SULLIVAN MISSOURI

Collaborative effort with six neighboring schools to participate in the Hexagon Project, which wasinstalled at East Central Junior College

Hexagon Project 2019 Transforming Conflict

Students will make the connection between human actions/inactions and the resulting consequences in relation to chemical (fertilizers, pesticides, herbicides and sewage) run off into the watersheds and eventually to the ocean. This runoff is causing severe stress to an entire marine ecosystem affecting 8000+ miles of water. This issue is also compounded by the warmer temperatures caused by climate change.

Focus will begin with local watersheds and agriculture then build with the path water takes, eventually ending in the Gulf of Mexico.

Example

Objective: Students will create an artwork using collage and paint, on a pre-cut hexagon shape, which conveys the linkage between varying ecosystems.

VA:Cr1B.I Shape an artistic investigation of an aspect of present day life using a contemporary practice of art or design

VA:Pr6A.I Analyze and describe the impact an exhibition or collection has on personal awareness of social, cultural, and political beliefs and understandings.

DOK 3&4

Supplies:
Computer/Chromebooks
Drawing paper/Sketch Book
Colored Pencils
Pre-Cut Book Cover Hexagons
Magazines for collage
Elmer's glue or stick glue
Tempera/Acrylic Paint
Brushes of assorted sizes
Mod Podge

Activity #1:

Using sketchbooks, students will first jot down anecdotal notes about each conflict.

Resources

Conflict 1 -Fertilizers and Pesticides are needed to maintain our farm interests but have negative effects when they enter ecosystems through runoff and/or spillage

1.Students will develop a background regarding our local agricultural landscape. Including the soil composition which includes clay

* Missouri was once under a shallow sea
* Certain soils are more conducive to growing certain crops and soil types vary greatly throughout the state.

2.Just how important is farming to Missouri?
Access websites for statistics

* Take note of who is eating/using each crop (used for animal feed-not people)

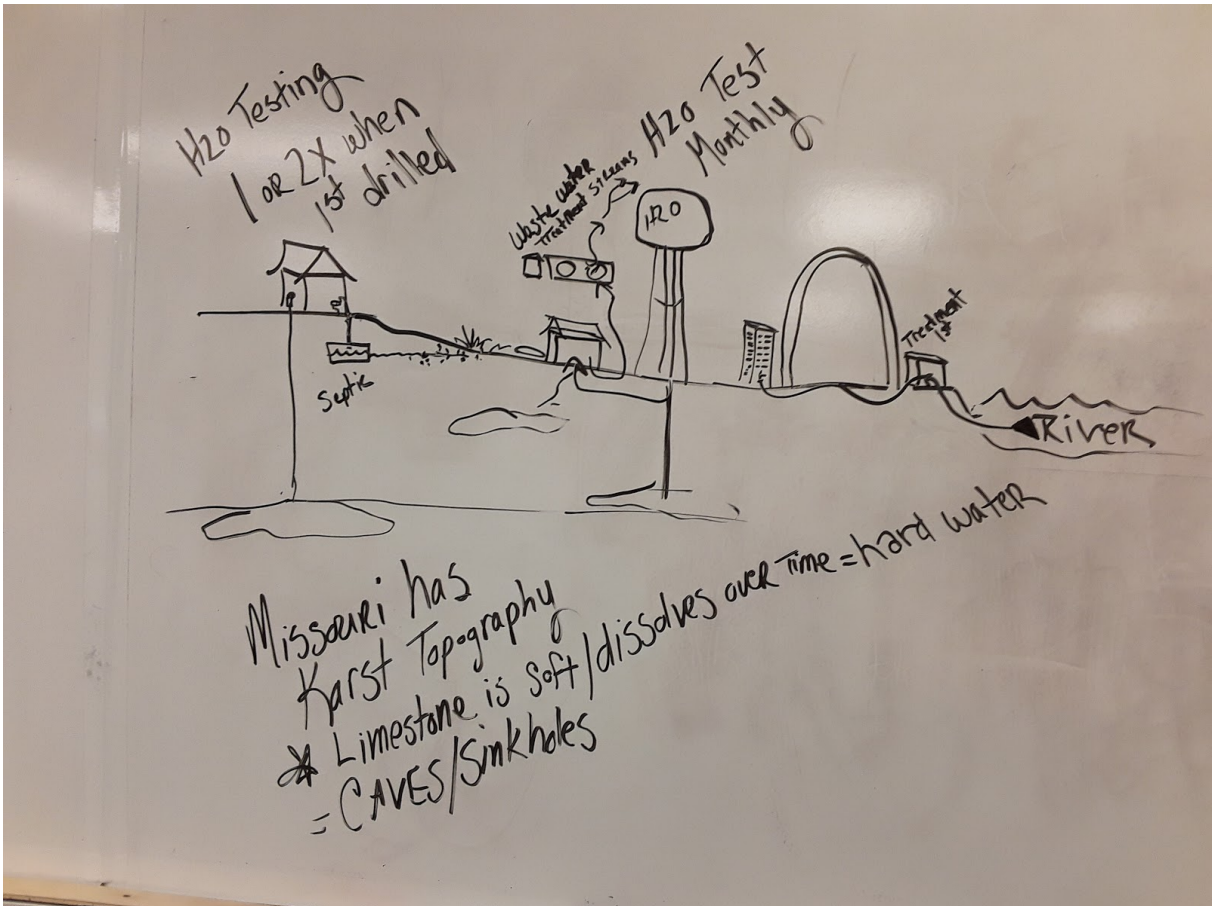
3. So how do we obtain a consistent and plentiful crops? Fertilizers and Pesticides are needed to maintain our farm interests but these can have negative effects when they enter ecosystems through runoff and/or spillage

