

## Planning To Use The Lessons At The K-2 Grade Levels

### Background Information

Before you start using this web site, it is important to know that you will not start with lesson 1 and use one after the other until you have completed all the lessons. Altogether there are nearly 1000 5-minute lessons, ...far more than what you will have time to use and far more than what you will need.

By listening to the students explain their solutions, you will know when they have developed understanding and the confidence to move on to lessons with larger numbers or to a new chapter. You can always revisit these lessons as review or as needed. Each group of representation lessons and each group of explore-and-preview lessons (chapters 1-10) has a 5-item assessment to inform and confirm your decisions.

### Use The Strategy Lessons (chapters 11-13)

To organize a plan for using the lessons, you should first identify when each reasoning strategy will be taught in your curriculum. The following shows a sample of what you might decide if you

- introduce counting on and counting back in kindergarten;
- extend understandings of counting to add and subtract in grade 1; and
- develop derived fact strategies, using ten and known facts, in grade 2.

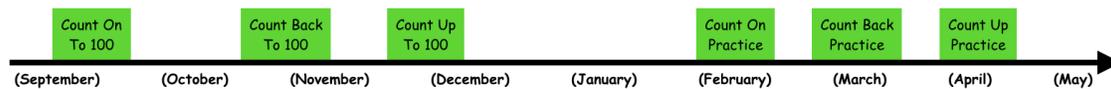
### One Sample Plan For Strategy Lessons

All of these strategy lessons are in chapters 11 and 12.

#### Kindergarten



#### Grade 1



#### Grade 2



Helping students make sense of these reasoning strategies is critical for them to make sense of addition and subtraction and to develop fluency with basic facts. Provide enough time for each of these strategies, even extra time if necessary, to help students develop flexibility and fluency in their use. Note that the strategy lessons appear repeatedly throughout K-2.

### **Use The Representation Lessons (chapters 1 and 9)**

Now that you have a plan for the reasoning strategies, chapter 1 has lessons to help students make sense of the ten frame. Students may not need all of these lessons, but use the ten frame lessons before the explore-and-preview lessons to ten.

Similarly, chapter 9 helps students make sense of the number line. Use these lessons prior to the explore-and-preview lessons for larger numbers. Other representations are woven into the lessons to help students develop flexibility.

The assessments in chapters 1 and 9 can help you decide how many of these lessons are needed. They can always be revisited, if needed.

### **Use The Explore-And-Preview Lessons (chapters 2-8, 10)**

Now all of the gaps in this time line should be filled with explore-and-preview lessons. None of these lessons needs to be mastered before moving on, ...but collectively they provide students experiences that will lead to deep understanding.

Chapters 2-4 can be explored before using Chapter 11, counting on to ten. Chapters 5-7 can be explored before using Chapter 12, counting back to ten. Any of the lessons in chapters 2-7 can be revisited or reviewed after beginning counting on and counting back. Chapter 11, counting on to one hundred and Chapter 12, counting back to one hundred, extend the use of these same strategies to larger numbers after introducing the number line (chapter 9). Chapters 5-7 also prepare students for Chapter 12, counting up.

Note that the practice lessons in Chapter 11, counting on, Chapter 12, counting back, and Chapter 12, counting up, provide opportunities for students to develop fluency with the use of these strategies. They should not be used until the students have made sense of the counting strategies and already developed comfort in using them. It is important to inform students that accuracy is far more important than completing every problem. Positive feedback should be given for accuracy. Don't worry about speed. Speed is a by-product of fluency in using the strategies accurately and comfortably.

Now Chapters 8 and 10 can be explored before starting the derived fact strategies, Chapter 11 and 12, using ten, and Chapter 11 and 12, using known facts. The order in which strategies are developed can be determined by the content in your regular curriculum. Making sense of these strategies and being comfortable in their use is needed before students learn addition and subtraction facts to twenty.

The practice lessons, for each of these derived fact strategies, provide opportunities for students to develop fluency with their use. They should not be used until the students have already made sense of the strategies and already developed comfort in using them.

### **Develop Deeper Number Sense**

Flexibility, fluency, and strategic choice of efficient thinking can be developed more by revisiting and reviewing chapters 2-10. Variations and extensions in the use of these strategies are developed in Chapter 11, flexible use of strategies, and Chapter 12, flexible use of strategies. An even greater focus on strategic choices for using the strategies efficiently is provided in Chapter 13.

