they can have a positive influence on their child's attitude about math!

You can ask school librarians and math resource teachers to help you find school materials to display at these workshops (math books, games, manipulative materials, etc.).

6:15–6:30 p.m.

Icebreaker—Headband game “Who am I?”

- * Explain to parents that they will work together in small groups.
- * Each parent will be given a headband with a number between 1 and 100 written on it. Participants must NOT see their own numbers! The object of the game is for each parent to guess his or her personal number by asking “yes or no” questions to other parents.
- * Give examples of possible questions:
 - * Is my number an even number?
 - * Is my number an odd number?
 - * Is my number divisible by 10?
 - * Is my number less than 70?
 - * Is my number between 25 and 50?
- * Give groups 10 minutes to do the activity. Emphasize that players used different questions and different strategies to discover

their numbers. Explain that children also use a variety of (sometimes very unique and creative) strategies to solve number problems.

Headbands can be made from strips of construction paper taped together.

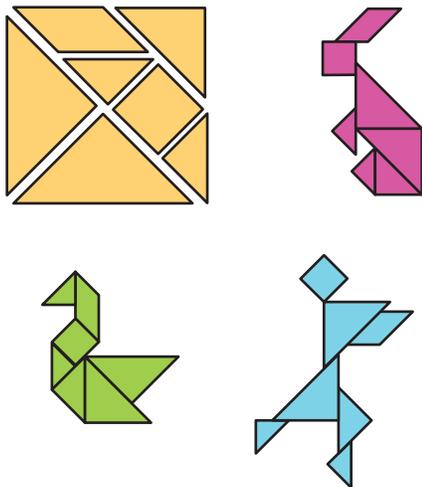
6:30–6:45 p.m.

Activity 1: Tangrams

- * A tangram is an ancient Chinese puzzle game. In this game, players try to create new shapes using only seven flat, geometric puzzle pieces, or “tans.” The pieces must not overlap.
- * Distribute tangram and shape templates to parents. Give parents time to cut out the seven pieces of their tangram puzzle. Explain that tangrams are part of an ancient Chinese game that uses different geometric shapes to create pictures.

Some parents may be nervous about attending a math workshop. Greeting them will help put them at ease!

- * Review the names of the shapes in the tangram: five isosceles triangles (two large, two small, and one medium), one square and one parallelogram.
- * Ask parents to create as many pictures on their tangram template as they can.
- * Show the following example of tangram pictures:



6:45–7:00 p.m.

Activity 2: Fraction strips

Fractions can be difficult for children to understand. Dividing a strip of paper into equal parts can help children see that fractions are equal parts of a whole.

- * For the first part of this activity, parents make fraction strips (see sample diagram). Make sure there are enough strips of paper of each colour for each parent.
- * Instruct parents to:
 - * Take one paper strip of each colour (one red, one yellow, one blue, one purple).
 - * Write “One Whole” in the centre of the first strip of paper.

Note: Each parent will need 16” strips of construction paper in four different colours. Cut and prepare these ahead of time.

- * Fold the second strip of paper in half and write the words “one half” and the numbers “ $\frac{1}{2}$ ” in each half of the strip. See example below.
- * Fold the third strip of paper in half and then in half again, creating four equal parts. Parents should write the words “one fourth” and the numbers “ $\frac{1}{4}$ ” in each of the four parts.
- * Fold the last strip of paper in half, in half again, and then in half a third time to create eight equal parts. Parents should write the words “one eighth” and the numbers “ $\frac{1}{8}$ ” in each of the eight parts.
- * Show parents how to arrange the strips in front of them, as in the example.
- * After each parent has made a fraction strip sheet, give each parent a cube template (see Photocopy Master). Explain that they will each make a die.
- * Ask them to label the die faces as follows: $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, skip, roll again.
- * Explain that they will use these dice to play a bingo-style fraction strip game:
 - * Ask parents to sit in small groups at the tables. Each player has a die, four fraction strips, and a blank sheet of paper.
 - * The first player rolls a die, then places a corresponding fraction strip on the blank sheet of paper.

Fraction Strips

1							
$\frac{1}{2}$				$\frac{1}{2}$			
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
$\frac{1}{8}$							

- * The second player rolls the die and places a corresponding fraction strip on the blank sheet of paper.
- * The position of the fraction strips should match the example. Arrange the strips in descending order: the strip showing “one whole” goes on top; the strip showing two halves is placed beneath it; the strip showing four fourths is placed beneath the halves; and the strip showing eight eighths is placed beneath the fourths.
- * Fraction strips can’t overlap. In other words, each fraction strip can be used only once.
- * Players can’t trade fraction strips.
- * If no fraction strip is available to match a roll, the player’s turn ends and the next player takes a turn.

