

1

Counting Large Collections



Counting beyond 100 uses the same patterns as counting to 100.

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

Starting at one hundred eight, 108, 109, 110, 111, 112, 113, 114, ...

Starting at one hundred forty-six, 146, 147, 148, 149, 150, 151, 152, ...

What numbers come after 199?
After 209?

Explore

Choose a collection of objects.

Group the objects, then count them.

Find a different way to group the objects. Count again.

Record your work.



Show and Share

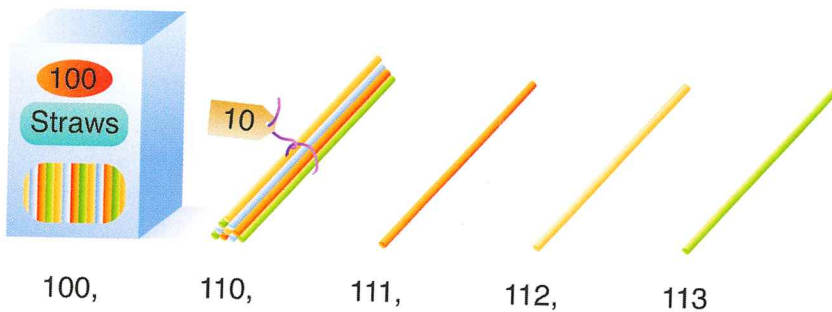
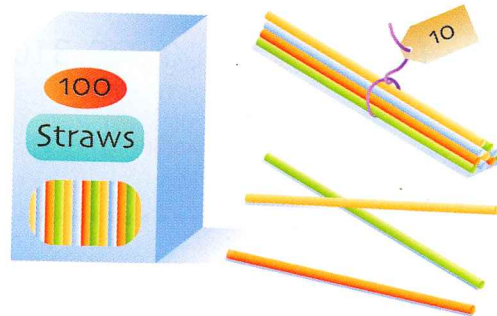
Show your collection to another group.
Explain how grouping helped you count the objects.
Discuss other ways you could group the objects.

Connect

One way to count a large collection is to make groups of tens and hundreds.

- ▶ Count the straws.
There is one group of 100, one group of 10, and three 1s.

First count the hundreds, then count on the tens and the ones.



There are one hundred thirteen straws.

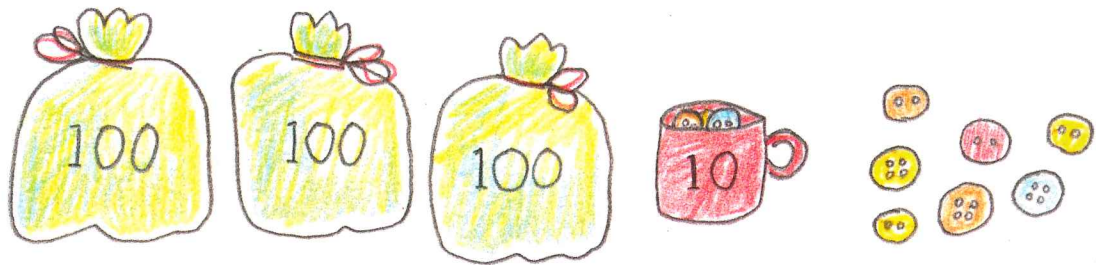
- ▶ Count the buttons.
There are 2 bags of 100 buttons, 3 cups of 10 buttons, and 4 single buttons.



There are two hundred thirty-four buttons.

► Draw a collection of 317 buttons.

Think: I need to draw 3 bags of 100 buttons, 1 cup of 10 buttons, and 7 single buttons.

