### **Number Identification:** Determine Whole Number Digit Values

#### **New Zealand Curriculum**

This lesson plan could be used to support the teaching and learning of the following Achievement Objective(s) from the New Zealand Curriculum.

Whole Lesson Time

50 mins

All timings are approximate.

#### Level Number 3: Number Knowledge

Achievement Objective: Know how many tenths, tens, hundreds and thousands are in a whole number.

<b>Student-Friendly Learning Intention:</b> To determine the value of each digit in the numbers to 1,000,000.	Resources: Lesson Pack Assessment Resource - a success criteria	Preparation: Place Value Grid - one per student Digit Detective Instructions - one per class	
Success Criteria: I can write numbers correctly into a	marking sheet is included if you wish to assess this lesson.	Digit Detectives Top Cards (Differentiated) - one per pair, printed onto card and cut out	
place value grid.		(Differentiated) - one per student	
I can describe the value of different digits.		Clock Face Conundrum - one per student	
I can use my knowledge of place value to determine the value of the whole		Digit Detective Number Sense Activity Sheet - one per student	
number.		Problem-Solving Cards - as required	
I can compare the value of the same digit in different numbers.	Key/New Words: Million, number, ten, hundred, thousand, ten thou	sand. hundred thousand.	

#### **Prior Learning**

It will be helpful if students have covered reading and writing numbers up to 1,000,000.

#### Learning Sequence

Suided Groups         Image: Suided Groups         Image: Suided Groups         Image: Suide Groups </th <th>Warm-up Describing Digits: Using the Lesson Presentation, guide students on how to use place value grids to understand the values of each digit. The presentation dives deeper into highlighting a digit and understanding the value of that digit. Students use the Place Value Grid to find the value of specific digits highlighted in the PowerPoint slides.</th> <th>10 mins</th>	Warm-up Describing Digits: Using the Lesson Presentation, guide students on how to use place value grids to understand the values of each digit. The presentation dives deeper into highlighting a digit and understanding the value of that digit. Students use the Place Value Grid to find the value of specific digits highlighted in the PowerPoint slides.	10 mins
Can students write numbers correctly into a place value grid.         Can students describe the value of different digits.         Can students use their knowledge of place value to determine the value of the whole number.         Can students compare the value of the same digit in different numbers?         Image: the students will identify the value of a digit in a number and compare the value of that digit to the digit in another students number by using the Place Value Grid for support. You may wish to use the Lesson Presentation as an example to the task. Students will need the two star Digit Detectives Top Cards and Digit Detective Instructions.         Can students write numbers correctly into a place value grid.         Can students use their knowledge of place value to determine the value of the whole number.         Can students use their knowledge of place value to determine the value of the whole number.         Can students use their knowledge of place value to determine the value of the whole number.         Can students will identify the value of the digit in a number and compare the value of that digit to the digit in another students number. You may wish to use the Lesson Presentation as an example to the task. Students will identify the value of the digit Detectives Top Cards and Digit Detective Instructions.         Can students describe the value of different digits.         Can students describe the value of different digit	Guided Groups  In this group, students will identify the value of a digit in a number and compare the value of that digit to the digit in another students number by using the Place Value Grid for support. You may wish to use the Lesson Presentation as an example to the task. Students will need the one star Digit Detectives Top Cards and Digit Detective Instructions.	10 mins Per Group
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Can students use their knowledge of place value to determine the value of the whole number.	Can students describe the value of different digits.	
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Can students compare the value of the same digit in different numbers?	
Follow-up Activities         This group will complete the one star Digit Detective Challenge Sheet where students will look at the value of each digit and be able to increase or decrease value. Students will demonstrate that they have a solid knowledge of place value by knowing which digit to change.	10 mins
This group will complete the two star <b>Digit Detective Challenge Sheet</b> where students will look at the value of each digit and be able to increase or decrease value. Students will demonstrate that they have a solid knowledge of place value by knowing which digit to change. Students are asked to swap the digits of a number and then work out the difference.	
This group will complete the three star <b>Digit Detective Challenge Sheet</b> where students will look at the value of each digit and be able to increase or decrease value. Students will demonstrate that they have a solid knowledge of place value by knowing which digit to change. Students are asked to swap the digits of a number and then work out the difference.	
Independent Activity Ideas Solveit: Students find the value of each digit in their own number by using the Digit Detective Number Sense Activity Sheet. Students then increase or decrease the value of the number by changing a digit.	15 mins
TickTockit: Students are challenged to place numbers on a clock face, based on a series of clues to solve the Clock Face Conundrum.	
Matchit: Students use theseto match the number inwords to the number in digit	
Wrap-upUse theseto make numbers together and compare the value of digits as well as the wholenumber. Eg. Can you make a number with five tens? Can you make a second number with five hundredthousands? Which number has the greatest overall value?	10 mins

