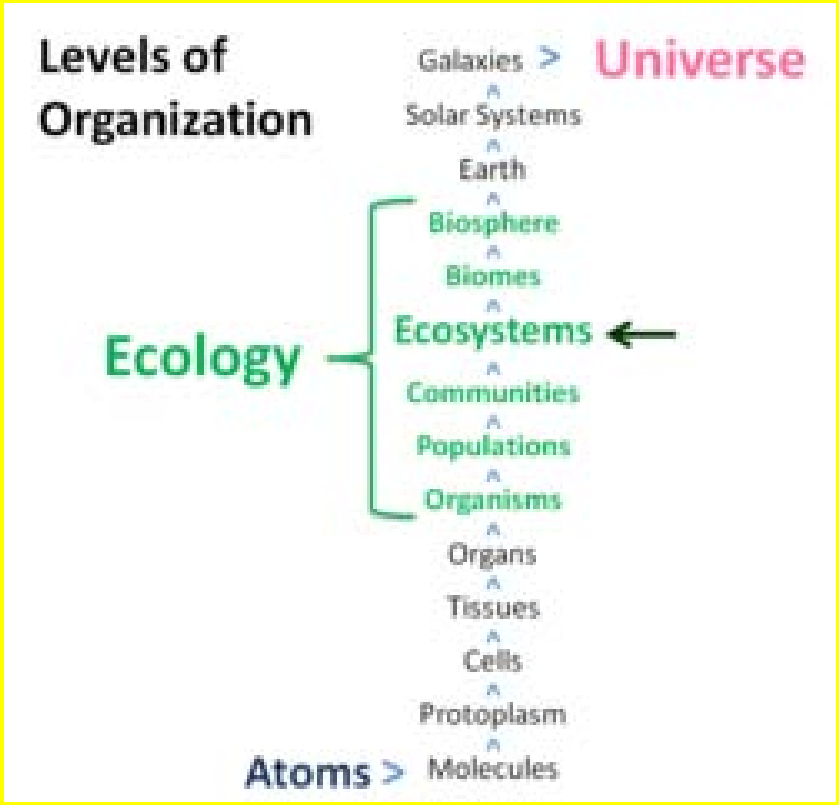
Ecosystem Monitoring Project

Beth McArdle


Levels of Organization
Galaxies > Universe
Solar Systems
Earth
Biosphere
Biomes
Ecosystems
Communities
Populations
Organisms
Ecology
Organs
Tissues
Cells
Protoplasm
Atoms > Molecules

Objectives

Give examples of ways in which organisms interact and have different functions within an ecosystem that enable the ecosystem to survive.

Explain the roles and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.

Explain how dead plants and animals are broken down by other living organisms and how this process contributes to the system as a whole.

Hidden Objective…..


What causes the haze?
How do plants produce oxygen?
Why do leaves change color in the fall?
Why are the plants different over there?
Why do some animals live in trees and not others?
Will this land always look like this?
Why do we have seasons?
Why are trees different in different areas of the world?
Is the temperature of the air different closer to the ground?
What did this land used to look like?
What other animals use this habitat?
Where do the birds go during the winter?
What happens to these dead leaves? Where do they go?
Does the weather effect how the plants grow?
Do I impact this land?

Other Hidden Objective…..

Purpose

Working by yourself, or with one other person, you will choose a plot of land to observe.

The plot should be between 1 – 3 square meters.

The location can be in your yard, on your walk home from school, near the school, or in your neighborhood. You will need to make frequent trips to the exact location, so it is necessary that this plot of land is easily accessible to you on a daily basis.

Choosing a location

Some guidelines:

Look for an area of land that has at least one plant and one animal in it on your first observation.

The more plants and animals, the more interesting your project will get.

Good examples are: the edge of a forest or stream, rock wall, garden. DO NOT pick an area on a black top, cement ground, or grassy lawn.

