



Data Detective (Day 1)

Initial Facts of the Case

- Using video camera footage from several locations, we know the thief escaped through the front door (which set off the alarm) and ran away at a constant speed, covering 300 meters in the first 80 seconds.
- It was 77 degrees Fahrenheit outside at the time of the robbery

Witness Testimonies

Witness A:

- Claims that the thief took off their shoes during their getaway and threw them over his fence into his yard. The shoes are size 10.
- *Also claims his thermometer showed 25 degrees Celsius.*

Witness B:

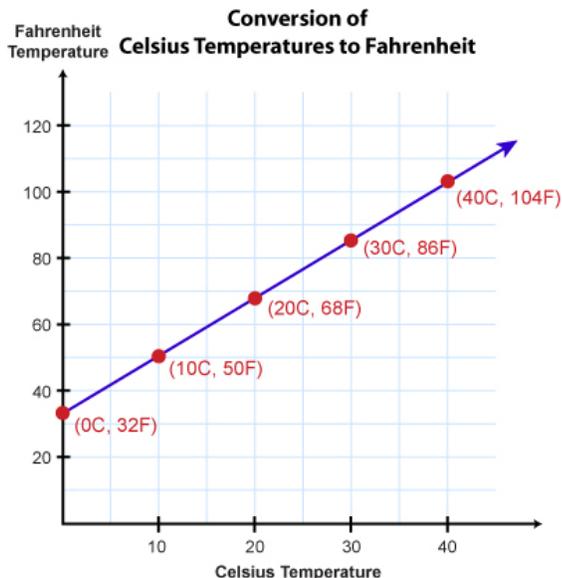
- Claims that the thief left a shoeprint in the mud on the sidewalk in front of his house that was size 8.
- *Also claims the thief ran past his house about 70 seconds after the alarm went off, and his house is approximately 160 meters away from the jewelry store.*
-

Are the witnesses each trustworthy? (Think-Ink-Pair-Share)

Your Mission: Decide which witness' testimony is reliable. Since both yield contradictory evidence, police believe one (or both) are not telling the truth. Compare the claims from each witness to the initial facts of the case, and provide the Police Chief with a report of your findings.

FINAL REPORT:

1. Use this graph to **write an equation** that represents the relationship between Celsius and Fahrenheit temperature.



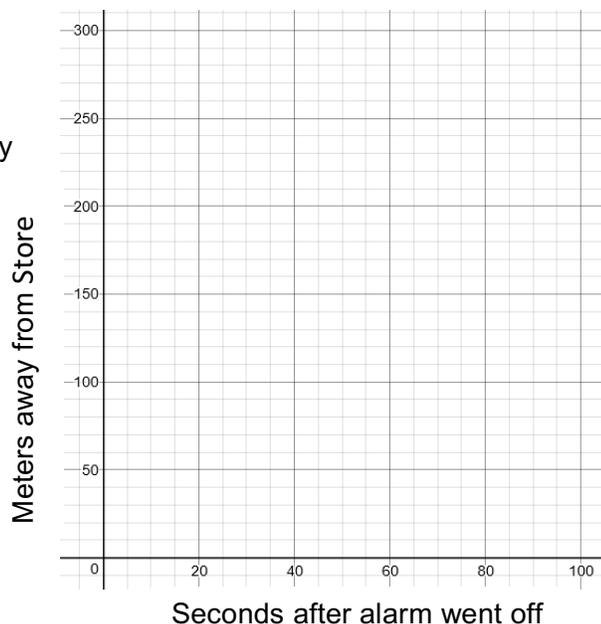
2. Based on the data, do you think **Witness A** is being honest? **Explain why or why not.**

Solve a Bonus Case: In a drug bust, a suspect claims it was a hot day around 100° F, and weather records show it was 34° C. Is the suspect a liar? Show your work below.

3. Use the **initial facts** of the case to determine **how many meters/second** the thief was running.

4. **Complete** the table to show how far the thief had run after so many seconds, and **sketch a graph** to represent how far away the thief was from the jewelry store after the alarm went off.

Time	0	20	40	60	80
Distance					



5. Based on the data, do you think **Witness A** is being honest? **Explain why or why not.**

6. **How far away** from the jewelry store would the suspect be **after 3 minutes**?