#### **Extending Learning**

For schools following a problem-solving approach, you may wish to extend learning with the **Problem-Solving Cards**. Alternatively, these could be used as a home learning task or introduction to another lesson.

### **Disclaimer/s**

We hope you find the information on our website and resources useful.

### Animations

This resource has been designed with animations to make it as fun and engaging as possible. To view the content in the correct formatting, please view the PowerPoint in 'slide show mode'. This takes you from desktop to presentation mode. If you view the slides out of 'slide show mode', you may find that some of the text and images overlap each other and/or are difficult to read.

To enter slide show mode, go to the **slide show menu tab** and select either **from beginning or from current slide**.

# **Mathematics**

### **Number Identification**

Mathematics | Number Identification | Read and Write Numbers to 1,000,000 | Determine Whole Number Digit Values | Lesson 3 of 4



### **Learning Intention**

• To determine the value of each digit in numbers to 1,000,000.

### **Success Criteria**

- I can write numbers correctly into a place value grid.
- I can describe the value of different digits.
- I can use my knowledge of place value to determine the value of the whole number.
- I can compare the value of the same digit in different numbers.

Warm-up

## 64,000

Can you read this number? Tell your partner now!

Could you read it?

It says sixty-four thousand.

We are going to think about everything we know about this number.

## 64,000

What can we say about this number? Can you tell your partner a fact about 64,000?

Complete these facts about 64,000.

- 1. 64,000 is made up of <u>four thousand</u> and sixty thousand.
- 2. There are <u>**6400**</u> tens in 64,000.

Warm-up

- 3. One more than 64,000 is \_\_\_\_\_\_64,001
- 4. **63,999** is one less than 64,000.
- 5. 64,000 is **<u>36,000</u>** less than 100,000.
- 6. 10,000 more than 64,000 is \_\_\_\_\_.

Today we are going to be digit detectives! We will explore and describe the value of the different digits in a number.

Each digit in a number has a particular value depending on its place in the number. This is what place value is all about!



In previous lessons, place value counters were ordered from right to left to find the value of different whole numbers. What number is represented?



We can use a place value grid to find out the value of each digit in a number.

Each digit of a number goes into a different column in the grid. We always start at the right when writing digits in the columns.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

Let's try an example all together. We will put the following number into the place value grid:

### 768,235

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
	7	6	8	2	3	5
	1 w					

0

### **Describing Digits**

768,235

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
	7	6	8	2	3	5

The digit in the ten thousands column is 6. It represents 6 ten thousands, or 60 thousands.

Choose one of the following numbers and write it on your **Place Value Grid** to find out what each digit represents. Remember to start from the right hand side.

8	★ 5,923		★★ 734,691		1 8	<b>★ ★ ★</b> 309,926
- · ·		1.11		_	<i>.</i>	
Millions	Hundred Thousands	Ten Thousands	Thousands	Hundre	ds Ten	ıs Ones
	1 10 7					
		/		/		

Choose one of the following numbers and write it on your **Place Value Grid** to find out what each digit represents. Remember to start from the right hand side.

*	**	***
85,923	734,691	809,926

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
		8	5	9	2	3
	7	3	4	6	9	1
	8	0	9	9	2	6

734,691 does not have a 9 in the hundreds place.

