ALBERT

Name _____ Date _____

Two-Way Tables Worksheet

Geometry · Common Core HSS-CP.A.4

> Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.

Practice

Builds the skill step by step.

1. The table shows 250 students' favorite subjects by grade. How many 11th graders prefer science?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

2. The table shows 250 students' favorite subjects by grade. A student is chosen at random. What is P(prefers math)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

3. The table shows 250 students' favorite subjects by grade. What is P(Grade 10 and prefers English)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

4. The table shows 250 students' favorite subjects by grade. What is P(prefers science | Grade 11)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

5. The table shows 250 students' favorite subjects by grade. How many 10th graders were surveyed?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

6. In a two-way table, what is a joint frequency?

   A. a column total

   B. a row total

   C. the grand total

   D. a count in one inner cell, for two categories together

7. The table shows 250 students' favorite subjects by grade. What is P(Grade 11)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

8. The table shows 250 students' favorite subjects by grade. What is P(Grade 10 | prefers math)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

9. The table shows 250 students' favorite subjects by grade. What fraction of 10th graders prefer English?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

10. The table shows 100 households by pet ownership. How many households own a dog but no cat?

	Owns a cat	No cat	Total
Owns a dog	12	18	30
No dog	28	42	70
Total	40	60	100

ALBERT

Name _____ Date _____

Two-Way Tables Worksheet

Geometry · Common Core HSS-CP.A.4

On Level

Grade-level practice.

1. 120 students were surveyed. 70 have a pet. 40 of the pet owners are girls, and 30 girls have no pet. How many boys have no pet?

2. In that survey (120 students; 70 with pets; 40 girls with pets; 30 girls without), what is P(girl | has a pet)?

3. The table shows 250 students' favorite subjects by grade. Are being in Grade 10 and preferring science independent?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

A. No: P(science | Grade 10) = 0.3 but P(science) = 0.36.

B. Yes: 30 is less than 60.

C. Yes: both grades have science fans.

D. You can't tell.

4. The table shows 100 households by pet ownership. Are owning a dog and owning a cat independent?

	Owns a cat	No cat	Total
Owns a dog	12	18	30
No dog	28	42	70
Total	40	60	100

A. Yes: P(cat | dog) = $\frac{12}{30}$ = 0.4 = P(cat).

B. No: 12 is less than 28.

C. No: most households have no dog.

D. You can't tell.

5. The table shows 250 students' favorite subjects by grade. What is P(prefers math or Grade 10)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

6. The table shows 250 students' favorite subjects by grade. What is P(prefers English | Grade 11)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

7. The table shows 250 students' favorite subjects by grade. Use conditional relative frequencies to decide whether grade and preferring math are associated.

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

8. Complete the table. How many females answered No?

	Yes	No	Total
Male	?	20	50
Female	40	?	?
Total	70	?	100

9. Using the completed table, what is P(Yes | female)?

	Yes	No	Total
Male	?	20	50
Female	40	?	?
Total	70	?	100

10. Using the completed table, what is P(male | Yes)?

	Yes	No	Total
Male	?	20	50
Female	40	?	?
Total	70	?	100

ALBERT

Name _____ Date _____

Two-Way Tables Worksheet

Geometry · Common Core HSS-CP.A.4

Challenge

Multi-step and word problems that stretch it.

1. A table has row totals 60 and 40, column totals 50 and 50 and a grand total of 100. If the row and column variables are independent, what count belongs in the top-left cell?

2. The table shows 250 students' favorite subjects by grade. What is P(does not prefer math)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

3. The table shows 250 students' favorite subjects by grade. What is P(Grade 11 and does not prefer English)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

4. In a table, 12 are A and B, 18 are not A and B, x are A and not B and 27 are not A and not B. For what x are A and B independent?

5. Which result shows an association between gender and joining a club?

   A. 60% of girls join and 35% of boys join.

   B. 60% of girls join and 60% of boys join.

   C. There are more girls than boys.

   D. Half the students join.

6. Of 400 students, 25% play a sport, and 60% of the players are seniors. How many senior players are there?

7. In that school (400 students; 100 players; 60 senior players), 40% of all students are seniors. How many seniors don't play a sport?

8. In that school, what is P(plays a sport | senior)?

9. The table shows 250 students' favorite subjects by grade. What is P(Grade 11 | prefers English)?

	Math	Science	English	Total
Grade 10	40	30	30	100
Grade 11	50	60	40	150
Total	90	90	70	250

10. Explain how to use a two-way table to decide whether two events A and B are independent.