Biodiversity Lesson Plan 6

Describing and Identifying Plants

Teacher: Elena Martin   Grade Level: 9-10   Date: Summer 2016

AZ Science Standard:	*Strand 1: Inquiry Process; Concept 2: Scientific Testing, PO5: Record observations, notes, sketches, questions, and ideas using tools such as journals, charts, graphs, and computers.*
AZ College and Career Readiness Standards:	*9-10.RST.4. Determine the meaning of symbols, key terms and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics* *9-10. WHST.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes*
Enduring Understandings/ Essential Questions:	Biodiversity (the variety of life on Earth): All Ecosystems contain a variety of life that is interdependent. How is biodiversity affected by human behavior? How does decreased/increased biodiversity affect life on Earth? How are humans dependent on biodiversity?
Content Objective: *Math Reading Writing Other:*	*Students will learn how to describe and identify native plant species*
Language Objective:	Students will use botanical words to describe plant specimens.

Vocabulary	Materials
Pinnate, branching, lobed, serrated, compound leaf…	• *Plant ID Game Handout (see below)* • *A variety of native desert plant specimens with their scientific and common names attached (refer to list of native species to chose those readily available to you or from schoolyard to prepare for plant walk)* • *Powerpoint on how to describe plants* • *Article,"Drawing as a Way of Seeing"* • *Hand lenses or magnifying glasses* • *Slips of paper* • *Native desert plant field guides ("Plants of Arizona; fireflyforest.com; AZ Native plant society website)* • *Plant List*

Seasonality
Autumn or Spring for cooler weather, or when plants are flowering.

Monsoon July-Sept.	Autumn Oct.-Nov.	Winter Dec- Feb.	Spring Mar.-Apr.	Dry Summer May-June

Guiding Questions:
What makes a good description that can help us identify an organism?

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Anticipatory Set:
Ask students what makes a good scientific description of an organism? (Write answers on the board)

Then ask them what makes a good plant description? Have students write a description of a plant they know without writing its name.

Activity/Investigation:

Think-Pair-Share
1. Have students compare their description with their neighbor and see if they can guess the plant you have described

2. Ask students if they know how many species of Palo Verde there are in the Sonoran Desert.
Bring in examples of each and show picture. Have students write a description of their similarities and differences.

3. Introduce plant forms and characteristics (power point)

4. Have students read the article, "Drawing as a way of Observing". Have them discuss the main idea and important details, giving examples in the text and how it relates to describing plants.

5. Organize students into groups of 3 to 4. Assign them to a table with 4 different native desert plant specimens. For each specimen include flowers and seedpods, if possible. Each group will be assigned a different set of native desert plants. Have students follow instructions on the handout. Students will make detailed composite drawings and descriptions of the native plant specimens at their station in their lab notebook, and try to identify them based on each other's descriptions.

Closure Question:
Similar to the anticipatory set, closure provides an opportunity for students to summarize their learning in their own words and make some sense of the activity they just completed.

Share the answers with the class
Ask students to write a reflection addressing the following questions:
What words were helpful in helping you to identify a plant by its description?
Which ones did you get right?

Check results – see which description help the most. What made them good descriptions?

**Native Desert Plant Game: Describing and Identifying**

Purpose: To practice observing and describing defining characteristics of native desert plants, then be able to identify them based on those descriptions.

Guiding questions: What are the defining characteristics of native desert plants species? What makes a good scientific description for identification?

Part I. Choose a plant from your lab to study, then
- Make a detailed sketch of your plant in the space below (or in your field notebook); label the parts including the stem, leaves, flowers and seeds.
- Measure the leaves or spines and include those measurements on your drawing
- Write a paragraph describing the appearance of the plant (leaf shape, bark texture, branching pattern). Describe its defining characteristics so that someone else could identify it based on your description.
- Write the description below your drawing (no plant names, please!), as well as on one of the index cards labeled A-D. Leave the index cards at your lab table.

