

## Assignment 2: Analysis of particle shape

The purpose of this exercise is to provide an opportunity to quantitatively describe the sphericity, roundness and forms of particles in the various ways discussed in class. Complete the following using the data provided in Table 1. Each clast is numbered and you should record the appropriate information in the numbered row in Table 1 following the procedure outlined below. Everything you need to know to complete this lab is contained in Chapter 2 of the course notes and the formulae are also summarized here.

### Part A. Roundness and Sphericity

Complete the following for the data describing clast axes lengths and volumes provided in table 1.

1. Determine the maximum projection sphericity for all of the clasts using the formula of Folk and Sneed:

$$\Psi_P = \sqrt[3]{\frac{d_S^2}{d_L d_I}}$$

2. Determine Wadell's expression of sphericity that is based on the volume, in millilitres, of each clast:

$$\Psi_w = \frac{\text{diameter of a sphere with the same volume (V) as the particle}}{\text{diameter of a circumscribing sphere}}$$

or

$$\Psi_w = \frac{\sqrt[3]{6V/\pi}}{d_L}$$

3. Calculate the Wadell sphericity using only the axes lengths and the following formula:

$$\Psi_{w2} = \sqrt[3]{\frac{d_S d_I}{d_L^2}}$$

Comment briefly on the differences in sphericity based on the methods used above.

