Leaps and Bounds
Toward Math Understanding

Student Resource Sampler: Number
(Topics 1–3, Draft Material)
Leaps and Bounds
Toward Math Understanding

With Leaps and Bounds, mathematics intervention is as easy as 1, 2, 3!

Representing Whole Numbers

Step 1: Administer the diagnostic assessment

Step 2: Select the intervention pathway

Step 3: Choose an open-ended intervention or guided intervention based on your students’ learning preferences or your instructional situation

You will need
• base ten blocks
• a place value chart

Kristen sold 305 tickets to the concert. Aki sold 530.

How are 305 and 530 alike?

How are 305 and 530 different?

Choose 305 or 530. Tell as many things about it as you can. Model it in as many ways as you can.

Tell

Model

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For more information and full Table of Contents, visit www.nelson.com/leapsandbounds
Representing Numbers to 1000

A number like 402 might tell how many students are in a school. You can model and show 402 in many ways.

Standard Form       Expanded Form
402              is        4 hundreds + 2 ones

- Make a model.
- Sketch the model.

You will need
- base ten blocks
- a place value chart

• Make other models.
- 402 is also 3 hundreds + 10 tens + 2 ones.

402 is also a lot of ones.

100 100 100 100 2

Try These
1. Write each number in standard form.
   a) 1 hundred + 1 one = 
   b) 2 hundreds + 2 tens = 
   c) 9 hundreds + 9 ones = 
   d) 6 hundreds = 

standard form
the usual way we write numbers
e.g., 231

2. a) Model 501 using 6 base ten blocks. Sketch your model.

Write the expanded form:
___ hundreds + ___ tens + ___ ones

b) Model 150 using 6 base ten blocks. Sketch your model.

Write the expanded form:

200 + 30 + 1

c) Model 132 using 6 base ten blocks. Sketch your model.

Write the expanded form:

100 + 30 + 2

d) Model 132 using 15 base ten blocks. Sketch your model.

Write the expanded form:
3. **a)** Model another number using 6 base ten blocks.
   Sketch your model.

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

   Write the standard form: ________
   Write the expanded form:

   **b)** Model a number greater than 6 using 6 blocks.
   Sketch your model.

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

   Write the standard form: ________
   Write the expanded form:

   **c)** Model your number from part b) using 15 blocks.

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

   Write the standard form: ________
   Write the expanded form:

   If you can represent numbers in lots of ways, you will be able to add, subtract, multiply, and divide. You will also understand the numbers better.

4. Write a number that fits the clue.
   Model it with base ten blocks in 2 ways. Sketch your models.
   **a)** a little more than one hundred ________

   Sketch: Sketch: 

   **b)** about two hundred ________

   Sketch: Sketch: 

   **c)** more than fifty-one but less than eighty-two ________

   Sketch: Sketch: 

5. Draw a line to match each clue with a number.
   **a)** The tens digit is 0. 762
   **b)** The ones digit is the greatest it can be. 203
   **c)** The hundreds digit is greater than 5. 520
   **d)** The number has 2 tens. 219
   **e)** 6 blocks can be used to model the number. 510

6. Make up a number for each clue.
   **a)** The tens digit is greater than the ones digit or the hundreds digit. ________
   **b)** 10 blocks are needed to model the number. ________
   **c)** The hundreds digit is 8. ________
   **d)** The ones digit is the least it can be. ________
42 people are at the pool. 24 people are in the gym.

How are 42 and 24 alike?

How are 42 and 24 different?

Choose 42 or 24. Tell as many things about it as you can. Model it in as many ways as you can.

Tell

Model

A children’s book by Margaret Mahy is called 17 Kings and 42 Elephants. You can model and show 42 in many ways.