- * The game continues until someone has played all four fraction strips. The first to do so wins.

7:00–7:30 p.m.

Video “Inspiring Your Child to Learn and Love Math!”

Introduce the video. Explain that this video focuses on how parents can encourage their children’s math education by:

- * Establishing consistent homework routines.
- * Engaging children in math talk about what the children learn in class.
- * Encouraging children to take risks and explain their problem-solving strategies.

Note: As parents watch the video, invite them to record their thoughts on the Reflection Sheet provided. Allow time for discussion after the video.

Case studies

After the video, distribute the “Primary Case Studies” handout.

Read each case study aloud and ask parents to think about each one.

Allow parents time to discuss each case study before discussing aloud with the group.

7:30–7:45 p.m.

Divide parents into two groups. Explain that one group will make place value tents and the other will play the double digit game. After 15 minutes, representatives from each group will “teach” their game to members of the other group.

Activity 3: Place value tents and double digit game

Explain to parents that they will make place value tents to take home. They will also learn to play a simple place value game that explains number position relationships.

- * Ask each parent to take one tent card in each colour and write “800” on the largest tent, “30” on the medium-sized tent, and “9” on the smallest tent.
- * Ask parents to line up the tents from largest to smallest.
- * Ask parents what number they see in front of them.
- * Discussion: Why is place value an important concept for young children? How could this activity help children understand place value? What would happen if the numbers were reversed?

Remember to prepare enough materials for the take-home activities.

- * Ask parents to make place value tents for all digits from “0” to “8”; for all tens from “10” to “90,” and for all hundreds from “100” to “900.”

Double digit game

- * For this game, each group needs one die and each player needs a copy of the “Double Digit” score sheet (see Photocopy Masters).
- * Note: If parents use the template to make dice, they must make sure that the sum of opposite faces is always 7—6 is opposite 1; 2 is opposite 5; and 3 is opposite 4.
- * To play the game, each player takes a turn rolling the die, then records the number on the “Double Digit” score sheet.
- * The player chooses whether to record the number in the tens column or the ones column. For example, if a “4” is rolled and recorded in the tens column, it represents 40. If it is recorded in the ones column, it is just a “4.”



- * After each player has rolled the die seven times, players add up their numbers.
- * The player whose total is closest to 100 without going over is the winner!

Alternate versions

Here is a simpler version of the game for younger children:

- * To begin, each parent draws three boxes on a sheet of paper.
- * One parent rolls the die and announces the number out loud.
- * Each person in the group writes that number in one of the three boxes. No changes are allowed after the digit is recorded.



* The next player takes a turn rolling the die and announcing the number. Each player writes that number in one of their remaining boxes.

* A third player repeats this once more so that the players can fill all three boxes.

The person with the largest total number wins!

To increase the difficulty of the game, players may:

* Play to get as close as possible to a particular number, such as 500.

* Play with more boxes to make a four- or five-digit number.

7:45 p.m.

Recommended Resources

Direct parents to the list of additional resources (including math books, songs, websites, apps, television shows, and games).

Wrap Up

* Ask parents if they have any further questions about the workshop information or suggestions for future workshops.

* Tell parents you will be available after the workshop if they have additional questions.

* Thank parents and attendees for coming and ask them to complete an evaluation form.

* Distribute fact sheets to parents before they go home.



Recommended Resources

There is a wealth of information on the internet in addition to the links and other resources listed below. For an up-to-date list, please check our website!

These resources remind us that:

- Math takes practice.
- Mistakes are part of learning.
- Asking, not telling, is most helpful to children's learning.
- Math is everywhere!

They also remind us to have fun doing math together!