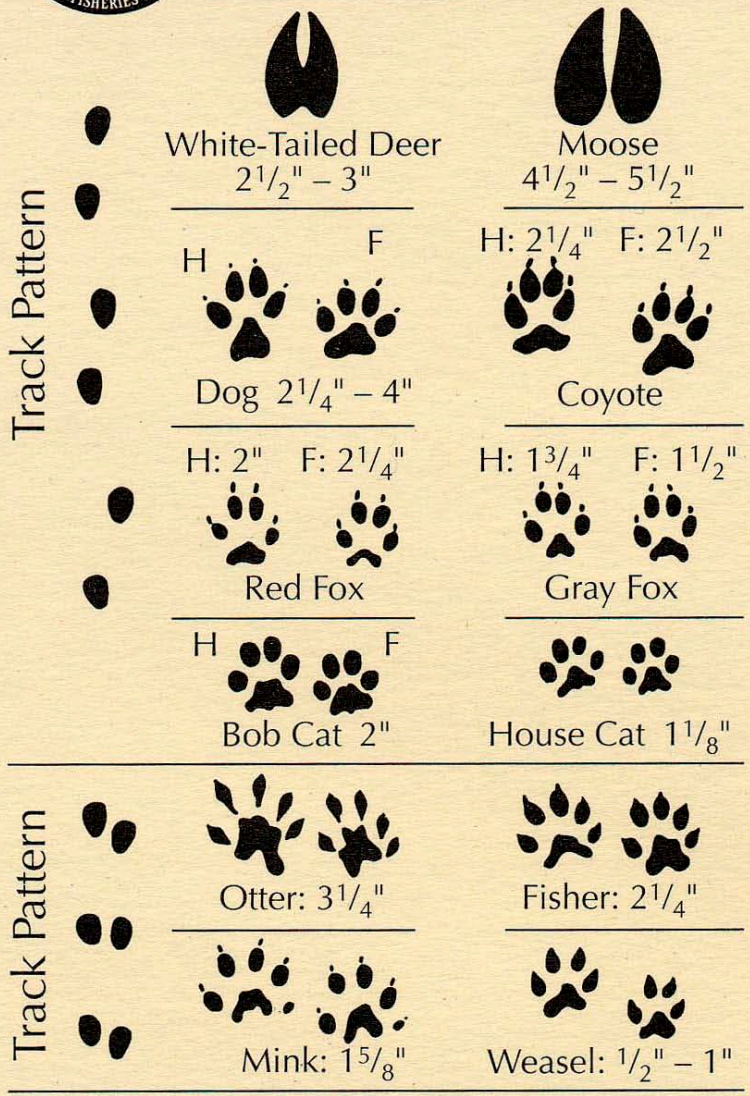
Class Example

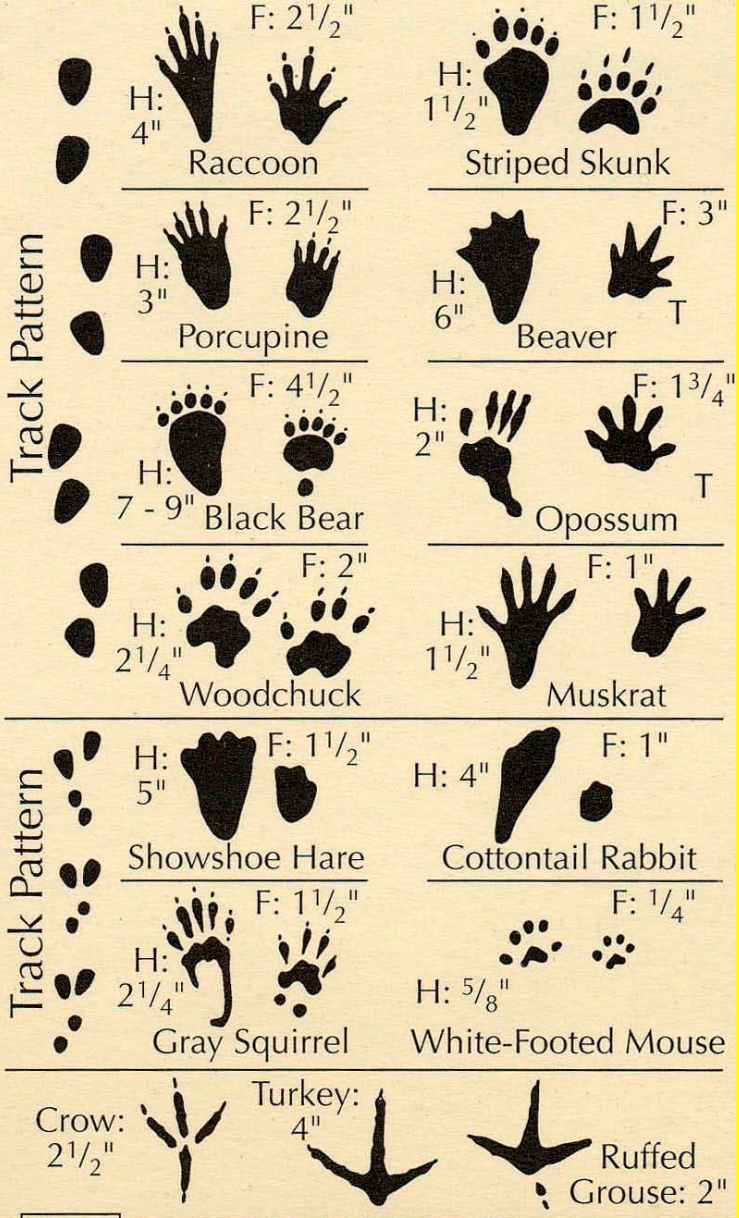
Date & Time	Weather Conditions	Biotic	Abiotic	Interactions observed	Changes observed	Questions
	Cloudy? Sunny? Rain (in.)? % of sunlight hitting area? Windy?	All living things in the area.	All nonliving things in the area. Including air temperature, soil, wind, water, sunlight, rocks, etc.	Any interactions that are observed within the area. Ex. Plant using sunlight, ant walking on a sticks, bugs following each other	Changes that are observed from that last time you observed.	At least one question that you have.

