BRIGHTER MATHS

Creating a whole generation of kids that are confident in maths

PLACEMENT TESTS SOLUTIONS

FOR

ASSESSMENT OF STUDENT UNDERSTANDING

MATHS AUSTRALIA

PLACEMENT ASSESSMENT INSTRUCTIONS

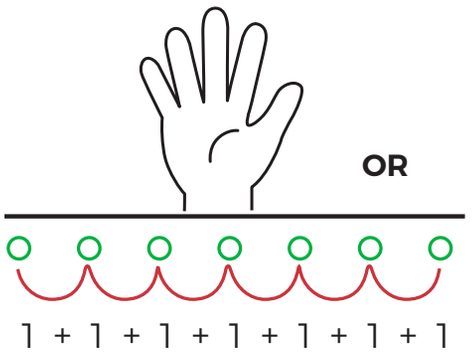
These placement tests have been intentionally and carefully developed to provide a simple, easy to follow system of assessing a students current level of mathematical mastery, integrating algebra and progressing through whole numbers to fractions, decimals and percents in the following sequence.

- **Counting**
- **Place Value**
- **Addition**
- **Subtraction**
- **Multiplication**
- **Division**

They are your key to determining your student's current level of mastery, and to having a clear starting point from which you can build, step by step

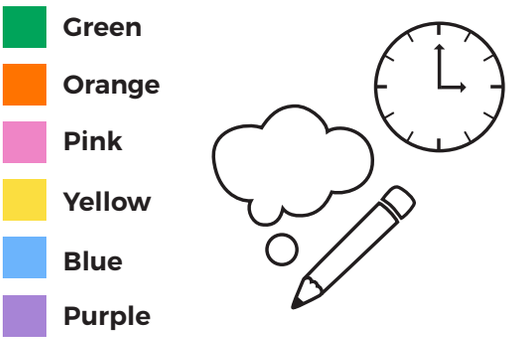
Step 1

If your student is using fingers or units to count, you will begin them at the Green level. Though no test is required, we recommend having them undertake this initial test as a benchmark to show their success as they progress.



Step 2

Progress through each Placement Test. Commence at the Green level. Observe the student and note when they are no longer progressing through the questions with ease, fluency and automaticity. Note the time it takes for them to complete the task.



Step 3

When the student scores less than 90% on a test or is no longer fluent with their answers, stop right there. This is the point you are looking for, and it marks their current level of maths mastery.

Step 4

Once you have finished the placement tests, you can feel confident you have identified your student's unique level of maths mastery and know where to begin to address their learning needs. Now we know where to begin...

Student Name

Date **Year**

Green Placement Test Result: _____ Time Taken: _____

Orange Placement Test Result: _____ Time Taken: _____

Pink Placement Test Result: _____ Time Taken:_____

Yellow Placement Test Result: _____ Time Taken:_____

Blue Placement Test Result: _____ Time Taken:_____

Purple Placement Test Result: _____ Time Taken:_____

GREEN PLACEMENT TEST

Student's Name ..... **Year** .....

Before you begin:

Do you like maths? _____

Do you think you are good at maths? _____

Why do you think that is? _____

Write two numbers that add together to make ten.

1+9, 2+8, 3+7, 4+6, 5+5, 6+4, 7+3, 8+2, 9+1

9 + 3 = 12

8 + 5 = 13

4 + 9 = 13

$$\begin{array}{r} 7 \\ +\ 6 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 3 \\ +\ 5 \\ \hline 8 \end{array}$$

Complete the following sequences.

4 , 5 , 6 , 7 , 8 , 9 , 10 , 11

62 , 64 , 66 , 68 , 70 , 72

70 , 80 , 90 , 100 , 110 , 120

10 , 9 , 8 , 7 , 6 , 5 , 4 , 3

What number is one before six?

five (5)

Write the following numbers in order, from smallest to largest.

3 , 7 , 10 , 2 2 , 3 , 7 , 10

Now write the same numbers in order, from largest to smallest.

