

CHAPTER 18 PART 2 NOTES  
SAMPLING DISTRIBUTION MODELS: MEANS

Match the descriptions with their correct symbol

(a.)  $s$       (b.)  $\bar{y}$       (c.)  $\sigma$       (d.)  $\mu$

- (1.) Sample mean \_\_\_\_\_  
 (2.) Population standard deviation \_\_\_\_\_  
 (3.) Population mean \_\_\_\_\_  
 (4.) Sample standard deviation \_\_\_\_\_

1

Example:

The newspaper reports on an estimate of the mean value of all houses (single family dwellings) in Happytown, USA. In a sample of 100 houses, the mean value was \$147,000 and the standard deviation was \$15,000.

- Identify the Sample

- Identify the Sample Statistics

- Identify the Population

- Identify the Population Parameters

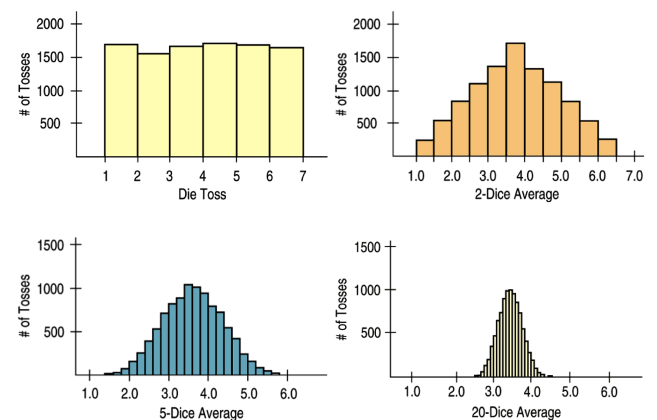
3

For the following set of sample data, calculate the sample mean ( $\bar{y}$ ) and sample standard deviation ( $s$ ).

$-4, 5, 7, 3, -1$

2

SIMULATING THE SAMPLE MEAN

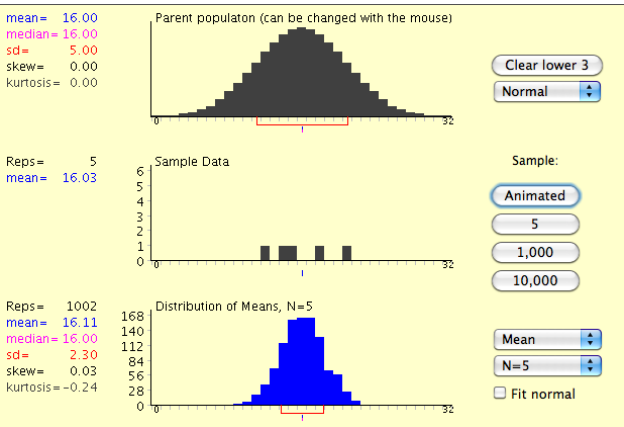


What seems to be happening to the sampling distribution of the sample mean as the sample size (number of dice) increases?

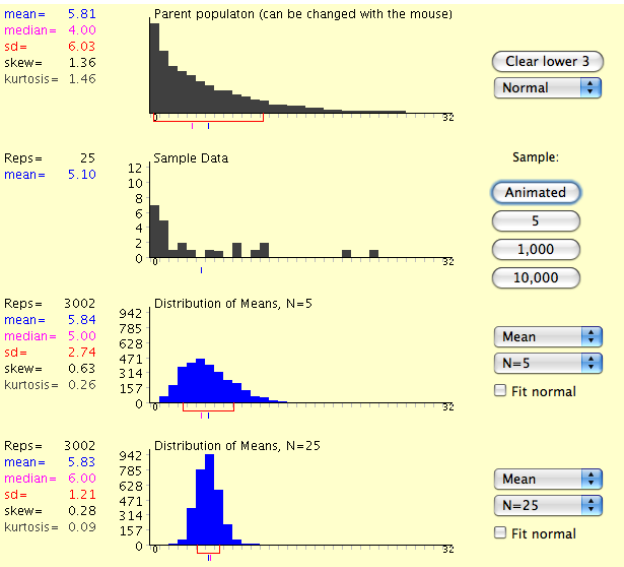
4

The sampling distribution of  $\bar{y}$  will be a normal distribution if the following four conditions/assumptions hold:

TOP: population distribution from which we are sampling  
MIDDLE: data values from one sample  
BOTTOM: sampling distribution for  $\bar{y}$



TOP: population distribution from which we are sampling  
MIDDLE: data values from one sample  
BOTTOM TWO: sampling distribution for  $\bar{y}$



### Example

Assessment records indicate that the value of homes in Ames is skewed right, with a mean of \$140,000 and standard deviation of \$60,000. Consider a random sample of 100 homes in Ames. Describe the sampling distribution of  $\bar{y}$  for  $n = 50$ .

### Example

Suppose the amount of soft drink poured into cups by an automated vending machine has a normal model with mean  $\mu = 7.6$  ounces and standard deviation  $\sigma = 0.4$  ounces. Consider a random sample of 14 soft drinks poured by this machine. Describe the sampling distribution of  $\bar{y}$  for  $n = 14$ .