

# **Water Quality Project Description – Upward Bound, Summer 2017**

## **Background**

Water quality is a continuous concern, not only for drinking water but for source water, as well. We depend on individuals in our communities to maintain a minimum quality of natural water resources. We also depend on clean water provided by the local government. To find out if these efforts are working, our class will be testing three water samples and compare the results.

## **Water Samples**

The three water samples we will test are:

1. Missouri river water, collected at the nearby Clay County Park
2. Vermillion tap water
3. Bottled water

## **Testing Details**

Testing strips are one of the easiest ways to get a large amount of information from a single test. There are more accurate and detailed methods, but these are expensive and time-consuming. Because of this, our class will use a test strip that tests for the following:

- pH
- Total alkalinity
- Total hardness
- Iron
- Copper
- Lead
- Nitrate
- Nitrite
- Free chlorine

## **Data Analysis**

Each group of students will report their data. The instructor will assist with building graphs. Finally, students will compare their results to the results of the other groups. This comparison will allow us to check our results for accuracy.

## Testing Details

- pH
  - the scale of whether the water is acidic (1-6), neutral (7) or alkaline (8-14)
  - If the water is too acidic, it can slowly dissolve the metal in the pipes and deposit it in the water
- Total Alkalinity
  - the ability of the water to resist changes in pH
  - If the water's alkalinity is too high it can affect the body's natural pH
- Total Hardness
  - hard water is water that is high in mineral content
  - Hard water can cause mineral buildup on the pipes and can cause a bad taste.
- Iron
  - Element Fe, dietary requirement
  - High levels can cause discoloration and bad taste
- Copper
  - Element Cu, very common, especially in pipes
  - Too much copper can cause digestive problems and liver/kidney disease
- Lead
  - Element Pb
  - High levels can cause low IQ in children, premature birth in pregnant women, and generally, cardiovascular and kidney problems
- Nitrate
  - Molecule made of oxygen and nitrogen ( $\text{NO}_3$ )
  - Birth defects and developmental issues can be caused by high levels
- Nitrite
  - Molecule made of oxygen and nitrogen ( $\text{NO}_2$ )
  - Birth defects and developmental issues can be caused by high levels
- Free Chlorine
  - Element Cl
  - Normal levels can kill bacteria, but high levels can increase your risk of cancer