10 , 7 , 3 , 2

Identify the number of hundreds, tens and units you have in each place.

96 H 0 T 9 U 6

413 H 4 T 1 U 3

In the number 362;

In which place is the numeral '3' hundreds

How many units is this? three hundred units

How many tens is this? thirty tens

How many hundreds is this? three hundreds

In which place is the numeral '6'? tens

How many units is this? sixty units

How many hundreds is this? zero hundreds

In which place is the numeral '2'? units

How many units is this? two units

How many tens is this? zero tens

How many hundreds? zero hundreds

How many units (ones) are there in one ten? ten units = one ten

How many tens are there in one hundred? ten tens = one hundred

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$$\begin{array}{r} 11 \\ -\ 8 \\ \hline 3 \end{array}$$

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8 - 4 = 4

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12 - 7 = 5

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15 - 9 = 6

The guests brought six red balloons and five yellow balloons to Meredith's party. How many balloons were brought to the party?

Eleven balloons were brought to the party.

6 + 5 = 11

Kayla rode her bike seven blocks and walked three blocks. How far did she travel?

Kayla travelled ten blocks.

7 + 3 = 10

Laura and her friend played a game. Laura scored nine points and her friend scored five points. What was the difference between their scores?

Laura scored four more points.

9 - 5 = 4

Elizabeth did thirteen maths problems. She got five answers wrong. How many answers were right?

Elizabeth answered eight problems correctly.

13 - 5 = 8

Eight children came to the picnic. Only two of them brought their baseball gloves. How many did not bring baseball gloves?

Six children did not bring baseball gloves.

8 - 2 = 6

ORANGE PLACEMENT TEST

Student's Name ..... **Year** .....

Calculate the following, showing each step:

22 + 48 = 70

183 + 368 = 551

$$\begin{array}{r} 907 \\ +168 \\ \hline 1075 \end{array}$$

$$\begin{array}{r} \$8.92 \\ +\ \$2.49 \\ \hline \$11.41 \end{array}$$

$$\begin{array}{r} 6,474 \\ 7,610 \\ +\ 3,685 \\ \hline 17,769 \end{array}$$

$$\begin{array}{r} 968 \\ 145 \\ 203 \\ +\ 75 \\ \hline 1,391 \end{array}$$

Calculate the following, showing each step:

23 - 17 = 6

115 - 98 = 17

$$\begin{array}{r} 403 \\ -215 \\ \hline 188 \end{array}$$

$$\begin{array}{r} 710 \\ -346 \\ \hline 364 \end{array}$$

$$\begin{array}{r} 5,834 \\ -\ 1,057 \\ \hline 4,777 \end{array}$$

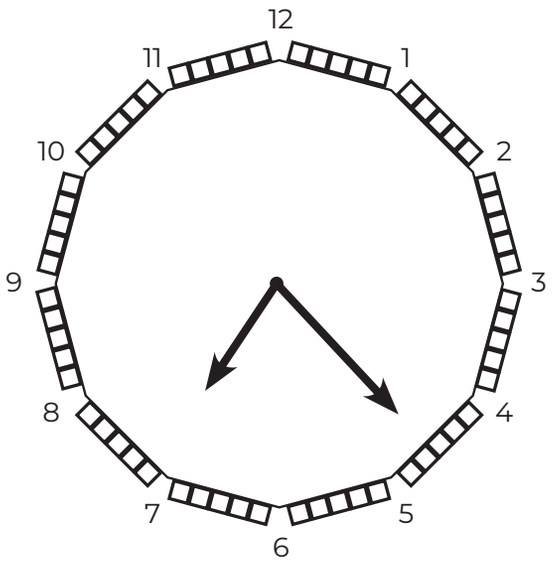
$$\begin{array}{r} 81,327 \\ -45,189 \\ \hline 36,138 \end{array}$$

Write the number and say it.

