New Horizon of Mathematics

Mathematics Literacy for elementary years

<3>

Mathematics Core Concept - A Literacy Oriented Approach

— Edite by Shy-Haw-Yaw / Pai Chan Ru —

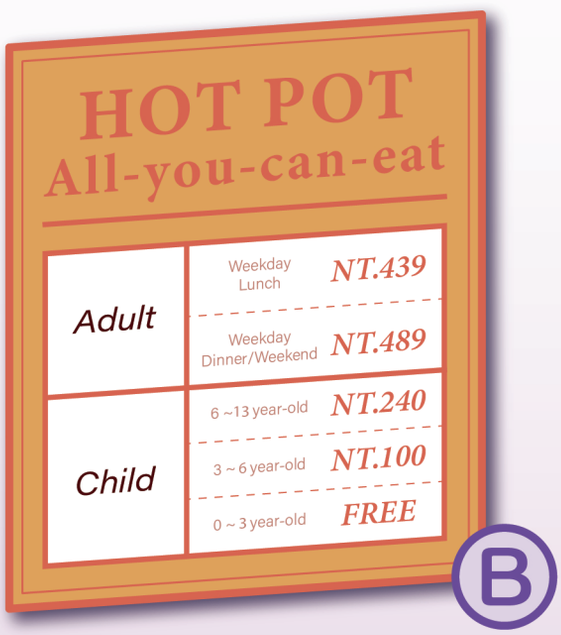
Unit 1

Numbers up to 1000

Look at the numbers in the pictures below.

A

B



C

D

Which pictures show serial numbers or codes? ___ , ___

Which pictures show numbers with different values? ___ , ___

Foreword

First , congratulations on being an elementary school student!
Begins the journey of learning and exploring knowledge!

What is mathematics?

It comes from the everyday life of our ancestors thousands of years ago.

When we have something in mind, want to do something, and then through calculation, get the result, solve the problem, it's math!

Hopefully New Horizon of Mathematics materials will make your math learning more interesting and feel like math is fun!

Enjoy the joy of learning!

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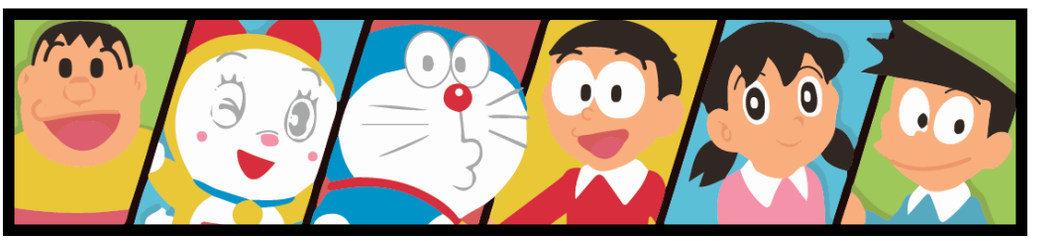
白晨如 Pai Chen Ju

2019 . 8 . 20

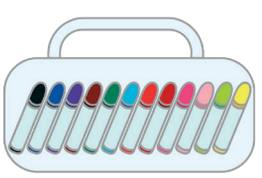
Contents

Circle one: Serial numbers / numbers with values function as names, allowing us to spot the difference between two or more things, like motorcycles.



Takesha Goda　Dorami　Doraemon　Nobita Nobi　Shizuka Minamoto　Suneo Honekawa

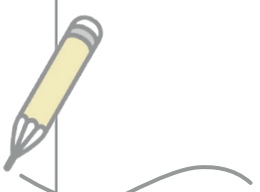
Numbers with values make it possible to describe the amount of a unit of something.
When you say that you got 85 on a test, you might say that you got 85 _____ .



12 colors

48 colors

Now, what about student numbers? Are they codes or do they show an amount? Discuss with your teacher and record your answer!



Calculate the Amount!

1. John, Jerry, and Jill want to pool their money to buy their father a birthday cake.

   The pictures below show how much each child has in his or her pocket.

John

Jerry

Jill

(1) Organize! Fill in the chart below by calculating the amounts of each bill or coin value for each child.

Currency Value	100	50	10	5	1
John					
Jerry					
Jill					
Total	Bills	Coins	Coins	Coins	Coins

What is the total value of all the bills and coins from the three children?

How many NT Dollars?	100 NTD Bills _____ NTD	50 NTD coins ___ NTD	10 NTD coins ___ NTD	5 NTD coins __NTD	1 NTD coins __NTD
Convert to these three values: 	 _____	 _____ _____	 _____  _____	 _____  _____	 _____  _____

After organizing the money by values, the three children have a grand total of _____ hundred and _____ New Taiwan Dollars.

(2)Look at the cake prices again. Which size(s) of cake can the children buy with the money they have?

Check all that apply: ☐ 6” ☐ 8” ☐ 10”

(3)The 10-inch cake costs 1099 NTD.

1099 is read as one thousand and ninety-nine dollars.

Ten one hundred dollar bills can be exchanged for one one-thousand dollar bill.

10 bills   

1000 is read as, “one thousand.”

With 857 NTD between them, the three children don’t have enough money to buy the ten-inch cake?
How much more money do they need?

Add ____ more 100 NT bills,

____ more 10 NT coins,

____ more 1 NT coins,

...and they’ll have exactly one thousand and ninety-nine NT dollars!

Getting to know paper and coin currency

Here are the front and back sides of the one hundred, five hundred, and one thousand NT dollar bills.

100 NTD Bills

500 NTD Bills

1000 NTD Bills

One 500 dollar bill can be exchanged for _____ 100 dollar bills.

One 1000 dollar bill can be exchanged for ____ 500 dollar bills.

2. Count!
How many dollars are there?


Two one-hundred dollar bills

⟹ _____ NTD

Six ten-dollar coins

⟹ _____ NTD

Seven one-dollar coins

⟹ _____ NTD

...is equal to_____hundred_____dollars.

Place Value Record

Place Value	Hundreds	Tens	Ones
Looks Like:	X00	X0	0
Numeral:	2	6	7

The hundreds place is a record of how many hundreds there are.
The tens place is a record of how many tens there are.
The ones place is a record of how many ones there are.

(1)Place five one hundreds, two tens, and nine ones into the table below. Then, write the English way of saying this number.

Place Value	Hundreds	Tens	Ones
Numeral			
English			

(2)There are seven one hundreds and eight tens. Mary and May each record this amount using a different method in the table below.
Which method is better?
Discuss with your teacher.

Place Value	Hundreds	Tens	Ones
Mary	7	8	
May	7	8	0

☐ Mary ☐ May

(3)There are seven one hundreds and eight ones. Mary and May each record this amount using a different method in the table below.
Which method is better?
Discuss with your teacher.

Place Value	Hundreds	Tens	Ones
Mary	7		8
May	7	0	8

☐ Mary ☐ May

3. John bought a pair of sneakers for 789 NTD at a shoe store.

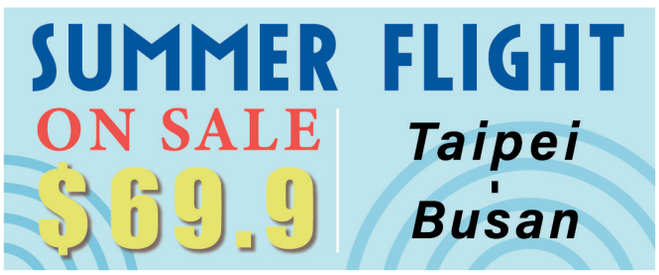
(1) If John first gives one $500 dollar bill to the cashier, how much more does he need to give her?
Use the place value table below to calculate.

Place Value	Hundreds	Tens	Ones
Amount given			
Missing Amount			
Price of the Sneakers	7	8	9

(2) If John first gives the cashier only nine NTD, by how much is he short?
Use the place value table below to calculate.

Place Value	Hundreds	Tens	Ones
Amount given			9
Missing Amount			
Price of the Sneakers	7	8	9

The Power of One!

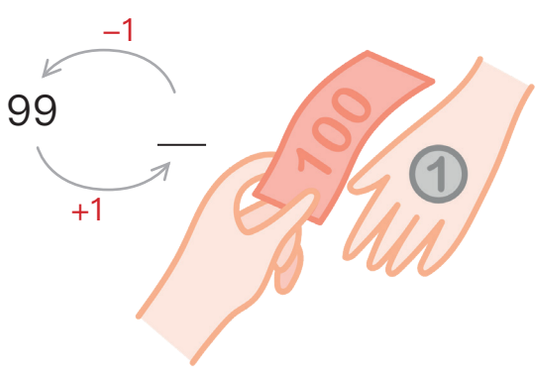


Whether it is something you eat, wear, use, or simply enjoy, businesses normally go out of their way to make sure that the price ends with a 9. Why might this be?

4. Let's find out!

(1)99 NTD plus 1 NTD is...

Place Value	Hundreds	Tens	Ones
Number		9	9
Add:			1
Total:	7	8	9



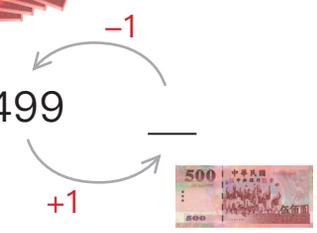
99 is simply 90 + 9.
9 + 1 is _____ .
Starting with _____ tens and then adding one more ten is _____ tens, which is the same thing as _____ .

(2)499 NTD plus 1 NTD is...

Calculate and record your answer using the place value table.

Place Value	Hundreds	Tens	Ones
Number:	4	9	9
Add:			1
Total:			

Hint :
Ten tens equals one hundred.

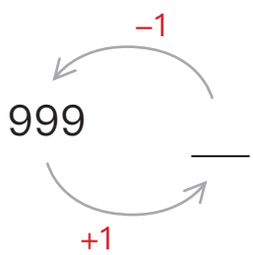


In the hundreds place, it looks like there is a difference of one hundred.
That looks like a lot!

(3)How much is 999 NTD plus 1 NTD?

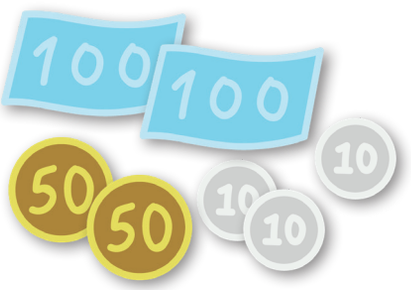
Hint :
Ten hundreds equals one thousand.