Go outside, find a spot using the guidelines, and **model** this as a class.

MassWildlife

Pocket Guide to MA Animal Tracks





Tracks Not To Scale

Tracks will show considerable variation depending upon conditions of ground (snow, mud, dust, sand, etc.) and movement of animal.

F: Front Track
H: Hind Track
T: Tail marks may be present

Protect wildlife and its habitat: Support the Wildlands Fund.

Division of Fisheries & Wildlife Field HQ
1 Rabbit Hill Rd.,Westboro, MA 01581
508.792.7270 • www.state.ma.us/dfwele/dfw

Animal Sounds

http://www.animalpicturesarchive.com/animal/SOUND/

Requirements:

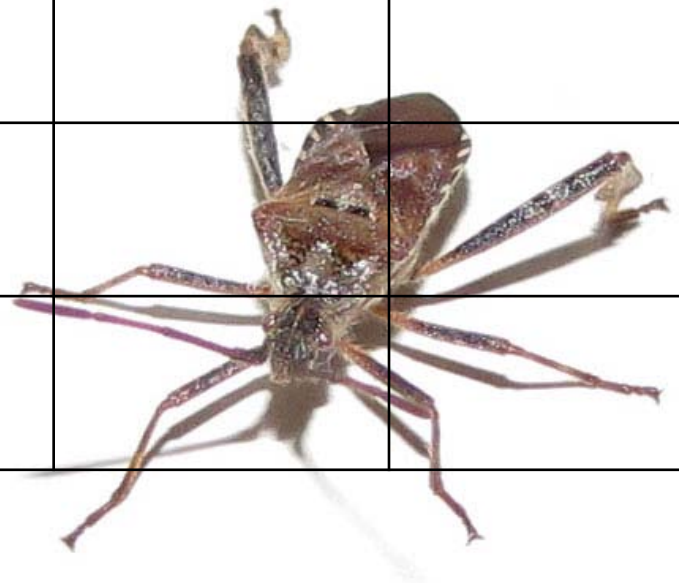
You must make at least 10 observations on your monitoring log.

With this data, you will put together a final project to present your findings.

Also required….1 Mini Experiment of your choice.

Daily Monitoring Log

Date	Weather Conditions	Biotic	Abiotic	Interactions observed	Changes observed	Questions



Mini Experiment Options

1 Ethogram

2 Bottle Biology

3 Water Quality Testing with Kits

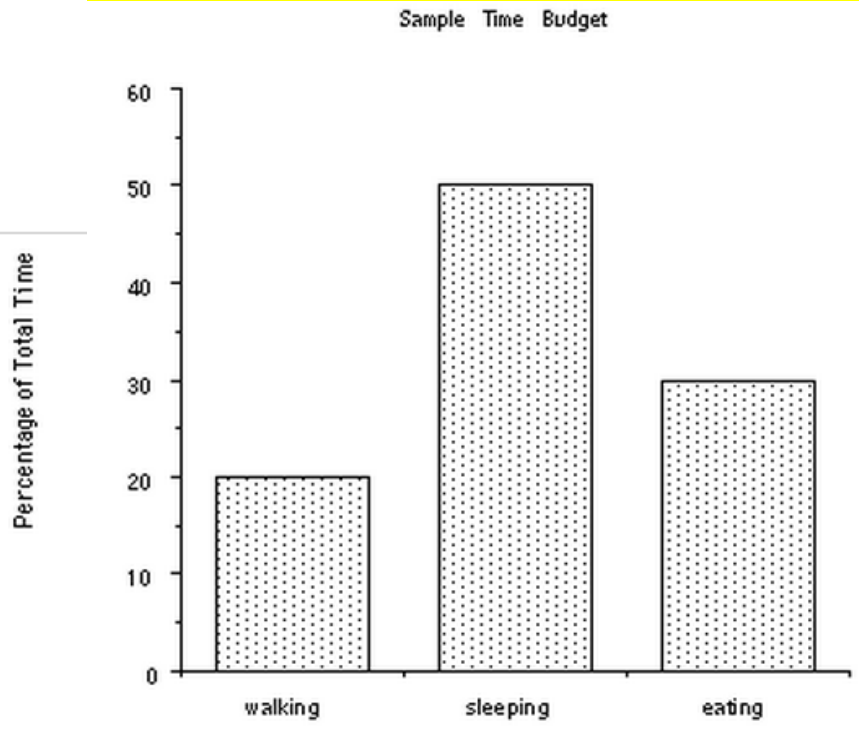
4 Water Quality Testing using Macroinvertebrates

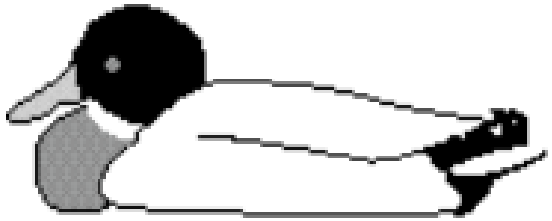
5 Your choice (approved by teacher)