* A growing population requires more food production, even though the majority of our local crops go to the production of animal feed, we need the animals for food (meats and dairy)
*Missouri needs the economic growth gained by growing our own crops and nurturing livestock in our state versus buying from elsewhere
*Fertilizers and pesticides protect crops and animals from diseases/pests and soil depletion of nutrients

Conflict 2- The water cycle is perpetual- inadvertently serves as a transport for pollutants

4. How are these chemicals/components moved beyond their intended application site?
Wind? *Water =Rain
*Farmers need water to grow crops and water livestock
*We need water to drink (groundwater and waterways provide drinking water to municipalities
*freshwater ecosystems need it to survive
Review the water cycle
Evaporation
Condensation
Sublimation
*Precipitation
Transpiration
*Runoff
*Infiltration
Any alteration of this cycle can have a negative affect on an ecosystem

5. Farming is not the only culprit
Sewage also “reeking” havoc
Utilize resources about 2015 flood of the Meramec River
Explore references about Meramec sewage overflow
Access data on Meramec River water quality and note pollutants
Explain where we get our water from and where sewage goes



Conflict 3- Rivers Will Flow-Do we tame them?

6. In conjunction with the issues of polluted runoff, we have altered the natural course of the Mississippi River, which has an effect on water quality.

*Rivers are used for transport of goods
*Drinking water is obtained from them
*Hydroelectric power created by them
*Levees, dikes and dams help protect towns and cities developed in the flood plains
*BUT...

River flooding is a natural part of the ever changing ebb and flow. When rivers and streams are naturally allowed to flow they deposit detritus (gravel, sand, silt, or other material produced by erosion & organic matter produced by the decomposition of organisms) all along the floodplains. This actually helps filter out the water as it returns to the main river course. Man has altered this natural process by forcing the rivers into channels by using dikes, dams and levees. This also plays a role in what is happening in the Gulf of Mexico.

Research Mississippi Valley levees
View map of all of the levees
Access map of Missouri rivers
137 Creeks and Rivers

- So where does all of our water go?

View map of the Mississippi River

*Into the Gulf of Mexico -the ocean

Conflict 4- What happens when pollutants enter the Mississippi and the Gulf receives the water?

7. Examining the Gulf of Mexico's Dead Zone

*ecosystems are changed by pollutants: Nitrogen and Phosphorus from fertilizers, and sewage

Research recent Dead Zone coverage

Climate change exacerbates the algal blooms - The phytoplankton gorge on the super nutrient rich freshwater which floats across the saltwater as it dumps from the Mississippi. Combined with warmer temperatures, this creates a perfect storm as their dead bodies sink. Through decomposition process their bodies as well and fecal matter from the phytoplankton and other animals, rob the water of dissolved oxygen which kills the bottom dwelling animals. They will either die or move away from it - but we are talking about 8000 plus miles of this problem. Follow the food web up and out to the terrestrial animals- such a birds

Research hypoxia

Create a list of all animals affected by various search queries

8. This alters the marine ecosystem, which in turn affects us again- Decimating it and causing $$$$$$$$$ loss

*back to "farmers" aka fisheries
*Tourism
*Loss of a stable ecosystem/ perpetuating climate change even more.
*Possibly pushing some animal species to the brink of becoming an endangered species
*Research endangered species of the Gulf

9. How do we prevent pollutants in runoff?
Research preventing runoff

*Crop rotation
*Programs to monitor water quality
*More strict regulations?

10. What are we to do? Each stage of this is interconnected-

Activity #2:

1. Teacher will set a quota for how many students per "conflict" based on class size. Then take volunteers and assign the rest. Each student will address 1 issue, which will be represented/painted & collaged on the hexagons.
2. Pre-Design in sketch book using colored pencils design an artwork that focuses on the conflict assigned
3. Each set of hexagons will then be attached using popsicle sticks, hot glue and clear tape to form an enclosed "circle". One hole will be drilled through the top of the topmost one to be hung on a suction cup hook.

Assessment

Observation
Completed hexagon with clear subject representation using collage and painting techniques