

## **Lesson Three: The Secrets of Orchids Secondary**

Lesson One: Introduction to Biomimicry provides the foundation for the remaining five lessons in this “Biomimicry” unit. “The Secrets of Orchids” (as well as Lesson Two) is the secondary visual arts lesson of the unit. Lesson Three - Elementary (as well as Lesson Two) is the elementary visual art lesson of the unit.

### **OBJECTIVES:**

1. Students will be able to create drawings using bilateral symmetry.
2. Students will be able to create different values with watercolor and oil pastels.
3. Students will be able to organize visual elements (size, overlap, warm and cool colors) within a complex composition in which at least one shape crosses the edge.
4. Students will be able to describe how an art exhibition impacts their understanding of the social, cultural or political importance of sustainability.

### **Preparation**

Preview the Secrets of Orchids PowerPoint. Print out multiple copies of orchid flower photos with simple petals and colors (rather than flowers with color patterns or frilly petals) and photos that show orchid roots or provide access to the Internet for students to do their own searches. Consider whether you will use “Questor Questions about Biomimicry at the Tempe Center for the Arts to supplement students’ reflection on the impact of an art exhibition on their understanding of a social-cultural-political issue (sustainability).

### **Resources and Supplies**

[Secrets of Orchids PowerPoint](#)

[Biomimicry Exhibition Preview PowerPoint](#)

OPTIONAL: [Questor Questions about Art Inspired by Nature pdf](#)

6”X11” cardstock (folded in half to make book cover)

5 1/2”X18” 80 lb paper (folded to make book pages)

gluesticks

labels for sketchbooks pdf

OPTIONAL: Ribbon to tie book closed

pencil and eraser

thin markers

print-outs of orchid flowers and roots from the Internet

petal templates

oil pastels

watercolor paper 7 ½ X 11

water cups/water/paper towels

paint brushes

### **Activities**

#### **DAY ONE AND DAY TWO**

Review: Review the theme in life that “Plants and animals have developed amazing ways to solve problems so they can live and thrive”, the theme in science that “Scientists identify problems in today’s world and explore sustainable solutions already working in the lives of plants and animals” and the theme in the arts that “Visual, performing and literary artists fascinated by the amazing abilities of plants and animals find exciting problems for their creative work.”

Review the unit's key questions:

How does nature inspire visual, performing and literary artists?

What visual elements will I use (bilateral symmetry, warm and cool colors, size and overlapping)?

Introduction and Assignment: Display The Secrets of Orchids PowerPoint slides 1-14 to:

- Explain how 1) people enjoy and use orchid, 2) scientists have solved an important problem by studying orchids and 3) artists have found inspiration for their art from nature (slides 1-2).
- Show some of the beauty of orchids (slide 3).
- Explain how orchids hang on to trees with their roots (slide 4 & 5).
- Note that we get vanilla flavoring from a special orchid bean (slide 6).
- Explain that some orchids (called epiphytes) get their nutrition from their air roots (slides 7-9).
- Show how parts of an air root gather water and how scientists imitated orchids to solve a water shortage in Africa (slides 9-12).
- Then, show an example of how an artist got an idea for his sculpture from nature (slide 13).
- Introduce students to their art assignment (slide 14).

Definition and Practice: Display The Secrets of Orchids PowerPoint slides 15-27 to:

- Illustrate steps in making a sketchbook to study orchids (slide 15-17).
- Define bilateral symmetry (slide 18).
- Practice identifying and analyzing bilateral symmetry in flowers (slides 19-22).
- Direct students to consult photos of orchids as they draw a bilaterally symmetrical orchid flower on page 1 of their sketchbooks (slide 23).
- Ask students to continue their study of orchids by drawing overlapping orchid roots on page 2 (slides 24).
- Define gradual value change (slide 25).
- Ask students to use pencil and oil pastel on page 3 (slide 26).
- On the last page of their sketchbooks, ask students to plan their final painting with bilateral symmetry, gradual value change, changes in scale, a shape crossing the edge of the paper and contrasting warm and cool colors (slide 27).

#### DAY THREE AND FOUR

Final Assignment: Display The Secrets of Orchids PowerPoint slides 28-33 to:

- Introduce the specific expectations of final assignment (slide 28).
- Direct students to consult their sketchbook as they refine or rework their plans and draw orchids on a sheet of watercolor paper (slide 29).
- Direct students to trace their drawing with oil pastel and use lighter pressure to create lighter values (slides 30 & 31).
- Direct students to add more value with watercolor (slide 32).
- Direct students to finish their paintings by adding contrasting warm and cool colors (slide 33).

#### DAY FIVE

Final Assignment: Display The Secrets of Orchids PowerPoint slides 34 & 35 to:

Display The Secrets of Orchids PowerPoint slides 34 & 35 to introduce the online Biomimicry exhibition and the final writing assignment.

Online Art Exhibition: Display the Biomimicry Exhibition Preview PowerPoint providing students with the opportunity to read all or selected artists' statements. You may wish to distribute copies of "Questor Questions about Art Inspired by Nature" handout to supplement students' reflection.

Reflection: Ask students to write a paragraph about how the Biomimicry exhibition impacted their understanding of the social, cultural or political importance of sustainability.

### **Art Vocabulary**

bilateral symmetry  
gradual value change

### **Other Vocabulary**

epiphyte  
air roots

### **Extension Ideas**

Consider introducing students to artists inspired by flowers, such as Georgia O’Keeffe, Vincent Van Gogh and Jan van Huysum.

### **Assessment Guides**

**OBJECTIVE 1:** Students will be able to create drawings using bilateral symmetry.

Exceeds Expectations: Multiple orchid flowers have clear bilateral symmetry

Meets Expectations: At least one orchid flower has clear bilateral symmetry or several show some similarity between right and left sides.

Approaches Expectations: At least one orchid flower shows similarity between right and left sides.

Fails to Meet Expectations: Painting shows orchid/s.

**OBJECTIVE 2:** Students will be able to create different values with watercolor and oil pastels.

Exceeds Expectations: Painting includes even transitions in value change throughout, in flowers and elsewhere, for example in stems or roots or background colors.

Meets Expectations: Painting includes gradual value change in all flowers.

Approaches Expectations: Painting includes several values and some gradual value change.

Fails to Meet Expectations: Painting includes at least two values.

**OBJECTIVE 3.** Students will be able to organize visual elements (size, overlap, warm and cool colors) within a complex composition in which at least one shape crosses the edge.

Exceeds Expectations: Painting is organized with all four of the following: changes in size, overlapping, warm and cool colors and shape/s crossing the edge.

Meets Expectations: Painting is organized with at least three of the following: changes in size, overlapping, warm and cool colors and shape/s crossing the edge.

Approaches Expectations: Painting is organized with at least two of the following: changes in size, overlapping, warm and cool colors and shape/s crossing the edge.

Fails to Meet Expectations: Painting is organized with at least one visual art element or a shape that crosses the edge.

OBJECTIVE 4: Students will be able to describe how an art exhibition impacts their understanding of the social, cultural and or political importance of sustainability.

Exceeds Expectations: The paragraph describes persuasively at least two ways that the art exhibition impacted the student's understanding of the importance of sustainability as a social, cultural or political issue.

Meets Expectations: The paragraph describes some way that the art exhibition impacted the student's understanding of sustainability as a social, cultural or political issue.

Approaches Expectations: The paragraph describes some relationship between the art exhibition and sustainability.

Fails to Meet Expectations: Paragraph addresses **either** the art exhibition **or** sustainability.