MILESTONE MATHS
making maths simple

Thank You For Downloading

This is an example of a real world application lesson that appears in Level D of Milestone Maths. Every milestone ends with a real world application lesson like this one to prove to students that the maths they are learning is relevant to the world around them.

Milestone Maths is a home-grown print based maths curriculum written by an Australian homeschooler specifically for Australian homeschoolers. Our mission is to make maths simple for Australian homeschoolers.

If you like this lesson and would like to see if Milestone Maths would be a good fit for your family, visit our website at milestonemaths.com.au or scan the QR code below.

Lesson 3.7: Real World Application:

Checking with Digit Sums

"Estimating didn't tell us anything!" lamented Toby, "But, hey! I just remembered a trick Nanna showed me. Let's use digit sums!"

Digit sums is a way to check your work that will give you a very good idea if you have the right answer. The only time it doesn't work is if the mistake you made was geÈing the order of the digits wrong when you copied out the sum.

Step 1: Finding digit sums

To find the digit sum of a number, you add the digits together. If you end up with a two (or more) digit sum, you add those digits together and keep going until you have only one digit. If you ever get a nine in your calculation (or in the number), you set it to zero.

Example

Find the digit sum of the following numbers:

Number	Digit Sum	Number	Digit Sum
184	$1+8+4=\overset{0}{\cancel{9}}+4=4$	731	$7+3+1=11;1+1=2$
239	$2+3+\overset{0}{\cancel{9}}=5$	465	$4+6+5=\overset{0}{\cancel{9}}+6=6$

Lesson Practice

Find the digit sums of the following numbers

Number	Digit Sum	Number	Digit Sum
214		892	
973		362	

Step 2: Using digit sums to check addition

Example

Here's how Toby and Ben used digit sums to check their work.

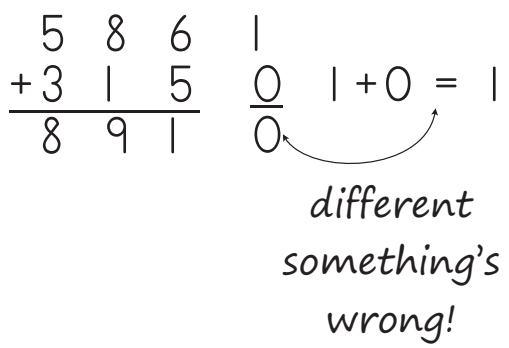
1. Calculate the digit sum of every number in the calculation, including the answer you got.

2. Add the digit sums of the the two numbers that you originally added together.

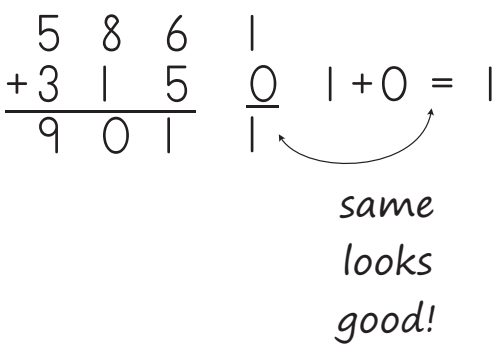
3. Compare the result of step 2 with the digit sum of the answer.

4. If they are the same, your calculation is most likely correct. If not, your calculation is wrong.

Ben's Paper



Toby's Paper



Lesson Practice

Eddy completed a maths lesson for his mum but he was careless and made many mistakes. Use digit sums to decide which sums he got right. Cross out the ones that he got wrong.

3 9 0 +2 6 3 6 5 3	2 1 4 +3 0 8 5 1 2	4 1 8 +8 2 4 1 2 4 2
9 7 3 +5 5 7 1 5 2 0	8 9 2 +9 0 9 1 8 0 1	9 3 8 +5 2 6 1 4 5 4

Research Project

Digit sums are a very old example of a very high tech method used by modern computer systems called checksums. Ask your parents if you can research checksums to find out exactly what they are and how they are used. You might find some information online or at your local library.

If you can't do your own research, here's a liÈle summary:

When you store files on your computer, phone, an SD card, a USB thumb drive or any other "digital" storage device - there's always the possibility that a mistake can happen. It's like when you're copy something from a book for your homeschool and you make a mistake. Maybe you spell a word wrong or you miss out a few words.

Well, with a computer, a mistake is a much bigger problem. When you make a mistake your mum might make you fix it or ask you to redo the task. When there's a mistake in a computer file it just won't work! Your photo won't show, your game won't start or your video won't play. So, there needs to be a very good way of finding and fixing errors as they happen. That's what checksums are for. They work very much like the digit sums we've just learned about:

1. A computer takes all the data (the numbers in the file) and calculates a checksum number for the entire file.
2. It stores the file **and** the checksum.
3. Then the computer reads the file, and recalculates the checksum. If the new checksum doesn't match the old one, the computer knows the file has been corrupted (has a mistake) and can try to fix it!