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○	○	○	●	PAK-2	Ordinal Numbers	F-4
●	●	●	●	PAK-3	Patterns in Motion	F-8
●	●	●	●	PAK-4	Patterns with Objects	F-11
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●	●	●	●	NSK-26	Counting 6 and 7	G-5
●	●	●	●	NSK-27	The Numbers 6 and 7	G-10
●	●	●	●	NSK-28	Writing 6 and 7	G-15
●	●	●	●	NSK-29	Counting 8 and 9	G-18
●	●	●	●	NSK-30	The Numbers 8 and 9	G-23
●	●	●	●	NSK-31	Writing 8 and 9	G-27
●	●	●	●	NSK-32	Counting 10	G-29
●	●	●	●	NSK-33	The Number 10	G-33
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●	●	●	●	NSK-35	Review of 0 to 10	G-38
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●	●	●	●	NSK-37	The Same Number (Equal)	H-4
●	●	●	●	NSK-38	Greater Than	H-9
●	●	●	●	NSK-39	Less Than	H-15
●	●	●	●	NSK-40	One More Than	H-21
●	●	●	●	NSK-41	Comparing Numbers	H-28
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Generic Blackline Masters

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Kindergarten, Part 2

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○	○	○	●	MEK-3	Measuring Capacity	K-9
●	●	●	●	MEK-4	Height	K-12
●	●	●	●	MEK-5	Length	K-17
○	○	○	●	MEK-6	Measuring Length and Time	K-22
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●	●	●	●	MEK-8	Weight	K-30
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●	●	●	●	NSK-43	Acting Out Addition	L-7
●	●	●	●	NSK-44	Decomposing up to 5	L-9
●	●	●	●	NSK-45	Decomposing 5	L-13
●	●	●	●	NSK-46	Adding Small Numbers	L-17
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○	●	○	●	NSK-68	Subtracting with Objects (2)	Q-11
○	○	○	●	NSK-69	Subtracting with Pictures	Q-15
○	○	○	○	NSK-70	Subtraction Expressions	Q-18
○	○	○	○	NSK-71	Subtracting	Q-21
○	○	○	○	NSK-72	Writing Subtractions (Advanced)	Q-25
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Generic Blackline Masters

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Welcome to JUMP Math and Your Kindergarten Teacher Resource

JUMP Math is ...

JUMP Math is an award-winning charitable organization dedicated to helping people lead more fulfilled lives. JUMP Math's research-informed materials and professional development replace math anxiety with an understanding and a love of math in students and educators.

JUMP Math Features

The following are the features of JUMP Math:

- Confidence building
- Structured inquiry
- Guided practice
- Scaffolded instruction
- Continuous assessment
- Differentiation
- Mental math

Confidence building

JUMP Math recognizes that math anxiety is a significant barrier to learning for many students. The research in cognition that shows the brain can be altered by education also shows that the brain can't register the effects of education if it is not attentive. However, a student's brain can't be truly attentive unless the student is confident and excited and believes that there is a point in being engaged in the work. The JUMP Math approach reduces math anxiety by building on success in small steps. When students who are struggling become convinced that they cannot keep up with the rest of the class, their brains begin to work less efficiently, as they are never attentive enough to fully consolidate new skills or develop new neural pathways. That is why it is so important to give students the skills they need to take part in lessons and to give them opportunities to show off by answering questions in front of their classmates.

Structured inquiry

Structured inquiry is a balanced instructional approach that incorporates explicit instruction combined with guided and independent practice. In JUMP Math lessons, students are expected to derive concepts and solve problems themselves, but the teacher provides enough rigorous guidance to make sure this happens with all students and not just the advanced few. Students are led to deep conceptual understanding and computational fluency.

Guided practice

In guided practice, teachers offer students purposeful practice that immediately follows the teaching of a skill or scaffolded step of a concept. This guided practice allows the teacher to continuously assess and confirm students' understanding and mastery.

Scaffolded instruction

Scaffolded instruction is an effective instructional practice where new ideas and skills are reviewed and introduced in smaller incremental steps directly linked to and built upon earlier learning. Each lesson offers a series of carefully considered explorations in which each new concept follows from the last. Students are more likely to make discoveries if the progression of ideas makes sense to them and does not overwhelm them.

Continuous assessment

The progression of learning contained in each JUMP Math lesson enables active and ongoing assessment, often referred to as “continuous assessment.” Through observation, questioning, and interaction with students as they work, teachers are readily able to check for understanding, identify and correct misunderstandings, and differentiate instruction with timely interventions. Continuous assessment often provides a more accurate and complete picture of a student’s ability and has a positive impact on learning.

Differentiation

JUMP Math recognizes that classrooms are diverse in their makeup and needs, and that students range in their levels of focus, concentration, engagement, processing speed, and readiness to explore and demonstrate learning. In order to support this diversity, JUMP Math lessons and supporting resources provide multiple approaches to exploring, practicing, and assessing skills. Teachers can differentiate the development of skills without differentiating the outcomes of their students by teaching lessons in short instructional pieces and asking scaffold questions, assigning hands-on activities in class and at activity centres, and providing extension questions. In JUMP Math, mastery is the goal of each lesson and all students are supported to reach that goal.

Mental math

Mental math is a mathematical framework that includes number sense, computational fluency, and the application of number concepts through purposeful and varied practice, not just rote memorization. In JUMP Math, mental math is explored through regular practice.

JUMP Math Classroom Materials

JUMP Math has developed a variety of materials to help you teach math. In this section, we will describe the following components and features of the JUMP Math classroom materials:

- Teacher Resource table of contents
- Mental math
- Getting Ready for Kindergarten Math
- Unit introductions
- Lesson plans
- Digital lesson slides
- Blackline Masters (BLMs)
- Assessment & Practice Books
- Assessment tools
- Curriculum correlations

Teacher Resource Table of Contents

The table of contents for the Teacher Resource contains information on where to find each component, as well as details on the provincial curriculum requirement for each lesson. The lessons are flagged as required, recommended, or optional for each province. Lessons labelled as required are necessary to cover the curriculum. Lessons labelled as recommended contain material that is used in future lessons. Lessons labelled as optional cover material that is not required by the curriculum or in future lessons.

