Math 1

7-1 **Analyzing Histograms Practice**

Name _____

Date _____

Learning Goals:
- I can describe the center and spread of a distribution.
- I can compare two distributions by examining their shapes, centers and spreads.
- I can interpret the differences in the shape, center, and spread of a data set in the context of a problem.

The 3 histograms below show the batting averages of the winners of the batting title in the major league baseball (for both the American & National leagues) for certain years in the 1900s. Batting average shows the percent (written as a decimal) of the time a certain player gets a hit. A player who has a batting average of 0.405 has gotten a hit in 40.5 % of the times that they were at bat. The batting title is an award given to the player with the highest batting average for a given season. Refer to the histograms as you answer questions 1 – 5.

Batting Title Averages 1901 - 1930

Batting Title Averages 1931 - 1960

Batting Title Averages 1961 - 1990
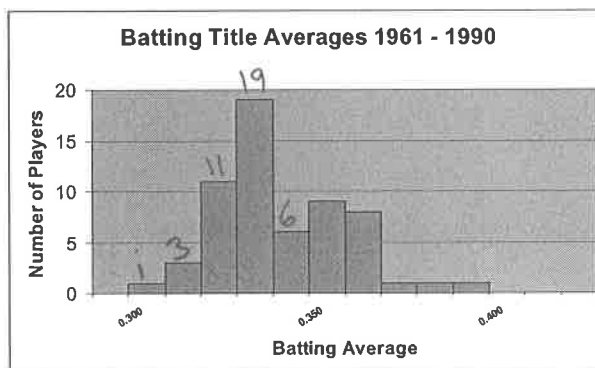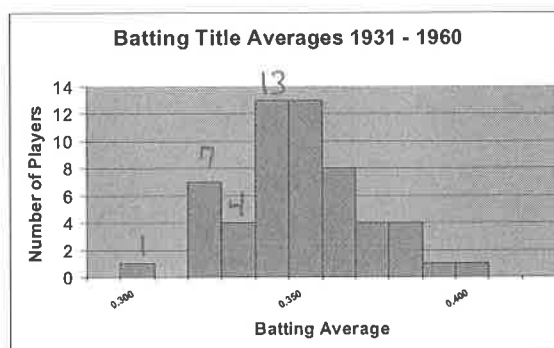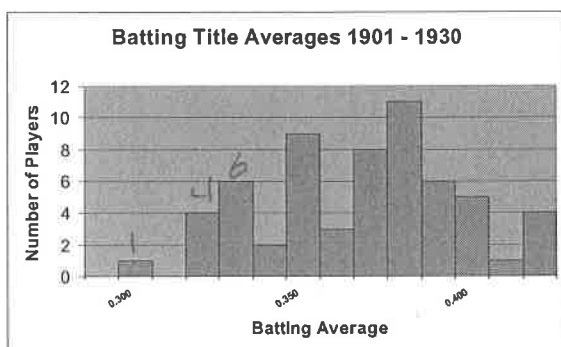
_____11_____ 1. How many batting titles were won with a batting average of between 0.300 – 0.350 from 1901 to 1930?

_____25_____ 2. How many batting titles were won with a batting average of between 0.300 – 0.350 from 1931 to 1960?

_____40_____ 3. How many batting titles were won with a batting average of between 0.300 – 0.350 from 1961 to 1990?

4. If you were to find the mean of each of the winning batting averages for each time period, which time period do you think would have the highest mean? Explain.

Averages from 1901 to 1930. The balance point of that graph is further right. More values at higher batting averages.

5. As the century progressed, what in general happened to the batting averages of the batting title winners? Explain.

They decreased as a whole. More data points were occurring at lower averages.

For questions 6 – 10, refer to the following 2 histograms. These histograms were made in an attempt to determine if William Shakespeare was really just a pen name for Sir Francis Bacon. (A pen name is a fake name used by another person when writing). A few scholars have had this idea and in order to determine if this was true, a researcher had to count the letters in every word of Shakespeare's plays & Bacon's writing (and you thought you had a lot of homework). Their results are recorded in the histograms below.

