MISSION LOG

# Explore Collect data (in cm) to evaluate the performance of your astronaut.

|  | **PING PONG** | **GUMMY SNACK** |
| --- | --- | --- |
| Launch Angle: 45° Pull-back angle: 60° | **Landing distance (cm)** | **Landing distance (cm)** |
| **Trial 1** |  |  |
| **Trial 2** |  |  |
| **Trial 3** |  |  |
| **Trial 4** |  |  |
| **Trial 5** |  |  |
| **Trial 6** |  |  |
| **Trial 7** |  |  |
| **Trial 8** |  |  |
| **Trial 9** |  |  |
| **Trial 10** |  |  |

# Explain Create a side-by-side comparative box plot for the landing distance of the ping pong ball and gummy snack.

# Write the 5-number summary, IQR, the left and right fence, mean, and standard for the treatment.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Min** | **Q1** | **Med** | **Q3** | **Max** | **IQR** | **L-Fence** | **R-Fence** |
| **Ping Pong** |  |  |  |  |  |  |  |  |
| **Gummy Snack** |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Ping Pong** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Gummy Snack** |  |  |  |  |  |  |  |  |  |  |  |  |  |
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1. Write a few sentences comparing the shape, center, spread, and unusual features of the two plots. Be sure to use appropriate metrics for the center and spread.
2. Use an appropriate statistic(s) to describe which astronaut typically flies further.
3. Use an appropriate statistic(s) to describe which astronaut is the most consistent.
4. Which statistic would you consider the most important metric in evaluating the performance of our astronauts?
5. Which astronaut would you use?
6. What are the factors we can manipulate? At what levels?
7. What is our response variable?

# Extend Collect bivariate data at different launch angles. You will need to hit a target ranging from 1 to 3.5 meters. Try 3 different launch angles to cover the range and create 3 models.

|  | **LAUNCH ANGLE** | | **LAUNCH ANGLE** | | **LAUNCH ANGLE** | |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Pull-back Angle** | **Distance** | **Pull-back Angle** | **Distance** | **Pull-back Angle** | **Distance** |
| **Trial 1** |  |  |  |  |  |  |
| **Trial 2** |  |  |  |  |  |  |
| **Trial 3** |  |  |  |  |  |  |
| **Trial 4** |  |  |  |  |  |  |
| **Trial 5** |  |  |  |  |  |  |
| **Trial 6** |  |  |  |  |  |  |
| **Trial 7** |  |  |  |  |  |  |
| **Trial 8** |  |  |  |  |  |  |
| **Trial 9** |  |  |  |  |  |  |
| **Trial 10** |  |  |  |  |  |  |
| **Trial 11** |  |  |  |  |  |  |
| **Trial 12** |  |  |  |  |  |  |
| **Trial 13** |  |  |  |  |  |  |
| **Trial 14** |  |  |  |  |  |  |
| **Trial 15** |  |  |  |  |  |  |

**Evaluate**

1. Aggregate your findings. What is your chosen regression model, what is the r-squared value of that model, and what are the launch settings that yield the most consistent results?
2. Record the number of attempts until your 1st success.
3. Record the Launch and Pull-back Angle that was successful.
4. Record the number of successes in 10 attempts by placing an X in 1 box for each success.

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| **Successes** |  |  |  |  |  |  |  |  |  |  |