Ethograms

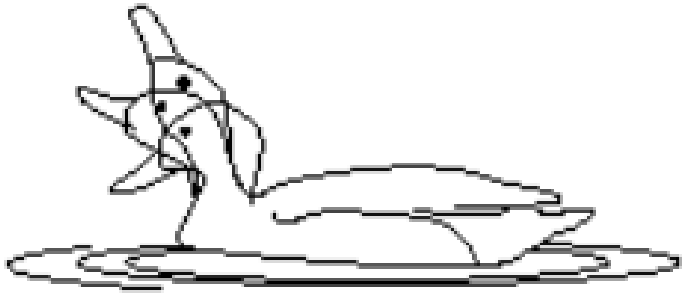
- Describes animal behavior.

Time	Walking	Sleeping	Eating
14:02	x		
14:04	x		
14:06		x	
14:08		x	
14:10		x	
14:12		x	
14:14			x
14:16			x
14:18	x		
14:20	x		

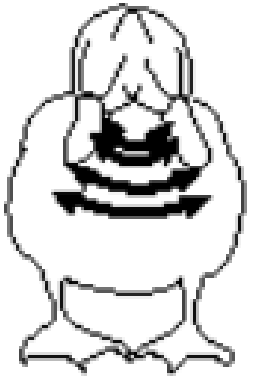




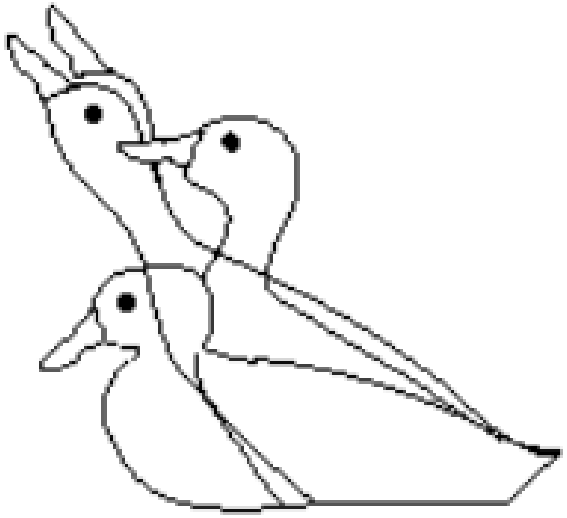
Head - round



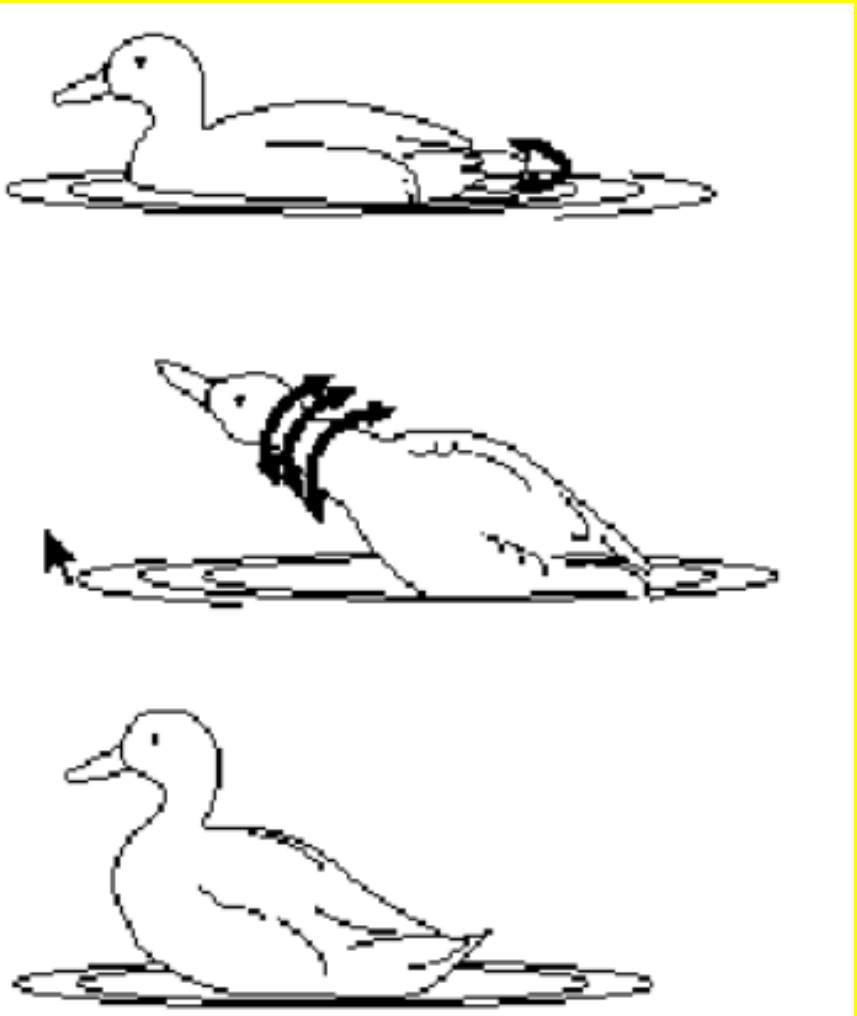
Head-flick



Head shake

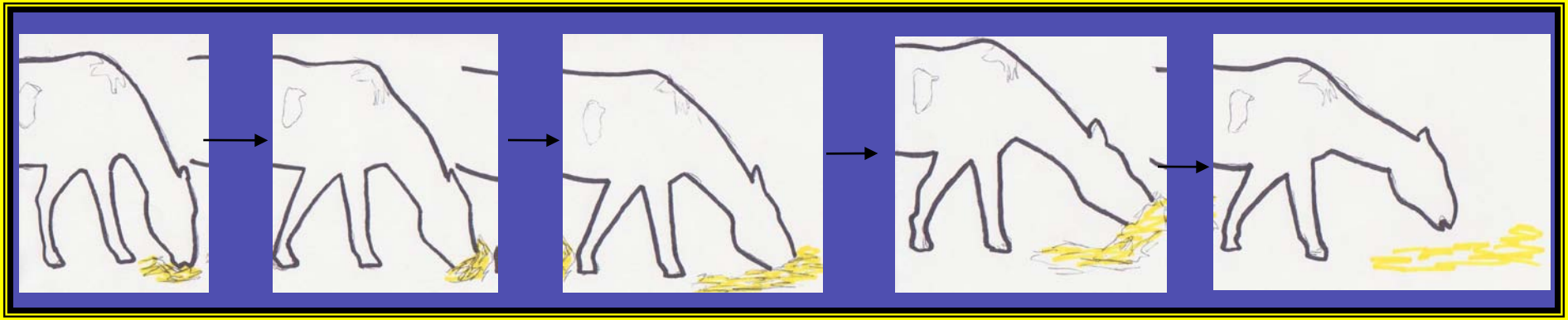


Schema of the movement in Introductory body-shaking



Swimming-shake

Moving hay with nose:
-putting nose into hay on the ground
-nudging the hay forward while picking up head
-moving the hay in a forward direction



Class Examples

Watch animals on Animal Cams and do a “Class Ethogram”

