

Sum of Parts – presenter summary

Introduction: Briefly talk about how land development and land use can impact water quality.

Vocabulary Words:

- Point source pollution – water pollution coming from a single point; i.e. sewage outflow pipe
- Non-point source pollution – pollution discharged over large area, not a specific location; i.e. sediment from construction areas, excess fertilizer from farm fields, etc.
- Steward – a person who uses our natural resources through conservation and sustainable practices

Dripial Pursuits:

- ◆ When pollution is coming from a single point into a water body (i.e. outfall) what is it called? (point source pollution)
- ◆ When you cannot pin point where pollution is coming from, possibly from a large area, construction sites, etc. what is it called? (nonpoint source pollution)
- ◆ What is the term used for someone who uses our natural resources through conservation and sustainable practices? (steward)

Activity: Have a diagram of the 12 plots - six on each side of the river and explain that they were each given a million dollars to develop the land in any way they want. Next, have a page with a list of possible development/land uses they can use, but encourage their imagination. Give them about 5 minutes to draw or list their ideas on the provided paper. After five minutes have each group tell the whole group what they decided to do. Take a couple of moments to share some of the ways land development and land use can impact the environment and water quality. A few general ideas/examples helps to get them thinking. Give them several more minutes to come up with a form of pollution that they may contribute and have each group go and pick out a representative item from the "pile O pollution". Start at one end of the river and have each group repeat their form of land development and what pollution they are contributing and they add the item to the bucket. Go all the way down the river and when the last group has contributed their pollution, show the buckets to the group. Point out that each group only contributed one thing, but by the time everything was passed down the river it added up to a whole bunch of stuff.

Wrap-up: Repeat the three terms (point source & non-point source pollution, and steward) - see if they remember what the words mean. If not remind them of the definitions and give them some ideas of things they can possibly do to be good stewards.

Journaling: Put the three words up with definitions so they can add this to their journal. Additional questions about things they can do to avoid being point-source polluters or good stewards would be appropriate. Most of the teachers were going to talk about the words in their next science period, so making sure the words and definitions were good.

Sum of Parts activity contents

Gas/oil can	Construction materials	Mixer blades
Garbage from campers/outdoor recreationists	Logging debris and erosion	One large blue mat cut into a RIVER
Paper plate	large sticks	String
Manure	Plastic bottles	Plastic bottle caps
Mine runoff	Pesticides/herbicides	Rubber duck (toys)
Dog waste(s)	Industrial waste	Boat gas and oil
Toxic chemicals	Paper egg carton	Fertilizer
Cigarette butts	6-pack plastic rings	Household cleaners
Household garbage	Car oil	Fertilizers
Milk jug	Antifreeze & other auto fluids	Waste oil
Plastic bags	Styrofoam cup	Deicer
Styrofoam egg carton	Paper	Chunks of Styrofoam

Sum of Parts – Flooding addition

My addition of flooding to Sum of the Parts is somewhat similar to Ray’s suggestion; however, I use the existing Sum of the Parts method with one additional line. I lay out the Sum of the Parts map on the floor and on one side of the river I add a line that represents a high water flood mark. I dismantle the map and proceed with the activity in normal pattern. When people see the line they will ask questions. I tell the participants that this line shows the level of a 10 year flood or a 100 year flood or a 500 year flood to introduce the concept of risk and also to explain what these events mean. When I conduct the activity, I select a 100 year flood and then run the activity based on normal instructions. Obviously, by saying the land below the 100 year flood mark has a potential to flood, causes the participants to rethink what they do below the mark. Some of the risk takers, dismiss the line and later we discuss potential consequences. Others discuss ways to reduce the impact of the 100 year flood. I purposely do not draw a line on the other side of the river with the anticipation that someone will determine that if it floods on one side of the river, that it may also flood on the side. This discussion typically leads to the need for a study to determine the high water mark and a more cautious approach to land use and development.