ALL LEARNERS NETWORK

Additive Reasoning
Grade One HLC

Understanding of number values and sequences to 120 *(cross century, cross decade)*
Understanding place value when adding and subtracting numbers within 100 *(in context and in equations)*

September	⟶	**Grade One Learning Progressions**	⟶	June

Students must use models to build understanding of the HLC and interact with a variety of contexts.

Rote Oral Count Sequence Teachers need to purposefully choose a variety of number ranges including opportunities to practice teen numbers, crossing decades, and centuries. This information is often best collected in student interviews checking on clusters of 5 numbers at various starting points.

| Counts Forward (FWD) and Backward (BWD) within the range **1-30** starting at any number	Counts FWD and BWD within the range **1-50** starting at any number	Counts FWD and BWD within the range **1-100** starting at any number Skip counts by 10s FWD and BWD within the range 1-100 on decade.	Counts FWD and BWD within the range **1-120** starting at any number Skip counts by 10s FWD and BWD within the range **1-120** starting at any number.

Subitizing *(immediate recognition of quantity - ten and twenty frames, fingers, regular dot patterns)*

Conceptual subitizing within 20 *(quickly composing greater quantities by seeing and combining smaller parts and using groups of ten)*
This connects to an understanding of part/part/total and/or decomposing and recomposing.

Examples of quick images to support conceptual subitizing					
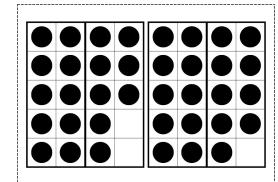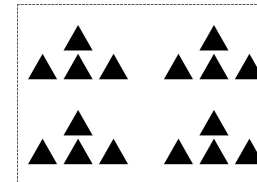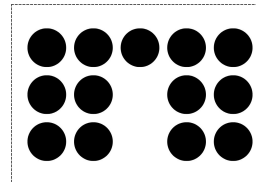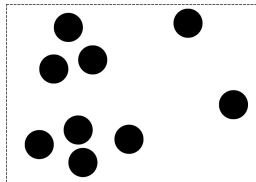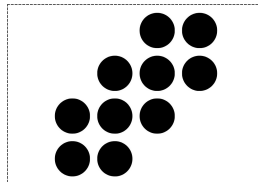
Symbolic Notation Reversals in numeral formation are expected at this developmental stage, but transpositions (eg., 71 for 17) are an indicator of a misconception and may interfere with representing quantities.

| Identifies and writes numerals within 20	Identifies and writes numerals within 100	Identifies and writes numerals within 120

ALL LEARNERS NETWORK

Counting Collections to Build Place Value Understanding

Students must use models to build understanding along this trajectory and interact with a variety of contexts for counting. Models should support students developing understanding of the magnitude of digits in their place values. Students are given amounts of discrete objects to determine the total quantity. All of the skills noted below are observable during a Counting Collection. Each understanding might develop at different times for each number range. **Students must use models to build understanding of unitizing: 10 ones = 1 ten; 10 tens = 1 hundred.**

Counts objects within 20	Counts objects within 50 (using groups of ten)	Counts objects within 100 (using groups of ten)	Counts objects within 120 (using groups of ten)

-1:1 correspondence (*each item gets one count*)
-Organizing (*keep track of what's been counted and what still needs to be counted without prompting*)
-Tracking and recording methods (*organizing, grouping and recording*)
-Stable order (*correct number word sequence*)
-Conservation of number (*quantity is the same regardless of arrangement - ex: objects lined up, then spread out, organized by 10 or not organized*)
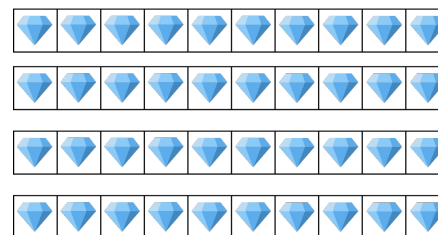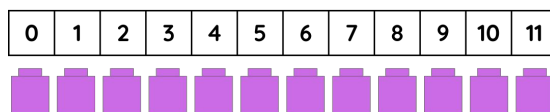
Examples of counting collections
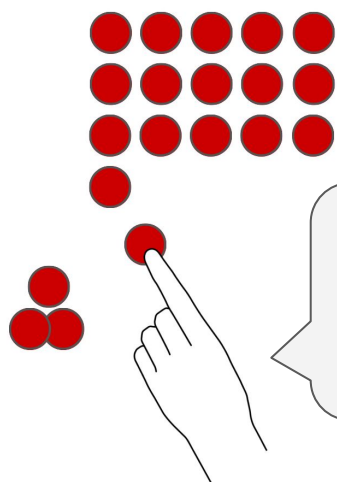
one, two, three, four, five,
six, seven, eight, nine, ten,
eleven, twelve, thirteen, fourteen, fifteen,
sixteen, seventeen, eighteen, nineteen, **twenty**