Mental Math

Mental math is a mathematical framework that includes number sense, computational fluency, and the application of number concepts through purposeful and varied practice, not just rote memorization. Essential mental math concepts, skills, and assessments that can be used throughout the year are presented in this section (see p. A-23).

Getting Ready for Kindergarten Math

The first unit in the Kindergarten Teacher Resource is a collection of lessons focused around mathematical games and activities. Patterns, basic sorting, and pre-writing skills are taught through the use of stories and games. Students will also begin to learn classroom techniques used in JUMP Math lessons, such as signalling and turn taking. These can be used for 2–3 weeks at the beginning of the year to ease students into math class and to help bring all students to a common level of comfort with pre-Kindergarten math. Throughout the year, the activities in this unit can be used to build and reinforce necessary skills.

Unit Introductions

Each unit begins with an introduction that is designed to serve as a planning support. The unit introductions include some or all of the following:

- Overview of the topics covered in the unit
- Specifications on meeting your curriculum
- Notes on materials and vocabulary used in the lessons, where applicable
- Descriptions of activities that are used frequently in the unit

[illegible]

Lesson Plans

The JUMP Math lesson plans guide teachers through a progression of foundational skill and concept development providing varied opportunities to guide student exploration, practice, and learning. The lesson plans give clear explanations and explicit guidance on how to introduce one concept at a time, explore concepts and make connections between them, assess students quickly, enhance learning with interactive activities, and challenge students with bonus questions. Problem-solving skills are developed progressively throughout the lesson with a series of probing questions and enriched discussions. The lesson plans are designed to be used in conjunction with Blackline Masters, digital lesson slides, and corresponding pages in the Assessment & Practice Books.

Pages in the Assessment & Practice Book related to this lesson.

Indication if the lesson is required, recommended, or optional to cover your provincial curriculum.

New vocabulary terms appear in bold in the vocabulary list and in italics when defined in the lesson plans.

Suggestions for practising mental math

Grade

Lesson number

PA = Patterns and Algebra
NS = Number Sense
ME = Measurement
G = Geometry
PDM = Probability and Data Management

NSK-45

Pages 32–33

Decomposing 5

Lesson title

CURRICULUM REQUIREMENT
AB: required
BC: required
MB: required
ON: required

VOCABULARY
all
five-frame
more
plus

Goals

Students will decompose 5 in a variety of ways, using objects and pictures, and use those decompositions to answer questions about ways to share or partition five things.

PRIOR KNOWLEDGE REQUIRED

Can count to 5

MATERIALS

7 enlarged paper frogs from **BLM Animal Cards (1)** (p. S-18)
red and yellow chalk or markers
BLM Game Cards (p. S-12)
2 pencil crayons per student
BLM Five-Frames (p. L-48) or five-frames made from egg cartons
5 two-sided counters, 5 dried beans painted on one side, or 5 of each of two colours of blocks per student
paper cups (see Activity Centre 1)
BLM Making 5 (p. S-14, see Activity Centres 1–3, Extensions 1, 2)
5 plastic bowling pins or empty plastic water bottles and a soft ball per student or student pair (see Activity Centre 2)

Counting practice. Practise counting to 80. Count on and back within 5. Say the numbers 1 to 5 in random order and for each number ASK: What is the next number?

Introduce five-frames. Draw on the board:

Point to the picture and SAY: This is a *five-frame*. It has five boxes. Count (or have a volunteer count) the boxes. SAY: The frame helps us to count quickly. If there is one thing in each box, then there must be five things in all.

ASK: Where else do we see the number 5? Where do we have five on our body? (fingers on one hand, toes on one foot) SAY: We can use five fingers on our hand to help us think about the number 5.

Affix five paper frogs to the board, one in each box of the five-frame.

ASK: How many frogs are there? (5) SAY: Since there are five boxes and there is one frog in each box, there must be five frogs. Remove all the frogs, then put back only three; one per box, from left to right. ASK: Are there five frogs now? (no) How can you tell by looking at the five-frame that we do not have five frogs yet? (some boxes are empty) Add four more frogs by putting two frogs in each of the empty boxes. SAY: None of the boxes are empty. ASK: Are there five frogs now? (no) Why not? (some boxes have more than 1 frog) SAY: When there is exactly one frog in each box, I know that I have five frogs.

Number Sense K-45

L-13

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The main idea or concept behind each part of the lesson is in bold at the beginning of a paragraph.

Specific prompts provide suggested wording

Many lessons include activities.

Activity centre types can include pairs, individual, or groups, and active or imaginative.

Separating 4 into groups. Draw on the board:




ASK: How many circles did I draw? (4) Draw a line to show 3 and 1.
ASK: What parts does this picture show? (3 and 1) **Write "4 is 3 and 1"** below the picture.

Redraw the picture without the dividing line, and write "4 is 2 plus 2" below the picture. Have a volunteer draw the line to show the decomposition. Repeat for 4 is 0 and 4.

ACTIVITY

Addition dominoes. In advance, make cards using **BLM Game Cards**. On the left side, show a picture of three, four, or five circles in a frame, with a line separating them into two groups. On the right side, write an addition equation. Make sure that the right side of each card can be matched to the left side of another card and vice versa. Example:



4 is
2 and 2

Player 1 places a card and reads the two representations of equations. For the card shown, the player would say, "I have 4 is 3 and 1 and 4 is 2 and 2." The player whose card matches the equation on the right side then places his or her card to make a chain. Demonstrate how to play the game before breaking the class into small groups. Each player plays once.

Activity Centres

- Five Counters** (see unit introduction, p. L-2)
Variation: Give each student four two-sided counters (or dried beans painted on one side), a paper cup, and **BLM Making a Number** (with the answer, 4, filled in by you for each addition).
- Bowling**
Type: Individual or pairs, active
Objective: To write the decompositions modelled by four bowling pins (some upright, some knocked over)
Preparation: Set up a bowling lane using four plastic pins or empty plastic water bottles per student or per student pair. Provide a soft ball and **BLM Making a Number**. Since students might knock over either all or none of the pins, make sure students understand that "0 and 4" and "4 and 0" are 4 before they do the activity.
Instructions: Set up four pins. Have students roll the ball once and then use the **BLM** (with the answer, 4, filled in by you for each addition) to

Number Sense K-44

L-11

Sample answers are provided in brackets.