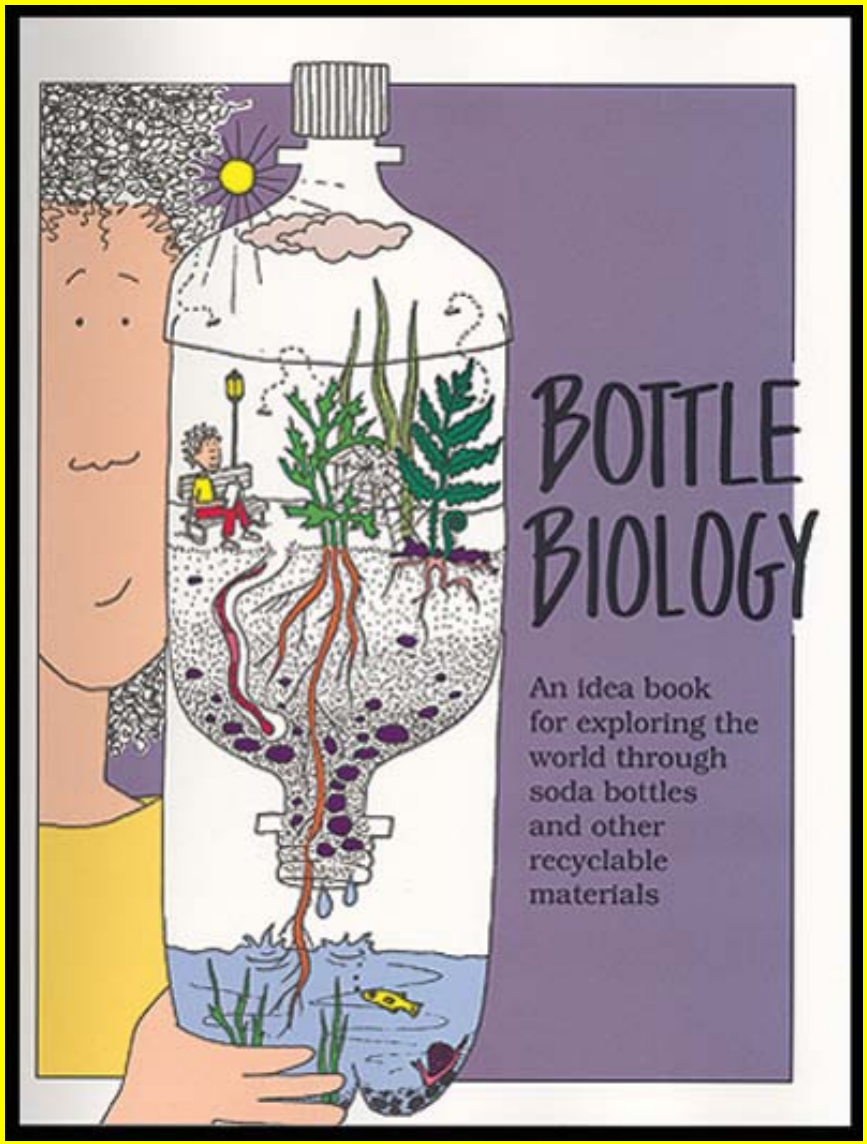
National Zoo Animal Cam

http://nationalzoo.si.edu/Animals/WebCams/default.cfm

Bald Eagle Cam

http://www.wvec.com/marketplace/microsite-content/eagle-cam.html

Bottle Biology



Final Project

At the conclusion of your observations, you will be putting together a presentation to share with the class.

Criteria

- Present all Biotic and Abiotic factors of your ecosystem.
