

# Tootsie Rolls & Hand Span

(You can substitute Starburts for Tootsie Rolls)

## The set-up

Have you ever wondered how many Tootsie Rolls you could pick up with one hand? If you had a bigger hand, might you be able to pick up even more candy? Have you ever envied the bigger kids at Halloween? In fact, did you ever think you might be able to predict how much candy a person could pick up?

Our goal with this project is to investigate the relationship between the size of a person's hand and how many Tootsie Rolls that person can pick up. If our model is good enough, we can predict the number of pops someone can pick up based on his or her hand span.

REQUIREMENTS: A large number of Tootsie Rolls and some rulers.

1. Some people have a larger and/or stronger dominant hand. You must decide as a class, which hand will each person use: the left, the right, the dominant hand, or the weak hand?
2. Hand span refers to the distance between the tip of your thumb and the tip of your pinkie. You must agree as a class, how will you measure hand span: with all five fingers outstretched, or with the middle three fingers tucked in?
3. Finally, what units will you use to measure hand span: inches, centimeters, or something else?
4. Why are questions 1-3 important? What would happen if everyone used his or her own system for conducting this study?

## Data collection & summary

5. We want to use hand span to predict the number of Tootsie Rolls a person can pick up. Which is the explanatory (predictor) variable, and which is the response variable?

6. Each person should measure his or her hand span according to the rules the class agreed upon. Record your pair of data below. Be sure to include units on hand span.

Hand span = \_\_\_\_\_

# of Tootsie Rolls = \_\_\_\_\_

7. Collect the data for the entire class and use your calculators or a computer to create a scatter plot of the data. Describe all the features you see.

8. Compute and interpret  $r$  and  $r^2$  for this data.

9. Compute the least squares regression line for this data. What are the meanings of the intercept and the slope in this context? Do they make sense?

10. Make a residual plot. Identify and discuss any outliers or influential points.

11. Predict the number of Tootsie Rolls picked up by someone with a hand span of 22 cm and someone with a hand span of 27 cm. Which prediction do you feel is more reliable, and why?