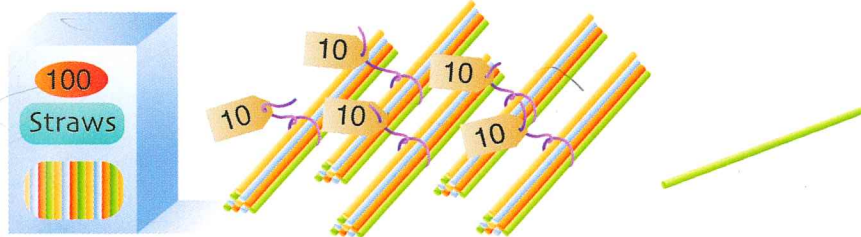


Count to check: 100, 200, 300, 310, 311, 312, 313, 314, 315, 316, 317

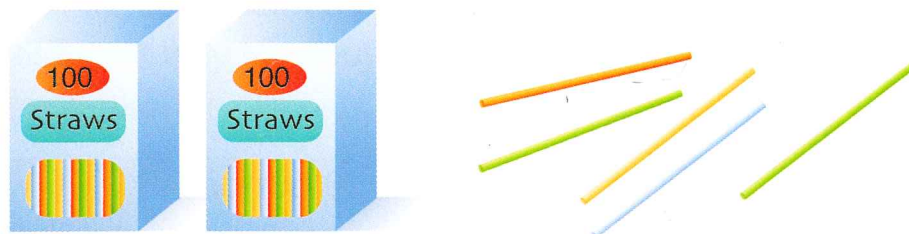
Practice

1. How many? Record your count.

a)



b)



2. Draw pictures to represent each number.

Tell the number of hundreds, tens, and ones.

a) 139

b) 224

c) 120

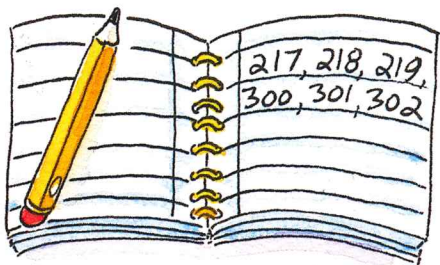
d) 73

3. Why do we use groups of tens and hundreds to help count large collections?



4. Draw a collection of 333 objects.
Use your drawing to explain the meaning of each digit in the number 333.

5. Céline counted the pennies in her bank but she knows she isn't right.
Find her mistake and correct the count.



6. Copy the rows of this hundred chart.
Fill in the missing numbers.

101	102	103	104	105				109	
	112	113			116	117	118		
		123	124	125	126	127	128		

7. Michael filled in this row of a hundred chart.
Find the mistakes he made.
What numbers belong in those spaces?

251	252	253	254	255	265	257	258	259	270
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Reflect

Explain one way to make counting large collections easier.

At Home

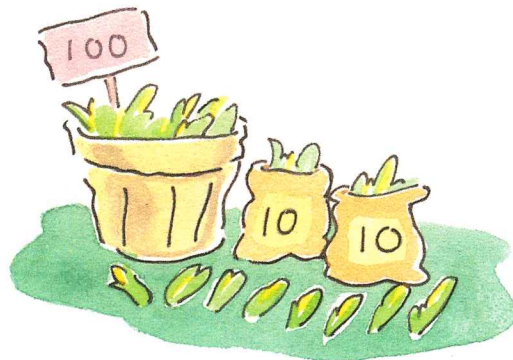


Find a large collection. Count how many objects are in the collection.

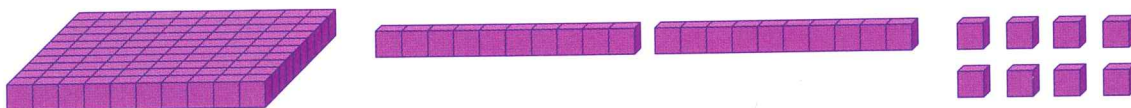
Modelling 3-Digit Numbers

A farmer harvests 128 ears of corn.

You can use pictures to show this number.



You can use Base Ten Blocks to model this number.



You can use a place-value chart to show this number.