Ontario curriculum

edu.gov.on.ca/eng/curriculum/elementary/math18curr.pdf

TVOntario parents math resources

tvoparents.tvo.org/

TVOntario kids activities

Beat the Clock. Kids practice telling time with digital and analog clocks.

tvokids.com/games/beatclock

Bruce McBruce Doodle Dots. Kids practice skip counting by 2s and 5s.

tvokids.com/games/brucemcbrucedoodledots

Coin Combo. Kids learn to add coin combinations.

tvokids.com/games/coincombo

The Odd Squad. Kids use math to complete the puzzle.

tvokids.com/games/oddsquad

Apps

The Prime Radicals pentomino app. Puzzles to solve using slides, flips, and turns.

tvokids.com/apps/primeradicalspentominos

Fun and educational math support and activities

Mathies, a website designed for Ontario K–12 students and parents.
mathies.ca

The Family Math Project provides videos and workshops about math topics related to daily life.

Sample titles: “Patterns from a shopping bag”; “How long is the stick?”; “Geometry at the bicycle shop.”

familymathcanada.org/

Books

Number

Two of Everything: A Chinese Folktale, Lily Toy Hong

A Place for Zero: A Math Adventure, Angeline Sparagna LoPresti

A Remainder of One, Elinor J. Pinczes

Amanda Bean’s Amazing Dream, Cindy Neuschwander

Sea Squares, Joy Hulme

The King’s Chessboard, David Birch

Anno’s Mysterious Multiplying Jar, Masaichiro and Mitsumasa Anno

How Much is a Million?, David M. Schwartz

A Three Hat Day, Laura Geringer

Measurement

How Much, How Many, How Far, How Heavy, How Long, How Tall Is 1000?, Helen Nolan

Measuring Penny, Loreen Leedy

How Big is a Foot?, Rolf Myller

Millions to Measure, David Schwartz

Probability

Do You Wanna Bet? Your Chance to Find Out About Probability, Jean Cushman

Probably Pistachio, Stuart J. Murphy

Cloudy with a Chance of Meatballs, Judi Barrett

Shapes

The Greedy Triangle, Marilyn Burns

Primary Case Studies Handout

Module Three—*Making it Count*

Here are some common scenarios for you to think about and discuss. For each case, imagine that you are facing the situation presented, then discuss your observations with the rest of your small group. How would you react? Why? After all cases have been discussed, solutions will be presented to the group as a whole. The solutions should inform the discussion and provide specific helpful strategies for parents.

Case Study One

Your child shows you their answer to $7 + 6$

You notice that they have written “31.” Quietly, you panic: “Is my child dyslexic?”

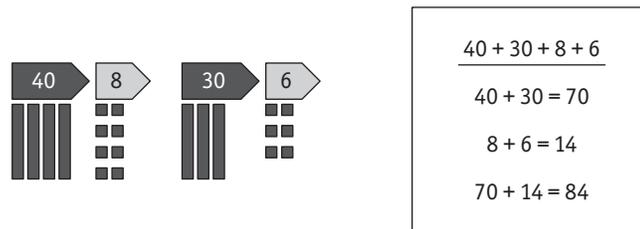
Case Study Two

You notice that your child calculates an incorrect answer in a number sentence by writing the number 17 as the answer to $7 + \underline{\quad} = 10$

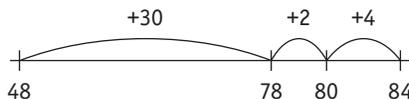
Case Study Three

You see your child trying to find a solution to the question $48 + 36 = 84$

Using a strategy that you have never seen:



Checking the answer by using the number line:



Should you jump in and show them “your way” because you think it is faster and better?

Primary Case Studies Handout

Case Study Solutions

Case Study One Solution

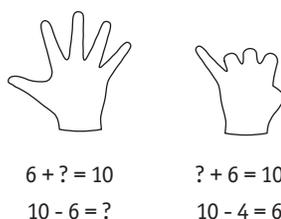
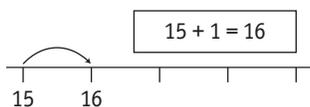
Children might reverse the digits in numbers from “13” to “19” because of the way the words sound. Although 13 means $10 + 3$, when you say “thirteen” out loud, you say “thir” and then “teen.” When children hear the “thir,” which represents “3,” they often scribe this digit first, followed by the “1,” which is the tens digit.

Encourage your child to stop, think, and estimate. You can say, “You are adding $7 + 6$. What number sentence is close to this?” The child should reply “ $6 + 6$.” Children usually learn doubles early and quickly, so the child should realize that $6 + 6 = 12$. “Twelve” is a stand-alone word with a specific meaning, so the child is able to write the correct number. When the child in this scenario recognizes that their original answer, 31, is not close to 12 (which they can point to on the number line that their parents have unrolled from the homework drawer), they can recognize their error and correct it.

