How big is a raindrop?

Introduction: There are many words and many descriptions for different types of rain: fine rain, heavy rain, pelting down, mizzling. In fact the BBC news magazine has an article entitled "Fifty words for rain" But how big is a rain drop? Does the size vary depending upon the time of year or the type of rain?

Aim: To collect data, manipulate data and analyse data to calculate and compare the size of raindrops.

Equipment Required.

- A platform of area of about $0.5m^2$ with edges.
- Enough flour to cover the platform to a depth of about 3cm
- An accurate measuring device, e.g. electronic sliding callipers.

Collecting the data

Cover the platform with the flour.

Place the platform in the rain for about 90 seconds, long enough for about 200 raindrops to hit the platform.

Use your measuring device to measure the diameter of the raindrops and record the data.

Manipulating, analysing, displaying and interpreting the data

There follows a number of suggestions of how the data can be used depending upon the ability of the students.

1. Calculate the mode, mean and median diameter of raindrop. Which is the most appropriate measure to use? Compare results from different groups.

2. Group the data into appropriate groups. Represent the data using histograms. Discuss whether it is appropriate to have all the groups the same size of vary the size of the groups. Compare the results from different groups. Compare data collected at different times of year if possible.

3. Calculate the spread of the data using range, interquartile range and standard deviation.

4. Discuss different methods of displaying the data. Is the data discrete or continuous? Should a bar chart or a histogram be used? This activity is ideal for discussing when a histogram should be used and the reasons for using a histogram.

5. Draw box plots to show the distribution of the data. Compare the spread of different data sets. What does this information tell us?

6. Write a report comparing the size of raindrops.

Extension

It may be appropriate for Advanced level students to explore the log-normal distribution as discussed in the accompanying article.