



## “Sum of the Parts” [MC]

\*Adapted from Project WET® and New Wave of Learning\*

**Grades:** 6-8

**Time:** 45 minutes to 1 hour

**Goal:** To demonstrate how everyone contributes to the pollution of a river as it flows through a watershed.

### **Objectives:**

Students will be able to: distinguish between point- and non-point source pollution; recognize that everyone is responsible for the pollution of the water source in their community; and identify best management practices to reduce pollution.

### **Materials:**

Pre-made “riverfront property” pieces (see sample provided)

Pieces of colored paper (to represent pollution types)

Crayons, markers, colored pencils

### **Procedures:**

1. Pre-Activity (introduction): Begin with defining point- and non-point source pollution and give examples of each. Create a list on the board and designate a color to each (for the purpose of the activity). Describe the estuarine watershed in terms of its tributaries, major rivers, and how water flows from upstream to downstream. Explain that the activity will explore what happens in an ecosystem when you add pollution into the watershed and it too flows from upstream to downstream.
2. Activity: Begin the activity by telling the students they have “hypothetically” won a million dollars and have been given a piece of real estate to build on, right alongside a nice, clean river. Pass out the “riverfront property” pieces and explain they can build whatever they choose to on their property. Give them approximately twenty minutes to use their imaginations and create.

After they have completed what is to go on their property, have the students line up their pieces according to the diagram provided, so they can see the layout of the river when it is connected. Beginning with property labeled number one, explain that these properties are upstream and everything else is considered downstream. Have each student explain what they created on their property and designate specific pollution examples to their property. For example, if they have a mansion with a well-manicured lawn, add fertilizers to their property. As you go to the next set of properties, designate pollution based on what they drew.



Once you have reached the end of the river, explain that heavy rains and winds are pushing the water fast downstream. Beginning with the first pieces of property, have the students pick up their pollution pieces and hand them to the person standing next to them downstream. Property number two will take all of their pollution and add it to what they were just given all the way down the line until the end properties have everyone's pollution.

3. Post-Activity (review): Emphasize the key fact that pollution of any type has flowed downstream without anything standing in its way. Ask the students to consider different management options the individual property owners could use as well as the community as a whole with respect to preventative measures. The students may keep their properties.

**Key Words:**

Point-source pollution  
Development

Non-point source pollution  
Water quality

Urban sprawl  
Watershed

**Background Information:**

\*Adapted from New Wave of Learning\*

Point-source pollution causes major damage to any aquatic system, especially within the estuarine environment. Because the estuary has water flowing into it from both upstream rivers and the ocean, it can be exposed to pollution from both sides, causing detrimental damage to occur. Inland and upriver, most pollution enters the waterways either by passing through a storm drain on the side of the road, percolating down into the soils, or being dumped directly into a tributary or the river itself. Water in a watershed always flows downstream, and because these pollutants do not pass through a water treatment plant, they are directly emitted into the estuary. Ocean pollution, by contrast, can come from boat oil or illegal dumping of chemicals, as it is pushed into the estuary with the incoming tides and currents.

There are two main types of pollution: point- and non-point source pollution. Point-source pollution is often described by its namesake and usually consists of pipes that emit pollutants directly from a factory or plant into the water. You can literally “point” out where the pollution is coming from and “point” blame on the culprit. Non-point source pollution is much more difficult to identify the cause or where it originally came from. Pet waste, detergents and soaps from cars or homes, fertilizers and pesticides for lawns and gardens, and general garbage debris can all be considered non-point source pollution. These items can be twice as detrimental because they tend to be exponentially added to the water system.



In the Barnegat Bay watershed, for example, pollution of any kind, but especially water pollution, affects everyone and everything, from the water we drink, to the lakes and ponds we might swim in, to the rivers and bays organisms use as their home. Since we all utilize this vast water resource collectively, we are the only ones who can do something about it. Everything that enters a system upstream will eventually make it downstream so what we do will affect how someone else utilizes the water source we both share.



Sample Riverfront property cards