*	**	***
85,923	734,691	809,926

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
		8	5	9	2	3
	7	3	4	6	9	1
	8	0	9	9	2	6

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The 8 in 85,923 represents 8 ten thousands. The 8 in 809,926 represents 8 hundred thousands. The value of the digit 8 is greatest in 809,926.

*	**	***
85,923	734,691	809,926

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
		8	5	9	2	3
	7	3	4	6	9	1
	8	0	9	9	2	6

Can you be digit detectives and describe the magnified digit in each number? You can use your place value grid to help you.









### **Learning Intention**

• To determine the value of each digit in numbers to 1,000,000.

### **Success Criteria**

- I can write numbers correctly into a place value grid.
- I can describe the value of different digits.
- I can use my knowledge of place value to determine the value of the whole number.
- I can compare the value of the same digit in different numbers.



# **Clock Face Conundrum**

This is a clock face with some very strange numbers on it! There is a different number in each box. Can you cut out the number cards and stick the correct number in each box by following the ten clues?



- 1. No numbers with the same amount of digits are next to each other.
- 2. The numbers on the vertical axis (a and g) both have 3 digits each. They both have a 9 in the tens place and both have a digit total of 11. They are not the same number.
- 3. The numbers on the horizontal axis (d and j) both have 4 digits. They both have an 8 in the thousands place and a 3 in the ones place. Each number has a digit total of 13. They are not the same number. These numbers are interchangeable.
- 4. The number at (a) has a 2 in the hundreds place.
- 5. The number at (f) has 3 ten thousands, 5 thousands, 8 hundreds, 2 tens and 9 ones.
- 6. The number at (k) is 100,000 more than the number at (f).
- 7. There is a difference of 101,000 between the number at (l) and the number before it (k).
- 8. The number at (c) is 100,000 more than the top number (a), 110 more than the number at (h) and 110,000 less than the number at (e).
- 9. The number at (b) has 7 tens and 5 ones.
- 10. The number at (i) has the same amount of ones as the number at (k), the same amount of tens as the number at (c) and the same amount of hundreds as the number at (g).

8113	210,290	135,829	290	34,829	8023
35,829	199	75	100,180	191	100,290

# **Clock Face Conundrum**

This is a clock face with some very strange numbers on it! There is a different number in each box. Can you write the correct number in each box by reading the ten clues?



- 1. No numbers with the same amount of digits are next to each other.
- 2. The numbers on the vertical axis (a and g) both have 3 digits each. They both have a 9 in the tens place and both have a digit total of 11. They are not the same number.
- 3. The numbers on the horizontal axis (d and j) both have 4 digits. They both have an 8 in the thousands place and a 3 in the ones place. Each number has a digit total of 13. They are not the same number. The number at (d) is 90 more than the number at (j).
- 4. The number at (a) has a 2 in the hundreds place.
- 5. The number at (f) has 3 ten thousands, 5 thousands, 8 hundreds, 2 tens and 9 ones.
- 6. The number at (k) is 100,000 more than the number at (f).
- 7. There is a difference of 101,000 between the number at (l) and the number before it (k).
- 8. The number at (c) is 100,000 more than the top number (a), 110 more than the number at (h) and 110,000 less than the number at (e).
- 9. The number at (b) has 7 tens and 5 ones.
- 10. The number at (i) has the same amount of ones as the number at (k), the same amount of tens as the number at (c) and the same amount of hundreds as the number at (g).

# **Clock Face Conundrum**

This is a clock face with some very strange numbers on it! There is a different number in each box. Can you write the correct number in each box by reading the ten clues?