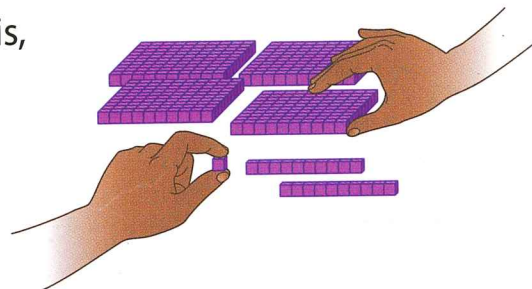
Hundreds	Tens	Ones
1	2	8

Explore



You will need Base Ten Blocks and a place-value chart.

- Choose a secret number between 100 and 1000. Model it with Base Ten Blocks.
- Have your partner tell what the number is, and write it in a place-value chart.
- Switch roles. Repeat this activity 5 times.

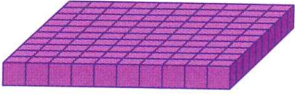




Show and Share

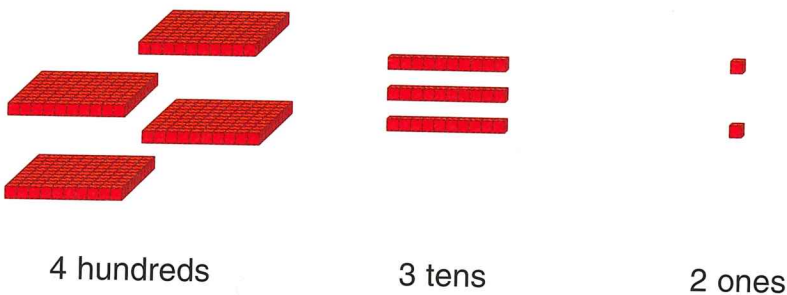
Tell your partner how you knew what to write in the place-value chart.

Connect

Our number system is based on groups of 10.

		
100 one hundred 1 hundred = 10 tens	10 ten 1 ten = 10 ones	1 one

Here is one way to model 432.



Hundreds	Tens	Ones
4	3	2

↑

The value of this digit is 4 hundreds, or 400.

↑

The value of this digit is 3 tens, or 30.

↑

The value of this digit is 2 ones, or 2.

We can think of 432 as $400 + 30 + 2$.
 The base-ten name is 4 hundreds 3 tens 2 ones.
 In words: four hundred thirty-two

Here is a way to show 205.

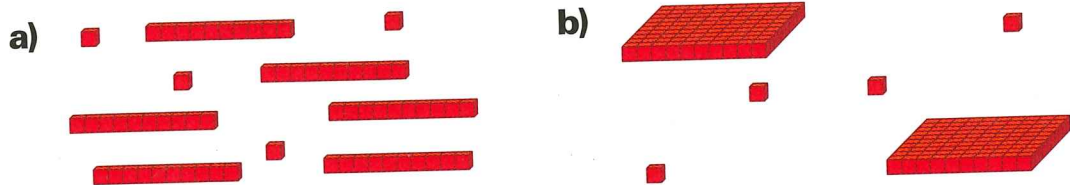
Hundreds	Tens	Ones
2	0	5

The base-ten name is 2 hundreds 5 ones.
 In words: two hundred five

The 0 in 205 tells we can model the number using no tens.

Practice

1. Use a place-value chart to show each number. Write the number.



2. Draw a picture to show each number.

- a) 417 b) 540 c) 966 d) 795 e) 128 f) 702

3. Write the base-ten name for each number.

- a) 582 b) 414 c) 690 d) 308 e) 500 f) 987

4. Write the number for each base-ten name.

- a) 9 hundreds 6 tens 2 ones b) 7 hundreds 8 tens
c) 5 hundreds 7 ones d) 8 hundreds 8 tens 8 ones

