Finding a Sink-in-the-Snow Coefficient

Verne N. Rockcastle

1. Place one foot on paper marked off in square centimeters. Trace around one foot with a pencil or crayon. Then count the number of squares inside the outline. Besides all the complete squares, count all squares that have more than half their area inside the outline. Do not count any squares that have less than half their area inside the outline.
Write this number here: _____ cm^2
(square centimeters)
Now double that number (because you have two feet).
Write the number here: _____ cm^2

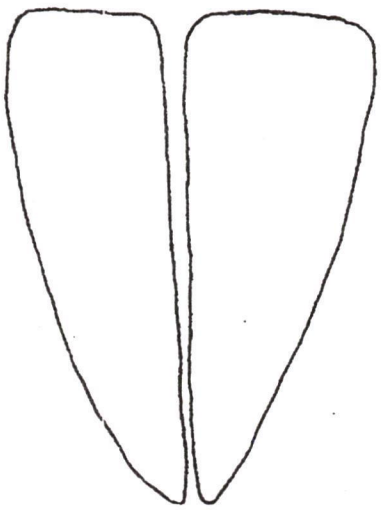
2. Find your weight from the metric bathroom scales.
Write it here: _____ kg

3. Since, when you stand in snow, your weight is on your feet, write your weight above the area of your feet:

$$\frac{\textbf{your weight in kilograms}}{\textbf{the area of your feet}} = ?$$

4. What is the ratio? It is your "sink-n-the-snow coefficient."
Write it in the blank here: _____.
(My "sink-in-the-snow coefficient")

5. Now do the same with a deer track, assuming one foot to have a track this size:

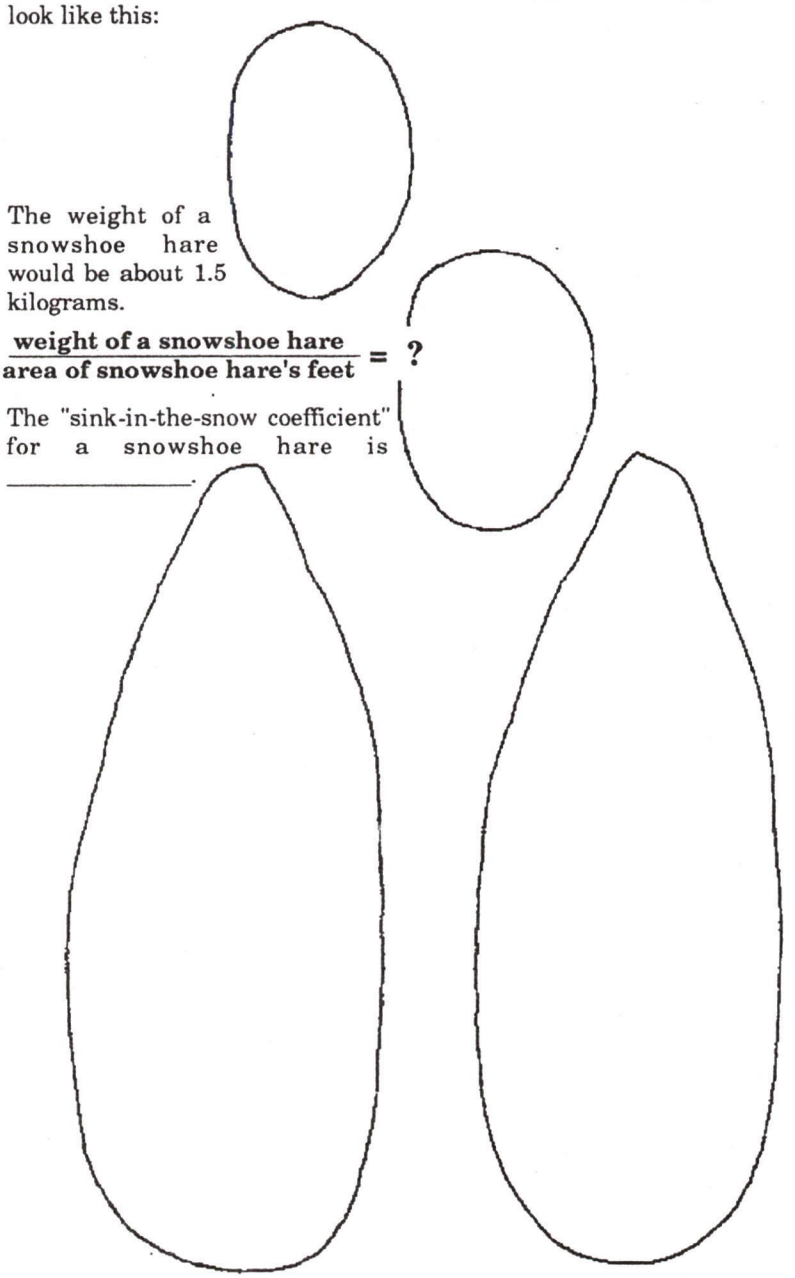


Assume the weight of an average deer to be 80 kilograms.

$$\frac{\textbf{a deer's weight in kilograms}}{\textbf{the area of a deer's footprints}} = ?$$

What is a deer's "sink-in-the-snow coefficient?"
Write it here: _____.

6. Do the same with the track of a snowshoe hare, assuming it to look like this:



The weight of a snowshoe hare would be about 1.5 kilograms.

$$\frac{\textbf{weight of a snowshoe hare}}{\textbf{area of snowshoe hare's feet}} = ?$$

The "sink-in-the-snow coefficient" for a snowshoe hare is _____.

7. Now consider yourself standing, not on your two feet, but on snowshoes. Find the area of a snowshoe, then double it, and write the fraction (ratio) of your weight-to-area when wearing snowshoes.
Hint: Since the area of one snowshoe may be too large for easy tracing and counting of squares, you can find it by tracing the outline on a cardboard, cutting out the cardboard, and weighing it. Then cut out a smaller square of, say, 100 cm2. Weigh this small piece. Then find how many times larger the snowshoe outline is than the smaller square. That will tell you the area of the outline.

$$\frac{\textbf{your own weight}}{\textbf{the area of the snowshoes}} = ?$$

What is your "sink-in-the-snow coefficient" with snowshoes on?