Activities for centre time are provided.

Any advance preparation is described.

Goals of activity centres are clearly stated.

Explanation or instructions are given.

3. Practise for Fluency
Type: Pairs
Objective: To develop fluency in composing 5
Preparation: In advance, gather dominoes with dots that add to 5 or less, or prepare dominoes from **BLM Dominoes (1)**.
Instructions: Players place the dominoes face down between them. Player 1 turns over a domino and says how many in all. If Player 2 agrees with the answer, the domino stays face up. Otherwise, Player 1 turns it face down again. Players switch roles. Play continues until all the dominoes are facing up.

4. Colouring Dots for Decomposition
Type: Individual
Objective: To create and record a die pattern that shows decomposition
Preparation: Give each student two colours of pencil crayons, crayons, or markers, and cards cut from **BLM Colouring Dots**.
Instructions: For each card, students colour up to five dots in two colours and then write the decomposition.
Bonus: ~~Students use three colours. In advance, add a third blank and a plus sign to each equation template, or have students do so.~~

Extensions
1. Give each student or student pair two dice. If playing in pairs, students take turns rolling the dice, ordering the dice so that they start with the higher roll first and then counting on using the second die to find the total. For example, if they roll 6 and 4, students point to the die with 6 and say “6” and then continue counting as they point once to each dot on the die with 4 and say “7, 8, 9, 10.”
2. Repeat Activity Centres 1 and 2 using any number of counters up to 12.
3. Repeat Activity Centre 3 using dominoes with dots that add to 9 or less, or prepare dominoes from **BLM Dominoes (1) to (2)**.

Number Sense K-46

L-19




Bonus material is often provided.

Extension questions appear at the end of the lesson plan.

Digital Lesson Slides

Digital lesson slides guide teachers to follow the progression of skill development within a lesson. They are not intended as stand-alone tools or lessons, but are to be used in tandem with the lesson plans. The slides include diagrams, sample problems, practice exercises, bonus questions, and extensions.

Have volunteers match each line to the correct phrase.


	longest
	in between
	shortest


Which is correct?


2 5


Exercises:

Is the shape a **circle**?

a) 

b) 

c) 

d) 

Blackline Masters (BLMs) are reproducible pages that are lesson-specific or used repeatedly throughout the unit and are designed to supplement instruction in the lesson. BLMs can be used to, for example, provide practice that is integral to the lesson, provide additional practice for students who require it, or serve as templates or manipulatives that can be used during the lesson.

NAME _____ DATE _____

Finding the Mistakes (4)

☐ Colour ☒ for correct. Colour ☐ for not correct.

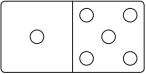
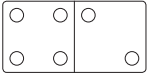
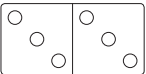
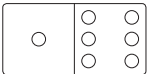
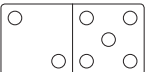
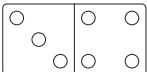
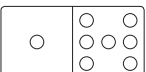
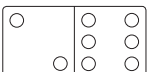
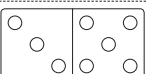
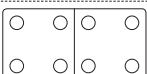
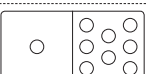
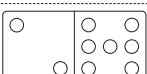
<p>19.</p>	<p>20.</p>
<p>21.</p>	<p>22.</p>
<p>23.</p>	<p>24.</p>

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NAME _____ DATE _____

Dominoes (2)

38

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Assessment & Practice Books

These consumable books dovetail seamlessly with the lesson plans. Tear-away pages give teachers the flexibility to choose some or all of the pages for students to work on, either inserted in plastic sheet protectors for use in activity centres, or as individually assigned seat or home work. Students work directly on the pages to consolidate the skills and concepts explored during the lesson, while teachers assess student understanding. For full curriculum coverage, use both Part 1 and Part 2 of the Assessment & Practice Books.

PA = Patterns and Algebra
NS = Number Sense
ME = Measurement
G = Geometry
PDM = Probability and Data Management

Grade
Lesson number
Lesson title

NSK-45 Decomposing 5

☐ How did we make 5?

1. 3 and 2

2. and

3. plus

4. BONUS plus

☐ Colour to show making 5.

5. 2 plus 3

6. 3 plus 2

7. 1 plus 4

8. 4 plus 1

Partial or complete answers are often provided.

Bonus questions are often provided.

Grey boxes show complete answers.

32 Number Sense K-45

Strand, grade, and lesson number

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Students can use checkboxes to keep track of completed tasks.

- ☐ Colour to show one way to make 5.
☐ Write how you made 5.

9.

--	--	--	--	--

5 is _____ plus _____

The boxes around each problem create clear separation of questions.

10.

--	--	--	--	--

5 is _____ plus _____

11.

--	--	--	--	--

5 is _____ plus _____

Interlined spaces are provided for most answers.

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Assessment Tools

JUMP Math provides checklists for progressive assessment. We provide one checklist per unit grouped into topics covering, on average, four lessons. Key “look fors” with suggested opportunities for assessment are listed.

The assessment checklists are available in print and online at www.jumpmath.org as PDFs that can be filled out electronically.

Unit 7: Measurement

Assessment Checklist

AC: Activity Centre
AP: Assessment & Practice Book
✓ Check when student has demonstrated associated skill.

● Required
○ Recommended
○ Optional

Student Name: _____

Comparing Size

Look For

In Lesson

Date Assessed

MEK-2: AC 1, 2, or 3

Decides which of two containers holds more and which holds less by direct comparison.

● AB ● BC ● MB ● ON

Decides which of two people or objects are “taller” or “shorter”.

MEK-4: AC 1 or 2

● AB ● BC ● MB ● ON

Compares the lengths of two objects and describes them as “longer,” “shorter,” or “same length.”

MEK-5: AC 1

● AB ● BC ● MB ● ON

Summative: MEK-7: AC 3

Notes:

Measuring

Look For

In Lesson

Date Assessed

MEK-3: AC 1

Measures and compares objects using non-standard units.

Capacity

Length

MEK-6: Activity or AC 1

○ AB ○ BC ○ MB ○ ON

Summative: n/a

Notes:

Assessment Checklists for Kindergarten

T-1

Curriculum Correlations

Curriculum correlations are documents that show, for each region and grade level, how JUMP Math lessons are aligned to curriculum learning outcomes in Alberta, British Columbia, Manitoba, and Ontario.