Two hundred seventy-six thousand , five hundred ninety-one = _____

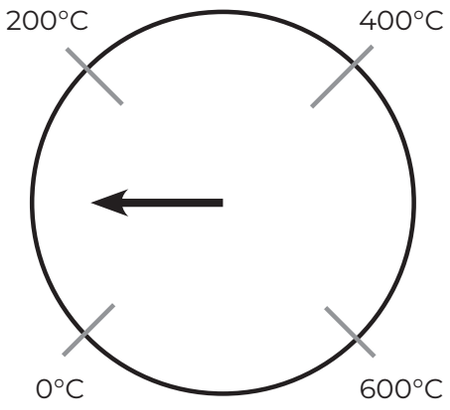
276, 591

Write the time with hours and minutes in digital clock form.



7:23

Read the gauge to show the temperature.



100°C

Round 15 to the nearest ten 20

Round 152 to the nearest hundred 200

Round 76 to the nearest ten 80

Penny counted twenty-eight green cars and forty-three red cars on the trip to Grandmother's house. Estimate how many cars she counted in all, then find the exact answer.

28 ≈ 30; 43 ≈ 40; 30 + 40 = 70; 28 + 43 = 71 cars.

A fisherman caught four hundred and fifteen big fish and two hundred and twenty-one little fish. How many fish did he catch altogether?

415 + 221 = 636 fish.

Brooke rode her bike for three hours on Monday, four hours on Tuesday, and six hours on Wednesday. On Thursday she was tired and only rode one hour. How many hours has Brooke ridden in all?

3 + 4 + 6 + 1 = 14 hours.

Cameron earned two hundred and fifty-five dollars last winter doing chores. His grandmother gave him one hundred and twenty-five dollars for his birthday. Cameron then spent one hundred and forty dollars on Christmas gifts. How much money does Cameron have left now?

$255 + $125 - $140 = $235

Jill had eleven chores to do. She already did four of them, and her sister helped by doing two more. How many chores does Jill still have left to do?

11 - 4 - 2 = 5 chores left to do.

Richard is twenty-nine years old and Joanne is twenty-six years old. How many years older is Richard than Joanne?

29 - 26 = 3 years older.

Alan went to the store with fifty-five dollars and came out with twenty-one dollars and fifteen cents. How much money had he spent in the store?

$55.00 - $21.15 = $33.85 spent.

PINK PLACEMENT TEST

Student's Name ..... **Year** .....

Calculate the following;

4 x 7 = 28

0 x 1 = 0

(6) (6) = 36

(4) (9) = 36

8 x 5 = 40

7 x 7 = 49

$$\begin{array}{r} 6 \\ \times\ 1 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 7 \\ \times\ 6 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 3 \\ \times\ 6 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 85 \\ \times\ 26 \\ \hline \\ \hline 2,210 \end{array}$$

$$\begin{array}{r} 421 \\ \times\ 73 \\ \hline \\ \hline 30,733 \end{array}$$

$$\begin{array}{r} 7,546 \\ \times\ 8 \\ \hline \\ \hline 60,368 \end{array}$$

$$\begin{array}{r} 509 \\ \times\ 636 \\ \hline \end{array}$$

323,724

$$\begin{array}{r} 3{,}482 \\ \times\ 59 \\ \hline \end{array}$$

205,438

$$\begin{array}{r} 6{,}187 \\ \times\ 467 \\ \hline \end{array}$$

2,889,329

Write all of the factors of forty eight.

48 = 1x48, 2x24, 3x16, 4x12, 6x8

Factors: 1, 2, 3, 4, 6, 8, 12, 16, 24, 48

Write all of the factors of fifty six.

56 = 1x56, 2x28, 4x14, 7x8

Factors: 1, 2, 4, 7, 8, 14, 28, 56

Write <, > or = in the oval to show the inequalities below.

6 x 2 (=) 3 x 4

8 x 8 (>) 5 x 12

7 x 6 (<) 9 x 5

Mrs. Miller made three sandwiches for each of her four children. How many sandwiches did Mrs. Miller make in all?