There are **twenty** dots.

ten, twenty, thirty,
thirty-one, thirty-two,
thirty-three, thirty-four,
thirty-five, thirty-six,
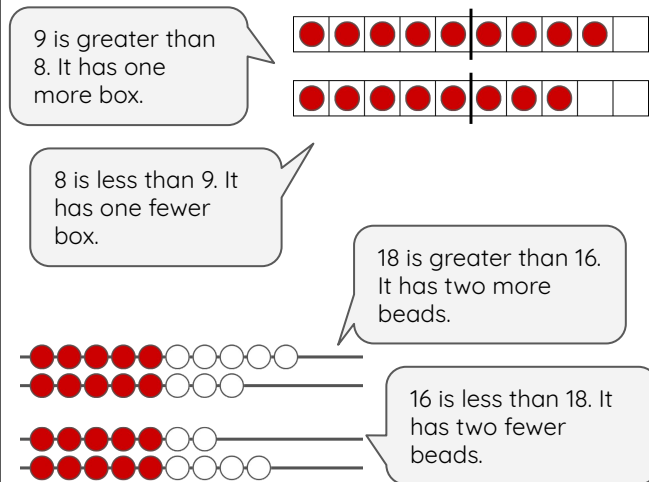**thirty- seven**

There are **thirty-seven** cubes.

Ten, twenty, thirty, **forty**

There are **forty** gems.

1 ten, 2 tens, 3 tens
and 7 ones is
thirty-seven

There are
thirty-seven cubes.

one, two, three, four, five,
six, seven, eight, nine, ten,
eleven

There are **eleven** cubes.

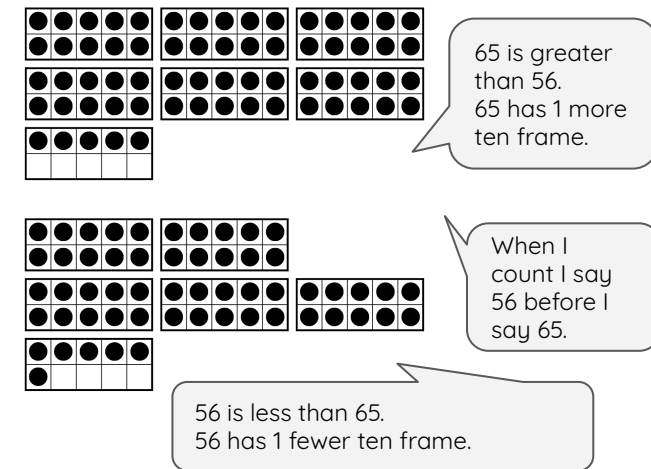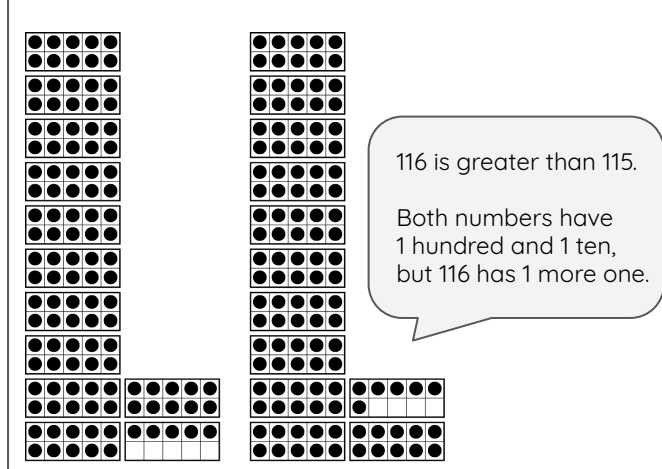| 0	1	2	3	4	5	6	7	8	9	10	11
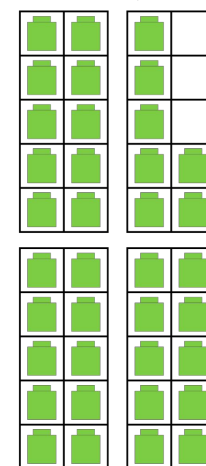
Ordering & Magnitude

