Biophilia

The Art and Science of Display

As you walk through the exhibit, observe how the specimens are grouped and displayed in different areas. Groupings done by color is one example of a theme. List as many as you can find.

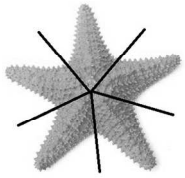
Theme	Description of Theme
Color	Various shades of one color

Explain which theme was most visually and cognitively impactful to you and why.

Animal Classification: Body Symmetry

At a basic level of classification animals can be divided into three groups based on the symmetry of their body plan: radially symmetrical, bilaterally symmetrical, and asymmetrical. Asymmetry is a unique feature of phylum Porifera (sponges).

Radial Symmetry is a form of symmetry wherein identical parts are arranged in a circular fashion around a central axis. A sea star is an example of an animal with radial symmetry.



Bilateral Symmetry is a form of symmetry wherein the equal arrangement of parts are about a vertical plane running from head to tail. Humans are an example of an animal with bilateral symmetry.

Find two examples of organisms showing radial symmetry and two displaying bilateral symmetry. List each organism under the proper heading and make a simple sketch of each in the space provided.

Organisms with radial symmetry

1.

2.

Organisms with bilateral symmetry

1.

2.

Animal Classification: Shared Characteristics and Relationships

Animals can be grouped by their shared characteristics and relationships. Splitting all organisms into vertebrates and invertebrates is an example of this. Explore the exhibit and find the animals listed in the chart below. Fill in the information in the spaces provided. Then, choose two animals from the chart that you think are most similar. Justify your choice in one sentence.

Animal	Lives in what environment Land/Water/Air	Type of skin Fur/Feathers/ Exoskeleton	General Size In comparison to a human being	Type of birth Live offspring/Eggs
Horseshoe Crab				
Bamboo Shark				
Parrot				
Octopus				
Chameleon				
Stag Beetle				

Animal Classification: Linnaean Taxonomy

Carolus Linnaeus developed a system to organize living things. We still use the basic principles of his system today. Scientists are constantly refining the system. Classifying things in this manner is called taxonomy. Linnaeus's system has seven levels: kingdom, phylum, class, order, family, genus, and species. Using the chart below, answer the following questions:

1. Why was it not necessary to include kingdom, for example animal or plant, on this chart?

2. Is the following statement true or false? Explain your answer. Two animals in the same genus must also be in the same family, order, class, phylum, and kingdom.

Common Name	Phylum	Class	Order	Family	Genus	Species
Horseshoe Crab	Arthropoda	Merostomata	Xiphosurida	Limulidae	Tachypleus	*T. gigas*
Bamboo Shark	Chordata	Chondrichthyes	Orectolobiformes	Hemiscylliidae	Chiloscyllium	*C. burmensis*
Macaw	Chordata	Aves	Psittaciformes	Psittacidae	Ara	*A. chloropterus*
Long Legged Octopus	Mollusca	Cephalopoda	Octopoda	Octopodidae	Octopus	*O. cyanea*
Chameleon	Chordata	Reptilia	Squamata	Chamaeleonidae	Chamaeleo	*C. parsonii*
Beetle	Arthropoda	Insecta	Coleoptera	Lucanidae	Prosopocoilus	*P. giraffa*

Animal Adaptations: Color

Animals use color to camouflage, mimic other organisms, startle predators, intimidate rivals, and to attract mates.

Protective Coloration: Camouflage and Mimicry

Some organisms have evolved outer appearances and behaviors that allow them to blend in or match with part of their surroundings to protect themselves. This strategy is known as camouflage. Find four examples of animals that use camouflage and list them below. Pick two of the animals you chose and compare and contrast how they use color for camouflage.

1.

2.

3.

4.

Another tactic is for an animal to mimic the appearance of a different animal that is typically dangerous or less desirable as a prey item. Find two organisms that employ this strategy and list them below.

1.

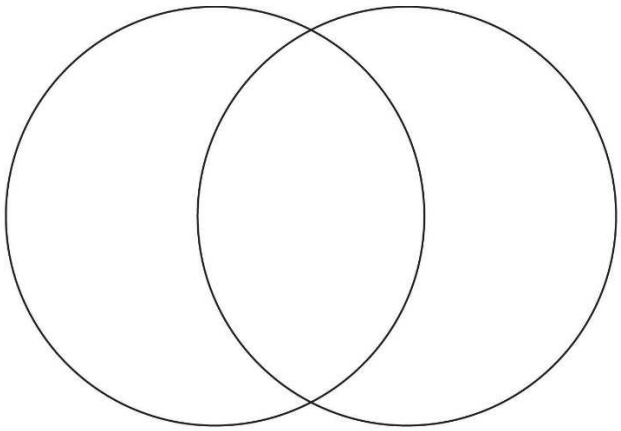
2.

Pick one animal from above and describe how this adaptation works to protect the organism from predation.

Mimicry can also involve having a body part or coloration that imitates a different part of the body. Eye spots are an example of this type of mimicry. Find one example of an animal that uses this form of mimicry and list it below. Make a simple sketch of this animal.

Can you locate an animal who uses mimicry to attract prey? Explain how the animal uses its specific adaptation to survive.

Both camouflage and mimicry help animals survive. Compare and contrast them by completing the Venn diagram below.



Advertising Coloration

Animals and plants use advertising coloration to get noticed. Sometimes the color is meant to attract a mate or prey and in other cases, it is meant to intimidate rivals.

Some butterflies use vivid colors to communicate with each other while courting or mating. Find a butterfly that has bright blue wings and an underside that is a dull brown color.

What species is this butterfly?

Why do you think it has contrasting colors on the front and back of its wings?

What function do the spots on the underside of the wings serve? These spots are an example of what kind of coloration?

Structural Color vs. Pigmented Color

Bird feathers come in many different colors and patterns. The colors in the feathers are produced in two different ways. Pigments that the animal produces account for blacks, browns, and sandy reds. Structures in the feathers that refract and scatter light are responsible for the more vivid colors and iridescence. In some cases the colors we see are produced by a combination of pigmented and structural color.

Other animals use structural color as well. Find two organisms that have iridescence and list them below.

1.

2.

What function could iridescent coloring serve? List two possibilities and explain why you think this.

1.

2.

The artist states that one of his goals is to, “increase the love and appreciation for the aesthetics of organisms”. Briefly explain what you think he means by this statement.

Do you feel that he was successful in increasing your interest and appreciation for the organisms displayed? Explain why or why not.

Are there any organisms in the exhibit that would cause you fear or distress if you confronted them in nature? If so, which one?

Did the exhibit change your feelings toward this organism? Explain why or why not.

What was your favorite piece or grouping of pieces in the exhibit?

Why did this piece or grouping of pieces appeal to you? What feelings or ideas did it invoke?