Wastewater and Aquatic Habitats

Age: Middle School

Objective

- **To determine the local negative effects of community wastewater on aquatic habitats**
- **To determine if there more environmentally friendly disposal methods that do not have adverse effects on aquatic habitats**
- **To determine if local populations and governments can achieve positive results regarding the proper disposal of wastewater to minimize damage to aquatic habitats**

The Activity

Materials

- **Internet access**
- **Reading material pertaining to wastewater and the disposal techniques that pollute aquatic habitats or prevent pollution.**
- **Contact information of local government officials (mailing or email addresses)**

Procedure

- **Gain knowledge of what wastewater actually is. Have the students write down their interpretation of what wastewater is, and have some volunteers present their definitions. Once this is done, make sure your students have a full understanding of what wastewater includes. The students should discern that it is not just the water they use to wash their faces or shower with, but in fact, wastewater has many industrial uses and is directly deposited back into the rivers or lakes where it was originally taken from.**
- **Inform students that after treatment, most wastewater is disposed of through the sewage systems. There are, however, some communities that still dump untreated wastewater into lakes and rivers. This untreated wastewater contains many harmful chemicals and bacteria that may cause damage to both flora and fauna in lakes and rivers.**
- **Create discussion with the class regarding what they think some of the negative side effects would be to aquatic habitats from disposal of untreated wastewater. Encourage the students to consider not just the river or lakes, but plants and animals that live in and use the water source and how they are affected.**
- **Here you can play devil's advocate and educate the students that some wastewater treatment methods are harmful as well. There are methods that kill harmful bacteria but add nutrients to the wastewater that can cause eutrophication in the areas in which the wastewater is being disposed. Other disposal methods do the opposite and deoxygenate the wastewater, leading to reduced oxygen level in the disposal site.**

- **Hand out the material you have collected to allow your students to become familiar with the different disposal methods of wastewater, and how local aquatic habitats are affected.**
- **Do the students know how wastewater is disposed of in their own community? You can have the student's research using the school's library and internet. Provide them with the list of government officials who would be able to give them information on your local wastewater-disposal plan.**
- **Have the students arrange an invitation to one of the government officials. Appoint two or three volunteers to draft a letter to the official inviting him/her to speak to your class about the topic of wastewater treatment methods in your community.**
- **The guest speaker invitation could be arranged in advance of this lesson as well as it may take some time to arrange a time for the speaker to be available.**
- **Students should be put into groups and directed to form a list of 8 to 10 questions they would like to have answered. The questions should be based on the knowledge they have gained from research of their local wastewater treatment methods.**
- **Questions from each group can then be voted upon by the class to form a master list that will eventually be asked to your guest speaker.**
- **After the guest speaker's visit, continue the wastewater discussion with your class. Do your students think their community provides safe treatment and disposal of wastewater? Can they come up with any additional ideas on how to better treat and dispose of wastewater in your community?**
- **Have the students return to their groups and write letters to government officials with suggestions for improvements in the treatment and disposal of wastewater based on what they have learned through their research. The students may also choose to compliment these officials on the choices that have been made in regards to the safe treatment and disposal of wastewater in your community.**

Post Activity Discussion

- **Where does urban and agricultural runoff go?**

- **What are activities the region can take to reduce the amount of urban and agricultural runoff?**

- **What will happen to _____(use a local watershed as an example) if there is continued runoff pollution? If things continue without correction, what will happen to surrounding communities?**

- **Discuss why it is important to preserve the biological and economical ecosystems of aquatic habitats.**

- **What are the major impacts of cities or towns near sensitive aquatic ecosystems?**

- **Are other ecosystems such as the rainforest or desert facing the same environmental problems? Is there a common solution to all ecosystems issues or is it strategically different for each?**

- **What active role can you play to preserve sensitive aquatic habitats? (education, scientific research, lobbying, other conservation work etc.)**