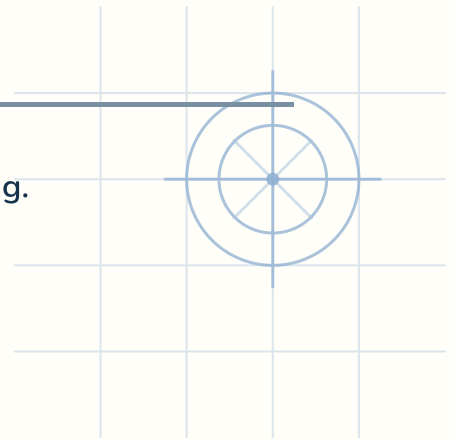


Off-by-one puzzles — 3 kinds

Name: _____

Date: _____

Decide whether you want the things or the gaps. Show your working.



- 1 A log is sawn into 14 equal pieces.

How many cuts does that take?

Why

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.....

- 2 A log is sawn into 8 equal pieces.

How many cuts does that take?

Why

.....

.....

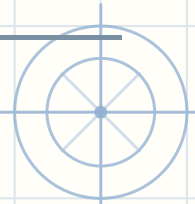
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Off-by-one puzzles — 3 kinds

Name: _____

Date: _____



Decide whether you want the things or the gaps. Show your working.

- 3 A path is 14 meters long. A tree is planted every 2 meters, with one at each end.

How many trees are there?

Why

.....

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- 4 A fence is 42 meters long. A post goes every 6 meters, starting 6 meters in from the left-hand end and finishing at the right-hand end.

How many posts are there?

Why

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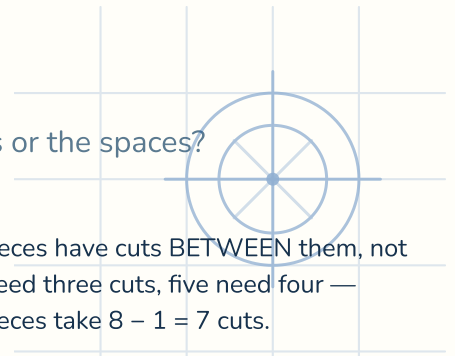
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Off-by-one puzzles · 3 kinds — Answer key

If they are stuck

- Draw four of them in a row and count the gaps. Is the answer the things or the spaces?



1. Picture the log: the 14 pieces have cuts BETWEEN them, not at the ends. Four pieces need three cuts, five need four — always one fewer. So 14 pieces take $14 - 1 = 13$ cuts.

3. $14 \div 2 = 7$, but that counts the GAPS between the trees. There is a tree at both ends, so there is always one more tree than gap: $7 + 1 = 8$ trees.

2. Picture the log: the 8 pieces have cuts BETWEEN them, not at the ends. Four pieces need three cuts, five need four — always one fewer. So 8 pieces take $8 - 1 = 7$ cuts.

4. $42 \div 6 = 7$ gaps. This time there is no post at the left-hand end, so the posts and the gaps come out equal: 7 posts. Not every one of these questions adds one.