LESSON MAKER PRO

Who Is Included?

Find conditional probabilities in two-way tables.

HIGH SCHOOL · MT.CORE.DATA.PROB.2.b

MT.CORE.DATA.PROB.2.b "Understand the concepts of conditional probability and independence in context. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities by: Computing the conditional probability of..."

NAME _____ DATE _____

START WITH THE GIVEN GROUP

To find P(A | B), look only at the people or outcomes in group B. Divide the number in both A and B by the total in B. When you explain your answer, name the group you started with.

WORKED EXAMPLE

The table shows ticket purchases for a school play. What is P(Friday | online)?

SCHOOL PLAY TICKETS

Show day	Online	At door
Friday	7	11
Saturday	13	19

1. Focus on online purchases: 7 + 13 = 20.
2. Of those purchases, 7 were for Friday.
3. P(Friday | online) = 7/20.

Answer: 7/20. Of the online ticket purchases, 7 in 20 were for Friday.

PRACTICE 6 problems

1 What fraction of students who listened to music finished homework before 8 p.m.?

HOMEWORK SURVEY

Finished homework	Listened to music	No music
Before 8 p.m.	6	14
At or after 8 p.m.	10	18

ANSWER _____

2 What is P(packed lunch | ate outside)?

LUNCH CHOICES

Lunch	Ate outside	Ate inside
Packed lunch	8	12
School lunch	16	24

ANSWER _____

3 At a community library event, what fraction of teens who came with a friend chose the art station?

LIBRARY EVENT

Station	Came with a friend	Came alone
Art	9	15
Coding	21	25

ANSWER _____

4 At a local skate park skills day, what is P(biking | afternoon)?

SKATE PARK SKILLS DAY

Activity	Morning	Afternoon
Skateboarding	18	28
Biking	30	32

ANSWER _____

5 What fraction of students who did not attend the game shared a ride that weekend?

STUDENT WEEKEND SURVEY

Travel	Attended game	Did not attend game
Shared a ride	12	22
Did not share a ride	14	26

ANSWER _____

6 Find P(saved playlist | posted review) and P(posted review | saved playlist). Write both fractions.

MUSIC APP SURVEY

Playlist	Posted review	Did not post review
Saved playlist	8	12
Did not save playlist	24	36

ANSWER _____

APPLY IT Show your work

1 A fictional Montana Indigenous-led community center offers a teen media workshop. Teens choose a podcast or short video project. Among teens who chose a podcast, what fraction submitted a final project? Explain what your answer means.

TEEN MEDIA WORKSHOP

Project	Submitted	Did not submit
Podcast	18	12
Short video	24	30

ANSWER _____

2 A Montana high school is considering a late bus after games. Students said whether they wanted a late bus and whether they stayed for the band's closing set. Among students who stayed, what fraction wanted a late bus? Explain what that fraction tells the planners.

AFTER-GAME SURVEY

Late bus preference	Stayed for closing set	Left early
Wanted late bus	16	28
Did not want late bus	32	36

ANSWER _____

CHALLENGE One step up

In this survey, are joining the gaming club and watching the livestream independent? Compute P(joined | watched) and P(joined), then explain your decision.

GAMING CLUB SURVEY

Club membership	Watched livestream	Did not watch
Joined gaming club	6	9
Did not join	10	15

WORK SPACE AND ANSWER

ANSWER KEY

Who Is Included?

HIGH SCHOOL · MT.CORE.DATA.PROB.2.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	What fraction of students who listened to music finished homework before 8 p.m.?	**3/8**
2	What is P(packed lunch | ate outside)?	**1/3**
3	At a community library event, what fraction of teens who came with a friend chose the art station?	**3/10**
4	At a local skate park skills day, what is P(biking | afternoon)?	**8/15**
5	What fraction of students who did not attend the game shared a ride that weekend?	**11/24**
6	Find P(saved playlist | posted review) and P(posted review | saved playlist). Write both fractions.	**P(saved playlist | posted review) = 1/4; P(posted review | saved playlist) = 2/5.**

PART 2 · APPLY IT

1. **3/5. Of the teens who chose a podcast, 3 in 5 submitted a final project.** Use the podcast row as the given group. Divide 18 by 18 + 12 to get 18/30 = 3/5.
2. **1/3. Of the students who stayed for the closing set, 1 in 3 wanted a late bus.** Use the students who stayed as the given group. Divide 16 by 16 + 32 to get 16/48 = 1/3.

CHALLENGE

Yes. P(joined | watched) = 6/16 = 3/8, and P(joined) = 15/40 = 3/8. The probabilities are equal, so the events are independent in this survey.

Accept equivalent fractions. For interpretations, check that students describe the group after the vertical bar as the group they started with.