- 1. No numbers with the same amount of digits are next to each other.
- 2. The numbers on the vertical axis (a and g) both have 5 digits each. They both have a digit total of 20, and the number at (g) is 900 more than the number at (a). Both the numbers have a 1 in the ten thousands place and a 5 in the ones place.
- 3. The numbers on the horizontal axis (d and j) both have 3 digits. They both have a 4 in the hundreds place. One of the numbers has a 2 in the tens place, and the other number has a 6 in the ones place. The numbers add up to 879. They are not the same number. **These numbers are interchangeable**.
- 4. The number at (e) has 5 ones, 6 hundred thousands, 9 tens and 8 thousands.
- 5. The number at (a) has an 8 in the thousands place. Its tens digit is half of this.
- 6. To find the number at (l), take (a) and add 100,000, then subtract 1100.
- 7. The digits in the number at (k) are all 1 less than the digits in the number at (l).
- 8. The number at (b) has 5 ones, 7 thousands and 1 ten.
- 9. The number at (c) is 111,000 more than the number at (k), 105,105 more than the number at (i) and one million less than the number at (f).
- 10. The number at (h) has double the value of the millions digit of the number at (f), half the value of the tens digit of the number at (g), quarter of the value of the thousands digit of the number at (e) and a third of the value of the hundreds digit of the number at (i). All other digits are 0.

### Clock Face Conundrum Answers



### Clock Face Conundrum Answers



### Clock Face Conundrum Answers



# Digit Detective Top Card Instructions

#### 1

To start the game, shuffle the cards and share them out between each of you. Don't look at the cards as you share them out. Each player should hold their cards so that they can only see the information on the top card.

### 2

Decide which player is going to start. This player should read out the value of one of the digits in the number on the card, for example: 'The digit in the ten thousands place is a five.'

#### 3

The other player then reads out the digit in the same place from their card. The player with the highest value wins, and that player collects both the top cards, including their own, and moves them to the bottom of their pile. It is then their turn to choose a digit value from their next card. If both your cards share the same digit for the chosen value, or if one of the numbers

does not have a digit in that particular place, then all the cards should be placed on the table and the player should choose again from their next card. This time, the player with the highest digit value takes the cards from the table as well as the two top cards. The person with all the cards at the end is the winner.



To determine the value of each digit in numbers to 1,000,000.

Solve these challenges using your knowledge of the value of each digit in a number.

Here is a 5-digit number:

### 45,602

Write down the number that is:

1. One thousand more \_\_\_\_\_

- 2. Ten less \_\_\_\_\_
- 3. One hundred more \_\_\_\_\_
- 4. Ten thousand less \_\_\_\_\_
- 5. One more \_\_\_\_\_



To determine the value of each digit in numbers to 1,000,000.

Solve these challenges using your knowledge of the value of each digit in a number.

Here is a 6-digit number:

### 504,692

Write down the number that is:

- 1. Ten thousand more \_\_\_\_\_
- 2. One less \_\_\_\_\_
  - 3. One hundred more \_\_\_\_\_
  - 4. One hundred thousand less \_\_\_\_\_

We can change the digits in a number by adding or subtracting from certain digits.

What can we subtract from 504,692 to swap the last 2 digits?

The last two digits are the 9 and the 2: 504,692. If we swap these digits, we will make 504,629.

We need to find the difference between these numbers to work out what to subtract.

Can you find the answer?

Try this one:

What can we add to 504,692 to swap the digits in the thousands and the hundreds places?

Think about which these digits are, and how you can find the difference to work out what you need to add.

To determine the value of each digit in numbers to 1,000,000.

Solve these challenges using your knowledge of the value of each digit in a number.

1. What could you add to 8,234,051 to reverse the last three digits?

2.	W	hat	сои	ld y	jou	subt	trac	t fro	om 5	5,734	4,20	)1 to	rev	erse	e the	e las	t fo	ur d	ligit	s?			

3.	W	hat	cou	ıld y	Jou	add	to 3	8,46	5,29	97 to	o rev	verse	e all	of t	he c	digi	ts?				

4	. W	hat	cou	ıld y	Jou	subt	trac	t fro	om 4	+,53	2,98	81 to	rev	erse	all	the	dig	its?				

## Digit Detectives Answers

Solve these challenges using your knowledge of the value of each digit in a number.

