

Lesson Plan Title

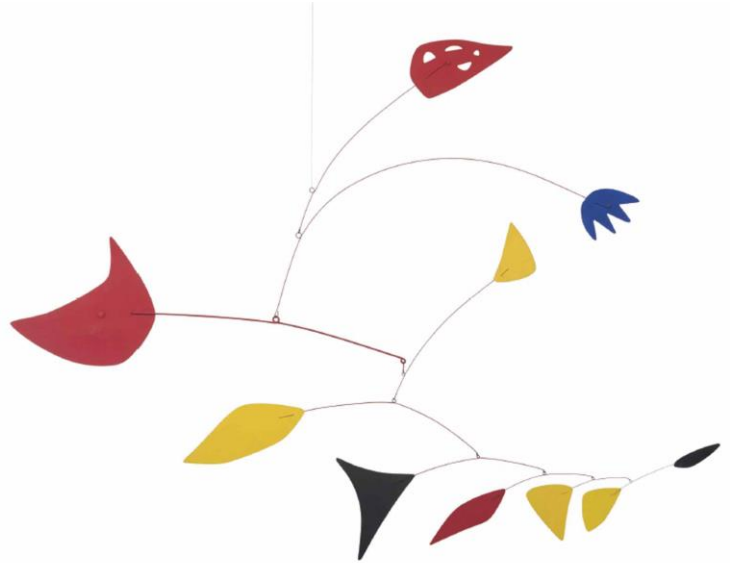
Creating Mobiles to Explore Newton's Laws

Grade Level

5th Grade

Subject Area

Science

**MSCCRS PERFORMANCE OBJECTIVES:**

P.5.6.1 - Obtain and communicate information describing gravity's effect on an object.

P.5.6.2 - Predict the future motion of various objects based on past observation and measurement of position, direction, and speed.

P.5.6.3 - Develop and use models to explain how the amount of type of force, both contact and non-contact, affects the motion of an object.

P.5.6.4 - Plan and conduct scientific investigations to test the effects of balanced and unbalanced forces on the speed and/or directions of objects in motion.

P.5.6.5 - Predict how a change of force, mass, and/or friction affects the motion of an object to convert potential energy into kinetic energy.

MSCCRS OBJECTIVES ESSENTIAL QUESTION:

How has our knowledge of forces and motion helped to make us safer?

MSCCRS CORE IDEAS:

Motion, from the atom to the planets, is controlled by the net impact of forces. For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction. The motion of an object is determined by the sum of forces acting on it. The greater an object's mass, the greater the force needed to achieve motion.

Art Form

Visual Art

MSCCR Creative Arts Standards

VA: Cr1.2.5 Generate and conceptualize artistic ideas and work.

a. Identify and demonstrate diverse methods of artistic investigation to choose an approach for beginning a work of art.

VA: Pr6.1.5 Convey meaning through the presentation of artistic work.

a. Cite evidence about how an exhibition in a museum or other venue presents ideas and provides information about a specific concept or topic.

VA: Re7.1.5 Perceive and analyze artistic work.

a. Compare one's own interpretation of a work of art with the interpretation of others.

VA: Cn10.1.5 Synthesize and relate knowledge and personal experiences to make art.

a. Apply formal and conceptual vocabularies of art and design to view surroundings in new ways through art-making.

Duration

2 - 50 minute class periods

Materials

Construction
Paper
Scissors
Hole Punch
Thread/Yarn
Sticks/ Straws

Objectives

- *Make visual arts connections to science standards about motion and stability
- *Explore the life and work of Alexander Calder
- *Incorporate new knowledge about symmetry and balance into the construction of mobiles
- *Students will learn the vocabulary of contemporary sculpture
- *Distinguish between abstract and realistic sculpture & mobile and immobile

Visual Art Vocabulary

Balance
Kinetic Sculpture
Geometric Shape
Space
Form
Stability
Mobile/ Immobile
Abstract/ Realistic

Newton's Laws of Motion Vocabulary Words

Inertia
Kinetic
Potential
Energy
Gravity
friction
Force
Motion

Lesson Description**STEP 1 (SHOW/REVIEW)**

- Describe the following forces:

* Gravity: the force that attracts a body toward the center of the Earth, or toward any other physical body having mass

* Friction: the resistance that one surface or object encounters when moving over another

- Describe the various effects forces can have on an object (e.g., cause motion/ halt motion/ change direction of motion)

- Show students the 3-minute film "Alexander Calder" as directed by Roger Sherman to give them a glimpse of Calder's work

- * What kind of materials did Calder work with to create artwork?
- * How do you think Calder balanced his mobiles?
- Show students Calder's stabile sculpture 'Cheval Rouge' and his mobile 'Untitled' and compare and contrast their characteristics:
 - * Mobile/ immobile ; Material ; Color natural for the subject/ symbolic ; Abstract or realistic
 - * What conclusions can you draw?
 - * Discuss the term mobile. How does the innovation of movement change the work of art?
 - * Why do you think Calder chose to title his mobile 'Untitled'?

STEP 2 (INSTRUCTIONAL SEQUENCE/CREATE)

- Take students outside and give them 10 minutes to collect 3 or 4 sticks. Have students look for sticks of different lengths, but emphasize that they should focus on only collecting sticks that are thin.
 - * If you are in an urban area/school campus, have students use colored straws instead of sticks as the base of their mobiles. Take this time to allow students to choose the 4 colored straws to construct their mobiles with.
- Students cut straws to varying lengths.
- Students choose 3 pieces of construction paper with varied colors. This will be the paper that students cut to make their hanging shapes.
- Students may cut as many shapes as they like.
- Have students hole punch a hole at the top of each of their shapes.
- Students lay the sticks they collected out in the order they want them to hang and place their shapes underneath the area on the stick that they will hang them. Add string to each shape and tie to the sticks to hang.
- Instruct students to add an extra piece of string at the top of their mobile so you will be able to hang them up once they are completed.

Recommended Resources

"Alexander Calder" by Roger Sherman:

<https://www.youtube.com/watch?v=pAWkv1U8-cA>

"Alexander Calder's Happy Art" (these are videos more geared towards children):

https://www.youtube.com/playlist?list=PL2AVYmYkaqM3Cx1HNbEz_BskPe4FVBGpC

More Lesson Details:

<https://www.psarts.org/wp-content/uploads/2015/08/calder.pdf>

Extended Learning Activities

- Using the performance objective below, students can write predictions about how different movements, additions to the mobile, subtractions from the mobile, air movement, etc... affect the mobile
 - *P.5.6.5 - Predict how a change of force, mass, and/or friction affects the motion of an object to convert potential energy into kinetic energy.
- Have students write vocabulary terms on the different pieces of the mobile as they create.

Sources

P.S. Arts To Go - <https://www.psarts.org/mission/>

Tips

- Using the following reflection exercise can help students deepen their knowledge of vocabulary and how to use it.

*REFLECT: Collect and hang student's mobiles around the classroom. Have students walk around the classroom and observe how each mobile balances differently. Are all the mobiles balanced? What made your mobile successful/ what changes could you make to improve upon it?



STEP 1



STEP 2



STEP 3



STEP 4



STEP 5



STEP 6

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Adapted by:
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