My Backyard Stream
Substrate

Key Terms:

Streambed
any long, narrow, sloping depression on land that is shaped by flowing water
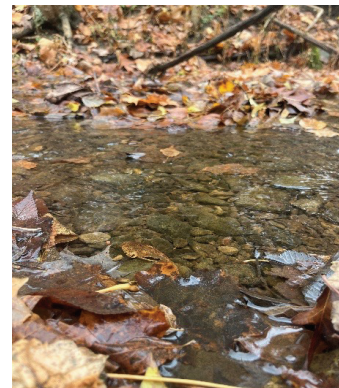

Calipers
a device found in your My Backyard Stream Kit used to measure the dimensions of an object (Figure 1).

Macroinvertebrate an
animal lacking a backbone and can be found in streams

What is substrate?

Substrate is the surface and subsurface materials found in a streambed. These materials can consist of boulder, cobble, pebble, gravel, sand, and silt. The type of substrate varies based on the area and can change due to surrounding land use and water velocity.

Did you know that substrate influences the animals that live in a stream?

Any change in substrate can affect the population of aquatic macroinvertebrates in a particular stream. This is because macroinvertebrates prefer certain types of substrates over others, and lots of them. Typically, a stream with a higher diversity of substrate sizes will have more macroinvertebrates living there.

For example, streams dominated by a good mix of cobble, gravel, and sands are home to a variety of macroinvertebrates, while streams that have more silt and sand provide less habitat options for aquatic organisms and will lack species diversity.

How is substrate classified?
Particle size is used to classify substrate. Below is a chart called the 'Modified Wentworth Classification Chart' that tells you the type of substrate, substrate code, and the particle size range.


Streambed with flowing water, fallen leaves, and substrate.

Code	Particle size range (mm)	Substrate definition
5	> 256	Boulder
4	64 - 255	Cobble
3	16 - 63	Pebble
2	2 - 15	Gravel
1	0.06 - 1	Sand
0	< 0.059	Silt

⚠️ ***Safety:*** *Before you get started make sure you are aware of your surroundings and traffic. Always be with an adult while exploring, be cautious of sharp objects that may be in the creek or on the streambank, and never enter a stream with high or fast-moving water.*

STEP 1
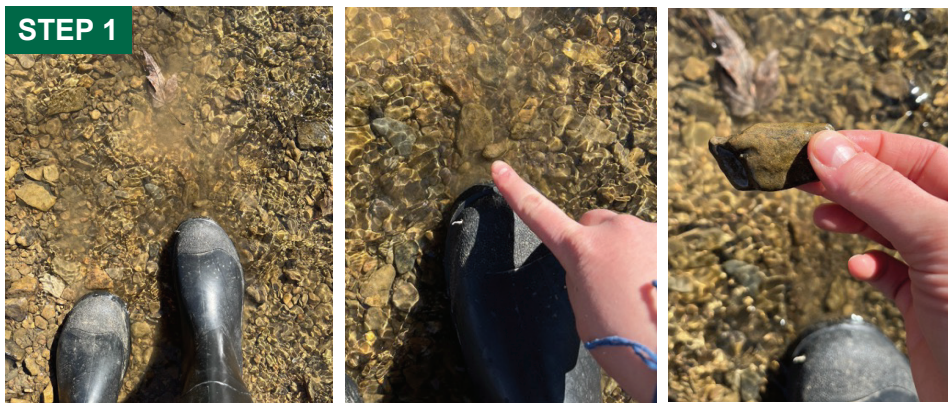
Walk along the stream and pick up 20 pieces of substrate

Tip: pick up 20 randomly selected pieces, make sure you obtain a variety of substrate not just the large objects what your eyes will be drawn too. An easy way to select randomly is to take a step and pick up the first object you feel at the tip of your boot while not looking.

STEP 2

(A) Long axis
(B) Intermediate axis
(C) Short axis

The intermediate axis is the pebble's diameter.

Using the calipers in your kit, measure the intermediate axis of each of the 20 pieces

Tip: refer to the diagram below for measuring substrate

STEP 3

| Long-axis **INCORRECT** | Short-axis **INCORRECT** | Intermediate axis **CORRECT!** |

Identify the substrate types using the substrate classification chart above

STEP 4

Record the substrate types on your field sheet by tallying the different types you found. Make a note3 of the substrate type that was the most common
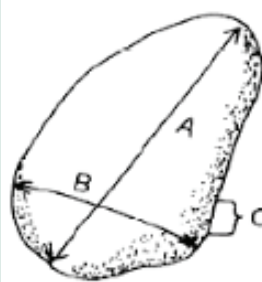
STEP 5

Once you have collected all the data on the field notetaking sheet, you can then submit your findings into the My Backyard Stream database.

To do this, visit watersheddata.com/Education/BackYardStreamCode.aspx and find the "Citizen Scientist Data Submission" button.

Enter in the data you collected and submit.

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