Title: These Feet Were Made for Walking

Content Standard A (Grades 5-8): Mathematics is important in all aspects of scientific inquiry.

Standard 5

Indicator 5.5.1 Make precise and varied measurements and specify the appropriate units.

Standard 2

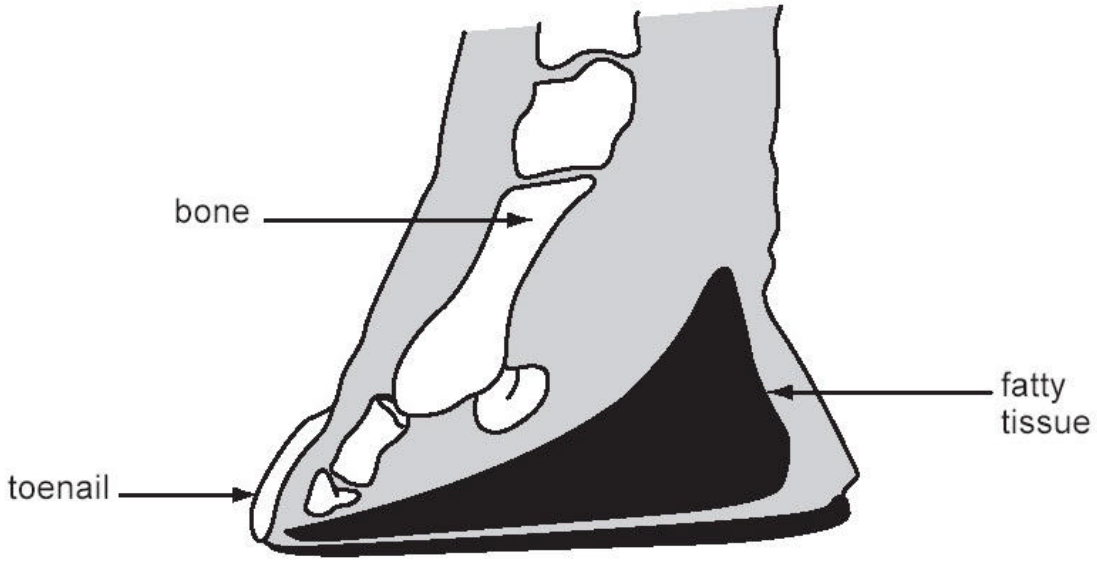
Indicator 6.2.2 Use technology, such as calculators or computer spreadsheets, in analysis of data.

Standard 2

Indicator 7.2.2 Use formulas to calculate the circumferences and areas of rectangles, triangles, and circles, and the volumes of rectangular solids.

Background:

Did you know that an elephant, which is the heaviest of all land animals, walks on its tiptoes? The bones of the elephant's foot are angled with a huge, spongy pad of fatty tissue behind the heel. This foot formation allows the elephant to move silently and acts as a shock absorber for its enormous weight. The elephant's foot size is used to judge the overall size of an elephant and can be used to estimate the elephant's height to its shoulder.



Purpose: To use the measurements of an elephant's foot to calculate the estimated height of the elephant.

Materials:

- Elephant foot mold from Indianapolis Zoo's Elephant Resource Kit
- Tape measure
- Calculator

Activity:

1. Measure the diameter of the elephant foot mold. Use this measurement to find the radius.

$$r = \frac{d}{2}$$

2. Calculate the circumference of the mold.(use the formula circumference = $2 \pi r$)
3. Multiply the number by two. This will give you the estimated height of the elephant.
4. Compare the calculated (estimated height) number to the actual height of the elephant.

Extensions:

1. Make a mold of each student's foot, using modeling clay or plaster of paris. (or have student outline their shape of their foot on paper.)
2. Use string to measure the circumference of the student's foot mold (or outline on paper) and then measure the string with a tape measure.
3. Multiply the circumference by 2. This value will give the estimated height of that student.
4. Compare the estimated height of the student to their actual height.
5. Use foot tracks of other animals, perform calculations and compare their estimated height to their actual height.

Assessment:

1. Calculations estimating the height of the elephant.
2. Discussion on validity of calculations of estimated heights and actual heights of the animals.
3. Discussion on whether there are better methods on estimating the height of an elephant or other types of animals.

Resources/teacher notes:

1. Obtain elephant foot mold from the Indianapolis Zoo's Elephant Resource Kit.
2. See Appendix for statistics on elephant.