BRIDGES IN MATHEMATICS 1

GRADE 1 SUPPLEMENT

Set A1 Number & Operations: Numbers to 120

Includes

Skills & Concepts

★ count by ones forward and backward from 1 to at least 120, and count by 2s, 5s and 10s to at least 100

★ name the number before and after any number given verbally up to at least 120

★ read aloud numerals to at least 120

★ order objects or events using ordinal numbers

★ recognize whole-number words that correspond to numerals though twenty

★ read, compare, and order numbers to at least 120 using the words equal to, greater than, less than, greatest, and least when appropriate

★ group numbers into tens and ones in more than one way

★ use estimation to determine the approximate number of objects in a set of 20 to 100

★ identify the given information that can be used to solve a problem

★ recognize when additional information is required to solve a problem

★ answer the question asked in a problem

★ identify the answer to the question in a problem

Bridges in Mathematics Grade 1 Supplement
Set A1 Numbers & Operations: Numbers to 120

Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

The Math Learning Center is a nonprofit organization serving the education community. Our mission is to inspire and enable individuals to discover and develop their mathematical confidence and ability. We offer innovative and standards-based professional development, curriculum, materials, and resources to support learning and teaching. To find out more, visit us at www.mathlearningcenter.org.

Set A1 ★ Activity 1

ACTIVITY

The Classroom Number Line

Overview

The teacher works with input from students to record one number each school day on a sentence strip posted on the classroom wall. New sentence strips are added as needed, and the number line that results can be used for many different counting and whole number relationship activities through the year.

Skills & Concepts

★ count by ones forward and backward from 1 to at least 120, and count by twos, fives, and tens to at least 100

★ name the number before or after any number given verbally up to at least 120

★ read aloud numerals to at least 120

★ order objects or events using ordinal numbers

★ recognize whole-number words that correspond to numerals through twenty

You'll need

★ 13 or more sentence strips (see Advance Preparation)

★ a yardstick

★ dry wipe pens in black, red, and blue

★ 7 sentence strips cut into 8" lengths (optional)

Advance Preparation You'll need at least 13 sentence strips for this activity; 18 or 19 if you want to continue the line through the entire school year. Write a 0 at the far left side of one of the strips, but leave the rest of the strip unmarked. Laminate all the strips so you can reuse them in future years. Post just the first strip before school starts. Place it near your Number Corner display board where all the students can see it easily.
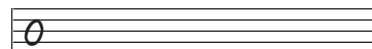
Instructions for The Classroom Number Line

1. On the first day of school, call children's attention to the laminated paper strip you've posted. Explain that this is a number line, and you'll be writing a number on it for each school day that passes. Read the numeral 0 with the class, and let students know that you wrote this number on the line yesterday, before school even started. Ask them to verbalize the fact that this is the *first* day of school, and then use a black wide-tipped dry-wipe pen to record the numeral 1 on the line. Gauge the amount of space you leave between the 0 and the 1 knowing that you'll only be writing the numerals up through 9 before you switch to another strip.

2. The following day during Number Corner, ask students to verbalize the fact that this is the *second* day of school, and record the numeral 2 on the line. Continue each day in this fashion through the ninth day of school. Then attach a second strip to the first, and add a new number to the strip each day until you've reached the 19th. Attach a third strip for the numerals 20–29, a fourth for the numerals 30–39, and so on. You may want to record the first number on each new strip in red instead of black to highlight the fact that it's a counting-by-ten number.
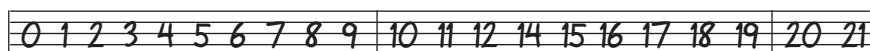
Activity 1 The Classroom Number Line (cont.)

Starting on about the tenth day of school, you can use the line for a variety of counting exercises and activities, including the ones listed below.

- Point to each numeral as students read and count forward with you. When you get to the last recorded numeral, ask students to verbalize the ordinal numbers for the current day and the next (i.e., today is the *tenth* day of school; tomorrow will be the *eleventh* day of school). Then ask a few volunteers to tell the class something they know about the number you'll be writing on the line the following day. Their descriptions might pertain to the name, the appearance, or the composition of the numeral. For example, one student might say that you're going to write the number 11 because 11 is next after 10. Another might say that you're going to write a 1 and then another 1. A third might say that 11 is 10 plus 1 more.
- Starting with the last recorded numeral, point to each one as students count backward with you to 0.
- Have students practice counting by 2s, 5s, or 10s on the number line. Point to the numbers, or underline them in red or blue, as the students count along with you.
- Have students take turns pointing on the line to specific numerals you name, or to the numbers that come before or after specific numerals you name.