Plant Drawing
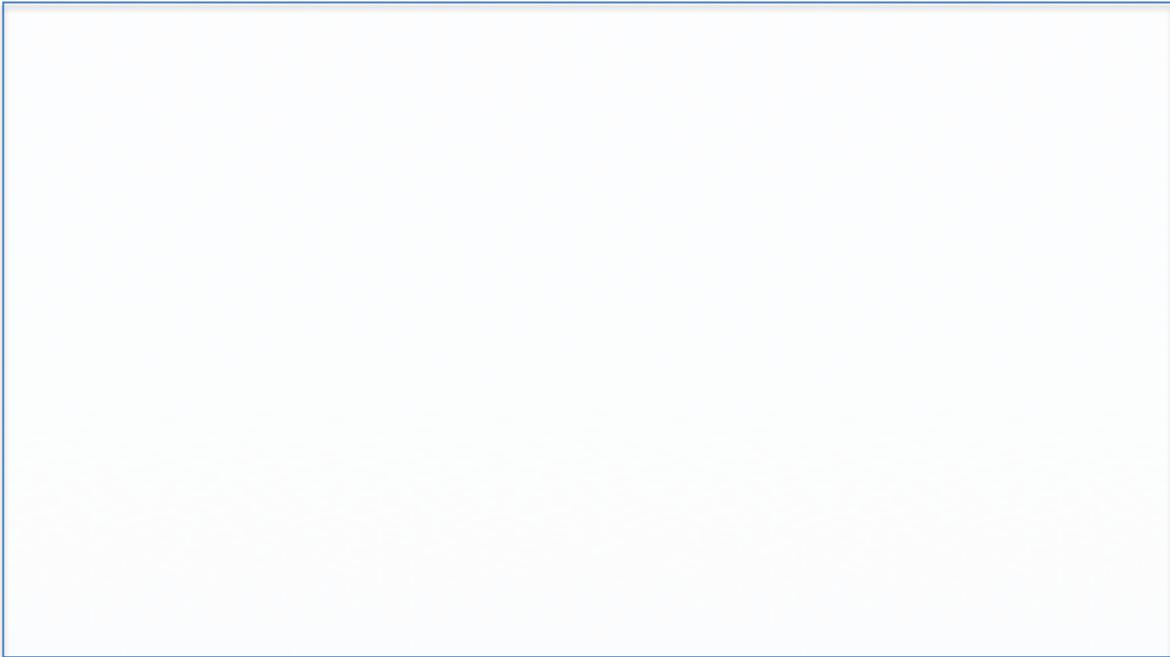
Description:

_____
_____
_____
_____
_____

Part 2: Playing the Game!

1. Rotate to a different lab table. Each plant will have a number attached to it. Read the descriptions as a group and decide which plants they match. Write the letter of the description next to the number of the plant below. Also include the lab table number.

Table # _____   Plants: 1. _____ 2. _____ 3. _____ 4. _____ Score: _____

Repeat until you have rotated through all the stations, or as many as you have time for.

Table # _____   Plants: 1. _____ 2. _____ 3. _____ 4. _____ Score: _____

Table # _____   Plants: 1. _____ 2. _____ 3. _____ 4. _____ Score: _____

Table # _____   Plants: 1. _____ 2. _____ 3. _____ 4. _____ Score: _____

Table # _____   Plants 1. _____ 2. _____ 3. _____ 4. _____ Score: _____

Table # _____   Plants: 1. _____ 2. _____ 3. _____ 4. _____ Score: _____

Table # _____   Plants: 1. _____ 2. _____ 3. _____ 4. _____ Score: _____

3. Put your teams answers on the board, along with everyone else's, then check to see how many you got right!

4. Return to your group and discuss your results. Which ones did you get right? What made those descriptions better than others you didn't get right? What makes a good plant description useful for

identification? Make a list of words that were helpful in describing these plants.

Write a reflection below based on what you learned from the exercise and your discussion.

Reflection:

5. Return to your station and use the plant guidebooks to identify three plants at your table. List their common name, scientific name, defining characteristics and habitat they are found in.

Table#_____

Plant # _____ Common Name: _____

Scientific Name: _____

Defining Characteristics: _____

Habitat description: _____(Elevation: _____)

Plant # _____ Common Name: _____

Scientific Name: _____

Defining Characteristics: _____

Habitat description: _____(Elevation: _____)

Plant # _____ Common Name: _____

Scientific Name: _____

Defining Characteristics: _____

Habitat description: _____(Elevation: _____)

Summary:

5. Based on your observations, what characteristics do many desert plants have in common? Describe at as least five characteristics below.

6. What native desert plants do you think you have at home? List them. You may use the guide to help you.

7. Where can you find native desert plants? Name three places you could get to on your own where you could find native desert plants. Be specific.

