

Chance Chains

Find probabilities across repeated trials.

GRADE 8 • MA.8.DP.2

MA.8.DP.2 "Represent and find probabilities of repeated experiments."

NAME _____

DATE _____

MULTIPLY ALONG THE PATH

For repeated independent trials, the result of one trial does not change the next result. Represent possible outcomes with a list, table, or tree diagram, then multiply the probabilities along the path you need. If an item is not replaced, update the total before finding the next probability.

WORKED EXAMPLE

A fair spinner has 19 equal sections, 8 purple and 11 yellow. You spin once, then spin again. What is $P(\text{purple, then yellow})$?

1. Write the first-spin probability: $8/19$.
2. Write the second-spin probability: $11/19$.
3. Multiply: $(8/19) \times (11/19) = 88/361$.

Answer: 88/361

PRACTICE 6 problems

- 1** Flip a fair coin twice. List the equally likely outcomes, then find the probability of getting exactly one head.

ANSWER _____

- 2** A fair six-sided number cube is rolled, then rolled again. Find $P(\text{first roll is greater than 4 and second roll is 1})$.

ANSWER _____

- 3** A fair spinner has 12 equal sections, 5 with triangles and 7 with squares. You spin it twice. Find $P(\text{triangle on both spins})$.

ANSWER _____

- 4** A bag has 4 red marbles and 5 blue marbles. You draw one marble, replace it, then draw another. Find $P(\text{red, then blue})$.

ANSWER _____

- 5** A box has 7 tickets, 3 marked WIN and 4 marked TRY AGAIN. You draw one ticket and do not replace it before drawing again. Find $P(\text{WIN on both draws})$.

ANSWER _____

- 6** A fair four-sided number cube labeled 1, 2, 3, and 4 is rolled twice. Use a table or organized list to find the probability that the product of the rolls is 4.

ANSWER _____

APPLY IT Show your work

- 1** A video app has 9 short clips, 4 dance clips and 5 sports clips. Each clip is equally likely to be chosen. The app chooses a clip, puts it back into the choices, then chooses another clip. What is the probability that both clips are sports clips?

WORK SPACE

ANSWER _____

- 2** At an esports event, a player takes one random item from a digital reward chest, returns it, then takes another item. The chest has 12 equally likely items: 7 avatar frames, 4 badges, and 1 bonus level. What is the probability of getting an avatar frame first and a badge second?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A bag has 5 red, 3 blue, and 2 green tokens. You draw one token and do not replace it before drawing a second token. What is the probability that the two tokens are different colors? Explain your reasoning using an organized count.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Flip a fair coin twice. List the equally likely outcomes, then find the probability of getting exactly one head.	HH, HT, TH, TT; $\frac{1}{2}$
2	A fair six-sided number cube is rolled, then rolled again. Find P(first roll is greater than 4 and second roll is 1).	$\frac{1}{18}$
3	A fair spinner has 12 equal sections, 5 with triangles and 7 with squares. You spin it twice. Find P(triangle on both spins).	$\frac{25}{144}$
4	A bag has 4 red marbles and 5 blue marbles. You draw one marble, replace it, then draw another. Find P(red, then blue).	$\frac{20}{81}$
5	A box has 7 tickets, 3 marked WIN and 4 marked TRY AGAIN. You draw one ticket and do not replace it before drawing again. Find P(WIN on both draws).	$\frac{1}{7}$
6	A fair four-sided number cube labeled 1, 2, 3, and 4 is rolled twice. Use a table or organized list to find the probability that the product of the rolls is 4.	$\frac{3}{16}$; favorable ordered pairs: (1,4), (2,2), (4,1)

PART 2 • APPLY IT

1. **$\frac{25}{81}$** The probability of a sports clip on each choice is $\frac{5}{9}$. Multiply: $(\frac{5}{9}) \times (\frac{5}{9}) = \frac{25}{81}$.
2. **$\frac{7}{36}$** Multiply the probability of a frame by the probability of a badge: $(\frac{7}{12}) \times (\frac{4}{12}) = \frac{28}{144} = \frac{7}{36}$.

CHALLENGE

$\frac{31}{45}$. There are $10 \times 9 = 90$ possible ordered draws. Different-color ordered draws total $15 + 10 + 15 + 6 + 10 + 6 = 62$, so the probability is $\frac{62}{90} = \frac{31}{45}$.

Accept equivalent fractions and correct unsimplified products. For list or table items, accept outcomes in any order when all outcomes and favorable outcomes are correct.