Estimating strategies, are developed in Chapter 14. These strategies include estimating by using front-end, nice numbers, bounds, and rounding. The lessons also focus on knowing when an estimate can be used and when an exact answer is needed.

All of the strategies through chapters 1-14 are mental computation and are designed to help students make sense of using addition and subtraction in everyday situations. They are designed to help students develop number sense—not simply getting correct answers to problems. Number sense includes knowledge about understanding numbers, understanding operations, and understanding when and how to use that knowledge in everyday situations. But it also includes the development of attitudes so students

- have confidence,
- have a mindset to make sense,
- persevere,
- monitor their thinking to make sure they are on the right track,
- make strategic choices using strategies that are efficient, given the context and the numbers involved,
- reflect on their answers and judge their reasonableness, and
- develop self-esteem as a critical thinker.

### **Use Standard Procedures**

Most parents and teachers expect students to learn standard paper-and-pencil procedures to add and subtract. But learning a procedure is not enough. Without making sense, students often

- do not recognize when a simple error leads to an answer that is not reasonable,
- forget the procedure after vacations,
- confuse one procedure with another, and
- simply rely on the calculator on their phone without even attempting to estimate or compute.

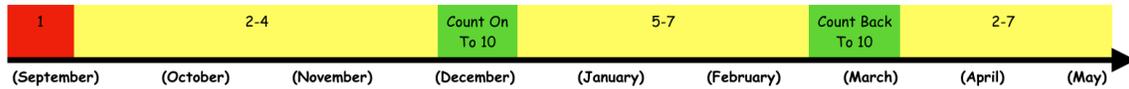
The lessons in Chapter 15 are designed to help students avoid these errors and make sense of standard procedures for written addition and subtraction.

## Putting It All Together

Your plan might look something like charts below. The outcomes you can expect are listed below each grade level time line. The representation lessons are shown in red, the explore-and-preview lessons in yellow, and the strategy lessons in green. The numbers in each red and yellow box are the chapters from which these lessons may be selected.

### One Sample Plan For Using The Lessons

#### Kindergarten

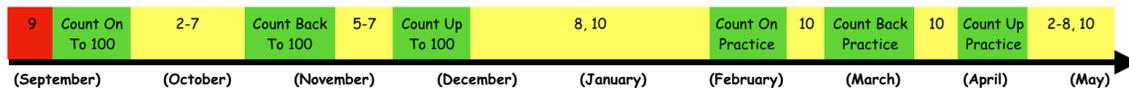


The numbers in the red and yellow boxes are the chapters in which you can find those lessons.

With these experiences, students will have

- made sense of the ten frame,
- explored joining and separating,
- explored parts and the whole,
- been introduced to counting on and counting back as ways to solve addition and subtraction problems, and
- an excellent preparation for learning addition and subtraction in grade 1.

#### Grade 1



The numbers in the red and yellow boxes are the chapters in which you can find those lessons.

With these experiences, students will have

- made sense of the number line,
- extended their use of counting on and counting back to larger numbers,
- made sense of counting up to subtract and extended the use to larger numbers,
- explored relating and extending addition and subtraction concepts to other Cognitively Guided Instruction problem structures,
- practiced counting strategies to develop fluency, and
- an excellent preparation for mastering addition and subtraction in grade 2.

#### Grade 2



The numbers in the red and yellow boxes are the chapters in which you can find those lessons.

With these experiences, students will have

- made sense of the open number line and tree diagram,
- made sense of all addition and subtraction problem structures, as described by Cognitively Guided Instruction,
- made sense of counting and derived fact strategies as ways to solve addition and subtraction problems,
- developed flexibility in the use of reasoning strategies,
- learned when to use these concepts in everyday life,
- developed reasonable fluency with all basic addition and subtraction facts, and
- an excellent preparation for learning addition and subtraction in grade 3.

## A Flow Chart For Prerequisites

A general flow chart for using the lessons is shown below. Exceptions, especially for the explore-and-preview lessons in yellow, can easily be justified. If students understand and can easily solve the problems, move on to lessons with larger numbers or to another chapter. Assessments for the representation and explore-and-preview lessons can help you decide.