- Give at least 4 examples of interactions that you observed between organisms in your ecosystem.
- Explain at least 4 changes that you saw over the time of your observations.
- Present at least one question that you would be interested in answering.
- Summarize Mini Experiment and report conclusions

Sample Ideas

Video- Make a video to show the class

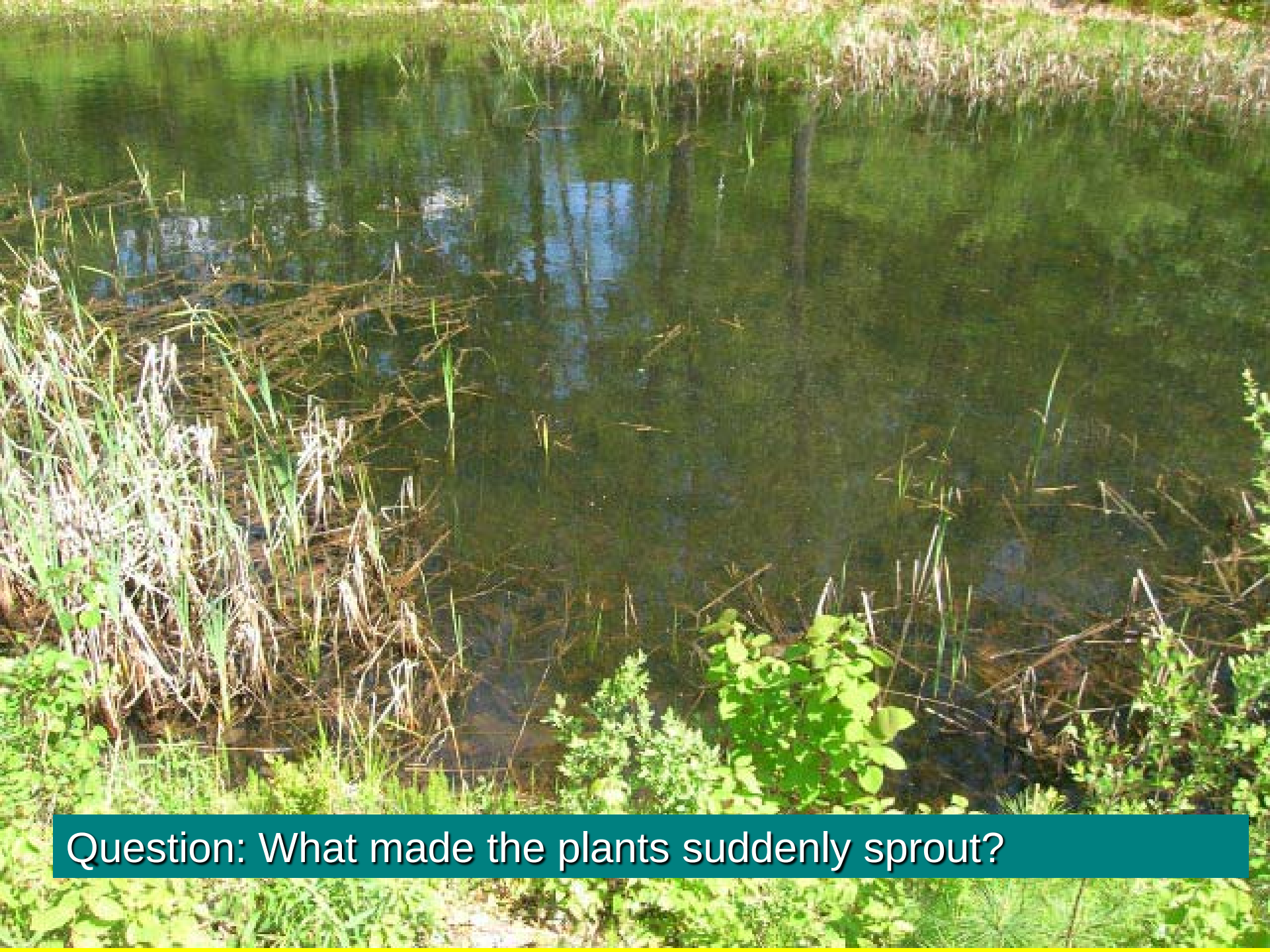
Digital cartoon- Add to your presentation with graphics