Case Study Two Solution

If your child gets a wrong answer, be calm. Mistakes are opportunities to learn. When children see an expression such as $7 + \underline{\quad} = 10$, they often respond “17” because they think the problem is asking, “What is $7 + 10$?” instead of, “7 plus what missing number equals 10?”

A simple strategy is to ask the child to prove to you that their answer is correct. Encourage children to use fingers, a number line, or counters to act out these types of problems.



$$\bullet\bullet\bullet\bullet\bullet\bullet + \underline{\quad} = \circ\circ\circ\circ\circ\circ\circ\circ\circ\circ$$

Primary Case Studies Handout

Case Study Solutions

Case Study Three Solution

This method keeps place value prominent in children’s minds, and so it is commonly used to teach children in primary division how to calculate with larger numbers. Children can be confused when they see a number such as “875.” They do not understand that the position of the eight tells them that “8” is not just a digit, but means 800. Similarly, they do not yet understand that “7” means 70 and “5” means five ones.

This method works by partitioning (or splitting) each number into its hundreds, tens, and units. The parts of the number are then added together, with a final addition required to get the answer. Here is an example:

Example 1: $47 + 76$

First partition (split) each number into tens and units:

$$\begin{array}{r} 47 = 40 + 7 \\ + 76 = 70 + 6 \end{array}$$

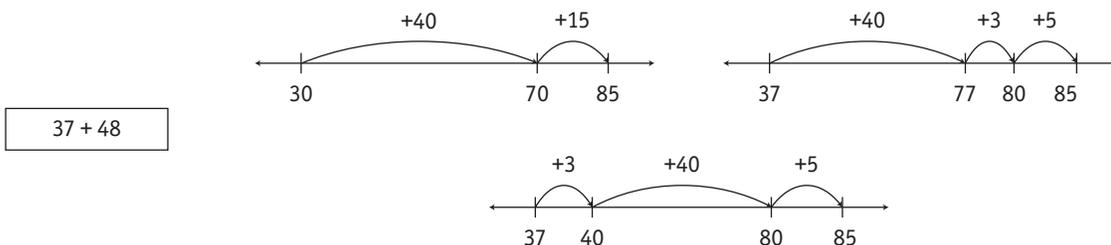
Add the tens and write the answer below, then add the units and write the answer below:

