# Protocol 6: Substrate Sampling

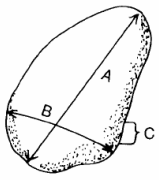
## Materials:

- Field book or field sheets and pencil or waterproof pen
- Calipers or flexible plastic ruler

## Method:

At the sampling site:
Remove 100 rock samples from the stream bed.

1. If sampling with a D-net ½ of the total rock samples can come from reaching in to the bucket that the D-net has been emptied into, taking out and measuring the first pebble or rock that you touch (don't look!).
2. If not sampling with a D-net, or for the remaining rocks: Start transect at a randomly selected point (throw a pebble) along the edge of stream.
3. Take one step into the water perpendicular to flow and, while averting your eyes, pick up the first pebble you touch next to your big toe.
4. Measure the pebble along its longest axis (see diagram) using the calipers or plastic ruler- return pebble to the stream.
5. For embedded pebbles or those that are too large to move, measure the longest axis visible.
6. Take another step across the stream and repeat steps 3. through 5. until you reach the opposite side. Establish a new transect and begin the process over again.




A = LONGEST AXIS (LENGTH)
B = INTERMEDIATE AXIS (WIDTH)
C = SHORTEST AXIS (THICKNESS)

7. If your stream reach is relatively narrow (<2 m), you can modify the method by walking upstream in a zig-zag pattern instead of perpendicular to flow.
8. Group (bin) pebbles in groupings of five centimeters (or in the size classes listed below). Calculate and then graph the percentages for each size class.

| Size Class | Size Range (mm) |
|---|---|
| Sand | <2 |
| Very Fine Gravel | 2-4 |
| Fine Gravel | 4-6 |
| Fine Gravel | 6-8 |
| Medium Gravel | 8-11 |
| Medium Gravel | 11-16 |
| Coarse Gravel | 16-22 |
| Coarse Gravel | 22-32 |
| Very Coarse Gravel | 32-45 |
| Very Coarse Gravel | 45-64 |
| Small Cobble | 64-90 |
| Medium Cobble | 90-128 |
| Large Cobble | 128-180 |
| Very Large Cobble | 180-256 |
| Small Boulder | 256-512 |
| Medium Boulder | 512-1024 |
| Large Boulder | 1024-2048 |
| Very Large Boulder | 2048-4096 |