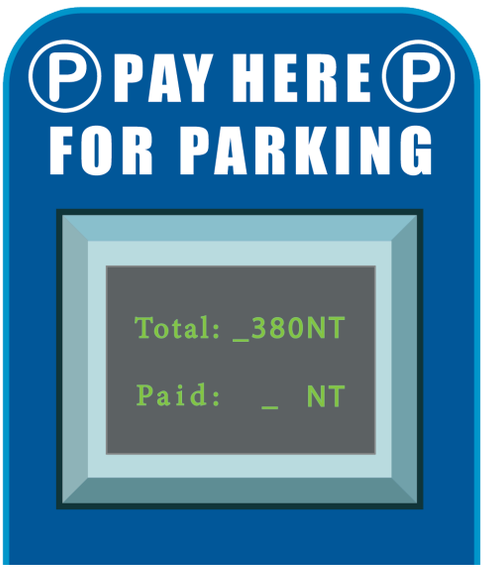
Place Value	Thousands	Hundreds	Tens	Ones
Number:		9	9	9
Add:				1
Total:				



5. Jack's father is paying a parking fee of 380 NTD.

(1) He deposits the bills and coins in the following order:





At this point, the Amount Paid number will be _____.

(2) If Jack's father deposits four one-hundred dollar bills, will the parking machine give him change? ☐ Yes ☐ No

Circle one: 400 NTD is more/less than 380 NTD.

Place Value	Hundreds	Tens	Ones
Number:	3	8	0
Add:			
Total:	4	0	0

Calculate and record.

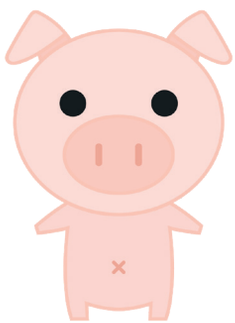
How much more money is 400 NTD than 380?

(3) If Jack's father deposits one five-hundred dollar bill into the parking machine, the machine will give him _____ NTD in change.

Comparing the Size of Numbers

Which of the three dolls below is the cheapest?

Which one is the most expensive?



Piggy
259NTD

Cub
99NTD

Poppy
289NTD

With 100 NTD, you can buy the _____ .

If the price of the piggy is raised/lowered by _____ NTD, it will equal the price of the puppy.

Therefore, the cheapest doll is:  (Circle one)

The most expensive doll is:  (Circle one)

Write the doll prices, 99, 259, and 289 NTD, in the place value table below.

Place Value	Hundreds	Tens	Ones
Cub		9	9
Piggy	2	5	9
Poppy	2	8	9

Less than one hundred.

Both have two one hundreds.

Five tens is three tens less than eight tens.

Accordingly, 259 is less than 289. This is written as “259 < 289.” This math sign, <, is read as, “less than,” and it is called the less than sign.

Another way to say the same thing is to say that 289 is greater than 259. This is written as, “289 > 259.” This sign, >, is read as, “greater than,” and it is called the greater than sign.

Thinking Mathematically

1. Compare the size of numbers.

(1)Which number is greater, 345 or 543? Write a less than sign, < , or a greater than sign, > , in the box below.

Hundreds	Tens	Ones
3	4	5
5	4	3

543 □ 345

Which place values determine the size of the number? Circle them!

(2)Which number is greater, 243 or 234? Write a less than sign, < , or a greater than sign, > , in the box below.

Hundreds	Tens	Ones
2	4	3
2	3	4

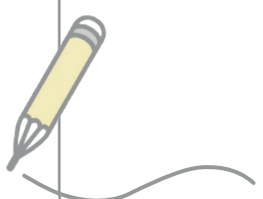
243 □ 234

Which place values determine the size of the number? Circle them!

(3)Please write the numbers 631, 142, and 53 in order from least to greatest.

_____ < _____ < _____

How did you figure out the size of these numbers? Please explain in the box below!



《Literacy Point!》

1.Each place value carries to the left when the value reaches 10.

2.Knowing the place value of each digit in any number makes the size of two or more numbers easy to see.

Practice question:

1. Flip through the pages of your math textbook and look at the page numbers. After reading the last page number in the book, would say that page numbers are serial numbers or do they have value?

   Check one. ☐ Serial numbers ☐ Numbers with values

2. Look at the numbers in the table below.

1st grade	2nd grade	3rd grade
101	201	301
102	202	302
103	203	303
104	204	304
105	205	305
106	206	306

What do the numbers tell us? Explain!

3. Johnny spent 209 NTD on lunch today. In the box below, use the following symbols, 100 、50 、10 、1 、 , to draw one possible way he could give the correct amount to the cashier.

4. Review how to read and record place values.

(1)The number 608 means that there are _____ one hundreds, _____ tens, and _____ ones together.

Hundreds	Tens	Ones
6	0	8

Read as: _____

(2)13 tens is actually written as the number _____ .

Hundreds	Tens	Ones
	1	3

Read as: _____

5. Please write a number that has the same hundreds place value as 479, but is greater than 489. _____

Hundreds	Tens	Ones
4	8	9

6. Please write a number that has 9 in the tens place, 7 in the ones place, and is less than 485. _____

Hundreds	Tens	Ones
4	8	0

Unit 2

Vertical Addition and Subtraction in the Double Digits

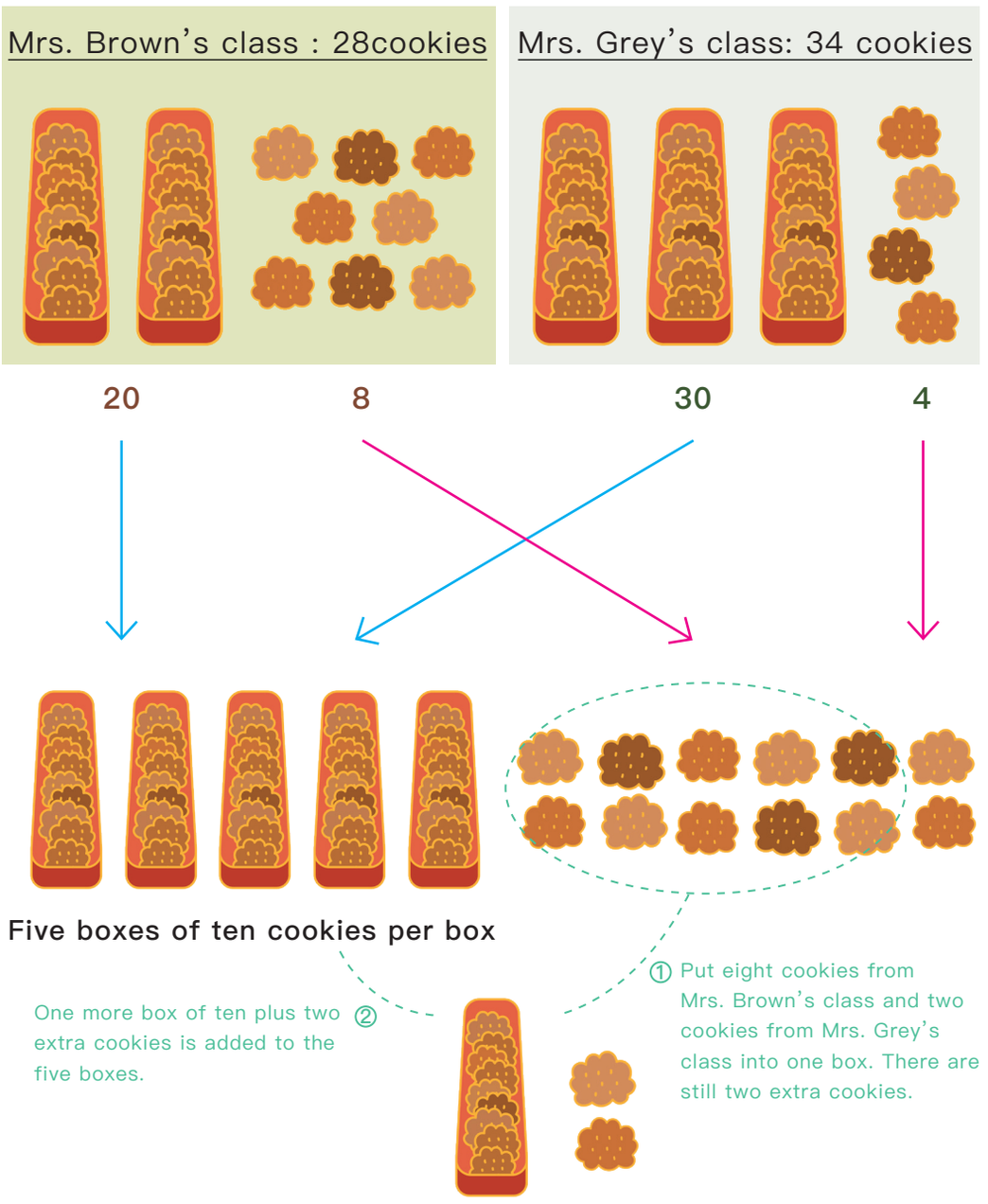
Vertical Addition

Mrs. Brown and Mrs. Grey are teachers at the same school. They decide to buy cookies together for their classes. There are 28 students in Mrs. Brown's class and 34 students in Mrs. Grey's class. They buy one cookie for each student.

How many cookies did the teachers buy?

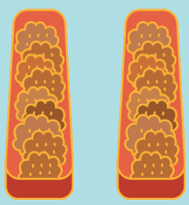
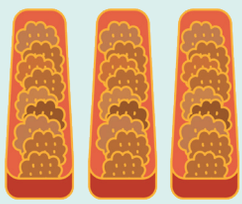
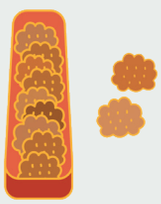
First, write the numbers to be calculated:

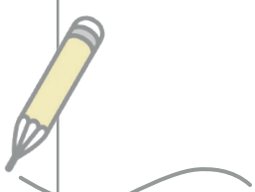
$\Longrightarrow$ 28 + 34



Therefore, Mrs. Brown and Mrs. Grey have bought six boxes of cookies plus two extra, which is really just six tens and two ones. Six tens and two ones is also called the number 62.

(1)When performing this addition all at once, make sure to add the tens to the tens and the ones to the ones.