Extension

- Starting on the first day of school, work with input from the class to write the numeral and the word that corresponds to that numeral on an 8" sentence strip. Continue through the twentieth day of school. Have students read the words frequently and practice writing the numeral names up through ten periodically.

0 zero	10 ten	20 twenty
1 one	11 eleven	
2 two	12 twelve	
3 three	13 thirteen	
4 four	14 fourteen	
5 five	15 fifteen	
6 six	16 sixteen	
7 seven	17 seventeen	
8 eight	18 eighteen	
9 nine	19 nineteen	

Set A1 ★ Activity 2

ACTIVITY

Guess My Number

Overview
Students ask questions to identify a secret number the teacher has hidden in his or her pocket.

Skills & Concepts
★ name the number before or after any number given verbally up to at least 120

★ read, compare, and order numbers to at least 120 using the words *equal to, greater than, less than, greatest,* and *least* when appropriate.

★ identify the given information that can be used to solve a problem

★ recognize when additional information is required to solve a problem

★ answer the question asked in a problem

★ identify the answer to the question in a problem

You'll need
★ class number line from Set A1 Activity 1

★ chart paper or whiteboard space

★ markers

Instructions for Guess My Number

1. Once you've recorded numerals up through 50 or 60 on the class number line, you can use it to play Guess My Number, a quick problem solving activity that offers students many opportunities to read and compare numbers. Before class, record on a small slip of paper one of the numerals currently on the line. Place the slip of paper in your pocket.

2. During Number Corner, tell students you're thinking of one of the numbers on the line, and invite them to ask questions about it until they have enough information to identify the number with confidence. Record the information they collect on the whiteboard or a piece of chart paper using a t-chart similar to the one shown on the next page.

> **Teacher** *This morning before school, I copied one of the numbers from our number line onto a piece of paper and put it in my pocket. Who'd like to ask a question to try to find out what my secret number is?*

> **Sara** *Is it 23?*

> **Teacher** *No, my number is greater than 23.*

> **Joji** *I bet it's 50 because 50s the last number up there!*

> **Teacher** *Nope, it's less than 50.*

Activity 2 Guess My Number (cont.)

Natalie   *Is it 40?*

Teacher   *No, it's greater than 40.*

David   *Then it must be 41!*

Teacher   *It's greater than 41, but less than 50.*

Jena   *It's 45, right?*

3. Help students evaluate their progress toward identifying the secret number by reviewing the chart with them every few questions.

Greater than >	Less than <
23 40 41	50

Teacher   *Could my number be 45? Let's see if 45 matches all the clues you've gathered so far. Is 45 greater than 23?*

Students   *Yes!*

Teacher   *Is 45 greater than 40 and 41?*

James   *Yes, because 41, 42, 43, 44, 45.*

Teacher   *Is 45 less than 50?*

Ashley   *It comes before 50 on the line.*

30 31 32 33 34 35 36 37 38 39 | 40 41 42 44 45 46 47 48 49 | 50 51

Teacher   *So it could be 45, but are there any other numbers it could be?*

Students   *It might be 42.*
Or maybe it's 12, I think it's 12.
No, it can't be 12. Twelve is a really little number! It has to be more than 40!

4. When one of the students identifies the number correctly, don't pull the slip of paper out of your pocket right away. Instead, review the clues on the chart one more time with students to confirm that the number they've identified matches all of them. After they've confirmed that it does, show them the slip of paper and play the game again. Once students have played the game a few times, occasionally choose volunteers to select the secret number.

Activity 2 Guess My Number (cont.)

Greater than >	Less than <
23	50
40	45
41	
43	

Rosa *I think your number is 44. It has to be that.*

Teacher *Let's compare 44 to the clues on our chart. Is 44 greater than 23, 40, 41, or 43?*

Students *It's more than 43.*
It comes right after 43, like 43, 44.

Teacher *Is it less than 50 and also less than 45?*

Students *Yes!*

Teacher *Are there any more numbers between 43 and 45 here on our line?*

Rosa *No! That's why I said it has to be 44!*

Set A1 ★ Activity 3

ACTIVITY

Estimate & Count the Cubes

Overview
The teacher shows students a bag of Unifix cubes and asks the children to estimate how many cubes are in the bag. Next, he or she records students' estimates and plays a quick guessing game with the numbers recorded. Then the class counts the cubes by 1s to determine the total. Finally, the cubes are regrouped in various ways and the total compared each time.

