Kinetic Sculpture

Developed with i2 Learning by MIT Edgerton Center

Grade 7

In this course, students will be introduced to key concepts and skills of kinetic sculpture, including balance, gearing, energy sources and design-oriented thinking. They will use the work of Alexander Calder, George Rhodes, Anne Lilly and Arthur Ganson as examples of various forms of moving sculpture. Each day they use the principles they learn as the basis for their own creations, and at the end of the week they'll bring together their complete array of new skills to create a large-scale, chain-reaction-type work of art.

Course Schedule

4 hours per day | **20** hours per week | Student-Led Showcase

5 additional hours of curriculum available

Sample Activities

Throughout the week, students will create their own kinetic sculptures, learning about the physics and mechanics of these types of sculptures through activities like those below.

Meet Alexander Calder

Students are introduced to the work of Calder as inspiration for their own mobile designs.

Master Mobiles

Students design their own mobiles using criteria, constraints, and the principles of balance and center of mass that they have explored throughout the day.

Meet Anne Lilly

Students review the work of Anne Lilly, who creates many different types of kinetic sculpture, including some using gears.

Getting Into Gear

Students investigate gears and note the ways that gears can impact motion.

Engineering Automata

Students engineer automata using gears.

Crushable Sculpture

Students learn about an artist who represents collisions with his work and use the premise to create their own crushable sculptures.

Sculptures with Magnets

Students create small interactive sculptures that include magnets.

Blowing in the Wind

Students create blades that power a windmill sculpture.

Back to Balance

Students experiment with kinesthetic kinetics as they explore how balance can impact performance art.

Materials and Classroom Requirements

Curriculum guide and materials kits provided for all activites

You will need to hang mobiles (and potentially other sculptures) students create from either the ceiling, over cabinet doors, or chairs.

It is ideal to have desks or tables that students can move around to facilitate group work.

You will need one table or area of the room that can be designated as the materials table.

Additional materials to be provided by the school

- Scissors
- Markers/crayons
- Chart paper

Standards Addressed in the Unit

MA Science and Technology/Engineering Standards

MS-PS2-5. Use scientific evidence to argue that fields exist between objects with mass, between magnetic objects, and between electrically charged objects that exert force on each other even though the objects are not in contact.

MS-PS3-1. Construct and interpret data and graphs to describe the relationships among kinetic energy, mass, and speed of an object.

MS-PS3-2. Develop a model to describe the relationship between the relative position of objects interacting at a distance and their relative potential energy in the system.

MS-PS3-7(MA). Describe the relationship between kinetic and potential energy and describe conversions from one form to another.

MS-ETS1-2. Evaluate competing solutions to a given design problem using a systematic process to determine how well each meets the criteria and constraints of the problem. Use a model of each solution to evaluate how variations in one or more design features, including size, shape, weight, or cost, may affect the function or effectiveness of the solution.

MS-ETS1-4. Generate and analyze data from iterative testing and modification of a proposed object, tool, or process to optimize the object, tool, or process for its intended purpose.

MS-ETS1-7(MA). Construct a prototype of a solution to a given design problem.

Common Core standards

Reading Standards for Literacy in Science and Technical Subjects

3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Mathematics

6.RP Understand ratio concepts and use ratio reasoning to solve problems.

7.G Draw, construct, and describe geometrical figures and describe the relationships between them.

8.G Understand congruence and similarity using physical models, transparencies, or geometry software.