Name _____ Date _____

Using Probabilities to Make Fair Decisions - Guided Lesson Explanation:

Explanation#1

The dice has 6 sides. Write the probability distribution for a single roll and the amount of dollars they win.

X = Number	Number 1	Number 6	Other numbers (2, 3, 4, 5)
P (X)	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{4}{6}$
Dollars ($)	$5	$10	-$3

Formula:-

$E(x) = 5 \times (\frac{1}{6}) + 10 \times (\frac{1}{6}) + (-3) \times (\frac{4}{6})$

$= \frac{5}{6} + \frac{10}{6} - \frac{12}{6}$

$= \frac{3}{6}$

$= \frac{1}{2}$ or 0.5

The expected value is not zero, and the game is not fair. So they will lose about $0.5 for a single roll on average.

Explanation#2

This is 8 sector spinner. In this spinner every sector is of equal size.

So, this spinner is fair.

Explanation#3

Spinner 1 has the even probability for Charlie and Molly of $\frac{1}{4}$.

But in spinner 2 the probability for Charlie is $\frac{2}{6}$ and the probability for Molly is $\frac{1}{6}$.

So, spinner 1 is fair, but spinner 2 is not fair.