Here is a 5-digit number:

### 45,602

Write down the number that is:

- 1. One thousand more **46,602**
- 2. Ten less **45,592**
- 3. One hundred more 45,702
- 4. Ten thousand less **35,602**
- 5. One more **45,603**

## Digit Detectives Answers

Solve these challenges using your knowledge of the value of each digit in a number.

Here is a 6-digit number:

### 504,692

Write down the number that is:

- 1. Ten thousand more **514,692**
- 2. One less 504,691
- 3. One hundred more **504,792**
- 4. One hundred thousand less 404,692

We can change the digits in a number by adding or subtracting from certain digits.

What can we subtract from 504,692 to swap the last 2 digits?

The last two digits are the 9 and the 2: 504,692. If we swap these digits, we will make 504,629.

We need to find the difference between these numbers to work out what to subtract.

Can you find the answer?

#### We need to subtract 63.

Try this one:

What can we add to 504,692 to swap the digits in the thousands and the hundreds places?

Think about which these digits are, and how you can find the difference to work out what you need to add.

#### We need to add 1800.

# Digit Detectives Answers

Solve these challenges using your knowledge of the value of each digit in a number.

1	. W	hat	cou	ıld y	Jou	add	to 8	3,23	4,0	51 to	o rev	/erse	e th	e las	st th	iree	dig	its?				
																				99		

2.	W	hat	cou	ıld y	Jou	subt	trac	t fro	om 5	5,734	4,20	)1 to	rev	erse	the	e las	t fo	ur d	igit	s?				
																					•	3177	,	
																					•			

3	. W	hat	cou	ıld y	Jou	add	to 3	3,46	5,29	97 to	o rev	/erse	e all	of t	:he d	digi	ts?					
																			4.4	60.3	346	
																			.,.	,.		

4.	. W	hat	cou	ıld y	jou	subt	trac	t fro	om 4	+,53	2,98	81 to	rev	erse	all	the	dig	its?					
																				2.6	40 6	527	
																				2,0			 

# **Number Sense**

To determine the value of each digit in numbers to 1,000,000.
My 5-digit number:
000
My 5-digit number in words:
1. My number is made up of thousand and thousand.
2. There are thousands in my number.
3. There are hundreds in my number.
4. One more than my number is
5 is one less than my number.
6. My number is less than 100,000.
7. 10,000 more than my number is

# **Number Sense**

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$\left( \right)$	To determine the value of each digit in numbers to 1,000,000.
	My 6-digit number:
	0000
	My 6-digit number in words:
1.	My number is made up of thousand and thousand.
2.	There are thousands in my number.
3.	There are hundreds in my number.
4.	There are tens in my number.
5.	One more than my number is
6.	is one less than my number.
7.	My number is less than 1,000,000.
8.	100,000 more than my number is

# **Number Sense**

To determine the value of each digit in numbers to 1,000,000.

My 7-digit number:

	0	0	0	0	0
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My 7-digit number in words:

1. My number is made up of \_\_\_\_\_\_ million and \_\_\_\_\_\_ thousand.

- 2. There are \_\_\_\_\_\_ ten thousands in my number.
- 3. There are \_\_\_\_\_\_ thousands in my number.
- 4. There are \_\_\_\_\_\_ hundreds in my number.
- 5. There are \_\_\_\_\_ tens in my number.
- 6. One more than my number is \_\_\_\_\_.
- 7. \_\_\_\_\_ is one less than my number.
- 8. My number is \_\_\_\_\_ less than 10,000,000.
- 9. 1,000,000 more than my number is \_\_\_\_\_.