Standard Form          Expanded Form
42             is        4 tens + 2 ones

You will need
• base ten blocks
• a place value chart
• linking cubes

Try These
1. Write each number in standard form.
   a) 1 ten + 1 one = _______
   b) 2 tens = _______
   c) 4 tens + 5 ones = _______
   d) 5 tens + 4 ones = _______
   e) 9 tens + 9 ones = _______

Remember
• 1 ten is 10 ones.
• You add the tens and ones parts of the number to know the size of the number.
• Each part is called a digit. In 51, the digits are 5 and 1.

standard form
the usual way we write numbers
e.g., 31
2. a) Model 71 using 8 base ten blocks. Sketch your model.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
</table>

Write the **expanded form**: ____ tens + ____ ones

b) Model 26 using 8 base ten blocks. Sketch your model.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
</table>

Write the **expanded form**: ____ tens + ____ ones

c) Model 80 using 8 base ten blocks. Sketch your model.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
</table>

Write the **expanded form**: ____ tens + ____ ones

d) Model 44 using base ten blocks. Sketch your model.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
</table>

Write the **expanded form**: ____ tens + ____ ones

e) Model 44 using 17 base ten blocks. Sketch your model.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
</table>

Write the **expanded form**: ____ tens + ____ ones

3. a) Use 8 blocks to model a number greater than 8. Sketch your model.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
</table>

**Write the standard form:**

**Write the expanded form:**

b) Model the number in part a) using 17 blocks or 26 blocks. Sketch your model.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
</table>

**Write the standard form:**

**Write the expanded form:**

4. Model a number that fits the clue. Sketch your model.

a) a little less than nineteen

Sketch:

b) about 10 more than sixteen

Sketch:

5. Draw a line to match each clue with a number.

a) The ones digit is 0. 18
b) The number has 2 tens. 32
c) The ones digit is greater than 6. 70
d) The number can be modelled with 5 blocks. 24

6. Make up a number for each clue.

a) The tens digit is 6. _______
b) The ones digit is greater than the tens digit. _______
c) The ones digit is 5. _______
Representing Numbers to 20

OPEN-ENDED

You will need
• counters
• 10-frames

12 birds are sitting on one branch of a tree. 18 birds are on another branch.

How are 12 and 18 alike?

How are 12 and 18 different?

Choose 12 or 18. Tell as many things about it as you can. Model it in as many ways as you can.

Tell  Model

GUIDED

You will need
• counters
• 10-frames

12 students are sitting at picnic tables.

Standard Form  Expanded Form
12 is 1 ten + 2 ones

• Use two 10-frames to show 12.

6 describes the number of students at one table.
• Use one 10-frame to show 6.
6 is 0 tens + 6 ones.

Try These
1. Write the number for each model.

a)  

b)  

c)  

d)  

Remember
• Fill up a 10-frame starting at the top left.
• Fill up the first row before you start the second row.
• Fill up the second row starting at the left.
2. Model each number using counters on 10-frames. Write the number of tens and ones in each.

   a) 11
      
      ____ tens + ____ ones

   b) 19
      
      ____ tens + ____ ones

   c) 8
      
      ____ tens + ____ ones

   d) 17
      
      ____ tens + ____ ones

   e) 4
      
      ____ tens + ____ ones

   f) 15
      
      ____ tens + ____ ones

   g) 7
      
      ____ tens + ____ ones

3. a) Model a number using one or two 10-frames. Choose a number you did not use in Question 2.
      
      Write the number of tens and ones.
      
      ____ tens + ____ ones

   b) Model another number using one or two 10-frames. Choose a number you have not modelled yet.
      
      Write the number of tens and ones.
      
      ____ tens + ____ ones

4. Write 2 numbers to match each clue. Use the numbers 1 to 20.

   a) One 10-frame is a bit more full than the other.
      
      ______  ______

   b) Only complete rows are filled with counters.
      
      ______  ______

   c) Most of one 10-frame is full.
      
      ______  ______

   d) Most of two 10-frames are full.
      
      ______  ______

   e) One 10-frame is much more full than the other.
      
      ______  ______

   f) There are more ones than tens.
      
      ______  ______
Skip Counting to 1000

You can skip count to figure out the number of cents in groups of coins.

You will need
• base ten blocks (optional)
• number lines

• Skip count forward from 375. Show as many ways as you can.

375
375
375
375

• Skip count back from 825. Show as many ways as you can.

825
825
825
825

What do you notice about the digits that change in the numbers? Tell as many things as you can.

You also skip count to put numbers on a number line.

