

8th Grade Open Response Question Fantasy Baseball Probability

Academic Expectation 1.5: Students use mathematical ideas and procedures to communicate, reason, and solve problems.

Academic Expectation 2.13: Students understand and appropriately use statistics and probability.

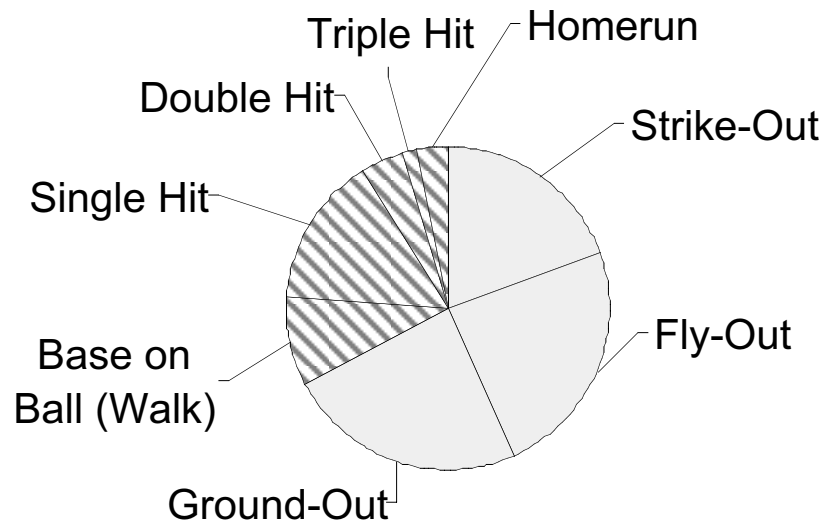
KY Core Content; Skills—Students will perform the following mathematical operations and/or procedures accurately and efficiently and explain how they work in real-world and mathematical situations:

MA-M-2.2.6: Estimate and determine the measurement of angles.

MA-M-3.2.5: Make predictions and draw conclusions from statistical data and probability experiments.

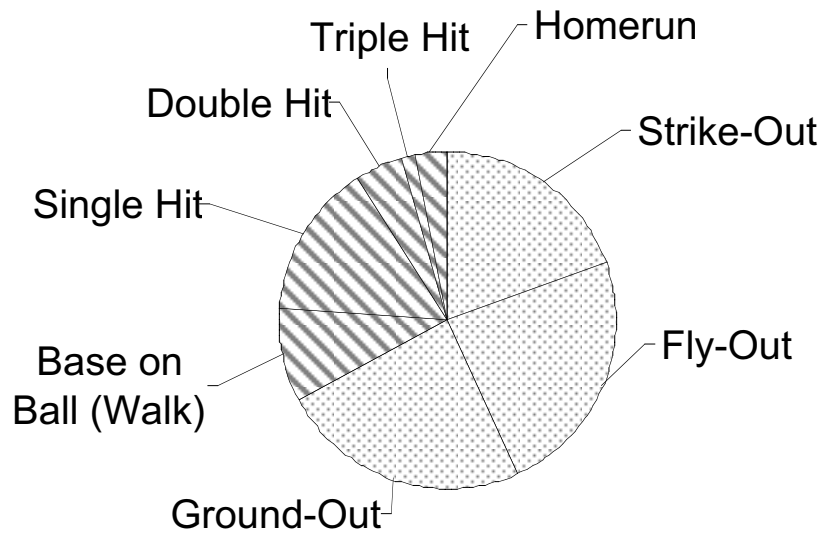
MA-M-3.2.7: Represent probabilities in multiple ways such as fractions, decimals, percents, and area models.

Baseball Record for Joe Slugger



Students in Mrs. Gabbard's 7th grade math class created this spinner for one batter in their Fantasy Baseball Game. Using the statistics given on Joe Slugger's baseball card, students calculated the outcomes for the player's next turn at bat and made the areas of the pie chart match the chances of each outcome. Measure the angles on the spinner to answer the following questions:

- What is the theoretical probability that the batter will get a homerun on his next turn at bat? Show your work and give the answer in fractional form, decimal form, and as a percent.
- What is the theoretical probability that the batter will **not** get out on his next turn at bat? Show your work and give the answer in fractional form, decimal form, and as a percent.

**8th Grade Open Response Question
Fantasy Baseball Probability****Baseball Record for Joe Slugger**

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**Rubric for
8th Grade Open Response
Fantasy Baseball Probability**

The final score is the sum of all the points earned as stipulated below.

Part	Points	Response
a)	.5	Student correctly measures the homerun angle as 11 degrees +/- 2 degrees.
	.5	Student correctly gives the probability in fractional form: $11/360$
	.5	Student correctly gives the probability in decimal form: .03
	.5	Student correctly gives the probability as a percent: 3%
b)	.5	Student correctly measures the sum of the 5 favorable/on-base angles as 120 degrees +/- 2 degrees; OR Student correctly measures the sum of the 3 out angles as 240 degrees +/- 2 degrees and then takes the difference of $360 - 240 = 120$.
	.5	Student correctly gives the probability in fractional form: $120/360$ (not necessary to simplify). Allow for measurement variation in the numerator +/- 2 degrees.
	.5	Student correctly gives the probability in decimal form: .33. .34 is acceptable if the angle measure was 121 or 122 degrees; OR Student finds the decimal answer for the probability of getting out as $240/360 = .67$ and then finds the difference $1.00 - .67 = .33$ for favorable outcomes.
	.5	Student correctly gives the probability as a percent: 33%. 34% is acceptable if the angle measure was 121 or 122 degrees; OR Student finds the probability of getting out as 67% and then finds the difference $100\% - 67\% = 33\%$ as the probability of getting a favorable outcome.

8th Grade Open Response
Fantasy Baseball Probability
Distinguished Response Example

- a) The probability of Joe Slugger hitting a homerun is $\frac{11}{360}$, since the angle measure is 11 degrees and the entire circle is 360 degrees. I know that to find the probability, I put the desired outcomes as the numerator and the total outcomes as the denominator. In this case the outcomes are shown as degrees, so I use that information to make the fraction. The fraction $\frac{11}{360}$ cannot be simplified, because 11 is a prime number and it does not evenly divide into 360. This probability can also be written as a decimal .03, which I found by dividing 11 by 360. The percent 3% is found simply by dropping the decimal point, since the first 2 decimal places give hundredths.
- b) I measured the area which shows not getting out (the sum of single hit, double hit, triple hit, homerun, and base-on-balls) as 120 degrees. Therefore the fractional probability of not getting out is $\frac{120}{360}$ and the decimal probability is .33 or 33%. This means that 33 times out of a 100 he will have a favorable outcome. This also means that 67 times out of a 100 he will get out.