Kindergarten JUMP Math Correlation to the Ontario Curriculum

NOTES:
JUMP Math strands are represented by:
NS Number Sense
ME Measurement
G Geometry
PA Patterns and Algebra
PDM Probability and Data Management

OE15			
General Outcome			
demonstrate an understanding of numbers, using concrete materials to explore and investigate counting, quantity and number relationships			
Specific Expectations	JUMP Math Lessons		
15.1 investigate (e.g., using a number line, a hundreds chart, a board game with numbered squares) the idea that a number's position in the counting sequence determines its magnitude (e.g., the quantity is greater when counting forward and less when counting backward)	Part	Unit	Lessons
	1	6	NSK-40, 41
15.2 investigate some concepts of quantity and equality through identifying and comparing sets with more, fewer, or the same number of objects (e.g., find out which of two cups contains more or fewer beans [i.e., the concept of one-to-one correspondence]; investigate the ideas of more, less, or the same, using concrete materials such as counters or five and ten frames; recognize that the last number counted represents the number of objects in the set [i.e., the concept of cardinality])	Part	Unit	Lessons
	1	1	NSK-5, 6, 8, 11
15.3 make use of one-to-one correspondence in counting objects and matching groups of objects	Part	Unit	Lessons
	1	2	NSK-17 to 21, 24
	Part	Unit	Lessons
	1	6	NSK-26, 29, 32, 35
	Part	Unit	Lessons
	1	6	NSK-37 to 41

JUMP Math Correlation to the Ontario Curriculum — Kindergarten

X-1

Teaching with JUMP Math

Professional Development

JUMP Math provides a variety of engaging on-site and online professional learning (PD) opportunities throughout the year. Each PD session is designed to enhance and support instructional practices, leading to improved success for students. Learn from our team of experienced educators who work closely with K–8 classroom teachers, principals, administrators, and parents to use research-informed instruction, practice, and assessment methods.

You can learn more about our professional learning opportunities on the Professional Development section at www.jumpmath.org, or by getting in touch (see the Contact Us section).

Teaching Order

Half-day programs

For provinces where Kindergarten is a half-day program, the required and recommended lessons can be completed by doing three per week, most weeks. We suggest using extensions or activity centres as whole-class activities on the remaining days.

Two-year programs

The easiest way to use JUMP Math’s Kindergarten resource as a two-year program is to cover Part 1 in the first year and Part 2 in the second year. This requires teaching a new lesson every other day (slightly more often in the first year). We suggest using extensions or activity centres as whole-class activities on the remaining days. Another possibility is to teach all of the Kindergarten concepts using the numbers 1 to 5 in the first year and to extend those concepts to the numbers 0 to 10 in the second year. In this scenario, in their first year students would use Getting Ready for Kindergarten Math, Units 1 to 4, and Units 8 and 13. In their second year, students would use Units 5 to 7, Units 10 to 12, and Unit 14.

Split classes

Since student knowledge builds quickly in Kindergarten, it can be difficult to teach to different grade levels simultaneously. However, it can be made easier when students work in the same areas at different levels. This can be accomplished using either approach to a two-year program described above. For example, if Junior Kindergarten students use Part 1 and Senior Kindergarten students use Part 2, all students can work in related strands, as shown below:

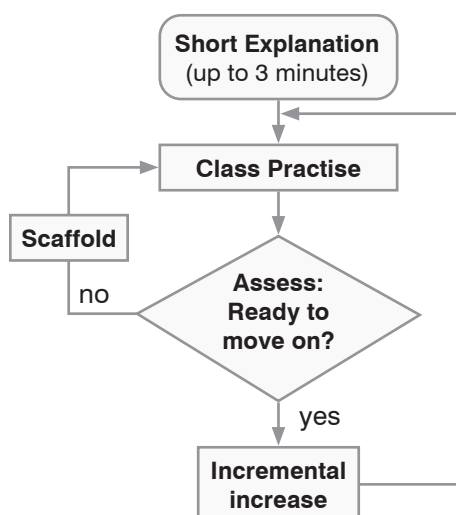
Units in Kindergarten Part 1	Number of Lessons		Units in Kindergarten Part 2
Getting Ready for Kindergarten Math: Songs, Stories, and Games	13	10	7. Measurement: Comparing and Measuring
1. Number Sense: Numbers 1 to 5	14	12	8. Number Sense: Addition within 5
2. Number Sense: Comparing Numbers 1 to 5	10	12	9. Number Sense: Addition within 10
3. Geometry: Flat Shapes	15	7	10. Probability and Data Management: Sorting and Graphs
		7	11. Geometry: Solid Shapes
4. Patterns and Algebra: Patterns and Ordinal Numbers	6	5	12. Patterns and Algebra: Patterns and Probability
5. Number Sense: Numbers 6 to 10	11	9	13. Number Sense: Subtraction within 5
6. Number Sense: Comparing within 10	6	8	14. Number Sense: Subtraction within 10

For example, when Junior Kindergarten students are learning to count and compare numbers to 5 (Units 1 and 2), Senior Kindergarten students are adding within 5 and then within 10 (Units 8 and 9). All students are working on their number sense skills. If possible, we recommend that teachers use alternate days to introduce new material to the two sections within the class.

Lesson Structure

JUMP Math lessons are designed to keep the class engaged and moving through the material together. A typical lesson begins with a brief review of relevant previous material. This recalls knowledge that will be needed in the current lesson and starts students on a comfortable footing.

The body of the lesson is taught in manageable pieces, with frequent opportunities for student participation and assessment. The bold in-line descriptive subheadings in the lesson plans outline the content and flow of the lesson. Within these sections, you will teach explicitly only for brief periods before you ask a question or assign a challenge that students can explore. These challenges are taken up and discussed immediately, with the expectation that all (or virtually all) students will understand and master the material before moving on. The lesson continues with an incremental increase in difficulty and another short explanation.



Kindergarten lessons also include a selection of activity centres, which can be used as part of a whole-class lesson or during a designated activity time.

