



**Missoula Urban Demonstration Project**  
**YOUTH EDUCATION PROGRAM in Sustainability**  
629 Phillips Street, Missoula, MT 59802  
Office: 406.721.7513 Tool Library: 406.549.6790  
[info@mudproject.org](mailto:info@mudproject.org) [www.mudproject.org](http://www.mudproject.org)

## **Backyard Ecology**

### **Living sustainably in your own backyard!**

#### **Objectives:**

1. Students understand the concept of sustainability.
2. Students learn and feel empowered to take actions to live in a more sustainable manner. Students understand that problems can be solved by taking small steps toward a larger goal.
3. Students learn the functional aspects of various sustainable living tools (regulations about chickens, what can be composted, etc.)

#### **OPI Content Standards Addressed in this Module**

##### **End of Grade 4**

- Social Studies 3.3: Describe and illustrate ways in which people interact with their physical environment (e.g., land use, location of communities, methods of construction, design of shelters)
- Social Studies 5.4: Describe how personal economic decisions, (e.g., deciding what to buy, what to recycle, how much to contribute to people in need (affect the lives of people in Montana, United States and the World.
- Mathematics 1.5: Length, Time, and Temperature: Select and apply appropriate standard units and tools to measure length, time and temperature within relevant scientific and cultural situations, including those of Montana American Indians.
- Mathematics 3.4: Linear Measurement: Estimate and measure linear attributes of objects in metric units such as centimeters and meters and customary units such as inch, foot, and yard.

##### **End of Grade 8**

- Social Studies 3.3: Analyze diverse land use and explain the historical and contemporary effects of this use on the environment, with an emphasis on Montana.
- Social Studies 3.7: Describe major changes in a local area that have been caused by human beings (e.g. a new highway, a fire, construction of a new dam, logging, mining) and analyze the probably effects on the community and environment.
- Mathematics 1.5: Metric and Standard Measurement: Use metric and standard units of measurement in relevant scientific and cultural situations, including those of Montana American Indians, compare and convert within systems, and use appropriate technology.

##### **End of Grade 12**

- Differentiate and analyze the relationships among various regional and global patterns of geographic phenomena, (e.g., land forms, soils, climate, vegetation, natural resources, population)

## Introduction

Welcome students to MUD and have them sit on the semicircle benches. Introduce yourself and ask them to go around the circle saying their name, grade (if they are in different grades), and one thing about themselves (their favorite plant, vegetable, etc.) Tell them that each letter in MUD stands for something and ask if anyone knows what the “M” stands for. Even little kids can guess “Missoula” if prompted! Next ask if they know what the “U” and the “D” stand for. Check to be sure that they know what the word “urban” means before proceeding! This gets confused at all ages. Explain that MUD exists to show people how to live sustainably inside of a city. Have students think of different ways that you can live sustainably (you may need to explain what sustainably means and why it is something we want!)

## Activity 1: Quote Discussion (Grades 4-12)

### Materials:

Backyard Ecology Quotes

### Preparation:

Select a quote ahead of time that applies to the other activities to be done that day. Think of questions ahead of time to ask students about the quote! Several preselected quotes are located in the trunk, but others could be used as well!

Have one student read the quote aloud, then ask questions to encourage discussion of the quote. This is a great way to get older students to start participating in group activities.

## Activity 2: Problem/Solution Tag (grades 4-8)

### Materials:

- Problem and Solution Cards

Give each student either a Problem or a Solution card. Have them put them on and explain that each Solution wants to catch a Problem in order to solve it. Each Solution will have a list of the Problems that it is allowed to tag and each Problem will have a list of Solutions that it should be running from.

The game is played like tag, where each Solution needs to tag one of the Problems After Solutions have all tagged a Problem have several of them say how their Solution actually helps to solve the problem in question.

## Activity 3: Garden Tour (all ages)

This activity will vary greatly depending on the season. Ask MUD staff about current garden activity that should be highlighted. Make sure that students stay on the paths in the garden and they only pick the fruits and veggies that you instruct them to pick. Some things won't be ripe yet and we need to let them grow!

## Activity 4: Pin the Sustainability on MUD (Grades K-5)

### Materials:

- Sustainable Feature Pictures
- Poster Tack
- Blindfold
- Packing Tape
- MUD Backdrop

Ask students about things they see at MUD that help us be sustainable (you may need to prompt some of these). Have different students get blindfolded and put each item on the backdrop in the correct place. Other students help by calling out directions or telling them if they are hot or cold. It helps to have the other students sitting for this activity! Make sure everyone gets a turn that wants one, even if it means doing some items twice. It works well to do this on the wall of the Tool Library if you take the bulletin board down and put the backdrop up in its place. Have packing tape on hand in case the poster tack isn't sticking to the wall.

## Activity 5: The Earth as an Apple (all ages)

### Materials:

- The Earth as an Apple Instruction Page
- Apple
- Knife
- Plate or Cutting Board

Follow the instructions on the Earth as an Apple instruction page. If students are old enough they can take turns reading paragraphs aloud as you cut the apple.

After finishing the activity discuss the implications. Is there much soil left for farming after all the un-farmable areas are removed? Is this amount of soil growing or shrinking? Is there a way to make more soil? (yes, COMPOST!) Talk about compost bins and what you can put in them. Explain that worm composting can work for people even if they don't have a yard or space for a compost pile.

\*\* 5-8<sup>th</sup> graders (and possibly younger grades as well) should discuss areas around Missoula where potential farm land has been covered up by construction, etc. What are the impacts that this has on their community and the environment?

