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Handout: The Cats and Rats Puzzle

Question: If seven cats kill seven rats in seven minutes, how many cats would be needed to kill one hundred rats in fifty minutes?

Answer: 15. In 7 minutes, they'd kill 1*15 = 15. In 49 minutes they'd kill 7*15 = 70 + 35 = 105. If there were 14, they'd only kill 14 per 7 minutes, and 98 in 100 minutes.

One way to start thinking about this is to think about those original 7 rats. What if you just let them keep going for 50 minutes? They would have 7 times as long as the original 7-minute period, so they'd kill 7 times as many rats—-49, and get a little started on killing more. This isn't enough. How about if we double the number of cats? Then we'd double the number of rats killed in 49 minutes, to 98. That's almost enough. One more cat would surely do it, because cats kill rats at a rate of 1 every 7 minutes, so that one more cat would kill about 7 rats in our 50 minutes, which is plenty to reach 100 if we start with the 98 killed by the other 14 cats.

Note that if we could use fractional cats this would be a harder problem.

This is a puzzle I found in a book Mrs. Wegener lent to me.