5. Give the value of each underlined digit.

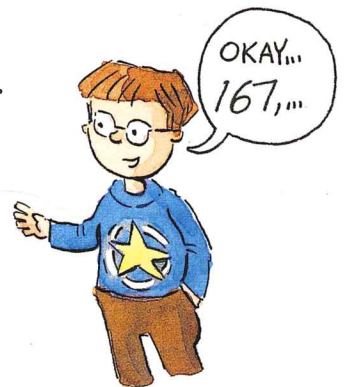
- a) 854 b) 715 c) 109 d) 526
e) 708 f) 339 g) 350 h) 688



6. a) How many ones make 1 ten?
b) How many tens make 1 hundred?
c) How many hundreds make 1 thousand?
d) What pattern do you see?
e) How many thousands make 10 000? Explain.

7. Draw Base Ten Blocks to show each answer.

- a) Which number is 10 more than 167?
b) Which number is 3 less than 348?
c) Which number is 200 more than 203?



Reflect

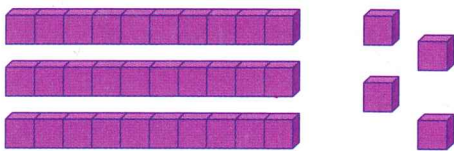
How does the value of each digit in 747 depend on its place in the number?
Use words, pictures, or numbers to explain.

3

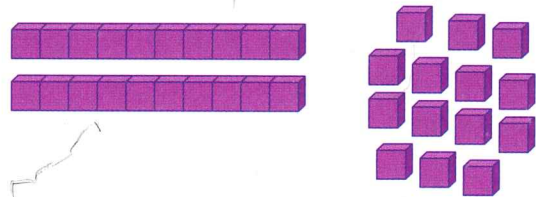
Showing Numbers in Many Ways

Sam and Jamie use Base Ten Blocks to model the number 34.

Sam: 3 tens 4 ones



Jamie: 2 tens 14 ones



What other ways can you model 34 with Base Ten Blocks?

Explore



You will need Base Ten Blocks, a pencil, and paper.

- Show 236 in 3 different ways with Base Ten Blocks. Record each way. Use pictures, words, and numbers.

Show and Share

Talk about the different ways you modelled the number.

Connect

Here are different ways to show 208.
When you use digits, the number is written in **standard form**: 208

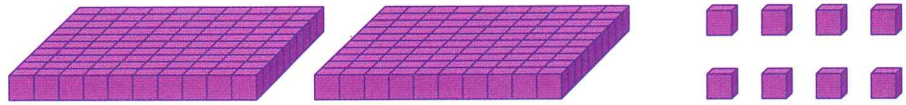
Picture:

Base-ten name: 2 hundreds 8 ones

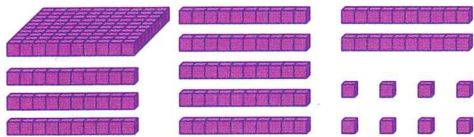
Place-value chart:

Hundreds	Tens	Ones
2	0	8

Base Ten Blocks:

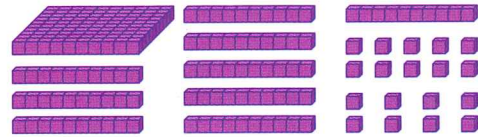


You can also show 208 as



1 hundred 10 tens 8 ones

or as



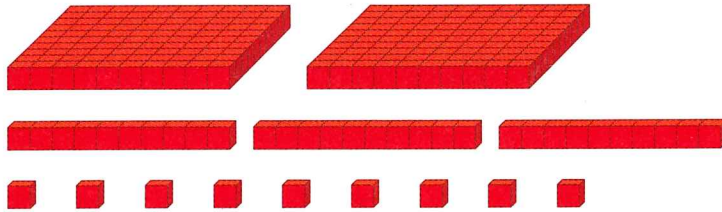
1 hundred 9 tens 18 ones

Practice

Use Base Ten Blocks when they help.