RETURN TO FRONT TO WRITE FINAL REPORT



Data Detective (Day 2)

Explore the Sim

-Open the Least-squares regression sim and **play** for a few minutes

Describe:

- Two things that look familiar

- Two things that don't look familiar

Different Kinds of Trends

Match each term with a **dataset** from the **drop-down list**.

Write the name of the dataset below.



1. **Nonlinear Association:** A relationship that would NOT be modeled well with a straight line

2. **Positive Association:** As the value of one variable increases, the other generally increases

3. **Negative Association:** As the value of one variable increases, the other generally decreases

4. **Outliers:** One (or more) dots that is strangely distant from the others

5. **Clustering:** Data that is clustered and bunched together

6. Which of these graphs could be used to help us catch the thief?

Your Mission: The thief got away with rings from the “sizing room” and the clerk’s laptop, which saved all of the store records. Use data to determine how many rings the thief stole!

7. At the end of the week, the jewelry store records:

1. The number of hours each week in which there are NO customers in the store
2. The total number of rings sold for the week

Do you think these two variables are linearly associated? What kind of association could they have? Do you think they have a strong or weak relationship?

8. Use the **sim** to **create a custom scatterplot** that could represent the association you described above (let's say the jewelry store never sells more than 20 rings a week and never has more than 20 hours of no customers)

Let's think of "# hours with NO customers" as being the x-axis

Let's think of "Total # of rings sold" as being the y-axis

Plot about 15 weeks of data according to the association you think they have

9. **Compare your screen with another group.** How are the graphs alike or different?

10. Using your scatterplot, use the "**My line**" option to fit a line that best represents the relationship between these two variables and record that equation below.

11. This week, the jewelry store clerks reported **13 hours** with no customers in the store. **Estimate** the number of rings the thief stole using your equation.

12. Let's assume that your scatterplot represents the actual data. Do you think your estimate for the number of rings stolen is exactly right? Why or why not?

FINAL REPORT:

Using the "official" data of the case shared by your teacher on the board, come up with your **best estimate** and **estimate range** for the number of rings the thief stole, and **explain** your findings to the police chief.

Data Detective (Day 3)



The Suspects

Molly Mint

IQ: 92

Height: 64 inches

BMI: 18.0

Jerrell Jones

IQ: 116

Height: 75 inches

BMI: 22.5

Kenny Kass

IQ: 101

Height: 69 inches

BMI: 30.0

Shania Snow

IQ: 121

Height: 67 inches

BMI: 23.5

Ravi Raines

IQ: 96

Height: 66 inches

BMI: 22

Nina Nash

IQ: 110

Height: 59 inches

BMI: 25.5

The Evidence

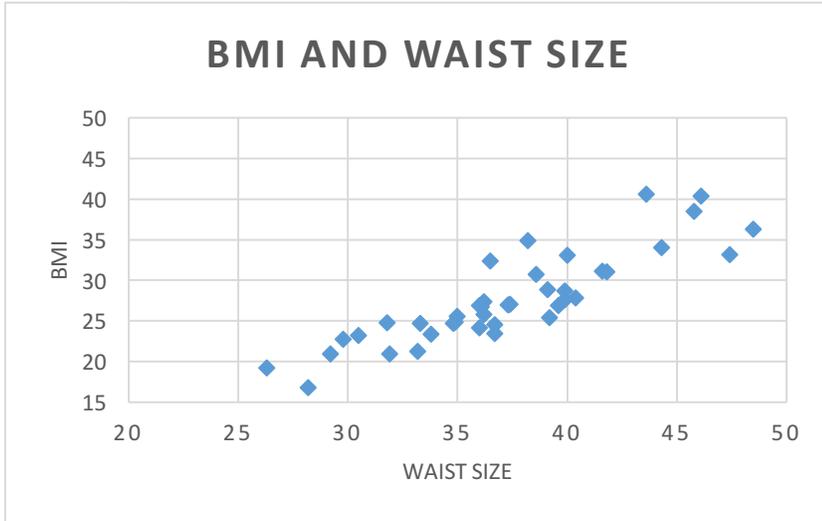
- 1) The lock to the safe was picked in 16 minutes
- 2) A belt was left behind at the scene of the crime that must have been used in the break-in. It was a gender-neutral belt that appears to have been worn by someone with a 34-inch waist
- 3) The thief wore size 10 shoes

