Plant Puzzlers

Science Standard V:
Students will understand the physical characteristics of Utah's wetlands, forests, and deserts and identify common organisms for each environment.

Objective 2:
Describe the common plants and animals found in Utah environments and how these organisms have adapted to the environment in which they live.

Intended Learning Outcomes:
1. Use Sciecne Process and Thinking Skills
3. Understand Science Concepts and Principles

Content Connections:
Math IV-2; Language Arts VII-6; Art

Science Standard V

Objective 2

Connections

Background Information

This activity requires students to sort data about plants of Utah. Fourth grade students are to learn about plants that live in deserts, wetlands, and forests. Those listed in the *Science Words to Know* section of the standard include:

cottonwood	Utah juniper	quaking aspen	pinyon pine
bulrushes	cattails	sagebrush	prickly pear

Some other common Utah plants:

Douglas pine	sego lily	Blue spruce	fir
Gamble's oak			

Playing this game requires students to make inferences about why plants might live in a particular environment and how physical characteristics influence survival in these areas. A great resource to help students find answers, or for teacher information, is the 4th grade science Web page listed under *Resources* in the science section of the USOE Web site.

Invitation to Learn

Start a clapping rhythm such as knees, clap, snap fingers, clap, and keep it going while you say,

Plants, plants, everywhere

Let's name parts that plants all share.

Continue the clapping rhythm and call on a student who will then recite a plant part that they know. This should all be to the rhythm.

Example:

Plants, plants, everywhere

Let's name parts that plants all share.

Knees, clap, snap, clap (call student name)

Knees, clap, snap, clap—FLOWERS

Continue until students run out of parts (e.g., branches, leaves, roots, seeds, etc.).

If you have studied plant adaptations, try this rhythm with them changing the second line to "Name adaptations plants can share" (e.g., color, thorns, waxy coating, etc.). This leads into the following activity.

Instructional Procedures

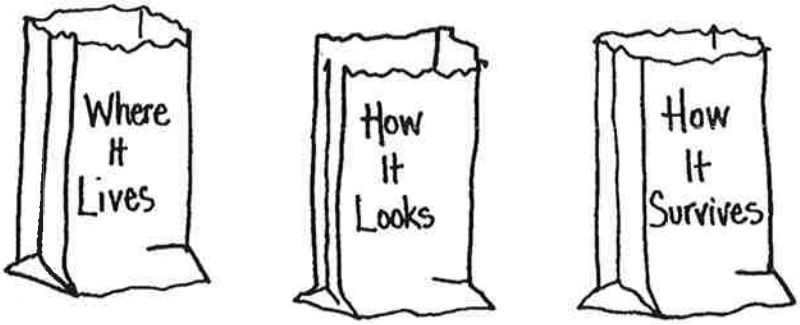
Materials

For each pair of students:

- ❑ Three lunch bags
- ❑ *Plant Puzzler Cards*
- ❑ *Plant Puzzlers Student Worksheet*
- ❑ *Plant Puzzler Journal*

1. Prepare materials for the activity. Each pair of students should label their sacks (Where It Lives, How it Looks, and How it Survives) and cut up the *Plant Puzzler Cards* (p. 7-9). Decide which sack the cards will go in.

   This is a place where students will need to sort the data and make decisions about where to put it. Some pairs might put different cards in different places. For example, "furry leaves" is a physical characteristic, but it can also be a means of survival for some plants. Students will need to be able to explain their decisions if questioned.



2. Make sure the students understand all the words on the *Plant Puzzler Cards*. Tell them they will be looking at data about plants and then determining which plant might fit the characteristics.
3. One team member will take a card from each bag. The other student will write the words on different squares in the correct column of the *Plant Puzzlers Student Worksheet* (p. 7-10).
4. The next team member takes a turn. Continue until each member has filled in two rows across.

5. As a team, look at the rows of words. Through research, determine a plant that can fulfill all the descriptors. For example, if a row lists desert, attracts pollinators, and spiny skin, students might determine that the name of the plant is the prickly pear cactus. Have the team draw an illustration of their plants in the space on the chart and label, or draw larger illustrations on another paper.
6. As students research each group, they might discover one that isn't solvable (e.g., wetland, spiny skin, loses leaves, etc.). If this happens, they might want to pick another card from the appropriate bag.
7. Students will present their findings to the class. They should be prepared to explain how the plant is suited for the environment it lives in.

Possible Extensions/Adaptations/Integration

Art Target

Arrange subjects in a piece of art so some of them touch or extend out of its edges.

Journal Activity

The journal cover is made with leaf rubbings or leaf printing in two colors. Students will see that creating interesting combinations can require them to go off the page, or work "beyond the box."