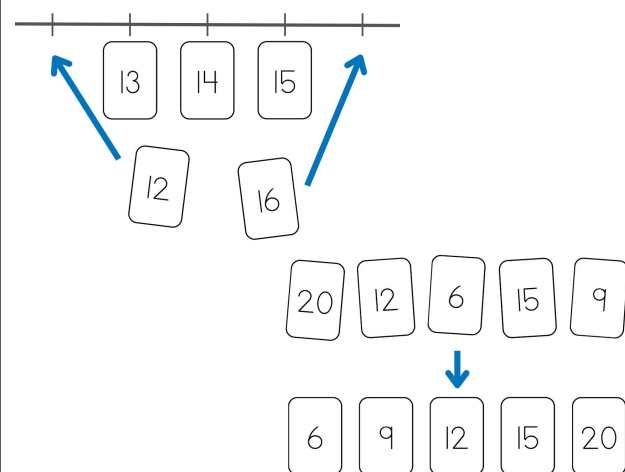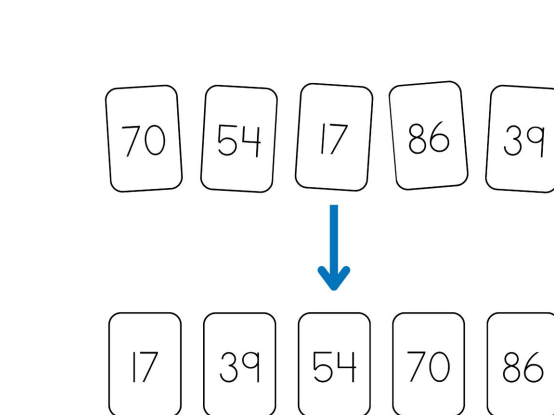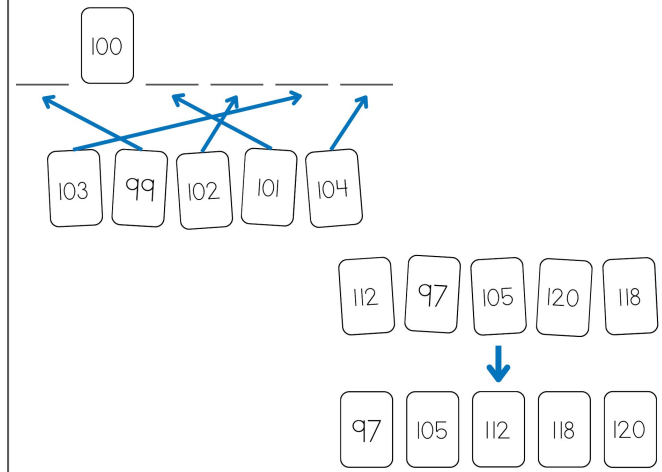| Compares quantities within 20 by using items or visuals - using perception and/or counting	Compares quantities within 100 by using models - using references to counting or how many more/less or by using place value	Compares quantities within 120 by using models - using place value language, including knowledge of tens and ones

9 is greater than 8. It has one more box.

8 is less than 9. It has one fewer box.

18 is greater than 16. It has two more beads.

16 is less than 18. It has two fewer beads.

65 is greater than 56. 65 has 1 more ten frame.

When I count I say 56 before I say 65.

56 is less than 65. 56 has 1 fewer ten frame.

116 is greater than 115.

Both numbers have 1 hundred and 1 ten, but 116 has 1 more one.

