ALBERT

Name _____ Date _____

Two-Way Frequency Tables Worksheet

Algebra 1 · Common Core HSS-ID.B.5

> Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

Practice

Builds the skill step by step.

1. The table shows 200 students by grade and whether they have a phone. How many 9th graders have a phone?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

2. The table shows 200 students by grade and whether they have a phone. How many students have a phone?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

3. The table shows 200 students by grade and whether they have a phone. What is the joint relative frequency of 10th graders with a phone?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

4. The table shows 200 students by grade and whether they have a phone. What is the marginal relative frequency of 9th graders?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

5. The table shows 200 students by grade and whether they have a phone. What fraction of 9th graders have a phone?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

6. The table shows 200 students by grade and whether they have a phone. What fraction of 10th graders have a phone?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

7. The table shows 200 students by grade and whether they have a phone. What association does the table suggest?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

A. Most students have no phone.

B. Grade and phone ownership are unrelated.

C. 9th graders are more likely to have a phone.

D. 10th graders are more likely to have a phone than 9th graders.

8. The table shows 200 students by grade and whether they have a phone. What percent of all students have no phone?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

9. The table shows 200 students by grade and whether they have a phone. Of the students with no phone, what fraction are in grade 10?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

10. What is a joint relative frequency?

A. a cell count divided by its row total

B. a cell count divided by the grand total

C. the largest cell

D. a row total divided by the grand total

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On Level

Grade-level practice.

1. 150 people were surveyed. 70 prefer summer and 40 of those are adults. 50 adults prefer winter. How many children prefer winter?

2. In that survey (60 children, 30 preferring summer), what fraction of children prefer summer?

3. In that survey (90 adults, 40 preferring summer), what fraction of adults prefer summer?

4. In that survey, 50% of children and about 44% of adults prefer summer. What does this suggest?

   A. at most a weak association between age group and season

   B. a strong association

   C. no data

   D. that adults prefer summer more

5. The table shows 100 students. Is playing a sport associated with taking music?

	Music	No music	Total
Sport	24	36	60
No sport	16	24	40
Total	40	60	100

A. No: 40% of each group takes music.

B. Yes: more athletes take music.

C. Yes: fewer athletes take music.

D. You can't tell.

6. The table shows 200 students by grade and whether they have a phone. Interpret the conditional relative frequency 0.8.

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

7. The table shows 200 students by grade and whether they have a phone. Of the students with a phone, what fraction are in grade 9?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

8. The table shows 100 students. What is the marginal relative frequency of students who don't play a sport?

	Music	No music	Total
Sport	24	36	60
No sport	16	24	40
Total	40	60	100

9. The table shows 200 students by grade and whether they have a phone. Which statement describes a trend?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

A. Every student has a phone.

B. Phone ownership is higher in grade 10.

C. No students lack phones.

D. Grade 9 has more students.

10. The table shows 200 students by grade and whether they have a phone. What is the joint relative frequency of 10th graders without a phone?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

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Challenge

Multi-step and word problems that stretch it.

1. Complete the table. How many in-person students answered No?

	Yes	No	Total
Online	?	30	80
In person	45	?	?
Total	?	?	150

2. Using the completed table, what fraction of online students answered Yes?

	Yes	No	Total
Online	?	30	80
In person	45	?	?
Total	?	?	150

3. Using the completed table, what fraction of in-person students answered Yes?

	Yes	No	Total
Online	?	30	80
In person	45	?	?
Total	?	?	150

4. Online students answered Yes about 63% of the time and in-person students about 64% of the time. What does this suggest?

   A. little or no association between format and answer

   B. a strong association

   C. online students always say Yes

   D. in-person students never say No

5. Using the completed table, what is the joint relative frequency of online students who answered Yes?

	Yes	No	Total
Online	?	30	80
In person	45	?	?
Total	?	?	150

6. The table shows 200 students by grade and whether they have a phone. Describe a trend in the data and support it with relative frequencies.

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200

7. At another school, 60% of 9th graders have a phone, and there are 150 9th graders. How many 9th graders have a phone?

8. Which result would show no association between two categories?

   A. a large grand total

   B. one very large cell

   C. equal conditional relative frequencies across groups

   D. unequal row totals

9. What is the sum of the conditional relative frequencies across one row of a two-way table (using that row's total)?

10. The table shows 200 students by grade and whether they have a phone. The fraction of 10th graders with no phone is how many times the fraction of 9th graders with no phone?

	Grade 9	Grade 10	Total
Phone	60	80	140
No phone	40	20	60
Total	100	100	200