MathNavigator™
Common Core

Using Addition and Subtraction to Solve Problems to 100

AMERICA'S CHOICE
SAVVAS LEARNING COMPANY

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LEARNING COMPANY

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1 2 3 4 5 6 7 8 9 10 16 15 14 13 12

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Introduction to Math Navigator

Dear Parent/Guardian,

_____ has been selected to participate in Math Navigator! Math Navigator is one of the ways that our school is working to help all students succeed in mathematics. The program gives students the additional time and instruction they need to improve their performance in this important subject.

Your child will be participating in the *Using Addition and Subtraction to Solve Problems to 100* module. The main goals of this module are to help students review addition and subtraction facts to 20 and to help students explore the types of word problems that can be solved using addition and subtraction. Students will use addition and subtraction to 100 to solve word problems with situations that involve adding to, taking from, putting together, taking apart, and comparing. Students will use math drawings, diagrams, and equations. Students will learn that two-step word problems require you to begin by identifying the implied first step: You must figure out the "missing question" and find the "hidden amount," and then solve the second step of the problem. The last part of the module sets the stage for the study of multiplication in later grades. Students will explore even and odd numbers using arrays, number patterns, and skip-counting, and they will solve word problems using repeated addition.

There are a variety of materials students will use with this module: one of them is a set of Study Cards. These cards include mathematical ideas for students to master, game cards, and blank cards that students can customize with concepts that they need to work on. Students are encouraged to use these cards during the lessons, as well as during free time and at home. Please encourage your child to share them with you.

The more enthusiastic you can be about Math Navigator, the more it will help your child. Ask questions each day about what your child learned and how the Math Navigator class was different from your child's regular math class. It is important for you to acknowledge what your child has accomplished both on a day-to-day basis and after completing the Math Navigator module.

We are excited about using Math Navigator with students. Learn more about this special program and how it works by reading the short description that follows. If you have any questions about the program, please do not hesitate to contact us here at school.

How Math Navigator Works

Structure of a Module

Each module contains 20 days of 30- or 45-minute lessons, including a pre-test and post-test. During the 20 days, students have two or three checkpoint lessons that assess their understanding of the concepts in the module.

Frequent Skills Practice

Most lessons include a Show Me session in which students practice and reinforce skills. It is also a time for students to learn strategies and techniques that make computation easier.

Emphasis on Understanding

The lessons are carefully designed to uncover mistakes that result from students misunderstanding something. We call such mistakes *misconceptions*. Misconceptions need to be corrected because they can interfere with new learning. Math Navigator modules do not attempt to reteach everything that students have learned about a topic. Instead, they help students understand the mathematics of the procedures and concepts that they have already learned so that they can correct the misconceptions that are getting in the way of their progress.

Learning to Think Mathematically

Lessons are structured to teach students to think like mathematicians. Students will learn how to ask themselves questions before beginning a problem; to use diagrams, tables, and other methods of representing problems; and to estimate as a way of determining whether their answers are reasonable. Most importantly, they will come to see that mistakes are opportunities for learning, rather than something to hide.

Blank Number Lines

Hundred Chart

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

Misconceptions and Errors

Although this module is designed as initial teaching, it is likely that student misconceptions will become evident as they work through the lessons. Possible misconceptions include:

F21	Does not understand the concept of equivalence
O3	Does not recognize an addition situation
O4	Does not recognize a subtraction situation
O21	Is unable to generalize addition or subtraction facts to new situations or formats
O23	Is unable to transfer between different representations of the same operation
O38	Given a number, is unable to create an array representing that number

F21 Does not understand the concept of equivalence

example

Finish this equation:

4 + 3 = 1 + 8

O3 Does not recognize an addition situation

The student overspecializes during the learning process so that he recognizes some situations as addition but fails to classify other addition situations appropriately.

example

The temperature was 47° at 8 am, which was 12° cooler than it is now. What is the temperature now?

The temperature now is 35°. 47 - 12 = 35

O4 Does not recognize a subtraction situation

The student overspecializes during the learning process so that she recognizes some subtraction situations as subtraction but fails to classify other subtraction situations appropriately.

example

Tom and Megan have 24 books altogether. Megan has 12 books. How many books does Tom have?

24 + 12 = 36. Tom has 36 books.

O21 Is unable to generalize addition or subtraction facts to new situations or formats

The student can only correctly solve problems if they are written in columns.

example

Solve: 17 + 25 =

17 + 25 = 32

$$\begin{array}{r} 24 \\ +\ 18 \\ \hline 42 \end{array}$$

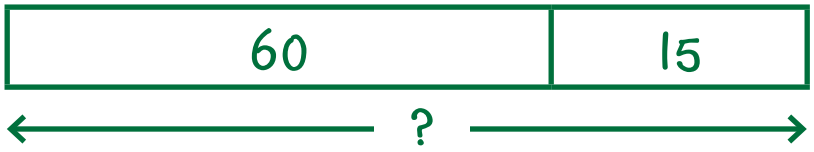
O23 Is unable to transfer between different representations of operations

The student has problems reading or creating different representations of addition or subtraction.

example

Mr. Gomez bought 60 bottles of water.
Mrs. Chi bought 15 fewer bottles than Mr. Gomez.
How many bottles of water did Mrs. Chi buy?