$$\begin{array}{r} 47 = 40 + 7 \\ + 76 = 70 + 6 \\ \hline 110 + 13 \end{array}$$

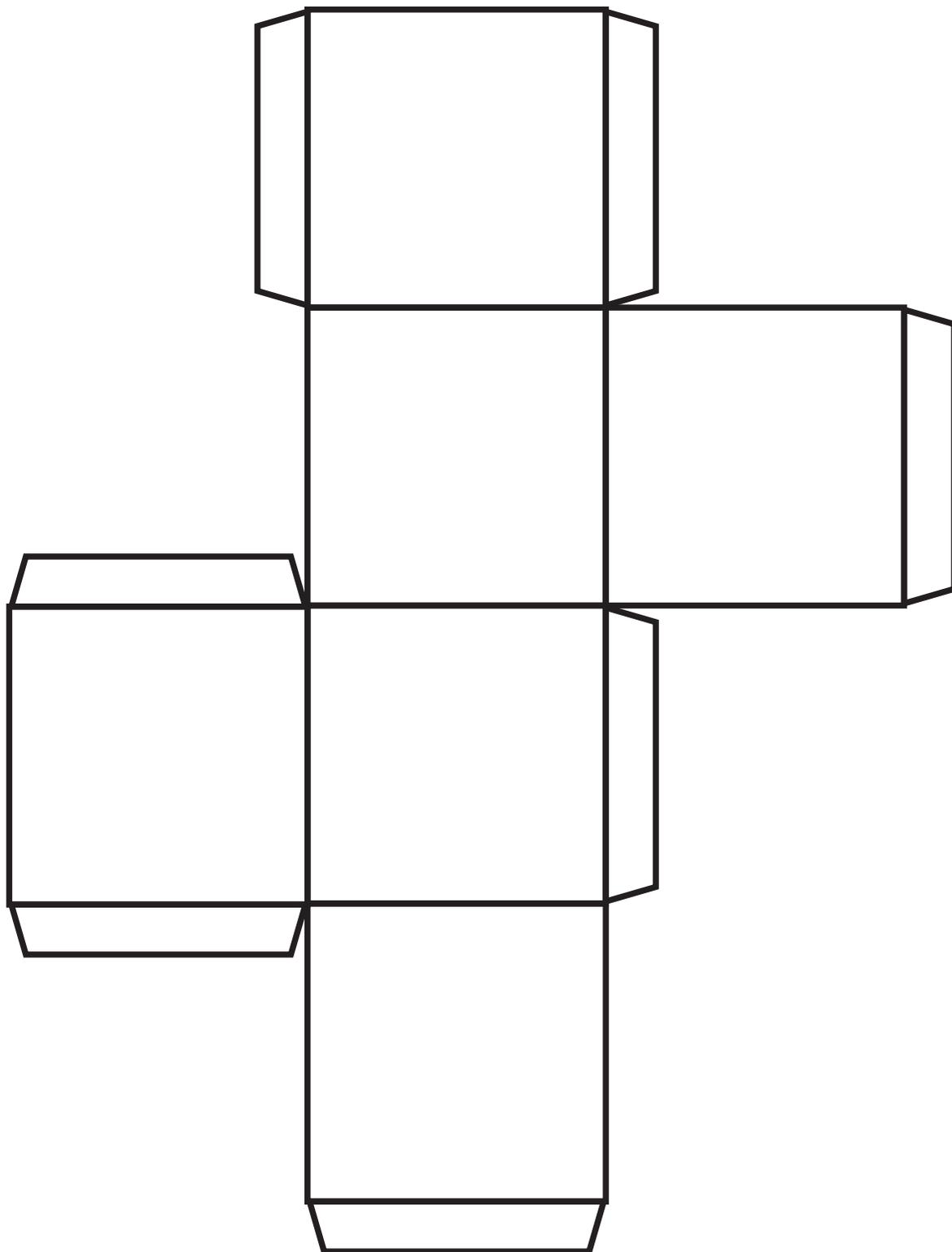
Add the two totals together to get the final answer:

$$\begin{array}{r} 47 = 40 + 7 \\ + 76 = 70 + 6 \\ \hline 110 + 13 = 123 \end{array}$$

The number line can be used to solve a simple addition computation question in more than one way:



Double Digit Game Die Template



Double Digit Score Sheet

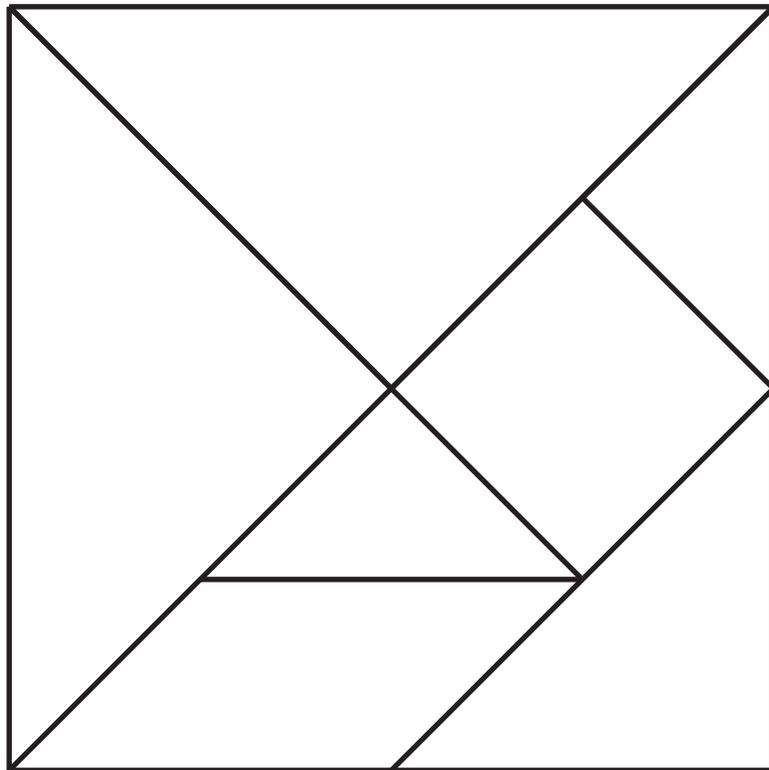
Tens	Ones
1.	
2.	
3.	
4.	
5.	
6.	
7.	
Total	

