

Enviroscape and Marble Table

- * Ask students what a watershed is
- * Ask students what their definition of pollution is
- * Ask them to define non-point and point source pollution
 - have them “point” out examples of each on the enviroscape
- *either sprinkle the “pollution” or have a student sprinkle the pollution
 - factories, farms, golf courses, roads, construction sites, residential areas, etc.
- *Ask students “what is going to happen when it rains?”
 - have a student make it rain at the golf course, another student make it rain at the factory, etc.
- *As the “rain” is falling, point out where all the pollution is going
 - ask students if they would like to swim in that lake or eat fish out of that lake, etc.
 - pull the cork out and drain the lake, try to clean the lake area with “rain”
- *Discuss what could be done to prevent the pollution from going into the lake
 - Best Management Practices (BMPs) for the golf course include planting more vegetation, planting native vegetation that doesn’t need much fertilizer if any, etc.
 - BMPs for the residential areas include planting native grasses that doesn’t require fertilizer, having a marshy area around residential area, **planting a rain garden**, having septic tanks pumped, etc.
 - BMPs for the construction site include planting a buffer of grasses and vegetation around the edges to stop soil erosion, etc.
 - BMPs for the factory include placing a filter by the point source for the pollution, having the water go through the water treatment plant, place scrubbers on smokestacks, etc.
 - BMPs for the roads include carpool, hybrid cars, drive less, etc.
 - BMPs for the farm include planting a riparian buffer along the lake, putting up fences for the cows, using better trackers (less oil on soil), planting more trees along the edge of the lake, using wetlands for septic systems, etc.
- *Allow students to place the “vegetation” around the watershed/Enviroscape
 - sprinkle fertilizer in the same spots (not as much this time)
 - have students make it rain again...point out that when they “rain” on the new vegetation, the water gets absorbed instead of instantly running off
 - talk about the wetlands and riparian buffer at the farm and how they absorb the water and the soil runoff
- *Have student evaluate the lake (should be much cleaner with just a little pollution)
 - ask them if they would like to swim in the lake now, compare to area lakes to give them “real life” examples

- *Move over to the Marble table
- *Race two marbles down the channels
 - ask the students why the straight channel marble goes almost twice as fast
 - race again with the same length of channel (there is a marker on the meandering stream for distance)
 - ask the students why the straight channel marble was still faster when the distance was the same

- *Ask the students for reasons to straighten a stream or river
 - explain that the marble proved that the river is moving faster and can hold much more sediment and will erode much faster than the curvy river
- *Mention that the curvy river erodes also, but not as fast and that there are BMPs that can slow the erosion of a curvy river
 - ask what the students would do to slow the erosion
 - have students place “vegetation” on the curves of the river and correlate it with the riparian buffer on the Enviroscope (it absorbs the water and stops soil erosion/slow down the water and absorbs some of the kinetic energy)
- *Discuss the pros and cons of channelization and what the inevitable outcome will be (more erosion, stream will eventually begin to meander again)

- *Review all major points: watersheds, point and non-point source pollution, BMPs for farmers/golf courses, etc., channelization (fast vs. slow and outcomes)