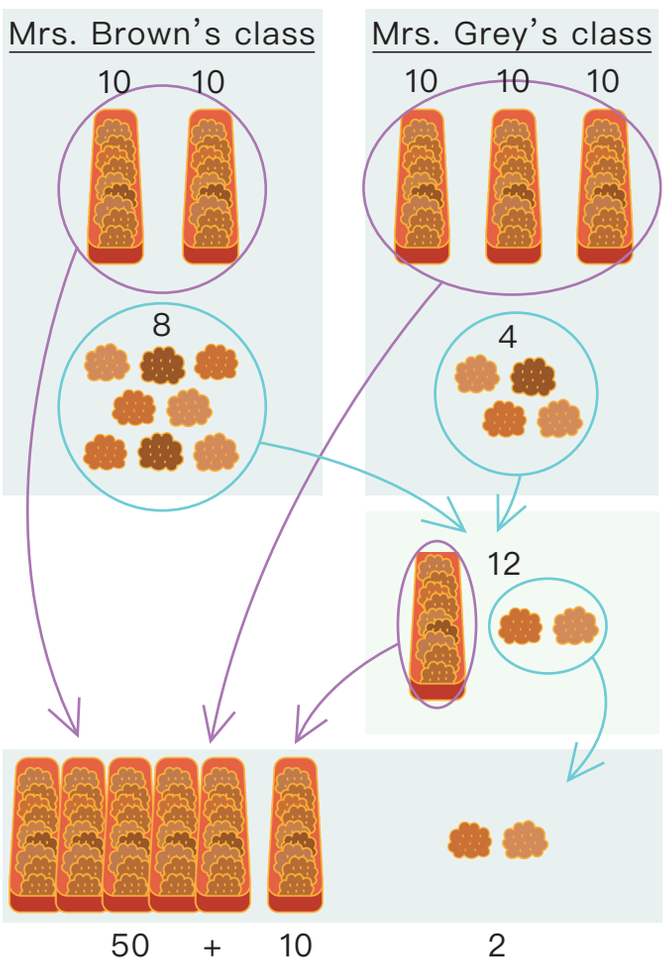
Type	Boxes	Cookies	Tens	Ones
Mrs. Brown's Class			2	8
Mrs. Grey's Class			3	4
Total in tens and ones			5	12 ⇓ 10+2
Grand total			6	2



Math Literacy Points!

1. Every time an amount reaches 10, use the next place value to the left.
2. Add the ones before the tens.

For example, first add the ones that are carried over...

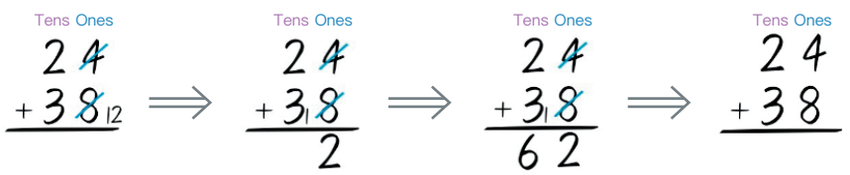


Notes

Tens	Ones
2	8
3	4
	12
1	2
6	2

... and then add the tens together.

A simpler vertical method of taking notes is used.

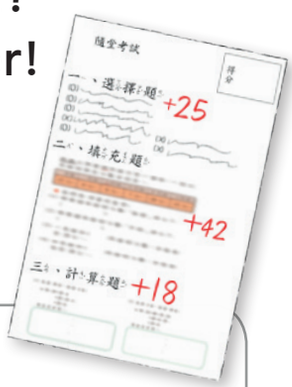


Therefore, Mrs. Brown and Mrs. Grey bought a total of 28 + 34 = 62, or 62 cookies.

Now...It's your turn!

$$\begin{array}{r} 24 \\ +\,38 \\ \hline \end{array}$$

1. Look at the exam paper on the right. What score did the student get? Add the three numbers together!



25 + 42 + 18 = _____

First calculate 25 + 42. Then add 18.

$$\begin{array}{r} 25 \\ +\,42 \\ \hline (\quad) \end{array} \qquad \begin{array}{r} (\quad) \\ +\,18 \\ \hline \end{array}$$

2. Jack bought two lunch combos for 59 NTD each. How much did he spend? Adding two 59 NTD amounts together can be recorded as 59 + 59 = _____

Practice calculating vertically!

Tens Ones

$$\begin{array}{r} 59 \\ +\,59 \\ \hline \end{array}$$

(1)First, add two 9s : _____

(2)Then, add two 50s : _____

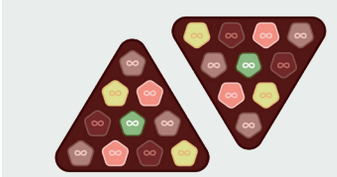
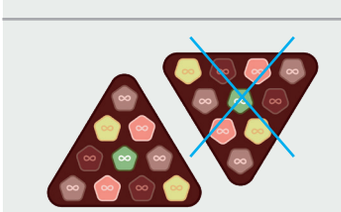
(3)The total amount is : 1 one hundred, _____ ten(s), and _____ one(s)

Vertical Subtraction

There were 33 pieces of chocolate, but 15 disappeared. How many are left?

Question in number form: **33 – 15 =?**

1. Remove five chocolates from one box. Then, remove one box of ten.

	Tens	Ones
	~~3~~ 2	13
	2	~~13~~ Remove 5 8
	~~2~~ Remove 10 1	~~13~~ 8

Now, calculate and record vertically!

33 – 15 ⟹ 20 + 13 – 15 ⟹ 20 + 8 – 10 ⟹ 10 + 8

$$\begin{array}{r} 3\ 3 \\ -\ 1\ 5 \\ \hline \end{array}$$

$$\begin{array}{r} {\scriptstyle 2}\ {\scriptstyle 10} \\ \not{3}\ 3 \\ -\ 1\ 5 \\ \hline \end{array}$$

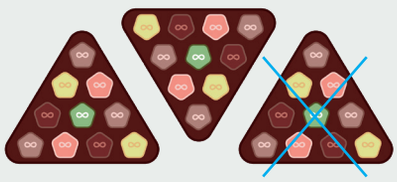
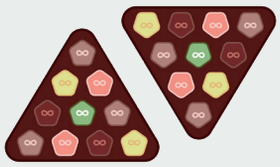
$$\begin{array}{r} {\scriptstyle 2}\ {\scriptstyle 10} \\ \not{3}\ \not{3} \\ -\ 1\ \not{5} \\ \hline 8 \end{array}$$

$$\begin{array}{r} {\scriptstyle 2}\ {\scriptstyle 10} \\ \not{3}\ 3 \\ -\ 1\ \not{5} \\ \hline 1\ 8 \end{array}$$

Now...It's your turn!

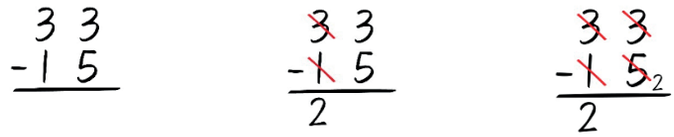
$$\begin{array}{r} 3\ 3 \\ -\ 1\ 5 \\ \hline \end{array}$$

2. Remove one box of ten chocolates. Then, remove five more pieces of chocolate.

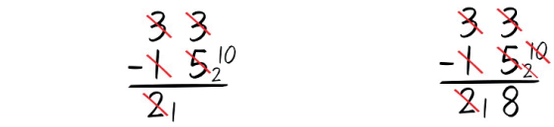
	Tens	Ones
 	~~3~~ 2	3
 	2	~~3~~ Remove 3, but there are still 2 more to remove. 8
  	~~2~~ 1	~~10~~ ~~3~~ 8

Now, calculate and record vertically!

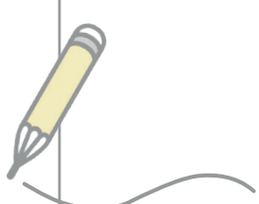
33 − 15 ⟹ 23 − 5 ⟹ 20 − 12



⟹ 10 + 10 − 2 ⟹ 10 + 8

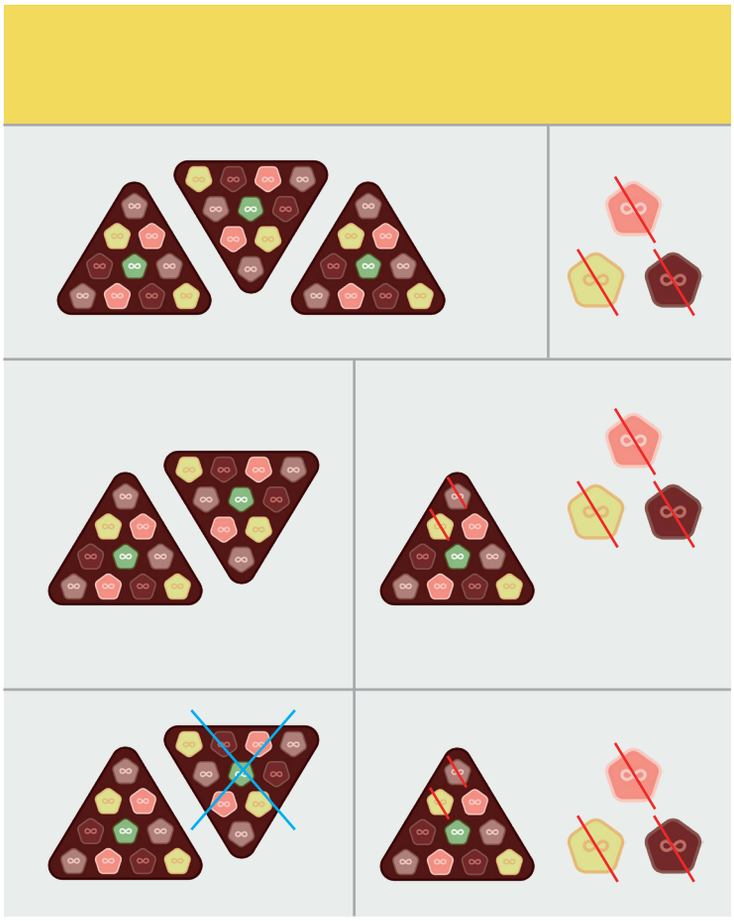


Now...It's your turn!



$$\begin{array}{r} 33 \\ -\ 15 \\ \hline \end{array}$$

3. Remove five chocolates from one box. Then, remove one box of ten.



Tens	Ones
3	3
3	3
	10
	Remove three, but there are still two more to remove.
2	8
2	
1	8

Now, calculate and record vertically!

