

2. Bedrock and Mountain Clues

Geologists have observed three kinds of bedrock on Bowen. Compare the exposed bedrock under your feet to your black mystery rock.

	Mystery Rock	Bedrock
Colour	_____	_____
Texture	_____	_____
Layers	_____	_____
Cracks	_____	_____
Other	_____	_____

Are there mystery rocks like yours here?

Look over at the North Shore Mountains, even if they are partly hidden by clouds. Ask others in your group to listen for clues to help solve the mystery as you read the following text out loud:

“Geologists have observed that the North Shore Mountains are formed of different rock types than Bowen Island bedrock. Squeezed and lifted by the slow, powerful movement of tectonic plates, the North Shore Mountains continue to rise to this day. Volcanoes have forced their way up through the mountains too along the edges of the moving plates. Mt. Garibaldi, for example, erupted near Squamish during the last ice age.”

Hypothesis Check

Turn back to page 1 and make any changes or additions to your hypothesis using what you now know.

Next Stop: Sliding Rock

Walk back through the alder grove and turn right on the trail that runs beside the soccer field. Continue to the first rock outcrop on your left and make your way up to the top. The school will still be in view. The rock gets its name from the smooth slope that younger children sometimes use as a slide.



Mystery Rock Worksheet

3. Sliding Rock Clues

Are there mystery rocks like yours here? _____

Can you see lines (not cracks) scratched into the rock's surface? _____

Do they point different directions, or approximately the same direction?

What force could have smoothed this rock, other than the jeans of younger students?

Could it be the same force that flowed down from the higher mountains to carve the fjord that is Howe Sound?

Hypothesis Check

Any changes? Go to page 1 and make them now.

Next Stop: Terminal Creek Bridge for Gravel Clues

Continue along the trails towards the meadow until you reach the bridge. Cross it, step off, and you are at the next stop, just at the base of the stairs.



4. Gravel Clues

Are there mystery rocks like yours here? _____

Are these rocks and gravel similar to other rock you have observed so far today? _____

How might this rock and gravel have got here? Could the mystery rocks have come the same way?

Hypothesis Check

Any changes? Go to page 1 and make them now.

Next Stop: Root Hollow for Black Soil Clues

Turn right at the next T-junction and follow the trail through the meadow. Once you enter the trees, look for the lifted roots of a big blown-down alder tree on your left before you get to the next bridge. The soil exposed by the roots and in the ditch is the subject of the next stop.



5. Black Soil Clues

Are there mystery rocks like yours here? _____

Why is there more soil here in the valley bottom than at the sliding rock?

Hypothesis Check

Any changes? Go to page 1 and make them now.

Next Stop: Green Culvert for Red Soil Clues

Continue, crossing the bridge and turning left at the T-junction. When the trail splits, take the left fork and begin to look for the edge of the green plastic culvert sticking out from under the right-hand edge of the trail. The exposed soil at the culvert is the subject of the next stop.



Mystery Rock Worksheet

6. Red Soil Clues

Are there mystery rocks like yours here? _____

What is different about this soil from the last spot? Why?

Read aloud to the others in your group:

“Rust gives the soil this red colour. Traces of iron in the soil and rocks are rusting (oxidizing) due to oxygen being constantly being carried past by water flowing through the soil on its way down the slope.”

What else besides oxygen could the water carry? _____

Hypothesis Check

Any changes? Go to page 1 and make them now.

Next Stop: Big Boulder

Continue along the trail. As it climbs, watch for two short but very stout nurse logs on the trail's edge to your right. Just past them is a big boulder, also on your right.



7. Boulder Clue

Is this rock type the same as your mystery rock? _____

Is it similar to the bedrock from the first clue site? (Check your notes)

How might this boulder have ended up here, lying on the surface?

Hypothesis Check

Any changes? Go to page 1 and make them now.

Next Stop: Tree Roots

Continue until the trail intersects with a gravel road. Turn left on the road and walk down. Turn right onto the next trail, and start watching for tree roots clinging to pale, exposed and broken rock on your left.



8. Tree Root Clues

Look at the rocks around the roots of trees on your left. Tree roots have been breaking the bedrock up by getting into tiny cracks and then growing bigger, forcing the rock apart.

Why might your mystery rock's edges be rounded and not sharp like those among the tree roots?

Where have you seen rounded rocks on Bowen? _____

Where might you look next to find more mystery rocks?

in soil creek beach soil's surface other

Next Stop: Creek Bed

Follow the trail through the picnic area and along the lakeshore. When you first catch sight of a bridge, step off the trail to the left to find the creek within a few feet. You may find a faint track to follow. If you overshoot and reach the bridge, just find your way a short distance upstream to a clear area without overhanging bushes.