The *Plant Puzzler Journal* (p. 7-11) can be any size, but using half of a 9" x 12" sheet of art paper (4 1/2" x 12") works well for the cover.

- Fold the paper like a "wallet" (1). The approximate size is 5" x 5" with a foldover piece of two inches.
- The inside pages can be made using one half of an 8 1/2" x 11" paper, folded (2).
- You will also need to cut graph paper to the size of the inside pages for your perimeter leaf drawings (3).
- Fold these in half and "tuck" into the book.
- Punch a hole with a hole punch on the fold close to the top and bottom of the pages (4).
- Insert the toothpick or skewer into the holes to create the book binding (5).
- Secure the foldover by cutting a small slit in the front cover and tucking the piece into the slit.

Suggested activities for the journal contents:

- Find some leaves with simple contour lines and trace them on the graph pages. Find the perimeter of the squares for simple leaves.
- Use the journal to record any data students collect about plants and their physical characteristics.
- Record and answer any questions students might have about the plants they investigate during the activity.

Possible Extensions/Adaptations/Integration

- *Create a New Plant* (p. 7-12).
- Use *Environmental Tree Page* (p. 7-14) to extend the activity further. Pick an environment. Choose an unusual or uncommon plant from Utah. In the branches provided, list physical characteristics of these organisms.

Assessment Suggestions

- *Plant Puzzlers Student Worksheet* with plants identified correctly is a good assessment tool.
- Usint the *Create a New Plant Rubric* (p. 7-13) will help determine if students have grasped the intended learning outcomes for this lesson.
- The *Plant Puzzler Journal* can also be used if it includes entries where students have recorded information about the physical characteristics of plants.

Additional Resources

Plants of the Rocky Mountains, by Linda J. Kershaw; ISBN 1-55105-088-7

Rocky Mountain Tree Finder, by Tom Watts (1972, Nature Study Guild, Berkeley); ISBN 0912550058

Rocky Mountain Plants and Animals Coloring Book, by Dot Barlowe (Dover Publications); ISBN 0486430456

Family Connections

- List different environments (forests, wetlands, deserts) in three columns on a page. Keep a tally of plants your family sees over the weekend, either at home, on television, in books, newspapers, etc. Which is most common?

Plant Puzzler Cards

Cut this page into squares along the lines. Put the squares into the correct bag.

forest	desert	wetland	woody stems
spiny skin	lives near water	loses leaves in Autumn	waxy coating
furry leaves	light color	leaves go dormant	seeds float and flutter
two-sided needles	looks dead in dry spells	grows acorns which are food for rodents, birds, or deer	long slender green stalks with brown growth on top
yellow flowers	roots are shallow	broad leaves	tall stalks with triangular stems
attracts pollinators	desert	forest	wetland

