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Methods of Stem Education
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Data Integration

- a. USGS Streamer: <https://txpub.usgs.gov/DSS/streamer/web/>
- b. For the last two years I have been teaching my second graders about earth's surface and erosion, the work that water does. We start the unit by making predictions about how water moves, and where it goes. Students are shown a map of the major rivers in North America. We then talk about what we notice. I then show them the direction that each river is flowing (toward the oceans) and we discuss again. The hands on part of the lesson are that my students make Paper Mountains and they spray the mountains with spray bottles. After several sprays "river and streams" start flowing down the mountains. After all students have sprayed their mountains we again talk about our noticing's and I bring the map back out. With the knowledge of the "experiment" and the map we talk about what might be at the headwaters of all of these rivers. Once students are on the right track I overlay the map with the map of the mountain ranges of North America. Students then make the connection that all rivers start in "high" places and flow downhill to low places like the ocean. The maps that I am currently using give the students concrete data on where rivers start and where they end up. But there are far more resources out there on rivers and waterways.
- c. After a little digging I found the USGS Streamer website which allows you to zoom in on a map of the United States. I was able to find the river that many of my students fish with their families on. Once you find your waterway you can click on it and "trace down" and it will trace the way the water will go all the way to the ocean. Since we are at the Headwaters of what ends up being the Colorado River, we use the river mostly for recreation. The river is narrow and fast moving with lots of rapids. But as the water moves closer to the ocean it becomes wider, and slower and many communities use the water for things such as agriculture. With this information my students could pick a different city (cities in which the river flows through are all listed on the website) and they could do a report on what the water is used for in that area. This sort of report would tie in literature and geography into the original lesson.
Looking further into the website you can pick a gauge station that is located on the river and it will tell you real time stream flow such as discharge and gauge height. Students could do an analysis on the river at a single point, describing what the water has been doing in the last seven days. Students could also compare and contrast discharge or gauge heights at two different points on the river, making inferences on why there is more or less water in different places. The possibilities are endless.