Plant List Reference

50 Common Native and Non-Native Desert Plants, Tucson, AZ
(Adapted from "Plants of the Desert: Running Plant list. Dick Barber, University of Arizona)

TREES	COMMON NAME	SCIENTIFIC NAME	HABITAT
☐	Arizona (Velvet) Ash	*Fraxinus velutina*	Riparian
☐	Arizona Black Walnut	*Juglans major*	Riparian
☐	Cottonwood	*Populus fremontii*	Riparian
☐	Desert Willow	*Chilopsis linearis*	Riparian
☐	Feather tree	*Lysoloma microphylla*	Riparian, endemic
☐	Ironwood	*Olneya tesota*	Desert
☐	Mesquite, Velvet	*Prosopis velutina*	Desert
☐	Netleaf Hackberry	*Celtis reticulate*	Riparian
☐	Palo Verde, Blue	*Cercidium floridum*	Desert
☐	Palo Verde, Foothills	*Cercidium microphyllum*	Desert
☐	Palo Verde, Mexican	*Parkinsonia aculeata*	Desert, introduced
☐	Sycamore	*Platanus wrightii*	Riparian
☐	Western Black Willow	*Salix gooddingii*	Riparian

SHRUBS

☐	Agave	*Agave sp.*	Desert
☐	Beargrass	*Nolina microcarpa*	Desert/upland
☐	Brickellia	*Brickellia sp.*	Desert
☐	Brittlebush	*Encina farinose*	Desert
☐	Burrowweed	*Isocoma tenuisecta*	Desert
☐	Burrobrush	*Ambrosia (Hymenoclea) salsola*	Desert
☐	Canyon Ragweed	*Ambrosia ambrosiadies*	Desert/Riparian
☐	Catclaw Acacia	*Acacia greggii*	Desert
☐	Condolia	*Condalia warnockii*	Desert
☐	Creosote	*Larrea tridentate*	Desert
☐	Desert Broom	*Baccaharis sarathodies*	Desert
☐	Desert Hackberry	*Celtis pallida*	Riparian
☐	Desert Lavender	*Hyptis emoryi*	Desert Riparian
☐	Desert Mistletoe	*Phoradendron californicum*	Parasite
☐	Ephedra	*Ephedra trifurca*	Desert
☐	Fairyduster	*Calliandra eriophylla*	Desert
☐	Graythorn	*Zizphus obtusifolia*	Desert
☐	Hopbush	*Dodonaea viscosa*	Desert
☐	Jojoba	*Simmondsia chinensi*	Desert
☐	Koeberlinia	*Koeberlinia spinosa*	Desert
☐	Krameria, White Ratany	*Krameria grayi*	Desert
☐	Limberbush	*Jatropha cardiophylla*	Desert

SHRUBS	COMMON NAME	SCIENTIFIC NAME	HABITAT
☐	Lippia/Beebush	*Aloysia wrightii*	Desert
☐	Mariola	*Parthenium confertu (incanum)*	Desert
☐	Ocotillo	*Foqueria splendans*	Desert
☐	Red Bird of Paradise	*Caesalpina Mexicana*	Desert, chihuahua
☐	Saltbush	*Atriplex canescens*	Desert
☐	Seepwillow	*Baccahris glutinosa*	Riparian
☐	Sotol	*Dasylirion wheeleri*	Desert
☐	Stephanomeria	*Stephanomeria exigua*	Desert
☐	Sweetbush	*Bebbia juncia*	Desert
☐	Tecoma stans	*Tecoma stans*	Riparian
☐	Texas Ranger	*Leucophyllum spp*	Desert, Chihuahuan
☐	Trixis	*Trixis californica*	Desert
☐	Tree Tobacco	*Nicotania glauca*	Desert
☐	Triangle-leaf Bursage	*Ambrosia deltoidia*	Desert
☐	Whitethorn Acacia	*Acacia constricta*	Desert
☐	Wolfberry	*Lycium spp* (need flowers to key out)	
☐	Yellow Bird of Paradise	*Caesalpinia gilliesii*	Desert
Yucca			
☐	Banana Yucca	*Yucca baccata*	Desert
☐	Soaptree Yucca	*Yucca elata*	Desert
☐	Schotts's Yucca	*Yucca Schotii*	Desert

