Gold Seal Lesson:

Copernicus Education Gateway

Author(s): ***Michael Lucky Voiselle***			***Lesson Title:*** ***THE CLIMBING ANIMALS***			
Grade Span			***ICLE Application Model***			
K-4 ***X***	***5-8***	***9-12***	***A***	***B***	***C*** ***X***	***D***

Instructional Focus:

Reading
Students read a variety of grade level materials, applying strategies appropriate to various situations

Measurement
Students use a variety of tools and techniques of measurement in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Science as Inquiry
Students demonstrate knowledge and skills necessary to perform scientific inquiry.

Communication
Students communicate and apply scientific concepts.

Performance Task

Your task is to follow directions and construct an animal that will climb to the ceiling. You need to answer each question and record them in a science journal. This will help you later as you do a conclusion write-up.

1. Cut a 5.5 centimeter x 7.5 centimeter rectangle out of a stiff piece of cardboard. (A manila folder will do fine.)
2. Draw a picture of your favorite animal on the front of the card.
3. Cut 2 straws 4 centimeters long. Look at the accompanying diagram and glue the straws to the back of the cardboard as shown in the diagram.
4. Cut a cotton or nylon string 3 or 4 meters long. Find the midpoint of the string and make a knot in the string to form a loop that you may hang from a nail to prevent the string from slipping. Thread one end of the through one of the straws. Thread theother end of the string through the other straw.
5. Hold both ends of the string taunt and pull one at a time. What do you observe? Look carefully. What do you think causes this action?
6. Examine the back of your animal and determine where the straws help your animal to climb. What makes the string stop to cause the animal to go upward? Keep pulling on both sides of the string, until you arrive at an explanation.
7. When we pull on the left hand of the string, why does the cardboard tilt to the left before climbing a small amount?
8. When we pull on the right hand string, why does the cardboard tilt to the right before climbing a small amount?

Take your creation home to share with family or friends. Get their opinions to the questions and record them in your journal.

You are to do a conclusion write-up in your best handwriting. The write-up must include all comments, observations, and answers to any questions presented while following the steps above. Include comments from other people with whom you shared this experiment.

You must include in your write-up the answers to the next 5 questions and thoughts.

1. What is friction?
2. How does friction help you in this project?
3. After examining the back while pulling, what causes the cardboard animal to rise?
4. How can you let your animal come back down and why?
5. Make a drawing of the cardboard and straws. Place a circle around the friction points.

Make two more climbing monkeys. Change 2 items and include in your summary what changes you made and how it affected your animal's climb. (You may change the length of the cardboard, spacing between the straws, or the angle between the straws, etc.)

You are to include a discussion of these changes in your conclusion write-up.

ICLE Essential Skills

Follow written directions carefully and accurately. (ela6)
Use writing as a tool for learning in formats such as learning logs, laboratory reports, note-taking, journals and portfolios. (ela40)
Present information in well-organized fashion that will be clear to the target audience. (ela11)
Know and apply the principles of scientific inquiry. *(Implicit in this statement are the processes of prediction, estimation, developing hypotheses, drawing conclusions, evaluation, and following ethical principles and professional procedures.) (Not Ranked s114)*
Plan and apply real or hypothetical models and constructions to facilitate investigation (Not Ranked s115)
Know how to obtain accuracy and precision using common measuring devices. (s33)

Scoring Guide:

4. The student is able to measure and construct a climbing animal independently. The student is able to follow directions with all comments and observations kept in a science journal. The summary is well written and in their best handwriting. The climbing animal was shared with others and their comments included in the write-up. The student made two other climbing animals with one variable changed each time. The reasons for the new behavior was included in their write-up. The student demonstrated an understanding of the role friction played in their animal's behavior.

3. The student is able to measure and construct a climbing animal independently. The student is able to follow directions with all comments and observations kept in a science journal. The summary is well written and in their best handwriting. The climbing animal was shared with others and their comments included in the write-up. The student only made one other climbing animal and did not include the new behavior in the write-up

2. The student is able to measure and construct a climbing animal independently. The student is able to follow directions with all comments and observations kept in a science journal. The summary is in his best handwriting but not organized well. The student did not make two other climbing animals. The student demonstrated a partial understanding of the role friction played in making their animal climb.

1. Student was able to construct the climbing animal with some help. Science journal was incomplete. Summary was not in their best handwriting. The student did not make two other climbing animals. The student does not demonstrate an understanding of why their animal was able to climb.

Keywords

English Language Arts	Mathematics	Science
Reading **Comprehension**	**Algebra**	**Earth Science** **Models/Construction**
Writing **Penmanship Organization**	**Geometry**	**Life Science** **Science Inquiry**
Communications **Retell**	**Statistics**	**Chemistry**
Literature	**Calculus**	**Physics** **Friction**
Other	**Trigonometry**	**Other**
	Other	

	Measurement	

Picture, Chart, or Graph file name(s):