Big Ideas Math®



Foot and Forearm Examination Activity

▶ Materials:

- Paper
- Pencil
- Shoe size and forearm length table
- Shoe size conversion chart
- Grid paper
- Ruler

▶ Directions:

Students work as a group. Have a student record the shoe size and forearm length of each student in your class in a table like the one provided. Let *x* be the shoe size (European size) and let *y* be the forearm length (inches). Note: European sizes are used here because there is no difference between male and female sizes, like in U.S. sizes. See the chart provided to convert from a U.S. standard size to a European size.

Have each student draw a scatter plot of the data in the table on grid paper. Then have them sketch a best-fitting line for the data. Students then choose two points on the line to find an equation of the best-fitting line and write the equation in slope-intercept form.

Students should ask you for your shoe size. Have students use their equation of the best-fitting line to predict your forearm length. Measure your forearm length, but don't tell the students until all of them have a prediction.

▶ Who Wins?

The student with the prediction closest to the actual lenth of your forearm wins.

Discuss:

Discuss why the predictions vary. Why are some predictions close to the real answer while some are far away?



| Student | Shoe size <i>x</i> (European size) | Forearm length <i>y</i> (inches) |
|---------|------------------------------------|----------------------------------|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | | |
| 17 | | |
| 18 | | |
| 19 | | |

| Student | Shoe size <i>x</i> (European size) | Forearm length <i>y</i> (inches) |
|---------|------------------------------------|----------------------------------|
| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | | |
| 26 | | |
| 27 | | |
| 28 | | |
| 29 | | |
| 30 | | |

| Size Conversion Chart for Women's Shoes | | |
|---|--------------------|--|
| U.S. Shoe Size | European Shoe Size | |
| 4 | 35 | |
| 4½ | 35 | |
| 5 | 35–36 | |
| 5½ | 36 | |
| 6 | 36–37 | |
| 6½ | 37 | |
| 7 | 37–38 | |
| 7½ | 38 | |
| 8 | 38–39 | |
| 8½ | 39 | |
| 9 | 39–40 | |
| 9½ | 40 | |
| 10 | 40–41 | |
| 10½ | 41 | |
| 11 | 41–42 | |
| 11½ | 42 | |
| 12 | 42–43 | |

| Size Conversion Chart for Men's Shoes | | |
|--|--------------------|--|
| U.S. Shoe Size | European Shoe Size | |
| 6 | 39 | |
| 6½ | 39 | |
| 7 | 40 | |
| 7½ | 40–41 | |
| 8 | 41 | |
| 8½ | 41–42 | |
| 9 | 42 | |
| 9½ | 42–43 | |
| 10 | 43 | |
| 10½ | 43–44 | |
| 11 | 44 | |
| 11½ | 44–45 | |
| 12 | 45 | |
| 13 | 46 | |
| 14 | 47 | |
| 15 | 48 | |
| 16 | 49 | |