1. Write the base-ten name for each number.

a)



b) 862

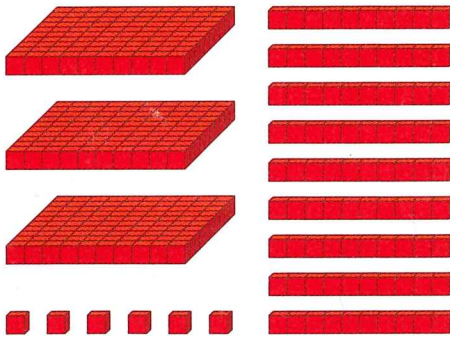
c) 501

d) twenty-seven



2. Write each number in standard form.

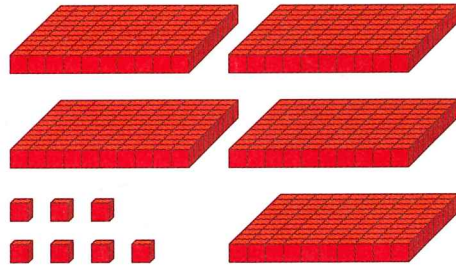
a)



c) sixty-seven

e) ninety-four

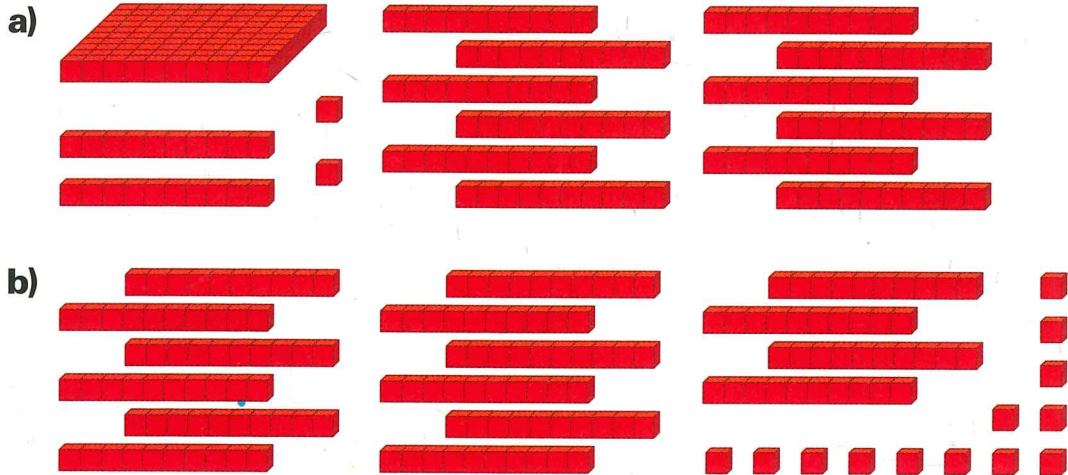
b)



d) 6 hundreds 8 tens

f) 3 hundreds 4 tens 5 ones

3. Draw Base Ten Blocks to show each number using the fewest blocks. Write each number in standard form.



4. Show each number in 3 different ways.

a) 286

b) 309

c) 529

Compare your ways with those of your classmates.

What do you notice?

5. Draw Base Ten Blocks to show each number in 3 different ways.

a) 61

b) 315

c) 406

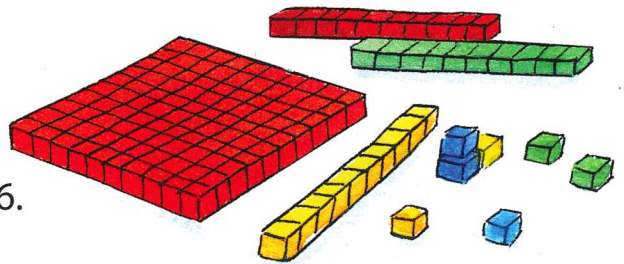
6. What does the zero in 308 mean?



7. Draw Base Ten Blocks.

Show 267 using exactly 24 blocks.

Explain how you did it.

