

## Lecture Material (Appendix I)

This lesson is best used after talking about watersheds. This is a simple but interesting activity you can have your students do to learn how to figure out how water flows in a watershed. They will also learn how to read a topographic map.

To start the lesson, hand out copies of topographic maps of your area. It would be best to make photocopies of the original map to hand out. You could also use a software program from Delorme or Maptech. [www.delorme.com](http://www.delorme.com) or [www.maptech.com](http://www.maptech.com) Once the students have the maps show them how to interpret them.

All of the lines on the map are called contour lines. On the map there are contour lines that are darker than the rest, these lines will give an elevation on them. For example you may find the line that says 1500 on it. That means that on that spot on the map the terrain is at 1500 feet above sea level. The line above it will be 1550 feet or 1600 feet depending on the scale of your map. You will have to look in the legend of the map to see what the spacing is between your contour lines. The line below the 1500 feet line will be 1450 or 1400.

As you look at the map you can distinguish mountains and valleys from each other by looking at the contour lines. Once you have gotten used to looking at the map and distinguishing between different land features find where you are at on the map. You can do this by finding the road that goes to the school and then locate a prominent feature near the school such as an intersection or a stream. Once you have found your position on the map find the closest stream.

Now that you know where you are located you are going to use that stream to see how large a watershed feeds that stream.

1. Pick a point on the stream. Make the point near your school if you can.
2. Once you have chosen your point start to draw a line from this point. When you draw the line you want it to intersect the contour lines at 90 degrees or at right angles.
3. As you draw the line make sure you keep crossing the contour lines at 90 degrees. If the contour line turns then your line must turn so that it stays at 90 degrees to the contour line.
4. If you come to the top of a hill make sure to keep your line at 90 degrees to the contour lines. At the top of the hill try to determine which way the water will flow. Keep your line so that the water on the top of the hill will flow into your watershed and the water that flows on the other side of the hill comes from outside your line.
5. Your line does not have to be perfectly straight; it should curve and flow to follow the contour lines at 90 degrees.

Once you have followed the contour lines at 90 degrees you should have ended up back at your starting point. You have just delineated the watershed. Any water inside your line will flow into the watershed of the stream you picked. When you look at your watershed delineation it should be logical. That is you shouldn't have your line cross over top of a mountain and include those areas in your watershed. That would mean water flows uphill. Your line shouldn't stop short of the top of a mountain either because the water from the top of the mountain must flow down into the watershed.

This is just a small watershed delineation. If you want you could then pick a larger watershed such as the watershed that drains into the ocean from your area. For example: the Susquehanna River watershed or the Lake Erie watershed. The delineation of these watersheds works the same. You use the same rules you just need a map of the larger area and more time to do the delineation. The delineation of those watersheds would be started at the mouth of the river that empties into the ocean.

If an overhead projector is available it maybe a good idea to make an overhead of the map you will be working with so that you can show the students how to do the delineation.

At the end of the activity you can discuss the watershed of your area and by using the map try to point out any sources of pollution or logging areas within the watershed. See if these areas have an impact on the watershed.