Activity: **Compare Human-Made Objects with Natural Objects**

GRADE LEVELS: 3-5

SUMMARY:

In small groups, students will experiment and observe the similarities and differences between human-made objects and nature. The students will compare the function and structure of hollow bones with drinking straws, bird beaks and tool pliers, and bat wings and airplane wings. A classroom discussion can be held to discuss similarities and differences that were observed along with follow up assessment activities such as journal writing and Venn diagrams

LEVEL OF DIFFICULTY [1 = Least Difficult: 5 = Most Difficult]

1-least difficult

TIME REQUIRED

60 min

COST

$0

STANDARDS:

PK-2 T/E

1.1 Identify and describe characteristics of natural (e.g. wood, rocks, wool) and human –made materials (e.g. Styrofoam, plastic, fabric).

1.2 Identify and explain some possible uses and advantages for natural and human-made materials.

3-5 T/E

2.4 Compare natural systems with mechanical systems that are designed to serve similar purposes, e.g., bird's wings as compared to an airplane's wings.

WHAT WILL THE STUDENTS LEARN?

Students will observe that many human-made objects get their basic design from things in nature. They will also discuss the importance of function in design.

BACKGROUND INFORMATION:

See the book "Nature Got There First" by Phil Gates

Vocabulary:

Evolution: the natural or artificially induced process by which new and different organisms develop as a result of changes in genetic material

Adaptation: the process or state of changing to fit new circumstances or conditions

Survival: continuation in life or existence

RESOURCES:

http://www.velcro.com/kidzone.html - Story of Velcro

Gates, Phil. Nature Got There First. New York, NY: Kingfisher Books. 1995. pg. 7-49 – Great examples

http://wings.avkids.com/Curriculums/Birds/wing-shapes_summary.html -Activity comparing birds wings and airplane wings

MATERIALS:

Models of bones

Drinking straws

Tubes

Pictures/models of bird beaks

Tool pliers

Pictures/models of airplane wings

Pictures/model of bat wings

Paper

Bee's nest

Velcro

Burrs

Other objects found in "Nature Got There First"

PREPARATION:

Gathering Materials and photocopying comparison chart

DIRECTIONS:

1. Read and Discuss Nature Got There First. Pg 7-50

2. Allow the children to explore the materials, and compare their similarities and differences.

3. Have students fill out the compare and contrast chart, in groups if desired. They are encouraged to fill it with the objects provided, and with others they know about. For younger grades, you may wish to have them draw and label the objects as well as comparing them.

4. for an extension (homework perhaps) have students find three other human-made objects that are designed after something in nature.

INVESTIGATING QUESTIONS:

How are things found in nature similar to human-made objects?

Why are objects in nature designed the way they are?

Why do many human-made objects resemble those found in nature?

Why do things in nature look the way they do (e.g. birds' beaks, bee's hive, armadillo)

REFERENCES:

None

SAMPLE RUBRIC:

Journal writing

Compare and Contrast Charts

Brainstorm other objects

Student observations:

All students should be able to identify common objects.

Advanced student should be able to describe the objects and other objects that they have discovered on their own.

Name: _____ Date: _____

COMPARE AND CONTRAST CHART

Objects		Similarities	Differences
Man Made Object			
Natural Object			
Man Made Object			
Natural Object			
Man Made Object			
Natural Object			
Man Made Object			
Natural Object			
Man Made Object			
Natural Object			
Man Made Object			
Natural Object			
Man Made Object			
Natural Object			
Man Made Object			
Natural Object			
Man Made Object			
Natural Object			

PreK-12 ENGINEERING

Activity Evaluation Form www.k12engineering.org

Activity Name: _____

Grade Level the Activity was implemented at:_____

Was this Activity effective at this grade level (if so, why, and if not, why not)**?**

What were the Activity's strong points?

What were its weak points?

Was the suggested Time Required sufficient (if not, which aspects of the Activity took shorter or longer than expected)**?**

Was the supposed Cost accurate (if not, what were some factors that contributed to either lower or higher costs)**?**

Do you think that the Activity sufficiently represented the listed MA Framework Standards (if not, do you have suggestions that might improve the Activity's relevance)**?**

Was the suggested Preparation sufficient in raising the students' initial familiarity with the Activity's topic (if not, do you have suggestions of steps that might be added here)**?**

If there were any attached Rubrics or Worksheets, were they effective (if not, do you have suggestions for their improvement)**?**

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