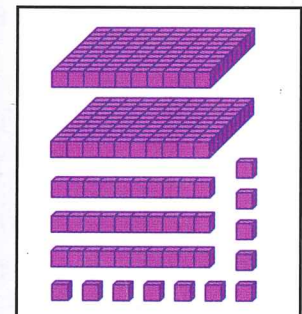
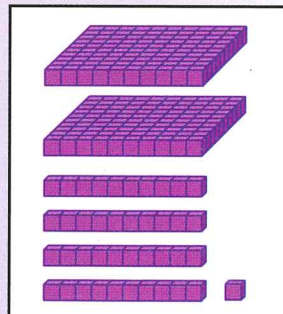


8. Ellen says that there are 53 tens in 536.

Do you agree? Explain your thinking.

Reflect

How do you know that both pictures show 241? Use words, numbers, or pictures to explain.



5

Comparing and Ordering Numbers

Explore



Who Has the Greatest Number?

You will need a game board for each player and 4 sets of cards numbered 0 to 9. Shuffle the cards and place them face down.

- Each player makes a 3-digit number. Follow these steps.
 - Turn over the top card to show a number.
Write the number in a blank space in the top row of your game board.
 - Turn over a second and third number.
- Players read out the 3-digit numbers they have made.
- The player with the greatest number gets 1 point.
If 2 or more players have the same number, each player gets a point.
- Move to the next row of your game board.



Play until one of you reaches 5 points.

Play the game again.

This time, try to make the least number.

Show and Share

Show how you decided where to put each number on your game board.

How did your strategy help you reach the greatest number?

The least number?

► You can use place value to **compare** numbers.

To compare 472 and 476:

1. Compare the hundreds digits.

472

476

Both have 4 hundreds, or 400.

2. Compare the tens digits.

472

476

Both have 7 tens, or 70.

3. Compare the ones digits.

472

476

2 ones are less than 6 ones.

Since 2 is less than 6, then 472 is *less than* 476 and 476 is *greater than* 472.

You can write this as:

$472 < 476$

and

$476 > 472$

This symbol means "less than."

This symbol means "greater than."

► You can also use place value to **order** numbers.

To order 574, 384, and 578, compare each digit.

Hundreds	Tens	Ones
5	7	4
3	8	4
5	7	8

384 has the fewest hundreds, so it is the least number.

578 and 574 have the same numbers of hundreds and tens.

574 has fewer ones than 578.

So, $574 < 578$.

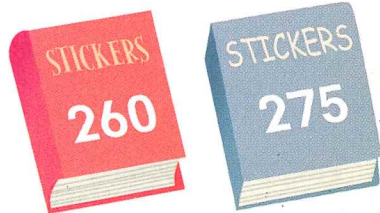
The order from least to greatest is 384, 574, 578.

The order from greatest to least is 578, 574, 384.

Practice

1. Which book has the greater number of stickers?
How do you know?

a)



b)



2. Copy each pair of numbers.

Use $>$ or $<$ to make a true statement.

a) $335 \square 281$

b) $435 \square 462$

c) $705 \square 709$

d) $162 \square 94$

3. Copy each statement.

Write a number to make each statement true.

a) $710 > \square$

b) $984 < \square$

c) $630 > \square$

d) $\square < 720$

e) $\square < 391$

f) $\square > 99$



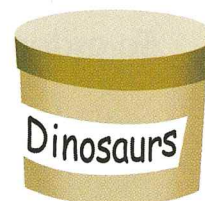
4. The number of dinosaurs in each box has 3 digits:
2, 5, and 6.

The blue box has fewer dinosaurs
than the green box.

How many dinosaurs could there be
in each box?

How do you know?

Show your work.