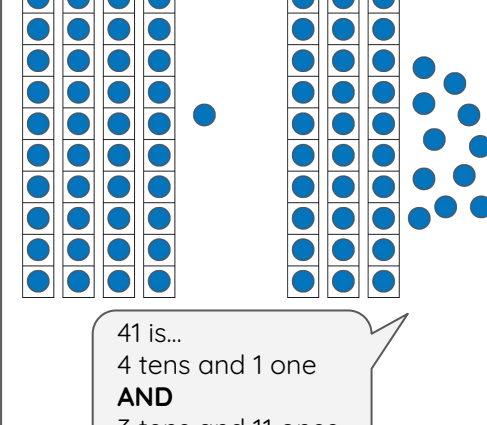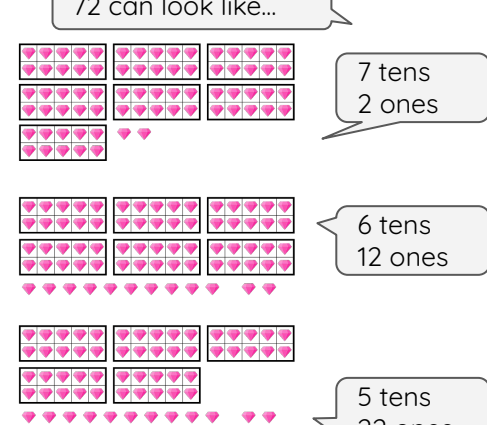| Orders numerals, sequential and nonsequential, within 20	Orders numerals, sequential and nonsequential, within 100	Orders numerals, sequential and nonsequential, within 120

13 14 15
12 16

20 12 6 15 9

6 9 12 15 20

70 54 17 86 39

17 39 54 70 86

100

103 99 102 101 104

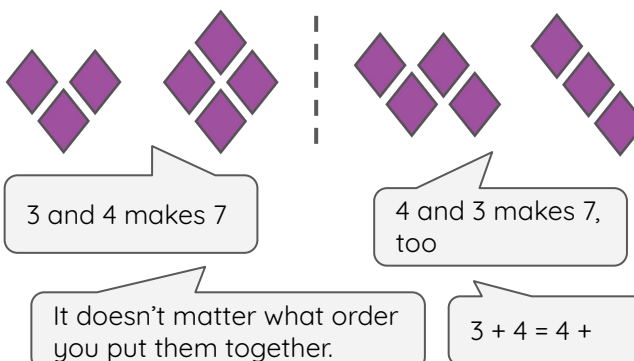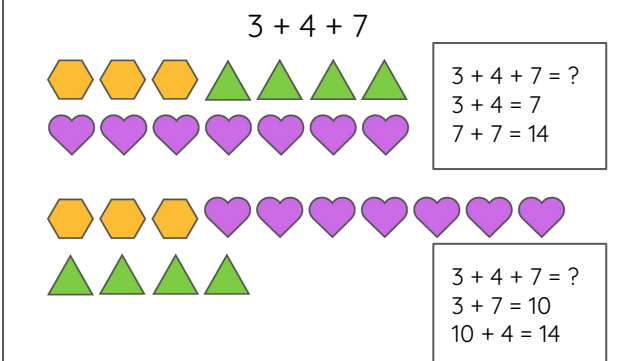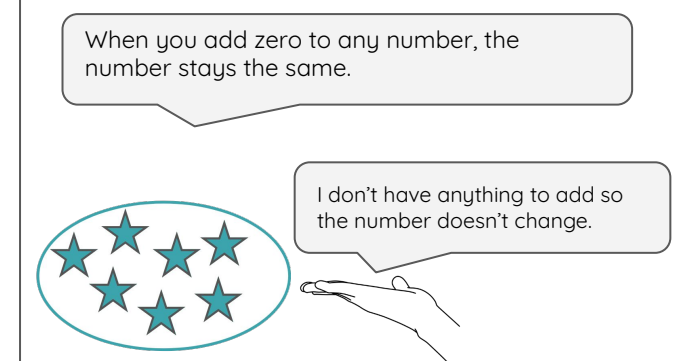112 97 105 120 118