0
100
200
300

• To skip count forward by 100s or 10s, you must put on an extra 100 or an extra 10 each time.
To count forward by 100s from 462, you could say 462, 562, 662, . . . .
To count forward by 10s from 462, you could say 462, 472, 482, 492, . . . .
If you want to add another 10 after 492, you will have 10 tens and can trade them for 1 hundred. The next number is 502.
4 hundreds + 10 tens + 2 ones = 5 hundreds + 0 tens + 2 ones

25, 50, 75, . . .

You will need
• number lines
• base ten blocks
• play coins (quarters)
• Skip counting backward by 100s or 10s works the same way, but you have one fewer 100 or 10 each time.
  To count backward by 100s from 633, you could say 633, 533, 433, . . . .
  To count backward by 10s from 633, you could say 633, 623, 613, 603, . . . . If you want to remove another 10 after 603, you need to think of one of the hundreds as 10 tens, and take away one of the tens.
  6 hundreds + 0 tens + 3 ones = 5 hundreds + 10 tens + 3 ones
  633, 623, 613, 603, 593, 583, . . .

• To skip count forward and backward by 25, think about quarters and the numbers 25, 50, 75, and 100.
  To skip count forward by 25s from 325, you would count 325, 350, 375, 400, . . . .
  To skip count backward by 25s, you go in reverse.
  875, 850, 825, 800, 775, 750, . . .

Try These

1. Count forward to continue each skip counting pattern.
   a) 215 315 415
   b) 135 235 335

2. Count backward to continue each skip counting pattern.
   a) 633 733 833
   b) 517 617 717
   c) 327 337 347
   d) 625 635 645
   e) 875 900 925
   f) 125 150 175
3. There is a mistake in these counting by 10s patterns. Correct the mistake.

   a) 378, 388, 398, 3118, 3128, …

   b) 723, 713, 703, 793, 783, 773, …

4. You skip count from 325 to 525.
   List the numbers you would say in between. Show as many solutions as you can.

5. Why is skip counting forward or backward by 10 the same as adding or subtracting 10?

6. Sometimes when you skip count by 10s, the hundreds digit changes (180, 190, 200, 210). Sometimes it doesn’t (180, 190, 200, 210). When does it change? Why?
You will need
• number lines
• 100 chart

You skip count when you are trying to count a group quickly.

You also skip count to put numbers on a number line.

You skip count forward by 10s, you must put on an extra 10 each time. To count by 10s, you could say 32, 42, 52, 62.... Notice that it is the tens digit that changes. If the numbers are on a 100 chart, you just go down one row.

You skip count to 100

To count backward, you use the same numbers as counting forward, but go the other way. To count back by 5s from 75, you would say 75, 70, 65, 60, ....

Try These

1. Count forward to continue each skip counting pattern.

   a) 21 31 41

   b) 17 27 37

   c) 25 30 35

   d) 55 60 65

Remember

• When you count by 10s, the ones digit does not change.
• When you count by 5s, the ones digits flip back and forth between 2 digits.
• When you count by 2s, there is a pattern in the ones digits (2, 4, 6, 8, 0).
2. Count backward to continue each skip counting pattern.
   a) 
   b) 
   c) 
   d) 
   e) 
   f) 

3. There is a mistake in these counting by 5s patterns. Correct the mistake.
   a) 35, 40, 45, 410, 415, 420, ...
   b) 95, 90, 85, 80, 85, ...

4. You skip count from 34 to 54.
   List the numbers you would say in between.
   Show as many solutions as you can.

5. Why is skip counting forward or backward by 10 the same as adding or subtracting 10?

6. Why does the ones digit keep changing from 5 to 0 or 0 to 5 when you skip count by 5s?
**Skip Counting to 20**

**Use 20 counters.**

Show as many ways as you can to count the counters. Write all the numbers you say for each way you count.

You are “it” in a game of hide-and-seek. You count down starting at 20. You want to count faster than by 1s. What might you count by? Write down all the numbers you say.

What other ways could you count?

**You will need**

- counters
- 10-frames

**Guided**

You skip count when you are trying to count a group quickly.