Double Digit Score Sheet

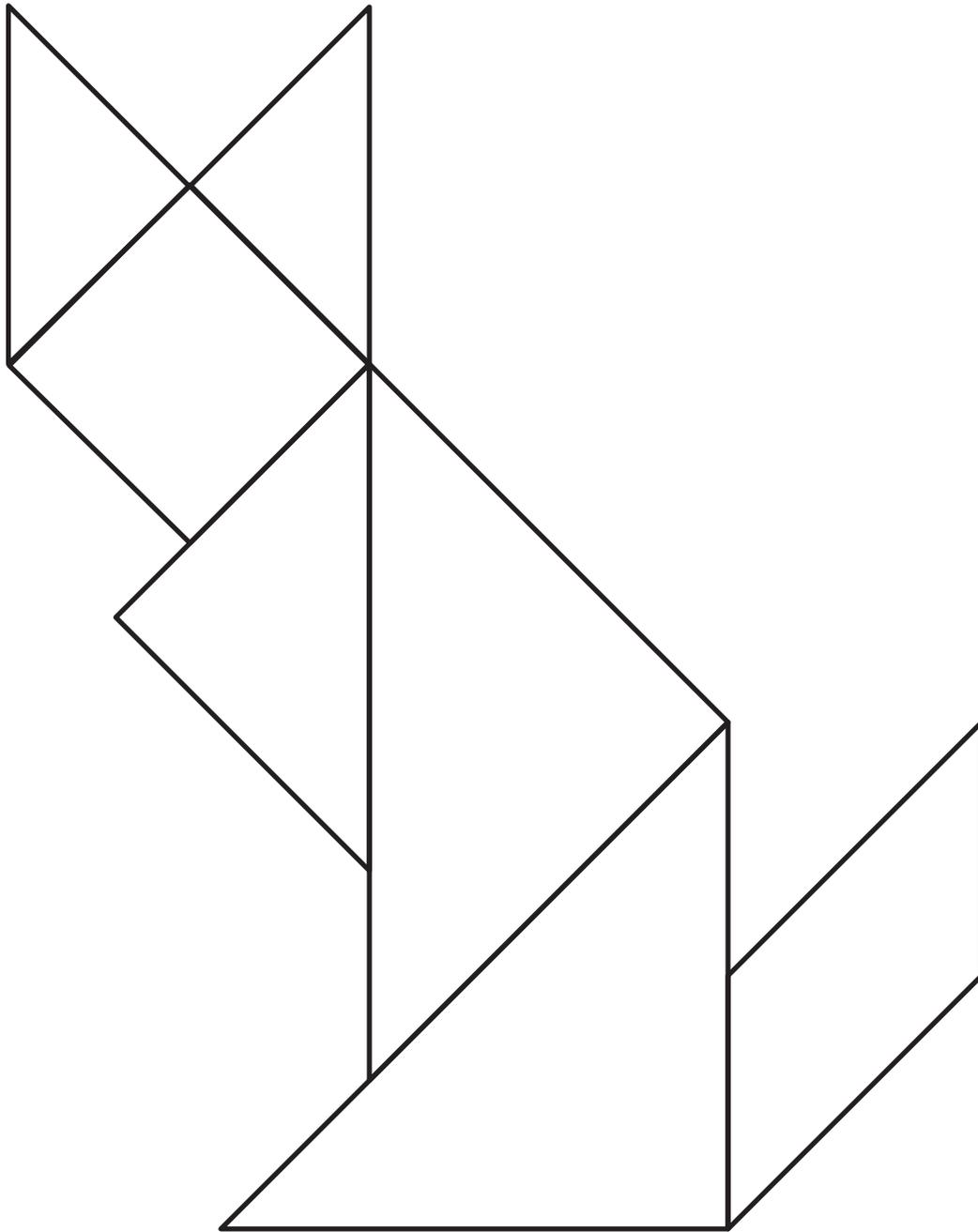
Tens	Ones
1.	
2.	
3.	
4.	
5.	
6.	
7.	
Total	