### Millions, Thousands, Hundreds, Tens and Ones Place Value Grid

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

#### a) 998,999

- b) 899,999
- c) 999,989
- d) 999,998
- e) 989,999
- a) 3 thousands or 3000
- b) 3 tens or 30
- c) 3 ten thousands or 30,000
- d) 3 hundred thousands or 300,000
- a) 748,601
- b) 428,824
- c) 707,350
- d) 648,288
- e) 125,521

#### 1) 530,865

- 2) Bradley is incorrect. He has given the value rather than the digit. He should have said 5.
- 3) a) Incorrect. The digit '5' represents fifty thousand.
  - b) Correct
  - c) Incorrect. The digit in the hundred thousands place increases by that amount, but the whole number gets bigger by 128,169.
  - d) Correct
  - e) Incorrect. You could have 654,287 dollar coins which would be less than a million. If some of your coins were two dollar coins, you would have even less coins.
  - a) You need to subtract 132,432.
  - b) To create the number 864,264 you need to add 599,400.
  - a) 414,212, 423,224, 432,236, 441,248, 214,112, 223,124, 232,136, 241,148
  - b) Answers will vary. Check that students have created a clue that, with the rest of Gina's clues, leads to just one of the numbers from 2a.
  - a) This is sometimes true. Numbers between 1,000,000 and 9,999,999 have 7 digits, but numbers over 9,999,999 have more than 7 digits.
  - b) This is never true. 100 × 100 = 10,000 To make a million we can multiply one thousand by one thousand.
  - c) This is sometimes true. In decimal numbers, there are digits with a lower value after the decimal point.









### Read and Write Numbers to 1,000,000

Use these digit cards to make numbers to match these criteria.



- a) more hundreds than thousands
- **b)** less than nine hundred thousand
- c) more ones than tens
- d) closest to 1,000,000
- e) between 980,000 and 990,000
- What is the value of the digit '3' in each of these numbers? a) 123,456
  - **b)** 450,132
  - **c)** 31,280
  - **d)** 370,548
- 3. What number matches each clue?

707,350 428,824 648,288 748,601 125,521

- a) In my number, the digit '8' represents eight thousands.
- **b)** When I reverse the digits, my number stays the same.
- c) My number has no ones.
- d) My number has only even digits.
- e) In my number the smallest digit has the greatest value.

### Read and Write Numbers to 1,000,000



- c) My number has no ones.
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#### Read and Write Numbers to 1,000,000

1.

What would you need to add to 123,456 to reverse all the digits, so the number becomes 654,321?

50,000

Bradley has written the number 654,287. Giovanni says, "What digit is in the ten thousands place?" Bradley replies, "50,000."

Is Bradley correct?

Explain your thinking.



3.

Giovanni has written the following statements about Bradley's number. Which are correct? Explain his mistakes and show the right answer.

### 654,287

- a) In this number, the digit '5' represents five thousands.
- **b)** To the nearest hundred thousand, this number rounds to 700,000.
- c) When I reverse the digits, Bradley's number gets bigger by one hundred thousand.
- **d)** The digit in the hundreds place is half of the digit in the thousands place.
- e) If you had \$654,287 in coins, you would have more than a million coins.

### Read and Write Numbers to 1,000,000



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### Read and Write Numbers to 1,000,000



- Here is a number: 264,864.
- a) What do I need to do to the number so that each digit halves in value?
- **b)** What calculation do I need to do to the number to swap the hundreds, tens and ones digits with the hundreds of thousands, tens of thousands and thousands digits?



- Gina is thinking of a number. What could Gina's number be?
- a) Follow the clues to find all possibilities.



My number is less than half a million.

The hundreds of thousands digit is twice the hundreds digit.

The tens digit is half of the ones digit.

The tens of thousands and thousands digits have a digit sum of 5.

My number has the same number of tens as tens of thousands.

ometimes True

Never True

Always True

**b)** Write a final clue which would leave only one possibility for Gina's number.

Are these statements always, sometimes or never true? Explain your answers.

a)

b)

c)

Numbers over one hundred thousand have 7 digits.

One hundred multiplied by one hundred makes	
a million.	

The digit in the ones place is worth less than all the other digits.

### Read and Write Numbers to 1,000,000



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Numbers over one hundred thousand have 7 digits.

#### b)

One hundred multiplied by one hundred makes a million.

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Read and Write Numbers to 1,000,000 | Determine Whole Number Digit Values

To determine the value of each digit in the number 1,000,000.	s to	
I can write numbers correctly into a place value grid.		
I can describe the value of different digits.		
I can use my knowledge of place value to determine the value of the whole number.		
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