3 x 4 = 12 sandwiches

Caitlyn ran two kilometres a day for two days. Then she ran five kilometres a day the remaining three days of the weeks. How many kilometres did she ran altogether this last week?

(2 x 2) + (5 x 3) = 4 + 15 = 19 kilometres.

A carton of eggs hold twelve eggs. How many eggs are in four cartons?

12 x 4 = 48 eggs.

Chuck caught two hundred and thirteen fish each week. Estimate the number of fish that he caught in the last four weeks.

213 ≈ 200 ; 200 x 4 = 800 ; ≈ 800 fish.

Terri's backyard measures twenty-four metres by thirty-six metres. What is the area of her backyard?

24 x 36 = 864 m^2.

YELLOW PLACEMENT TEST

Student's Name **Year**

$4 \overline{)36}$ = 9

$8 \overline{)32}$ = 4

$7 \overline{)49}$ = 7

$16 \div 8 =$ 2

$35 \div 7 =$ 5

$\frac{48}{8} =$ 6

$12 \div 4 =$ 3

$36 \div 6 =$ 6

$\frac{70}{7} =$ 10

$56 \div 7 =$ 8

$\frac{12}{6} =$ 2

Divide. Write your remainders without using fractions.

$4 \overline{)82}$ 20 r.2

$7 \overline{)53}$ 7 r.4

$648 \div 8 =$ 81

$5 \overline{)396}$ 79 r.1

Divide. Write your remainders with fractions.

$$25 \overline{)631} \quad 25\ \tfrac{6}{25}$$

$$349 \div 16 = 21\ \tfrac{13}{16}$$

$$\frac{30458}{6} = 5{,}076\ \tfrac{2}{6}$$

$$84 \overline{)57647} \quad 686\ \tfrac{23}{84}$$

Madison divided twelve apples equally between herself and a friend. How many apples did her friend receive?

12 ÷ 2 = 6; 6 apples.

Hannah made eighteen muffins yesterday and eleven more today. She plans to divide the muffins among her five friends as gifts. How many muffins will each firend receive?

18 + 11 = 29; 29 ÷ 5 = 5 r. 4
5 muffins each, 4 left over.

Jacob wants to divide thirty-one dollar coins among his four children. How many coins will each child receive? How many dollar coins will Jacob have left over?

31 ÷ 4 = 7 r. 3
7 one-dollar coins each, 3 left over.

Logan drove at fifty-five km every hour for three hundred and thirty km. How many hours did the trip take?

330 ÷ 55 = 6; 6 hours.

Thirty-four people wants to go picnic. If all the available cars hold five people each, how many cars are needed to take everyone who wants to go?

34 ÷ 5 = 6 r. 4
6 full cars + 1 more is needed; 7 cars needed.

A biologist placed twenty-four thousand three hundred and twenty-five fish eggs in total in tanks to hatch. If he has five tanks and put the same number of eggs in each, how many eggs are in each tank?

24, 325 ÷ 5 = 4, 865; 4, 865 eggs.

BLUE PLACEMENT TEST

Student's Name ..... **Year** .....

$\frac{1}{2}$ of 24 = 12

$\frac{2}{3}$ of 18 = 12

$\frac{7}{8}$ of 64 = 56

Fill in the missing numbers in the numerators or denominators to make equivalent fractions.

$\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16}$

$\frac{9}{10} = \frac{18}{20} = \frac{27}{30} = \frac{36}{40}$

Show inequalities.