9. Creek Bed Clues

Are there mystery rocks like yours here? _____

Introduce your mystery rock to others of its kind. Friends, at last!

Read aloud:

"The rocks here have rounded edges, partly from recently being tumbled with other rocks in the water as it flows down from the slopes of Mt. Gardner, wearing down those edges. Geologists think of creeks as creeks of gravel, with flowing water as the moving force that carries the gravel and rocks (bedload) along.

By the way, geologists have observed that the top of Mt. Gardner is not made out of rock like your mystery rock."

So where have these black rocks come from?

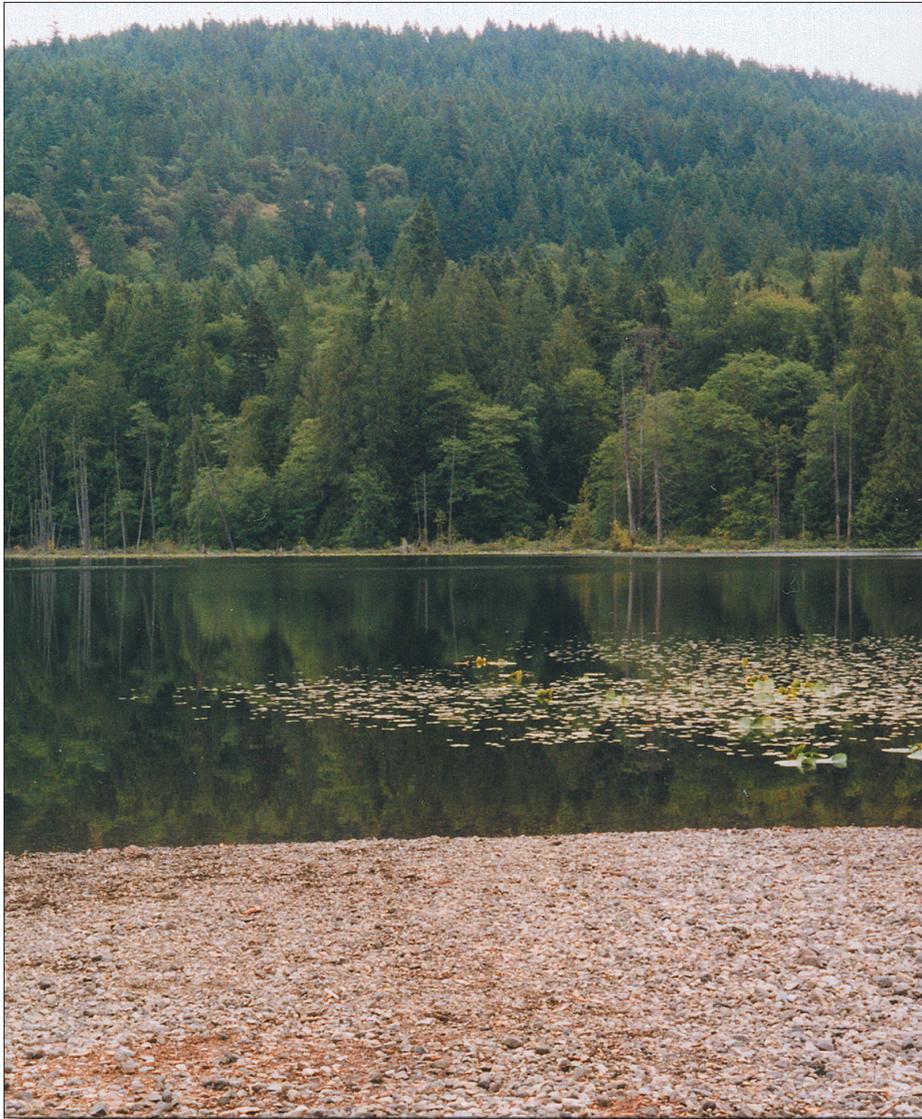
Last chance to revise your group's hypothesis. Take some time to look back over all the clues to be sure that it describes the origin of the mystery rocks to the best of your knowledge. No need to be boring—the answer, to be revealed at the next and last stop, is surprising. Use the lines below to write it out fresh if you need the room.

The origin of the black mystery rocks is:

Mystery Rock Worksheet

Next Stop: Rocky Beach for the Rock Show

You still don't need to cross the bridge. Instead, head out to the lakeshore on the rocks and gravel.



10. Rock Show: Mystery Solved

If your hypothesis came close to describing the real events, congratulations!

Hold onto your worksheets and your sample mystery rock until you return to the classroom.

That's it for the Mystery Rock excursion. Hope you enjoyed it!

