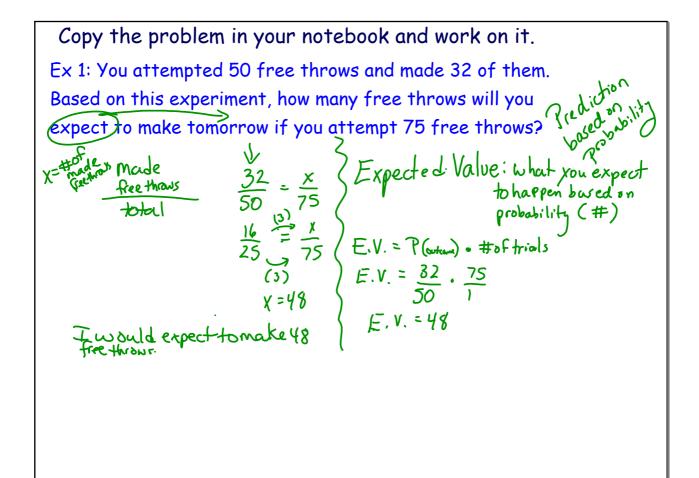6th Grade FM: How do we find expected value?

Pick up packet 3A and start working on the review of the last lesson.

Skip around so you practice all the skills.

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Copy the problem in your notebook and work on it.

Ex 1: You attempted 50 free throws and made 32 of them. Based on this experiment, how many free throws will you (expect) to make tomorrow if you attempt 75 free throws?

Prediction based on probability

$x = $ #of made (fractions) free throws

$$\frac{\text{made free throws}}{\text{total}}$$

$$\frac{32}{50} = \frac{x}{75}$$

$$\frac{16}{25} \xrightarrow{(3)} \frac{x}{75}$$

$(3)$

$x = 48$

I would expect to make 48 free throws.

Expected Value: what you expect to happen based on probability (#)

$E.V. = P(\text{outcome}) \cdot \text{# of trials}$

$E.V. = \frac{32}{50} \cdot \frac{75}{1}$

$E.V. = 48$

Ex 2:  You roll a number cube 33 times  How many times would you expect to roll a 3 or higher?

E.V.

33 trials

$P(3\uparrow) = \dfrac{4}{6}$

$E.V. = P(3\uparrow) \cdot \# trials$

$E.V. = \dfrac{24}{36} \cdot \dfrac{33}{1}$

$E.V. = 22$

I would expect to get a 3 or higher 22 times.

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Ex 3: You pick a gum ball out of the bag and then you pick a Hershey Kiss from another bag.  What is the probability that you will pick a blue gum ball and then pick a pink Hershey Kiss?

Sample Space

gum balls: Blue, Blue, Blue, Red, Yellow, Green, Green

Hershey Kisses: Pink, Green, Silver

$P(blue, pink) = P(b) \cdot P(P)$

$= \dfrac{3}{7} \cdot \dfrac{1}{3}$

$= \dfrac{3}{21}$

$= \dfrac{1}{7}$

There is a $\frac{1}{7}$ chance of a blue gumball and pink hershey kiss.

If you do this 49 times, how many times would you expect to get a blue gum ball and a pink Hershey Kiss?

E.V.

49 trials
$P(b, P) = \frac{1}{7}$

$E.V. = P(\text{blue, Pink}) \cdot \#\text{ of trials}$

$E.V. = \frac{1}{7} \cdot \frac{49}{1}$

$E.V. = 7$

I would expect to get a blue gumball and pink Hershey kiss 7 times.

E.V. Me

Proport

Ex 4:  Keisha spins a spinner 100 times and gets the results shown in the table.  If Keisha then spins the spinner 2,000 times, predict how many times you think the spinner would land on red.

| outcomes | frequency |
|----------|-----------|
| Red      | 25        |
| Yellow   | 8         |
| Blue     | 67        |

100 outcomes

$$E.V. = P(red) \cdot \#\, of\, trials$$

$$E.V. = \frac{25}{100} \cdot \frac{2000}{1}$$

$$E.V. = 500$$

Keisha would expect to land on red 500 times.

Probability Packets 3A and 3B