33 − 15 ⟹ 30 − 12 ⟹ 20 + 10 − 12

$$\begin{array}{r} 33 \\ -\,15 \\ \hline \end{array} \qquad \begin{array}{r} 33 \\ -\,15_{2} \\ \hline \end{array} \qquad \begin{array}{r} {\scriptstyle 2}\,{\scriptstyle 10} \\ 3\,\not{3} \\ -\,1\,5_{2} \\ \hline \end{array}$$

⟹ 20 + 8 − 10 ⟹ 10 + 8

$$\begin{array}{r} {\scriptstyle 2}\,{\scriptstyle 10} \\ 3\,\not{3} \\ -\,1\,5_{2} \\ \hline 8 \end{array} \qquad \begin{array}{r} {\scriptstyle 2}\,{\scriptstyle 10} \\ 3\,\not{3} \\ -\,1\,5_{2} \\ \hline 18 \end{array}$$

Now...It's your turn!

$$\begin{array}{r} 33 \\ -\,15 \\ \hline \end{array}$$

3. Mr. Brown bought 50 student workbooks and gave one to each of the 24 students in his class. How many are left over?

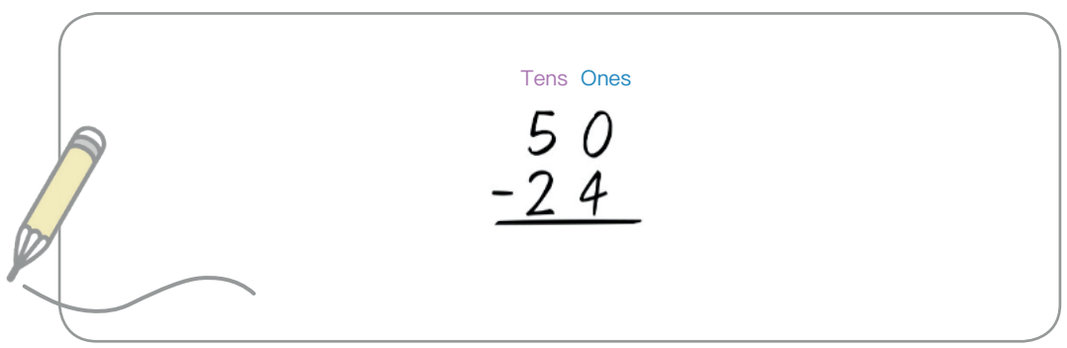
Write down the subtraction method: **50 − 24 = ?**

(1) First give out 20 workbooks, and then 4 more.

$$\Rightarrow 50 - 24 = 30 - 4$$
$$= 20 + 10 - 4$$
$$= 20 + 6$$

Draw here to show what happens!

Practice the vertical subtraction method.

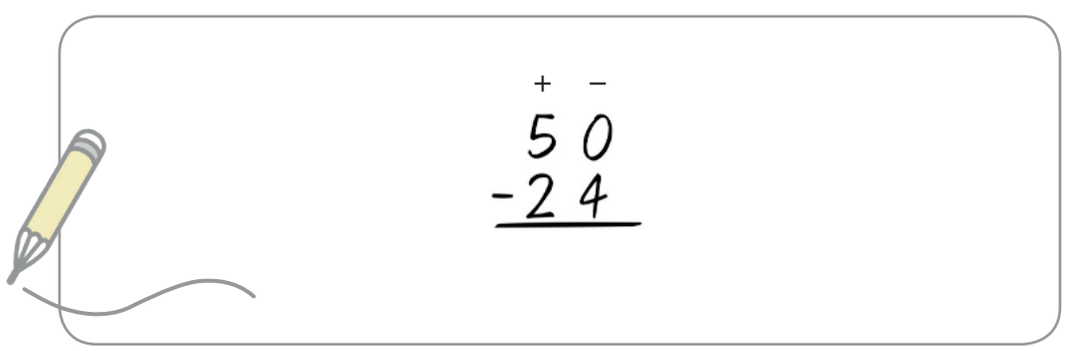


(2) First give out 4 workbooks, and then 20 more.

$$\Rightarrow 50 - 24 = 40 + 10 - 24$$
$$= 40 + 6 - 20$$
$$= 20 + 6$$

Draw here to show what happens!

Practice the vertical subtraction method.



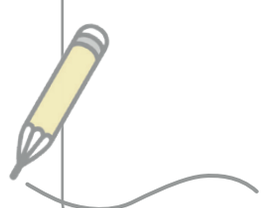
4. Bugs Bunny and Daffy Duck were having a jump rope competition.
Bugs Bunny jumped rope 28 times, while Daffy Duck jumped rope 45 times.
How many more times did Daffy Duck jump rope compared to Bugs Bunny?

Before solving, think about the problem like this:
Imagine that Bugs Bunny and Daffy Duck were jumping rope at the same time and speed. When they finish 28 jumps, Bugs Bunny stops, but Daffy Duck continues jumping _____ times.

Write down the subtraction method: **45 − 28 = ?**

Or, **28 + ( ) = 45**

Practice the vertical subtraction method.



Answer: Daffy Duck jumped rope _____ more times than Bugs Bunny did.

《Math Literacy》

POINTS!

1.Horizontal Method: used to record and organize units

2.Vertical Method: used to calculate after the tens and ones are organized.

Additional Practice:

1. Use the vertical method to calculate.

(1) 65 + 32	(2) 8 + 56
(3) 48 + 37	(4) 78 – 44
(5) 50 – 12	(6) 83 – 26

2. Show your method. Then, solve.

(1) There are three grade two classes at Sunnyside Elementary School. There are 25 students in Mr. White's class, 23 students in Mrs. Brown's class, and 24 students in Mr. Black's class. At Sunnyside Elementary School, how many grade two students are there in total?

Method: _____

(2) There were 58 books in the classroom bookcase, but then 22 were borrowed. Later, only 15 were returned. How many books are now in the bookcase?

Method: _____

(3) If you give the bookstore cashier 100 NTD to buy one notebook and two pens, how much change should she give you?

Method: _____

(4)A large bowl of dry noodles costs 10 NTD more than a small bowl does. If you wanted to buy one large and one small bowl, how much money do you need?

Method: _____

(5)Jimmy's mother is turning 37 this year, and Jimmy will be 9. How old was Jimmy's mother when she gave birth to Jimmy?

Method: _____

Before solving, think about the problem like this:
In the year Jimmy's mother gave birth to Jimmy, she was younger/older than she is now, which means that her age at Jimmy's birth is less/more than it is now.

Unit 3

Length in Centimeters and Millimeters

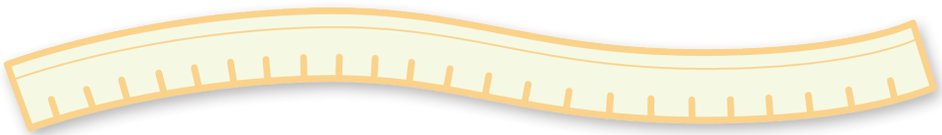
In the year 2020, there was a worldwide coronavirus pandemic.

For many months, people were advised to maintain a distance of 1 meter from other people when outdoors, and 1.5 meters when indoors.

This was called, “social distancing.”

Exactly how long is one meter?

Use a one-meter-long piece of rope that your teacher gives you to measure different parts of your body.



One meter is about the length from my feet to my _____ .

One meter is **longer/shorter** than my outstretched arms.

Compare one meter to other objects!

One meter is about as a long as a(n) _____ .

1. **Use the one-meter-long rope to measure the following objects. Your teacher can tell you how to use the rope to measure length accurately.**

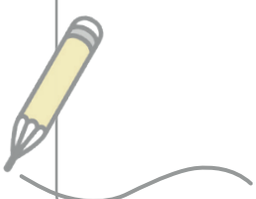
(1) The height of the classroom desks is more **than/less** than one meter.

(2) The length of the blackboard is greater than _____ meter(s) and less than _____ meters.

(3) The length of the classroom from front to back is a little longer than _____ meters!

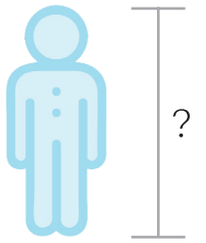
(4) Estimate the height of the classroom from floor to ceiling. Then, measure!

The ceiling is so high up! How will you measure this? Write down your method here.



The height of the classroom is about _____ meters from floor to ceiling.

2. You are _____ centimeters tall. How many more centimeters than a meter is your height? My height is greater than/less than one meter and a half.



Use a straight ruler to measure the rope. There are _____ centimeters in a meter. Therefore, my height is one meter and _____ centimeters.

《Math Literacy》

POINTS!

1.When larger units aren't precise, subdivide into smaller units.

2.One meter can be divided into 100 smaller units. These units are called centimeters, or cm(s) for short.

(1)Measure the length of more body parts!

Use your handspan to measure the width of the desk. The width of the desk is about ____ cms.

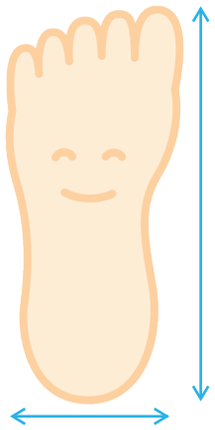
(2)Measure your armspan.

My armspan is about ____ cms.

My armspan is **longer/shorter** than my height.

(3)Draw your footprint on a sheet of A4 paper.

As in the picture on the right, measure the length and width of your foot.



My foot is ____ cms long.
My foot is ____ cms wide.

When you find yourself without a ruler, these lengths could be very handy

《Practical Math》

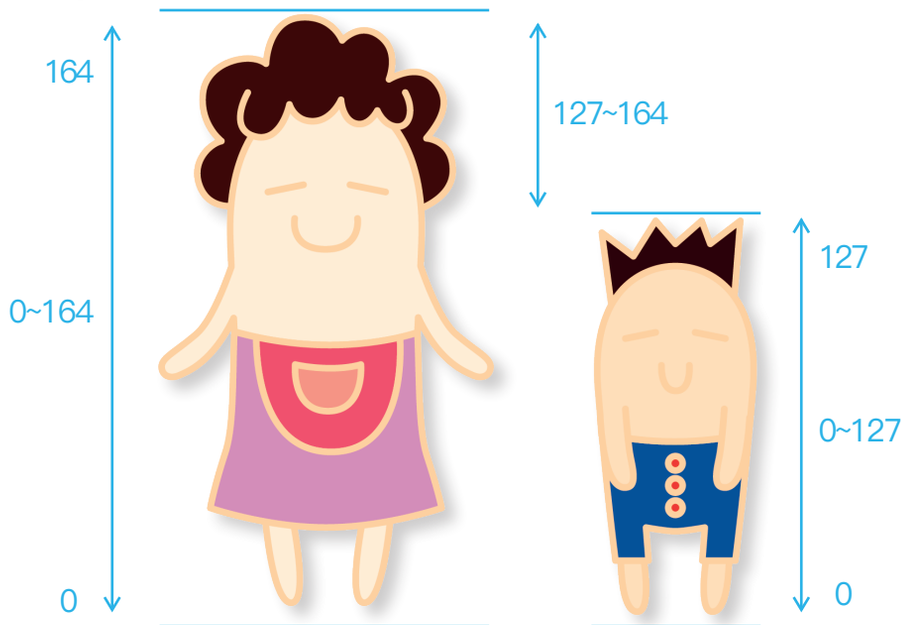
The prefix “centi–” in centimeter means 100 in Latin. This is why 1/100th of one meter is called a centimeter, or cm.

What are the practical advantages of having everybody know the length of one meter and one centimeter?

From Here to There

Mother is 164 cms tall, while Jimmy is 127 cms tall.