Slice the apple up and give everyone some to eat. Next, slice up the core and give to students to put in the compost pile

## Activity 6: Chickens

### 6a. Chicken Stories (Grades K-5)

Gather students in a seated group and read The Chicken Chasing Queen of Lamar County. After reading the story you can talk about the similarities and differences between the chickens in the book and the chickens at MUD. Do they make the same noises? What are boy chickens called? (Roosters) What are girl chickens called? (Hens) Do we have hens or roosters at MUD? (Hens) Why don't we have roosters? (Because they are TOO NOISY! It is against the law to have roosters inside of the city because of this.) Can the hens at MUD have chicks? Why not? (You need roosters to have chicks) Was there a rooster in the story? (yes) Can the hens at MUD lay eggs? (yes) How many chickens can you have in Missoula? (6) How many chickens were there in the story? (??? Go through and count some of them). Was it okay to chase the chickens? What allowed the girl to get close to the chickens? (feeding them and being very still and quiet).

### 6b. Chicken Feeding (all ages)

Before going over to the chicken coop, talk with students about how they behave around chickens. Give specific instructions of how to act and where they should stand. When next to the coop, have one student at a time come to see any eggs that are in the nest. Give each student a small amount of scratch and show them how to toss it gently onto the ground where chickens can eat it. Explain that they eat off of the ground the way we eat off of a plate. If you did not read and discuss the story about chickens, go over the important parts of keeping chickens in Missoula:

- Female chickens are called "hens" and males are called "roosters"
- You can only have hens within the Missoula city limits (roosters are TOO NOISY)
- You can have up to 6 chickens in Missoula (too many chickens might get noisy and stinky!)
- Hens will lay eggs even if there is no rooster. However, you can't have chicks without a rooster.
- Chickens will eat almost anything, even meat! They don't like orange peels but will eat all sorts of fruit and vegetable scraps. They also eat seeds, or scratch out of the dirt.

## Activity 7: Native Plant Garden

Before starting Native Plant Garden Activities, sit and talk with the students about what native plants are and why they are good to plant in your yard. (They are plants that grow in this area naturally. They don't need water like plants from other place because they are used to only being watered by the rain, just like plants up on Mt. Sentinel and Waterworks Hill. Native animals like birds are used to finding food in native plants and can make their homes in them.)

### 7a. Plant Observation (Grades 4-6)

#### Materials:

- Popsicle Sticks (labeled)
- Native Plant ID books
- Drawing Paper
- Pencils
- Cardboard Squares

Instruct each student to locate a plant with a popsicle stick in front of it. Tell them to draw the plant and/or write a description of it. When they are done with this observation give them an ID book and see if they can figure out which plant it is.

Give them a chance to identify other plants in the garden and/or present their drawings and explain their plant to the rest of the group.

### **7b. Plant ID Game (Grades K-8)**

Show students three different plants in the native plant garden. Call out different plant names and see who can find the native plant the fastest. You can play this game like Simon Says if you want (i.e. Simon says point to a Yarrow! Point to a Choke Cherry!) It works well to play this game twice if you have the group for two days. That way you can see what they retained and add more plants to the list.

### **7c. Invasive Species Scavenger Hunt (Grades K-8)**

## **Activity 8: Red Light/Green Light**

This game can be adapted to a variety of subjects. It is also included in the Talking Trash Module, so you may not want to do this for students participating in both modules.

Before starting the game ask students what plants need to grow. (light, water, soil, nutrients). Tell them that you will be playing Red Light/Green Light, but that they will run when you say something that helps plants grow, and stop when you say the opposite. Have them think of the opposite of light, water, soil and nutrients. Make it clear before beginning that students who run when they aren't supposed to go ALL the way back to the starting line.

## Activity 9: Rain Barrels (Grades 4-12)

### Materials:

- Precipitation/Equation Sheets
- Measuring Tapes
- Calculators
- Dry Erase/Wet Erase Markers

Divide the group into teams of no more than 5 people each. Explain that you can measure how much water goes into the rain barrels each month if you know how many inches of rain you receive and the size of your roof. Give each team a sheet with precipitation rates and the measurement equations. Walk them through the steps needed to figure out the number of gallons collected on average for your current month. Explain that this is an estimate because you are measuring the area of the building, not the actual roof. This will be close enough to get a good idea of how much rain water is collected. **\*\*Make sure you only measure the portion of the building that feeds into the Rain Barrel!** On the tool library you measure HALF of the building, starting at the peak of the roof and going out to the far post where the gutter is. The tool library works well for this activity because it is small enough to measure entirely. Compare answers and see if they are surprised at how much water is collected.

## Activity 10: Reflections

### 10a. Sidewalk Chalk Drawing (Grades K-6)

#### Materials:

- Sidewalk Chalk

Have students draw something they learned or a message for people passing by on the sidewalk. This works well if the group will be visiting for two different days and will be doing the “My Sustainable Backyard” activity on the second visit.

### 10b. My Sustainable Backyard (all ages)

#### Materials:

- Crayons
- Drawing Paper
- Pencils
- Cardboard Squares

Have each student draw their backyard and add in the sustainable features they learned about at MUD. Make sure they understand that even if they live in an apartment or don't have a backyard they can draw their kitchen and/or living room and add in some sustainable features like a recycling bin, worm composting box, and planters. If time allows, have them share their drawings with the group.

Some features they may add include:

- Native Plant Garden
- Vegetable Garden
- Compost Pile
- Chicken Coop
- Rain Barrel
- Recycling Bins