

Unit 7 Lesson 12: Estimating a Population Mean

1 Rolling Distribution (Warm up)

Student Task Statement

In the next activity, you will roll a standard number cube 35 times.

1. Draw a dot plot that shows the distribution of values you might expect for the rolls. Explain your reasoning.



2. If you rolled the number cube one million times and found the mean of all the values, what do you expect for the mean? Explain your reasoning.

2 Rolling for Means

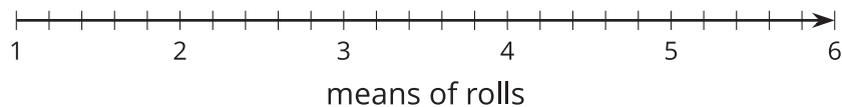
Student Task Statement

Roll your number cube 35 times, recording the values as you do so.

1. Every 5 values, find the mean.

rolls	1 through 5	6 through 10	11 through 15	16 through 20	21 through 25	26 through 30	31 through 35
mean							

2. Share your means with your group and create a dot plot of all the means from your group.



3. What do you notice about the shape of the distribution of means?
4. Using the dot plot of means, what do you think is a good estimate for the mean of all 140 rolls from your group? How does this value compare to your estimate from the warm-up?

3 Margin of Error for Means

Student Task Statement

As with the means of sample proportions, the means of sample means are usually within 2 standard deviations of the population mean when there is a large sample size or when the population distribution is approximately normal. For each situation:

- Use the sample means to estimate the mean of the population.
- Find the standard deviation of the sample means.
- Use the standard deviation of the sample means to estimate the margin of error.

1. 10 samples of 25 gas stations are selected at random and the price of regular gasoline is recorded for each gas station. The sample means are shown for the 10 samples.

\$2.38 \$2.42 \$2.64 \$2.35 \$2.65 \$2.47 \$2.67 \$2.59 \$2.63
\$2.41

2. The mean number of claimed UFO sightings are shown for 13 samples of 5 randomly selected months.

400.2 427.4 892.2 640.6 713.4 614 725.8 477.2 460
445.2 476.8 336.6 536.4

3. A company producing baseballs selects 10 baseballs at random 9 times a day and measures the diameter in centimeters. The mean of each of the 9 samples of 10 baseballs is shown.

7.5 7.6 7.2 7.4 7.2 7.3 7.5 6.9 7.5

4. A publisher takes 15 random samples of 10 people to determine the number of minutes they spend reading a newspaper. The sample mean is displayed for each of the samples.

11.1 9.2 8.1 10.5 10 9.7 7.7 11.8 11.1
7.6 6.3 9.4 10.4 8.7 10.2