After you teach a lesson, or a significant portion of a lesson, students work more independently on a more significant task, usually an activity or activity centre or on corresponding pages in the Assessment & Practice Book. As they work, you can circulate around the class and help students who need assistance. When students complete this summative task, they can work on some of the extensions that are included at the end of most lesson plans.

Instructional Strategies

Classroom Environment

Here are some effective techniques to keep students of all ability levels engaged in the classroom.

Build confidence and excitement about math.

Engaging the entire class in lessons is not simply a matter of fairness; it is also a matter of efficiency. While the idea may seem counterintuitive, you will enable stronger students to go further by helping students who struggle. You can create a real sense of excitement about math in the classroom simply by convincing struggling students that they can do well in the subject. The class will cover far more material in the year, and students who excel will no longer have to hide their love of math for fear of appearing strange or different.

Use daily routines.

Establish predictable routines that support deliberate practice of math fluency. For example, incorporate exercises from the counting practice section of the lesson and time for activity centres into your daily schedule.

Working in pairs or groups.

Promote communication by encouraging students to work in pairs or in small groups. Support students to organize and justify their thinking by demonstrating how to use mathematical terminology, symbols, models, and manipulatives as they discuss and share their ideas. Student groupings should be random and vary throughout the week.

Allow students enough time to think.

Discuss one or two skills or concepts at a time with the whole class, allowing students to develop ideas by themselves, but giving hints and guidance when necessary (the lesson plans show you how to do this). Ask questions in several different ways and allow students time to think and share their solutions with a partner before you solicit an answer. After presenting a particular concept, do not go on until all students are assessed and show a readiness to move ahead.

Use bonus questions.

When students have mastered a skill or concept, raise the bar slightly by challenging them to answer a question that is only incrementally more difficult or complex than the questions previously assigned. Be ready to write bonus questions on the board from time to time during the lesson for students who finish their tasks early. Bonus questions are included in most of the lesson plans. While students who finish quickly are occupied with these questions, circulate around the class doing spot checks of the work of students who are struggling. The bonus questions you create should generally be simple extensions of the material. (See “How to Create Bonus Questions” on p. A-19).

Use extension questions.

Extension questions should be used to keep students who work quickly engaged in the content of the lesson; they can also be assigned as a group exploration activity. Extension questions don't often introduce any skills or concepts that aren't taught in the lesson, so students who complete their work quickly should be able to work on these questions independently. Placing students into random groupings allows them to work together to find solutions to more challenging problems. Students can submit work for assessment either as a group or individually.

Support independent work.

Take the time to show students how to develop independent work habits during a lesson and while working on their own. The length of time required for this will vary depending upon age, attention, and maturity levels, so be prepared to model and demonstrate these skills over the course of several days or weeks, as needed.

During a lesson. Explain and demonstrate effective use of whiteboards and signalling as a practice tool throughout the learning process. Have students use interlined paper to support early writing skills.

Following a lesson. Guide students to navigate the corresponding pages in the Assessment & Practice Books by showing them where to find and how to use worked-out examples and bonus questions.

Teacher Explanations

Explain and demonstrate the work that you expect your students to do. If a student doesn't understand an explanation, select one to three students to rephrase or reword explanations. Sometimes lessons go too fast for a student or component concepts are inadvertently skipped. It is always possible to make an increment smaller. Taking time to reflect on what worked and didn't work in a lesson can help you reach even students who are having the most difficulty. When students are struggling, always ask, "How could I have improved the lesson?"

Continuous Assessment

The progression of learning contained in each JUMP Math lesson enables active and ongoing assessment, often referred to as "continuous assessment." Through observation, questioning, and interaction with students as they work, you are readily able to check for understanding, identify and correct misunderstandings, and differentiate instruction with timely interventions. Continuous assessment often provides a more accurate and complete picture of a student's ability and has a positive impact on learning. Here are some strategies for immediate assessment.

Signalling. When a problem has a simple answer, such as one word, a short phrase, or even a sign (such as $+$ or $-$), ask students to signal their answer with, for example, a thumbs up for yes or a thumbs down for no. Signalling is also useful when you have multiple-choice questions: number the answers and have students hold up the number of fingers corresponding to the answer they think is correct.

Signalling is most effective when students signal their answers at the same time. Give students adequate thinking time, and then have them show their answer on the count of three. Make sure students are familiar with this structure before using it in content-learning situations. Have students practise signalling the answers at the same time beforehand.

Individual whiteboards. Provide students with individual whiteboards to use throughout the lesson as they work through challenge tasks. Similar to the strategy of signalling, have students hold up their boards together on the count of three.

Using JUMP Math Components Together

Planning to Teach

Read each lesson from beginning to end, paying attention to the progression of learning that starts with the review of prior knowledge and ends with the extension questions. Following the initial reading, go back through the lesson and:

1. Review the suggested counting practice at the beginning of the lesson and decide which skill you will introduce, practise, and assess prior to teaching the lesson. It is most effective to concentrate on one skill per day.
2. Link the layers of skill development in the print lesson to the corresponding digital lesson slides. Decide which slides you will use, which slides you will modify or add, and how you will use the slides to support your teaching and student practice.
3. Re-read the lesson and consider how you may need to modify or adapt the lesson to meet the needs of your students.

Consider the following:

- Do my students have the prerequisite skills?
- How much review will I need?
- What materials, including Blackline Masters, will I need to gather and/or copy?

Decide in advance:

- Which prompts, activities, activity centres, and extensions will I use? Which students will be assigned to which activity centres?
 - Will I need to create more bonus questions?
 - What is the most effective means of organizing my students for learning, discussion, and practice?
 - How will I assess?
 - What questions will I have ready for struggling students?
 - Which questions will I have ready for students who grasp the concepts quickly?
4. Preview the corresponding pages in the Assessment & Practice Books. You may wish to use some of the exercises as models for practice during the lesson, or you may want to determine how many of the exercises you will assign to students.

Use of Activity Centres

Activity centres are designed to reinforce the goals of the lesson in different ways for students with different learning styles. They can be used as small-group or whole-class activities. They will usually require some direct teaching when they are first introduced. No new concepts are introduced in the activity centres, only new contexts. Students who complete an activity quickly can proceed to a bonus version.