**You will need**

- counters
- play coins (pennies and nickels)
- 10-frames

You also skip count to put numbers on a number line.

0 2 4 6

There are lots of ways to count. Sometimes we start at 1 and sometimes we start at other numbers. Sometimes we count more than one at a time.

- To count by 2s, you need to go up by 2 each time. To count by 2s starting at 4, you would say 4, 6, 8, 10, 12, 14, ...
  
  There is a pattern in the ones digits. This is called skip counting because you skip some of the counting numbers: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, ...

- To count forward by 5s, think of the numbers 5, 10, 15, 20.

- To count backward, you use the same numbers as counting forward, but you go the other way. To count backward by 2s from 16, you would say 16, 14, 12, 10, 8, 6, ...
Try These

1. Sketch the groups of buttons or use counters. Count them in groups of 2. Write the numbers you would say.
   a) 6 groups of 2 buttons

   

   b) 8 groups of 2 buttons

   

   c) 9 groups of 2 buttons and 1 extra button

   

2. Continue the skip counting pattern on the number line.

   0  2  4  6  8  10  12  14  16  18

3. Continue the skip counting pattern on the number line.

   18  20

4. You start at 4 and skip count by 2s. Write 3 numbers you will not say.

Comparing and Ordering to 1000

Maya gives these clues about 2 numbers:
• Both numbers have the same 3 digits.
• One number is much greater than the other.
What could the 2 numbers be?
List a few possible answers.

_______       ________
_______       ________
_______       ________

You will need
• base ten blocks
• a place value chart
• number lines

Pick one of your sets of numbers.
How do you know which number is greater?

Pick one of your sets of numbers.
How do you know that the greater number is much greater?

You will need
• base ten blocks
• a place value chart
• number lines
One school has 512 students.
Another school has 378 students.
You can compare the numbers to decide which school has more students.

- Model the numbers with base ten blocks and compare.

The number with more larger blocks is greater.
$512 > 378$

- Compare both numbers to a nearby number.

$512$ is more than 500.
$378$ is less than 500.

- Use a number line.

$512$ is to the right on the number line.

**Try These**

1. Which number is greater, 486 or 417?

Both numbers have _____ hundreds.
_____ has more tens than _____.
_____ is more than 480.
_____ is less than 480.

Which symbol makes the statement true? Circle it. $486 > < 417$

2. Circle the greater number in each pair.

a) [Base ten blocks]
   - or
   - [Base ten blocks]

b) [Base ten blocks]
   - or
   - [Base ten blocks]

c) [Base ten blocks]
   - or
   - [Base ten blocks]

d) [Base ten blocks]
   - or
   - [Base ten blocks]

3. Circle the greater number in each pair.

a) 513 or 531
b) 881 or 188
c) 113 or 311
d) 372 or 327
e) 66 or 65

4. Write $>$ or $<$ to compare the 2 numbers. Explain your answer.

a) 572 $<$ 417

b) 705 $>$ 750

Comparing numbers is useful when you have a choice about which of 2 things to buy or get. It also helps you decide if answers make sense when you add and subtract.
Jeff says that a two-digit number with a 3 in it is usually less than a number with a 9 in it. Do you agree? Explain your answer.

You will need
• base ten blocks
• a place value chart
• blank number lines

5. List 3 numbers that are greater than the given number.
   a) 132  _____  _____  _____
   b) 299  _____  _____  _____
   c) 317  _____  _____  _____
   d) 972  _____  _____  _____

6. Name a number that is greater than the first number and less than the second number. You can use the number line to help.
   a) 678  _____  872
   b) 412  _____  589
   c) 671  _____  681
   d) 612  _____  618

7. Use all of the given digits to make 3 different three-digit numbers. Then put the numbers in order.
   a) Use 1, 3, and 5.
      Your 3 numbers:  _____  _____  _____
      3 numbers in order:  _____  _____  _____
   b) Use 1, 3, and 9.
      Your 3 numbers:  _____  _____  _____
      3 numbers in order:  _____  _____  _____
   c) Use 2, 5, and 0.
      Your 3 numbers:  _____  _____  _____
      3 numbers in order:  _____  _____  _____
One student has 51 books. Another student has 37 books. You can compare the numbers to decide which student has more books.