$\frac{5}{7}$ (>) $\frac{3}{5}$

(or ≠)

$\frac{4}{8}$ (=) $\frac{3}{6}$

$\frac{4}{8} \times \frac{1}{3} = \frac{4}{24} = \frac{1}{6}$ * either answer is correct

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$\frac{8}{9} - \frac{5}{9} = \frac{3}{9} = \frac{1}{3}$ *

$\frac{1}{2} + \frac{1}{4} + \frac{7}{8} = \frac{13}{8} = 1\frac{5}{8}$ *

$\frac{4}{5} - \frac{1}{3} = \frac{7}{15}$

$4\frac{1}{3} + \frac{1}{5} = 4\frac{8}{15}$

$\frac{4}{5} \times 2\frac{3}{4} \times 3\frac{1}{3} = \frac{22}{3} = 7\frac{1}{3}$ *

$3\frac{4}{5} \div 2\frac{7}{25} = \frac{95}{57} = 1\frac{38}{57} = 1\frac{2}{3}$ *

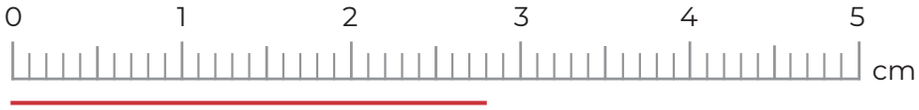
$12\frac{5}{6} - 1\frac{1}{6} =$ $11\frac{4}{6} = 11\frac{2}{3}$ *

$$7\frac{1}{4} - 5\frac{3}{4} = 1\frac{2}{4}$$

$$9\frac{2}{3} + 6\frac{5}{9} = 16\frac{1}{9}$$

$$5\frac{1}{5} - 2\frac{5}{6} = 2\frac{11}{30}$$

How long is the line?



2 8/10 cm

Write this as a decimal. 2.8 cm

Five eights of the trees in my yard are eucalyptus. If there are sixteen trees in my yard, how many are eucalyptus?

$\frac{5}{8} \times 16 = 10$; 10 eucalyptus trees.

Sophia used two fifths of her birthday money for school supplies and one third of it for gifts. With maths symbols, show what part of her birthday money she has spent so far.

$\frac{2}{5} + \frac{1}{3} = \frac{11}{15}$; $\frac{11}{15}$ of her birthday money.

Gavin saw three quarters of a pizza on the kitchen bench. By the time he was finished eating, there was only one eighth of a pizza left. What part of a pizza did Gavin eat?

$\frac{3}{4} - \frac{1}{8} = \frac{5}{8}$; $\frac{5}{8}$ of the pizza.

Three eighths of the guests at the picnic ate hamburgers. One half of the people who ate hamburgers had tomato sauce on them. What part of the people at the picnic had hamburgers with tomato sauce?

$\frac{1}{2} \times \frac{3}{8} = \frac{3}{16}$; $\frac{3}{16}$ of the people.

Marcy had three fourths of her birthday cake left over. She wants to give each of her guests one sixteenth of a whole cake. How many people can she serve?

$\frac{3}{4} \div \frac{1}{16} = 12$; 12 people.

Bria has three and one eighth kilograms of almonds. If she divides them into portions that each weigh five eighths **kilogram**, how many people can she treat? (Write these as fractions, show your workings).

$3\frac{1}{8} \div \frac{5}{8} = 5$; 5 people.

PURPLE PLACEMENT TEST

Student's Name **Year**

Add or subtract the decimal numbers.

$$\begin{array}{r} 7.52 \\ -\ 1.85 \\ \hline 5.67 \end{array}$$

6.0 + 5.28 = 11.28

32.041 - 0.596 = 31.445

Multiply the decimal numbers.

$$\begin{array}{r} 2.49 \\ \times 0.60 \\ \hline \\ \hline 1.494 \end{array}$$

1.7 x 3 = 5.1

$$\begin{array}{r} 0.004 \\ \times 0.05 \\ \hline 0.0002 \end{array}$$

$$\begin{array}{r} 3.75 \\ \times 5.00 \\ \hline 18.75 \end{array}$$

The circular sports field has a radius of fifty two metres. Draw it here and label the sports field.

Write the formula and calculate the circumference of the sports field.

$$C = 2\pi r$$
$$= 2 \times \frac{22}{7} \times 52\text{m}$$
$$= 326.86\text{m}$$

Write the formula and calculate the area of the sports field.

$$A = \pi r^2$$
$$= \frac{22}{7} \times (52)^2$$
$$\approx 8{,}498\ \text{m}^2$$

Change each fraction to a decimal and then to a percent.

