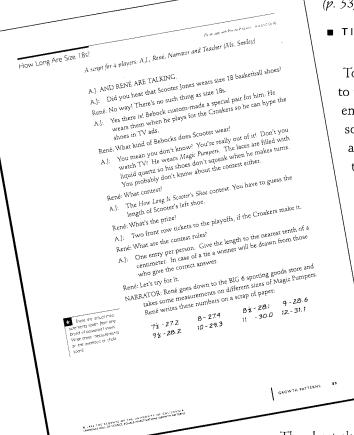
How Long Are Size 18s?



■ MATERIALS: Calculators, scripts for volunteer readers (3), (p. 53), transparencies from script (p. 53).

■ TIME: 1 hour

Too often students wait for their teacher or somebody else to tell them which strategy is appropriate in any given mathematical problem or situation. Students need to build a personal mathematical tool kit which allows them to choose and use mathematical instruments and strategies as tools to solve problems as independently as possible. In the Investigations Units much of the work students will be doing involves finding out about the relationships between two sets of numbers and using the relationship to make predictions.

In *How Long Are Size 18s?*, A. J. and René want to find the relationship between standard shoe sizes and the lengths of shoes. They use the following mathematical tools:

sketch a diagram; make a table; draw a graph; use a formula.

The short skit *How Long Are Size 18s*? reviews these tools and presents students choosing and using them as needed.

Select three students for the parts of A. J., René and the narrator. Have them read the script aloud to the class up to the assignment section of the script. Stop and let students work on predicting the length of Scooter's size 18s. Their work can serve as a pre-assessment for the unit.

After students share their predictions and methods, have the students continue the script. Be prepared to use transparencies or the chalkboard to supplement the script.

Resist the temptation to give out formulas — chances are the kids won't remember them anyway. If you wait and let your students figure them out on their own, they'll be much more useful.

— Middle school teacher

Note 1: Using linear regression to find the line of best fit for René's data gives an equation of y = 0.8574x + 20.72 where x is shoe size and y is the length of the shoe in cm. The correlation coefficient for these data is 0.996. Paired data with perfect linear correlation have a correlation coefficient of 1. Substituting 18 into the equation for x gives

a value of 36.15 cm.

Note 2: Shoe sizes in the U.S. are based on the inch. As decreed in 1324 by King Edward II of England, the inch equals a length of three barley corns.

Shoemakers of that day decided that the longest normal men's foot was about the length of 39 barleycorns or 13 inches.

Therefore the largest standard

size made was size 13, with smaller full sizes reduced by one barleycorn each. So size 12 was 38 barleycorns, size 11 was 37 barleycorns, etc. Since each barleycorn is a third-of-an-inch, half-sizes fall a sixth-of-an-inch shorter or longer than the full sizes they lie between. For women and children's shoes, a different sizing system is used. Although

the U.S. still uses this system of shoe sizing, England and the rest of the world now use a metric shoe-sizing system. More information about shoe sizing, and other weird measurements, can be found in Reading the Numbers: A Survival Guide to the Measurements, Numbers, and Sizes Encountered in Everyday Life by Mary Blocksma.