LESSON MAKER PRO

From Counts to Chances

Turn counts into histogram heights and cumulative points.

HIGH SCHOOL · MM.D3D.C.18.b

MM.D3D.C.18.b "Represent a probability distribution by a relative frequency histogram and/or a cumulative relative frequency graph."

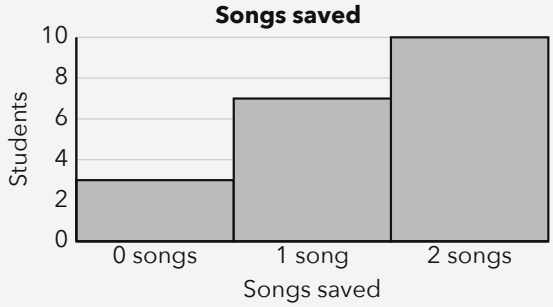
NAME _____ DATE _____

THE BIG IDEA

Divide each bin's count by the total count to find its relative frequency. Use those fractions as the bar heights of a relative-frequency histogram. For a cumulative graph, add the relative frequencies from left to right.

WORKED EXAMPLE

Use the count histogram to find the heights of a relative-frequency histogram.



1. Find the total: 3 + 7 + 10 = 20.
2. Divide each count by 20: 3/20, 7/20, 10/20.
3. Simplify the last height: 10/20 = 1/2.

Answer: Bar heights, left to right: 3/20, 7/20, 1/2.

PRACTICE 4 problems

1 Bins 0, 1, and 2 messages have counts 2, 6, and 4. List the relative-frequency histogram heights in bin order.

ANSWER _____

2 Score bins 0-9, 10-19, and 20-29 have counts 8, 4, and 8. List the relative-frequency histogram heights.

ANSWER _____

3 Bins 0, 1, and 2 late buses have counts 6, 9, and 15. List the relative-frequency histogram heights as percents.

ANSWER _____

4 Bins 0, 1, 2, and 3 app alerts have counts 4, 8, 6, and 2. List the relative-frequency histogram heights and name the tallest bar.

ANSWER _____

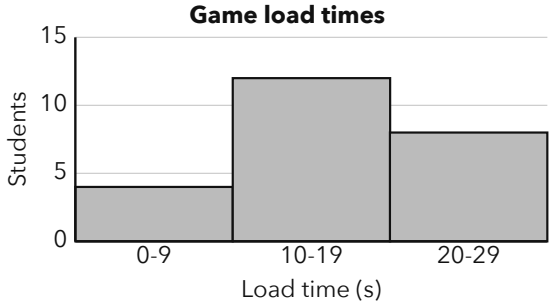
APPLY IT Show your work

1 A student tracked bus waits. Use the histogram to find the relative-frequency histogram heights in bin order.



ANSWER _____

2 Students timed how long a game took to load. Find the relative-frequency histogram heights, then name the most common time bin.



ANSWER _____

CHALLENGE One step up

A survey records 0, 1, 2, or 3 songs skipped, with counts 6, 9, 3, and 2. List the points (songs skipped, cumulative relative frequency) for a cumulative graph. Why is the last y-value 1?

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Bins 0, 1, and 2 messages have counts 2, 6, and 4. List the relative-frequency histogram heights in bin order.	**1/6, 1/2, 1/3**
2	Score bins 0-9, 10-19, and 20-29 have counts 8, 4, and 8. List the relative-frequency histogram heights.	**2/5, 1/5, 2/5**
3	Bins 0, 1, and 2 late buses have counts 6, 9, and 15. List the relative-frequency histogram heights as percents.	**20%, 30%, 50%**
4	Bins 0, 1, 2, and 3 app alerts have counts 4, 8, 6, and 2. List the relative-frequency histogram heights and name the tallest bar.	**Heights: 1/5, 2/5, 3/10, 1/10. Tallest bar: 1 alert.**

PART 2 · APPLY IT

1. **3/8, 1/2, 1/8** The counts total 16. Divide each bar's count by 16 and simplify.
2. **Heights: 1/6, 1/2, 1/3. Most common bin: 10-19 seconds.** The counts total 24, so the heights are 4/24, 12/24, and 8/24. The middle bar is tallest.

CHALLENGE

(0, 3/10), (1, 3/4), (2, 9/10), (3, 1). The last y-value is 1 because it includes all 20 responses.

Accept equivalent fractions or decimals for bar heights and cumulative values. Histogram heights must stay in the stated bin order.