LESSON MAKER PRO

Fair Chance Choices

Use probability to check fair selection methods.

HIGH SCHOOL · MA.912.DP.6.8

MA.912.DP.6.8 "Apply probabilities to make fair decisions, such as drawing from lots or using a random number generator."

NAME _____ DATE _____

EQUAL CHANCES

A random method is fair when each person has the same chance of being chosen. Give each person one equally likely outcome, then write probability as favorable outcomes/total outcomes.

WORKED EXAMPLE

A club has 11 applicants for one leadership spot. Each applicant gets one slip in a bag. What is each applicant's chance of being chosen?

1. There are 11 equal slips.
2. Each applicant has 1 favorable slip.
3. Probability = 1/11.

Answer: 1/11

PRACTICE 5 problems

1 Eight volunteers each have one name slip in a bag. What is each volunteer's chance of being chosen?

ANSWER _____

2 Seven name slips are in a bag. Mia has 2 slips, and each other student has 1 slip. Is this fair to every student?

ANSWER _____

3 A random number generator chooses an integer from 1 through 10. Each candidate gets a different number. What is each candidate's chance of being chosen?

ANSWER _____

4 Twelve volunteers are entered once each for 2 delegate spots. Two names are drawn without replacement. What is the chance that a particular volunteer is chosen?

ANSWER _____

5 Six players each receive 2 different numbers from 1 through 12. A random number generator selects one number. What is each player's chance of being chosen?

ANSWER _____

APPLY IT Show your work

1 A debate club has 8 members and 2 tournament spots. The adviser uses a random number generator to choose 2 different members. What is the probability that Maya gets a spot? Is the method fair?

WORK SPACE

ANSWER _____

2 A media team has 5 seniors and 4 juniors applying for one role. Each senior gets 2 slips, and each junior gets 1 slip. Is the drawing fair to individual applicants? How should it be fixed?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student council has 6 juniors and 9 seniors. It needs 3 representatives and wants every student to have the same chance. Plan A chooses 1 junior and 2 seniors. Plan B chooses 3 names from all 15 students. Which plan is fair to individual students? Explain.

WORK SPACE AND ANSWER

ANSWER KEY

Fair Chance Choices

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Eight volunteers each have one name slip in a bag. What is each volunteer's chance of being chosen?	**1/8**
2	Seven name slips are in a bag. Mia has 2 slips, and each other student has 1 slip. Is this fair to every student?	**No. Mia has a 2/7 chance, while each other student has a 1/7 chance.**
3	A random number generator chooses an integer from 1 through 10. Each candidate gets a different number. What is each candidate's chance of being chosen?	**1/10**
4	Twelve volunteers are entered once each for 2 delegate spots. Two names are drawn without replacement. What is the chance that a particular volunteer is chosen?	**1/6**
5	Six players each receive 2 different numbers from 1 through 12. A random number generator selects one number. What is each player's chance of being chosen?	**1/6**

PART 2 · APPLY IT

1. **1/4; yes, it is fair.** Maya can be one of the 2 selected members out of 8, so her probability is 2/8 = 1/4. Every member has the same probability.
2. **No.** A senior has a 1/7 chance, and a junior has a 1/14 chance. Give each applicant 1 slip. There are 14 slips. Seniors have 2/14 = 1/7, while juniors have 1/14, so the chances are not equal.

CHALLENGE

Plan B. In Plan A, a junior has a 1/6 chance and a senior has a 2/9 chance, so the chances differ. In Plan B, each student has a 3/15 = 1/5 chance.

Accept equivalent simplified fractions. For fairness explanations, students must show that all individuals have equal probabilities or identify the unequal probabilities.