Name _____

Plant Puzzlers Student Worksheet

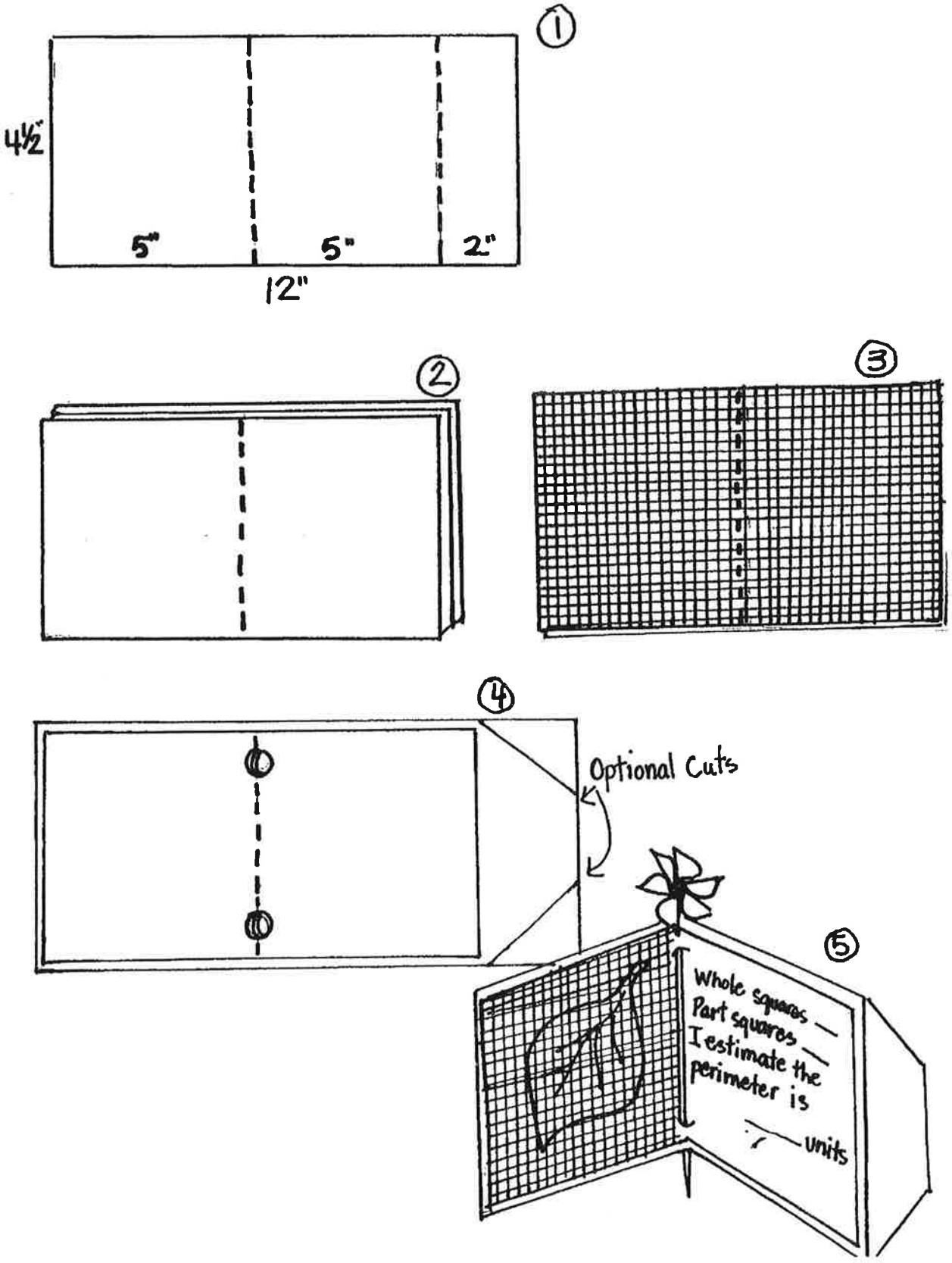
Directions:

One team member will take a square from each bag. The other will write the words on different squares in the correct column of this activity page. Take turns.

Continue until each member has filled in two rows across.

Where it Lives	How it Looks	How it Survives	Name of Plant

Plant Puzzler Journal



Name _____

Create A New Plant

Directions:

Pretend you are a scientist who has just discovered a completely new species of plant life in Utah. Using the description below, create this plant. Take the information you have put together and write a report to explain it to others.

New Plant Species Description

On a recent expedition in _____ of Utah, I discovered a new species of plant that I call _____. This plant appears to live in _____ . It resembles a/an _____, but also has _____ and _____.

There are many dangers that _____ must protect itself against in _____. _____threatens it the most, but this plant has adapted by _____. In addition, it has the ability to _____ when _____. During certain times of the (year/month/day) I observed _____ which caused the _____ to _____.

After studying this new organism for some time, I discovered some unique behavior patterns. The _____ lives (in groups of _____ or alone.) The main source of food for this plant is _____ which it gets through/by _____.

(Add any other interesting facts on the back of this sheet.)