This means that mother is _____ cms taller than Jimmy.

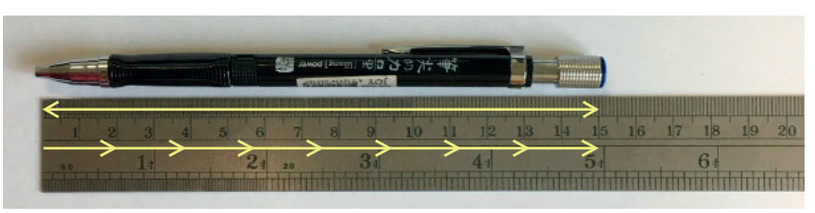


164 cms is _____ cms longer than 127 cms.

The distance from 127 cms to 164 cms is the same as 164 cms minus 127 cms.

3. Measure the lengths!

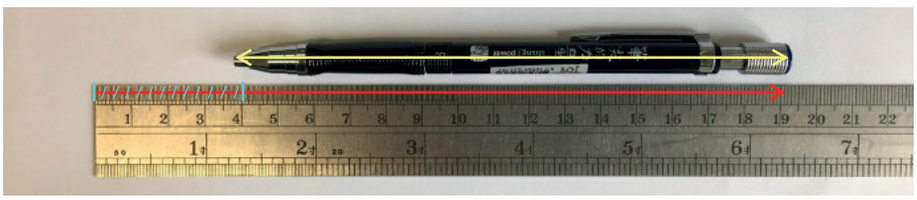
With the tip of the mechanical pencil lined up at zero, the other end of it is at the _____ cm mark.



The distance from 0 cms to _____ cms is the same as 15 one-centimeter units lined up in a row.

This mechanical pencil is about _____ cms long.

Now, the tip of the mechanical pencil is lined up at the 4–centimeter mark. The other end lines up at the _____ cm mark.



Adding _____ cms to 4 cms equals 19 cms, which is the same as saying that 19 minus 4 is 15.

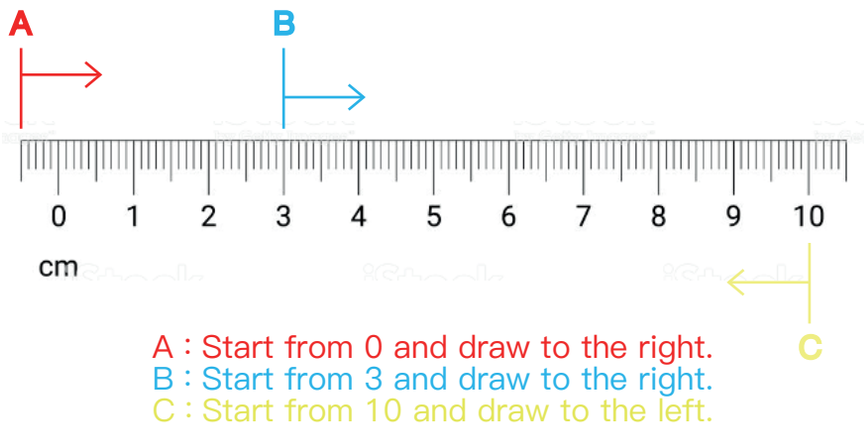
Now, the tip of the mechanical pencil is lined up at the 4–centimeter mark. The other end lines up at the _____ cm mark.

What is the advantage of measuring from zero? Share your answer below.

When not measuring from zero, what do you need to watch out for? Share your answer below.

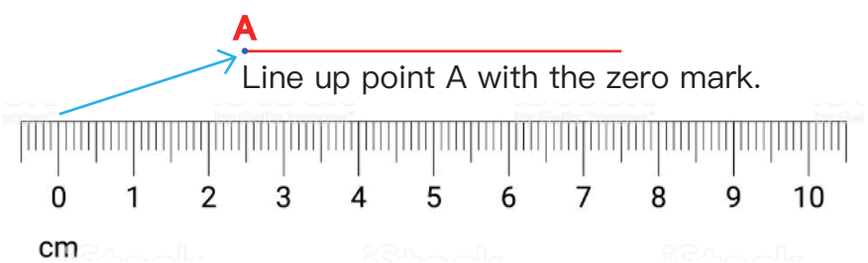
Solving Problems with Math

(1)Draw three straight lines, each 6 centimeters long.

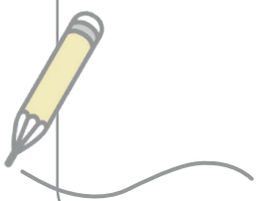


A : Start from 0 and draw to the right.
B : Start from 3 and draw to the right.
C : Start from 10 and draw to the left.

(2)Use a ruler to measure the red line. It is ____ cms long.



(3)Add a 4-cm-long blue line. The total length is now ____ cms. Draw this below!



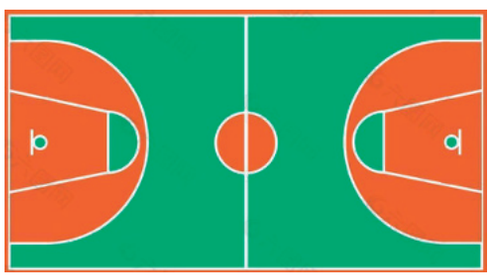
《Math Literacy》

POINTS!

Length is simply the extension of a line from a point.

Exactly how long is one meter?

Number of students: 3/team
Equipment: one piece of rope of different lengths per student.
What to measure: Lengths A and B of a basketball court



Method: Each rope is a measure of strength. Count how many times each student has to measure to finish measuring length A or B.

Notes : Our team is measuring length A/B. Measure lengths in meters and centimeters.

Student Name and Rope Length	How many measurements	Total Length
	Grand Total ⟹	

Notes : Our team is measuring length A/B. Measure lengths in meters and centimeters.

(1) When one piece of rope is measured _____ times, the total length is _____ cms.

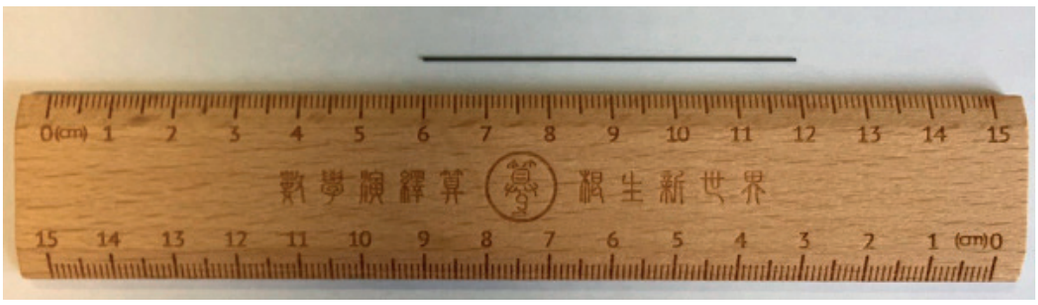
(2) The additional length of the last partial measurement is _____ cms.

(3) The length A/B of the basketball court is _____ m and _____ cms, which is the same as _____ cms.

Practice Questuons:

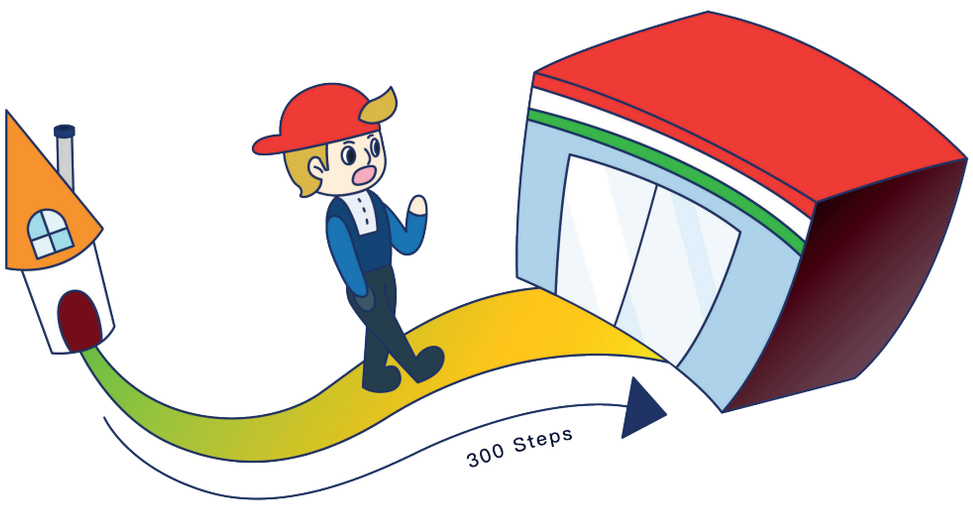
1. There is a 3-meter-long charging cable. How do we measure out one meter with it?

2. How long is the piece of mechanical pencil lead in the picture?



3. If each adult has an armspan of 170 cms, the diameter of this tree is _____ cms, which is the same as _____ m and _____ cms

4. If each step that Joey takes is **40 cms** long, how far is the convenience store from his house? The convenience store is _____ m and _____ cms away from Joey's house.



Unit 4

Comparing Area, Volume, and Weight

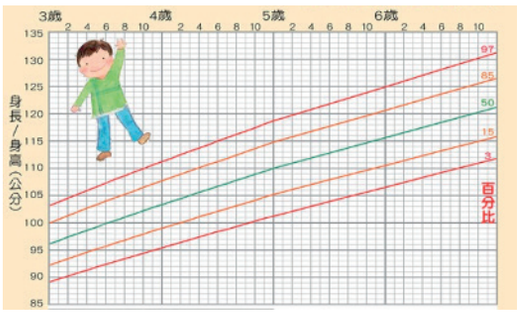
When a baby is born, its height and weight are recorded, and a footprint is made. Think about how much you have grown since then!

When I was born, I was ____ cms tall and weighed ____ grams. I drank ____ ml of milk in one sitting.

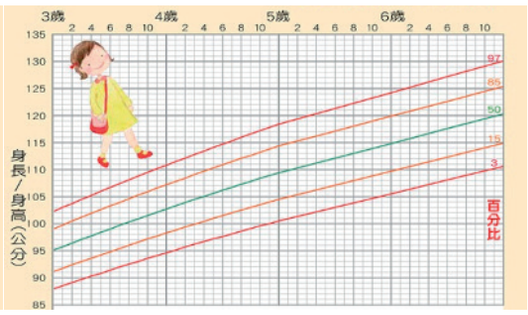
Now that I am ____ years old, I am ____ cms tall and weigh ____ kgs. I eat about ____ grams of food per meal. My feet are now ____ cms longer than they were when I was born!

From birth onwards, doesn't it seem like you have grown a lot?