Tangram Template

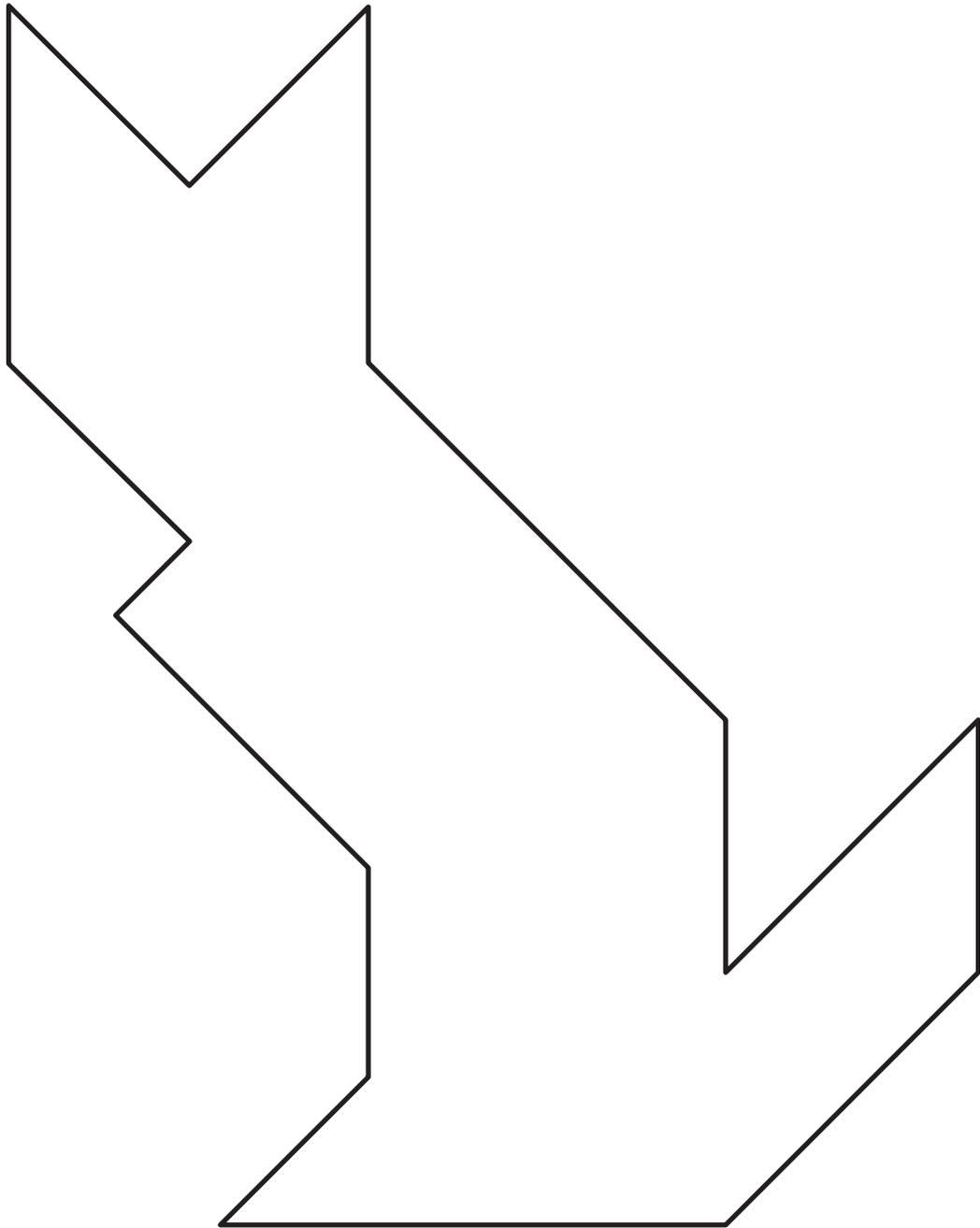
Print out onto card and cut very carefully along the lines to separate the seven pieces.



Tangram Solution

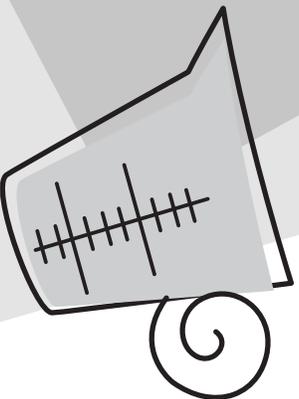


Tangram Template



Math in everyday activities

- Use and talk about the math tools that you have around the house already—such as thermometers, clocks, measuring cups, measuring tapes, and coins.
- Read books and play games with math themes.
- Keep the lines of communication open with your child's teacher:
- Find the best way to communicate with your child's teacher.
- If you are puzzled by the method your child is using, ask the teacher for clarification.
- If you think your child needs remedial or enrichment support, ask where to find such programs.
- Stay positive!