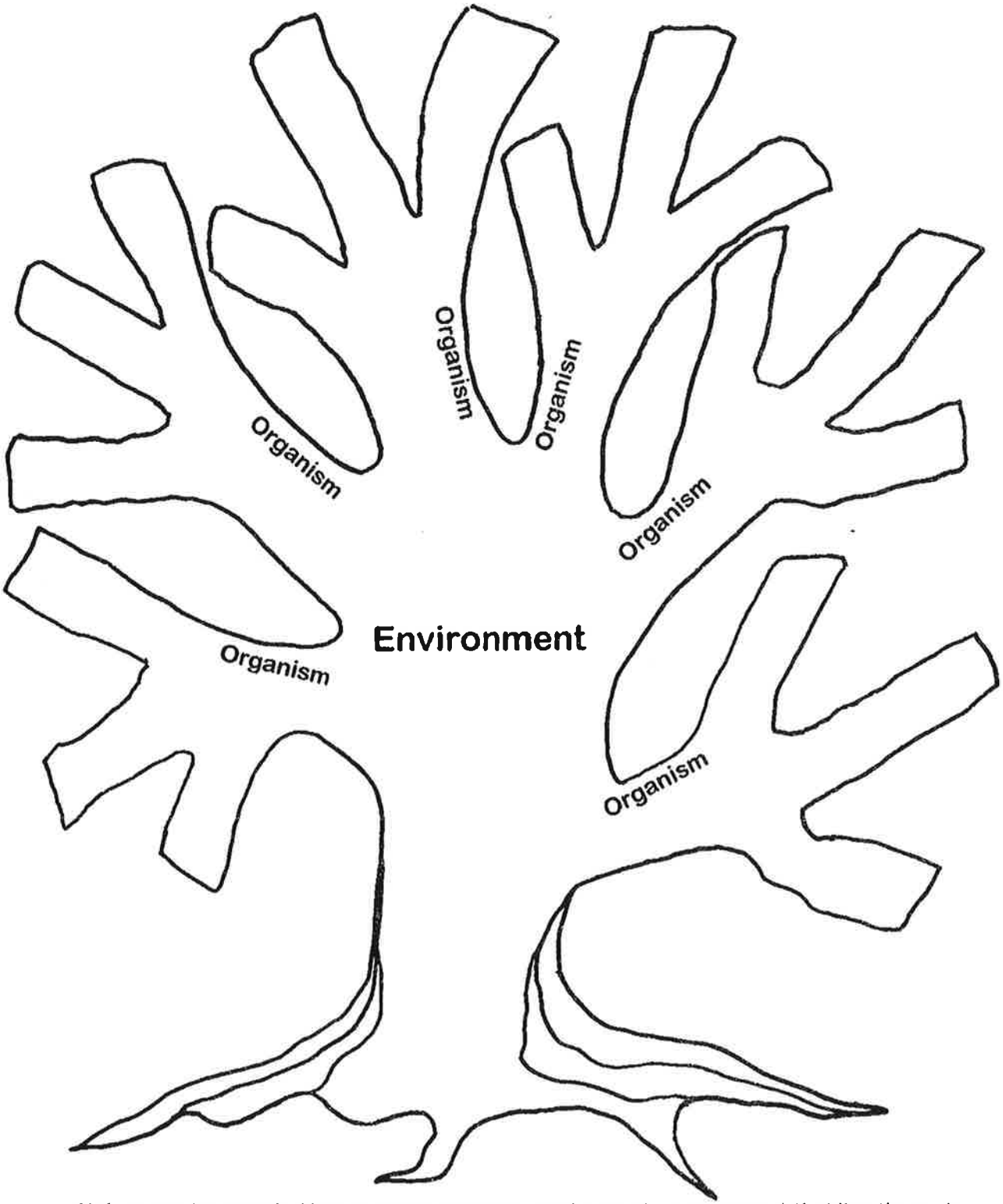
Name _____

Creative Plant Rubric

	• The written profile follows the structure given: name as title, describes habitat, identifies conditions, explains three adaptations, closes with an interesting fact. • The plant models or shows the information in the written profile. • The project is neat, well organized and completed on time
	• Written profile is complete but sections are out of order. • Plant may or may not be accurate to the written description. • Project is clearly organized, but could improve on neatness or was late
	• Written profile is out of order or is missing one or two sections. • Plant does not match its written profile. • Project lacks organization and neatness.
	• Written profile does not describe plant's adaptation to its habitat. • Plant does not match its written profile. • Project appears rushed and messy.

Comments:

Environment Tree Page



Pick an environment. Choose common plants and animals (organisms) that live there. In the branches of the tree list three physical characteristics of these organisms.

There Once Was a Daisy

There once was a daisy that grew on a plain
Where the sun helped it grow, and so did the rain –
Links in a food chain.

There once was a bug who nibbled on flowers,
Nibbled on flowers for hours and hours!
The bug ate the daisy that grew on the plain,
Where the sun helped it grow, and so did the rain –
Links in a food chain.

There once was a wren who gobbled up bugs,
And creepies and crawlies and slimies and slugs.
The wren ate the bug, who nibbled on flowers.
Nibbled on flowers for hours and hours!
The bug ate the daisy that grew on the plain,
Where the sun helped it grow, and so did the rain –
Links in a food chain.

There once was a snake who often grabbed birds,
And swallowed them whole, or so I have heard.
The snake ate the wren, who gobbled up bugs,
And creepies and crawlies and slimies and slugs.
The wren ate the bug, who nibbled on flowers.
Nibbled on flowers for hours and hours!
The bug ate the daisy that grew on the plain,
Where the sun helped it grow, and so did the rain –
Links in a food chain.

There once was a fox and I'll make a bet
He'd eat anything he could possibly get.
The fox ate the snake who often grabbed birds,
And swallowed them whole, or so I have heard.
The snake ate the wren, who gobbled up bugs,
And creepies and crawlies and slimies and slugs.
The wren ate the bug, who nibbled on flowers.
Nibbled on flowers for hours and hours!
The bug ate the daisy that grew on the plain,
Where the sun helped it grow, and so did the rain –
Links in a food chain.

The fox he grew older and died one spring day,
But he made the soil rich when he rotted away.
A new daisy grew where he died on the plain.
The sun helped it grow, and so did the rain –
Links in a food chain.