LESSON MAKER PRO

Chance Changes

See how the group you start with changes a probability.

HIGH SCHOOL · HSS-CP.A.5

CCSS.Math.Content.HSS-CP.A.5 "Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example..."

NAME _____ DATE _____

START WITH THE GIVEN GROUP

P(A given B) means find the chance of A after you limit the group to B. Divide the number in both groups by the number in the given group. Events are independent when knowing one event does not change the chance of the other.

WORKED EXAMPLE

Of 17 students who skateboard, 7 wear wrist guards. Find P(wrist guards given skateboard).

1. Start with the 17 students who skateboard.
2. Use the 7 who also wear wrist guards.
3. P(wrist guards given skateboard) = 7/17.

Answer: 7/17

PRACTICE 5 problems

1 Of 18 game-club members, 6 also play chess. Find P(chess given game club).

ANSWER _____

2 Of 25 library visitors, 10 borrow comics. Find P(comics given library visitor).

ANSWER _____

3 Of 15 students carrying lunch, 9 bought milk. Find P(milk given carrying lunch).

ANSWER _____

4 P(uses a music app) = 3/8. P(uses a music app given plays a sport) = 3/8. Are the events independent?

ANSWER _____

5 Of 20 drama-club members, 5 take photos for the club. Of 8 student photographers, 5 are in drama club. Find P(photographer given drama club) and P(drama club given photographer).

ANSWER _____

APPLY IT Show your work

1 At a school tournament, 15 students are on teams, and 9 of them buy pizza. Find P(buys pizza given on a team). Is there enough information to find P(on a team given buys pizza)?

WORK SPACE

ANSWER _____

2 In a poll of 30 students, 18 use a music app. Of 12 students who play a sport, 8 use a music app. Are using a music app and playing a sport independent? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

At a school event, 40 students attend. Ten wear school shirts, 8 of the shirt-wearers volunteer, and 16 students volunteer total. Find P(volunteer given school shirt), P(school shirt given volunteer), and decide whether wearing a school shirt and volunteering are independent. Explain.

WORK SPACE AND ANSWER

ANSWER KEY

Chance Changes

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Of 18 game-club members, 6 also play chess. Find P(chess given game club).	**1/3**
2	Of 25 library visitors, 10 borrow comics. Find P(comics given library visitor).	**2/5**
3	Of 15 students carrying lunch, 9 bought milk. Find P(milk given carrying lunch).	**3/5**
4	P(uses a music app) = 3/8. P(uses a music app given plays a sport) = 3/8. Are the events independent?	**Yes, they are independent.**
5	Of 20 drama-club members, 5 take photos for the club. Of 8 student photographers, 5 are in drama club. Find P(photographer given drama club) and P(drama club given photographer).	**1/4 and 5/8**

PART 2 · APPLY IT

1. **3/5; no, there is not enough information to find P(on a team given buys pizza).** Divide 9 by 15 to get 3/5. The total number of students who buy pizza is not given.
2. **No.** P(uses a music app) = 3/5, but P(uses a music app given plays a sport) = 2/3. Compare 18/30 with 8/12. Since 3/5 is not equal to 2/3, the events are not independent.

CHALLENGE

P(volunteer given school shirt) = 4/5. P(school shirt given volunteer) = 1/2. They are not independent because P(volunteer) = 16/40 = 2/5, which is not equal to 4/5.

Accept equivalent simplified or unsimplified fractions. For independence, students must compare a conditional probability with the matching overall probability and state whether they are equal.