Skills & Concepts
★ name the number before or after any number given verbally up to at least 120

★ compare, and order numbers to at least 120 using the words *equal to, greater than, less than, greatest,* and *least* when appropriate

★ group numbers into tens and ones in more than one way

★ use estimation to determine the approximate number of objects in a set of 20 to 100

★ recognize when additional information is required to solve a problem

★ answer the question asked in a problem

★ identify the answer to the question in a problem

You'll need
★ a quart-sized re-sealable plastic bag

★ Unifix cubes (see Advance Preparation)

★ chart paper or whiteboard and markers

★ a 3" × 5" index card

....

Advance Preparation Combine 10 green, 10 yellow, 10 blue, and 6 red Unifix cubes to make a total of 36. Place these in the re-sealable bag and close the top.

....

Instructions for Estimate & Count the Cubes
1. Gather students to your discussion circle and show them the bag of Unifix cubes you've prepared. Ask them to estimate how many cubes are in the bag. Record their estimates on a piece of chart paper or on the whiteboard. Encourage as many students as possible to volunteer estimates, and ask them to explain their thinking as they do so. If two or more students volunteer the same estimate, underline that number on the chart.

> **Students** *I think it's 100 because it looks like a lot in there.*
> *I think 60. It doesn't look like so big as 100 to me.*
> *Two hundred 'cause it's a real lot.*
> *I think 25 because it just looks that way.*
> *Thirty-nine because it's a good number for those cubes.*

Activity 3 Estimate & Count the Cubes (cont.)

2. Before you pour the cubes out of the bag and count them with the class, play a quick game by describing some of the numbers on the chart and asking students to identify them based on your clues. Circle each number as students identify it.

> **Teacher** *Let's play a game with the numbers on this chart before we count the cubes. I'm thinking of the number that comes right after 74. Raise your hand if you know which one it is.* (The teacher waits for a moment until most hands are up and then invites all the students to respond at the same time.)

> **Students** *It's 75!*
> *Yep, 75, because it goes 74, 75 when you count.*

> **Teacher** *Okay, now I'm looking right at the number that comes before 51. Whisper the number you think it is to your neighbor.* (The teacher waits for a moment and then invites the class to respond.)

> **Students** *52! I said it's 52!*
> *No, it's 50!*
> *Yes, 50 because Teacher said before 51, and it goes 50, 51.*

How many cubes do you think are in the bag?

100	24	26
60	(75)	45
200	15	130
25	48	13
(50)	39	69

There are many different riddles you can pose, depending on the strengths and needs of your students. Here are a few other examples:
- I'm thinking of the number on the chart that's one *more than* 38.
- I'm thinking of the number on the chart that's one *less than* 16.
- I'm thinking of the number on the chart that's 20 + 6.
- I'm thinking of the number on the chart that's 50 + 50.
- I'm thinking of the number that's *greater than* 24 but *less than* 26.

3. After you've circled 8–10 of the numbers on the chart, pour the cubes out of the bag and spread them out a little. Invite students to adjust their estimates. Does anyone want to change his or her estimate now that it's a little easier to see the cubes? If so, add the new estimates to your chart.

4. Count the cubes one by one as the students count with you. Stop after you've counted out about half the cubes and invite students to revise their estimates now that they have more information. Do they see any numbers that could be crossed off the chart?

Activity 3 Estimate & Count the Cubes (cont.)

Students *I don't think it's going to be 100. We're only up to 18, and there aren't very many cubes left.*
I guessed 100, and I still think it's going to be that many.
I think 200 is too much, though. We could get rid of that number off the chart.
*We went past 13 already, and 15. We don't need those numbers any more.*
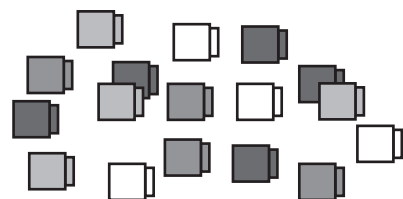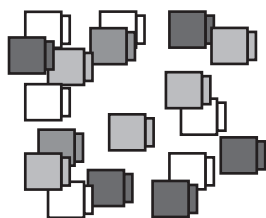
How many cubes do you think are in the bag?

|		
(100)	(24)	(26)
60	(75)	45
(200)	(15)	130
(25)	48	(13)
(50)	(39)	69

5. Allow a little time for discussion and debate, and then count the rest of the cubes with the class. Record the total on a 3" × 5" index card. Set the card beside the cubes and ask students to identify the estimate on the chart that comes closest to that number.