We have provided a variety of activity centre choices in each lesson. Since these will usually require some direct teaching, we recommend that you use only one or two at the beginning of the year. Many activity centres are repeated across lessons with only small variations so that you can gradually increase the number of centres used with minimal additional teaching. Choose the activity centres that you feel best reinforce the lesson or that your students would most enjoy. We also recommend always having an active activity centre ready for restless students—most lessons include active or imaginative activity centre options.

Use of the Assessment & Practice Books

The Assessment & Practice Books are designed to be used in tandem with the lesson plans. Before assigning questions from the Assessment & Practice Books, it is important to verify that all students are prepared to answer the questions without your help (or with minimal help). Never allow students to work ahead in the Assessment & Practice Books on material you haven't covered with the class. When students finish the assigned pages from the Assessment & Practice Books, they should be assigned bonus questions (see "How to Create Bonus Questions" on p. A-19) or they can start working on the extension questions. Write the bonus questions on the board or have extra pages prepared and ask students to answer the questions in their notebooks. While students are working independently on the bonus questions, you can spend extra time with anyone who needs help.

Use of the Assessment Tools

The most effective assessment strategy is one where student learning is verified throughout their learning process, and not simply at the end of a unit. We recommend using the activities suggested in the assessment checklists to observe and assess student performance every two to four lessons to ensure students are working toward mastery of the skills explored in those lessons. Information gleaned from close observation will help you catch and correct misunderstandings through review or re-teaching. At the end of each unit, use one of the suggested summative activities to assess the depth and consolidation of all of the skills covered in the unit.

How to Create Bonus Questions

You can make math lessons more exciting (and also make time to check the work of students who need extra time) if you know how to create engaging bonus questions. Bonus questions generally shouldn't be based on new concepts and they don't have to be extremely difficult to capture the attention of students. Students are more likely to consolidate their understanding and commit material to memory when they are attentive and engaged in appropriately challenging work.

Before You Create Bonus Questions

- Bonus questions shouldn't look tedious; avoid giving students an endless series of calculations that appear to have no purpose.
- Assign only a few questions at a time.
- It helps if you are excited when you assign bonus questions; students should feel like they are involved in a quest, faced with increasingly difficult challenges that they believe they can meet.
- Students can make conceptual gains even when the bonus questions vary the task only slightly, such as involving larger numbers or more terms or elements.
- Generalizing from smaller to larger numbers will help all students develop the ability to hold more material in their working memory, follow a series of steps in a procedure, stay on task, and see patterns and apply rules in increasingly complex situations.
- Be careful not to introduce any new skills or concepts in bonus questions.

Creating Bonus Questions

Here are some strategies you can use to create questions that will look hard enough to interest students who work quickly, but that all students can aspire to answer.

Make the numbers in a problem larger.

The simplest way to create bonus questions without introducing any new concepts is to make the numbers in a problem larger or to introduce extra terms. Students of all ages love showing off with larger numbers or with more challenging-looking rules and procedures. You can use this strategy in almost any lesson. For example, when sorting, sort more objects into more categories. In addition or subtraction, use larger totals or do repeated additions, repeated subtractions, or a combination of both.

Make a mistake and ask students to correct it.

Students love correcting a teacher's mistakes, and you can find a way to make mistakes in any lesson. For instance, if you are teaching adding 1, write on the board:

$$4 + 1 = 5$$

$$2 + 1 = 4$$

$$3 + 1 = 4$$

$$1 + 1 = 2$$

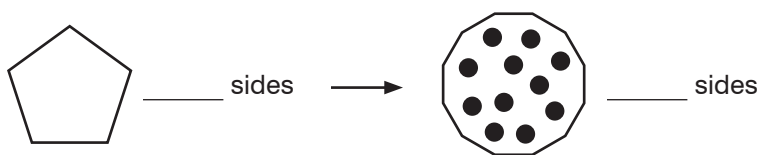
Tell students that you think you have made a mistake. Ask them to find the mistake and explain where you went wrong.

Increase the complexity of presentation.

When counting or matching, move objects farther apart or arrange them less neatly. In geometry lessons, combine several distractors, such as position, pattern, background, or number of sides, to hide shapes. In the higher grades, add distractors to word problems.

Example

Count the number of sides.



Partially complete a problem and ask students to say what is missing.

When matching to compare quantity, omit a matching line. When finding triangles, skip a few. When finding pairs that add to 5 or 10, create a list that is missing one addition. When teaching the counting sequence by 1s, 2s, 5s, or 10s, write the first ten numbers in a ten-frame but omit some numbers. In the higher grades, omit a step when solving an equation and have students fill it in.

Example

Fill in the missing numbers.

2	4		8	10
12		16	18	

Use more elements.

When sorting, sort more objects into more categories. Add three or more numbers instead of only two numbers. Create longer expressions, with more parentheses, to be evaluated.

Example

Evaluate.

$$15 + (7 \times 3 - 1) \longrightarrow (3 \times 5 - 7) \times 5 \div (16 - 6)$$

Make differences more subtle.

When the task is noticing differences, such as comparing numbers or distinguishing circles from non-circles, make the differences more subtle. For example, when comparing fractions with the same denominator, use numerators that vary by a single digit. Draw graphs on smaller grids or place points not on grid lines so that students have to pay attention to detail.

Example

Which is greater?

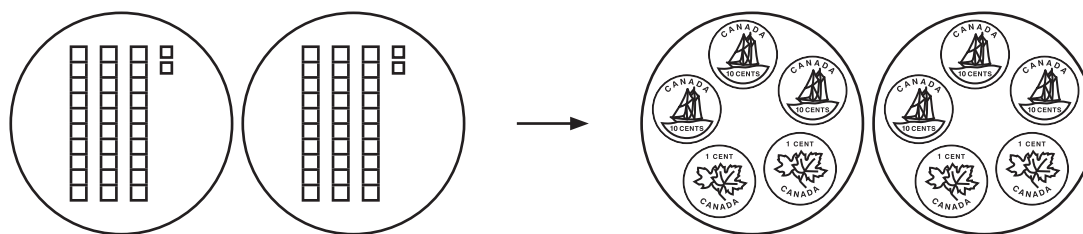
$$\frac{8}{11} \text{ or } \frac{9}{11} \longrightarrow \frac{54\ 645}{4\ 567\ 341} \text{ or } \frac{54\ 154}{4\ 567\ 341}$$

Vary the presentation of the problem.