$\frac{8}{10}$ = 0.8 = 80 %

$\frac{5}{8}$ = 0.625 = 62.5 %

Answer the following.

$4\overline{)13.3}$ = 3.325

$7\overline{)4.58}$ = 0.654

Divide until you see a pattern, and write the answer with a line over the repeating portion.

$6.5\overline{6}$

$6 \overline{)39.4}$

$0.7\overline{33}$

$.03 \overline{).022}$

Divide to the hundredths place, then write the remainder as a fraction.

$0.81\frac{9}{11}$

$11 \overline{)9.}$

$0.55\frac{5}{9}$

$9 \overline{)5}$

Fritha has four dollars and seventy-five cents and Rachel has six dollars and thirty cents. Do they have enough money to buy a new game that costs eleven dollars?

$4.75 + $6.30 = $11.05. Yes, they have enough.

Joel drove six hundred and forty-two kilometres yesterday. A kilometre is about zero point six of a mile. How many miles did Joel drive yesterday?

642 x 0.6 ≈ 385.2 miles.

Kyle bought a meal that cost fifteen dollars and ninety-six cents and left a fifteen percent tip. What was the total cost of the meal with the tip? (Round your answer to the nearest cent.)

$15.96 + ($\frac{15}{100}$ x 15.96) = $18.35

Ken has collected twenty-five football cards. His goal is to have four hundred percent of that number. How many cards does he hope to collect in all?

25 x 400% = 100 cards.

Julianne ordered items from a catalogue. They cost twenty-five dollars and sixty cents, eleven dollars and twenty cents, and forty-five dollars and twenty cents. Shipping is eight percent of the cost of the goods. GST is ten percent of the order including the shipping component. What is the total amount Julianne has to pay for her order?

25.60 + 11.20 + 45.20 = 82.00
82.00 + 6.56 + 8.86 = 97.42 $97.42 total.

Paul walked twenty-seven point three kilometres. He stopped to rest every nine point one kilometres. How many times did he stop? (Your answer will include his last stop at the end of the walk.)

27.3 ÷ 9.1 = 3 stops.

Debra has sixty-six dollars and thirty-five cents. How many items can she buy that cost three dollars and fifteen cents each?

$66.35 ÷ $3.15 = 21 items.

This page has been intentionally left blank for student workings.

BRIGHTER MATHS

Creating a whole generation of kids that are confident in maths

PLACEMENT TESTS

The science of learning teaches us that instruction needs to be explicit and . clear in the foundations of a subject and to then gradually build on the foundations, ensuring mastery at each step.

This mastery must be able to be recalled with fluency and automaticity, building on the concrete and progressing to a representation that is accurate, before the abstract symbolic stage can be taught.

At Maths Australia, we consider mastery to be achieved when the student can take a real life application and convert this into mathematical numerical form; then likewise take the abstract mathematical numerical form and relate that to every day life applications with confidence.

Our complete maths mastery system incorporates three critical components:

(1) Firstly, professional development that equips a teacher with an understanding of why, and how to teach in a multi sensory, sequential manner;

(2) Secondly, explicit teaching tools (manipulatives) that can progress a student efficiently and accurately through operations, commencing at counting and progressing to place value, addition, subtraction, multiplication and division;

(3) Thirdly, a lesson by lesson program that provides a teacher with the resources to be able to confidently implement this research and evidence-based approach into their daily practice. This program incorporates lesson by lesson instructional videos, accurate manipulative demonstrations, inline text through an online dashboard, succinct lesson plans that show curriculum alignment, success criteria, MTSS guidelines and UDL considerations, accurate flashcards and additional resources that will simplify the teachers application and provide them with the resources that they need.

We invite you to join us in transforming numeracy outcomes for your students through teaching them maths ‘the way they learn’.

Contact us at **www.mathsaustralia.com.au**

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