

I. Lesson Topic

Introduction to the Upper Clark Fork Superfund complex via Silver Bow Creek; history of society's use and abuse of Silver Bow Creek and its effect on the headwaters of the Columbia River watershed; also an application of fundamental environmental science principles such as water chemistry, geology and hydrology.

II. Montana Standards and Benchmarks*Science*

Standard 4: Benchmark 4

Social Studies

Standard 3: Benchmark 3

III. Objectives

Students will learn:

- The definition of 'watershed'
- Where local surface water goes – the path it follows and where it ends up
- The ability of water to carry sediments, and kinds of sediments

IV. Materials/Equipment/Resources Needed

PowerPoint – "Silver Bow Creek: A History of Use, Abuse and Reuse," computer and projector

Handouts – Silver Bow Creek timeline; Map of Silver Bow Creek watershed and Butte-Silver Bow Creek Area Superfund sites

Natural Resource Damages info on settlement and restoration of Silver Bow Creek

Clear cups or jars and tap water, Bucket of clean (tap) water

Multi-meter (test for pH and SC); nitrate and copper test strips

V. Vocabulary

Placer mining

Tailings

Remediation

Restoration

Surface Water

Groundwater

Dissolved metals

Conductivity

Pollution tolerance

Turbidity

Nutrients

VI. Assessment

Students take a multiple choice test (see attached) before and after the unit.

VII. Procedure

The teacher will present an interactive PowerPoint presentation to the class. The *notes view* of this presentation outlines teacher input and student activities on a slide by slide basis. The handout focuses student note-taking and provides hands-on activities during breaks in the presentation.

VIII. Resources

References and additional resources are listed in the *notes view* of the PowerPoint presentation.

IX. Science Process Skills

Knowledge: Reading, observing, listening

Comprehension: Generalizing, summarizing, drawing conclusions, identifying cause and effect

Application: Experimenting, predicting

Analysis: Identifying relationships and patterns, discussing

Synthesis: Writing

X. Montana Standards and Benchmarks:

Science

Standard 4: Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

Benchmark: 4. Describe the water cycle, the composition and structure of the atmosphere and the impact of oceans on large scale weather patterns.

Social Studies

Standard 3: Students apply geographic knowledge and skills (location, place, human/environment interactions, movement and regions).

Benchmark: 3. Assess the major impacts of human modifications on the environment (e.g. global warming, deforestation, erosion, pollution).