LOW SHRUBS AND BUSHES

SHRUBS	COMMON NAME	SCIENTIFIC NAME	HABITAT
☐	Cassia	*Senna covesii*	Australia, cultivar
☐	Datura	*Datura metelodies*	Riparian
☐	Desert Marigold	*Baileya multiradiata*	Desert
☐	Desert Tobacco	*Nicotina trigonophylla*	Desert
☐	Desert Zinnia	*Zinnia acerosa*	Desert
☐	Dyssodia	*Dyssodia acerosa*	Desert
☐	Janusia	*Janusia gracilis*	Desert
Mallows		*Sphaeralcea spp.*	Desert
☐	Globe Mallow	*Sphaeralcea ambigua*	Desert
☐	Herissanthia	*Herissanthia crispa*	Desert
☐	Indian Mallow	*Abutilon sp.*	Desert
☐	Rose Mallow	*Hibiscus sp.*	Desert
☐	Penstemon	*Penstemon spp.*	Desert
☐	Snakeweed	*Gutierrezia sarothrae*	Desert

LOW SHRUBS AND BUSHES, cont'd

	COMMON NAME	SCIENTIFIC NAME	HABITAT
☐	Siphonoglossa	*Siphonoglossa longiflora*	Desert

Verbena

☐	Gooding's (Desert)	*Glandularia goodingi*	Desert, washes
☐	Sand	*Abronia villosa*	Desert, washes
☐	Wright's	*Glandularia wrightii*	Desert
☐	Yellow Paperflower	*Psilostrophe cooperi*	Desert

SOME SUMMER ANNUAL FLOWERS/WEEDS

☐	Bahia	*Bahia absinthifolia*	Desert
☐	Caltrop	*Kalistroemia grandiflora*	Desert
☐	Clammyweed	*Polanisia dodecandra*	Desert
☐	Crownbeard	*Verbesina enceliodes*	Desert
☐	Devil's Claw	*Proboscidea parviflora*	Desert
☐	Euphorbs	*Euphorbia spp.*	Desert

SOME SUMMER ANNUAL FLOWERS/WEEDS, cont'd

☐	Five-fingered Gourd	*Curcurbita digitata*	Desert
☐	Horseweed	*Conyza canadensis*	Desert
☐	Senecia	*Senecio spp.*	Desert
☐	Sunflower	*Helicanthus annus*	Desert

CACTI (Family Cactacea)

☐	Barrel Cactus	*Ferocactus fulgida*	Desert

Cholla

☐	Jumping Cholla	*Cylindraopuntia (opuntia) fulgida*	
☐	Cane/Staghorn Cholla	*Cylindraopuntia acanthocarpa/versicolor*	
☐	Christmas Cholla	*Cylindraopuntia leptocactus*	Desert
☐	Pencil Cholla	*Cylindraopuntia arbuscula*	Desert
☐	Teddy Bear Cholla	*Cylindraopuntia bigellovii*	Desert
☐	Hedgehog, Strawberry	*Echinocerus engelmanii*	Desert, upland
☐	Hedgehog, Pinkflower	*Echinocerus fasciculatus*	Desert, upland
☐	Night-blooming cereus	*Peniocereus spp.*	Desert
☐	Organpipe	*Cereus thurberii*	Desert
☐	Pincushion	*Mammillaria microcarpa*	Desert
☐	Prickly Pear	*Opuntia spp*	Desert
☐	Saguaro	*Carnegia gigantean*	Desert

SOME INVASIVE DESERT SPECIES

	COMMON NAME	SCIENTIFIC NAME	ORIGIN
GRASSES			
☐	Buffelgrass	*Pennisetum ciliare*	Africa, Asia, M. East
☐	Burmuda grass	*Cynodon dactylon*	Middle East
☐	Cheatgrass	*Bromus tectorum*	Eurasia
☐	Fountain grass	*Pennisetum seteceum*	Africa, Asia
☐	Nutgrass	*Cyperus rotundus*	Eurasia, Africa
☐	Red Brome	*Bromus rubens*	Eurasia
FORBS			
☐	African (Sahara) mustard	*Brassica tournefortii*	Africa
☐	Diffuse Knapweed	*Centaurea diffusa*	Eurasia
☐	London Rocket	*Sisymbrium irio*	Eurasia
☐	Malta starthistle	*Centaurea meletensis*	Mediterranean
☐	Puncture Vine (Goat Head)	*Tribulus terristris*	Invasive, Eurasia
☐	Tumbleweed	*Salsola iberica*	Russia
☐	Velvetweed	*Guara mollis*	Asia
TREES/SHRUBS			
☐	African sumac	*Rhus lancea*	South Africa
☐	Athel Tamarisk	*Tamarix aphylla*	Eurasia, Africa
☐	Saltcedar	*Tamarix parviflora*	Eurasia, Africa