**Part B. Clast Form**

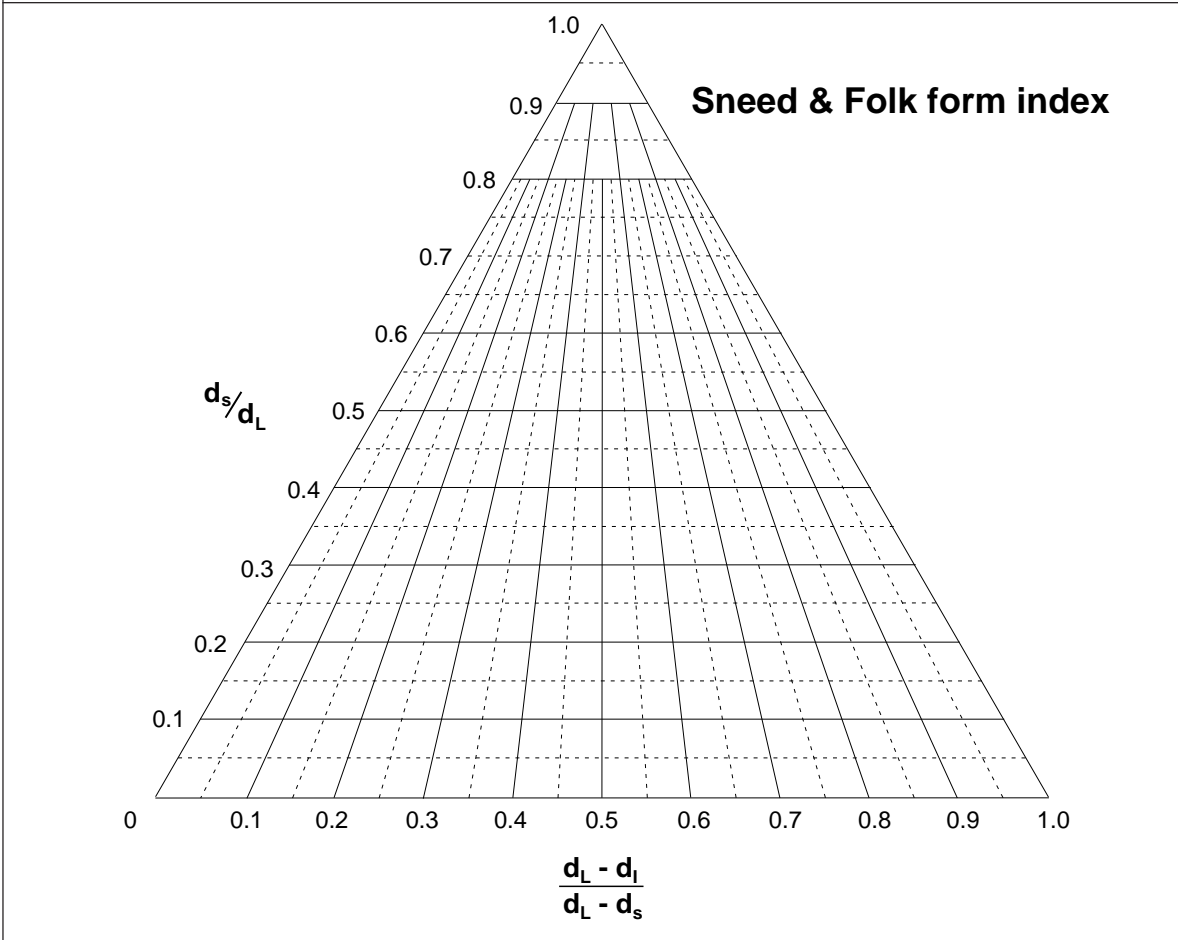
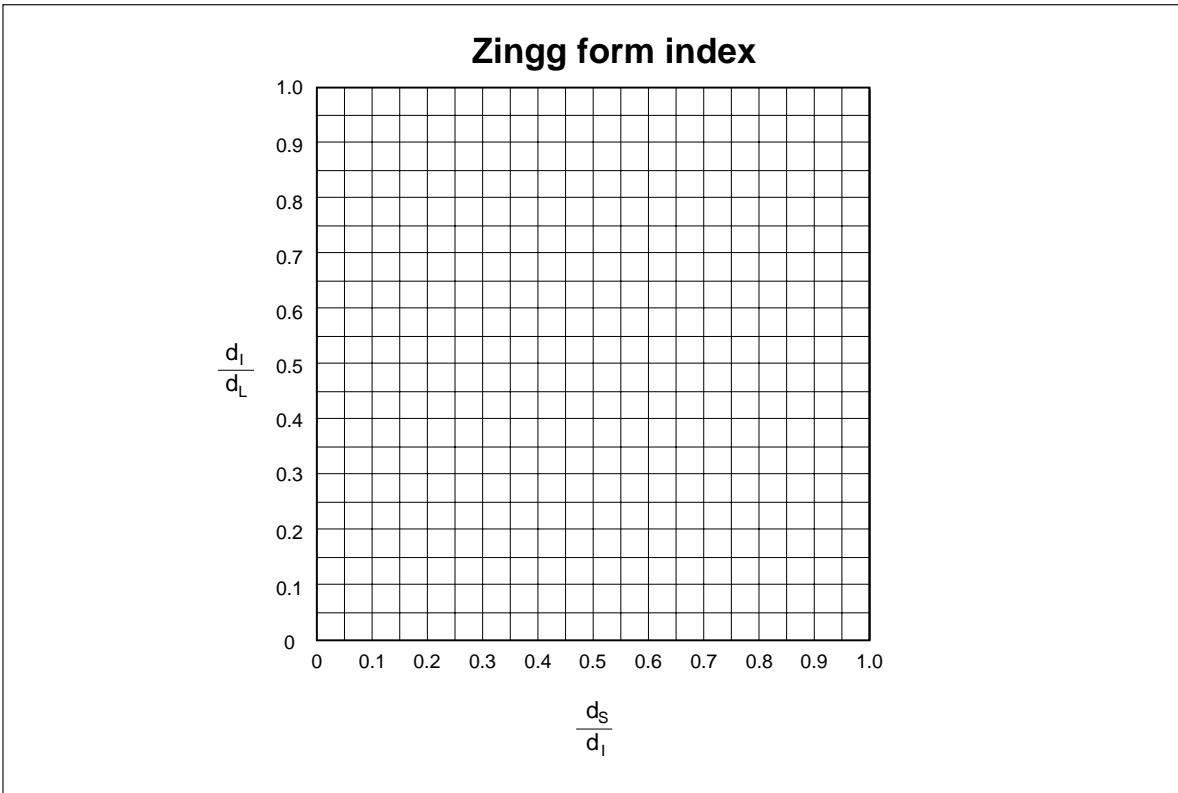
Calculate the various indices used to classify clasts according to their form using the methods of Zingg, and Sneed and Folk. Plot the various values on the appropriate diagrams on page 4 of this assignment. Note: number each point that you plot on the diagrams with the number on the actual clast. The Zingg and Sneed and Folk form classes can be determined by comparing the plotted points to figures 2-19 and 2-20, respectively, in the course notes. Write the appropriate term to describe each clast in the space provided in table 1.

Describe the shape of each clast in a couple of sentences (include any possibly comments that might explain the shape of the clast).

**For this lab you must hand in your completed table 1, your comments on the methods of calculating sphericity, your plots of data on the diagrams for the two form indices and comments regarding each clast. Put your name and student number on the bottom of each page and on the written material that you hand in.**

Table 1. Summary of axes lengths, measures of sphericity, form indices and form classes.

Clast number	$d_L$ (cm)	$d_I$ (cm)	$d_s$ (cm)	V (ml)	$\psi_p$	$\psi_w$	$\psi_{w2}$	$d_I/d_L$	$d_s/d_I$	$d_s/d_L$	$\frac{d_L - d_I}{d_L - d_s}$	Zingg form class	Sneed & Folk form class
<b>1</b>	6.980	5.895	5.195	100									
<b>2</b>	7.365	5.500	5.105	105									
<b>3</b>	7.050	5.005	4.450	75									
<b>4</b>	5.355	5.180	3.440	50									
<b>5</b>	6.545	3.355	3.270	45									



Your name: \_\_\_\_\_ Your student number: \_\_\_\_\_