Art Machines

Build a moving kinetic sculpture from connected levers.

GRADES K THROUGH 5 | AGES 5 TO 10 | ABOUT 45 MIN

These are the standards listed in the Art Machines educator guide. Under each one is where you will see it in the activity.

Next Generation Science Standards (NGSS)

CODE	WHAT IT COVERS
K-PS2-1	Motion and Stability: Forces and Interactions
	WHERE YOU'LL SEE IT (GRADES K-2): Learners **explore how pushing and pulling their Art Machines affects movement**. When they move the fulcrum closer or farther from the center, they observe how forces change the motion of their machine.
K-2-ETS1-2	Engineering Design
	WHERE YOU'LL SEE IT (GRADES K-2): Learners **follow the design process** by asking questions, imagining solutions, planning their builds, and iterating to improve their "feature function".
3-5-ETS1-1	Define a simple design problem with criteria for success and constraints
	WHERE YOU'LL SEE IT (GRADES 3-5): Learners **identify a specific challenge** (e.g., making their Art Machine pick up an object) and design an iteration that successfully moves an object from one place to another.
3-5-ETS1-3	Planning and Carrying Out Investigations
	WHERE YOU'LL SEE IT (GRADES 3-5): Learners **systematically test different fulcrum placements** to see how they affect the motion of their Art Machine, documenting their findings and adjusting their builds accordingly.

Common Core State Standards (Math and ELA)

CODE	WHAT IT COVERS
RI.K-2.7	Use illustrations and words in a text to describe key ideas
	WHERE YOU'LL SEE IT (GRADES K-2): Learners **refer to visual guides and instructional diagrams** to build their Art Machines, identifying how each part contributes to the final design.
SL.K-2.1	Participate in collaborative conversations
	WHERE YOU'LL SEE IT (GRADES K-2): Learners **discuss their design choices with peers**, describe challenges they encounter, and work together to solve problems.
RI.3-5.7	Interpret information from diagrams and text
	WHERE YOU'LL SEE IT (GRADES 3-5): Learners **analyze instructional diagrams** in the build guide to correctly assemble their Art Machine, then describe the function of each part.
W.3-5.2	Write informative/explanatory texts
	WHERE YOU'LL SEE IT (GRADES 3-5): Learners **document their design process**, explaining why they placed the fulcrum in a certain location and how different lever lengths affected motion.
K.MD.A.1	Describe measurable attributes of objects
	WHERE YOU'LL SEE IT (GRADES K-2): Learners **compare the locations of the fulcra** and discuss how moving them could affect balance and movement.
K.G.A.1	Describe objects using names of shapes and their relative positions
	WHERE YOU'LL SEE IT (GRADES K-2): Learners **describe the X-shape of connected levers** and identify the position of the fulcrum relative to the lever ends during assembly.
3.MD.B.4	Measure and estimate lengths
	WHERE YOU'LL SEE IT (GRADES 3-5): Learners **measure the length of levers** and record how small adjustments impact movement efficiency.
4.MD.A.2	Use measurement to solve problems involving distances
	WHERE YOU'LL SEE IT (GRADES 3-5): Learners **measure distances between fulcrum placements** and solve for optimal lever arm lengths to maximize range of motion.

LEARNERS EXPLORE

compound machines (levers and fulcra); systems thinking (parts working together); the engineering design process; creature/character design; fulcrum placement and motion