

Counting Puzzles

Advanced — ANSWER KEY

Codes, teams, and tournaments.

Think: Order matters → multiply the shrinking choices. Order doesn't matter → divide out the repeats.

1. Answers with the thinking.

1) In how many different orders can 4 runners finish a race (no ties)? **24**

$$\hookrightarrow 4 \times 3 \times 2 \times 1$$

3) A lock code has 2 different digits chosen from 7 digit cards (order matters, no repeats). How many codes are possible? **42**

$\hookrightarrow 7$ choices, then 6

5) In how many different orders can 4 songs play in a playlist? **24**

$$\hookrightarrow 4 \times 3 \times 2 \times 1$$

7) A team of 2 is chosen from 9 students (the order does not matter). How many different teams are possible? **36**

$$\hookrightarrow 9 \times 8 \div 2$$

9) A team of 2 is chosen from 7 scouts (the order does not matter). How many different teams are possible? **21**

$$\hookrightarrow 7 \times 6 \div 2$$

2) 8 players are in a checkers club. Every player plays every other player exactly once. How many games is that? **28**

$$\hookrightarrow 8 \times 7 \div 2$$

4) In how many different orders can 4 books stand on a shelf? **24**

$$\hookrightarrow 4 \times 3 \times 2 \times 1$$

6) 9 players are in a tennis group. Every player plays every other player exactly once. How many games is that? **36**

$$\hookrightarrow 9 \times 8 \div 2$$

8) A team of 2 is chosen from 8 students (the order does not matter). How many different teams are possible? **28**

$$\hookrightarrow 8 \times 7 \div 2$$

10) In how many different orders can 4 kids line up at a door? **24**

$$\hookrightarrow 4 \times 3 \times 2 \times 1$$