5. Which is the least number? How do you know?

a) 968

b) 215

c) 158

d) 528

79

296

96

514

841

207

91

404

324

233

382

671

6. These numbers should be in order from least to greatest. Find the errors. Write the numbers in the correct order.
- a) 43, 430, 417, 741 b) 296, 207, 215, 233
 c) 404, 541, 514, 528 d) 96, 91, 158, 149
7. Order the numbers from least to greatest.
- a) 625, 431, 662, 523
 b) 121, 99, 496, 407
8. Order the numbers from greatest to least.
- a) 510, 961, 847, 941 *510, 847, 941, 961*
 b) 865, 502, 969, 45
9. Write a number between 576 and 841.
 How do you know your number fits?
10. How many different 3-digit numbers can you write with the digits 3, 4, 7?
 Order the numbers from greatest to least.
 How can you tell if you have found all possible numbers?
11. Look at the numbers 263 and 460.
 How many digits do you need to compare to find which number is greater? Explain.

Math Link

History

Around 1900 BCE, the Babylonians counted by 60s because there are 60 minutes in 1 hour.

Around 700 CE, the Hindus in India were counting by 10s and using the numerals we use today.
 Why do you think we count by 10s?

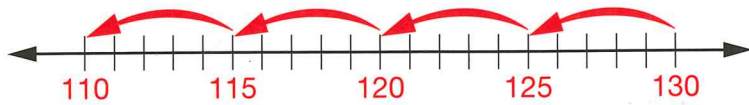


Reflect

Choose 3 different numbers between 100 and 500.
 Explain how to order the numbers.

Counting by 5s, 10s, 25s, and 100s

We can use a **number line** to count.



Start at 130. Count back by 5s.

130, 125, 120, ...



Explore



You will need a copy of blank number lines.

- Choose a starting number. Label it on a number line.
- Count on by 5s or 10s.
Record your count on the number line.
- Choose a different starting number. Label it.
- Count back by 5s or 10s. Record your count.
- Try different starting numbers.



Show and Share

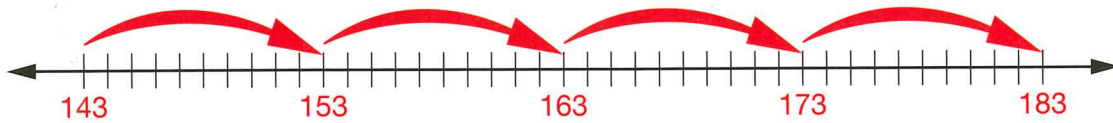
Trade number lines with another pair of students.

Check each other's work.

Share the patterns that you see.

Connect

- To count on by 10s, start anywhere.

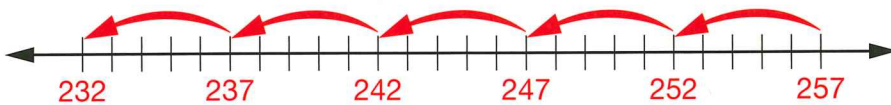


Note the pattern in the ones digits: 3, 3, 3, 3, 3, ...

Think about how this would look on a hundred chart.

141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190

- To count back by 5s, start anywhere.

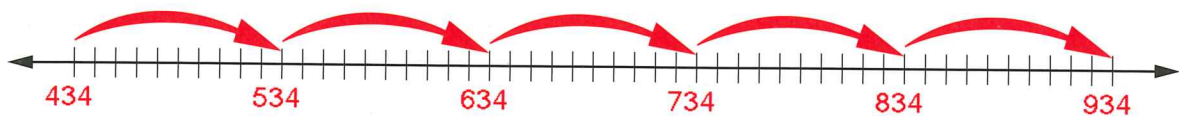


Note the pattern in the ones digits: 7, 2, 7, 2, 7, 2, ...

Think about how this would look on a hundred chart.

231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260

- To count on or back by 100s, start anywhere.



Only the hundreds digit is changing.
It is increasing by 1 each time: 4, 5, 6, 7, 8, 9.

- We can also count on or back by 25s.
Start at a number that ends in 25, 50, 75, or 00.