Boy Growth Chart Calculator



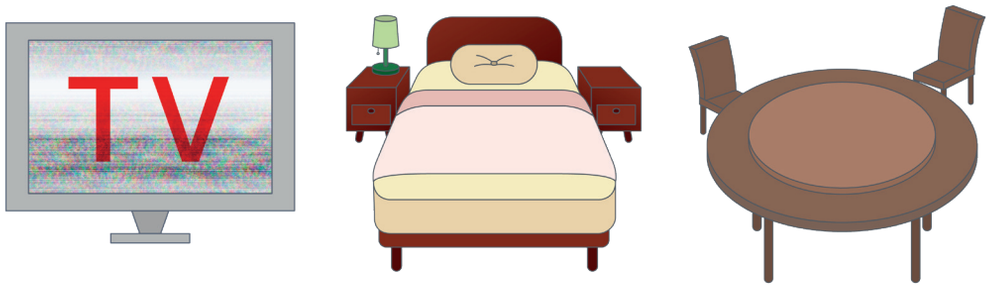
Girl Growth Chart Calculator



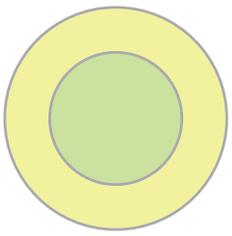
In this unit, you will learn about comparing area, volume, and weight. By the end of this unit, you will be heavier from all the knowledge you gained!

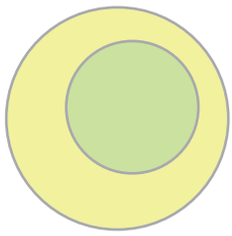
Comparing Area

When we say that a TV, bed, or dining table is bigger or smaller than another one, what are we comparing? Discuss.



1. The dining room table in the picture has two surfaces, with the smaller surface on top of the bigger surface. How much bigger is the bigger surface? (Explain where the size difference is.)

A. 

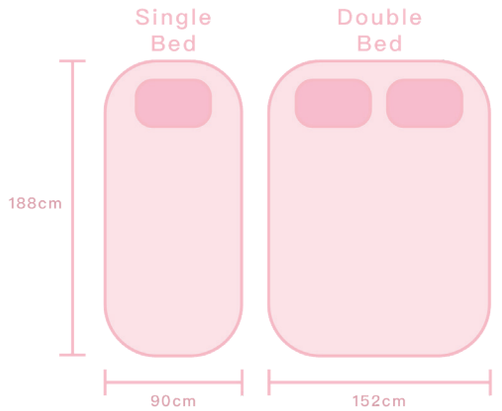
B. 

Is the yellow area the same size in pictures A and B?

☐ Yes ☐ No

Why or why not? Discuss.

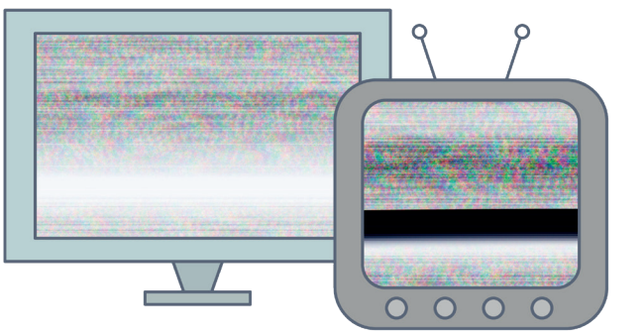
2. In your own words, which part of these two bed sizes are the same? Which part is different?



Which part of the double bed is greater than the single bed?

Mark the difference.

3. Jack： My TV is so big!
Jill： Oh yeah? Well, my TV is bigger!



Whose TV is actually bigger? Is there any way to find out? Write down your method below.

Method 1

Method 2

《Practical Math》

The size of televisions is measured by either of the lines that make an “X” diagonally across the screen.

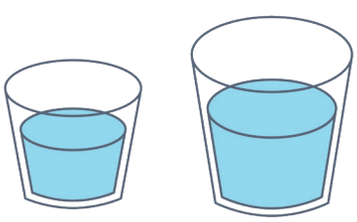
Comparing Volume

Think about objects in your kitchen that can hold water. Honestly speaking, many of them can!

When discussing the volume an object can hold, we are always talking about how much water it can hold.

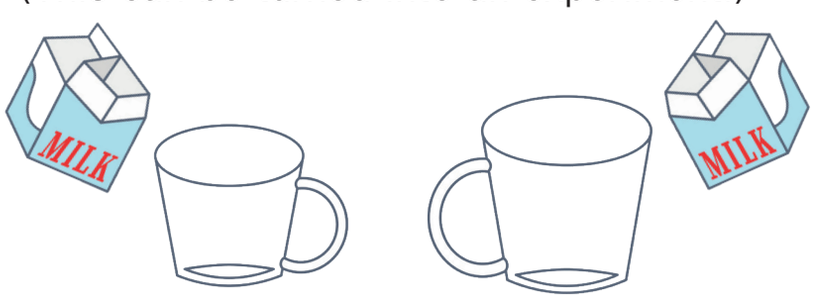
4. When you pour water into a cup, the more water you pour, the higher/lower the water level gets.

5. The water in these two cups is at the same level. Which cup holds more water? Check (✓) the correct box. How do you know?



☐ ☐

6. If you pour the same volume of milk into these two cups, which one will end up at a higher level? Check (✓) the correct box. How do you know? (This can be turned into an experiment.)

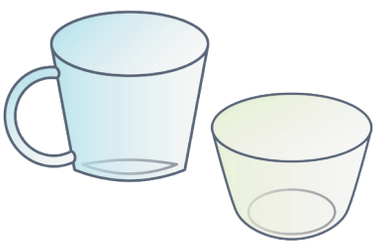


☐ ☐

7. Suppose we wanted to find out whether the cup or the bowl holds more water. How could we do this? Learn about one method below.

Method 1

Fill the bowl with water and then slowly pour it into the cup.



(1)The cup is completely filled with water from the bowl, and there is still extra water remaining in the bowl. In this case, the cup/bowl holds more water.

(2)All the water from the bowl is poured into the cup but the cup still isn't full. In this case, the cup/bowl holds more water.

Draw a picture below to explain.

Are there other methods that would work? Write them down here.

Method 2

《Math Literacy》

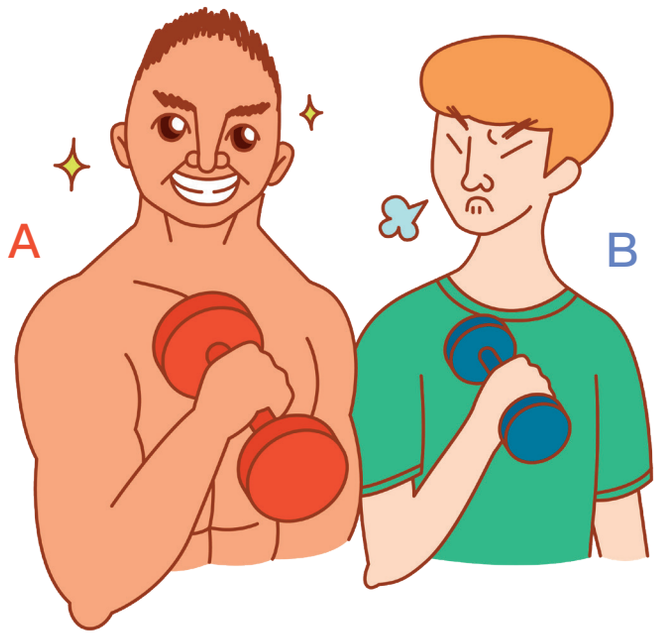
POINTS!

1.The lesser subtracted from the greater is called the difference.

2.Some amount can be added to the lesser to make it the same volume as the greater.

Comparing Weight

Is the following statement true or false? Look at the pictures to decide.



"The man in picture A is smiling, but the man in picture B looks like he's in pain. Therefore, the dumbbells in picture B must be heavier."

☐ True ☐ False

How do you know?

Therefore, if you wanted to know the weight of two bags:

☐ just look at them. The bigger one is heavier.

☐ lift them to feel which one is heavier.

☐ use a scale to figure out the weight

8. In the picture on the right, who's heavier?

☐ Kelly ☐ Nelly

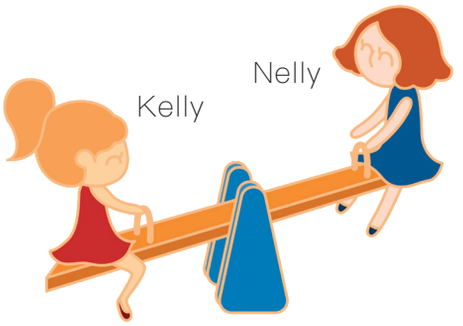
The answer can be recorded like this:

_____ 's weight > _____ 's weight

greater than

OR, _____ 's weight < _____ 's weight

less than



Circle the correct answer

It must be true that if Kelly weighs 26 kgs, then Nelly weighs more than / less than 26 kgs.

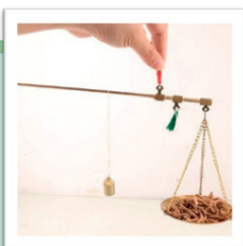
9. There are _____ on each side of the two scales in the picture.

The green/orange ball is heavier than the yellow one.

The green/orange ball is lighter than the yellow one.

Therefore, the heaviest ball is the _____ one.
The lightest ball is the _____ one.

《Practical Math》



Look at how a traditional steelyard balance is used for weighing.
Even today, some Chinese medicine herbalists still use this device to weigh out Chinese medicine.

Practice Questions:

1. Blinds are used to keep out sunlight. The further down we pull them, the bigger/smaller the area of sunlight gets.

2. There are many interlocking puzzle square floor mats in the picture. The more squares are used, the bigger/smaller the area gets.

