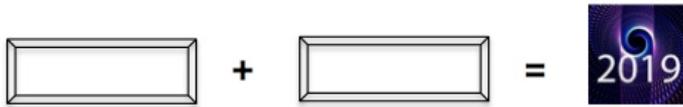


SAME SUM


$$\boxed{} + \boxed{} = \boxed{2019}$$

How many addition sums can you make by putting a whole number in each box to give the answer 2019?

You could put 1009 in one box and 1000 in the other box or you could put 2018 in one box and 1 in the other box. There are lots more ways to make 2019.

So how many ways can you add two whole numbers to get the answer 2019?

Can you add two even numbers to get the answer 2019?

Can you add two odd numbers to get the answer 2019?

If you find this difficult try the same problem for a smaller total. How many ways can you add two whole numbers to make 21? Can you add two even numbers to make 21?

SOLUTION

Think of the different numbers that you can put in the first box. You can put any of the whole numbers 0, 1, 2, 3 and so on up to 2019 in the first box so there are **2020 ways to make 2019** by adding two whole numbers.

If you add 2 even numbers you always get an even number so it is impossible to add to even numbers to get 2019.

If you add 2 odd numbers you always get an even number so it is impossible to add to odd numbers to get 2019.

NOTES FOR TEACHERS

Why do this activity? T

This activity requires learners to think mathematically. Some classes will find this very easy and it can be a 5 minute lesson starter. If so, as it is easier to explain ideas you find easy, to develop reasoning and communication skills, teachers can encourage learners to give reasons for their answers and praise learners who give clear explanations. Younger learners may need to start with a simpler problem like “how many ways can you add two whole numbers to make 21?”. The problem may lead to a discussion of whether zero is a whole number and it is helpful to make it clear that it is.

Intended learning outcomes

Development of reasoning and communication skills.

Development of understanding of counting and calculating principles.

Suggestions for teaching

Diagnostic Assessment

Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D.

What is another way to show 4,608?

- Ⓐ $46 + 8$
- Ⓑ $4,000 + 60 + 8$
- Ⓒ $4,000 + 600 + 8$
- Ⓓ $4,000 + 600 + 80$

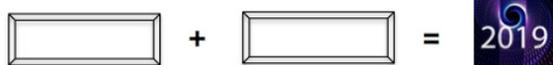
Common Misconception

I know this because
the 4 represents the 4,000,
the 6 represents the 60, and
the 8 represents the 8
(thousands, tens, units)

<https://diagnosticquestions.com>

Start your lesson with the diagnostic assessment. Steps for diagnostic assessment:

- Write the question on the board and ask the class to put up 1 finger if they think the answer is A, 2 fingers for B, 3 fingers for C and 4 fingers for D.
- Ask a learner who gave answer A to explain why he or she gave that answer and DO NOT say whether it is right or wrong but simply thank them for giving the answer.
- Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.
- Ask the class again to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.
- Give an explanation of why answer C is correct emphasising the place values, especially the hundreds and tens as the most common misconception is confusion between them.



Draw the diagram on the board and ask for a volunteer from the class to come and write a whole number in each box to make the sum add up to 2019. You may like to ask another learner for a different pair of numbers.

Then ask the class “how many different ways can you add two whole numbers to get the answer 2019?”

If necessary, make the problem simpler by asking the same question for a total of 21. Explain that it is often a good idea to make the problem simpler like this and solve easier versions of the problem before going on to solving the big problem.

Key questions

How did you find the answer?

Can you explain?

How many whole numbers are there from 0 to 2019?

What happens if you add 2 even numbers? What sort of number do you get?

What happens if you add 2 odd numbers? What sort of number do you get?

Possible extension

Can you find two multiples of 3 that add up to 2019? If so how many ways can you do this?

And a more difficult extension question: “Can you find two multiples of any number other than 1 that add up to 2019?” The answer is no because 2019 is prime and the only factors of 2019 are 1 and 2019.

Possible support

If learners find this question difficult give the same problem for a smaller total. How many ways can you add two whole numbers to make 21? How many ways can you add two even numbers to make 21?

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA and to Years 4 to 12 in the UK.				
	Lower Primary or Foundation Phase	Upper Primary	Lower Secondary	Upper Secondary
South Africa	Grades R and 1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
USA	Kindergarten and G1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
UK	Reception and Years 1 to 3	Years 4 to 6	Years 7 to 9	Years 10 to 13
East Africa	Nursery and Primary 1 to 3	Primary 4 to 6	Secondary 1 to 3	Secondary 4 to 6