

5 on the Clock

Age 7 to 11

When does 5 appear in the minutes display?

When does 5 appear in the hours display?

How will you know that you have got all the different times?

Examples of answers

We had a very impressive number of responses to this tricky problem. Thank you everyone who sent in their solutions. There were a couple of different ways of looking at the problem and because you explained your solutions so clearly, we can see that both are equally good.

Cassandra from Impington Village College (Cambridge) says that the 5 appears 170 times on a 24 hour clock and has clearly explained how she worked that out:

I counted how many times the 5 was in the units of the minutes (eg 01:25) each hour (6 times) then multiplied it by 24 (144).

Then I counted how many times the 5 appeared in the tens of minutes (eg 12:50) in 24 hours (24).

Finally I counted how many times it appears in the hours section (eg 05:00) (2).

I added it all up and got 170. The answer is the same for the 12 hour clock, because there's just two 5 o'clocks instead of 05:00 and 15:00.

Those of you who agreed with this interpretation were:

done.

Another solution came in from Jonathan from St. Andrews Primary (Devon). This is quite a different solution to Cassandra's because Jonathan looked at the problem in a different way. When Jonathan worked out his total, he counted the 5's that would be on the clock if he looked at it every minute. So, for example, at 05:53 there are two, then at 05:54 there are two, and at 05:55 there are three and so on. Here is his explanation:

My answer is 504. This is how I worked it out. I worked out that 5 appears 16 times in 22 hours (05, 15, 25, 35, 45, 50, 52, 53, 54, 55, 56, 57, 58, 59), but I had to add 60 more 5s when the hour was 5 or 15 to make 76.

I multiplied 16×22 to make 352, added 2×76 (152) to make my total.

Here is the sum to show what I did: $(16 \times 22) + (76 \times 2) = 504$.

Yes I think it is the same with a twelve hour clock, it just has 2 5s instead of 15.