UTAH OFFICE OF
ENERGY DEVELOPMENT

Mitigating an Empty Lot

Grade/Subject: 5th Grade

Strand/Standard 5.3.4 Evaluate **design solutions** whose primary function is to conserve Earth's environments and resources. *Define the problem, identify criteria and constraints, analyze available data on proposed solutions, and determine an optimal solution.* Emphasize how humans can balance everyday needs (agriculture, industry, and energy) while conserving Earth's environments and resources. (ESS3.A, ESS3.C, ETS1.A, ETS1.B, ETS1.C)

Lesson Performance Expectations: z

- Students will evaluate design solutions for the mitigation and improvement of a nearby field.

Materials:

- computer and projector to display empty lot
- colored pencils will be required.

Time: 60 minutes

Teacher Background Information:

1. Massive cleanups such as the work being done at the Kennecott Bingham Mine require considerable background knowledge. The location of this “clean up” is more familiar to students and the conservation concepts are simpler to understand.

Student Background Knowledge:

1. The resource being mitigated is the soil and habitat for birds, insects, small mammals etc. Students should have some background knowledge in soil erosion and environmental health.
2. The appearance of the site may also be considered a resource to a city’s image and health consciousness.

Teacher Directions: A standards-based lesson engages students’ curiosity, interest and motivation to learn more. Time and space for the students to experience the phenomenon and ask questions is essential. The student sheet provided below provides guidance but is only one example of how students might respond.

1. As a design standard, a phenomenon is not required. However, a great way to start the lesson would be to project the images of the empty lot and ask students if they know of other empty lots and why the lots need to be better conserved. Guide the conversation to preserving soil and encouraging living things.
2. You might ask the students to create their own design on another paper or create a small group design on a large piece of paper. When the students see the designs presented in the lesson, they can see how their ideas match- up.

3. Introduce the lesson using the student sheet (below).
4. To summarize the lesson, collect the scores from each student or student group (do some averages?) to see which method is most popular in your class. There is no right answer.
5. The last question on the Kennecott mine may require you to open the websites listed and help students grasp the enormity of the clean up needed.

Assessment of Student Learning.

1. What are characteristics of good design solutions to conserve an empty lot? Choose all that apply:

    A. The lot should be square.
    B. The lot should be improved for living things*
    C. The lot should have access to sidewalks and roads.
    D. The lot should have reduced soil erosion.*
    E. The lot should provide people with a resource.*

2. In Utah, which resource must usually be provided to improve the environment for living things?

    A. People
    B. Sunlight
    C. Trees
    D. Water*

3. To “conserve” something means to manage it in good condition for the future. How is the mitigation of the neglect of the empty lot a form of conservation?

Extension of lesson and Career Connections: Find a lot near your school and design a mitigation plan for it. Share the plans with the landowner or city official that manages it. Research careers in landscaping, urban design or environmental planning.

Title: Mitigating an Empty Lot
Name_____

Introduction: Empty lots are found in cities and suburban areas. The landowner may be saving it for a future building project or holding it for a variety of other reasons. The ⅓ acre lot (about the size of a large residential lot) pictured below is in West Jordan, UT and is an example of what empty lots look like. Imagine that your school got permission to manage and "mitigate" (repair the damage or neglect) at the lot. In this activity you will evaluate design solutions that each 5th grade class developed and decide which solution meets the criteria and constraints. Appropriate amounts and types of work can be done on the lot by 5th graders.

Top view/Side view

https://www.redfin.com/UT/West-Jordan/2200-W-7800-S-84088/unit-2/home/174958579

Criteria: The mitigation should include features that improve the environment for living things (plants and animals) and should preserve the soil. Other uses for the area can be added in the design.

