

# Grid Frame Mapping



## Objectives:

The student will be able to:

- map and describe a small area of the schoolyard.
- to ask further questions about habitats.

## Author:

Ecology Explorers Education Team based on "Mapmaking with Children" by David Sobel

## Time:

45-50 minutes

## Grade Level:

4-8

## Standards

### AZ Science

S1-C2-GR5-8-PO1  
S1-C2-GR6-PO3  
S1-C2-GR6-8-PO4, PO5  
S1-C2-GRHS-PO1, PO3,  
PO 5  
S4-C4-GRHS-PO9

### AZ Social Studies

C1-GR5-PO6  
SS4-C1-GR6-8-PO1  
SS4-C1-GRHS-PO1

**NGSS Core:** Biodiversity and Humans

**NGSS Practices:** Planning and Carrying Out Investigations

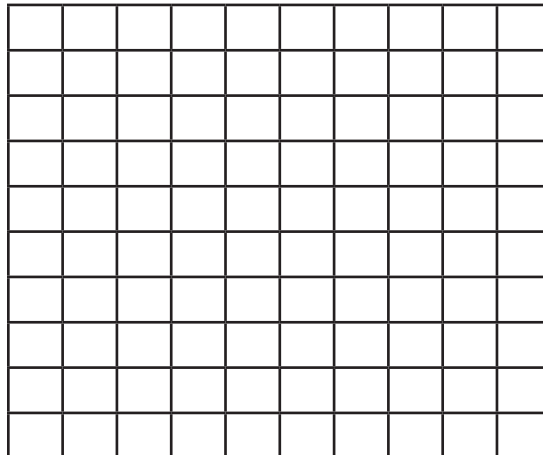
**Common Core Mathematics:** Represent and Interpret Data

## Background:

Ecologists and archeologists use a grid frame when mapping a small area of study. This allows them to look at more details that sometimes get lost when studying a large area. Grid frames can vary in size and construction depending on the study one is doing. The grid frames used with this lesson are one square meter divided into one-decimeter squared sections. This provides a small enough area to study and with a hundred squares makes calculations easy. The grids are made of PVC pipe and holes were drilled every ten centimeters. The string was then weaved through the holes to create the webbing. It's quick and easy to make and can be a valuable learning tool.

## Advanced Preparation:

Grid frames can vary in size and construction depending on the study one is doing. The grid frames used with this lesson are one square meter divided into one-decimeter squared sections. This provides a small enough area to study and with a hundred squares makes calculations easy. The grids are made of PVC pipe and holes were drilled every ten centimeters. The string was then weaved through the holes to create the webbing. It's quick and easy to make and can be a valuable learning tool.



- One meter PVC tubes
- PVC joiners at each corner
- Holes drilled every 10 cm

## Materials:

- One grid frame for every four students
- Grid handout
- Color pencils for each group

## Recommended Procedure:

### Engagement

- 1) Talk with your students about maps and why people draw maps of different places. Do they draw maps of large or small places? Explain that in this activity they will be making a detailed map of a small area to study. Their goal is to be as detailed as possible as they record what they see.

### Exploration

- 2) Choose areas that you or your students are interested in comparing or studying. Some examples include: a trampled vs. untrampled area, middle of the habitat vs. the edge, near water vs. away from water, etc.

Examples of things they might locate (you can come up with the list or have students generate it depending on what you are studying):

stones, dirt patches, twigs, anthills, pieces of paper, other trash, grass plants, weed plants

Students can come up with their own method for recording what they see. Some teachers find it easier if a key is decided upon before the activity.

- 3) Give students plenty of time to map. The handout is 1/4 of a single grid frame, so a group of 4 students would each complete 1/4 of the gridframe. The group will then need to determine a key if not already determined by the teacher. For example: green for grass, brown for dirt, black for twigs, etc...

### Explanation

- 4) Once students have finished their maps they can answer some of the questions below. Each group can report their findings and compare them with other groups. Students will start to see patterns and hopefully begin to ask further questions for possible investigations.

Questions from the data:

- What was the average number of plants in each square?
- In which area were plants further apart?
- Which area had more dirt patches, stones, or other objects?
- Which plants are able to grow where there's lots of foot traffic?
- What are some of the ways in which foot traffic changes an area of lawn?

- What percent of the area is covered by plants? by rocks? by dirt? etc...

- If we could protect a worn area from people walking on for a long period, how do you think it would change?

### Elaboration

- 5) To conclude have students write about the observations they made and any further questions they might have about habitats.

### Math Concepts

- Use different color string for the **vertical** and **horizontal** lines. Have students describe where objects are in the grid using their new vocabulary. "The stone is at where the third vertical line crosses the second horizontal line."
- There are one hundred squares, so various games and recording of data can be done to learn **percentages**, **area**, and **fractions**. How many of the squares are covered in green grass? 10 of the one hundred so 10% or 1/10. As students catch on, use fewer strings so that there are only twenty- five total squares.

### Evaluation:

- Student completes a detailed map of a small area of the schoolyard.
- Student records observations and questions about habitat based upon their map.

### Extensions:

More ideas about mapping small areas using the grid-frame such as an anthill or a puddle can be found in David Sobel's book "Mapmaking with Children".

### Standards

#### AZ Science

S1-C2-GR5-8-PO1  
S1-C2-GR6-PO3  
S1-C2-GR6-8-PO4, PO5  
S1-C2-GRHS-PO1, PO3, PO 5  
S4-C4-GRHS-PO9

#### AZ Social Studies

C1-GR5-PO6  
SS4-C1-GR6-8-PO1  
SS4-C1-GRHS-PO1

**NGSS Core:** Biodiversity and Humans

**NGSS Practices:** Planning and Carrying Out Investigations

**Common Core Mathematics:** Represent and Interpret Data

# Student Worksheet

## Gridframe Mapping



Name:

Section of Gridframe: (circle one) top left top right bottom left bottom right

Key: draw the symbols and/or color for each item found in your grid.

### 25-square grid (1/4 of total grid frame)


Other observations: