LESSON MAKER PRO

Choices or Orders

Decide whether order matters, then count the outcomes.

HIGH SCHOOL · MA.912.DP.4.10

MA.912.DP.4.10 "Given a mathematical or real-world situation, calculate the appropriate permutation or combination."

NAME _____ DATE _____

ORDER CHANGES THE COUNT

Use a permutation when a different order or different roles make a new outcome. Use a combination when you are only choosing a group. The formulas are nPr = n!/(n-r)! and nCr = n!/[r!(n-r)!].

WORKED EXAMPLE

Thirteen photos will compete for first and second place in a photo contest. How many possible results are there?

1. The award places are different, so use a permutation.
2. 13P2 = 13 x 12.
3. 13 x 12 = 156.

Answer: 156 possible results

PRACTICE 6 problems

1 Six candidates are running for president, vice president, and secretary of a club. How many ways can the three offices be filled?

ANSWER _____

2 A student chooses 3 novels from 7 novels for a book discussion group. How many groups can be chosen?

ANSWER _____

3 Five dancers are available for 3 different positions in a performance. How many ways can the positions be filled?

ANSWER _____

4 Ten students want to join a 3-person environmental committee. How many committees are possible?

ANSWER _____

5 A video editor chooses and arranges 3 opening clips from 9 clips. How many different opening sequences are possible?

ANSWER _____

6 Eleven players are eligible for a 3-person leadership panel. How many panels can be formed?

ANSWER _____

APPLY IT Show your work

1 A student podcast contest has 9 finalists. The judges award first, second, and third place. How many possible sets of winners are there?

WORK SPACE

ANSWER _____

2 At a campus gaming event, you can register for 3 of 10 independent workshops. The order in which you register does not matter. How many workshop schedules can you choose?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A game club has 10 members. It must choose a 3-person planning team, then choose a captain from that team. How many possible team-and-captain outcomes are there?

WORK SPACE AND ANSWER

Choices or Orders

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Six candidates are running for president, vice president, and secretary of a club. How many ways can the three offices be filled?	**6P3 = 120**
2	A student chooses 3 novels from 7 novels for a book discussion group. How many groups can be chosen?	**7C3 = 35**
3	Five dancers are available for 3 different positions in a performance. How many ways can the positions be filled?	**5P3 = 60**
4	Ten students want to join a 3-person environmental committee. How many committees are possible?	**10C3 = 120**
5	A video editor chooses and arranges 3 opening clips from 9 clips. How many different opening sequences are possible?	**9P3 = 504**
6	Eleven players are eligible for a 3-person leadership panel. How many panels can be formed?	**11C3 = 165**

PART 2 · APPLY IT

1. **504 possible sets of winners** The award places are different, so use 9P3. Calculate 9 x 8 x 7 = 504.
2. **120 workshop schedules** The workshops form an unordered group, so use 10C3. Calculate 10C3 = 120.

CHALLENGE

360 possible outcomes

Accept equivalent permutation or combination notation and correct numerical answers. For the challenge, accept 10C3 x 3 = 360 or an equivalent method.