Recommended Resources

There is a wealth of information on the internet in addition to the links and other resources listed below. For an up-to-date list, please check our website.

Ontario curriculum

edu.gov.on.ca/eng/curriculum/elementary/math18curr.pdf

Doing math with your child

- *Doing Mathematics with Your Child, Kindergarten to Grade 6, A Parent Guide* (Ontario Ministry of Education, 2014)
edu.gov.on.ca/eng/literacynumeracy/parentGuideNumEn.pdf

- TV0Parents resources to support math learning at home.
twoparents.two.org/topic/school-learning#1185/math
- Fun and educational math activities.
familymathcanada.org

Fun online math games

- TV0Kids shows about math for children aged 6 to 11.
twoparents.two.org/article/twokids-shows-ages-6-11-teaching-math
- The Odd Squad. Kids use math to complete the puzzle.
twokids.com/games/oddsquad

Books

- **Number** *Two of Everything: A Chinese Folktale*, Lily Toy Hong
- **Measurement** *How Much, How Many, How Far, How Heavy, How Long, How Tall Is 1000?*, Helen Nolan
- **Probability** *Do You Wanna Bet? Your Chance to Find Out About Probability*, Jean Cushman
- **Geometry** *The Greedy Triangle*, Marilyn Burns
- **Patterning/Algebra** *Pattern Bugs*, Trudy Harris

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Module Three

Fact Sheet

Primary (Grades 1, 2, and 3)

Making It Count



Handy math facts for primary division

Characteristics of children in primary division

Children in primary division tend to be:

- Curious, creative, and imaginative.
- Improving their fine motor skills. They are getting better at tasks such as holding a pencil and catching a ball.
- Improving their listening skills.
- Still quite egocentric. They might react without thinking, or lash out by saying, "I don't want to!"

Most children in primary division:

- Love math!
- Begin to make connections between school math and the world around them ("Snowflakes are made of geometric shapes and have symmetry").
- Take risks in new situations, but like the security of groups, organized play, and clubs.
- Like routine, step-by-step instructions, and games with clear rules.
- Tend to work quickly. Sometimes they reverse letters (b/d) and numbers ("31" instead of "13").
- Need to change activities and tasks often.

Math milestones for children in primary division

It is important to remember that not all children learn the same way or on the same day! Milestones, or learning expectations, are meant to describe what your child should know by the end of primary division in very broad brushstrokes.

Always remember to talk to your child's teacher or teaching team (including educational assistants, special resource teachers, and the school principal) if you have any concerns about your child's development.

By the end of grade 3, your child should be able to:

- Count forwards by 1s, 2s, 5s, 10s, 25s, and by 100s to 1,000.
- Multiply to "7 times 7" and divide to "49 divided by 7."
- Solve word problems with addition and subtraction of single- and multi-digit numbers.
- Represent fractions and money amounts to \$10.
- Read time to the nearest 5 minutes using analog clocks (6:55).
- Estimate and measure perimeter and area of regular shapes.
- Compare standard units of measurement (centimetre, metre, kilometre).
- Compare and sort two-dimensional shapes and three-dimensional figures.
- Determine the missing number in equations involving addition and subtraction of one- and two-digit number ($25 - 4 = 15 + ? = ?$).
- Predict the frequency of an outcome in a probability game (such as rolling dice).

Supporting your primary learner at home

Establish homework routines

- Make sure that your child has a quiet space, such as the kitchen table, for doing homework. It should be close to you and free from distractions.

- Schedule homework at the same time and location each day.
- Create a homework drawer. Fill it with items that your child needs to use often, such as pencils, erasers, scissors, rulers, graph paper, construction paper, and a calculator.
- Use refrigerator or pantry doors as home bulletin boards. Write on scrap paper or sticky notes and create math "word walls" about the topics your child is studying at school.

Show an interest

- Talk with your child about their math school work. Show an interest in what they are learning in class.
- Help your child with (but do not do) math homework. Ask your child to teach you how to do the homework problems.
- If your child makes an error:
 - Try not to react in a negative way.
 - Ask your child to show you why their answer is correct.
 - If your children become very frustrated, stop, then remind them of all the things that they can do successfully.
 - Tell your child that you have made mistakes, too, but you learned from them.
- Allow your child enough time to work out math problems. Solving math problems should never be a race against time.

Recite this phrase out loud together: "Mistakes are opportunities to learn!"

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