97 105 112 118 120

ALL LEARNERS NETWORK
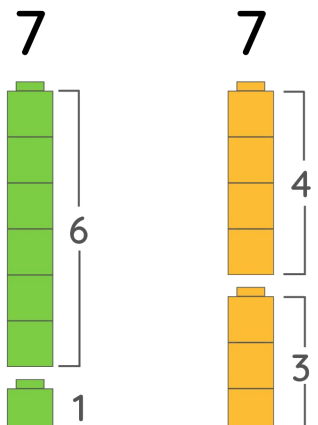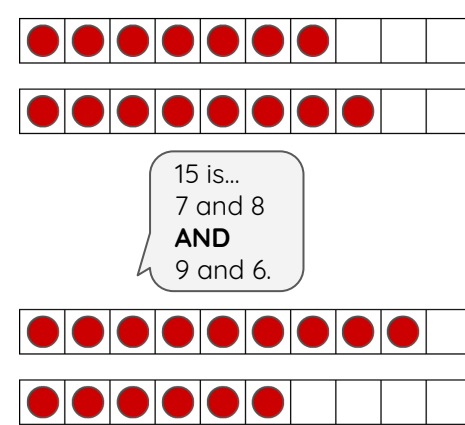
Operations: Addition and Subtraction
Students must use models to build understanding along this trajectory and interact with a variety of contexts for addition and subtraction. Models should support students developing understanding of the magnitude of digits in their place values.

Composition, Decomposition
Students must use models to build understanding and flexibility when composing and decomposing quantities.

All numbers within the range 1-10	All numbers within the range 1-20	All numbers within the range 1-50	All numbers within the range 1-100

7   7

6 1

4 3

15 is…
7 and 8
AND
9 and 6.

41 is…
4 tens and 1 one
AND
3 tens and 11 ones.

72 can look like…

7 tens
2 ones

6 tens
12 ones

5 tens
22 ones

Properties of Addition
These properties are investigated throughout the year with different numbers and problem situations. *The sequence of how the properties appear below does not suggest the order in which to explore them.* Many times the properties can be explored simultaneously with student work.

Commutative Property	Associative Property	Identity Property

3 and 4 makes 7

4 and 3 makes 7, too

It doesn't matter what order you put them together.

3 + 4 = 4 +

3 + 4 + 7

3 + 4 + 7 = ?
3 + 4 = 7
7 + 7 = 14

3 + 4 + 7 = ?
3 + 7 = 10
10 + 4 = 14

When you add zero to any number, the number stays the same.

I don't have anything to add so the number doesn't change.

ALL LEARNERS NETWORK

Place Value - Building Understanding Students must use models to build understanding along this trajectory and interact with a variety of contexts for addition and subtraction. Models should support students developing understanding of the magnitude of digits in their place values.

Models the number 1 more/1 less within 20 (connect to before/after)	Models the number 1 more/1 less within 50	Models the number 1 more/1 less within 100	Models the number 1 more/1 less within 120

6 comes before 7.

7 comes after 6.

6 is one less than 7.

7 is one more than 6.

7 comes before 8.

8 is one more than 7.

29 is one less than 30.

31 is one more than 30.

58 is one less than 59.

59 is one more than 58 and one less than 60.

60 is one more than 59.

108 is one less than 109.

109 is one less than 110 and one more than 108.

110 is one more than 109.

Models the number 10 more/10 less within 50	Models the number 10 more/10 less starting at any number within 100	Models the number 10 more/10 less starting at any number within 120

10 is ten less than 20.

20 is ten more than 10 and ten less than 30.

30 is ten more than 20.

49 is ten less than 59.

59 is ten more than 49 and ten less than 69.

69 is ten more than 59.

100 is ten less than 110.

110 is ten less than 120 and ten more than 100.

120 is ten more than 110.

ALL LEARNERS NETWORK

Use Place Value to compose, decompose and recompose
Decompose both numbers to add and subtract, decompose one number to add and subtract, recompose like units, missing addend, compensation
There is an explicit connection between counting and addition (i.e. counting 10 more is the same as adding 10, counting back 10 is the same as subtracting 10).