Words Used in Shakespeare's Plays

Words Used in Bacon's Writings
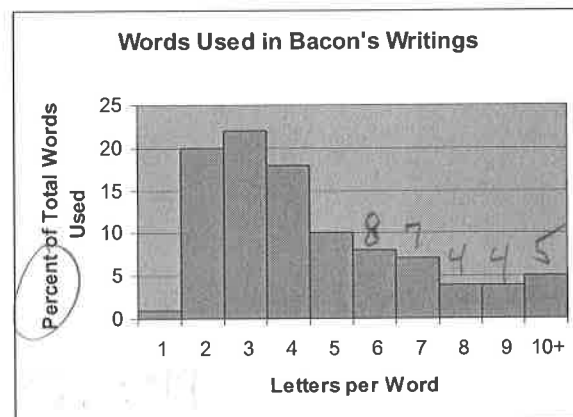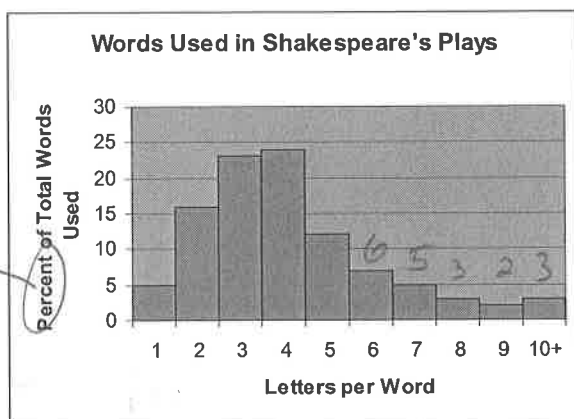
___24%___ 6. What percent of all Shakespeare's words are 4 letters long?

___18%___ 7. What percent of all Bacon's words are 4 letters long?
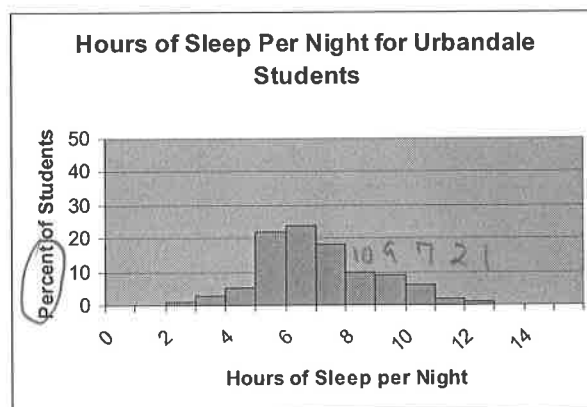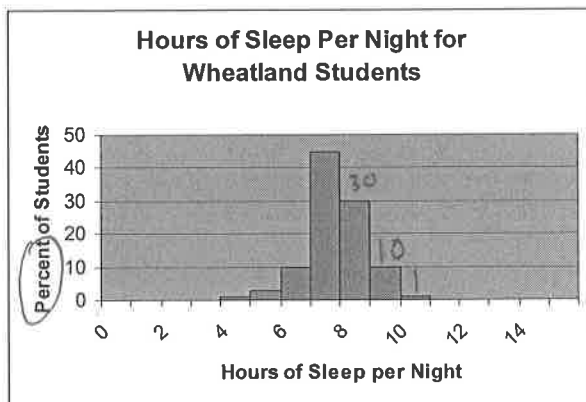
___19%___ 8. What percent of all Shakespeare's words are more than 5 letters long?

___28%___ 9. What percent of all Bacon's words are more than 5 letters long?

10. Based on these histograms on the previous page, do you think that William Shakespeare was really just a pen name for Sir Francis Bacon? Explain.

The graphs have the same general shape and spread, and their data is clustered around the 3-5-letter word mark. It's possible they are the same person.

Hours of Sleep Per Night for Wheatland Students

Hours of Sleep Per Night for Urbandale Students

Suppose that the two histograms above show the sleeping habits of the teens at two different high schools. Wheatland High School is a small rural school consisting of 100 students while Urbandale High School is located in a large city and has 3,500 students.

41% 11. About what percent of the students at Wheatland get at least 8 hours of sleep per night?

≥ 8

29% 12. About what percent of the students at Urbandale get at least 8 hours of sleep per night?