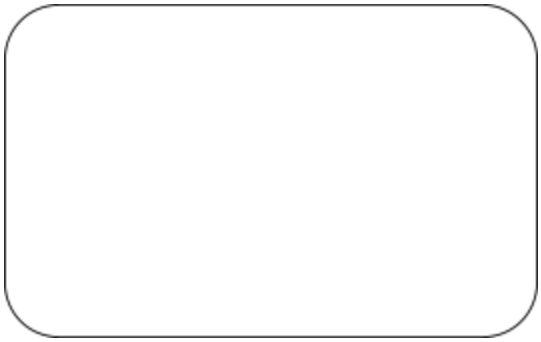
Constraints: The school PTA and city of West Jordan have provided $5,000 for the project. The landowner wants the lot to look better and be more useful.

Three 5th grade classes worked to present designs for the lot. The designs are explained below the table. Your task is to analyze the designs and summarize them in the table. Read all the solutions before you fill out the table. For each category, give each class a number between 1-3. Give the best design a 3, a 2 for the next best and a 1 for the design least able to fit this category.

Mitigation	Ms. Gentry's class	Ms. Monson's class	Mr. Gove's class
Improves the environment for living things.			
Uses land for a purpose (food, recreation etc)			
Improves the appearance of the lot			
Protects the soil and uses water responsibly.			
Cost (Give a 3 to the lowest cost, a 1 to the highest.			

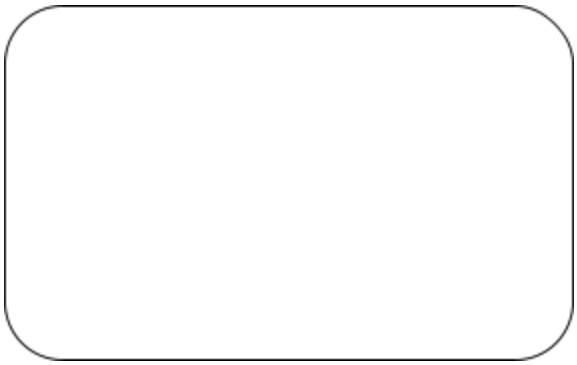
Ms. Gentry's class design solution:

The students wish to rake the weeds and prepare the soil for a lawn and exercise area. The sprinklers needed to water the lawn will cost $4,000 and the students will spend the $5000 on outdoor exercise equipment on a dirt running track. They will add wooden bark around the base of the exercise equipment and under the trees on the edge of the lot.
Draw what you think this might look like:

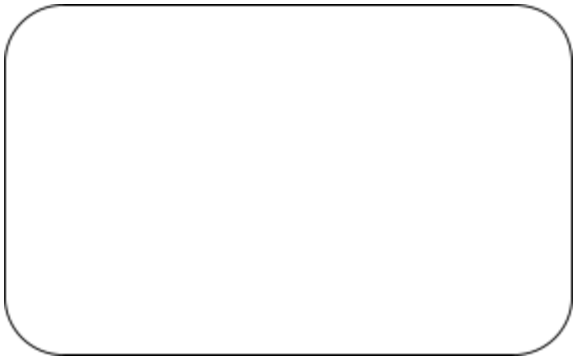


Ms. Monson's class design solution:

The students wish to scatter wild seeds on the property and plant drought tolerant shrubs and trees in clumps around the property. Near each planting the students will add a bench to sit on and signs to explain what types of plants are planted there. They will place bird feeders and bird houses in the trees on the edge of the property. The shrubs, trees, benches, and feeders will cost $2,000. A small pond will be created with water from a pipe that comes from the main line which will cost $3000. The pond will be lined with plastic that costs $300. Draw what you think this might look like:



Mr. Gove's class design solution:
The students wish to create a neighborhood garden on the lot. They measure 3 meter x 3 meters plots in the soil and fence them with stakes and string. There are pathways between the plots. They add an irrigation system with a pump and hoses in four places. The cost of the irrigation is $4,000. The students advertise to the community for people to claim a plot and take care of the vegetables they grow. The students will help the gardeners by pulling weeds.



Summary:

1. Which mitigation method received your highest score?
   Lowest?

2. Which method would you most like to see in the lot if your class was going to participate? Why?

3. Mitigating a small lot can help us understand how hard it might be to conserve a big site like a mine. What are other factors that would need to be studied to clean up the Kennecott mine?

Use this website to answer this question:
https://www.ksl.com/article/1280814
https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0800601#Done