

What About My Needs?



Next Generation Science Standards

Disciplinary Core Idea: LS1.A

Structure and Function Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.

Disciplinary Core Idea: ESS2.E

Biogeology Living things affect the physical characteristics of their regions.

FIELD STUDY OVERVIEW

During this Field Study, students will play an **Outdoor Learning Game** that models how invasive species can rapidly takeover an ecosystem if left unchecked. They will also conduct an **Environmental Exploration** and observe the level of biodiversity present in the environment. As a **Stewardship Activity**, students will remove invasive plant species and/or collect and plant seeds.

GUIDING QUESTIONS

- What is biodiversity, and why is it important?
- What do all plants need in order to survive?
- What is an invasive species and how does it impact biodiversity?

OBJECTIVE

Students will be able to demonstrate their understanding of the impact invasive species can have on an ecosystem and the role stewardship plays in maintaining biodiversity.

STEWARDSHIP ACTIVITY

Students will participate in a stewardship activity lead by staff at the Field Study site. This may involve removing invasive plant species and/or collecting and planting seeds.

EXPLORATION GUIDELINES

While exploring, students should note the variety of species they observe. Ask students to count the number of different species they observe in one specific area.

MATERIALS

Educators at the Field Site will provide the following materials:

- Poker chips: red for nutrients, white for space, yellow for sunlight, and blue for water spread in the playing area. You will need one of each color chip for approximately $\frac{3}{4}$ of the students participating in the activity to get what they need (e.g. 12 of each color for a group of 16 students).
- Plant cards for your habitat: different color paper for native plants vs. invasive. You will need twice as many invasive cards than native (e.g. 16 students will require eight native plant cards and 16 invasive plant cards).

What About My Needs? Procedures

Procedures

1. Remind students that a healthy ecosystem is one that supports the most variety of living things. Invasive plant and animal species that outcompete our native species for the resources needed to survive present a threat to the biodiversity in ecosystems.
2. Ask students to recall one strategy they have used to eliminate invasive species and support biodiversity at their Field Study site.
3. Explain that other species play a key role in supporting a wide variety of other organisms within their ecosystem. These organisms are known as a keystone species. Beavers are an excellent example of a keystone species in local wetland environments. Many other species rely on the ponds beavers by building a dam.
4. Tell students they are going to play a game that illustrates the impact of invasive species on an ecosystem.
5. Explain to the students that they will be taking on the role of either a native or invasive plant species.
6. Pass out plant cards; half of the students will take on the role of a native plant; the other half will take on the role of an invasive.
7. Discuss what all plants need in order to survive (sun, water, nutrients, and space). Tell students what each color of poker chip represents, and have them take note of how many of each they need to survive on their plant card (it varies with different habitats).

ROUND 1

1. Spread the chips around the playing area and allow only the native species to collect what they need in order to survive.
2. All of them should survive because there are plenty of resources to go around.
3. Discuss that in a healthy ecosystem, all species are able to get what they need because they have adapted to living amongst one another successfully.
4. Collect the chips.

ROUND 2

1. Redistribute the chips around the playing area and tell the students that an invader has made its way into our healthy ecosystem.
2. Allow both the native plants and invasive plants to try and collect what they need. Before students do so, make a new rule clear to the participants: invasive plants have the ability to outcompete native plants for needs. Therefore, invasive plants can take the chips that they need from native plants.
3. Any native plant that doesn't get what they need has to sit down because they did not survive the initial invasion.
4. Collect the chips.

ROUND 3

1. Redistribute the chips around the playing area, and tell the students that didn't survive the last round that they have to trade in their native plant card for an invasive plant card.
2. Once again let all plants try to collect what they need.
3. After each of the rounds ask the students: Did everyone get enough resources? Why or why not? How many different plants are in the community now?
4. If necessary, explain that many of the native plants did not survive, because the invasive plants were able to outcompete the native plants for sunlight. In real life, garlic mustard, white sweet clover, and purple loosestrife grow faster and taller than native plants. They create shade, which means the native plants cannot get enough sun to thrive and survive.

What About My Needs? Procedures

WOODLAND		
Plant Names	These Plants Each Need	Woodland Needs Cards
trillium (native) spring beauty (native) white trout-lily (native) Dutchman's breeches (native) smooth yellow violet (native) wild geranium (native) Solomon's seal (native) may apple (native) 8 garlic mustard cards (invasive) ★ Provide up to 8 extra garlic mustard cards for Round 3.	1 sun 1 water 1 space 1 nutrient	12 sun chips (yellow) 12 water chips (blue) 12 space chips (white) 12 nutrient chips (red)

PRAIRIE		
Plant Names	These Plants Each Need	Prairie Needs Cards
butterfly weed (native) purple coneflower (native) blazing star (native) compass plant (native) little bluestem (native) prairie dropseed (native) saw-tooth sunflower (native) shooting star (native) 8 white sweet clover cards (invasive) ★ Provide up to 8 extra sweet clover cards for Round 3.	3 suns 1 water 1 space 1 nutrient	12 sun chips (yellow) 12 water chips (blue) 12 space chips (white) 12 nutrient chips (red)

WETLAND		
Plant Names	These Plants Each Need	Wetland Needs Cards
skunk cabbage (native) marsh marigold (native) sedge (native) bulrush (native) cattail (native) swamp milkweed (native) great blue lobelia (native) blue iris (native) 8 purple loosestrife cards ★ Provide up to 8 extra purple loosestrife cards for Round 3.	1 sun 3 waters 1 space 1 nutrient	12 sun chips (yellow) 12 water chips (blue) 12 space chips (white) 12 nutrient chips (red)