- Model the numbers with base ten blocks and compare.

  The number with more larger blocks is greater. 5 tens is more than 3 tens. 51 > 37

- Compare both numbers to a nearby number.
  51 is more than 50; 37 is less than 50.

- Use a number line.

  0 10 20 30 40 50 60

  37

  51

  51 is to the right on the number line. 51 is past 50 and 37 is before 50.

**Try These**

1. Which number is greater, 48 or 41?

   Both numbers have _____ tens.

   _____ has more ones than _____.

   _____ is more than 45.

   _____ is less than 45.

Which symbol makes the statement true? Circle it. 48 > < 41

2. Circle the greater number in each pair.

   a) or

   b) or

   c) or

   d) or

3. Circle the greater number in each pair.

   a) 51 or 15

   b) 81 or 88

   c) 21 or 11

   d) 32 or 27

   e) 6 or 5

4. Write > or < to compare the 2 numbers. Explain your answer.

   a) 72 > 47

   b) 40 > 49

   c) 5 > 4

Comparing numbers is useful when you have a choice about which of 2 things to buy or get. It also helps you decide if answers make sense when you add and subtract.
5. List 3 two-digit numbers that are greater than each number.
   a) 34
   b) 29
   c) 37
   d) 97

6. Name a number that is greater than the first number and less than the second number. You can use the number line to help.
   a) 67
   b) 41
   c) 61
   d) 65

7. a) Make 3 numbers using 2 cards at a time.
   ______  ______  ______
   Which number is the greatest? ______
   b) Make 3 more numbers using the cards.
   ______  ______  ______
   Which number is the greatest? ______
   c) Is it possible to make a greater number? Tell why or why not.
   ______________________________________________________
   ______________________________________________________

8. There are more numbers between 51 and 61 than between 47 and 57. Do you agree or disagree? Explain your thinking.
   ______________________________________________________
   ______________________________________________________
GUIDED

Comparing and Ordering to 20

One group has 11 children. Another group has 9 children. You can compare the numbers to decide which group has more.

- Model the numbers and compare.

```
11

\[ \begin{array}{c}
\circ \circ \circ \\
\circ \circ \circ \\
\circ \circ \circ \\
\circ \circ \circ \\
\circ \circ \circ \\
\end{array} \]
```

11 > 9

- Compare both numbers to a nearby number.

11 > 9 since 11 is more than 10 and 9 is less than 10.

- Use a number line.

11 is to the right of 9 on a number line.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

- Line up the number of counters and compare.

```
\[ \begin{array}{c}
\circ \circ \circ \\
\circ \circ \circ \\
\circ \circ \circ \\
\circ \circ \circ \\
\circ \circ \circ \\
\end{array} \]
```

11 > 9 since there are leftovers.

- Count to see which number you say first.

## Try These

1. Circle the greater number in each pair.
   
   a) 5 or 8  
   b) 3 or 12  
   c) 8 or 10  
   d) 15 or 19  

2. Circle the greater number in each pair.
   
   a) 12 or 8  
   b) 15 or 17  
   c) 9 or 2  
   d) 10 or 12  
   e) 7 or 15  
   f) 17 or 9  
   g) 20 or 13  
   h) 11 or 8  

3. Name a number that is a little bit less than each number.
   
   a) 14  
   b) 10  
   c) 15  
   d) 8  

4. Name a number that is a little bit more than each number.
   
   a) 18  
   b) 10  
   c) 12  
   d) 3  

5. a) Make 2 numbers using 2 cards at a time.
   
   _______  _______

   Which number is greater? _______

   b) Make 3 more numbers using the cards.
   
   _______  _______  _______

   Which number is the greatest? _______

6. Name a number that is greater than the first number and less than the second number. Use the number line below.
   
   a) 3  
   b) 14  
   c) 9  
   d) 15  

7. There are more numbers between 0 and 10 than between 10 and 20. Do you agree or disagree? Explain your thinking.
   
   ____________________________________________
With Leaps and Bounds, mathematics intervention is as easy as 1, 2, 3!

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