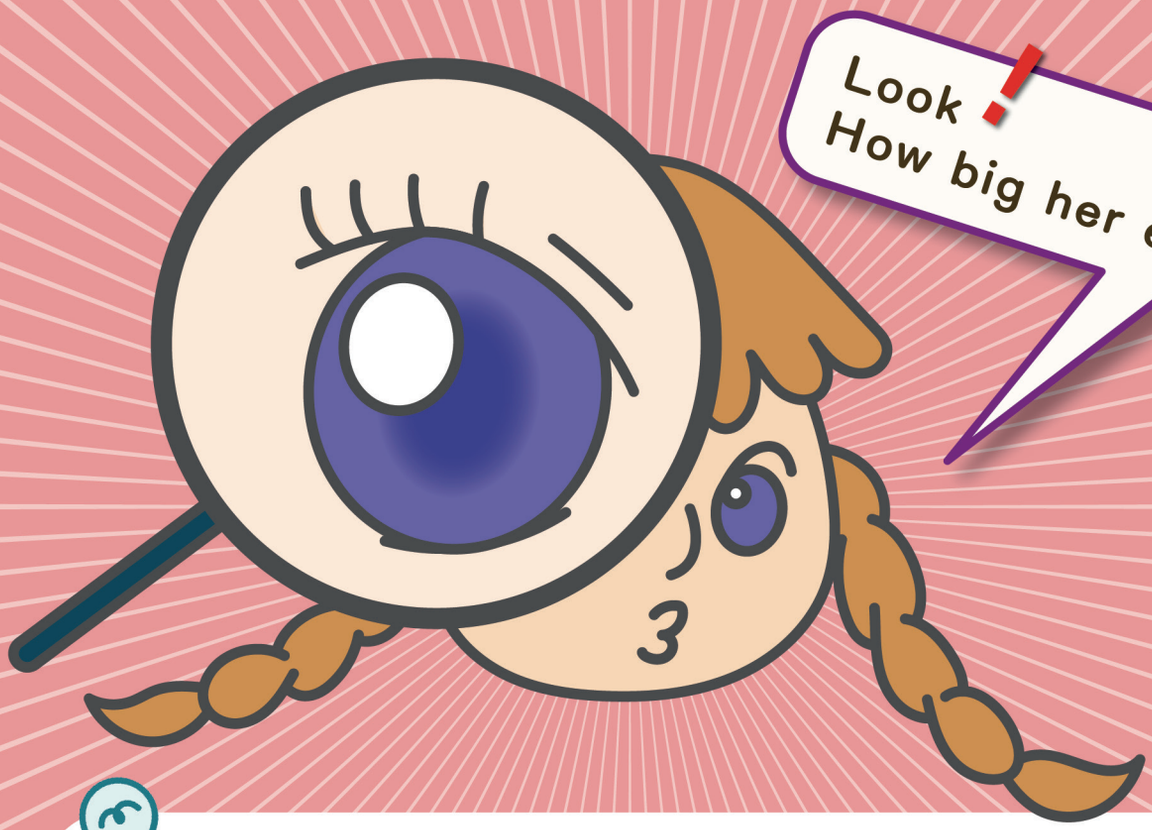
3. Some businessmen were having an important meeting. These two drink vats were filled to the top at the beginning of the meeting.
   By the end, there was more black tea leftover. This means that the businessmen drank more black tea /coffee.

4. Father is heavier than mother. Elder brother is heavier than mother, too.
   Therefore, who is heavier, father or elder brother?

   _____

Unit 5

Multiplication



A microscope can make small objects appear to be much larger than they actually are.

A microscope

60X magnification

100X magnification

An enlarged snowflake!

Multiples

【Scene 1】

The teacher tells you to copy down, “I will be considerate” three times. Sounds easy, right?

_____ _____ _____

On the other hand, if the teacher tells you to copy down the text on the right three times, boy are you in trouble!

Doing something three times means you repeat it the same way times three.

【Scene 2】

It’s time to take Chinese medicine! There is this much medicine in one packet.

The “x” sign is used to show that you take one packet three times per day.

X3 =

As an amount, “x3” means one packet taken three times.

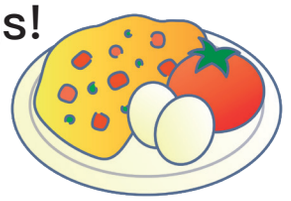
Now it’s time to take Western medicine! There are two pills in each packet and a total of five packets, which means that there are a total of ____ pills.

Five packets means that one packet is multiplied by five, like so: 1 packet X 5 = 5 packets. This is read as, “One packet times five equals five packets,” or, “One packet times five is five packets.”

【Scene 3】

Let’s make tomato scrambled eggs!

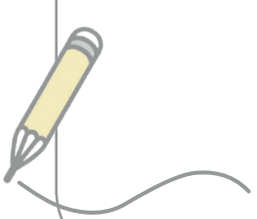
Ingredients for a four–person serving

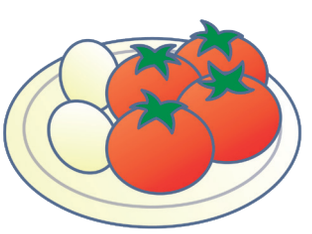


Now imagine that you need to serve 12 people. How many eggs are needed? How many tomatoes?

Number of Portions		
4	2	4
× ?	× ?	× ?
12		

Draw. Then, calculate.



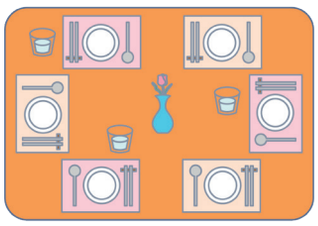


One plate serves four people.

12 portions is ____ times more than 4 portions.

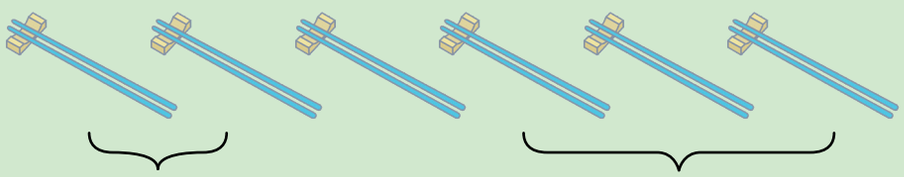
Multiplication by Two

Six people will be eating together, so six pairs of chopsticks will need to be set at the table.
How many individual chopsticks is this?



Calculate and read.

Two chopsticks in a pair.

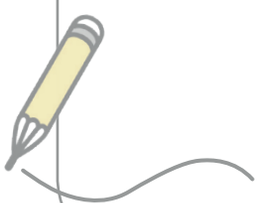


2,4
2 X 2 = 4
Two and two is four.

2,4,6
2 X 3 = 6
Two and three is six.

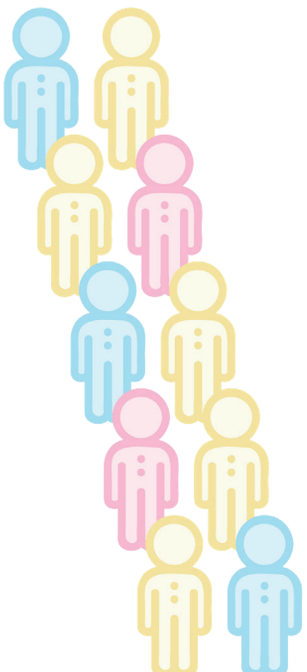
2 X 6 is two multiplied six times, or six twos, as follows:
2 X 6 = 2 + 2 + 2 + 2 + 2 + 2 = _____

Now, what is two multiplied eight times?
What is the total?
How can it be recorded?



Solving Problems with Math

The children are lined up in pairs for the Halloween parade.
If there are ten pairs of children, how many children are there in total?



There are two children per pair.
There are ten pairs, or ten twos.
What is the total?
How would it be recorded?

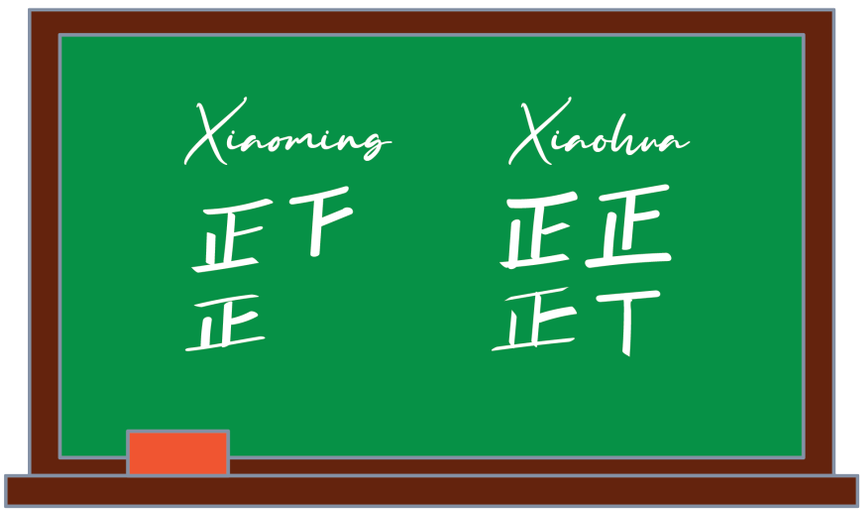
In Pairs: Multiples of Two

2 Times	Total	2 Times	Total
2 X 1	2	2 X 6	
2 X 2		2 X 7	
2 X 3		2 X 8	
2 X 4		2 X 9	
2 X 5		2 X 10	

Memorize the whole table. You can do it!

How many strokes are in the character “正”?

It’s time to choose the class leader!
Xiaoming/Xiaohua wins!



There are _____ strokes in the character 正 .

Look at the picture.
How many votes did Xiaoming (left) get?

5 + 5 + 3
= 5 x 2 + 3
= __ + 3 = __

Xiaoming got __ votes.

Look at the picture.
How many votes did Xiaohua (right) get?

5 + 5 + 5 + 2
= 5 x 3 + 2
= __ + 3 = __

Xiaohua got __ votes.

The character “正” is a way of counting in multiples of five.

Multiples of Five

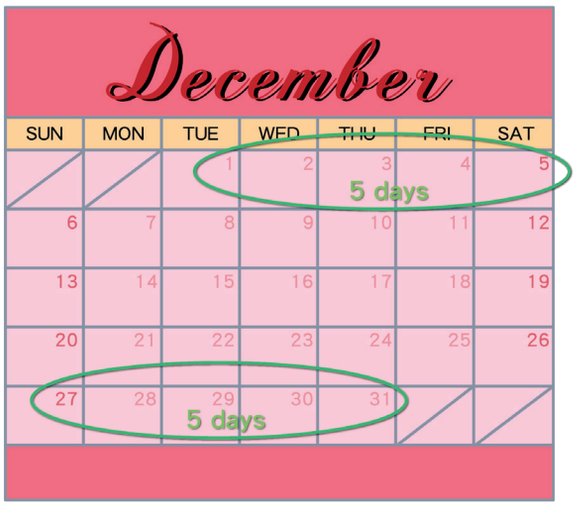
5 Times	Total
5 X 1	5
5 X 2	
5 X 3	
5 X 4	
5 X 5	

5 Times	Total
5 X 6	
5 X 7	
5 X 8	
5 X 9	
5 X 10	

5,1,5 ; 5,2,10 ; 5,3,15 ; ...
5 , 10 , 15 , 20 , 25 , ...

How many days are there in a given number of weeks?

How many days does December have?



There are three 7-day weeks.

7-days
7-days
7-days
} 7-days X 3

There are two 5-day weeks.