How is the evidence linked to suspect descriptions? (Think-ink-pair-share)

Your Mission: Examine and analyze the data, eliminate possible suspects, and **identify the thief!**

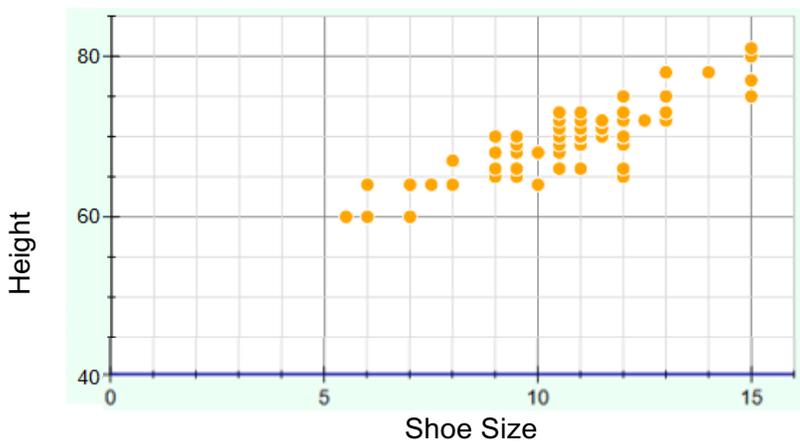
Examine the Data

The following data from statcrunch shows the BMI measurements and corresponding waist size of 41 adults.



1. **Draw a range** on the graph that could represent the **culprit**.
2. Which suspects can be **eliminated** based on waist size and BMI? **Explain**.

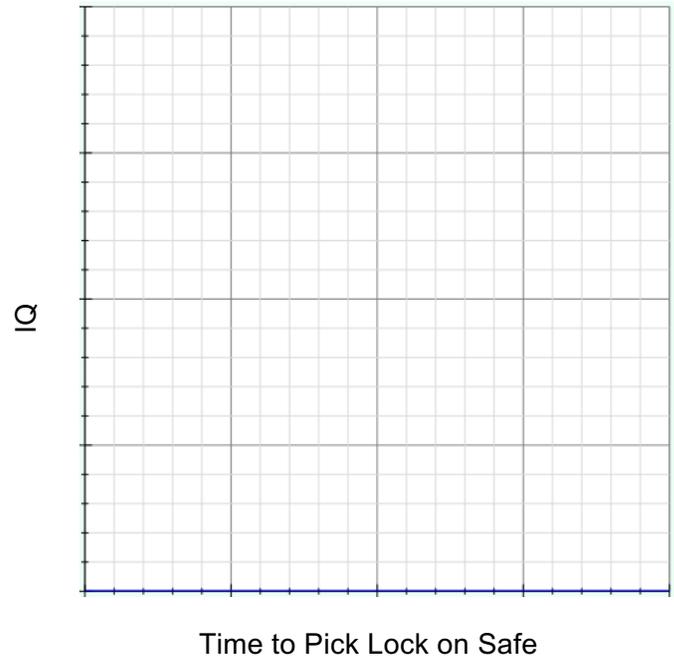
The following data from statcrunch shows the height and corresponding shoe size of 52 adults.



3. **Draw a range** on the graph that could represent the **culprit**.
4. Which suspects can be **eliminated** based on shoe size and height? **Explain**.

The following data was collected by the safe company to find out how long it took adults to pick this particular lock. They paired the time it took different people and paired that with their IQ to generate the data shown in the following table.

Time	IQ
15	112
19	107
29	90
25	104
16	125
25	97
27	92
20	114
15	130
16	117
24	93
21	99



5. Use this data to **make a scatterplot**.
Hint: Label x-axis from 10-30 and y-axis from 90-130

6. **Draw a range** on the graph that could represent the **culprit**.
7. Which suspects can be **eliminated** based on IQ and break-in time? **Explain**.

FINAL REPORT:

Which suspect should be arrested and why? Are there any lingering questions about the case that may need further investigation?

What did you learn from this assignment?