What About My Needs? Plant Cards

WOODLAND
TRILLIUM

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



WOODLAND
SPRING BEAUTY

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



WOODLAND
WHITE TROUT LILY

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



WOODLAND
DUTCHMAN'S BREECHES

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



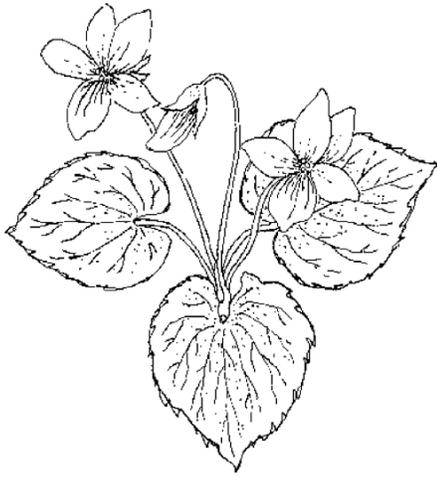
What About My Needs? Plant Cards

WOODLAND

SMOOTH YELLOW VIOLET

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient

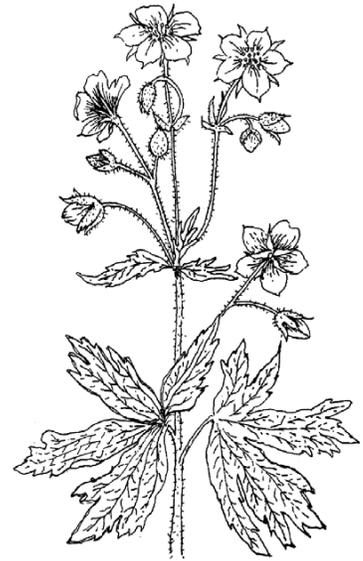


WOODLAND

WILD GERANIUM

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



WOODLAND

SOLOMON'S SEAL

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



WOODLAND

MAY APPLE

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



What About My Needs? Plant Cards

PRAIRIE
BUTTERFLY WEED

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



PRAIRIE
PURPLE CONEFLOWER

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



PRAIRIE
BLAZING STAR

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



PRAIRIE
COMPASS PLANT

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



What About My Needs? Plant Cards

PRAIRIE
LITTLE BLUESTEM

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



PRAIRIE
PRAIRIE DROPSEED

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



PRAIRIE
SAW-TOOTHED SUNFLOWER

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



PRAIRIE
SHOOTING STAR

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



What About My Needs? Plant Cards

WETLAND
SKUNK CABBAGE

PLANT NEEDS

- 1 - sun
- 3 - water
- 1 - space
- 1 - nutrient



WETLAND
MARSH MARIGOLD

PLANT NEEDS

- 1 - sun
- 3 - water
- 1 - space
- 1 - nutrient



WETLAND
SEDGES

PLANT NEEDS

- 1 - sun
- 3 - water
- 1 - space
- 1 - nutrient



WETLAND
BULRUSHES

PLANT NEEDS

- 1 - sun
- 3 - water
- 1 - space
- 1 - nutrient



What About My Needs? Plant Cards

WETLAND
CATTAILS

PLANT NEEDS

- 1 - sun
- 3 - water
- 1 - space
- 1 - nutrient



WETLAND
SWAMP MILKWEED

PLANT NEEDS

- 1 - sun
- 3 - water
- 1 - space
- 1 - nutrient



WETLAND
GREAT BLUE LOBELIA

PLANT NEEDS

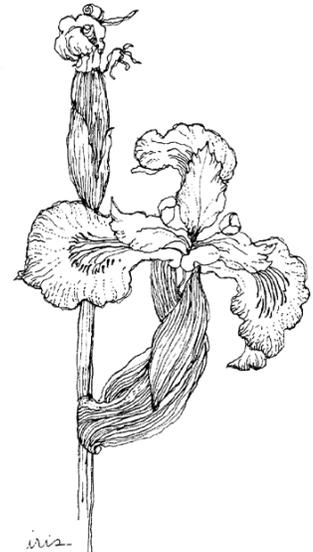
- 1 - sun
- 3 - water
- 1 - space
- 1 - nutrient



WETLAND
BLUE IRIS

PLANT NEEDS

- 1 - sun
- 3 - water
- 1 - space
- 1 - nutrient



What About My Needs? Plant Cards

WOODLAND
GARLIC MUSTARD

INVASIVE!

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



WOODLAND
GARLIC MUSTARD

INVASIVE!

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



WOODLAND
GARLIC MUSTARD

INVASIVE!

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



WOODLAND
GARLIC MUSTARD

INVASIVE!

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space
- 1 - nutrient



What About My Needs? Plant Cards

PRAIRIE
WHITE SWEET CLOVER

INVASIVE!

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



PRAIRIE
WHITE SWEET CLOVER

INVASIVE!

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



PRAIRIE
WHITE SWEET CLOVER

INVASIVE!

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



PRAIRIE
WHITE SWEET CLOVER

INVASIVE!

PLANT NEEDS

- 3 - sun
- 1 - water
- 1 - space
- 1 - nutrient



What About My Needs? Plant Cards

WETLAND
PURPLE LOOSESTRIFE

INVASIVE!

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space



WETLAND
PURPLE LOOSESTRIFE

INVASIVE!

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space



WETLAND
PURPLE LOOSESTRIFE

INVASIVE!

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space



WETLAND
PURPLE LOOSESTRIFE

INVASIVE!

PLANT NEEDS

- 1 - sun
- 1 - water
- 1 - space