6. Next, have a couple of volunteers help you sort the cubes by color. Then snap the green cubes, the blue cubes, and the yellow cubes into their own trains of 10, counting with the students as you go to establish that there are 10 in each train, and 6 red cubes which you'll leave as single 1s. How many cubes in all? Are there still 36 in the collection? Ask students to talk with their neighbors about this, and then invite a few to share their thinking with the class.

36
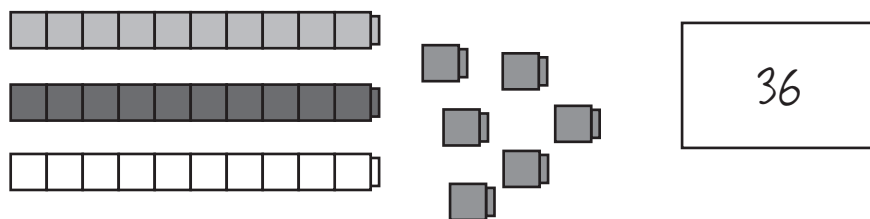
Students *It says 36 on the card, so it must be.*
It doesn't change anything if you put the cubes together.
But it might. Maybe there aren't as many because some of them are squished together.
Well, 10 and 10 is 20, and then keep counting. Maybe it's 36.
There are 6 red ones, and I think the others are 30. I think it's still 36.

7. Count the cubes by 10s and 1s with the class to confirm that there are still 36 in all. Next break one of the trains of 10 apart. What is the total now? Help students re-count the cubes by 10s and 1s.

Activity 3 Estimate & Count the Cubes (cont.)
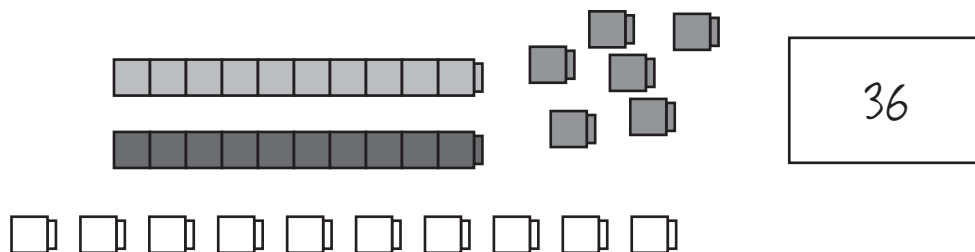
Teacher and Students 10, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36.

Students *Yep, it's still 36!*
I think it doesn't matter if you put them together or take them apart.
If one rolls away, then it won't be 36 any more.

8. If time allows and student interest holds, repeat Step 7 with the second, and even the third train of Unifix cubes so children have the opportunity to see 36 as 3 tens and 6 ones, 2 tens and 16 ones, 1 ten and 26 ones, and 36 ones.

Extension

Repeat this activity several times in place of Thursday Challenges in the November and December Number Corner, using the following collections of cubes:

• 10 red, 10 blue, 10 green, 10 yellow, and 5 brown (45 in all)
• 10 brown, 10 black, 10 white, 10 red, 10 yellow, and 7 green (57 in all)
• 10 blue, 10 burgundy, 10 yellow, 10 white, 10 orange, 10 green, and 1 white (61 in all)

Each time you repeat the activity, have children examine and discuss several different configurations of 10s and 1s for the number. For instance, show 45 as 4 tens and 5 ones; 3 tens and 15 ones; and 2 tens and 25 ones so students begin to understand that numbers can be grouped into tens and ones in more than one way. In each case, have them count to confirm that the total never changes, no matter how the number is grouped.

Set A1 ★ Activity 4

ACTIVITY

Rainbow Numbers

Overview

Students use a numbers grid to find and name numbers that come before and after numbers named by the teacher. The first time they do this activity, the grid is filled in for them. The next few times, they fill in missing numbers on the grid.

Skills & Concepts

★ count by ones forward and backward from 1 to 120

★ count by twos, fives, and tens to 100

★ read and write numbers to 120

★ name the number before or after any number given verbally up to at least 120

You'll need

★ 1–120 Number Grid (page A1.13, class set on copy paper and 1 copy on a transparency)

★ Missing Numbers Grids 1, 2, and 3 (pages A1.14–A1.16, class set of each sheet)

★ a ¾" plastic game marker

★ overhead pens in black, red, and blue

★ crayons

Instructions for Rainbow Numbers

1. Give each student a copy of the 1–120 Number Grid and place a copy on display at the overhead. Ask students what they notice about the grid, and give them a minute to pair-share observations. Then invite several volunteers to share their observations with the group.