Put on a play- Act it out

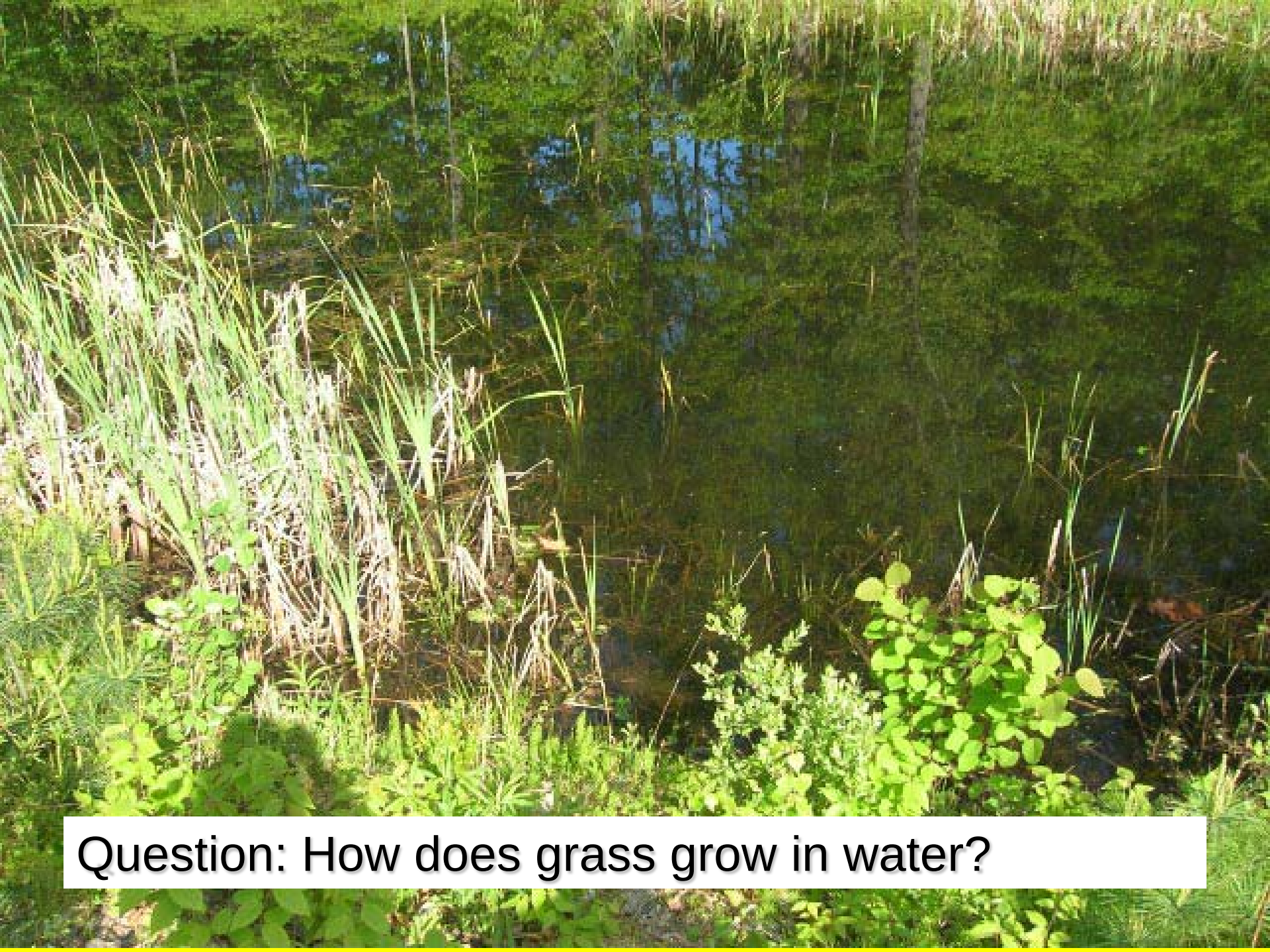
Sing a song- Write your own song

Drawings- Sketch your ecosystem each time you visit

Photo story- Show pictures of your ecosystem on each observation day



Question: What made the plants suddenly sprout?