Models & Strategies for Addition

	Strategies		
Models	**Place Value: Decompose both numbers**	**Place Value: Decompose one number**	**Compensation**
Ten Frames	$34+17$ $30+4$ $10+7$ $30+10=40$ $4+7=11$ $40+11=51$	$34+17$ $10+7$ $34+10=44$ $44+7=51$	$34+17$ $-3 \to 31+20 \gets +3$ $34-3=31$ $17+3=20$ $31+20=51$
Number Path	$34+17$ $30+4$ $10+7$ $30+10=40$ $40+4=44$ $44+7=51$	$34+17$ $10+7$ $34+10=44$ $44+7=51$	$34+17$ $-3 \to 31+20 \gets +3$ $34-3=31$ $17+3=20$ $31+20=51$
Place Value Materials	$34+17$ $30+4$ $10+7$ $30+10=40$ $4+7=11$ $20+11=51$	$34+17$ $10+7$ $34+10=44$ $44+7=51$	$34+17$ $31+20$ $34-3=31$ $17+3=20$ $31+20=51$

Models & Strategies for Subtraction

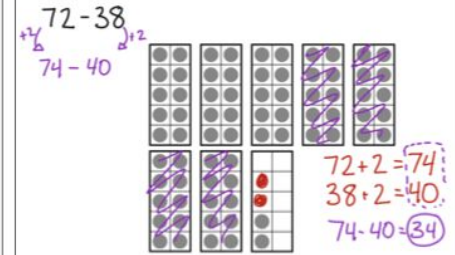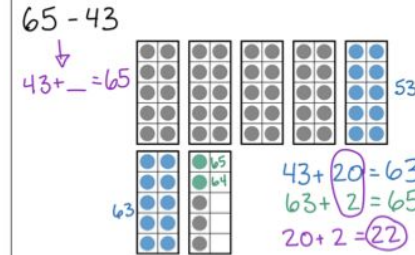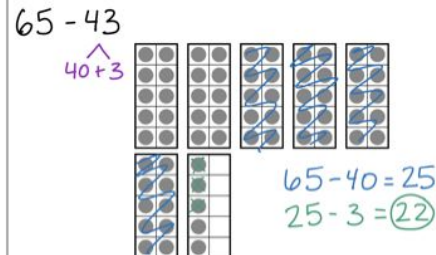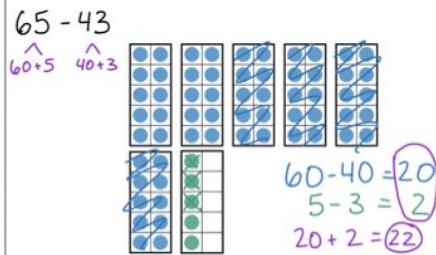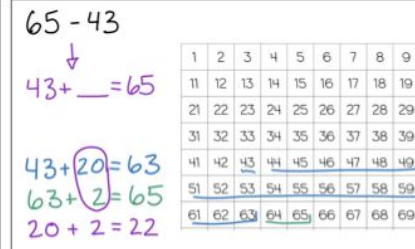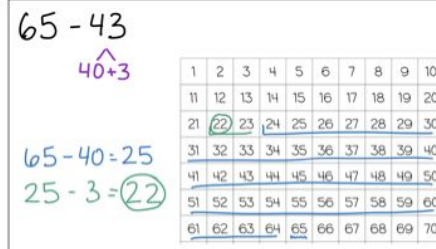|	Strategies			
Models	Place Value: Decompose both numbers	Place Value: Decompose one number	Missing Addend	Compensation
Ten Frames	65 - 43 60+5 40+3 60-40=20 5-3=2 20+2=22	65 - 43 40+3 65-40=25 25-3=22	65 - 43 43+__=65 43+20=63 63+2=65 20+2=22	72-38 74-40 72+2=74 38+2=40 74-40=34
Number Path	Number Paths are not an appropriate model for this strategy.	65 - 43 40+3 65-40=25 25-3=22	65 - 43 43+__=65 43+20=63 63+2=65 20+2=22	Number Paths are not an appropriate model for this strategy.
Place Value Materials	65 - 43 60+5 40+3 60-40=20 5-3=2 20+2=22	65 - 43 40+3 65-40=25 25-3=22	65 - 43 43+__=65 43+20=63 63+2=65 20+2=22	72-38 74-40 72+2=74 38+2=40 74-40=34