2. Explain that, in a few minutes, you're going to have them color in some numbers on their grid, but first you're going to do a little counting on the grid together. Ask the children to point to the 10s on their grid and count them with you, starting at 10 and going all the way up to 120. Then count by 2s from 2 to 100, pointing to the numbers on your grid as students do so on theirs.

3. Next, as students get out their crayons, place a colored game marker on top of the numeral 57 on your grid. Ask students to name the number you've covered. Then have them find the number that comes *before* 57 on their own grid and share their answer with the person sitting next to them. When they've confirmed with one another that the answer is 56, ask them to color the box with 56 in it red.

4. Repeat Step 3 five more times, selecting a different number to cover with your game marker each time. Alternate between asking students to find the number that comes before the one you've covered, and the one that comes after the one you've covered. Have them color each of the numbers they identify with a different color until they've used all the colors of the rainbow—red, orange, yellow, green, blue, and purple.

5. Send the sheet home with students, along with a note to families to help children practice counting by ones forward and backward from 1 to 120, by 2s, 5s, and 10s. Children can also find and color in numbers that come before and after others named by their family members.

Activity 4 Rainbow Numbers (cont.)

6. The following week, give each student a copy of the first Missing Numbers Grid. Ask children to work together to fill in the missing numbers. You might place your filled grid on display at the overhead for their reference, or challenge them to use their counting skills to fill in the empty boxes on the grid. When most children have finished filling in the numbers, conduct counting exercises similar to the ones you did the first week with the class and send the sheet home, accompanied by a note to families, for extra practice.

Set A1 Number & Operations: Numbers to 120 Blackl ne   Run a class set on copy paper

NAME _____   DATE _____

Missing Numbers Grid 1

1	2	3	4	5	6		8	9	10
11		13	14		16	17	18	19	20
21	22	23		25	26	27	28		30
31	32	33	34	35		37	38	39	
41	42		44	45	46	47	48	49	50
51	52		54	55	56	57	58		60
61	62	63		65	66	67	68	69	70
	72	73	74	75	76		78	79	80
81	82		84	85	86	87	88		90
91	92	93	94	95	96	97	98		100
101	102	103		105		107	108	109	110
111	112		114	115	116	117		119	120

7. Use the other two Missing Numbers Grids for similar activities in the weeks that follow. Each grid has a few more numbers missing and will offer just a bit more challenge.

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NAME _____   DATE _____

1–120 Number Grid

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
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120

NAME _____   DATE _____

Missing Numbers Grid 1

1	2	3	4	5	6		8	9	10
11		13	14		16	17	18	19	20
21	22	23		25	26	27	28		30
31	32	33	34	35		37	38	39	
41	42		44	45	46	47	48	49	50
51	52		54	55	56	57	58		60
61	62	63		65	66	67	68	69	70
	72	73	74	75	76		78	79	80
81	82		84	85	86	87	88		90
91	92	93	94	95	96	97	98		100
101	102	103		105		107	108	109	110
111	112		114	115	116	117		119	120

NAME _____   DATE _____

Missing Numbers Grid 2

1	2		4	5	6		8	9	10
11		13	14	15	16	17	18		20
	22	23	24		26	27	28	29	30
31	32		34	35	36	37		39	40
41	42	43	44	45	46	47	48	49	
51		53	54	55		57	58	59	60
61	62	63		65	66		68	69	70
	72	73	74		76	77	78	79	80
81	82	83	84	85	86	87		89	90
91	92		94	95	96	97	98		100
101		103	104		106	107		109	110
111	112	113		115	116		118	119	120

NAME _____   DATE _____

Missing Numbers Grid 3

1	2	3	4	5	6		8	9	10
	12	13		15		17	18	19	
21	22	23	24		26	27		29	30
31		34	35		37	38	39	40	
41	42	43		45	46		48	49	
	52	53	54		56	57	58		60
61	62			65	66	67		69	70
71		73	74	75	76		78	79	
81	82	83	84		86	87		89	90
91	92		94	95	96		98		100
	102	103		105		107	108	109	110
111	112		114	115	116	117		119	120