Make a math drawing for the problem.

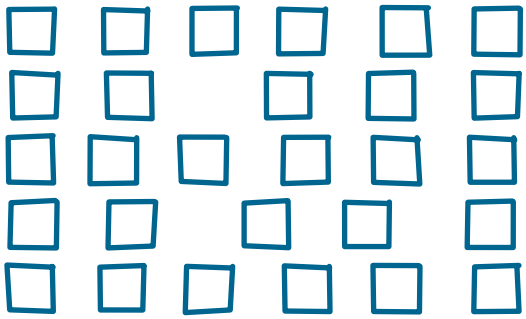


O38 Given a number, is unable to create an array representing that number

The student's drawing may have an incorrect number of rows or columns; an unequal number of units in columns or in rows; and/or an equal, but incorrect, number of units in each row or in each column.

example

Make a five-by (5×) array using 30 tiles.



Class Profile Instructions

About the Class Profile

Completing an analysis of student work gives you a clear picture of the strategies an individual student is applying to a particular problem or topic in mathematics. Such an analysis is even more powerful when it is applied to the Math Navigator class as a whole.

The Class Profile gives you both. By reading the Class Profile across a row, you can see where each student stands at any point in time. Reading down the columns allows you to see the strengths and needs of the entire class at a glance. By reviewing the Class Profile, you will be able to make decisions that target appropriate instruction to individuals, small groups, and the whole Math Navigator class.

The first pages of the Class Profile provide assessment items related to the content of the module. The last page is based on the mathematical practices from the Common Core State Standards for Mathematics.[1] On this page, record evidence of students using these practices.

Recording Data on the Class Profile

When you see—either through discussion, analysis of student work, or direct observation—that a student understands a concept, still has a misconception, or engages in a mathematical practice, make a note on your Class Profile. As the student's understanding increases, update the Class Profile.

Using the Class Profile

Review the Class Profile periodically during the lesson to help you decide which topics would be most beneficial for your students to focus on during the class discussion. Address topics that most of the students in the Math Navigator group need to learn during the show me, work time, or probing for understanding parts of the lesson. Address topics that only some students are struggling with during partner work or in conferences. If only one or two students need help with a topic, address the topic in an individual conference.

Give a copy of the completed Class Profile to each student's classroom teacher at the end of the module.

[1] Common Core State Standards Initiative. 2010. "Common Core State Standards for Mathematics": 6–8. Accessed July 1, 2011. http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf.

CLASS PROFILE (1 OF 4)

Student Name	Facts									
	FA6: Fluent with addition facts, +6	**FA7:** Fluent with addition facts, +7	**FA8:** Fluent with addition facts, +8	**FA9:** Fluent with addition facts, +9	**FA10:** Fluent with addition facts, +10	**FA20:** Fluent with addition facts, 20	**FS6:** Fluent with subtraction facts, −6	**FS7:** Fluent with subtraction facts, −7	**FS8:** Fluent with subtraction facts, −8	**FS9:** Fluent with subtraction facts, −9	**FS10:** Fluent with subtraction facts, −10
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
Observed Errors											

CLASS PROFILE (2 OF 4)

Student Name	Concepts									
	C1: Recognizes addition situations	**C2:** Recognizes subtraction situations	**C3:** Uses visual representations to represent addition and subtraction	**C4:** Writes equations to match addition and subtraction problems	**C5:** Recognizes and identifies hidden amounts in two-step problems	**C6:** Writes expressions and equations to find hidden amounts in two-step problems	**C7:** Recognizes and identifies even and odd numbers (to 20)	**C8:** Relates skip counting to counting by ones	Observed Errors	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

CLASS PROFILE (3 OF 4)

Student Name	Procedures			
	P1: *Solves two-step problems involving addition and subtraction*	***P2:*** *Makes appropriate estimates before computing*	***P3:*** *Uses addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns*	**Observed Errors**
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

CLASS PROFILE (4 OF 4)

Mathematical Practice Standards

MP1: Make sense of problems and persevere in solving them.

MP2: Reason abstractly and quantitatively.

MP3: Construct viable arguments and critique the reasoning of others.

MP4: Model with mathematics.

MP5: Use appropriate tools strategically.

MP6: Attend to precision.

MP7: Look for and make use of structure.

MP8: Look for and express regularity in repeated reasoning.

Student Name	Observations
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

A Complete Solution to a Math Story

Show your thinking.

Math drawing or diagram

1 + 2 = 3

Equation

Answer the question.

There are 3 apples.

What to Do If You Get Stuck

- Look at posted charts.
- Use counters or other materials.
- Make a math drawing or diagram.
- Use easier numbers.
- Ask a friend.
- Write what you do know.
- Think of questions to ask later.