

Square Sums

You need: a calculator (optional), a list of square numbers

INVESTIGATION

Steve and Leigha read on the Internet about a famous French mathematician named Fermat. One of Fermat's favourite conjectures was: "Every whole number is the sum of two, three, or four square numbers."

Steve and Leigha discuss Fermat's idea:

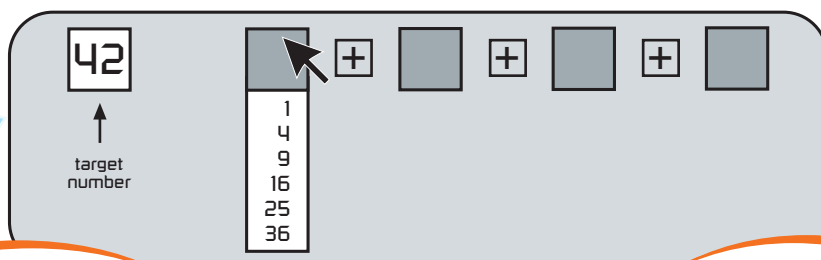
What about 0 and 1? And does it work for square numbers themselves, like 16?

It works for lots of numbers, like $14 = 9 + 4 + 1$ and $27 = 25 + 1 + 1$.



Steve and Leigha put a challenge on the school intranet.

They use a scroll-down menu to make sure that only square numbers are used in each sum.



Yes! It does work for 42.
 $42 = 25 + 16 + 1$

True, but that's not the only way.
 $42 = 36 + 4 + 1 + 1$ as well.



Does Fermat's conjecture work for all the whole numbers up to 100?