801	802	803	804	805	806	807	808	809	810
811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830
831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850
851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870
871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890
891	892	893	894	895	896	897	898	899	900

901	902	903	904	905	906	907	908	909	910
911	912	913	914	915	916	917	918	919	920
921	922	923	924	925	926	927	928	929	930
931	932	933	934	935	936	937	938	939	940
941	942	943	944	945	946	947	948	949	950
951	952	953	954	955	956	957	958	959	960
961	962	963	964	965	966	967	968	969	970
971	972	973	974	975	976	977	978	979	980
981	982	983	984	985	986	987	988	989	990
991	992	993	994	995	996	997	998	999	1000

Start at 825. Count on:

825, 850, 875, 900, 925, 950, 975, 1000

Note the pattern in the last 2 digits:

25, 50, 75, 00, 25, 50, ...

Start at 950. Count back:

950, 925, 900, 875, 850, 825, ...

Note the pattern in the last 2 digits:

50, 25, 00, 75, 50, 25, ...

Can you continue
my pattern?
825, 125, 625, ...



Practice

- Use number lines.
 - Start at 129. Count on by 5s to 169.
 - Start at 421. Count back by 10s to 321.
 - Start at 200. Count on by 25s to 350.
 - Start at 887. Count back by 100s to 287.

For questions 2, 3, and 4, use number lines or hundred charts.

- Start with each number.
Count by 5s, 10s, or 100s.
Describe your pattern.
 - 375
 - 812
 - 199
- Copy each pattern. Fill in the missing numbers.
 - $\square, 261, 361, 461, \square$
 - $\square, 758, 748, 738, \square$
 - $\square, 434, 429, 424, \square$
 - $\square, 525, 550, 575, \square$
- Find the mistakes in the patterns.
Rewrite the patterns correctly.
 - 369, 469, 669, 769
 - 876, 871, 866, 851
 - 375, 350, 327, 300
 - 519, 509, 419, 409



- Philippe started at 625 on a number line and counted on. He stopped at 725. What might his number pattern be? Find at least 2 ways he could have made the pattern. Show your work.



Reflect

Show a number pattern of your own on a number line.
Describe the pattern.

7

Skip Counting with Coins

A loonie is worth one dollar.
One dollar is also 100 cents.

The coin is named after the loon, a bird that lives in many parts of Canada.



The yellow-billed loon is a graceful swimmer. It dives for fish in the Arctic wetlands.

Explore



Choose a bag of coins.
Count how much money you have.
Record your work.

How many ways can you find to count the money?
Use pictures, numbers, or words to show how you counted.



Show and Share

Share your counting strategies with another pair of students.
Show them all the ways you used to count.

Connect

You can skip count to find the value of coin collections.

- Each quarter is worth 25 cents. Count by 25s.



25,



50,



75,



100,



125,



150,



175

The quarters are worth
one hundred seventy-five cents.
One hundred cents is one dollar.
So, we say one dollar and
seventy-five cents.

When we have more than
100 cents, we can say the
amount in dollars and cents.

- Each dime is worth 10 cents. Count by 10s.



10,



20,



30,



40,



50,



60,



70,



80,



90,



100,



110,



120

The dimes are worth one hundred twenty cents.
We say one dollar and twenty cents.

Ten dimes are one dollar. So, we could also arrange the dimes like this.



one dollar



one dollar and ten cents



one dollar and twenty cents

The dimes are worth one dollar and twenty cents.

Practice

1. Draw nickels to show one dollar and five cents.
2. Count the money. Write each amount in words.

a)



b)



c)



d)



3. How much money is in each picture?



4. Krista counted the nickels from her bank. Is her count correct? If not, find her mistake and correct it.

5, 10, 15, 20,
25, 35, 40



5. David has one dollar in his pocket. All his coins are the same. What coins could he have? How many solutions can you find? How can you tell if you have found all the solutions?

Reflect

How much are twenty nickels worth?
Use pictures, words, or numbers to show your work.