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## Laying eggs...



## Could it be normal?

Use the data summary below, Loggerhead (Caretta caretta) sea turtle nesting dates along Jupiter-Carlin Beach from 2010-2015, to complete the following tasks.

| Nesting Date <br> Window | Interval for the <br> Day of the Year | Mid-Interval <br> Day of the Year | Number of <br> Observed Nests <br> (Frequency) | Cumulative <br> Frequency |
| :---: | :---: | :---: | :---: | :---: |
| April 1-15 | $91-105$ | $\frac{91+105}{2}=98$ | 1 | 1 |
| April 16-30 | $106-120$ | $\frac{106+120}{2}=113$ | 41 | $41+1=42$ |
| May 1-15 | $121-135$ |  | 409 | 1243 |
| May 16-31 | $136-151$ |  | 1438 |  |
| June 1-15 | $152-166$ |  | 1446 |  |
| June 16-30 | $167-181$ |  | 1113 |  |
| July 1-15 | $182-196$ |  | 401 |  |
| July 16-31 | $197-212$ |  | 94 |  |
| August 1-15 | $213-227$ |  | 8 |  |
| August 15-31 | $228-243$ |  |  |  |
| September 1-15 | $244-258$ |  |  |  |
| September 15-30 | $259-273$ |  |  |  |

1. Complete the table by filling in the mid-interval value and the cumulative frequency for each range of dates.
2. Create a histogram to represent the data set. Sketch the histogram below.
3. Create a cumulative frequency diagram (ogive) to represent the data set. Sketch the diagram below.
4. Analyze the histogram to see what can be learned about the center and variation of the number of nests.
a. Estimate the mean using mid-interval values.
b. Estimate the standard deviation.
c. What is the shape of the distribution?
5. Determine whether the data can be considered normally distributed. Tell why or why not.
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## Using the Normal Distribution and its Properties



The nesting days for Loggerhead sea turtles along Jupiter-Carlin beach are normally distributed with a mean $(\mu)$ of the $174^{\text {th }}$ day of the year and a standard deviation $(\sigma)$ of 25.9 days.

1. Calculate the probability the following will occur:
a. $\quad P(x \leq 183)$
b. $\quad P(141 \geq x \geq 183)$
c. $P(x=205)$
2. Find the day of the year when the probability of a Loggerhead nesting is $45 \%$.

The length of Loggerhead sea turtle shells are normally distributed and $20 \%$ of the sea turtles along the coast have a shell length less than 85 cm and $10 \%$ greater than 103 cm .
3. Sketch a diagram of the normal curve with the above information clearly labelled.
4. Using z-scores, find the mean and standard deviation for the length of the sea turtle shells along this coastline.