⟶ 5-days X 2

7 multiplied 3 times is 7 X 3 = 7 + 7 + 7 = ___

5 multiplied 2 times is 5 X 2 = 5 + 5 = ___

Therefore, there are ___ days in December.

Solving Problems with Math

Look at a Western calendar.
There are about ___ weeks and ___ days left until the last day of the year.
In other words, there are ____ days left until New Year's Eve.

Let the countdown begin!

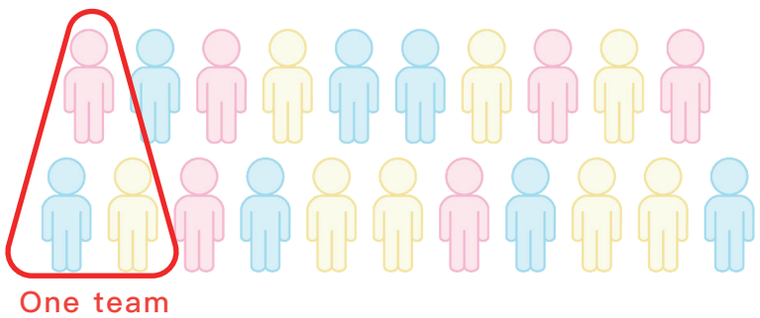
How many weeks? Multiples of Seven

7 Times	Total	7 Times	Total
7 X 1	7	7 X 6	
7 X 2		7 X 7	
7 X 3		7 X 8	
7 X 4		7 X 9	
7 X 5		7 X 10	

Lucky seven !

Making Groups

There are 21 students in the class.
If there are three students on each team, how many teams are there?



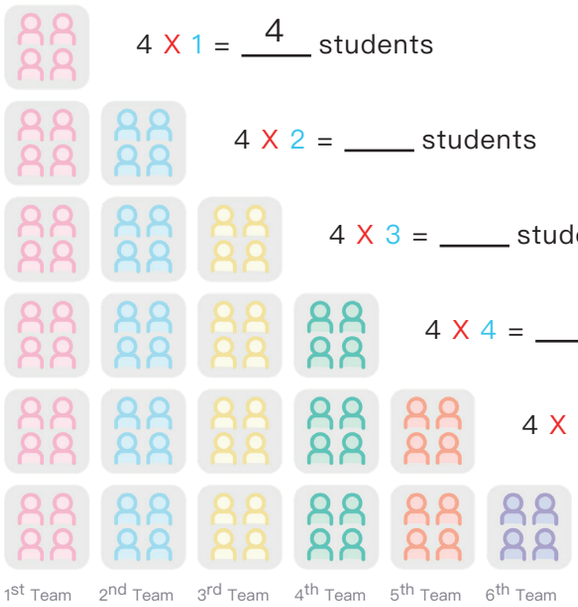
Given that there are 21 students in the class, there will be ____ teams of three. There will be/won't be any remaining students.

3 students X ____ + ____ = 21 students

Multiples of three

3 Times	Total	2 Times	Total
3 X 1	3	3 X 6	
3 X 2		3 X 7	
3 X 3		3 X 8	
3 X 4		3 X 9	
3 X 5		3 X 10	

Now imagine that there are four students per team in the same class of 21.
How many teams are there?
Are there any remaining students?



Given that there are 21 students in the class, there will be _____ groups of four.
There will be/won't be any remaining students.

$$21 = 4 \times \_\_\_\_\_ + \_\_\_\_\_$$

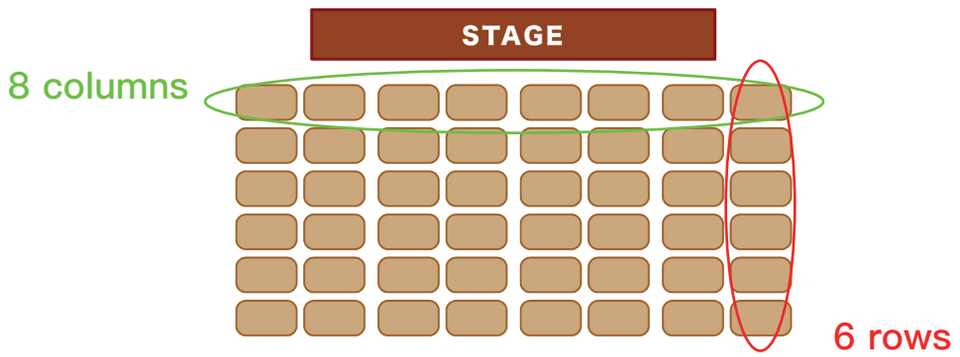
Multiples of Four

4 Times	Total
4 X 1	4
4 X 2	
4 X 3	
4 X 4	
4 X 5	

4 Times	Total
4 X 6	
4 X 7	
4 X 8	
4 X 9	
4 X 10	

Number of Seats

According to this seating plan, how many seats are there?
How would you calculate this?



Calculation Method 1

Fill the bowl with water and then slowly pour it into the cup.

Each column has six desks and there are eight columns.

6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 = ___ X ___

Show your work by drawing on the above seating plan.

Multiples of Six

6 Times	Total
6 X 6	6
6 X 7	
6 X 8	
6 X 9	
6 X 10	

6 Times	Total
6 X 6	
6 X 7	
6 X 8	
6 X 9	
6 X 10	

Calculation Method 2

Each row has eight desks and there are six rows.

Each row has eight desks and there are six rows.

8 + 8 + 8 + 8 + 8 + 8 = ___ X ___

Show your work by drawing on the above seating plan.

Multiples of Eight

8 Times	Total	8 Times	Total
8 X 1	8	8 X 6	
8 X 2		8 X 7	
8 X 3		8 X 8	
8 X 4		8 X 9	
8 X 5		8 X 10	

Solving Problems with Math

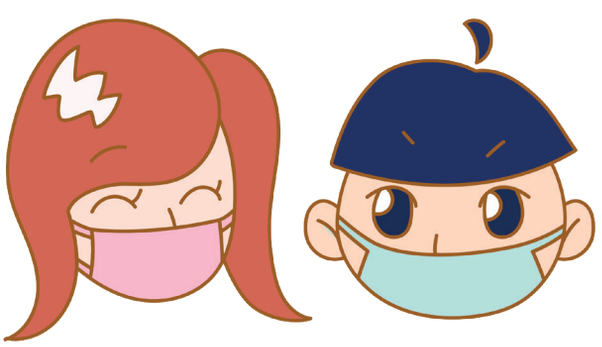
Mom bought 4 boxes of pineapple cakes,each box has 6.
If you change it to buy a box of 8 pieces,then just buy ( ) box and there are as many pineapple cakes.

Write down your formula.

Multiples of Nine

There are three adults and one child in William's family.
If one adult can buy 9 masks and one child can buy 10 masks, how many masks can they buy as a family?

1 adult ⇨ 9 masks
3 adult ⇨ ? masks



Write an equation for the adults

_____

Write an equation method for the family.
Solve.

(Hint: There are three adults with nine masks each and one child with ten masks.)

⇨_____

= _____

9 Times	Total
9 X 1	9
9 X 2	
9 X 3	
9 X 4	
9 X 5	

9 Times	Total
9 X 6	
9 X 7	
9 X 8	
9 X 9	
9 X 10	

One 9 is 10 minus 1.
Two 9s is two 10s minus 2.
Three 9s is three 10s minus 3.

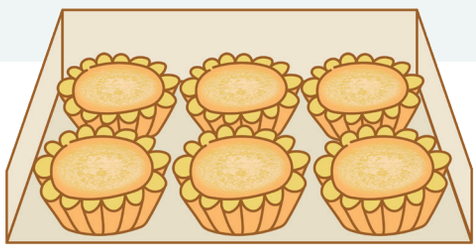
Multiples of Nine:

The Finger Method

Practice Questuons:

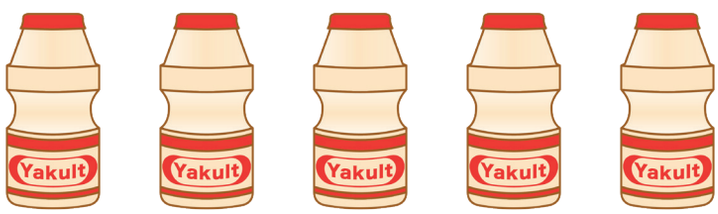
1. (1)There are six egg tarts in a box.
How many egg tarts are there in seven boxes?

___ X ___ = ____

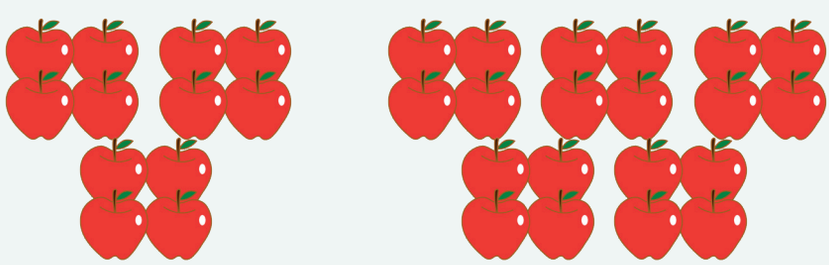


(2)One bottle of Yakult yogurt drink costs 8 NTD.
How many NTD would five bottles cost?

___ X ___ = ___



2. How many 4s is three groups of 4 and four groups of 4 added together?



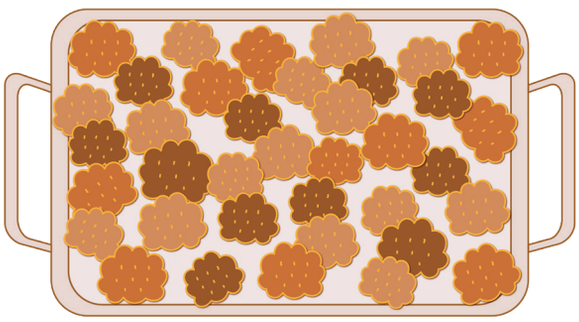
4 X 3 + 4 X 5

= 4 X ___

= ___ apples

3. Tina is making cookies.

(1)She is making 37 cookies in total.
She wants to give them to her friends in bags of five.
What is the highest number of bags of cookies she can make?



5x ____ bags = ____ cookies
5x ____ bags = ____ cookies
5x ____ bags = ____ cookies

The highest number of bags of cookies she can make is ____ .

(2)Tina made cookies again.She still wants to give them to her friends in bags of five.
This time, she was able to make 15 bags of cookies plus two extras. How many cookies did she make in total?

Calculation Method: _____

How will you solve this? Show your work here!

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https://tw.newhorizonofmathematics.com

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New Horizon of Mathematics

Mathematics Literacy for elementary years

<3>

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