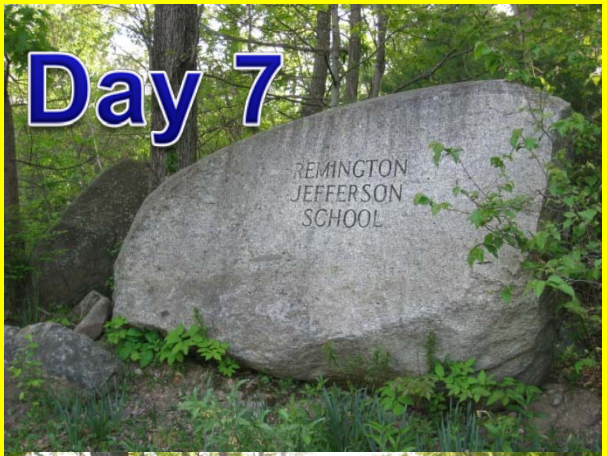
Question: How does grass grow in water?

Before

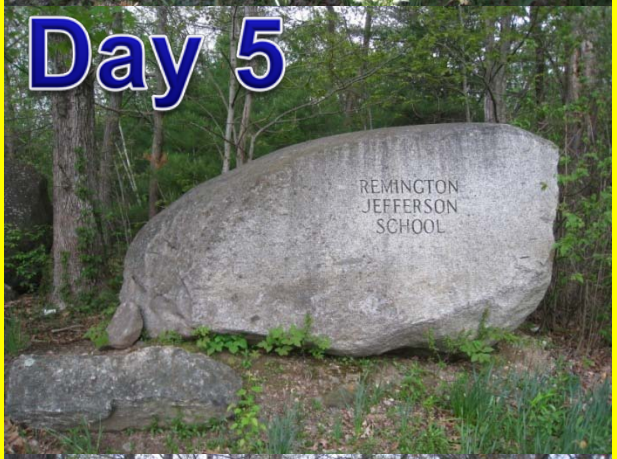
After


Day 1
REMINGTON
JEFFERSON
SCHOOL

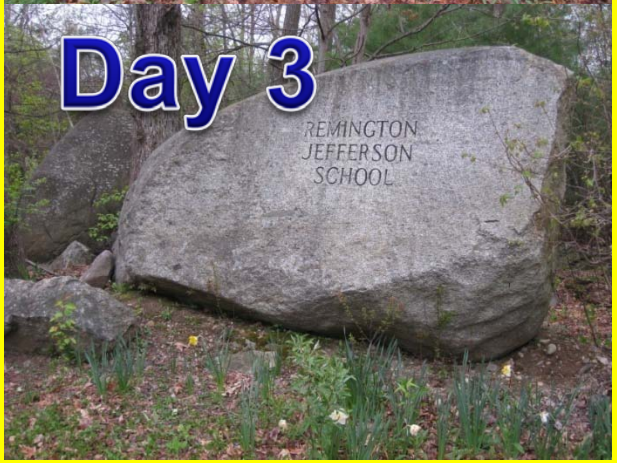

Day 4
REMINGTON
JEFFERSON
SCHOOL


Day 7
REMINGTON
JEFFERSON
SCHOOL

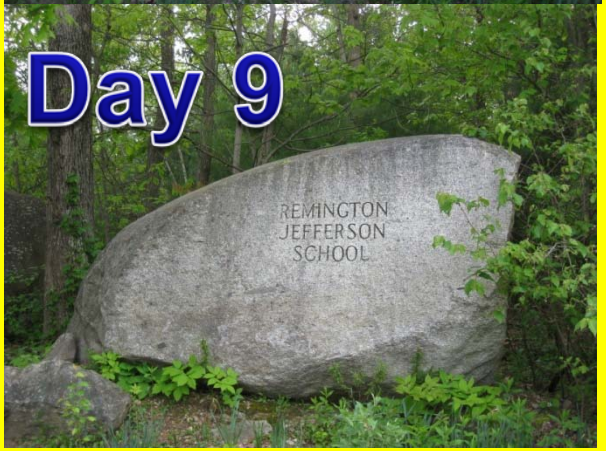

Day 2
REMINGTON
JEFFERSON
SCHOOL


Day 5
REMINGTON
JEFFERSON
SCHOOL


Day 8
REMINGTON
JEFFERSON
SCHOOL


Day 3
REMINGTON
JEFFERSON
SCHOOL


Day 6
REMINGTON
JEFFERSON
SCHOOL


Day 9
REMINGTON
JEFFERSON
SCHOOL

Cool Pictures From Day 2









Why did the poison ivy turn green from red?

Before

After

BEFORE

AFTER

Nick B’s Video

Sources

Pictures

fauza.wordpress.com

http://askabiologist.asu.edu/explore/i-spy-ecosystem

http://www.climatechangeconnection.org/impacts/Ecosystems.htm

http://www.whrc.org/mapping/semass/index.html

http://www.methuen.k12.ma.us/pathfinders/Massachusetts%20Animals.htm

http://www.statesymbolsusa.org/Massachusetts/black_capped_chickadee.html

http://www.suttonmass.org/animals/bugs/westernconfierseedbug/

Animal Tracks and Sounds:

http://www.amug.org/~jbpratt/education/theme/animals/animals.html

Ethogram Examples:

http://www.animalbehavior.org

http://college.holycross.edu/faculty/kprestwi/behavior/e&be_notes/E&BE_ethograms.pdf