Since students often under-generalize concepts, using different materials to present the same problem can seem like an entirely new problem. For example, you can use different shapes in models. Ask students to use triangles or squares instead of dots when drawing a model for a word problem, or have students identify fractions of a star instead of a circle. Division can be modelled with money instead of tens blocks. Represent the same repeated pattern with numbers, letters, colours, and shapes. When working with fractions or decimals, present a problem using money. Write rates in unconventional ways, such as hours/mile, or reverse the axes on graphs.

Example

Model $2 \overline{)64}$.



Look for applications of the concept.

Lessons generally begin from a concrete representation of a concept and move towards abstract ideas. Once students have been taught an abstract idea, reapplying it can be an added challenge. For example, once students have mastered comparing numbers, present problems such as, “Thirty-seven students are going on a school trip. The bus has forty-five seats. Are there enough seats for everyone?” For another example, students could identify applications of the Pythagorean Theorem in word problems.

Example

When teaching fractions of whole numbers, ASK: How many months are in ...

- a) $\frac{1}{2}$ a year? b) $\frac{2}{3}$ of a year? c) $1\frac{1}{2}$ years?

JUMP Math Website: www.jumpmath.org

For more information about, or support in using your new resource, please contact your regional Manager of Outreach & Teacher Support. You can find contact information by region on our website in the About Us section, along with information on:

- Research
- Professional learning (PD)
- K–8 classroom materials
- Videos
- Online store materials (e.g., digital lesson slides)

Mental Math

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What is Mental Math?

Mental math develops an internalized mathematical framework that includes number representations, number sense, computational fluency, and the application of concepts. To solve problems, learners must be able to see patterns in numbers (and what violates patterns) and make appropriate estimates and predictions. Consistent, intentional encounters with mental math, without the use of pencil and paper, allows learners to become familiar with the ways in which numbers interact. Students work with numbers using only their minds and (sometimes) their fingers. All of the exercises are first taught during the regular lesson so that students understand what they are doing and why it works.

Learning to Count

Learners must learn to recite the count sequence before they can do almost any other mathematics. JUMP Math's Kindergarten materials support learning the count sequence fluently and progressively throughout the year.

Counting to 100

In Unit 1, learners recite the numbers from 1 to 10; in Unit 2, they learn to recite the numbers from 11 to 20; and so on, until they reach 100 in Unit 10. After the number 20, when counting in English becomes more predictable, many students will find these lessons a confidence-boosting, easy break. You may wish to take advantage of these counting lessons to have students repeat activities from earlier units that would benefit them.

Counting practice

In addition to the progressive counting lessons that begin each unit, every lesson begins with a daily counting practice. The emphasis is always on the new numbers from the introductory lesson of that unit, but will also include anything of particular importance to the day's lesson, such as comparing or adding within 5.

More in-depth counting, such as associating number to quantity, is explicitly taught in the Number Sense units.

Counting Fluency

In developing a sense of numeracy, most students will learn to say the counting sequence in order, but without assigning meaning. Next, they acquire an understanding of one-to-one correspondence (one number for each object being counted). The third step is an understanding of cardinality (the last number said is the number of objects in the group and is independent of the order in which the objects are counted). Once this understanding is solidified, learners can be encouraged to subitize (identify without counting) and name quantities. Furthermore, students can begin to compare quantities and numbers.

Our materials support this process. We proceed in the order described first within 5, then within 10. Students who learn in an atypical fashion will have ample opportunity to revisit concepts when they are ready to assimilate them. The counting fluency checklist that follows (see p. A-25) lists the required skills in the order in which they are usually acquired. When assessing student progress, keep in mind that some students will learn differently.

*Most students will begin to acquire **Skills 1–3** in Unit 1 and should have mastered them by the end of Unit 5. **Skill 3** is taught explicitly in Unit 8 but will be acquired much earlier by most students.*

Skill 1: Saying the count sequence to 10

Skill 2: Naming numerals to 5

Skill 3: Subitizing 1 to 5 objects

*Students are ready to practise **Skills 4–5** after Unit 5.*

Skill 4: Naming numerals 1 to 10

Skill 5: Saying the count sequence backwards from 10 (optional)

*Students are ready to practise **Skill 6** after Unit 10.*

Skill 6: Saying the count sequence to 100 (optional)

Counting Fluency Checklist

[illegible]

Comparing and Composing

One of the greatest gifts you can give students is to expose them to number facts. Learners can begin to mentally add and subtract numbers in a short time if they are offered daily practice in a few basic skills. Beginning with fluent counting, these skills then progress to number comparison and early addition and subtraction skills, such as composing and decomposing, and operations within 5. The comparing and composing checklist that follows (see p. A-27) lists some of the required skills in the order in which they are taught in our materials. Again, when assessing student progress, keep in mind that some students will learn differently.

*Students are ready to practise **Skill 1** after Unit 2.*

Skill 1: Comparing numbers 1 to 5

*Students are ready to practise **Skill 2** after Unit 6.*

Skill 2: Comparing numbers 1 to 10

*Students are ready to practise **Skills 3–4** after Unit 8.*

Skill 3: Saying the number that comes next

Skill 4: Saying the next two numbers

*Students are ready to practise **Skills 5–6** after Unit 13.*

Skill 5: Saying the number that comes before

Skill 6: Saying the two previous numbers

Comparing and Composing Checklist

[illegible]

Games

Modified Go Fish

Purpose

If students know the pairs of one-digit numbers that add up to particular target numbers, they will be able to mentally break sums into easier sums. Kindergarten students should learn pairs to 5 and to 10.

Example: Since it is easy to add any one-digit number to 10, you can add a sum more readily if you can decompose the sum so that it includes pairs of numbers that add to 10.

$$7 + 5 = \underbrace{7 + 3}_{\text{These numbers add to 10.}} + 2 = 10 + 2 = 12$$

To help students remember pairs of numbers that add to a given target number, we have developed a cooperative version of Go Fish as well as a competitive version. We recommend that students play the cooperative version with each other in groups of 2–4. If you choose to use the competitive version, we recommend having a caring adult play with each individual student. The adult can build the student’s confidence by allowing the student to win as many times as the adult feels is necessary. We do not recommend that students play the competitive version with each other.

The Cooperative Game

Object of the Game: To make and lay down pairs of cards that add to 5

Materials: Four sets of cards numbered 1 to 4

The player to the left of the dealer starts the game. To decide the first dealer, pick a student at random.

The dealer gives each player 3 cards and puts the remaining cards face down into a draw pile. If players have any pairs of cards that add to 5 (e.g., one and four, two and three), they place these pairs on the table before play begins. If any player is left with no cards at this point, that player takes a card from the pile.

Player 1 selects one of the cards in her hand and asks Player 2 for a card that adds to 5 with the chosen card. For example, if Player 1’s chosen card is a three, she asks Player 2 for a two.

If Player 2 has the requested card, he must give it to Player 1. Player 1 puts the resulting pair down immediately. If Player 2 doesn’t have the requested card, he says “Go fish,” and Player 1 picks a card from the draw pile. If this card adds to 5 with a card in Player 1’s hand, she lays the pair down right away.

If Player 1 has no cards left, she takes a card from the draw pile.

Now it is Player 2’s turn to ask for a card from Player 3, and so on. On each turn, players ask for a card from the next player or pick one from the draw pile. On each turn, players may also set down any extra pairs in their hands.

Play ends when the draw pile runs out. At the end of the game, players are allowed to put down any pairs that remain in their hands. The team wins if, together, they have made the required number of pairs between them.

Scaffolding: Some students have trouble sorting their cards and finding pairs that add to 5. If this is the case, give the student only three cards, two of which add to 5. Ask the student to find the pair that adds to 5. After the student has mastered this step, repeat the exercise with four cards, then five cards, and so on.

You can also give a student a list of pairs that add to 5. As the student gets used to the game, gradually remove pairs from the list so that the student learns the pairs by heart.

The Competitive Game

Play as above with the following changes:

- Play ends when one player lays down all of his or her cards. This player receives four points. Players then receive one point for each pair they have laid down. The goal of the game is to score as many points as possible.
- Players get another turn if the player from whom they request a card has it.

Different Target Numbers

Go Fish is easily adapted to finding pairs that add to 10. Simply use cards numbered 1 to 9 and play as before.

Hundreds Chart Practice

Put a blank hundreds chart (or a hundreds chart with pockets) on the board. Place five numbers on the chart. Ask volunteers to place other numbers. The volunteers can find the correct spot for their numbers either by counting up from 1 or by counting on from one of the numbers you have placed.

Guess My Number

Tell students that you are thinking of a number between 1 and 10. Students are allowed to ask questions such as “Is your number less than 5?”, “Is your number equal to 6?”, and “Is your number greater than 2?” until they find your number. For a more advanced version of the game, use higher numbers. You might also use a hundreds chart and allow students to ask questions about the chart. For example, if you use numbers up to 30, a student might point to a row of the hundreds chart and ask “Is the number in this row?”

NOTE: The following games involve composition and decomposition and are therefore more advanced and should only be played later in the year.

Matching Sums

Make a set of cards with sums (3 and 1, 2 and 2, 1 and 1, 4 and 2, and so on) and a set of cards with answers to the sums. Place three of the sums in a column on the board. Place the answers in a column beside the sums, but not necessarily in the same order. Ask a volunteer to draw lines to connect each sum to its answer. You can increase the level of difficulty by placing more cards in the columns or using larger sums. Encourage students to find the answers using concrete materials (their fingers, blocks, or pictures) and then, eventually, from memory.

Make My Number

Write a number on the board and ask a volunteer to tell you a sum that gives the number. Ask students to find as many answers as possible. For example, if you chose the number 5, some possible answers are 3 and 2, 1 and 4, 4 and 1, and 0 and 5. For a more advanced version of the game, allow students to use more than two numbers in their sums (for example, $1 + 2 + 2$ makes 5) or allow them to use subtraction ($7 - 2$ makes 5).



Letter to Parents/Guardians

What is JUMP Math?

JUMP Math is an innovative, research-based math resource and teaching approach used by schools to foster a deep understanding and love of math in their students. Our approach is based on the belief that all children can excel at math and, through early and continued success, can develop the confidence and cognitive abilities required to do well in all subjects.

The JUMP Math approach, which has produced significant improvements in student achievement in a number of studies (including a randomized controlled trial), is based on a method called “guided discovery.” Each lesson is thorough and rigorous, and comes with instructional supports, exercises, assessments, activities, and extension questions that allow students to develop a deeper knowledge of the curriculum by working on incremental variations on the same topic. This allows teachers to focus their time and energy on real-time instruction and differentiation, rather than piecing lessons together from a variety of sources.

What are the components of JUMP Math?

The lesson plans are the heart of JUMP Math. Developed by a team of mathematicians and educators, it shows teachers how to:

- break concepts into fundamental units of understanding,
- assess and address gaps in student knowledge,
- present concepts in different ways and from different perspectives,
- build excitement with incrementally harder challenges, and
- foster advanced problem-solving skills.

Used in tandem with the student Assessment & Practice Books (AP Books), our teaching resources are aligned to provincial curricula.

How does JUMP Math benefit my child?

With JUMP Math, students derive concepts and solve problems themselves, and teachers provide guidance along the way to ensure this happens for all students, not just the advanced few. This approach ensures a critical balance of teaching and practice, and allows for varied forms of engagement, incremental challenge, and continuous assessment. At the end of each lesson, students work in their AP Books. These exercises match the material taught in the lesson exactly, allowing students to work independently to consolidate newly learned skills and concepts. At the same time, teachers get an immediate sense of where each student is and can provide individualized support as needed.

How can I support my child at home?

It’s important that children understand how you use math every day: to compare prices and calculate change, measure ingredients in a recipe, estimate how much gas to buy, and predict if it will rain. Talk with them about this, and use coins, dice, cards, or dominoes to increase basic numeracy skills, pattern recognition, and fluency with math facts. Most importantly, believe in your child’s potential to learn and become a mathematical thinker. If family members say “I don’t have a math brain” or “I was always bad at math,” your child gets the impression that math is scary and hard. Instead, use the language of possibility: “You don’t have it yet but you will!”

To learn more, speak to your child’s teacher or visit www.jumpmath.org.