Name: _____ Hour: _____

Lesson 2.2: Predicting Shape

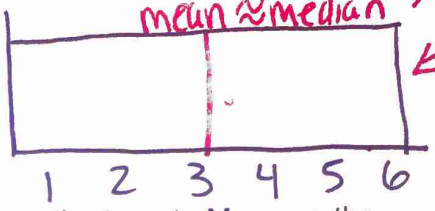
Complete each of the following experiments and submit your answers using the google form. Resubmit your answers for a total of 3 submissions. Predict (sketch) what the graphs of the class data from each experiment will look like if we did this **many many** times. Draw and label lines where you predict the mean and median will be.

Density Curve Area = 1

Experiment 1: Roll a die and record the value it lands on. 1st roll:__ 2nd roll:__ 3rd roll:__

Prediction:

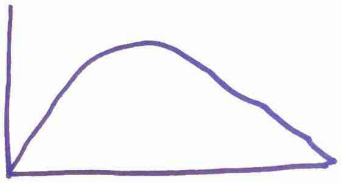
Actual:



height? = 1/6

Experiment 2: Try to toss a penny and make it land on the target. Measure the distance of the penny from the target in cm. Round to the nearest tenth.
1st Attempt: _____ 2nd Attempt: _____ 3rd Attempt: _____

Prediction:



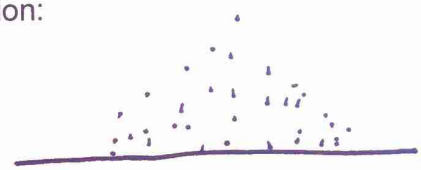
Actual:

Skewed Left mean < med.

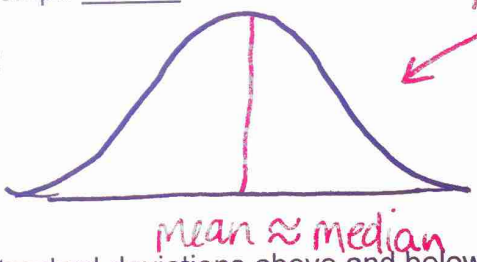
Skewed Right mean > med.

Experiment 3: Try to stop your stopwatch at exactly 5 seconds. Record what the stopwatch reads below. Record to the hundredths place.
1st Attempt: _____ 2nd Attempt: _____ 3rd Attempt: _____

Prediction:

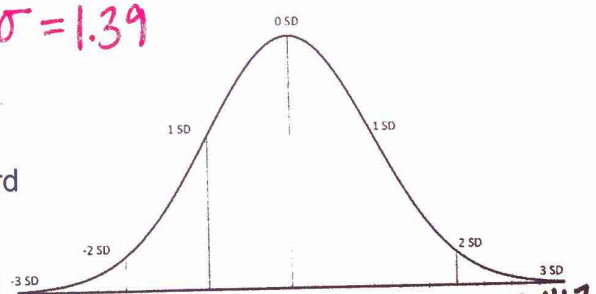


Actual:



Approx. Normal

Normal Curves: Label the values 1, 2, and 3 standard deviations above and below the mean using the stopwatch data. $\bar{x} \approx \mu = 5$ $s \approx \sigma = 1.39$



What percentage of the data is within two standard deviations of the mean? 95%.

What percentage of the data is further than two standard deviations from the mean? 5%.

What percentage of the data is greater than 1 standard deviation above the mean? 16%.

What percentage of the data is between $z = -1$ and $z = 2$?

81.5%.

TheStatsMedic

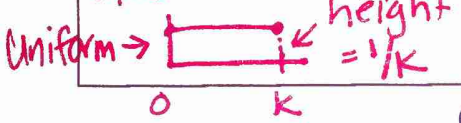
Name: _____ Hour: _____

Lesson 2.2 – Density Curves and Normal Distributions

Big Ideas:

LT #1 Density Curves
- Always above x-axis
- Area = 1

Uniform → height = 1/k



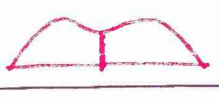
LT #2 skew right

med < mean

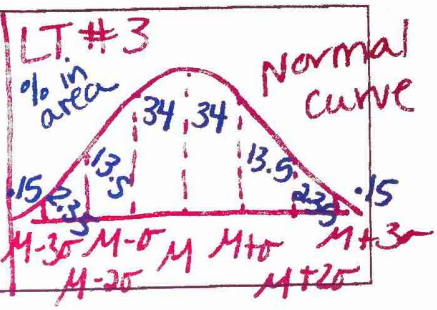
symmetric:

mean ≈ median

med > mean

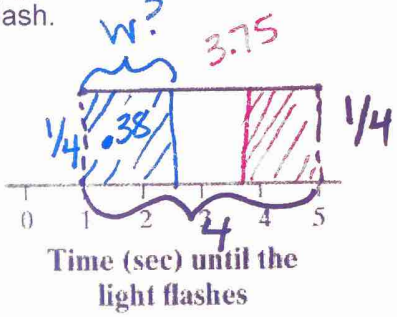


LT #3



Check Your Understanding:

1. An Internet reaction time test asks subjects to click their mouse button as soon as a light flashes on the screen. The light is programmed to go on at a randomly selected time after the subject clicks "Start." The density curve models the amount of time the subject has to wait for the light to flash.



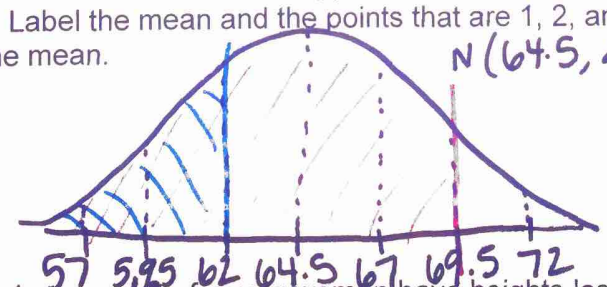
a. What height must the density curve have? Justify your answer.
1/4 Area = 1 = 1/4 × 4

b. About what percent of the time will the light flash more than 3.75 seconds after the subject clicks "Start"? Width = 5 − 3.75 = 1.25
Area = 1.25 × 1/4 = .3125 31.25%.

c. Calculate and interpret the 38th percentile of this distribution.
.38 = 1/4 × w w = 1.52 → +1 second start = 2.52
Approx. 38% of the time the flash will go off before 2.52 sec.

2. The distribution of heights of young women aged 18 to 24 is approximately Normal with mean μ = 64.5 inches and standard deviation σ = 2.5 inches.

a. Sketch the Normal curve that approximates the distribution of young women's height. Label the mean and the points that are 1, 2, and 3 standard deviations from the mean.



b. About what percent of young women have heights less than 69.5 inches? Show your work.
1 − (2.35 + 0.15) = 97.5%.
OR 0.15 + 2.35 + 13.5 + 34 + 34 + 13.5 = 97.5%

c. Is a young woman with a height of 62 inches unusually short? Justify your answer. Not unusually short, 16% of other young women are shorter than her.