Urbandale 13. Which high school has more actual students that sleep between 9 – 10 hours per night?

WHS: $100 \cdot 0.1 = 10$

UHS: $3500 \cdot 0.09 = 315$

Not including 10

Wheatland 14. Which high school has a higher median sleep time?

15. Wheatland's percent of students who sleep between 8-9 hours a night is **20** % more than Urbandale's percent of students who sleep between 8-9 hours per night.

16. It's hard to say who sleeps more. Urbandale has a higher % of students who sleep a lot (10-13 hours), but. Wheatdale has a significantly higher percentage of students who sleep 7-9 hours per night & their average is higher. I choose Wheatdale.
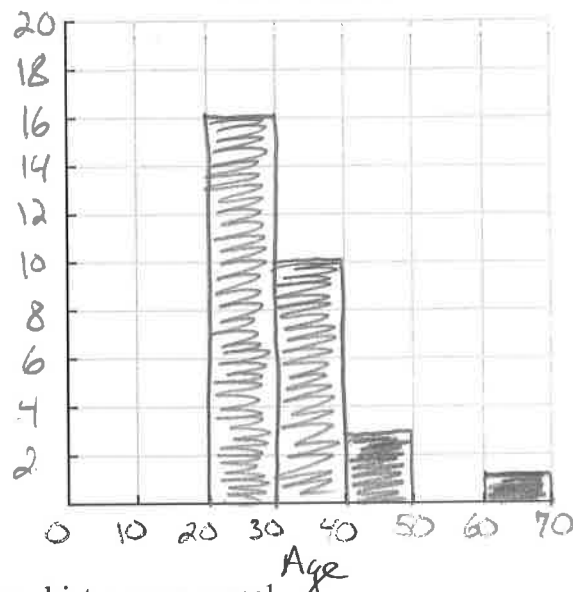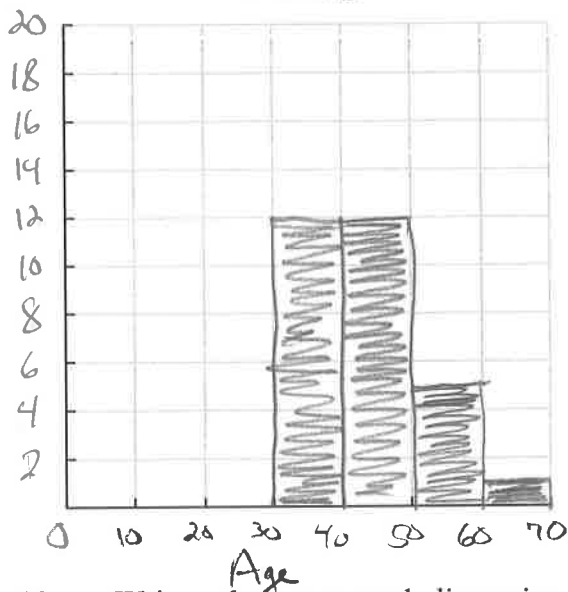
17. The tables below show the age of the actress & actor who won the Oscar for best actress or actor during the first 30 years of the Academy Awards. Use these distributions to make two histograms (one for winning actresses' ages & one for winning actors' ages) displaying this information. Use intervals of ten years (0-9; 10-19; 20-29 etc.) **Label your graphs!**

Year	Age of Winning Actress	Age of Winning Actor
1928	22	42
1929	36	40
1930	28	62
1931	62	53
1932	32	38
1933	24	34
1934	29	35
1935	27	52
1936	27	41
1937	28	37
1938	30	38
1939	26	34
1940	29	32
1941	24	40
1942	34	43

Year	Age of Winning Actress	Age of Winning Actor
1943	24	49
1944	29	41
1945	31	40
1946	30	49
1947	34	56
1948	34	41
1949	33	38
1950	28	38
1951	38	52
1952	45	51
1953	24	35
1954	26	30
1955	41	38
1956	41	41
1957	27	43

Actors

Actresses

18. Write a short paragraph discussing what your two histograms reveal.

- Both distributions are skewed right.
- Generally, the winning actresses are younger than the winning actors.
- The actress age of 62 might be an outlier.
- The actress ages are more spread out.