

ARTBOTICS

Best Practices and Lessons Learned



Timeframe



- * Pick and choose what exercises to use; all are available on the **artbotics.org**
- * Each can be expanded on as desired
- * Short exercises that introduce the basics, but allow for customization and expansion
- * Semester-long classes, after school programs, single day sessions, workshops

Artbotics Replication Curriculum: Del Mar High School, San Jose, CA



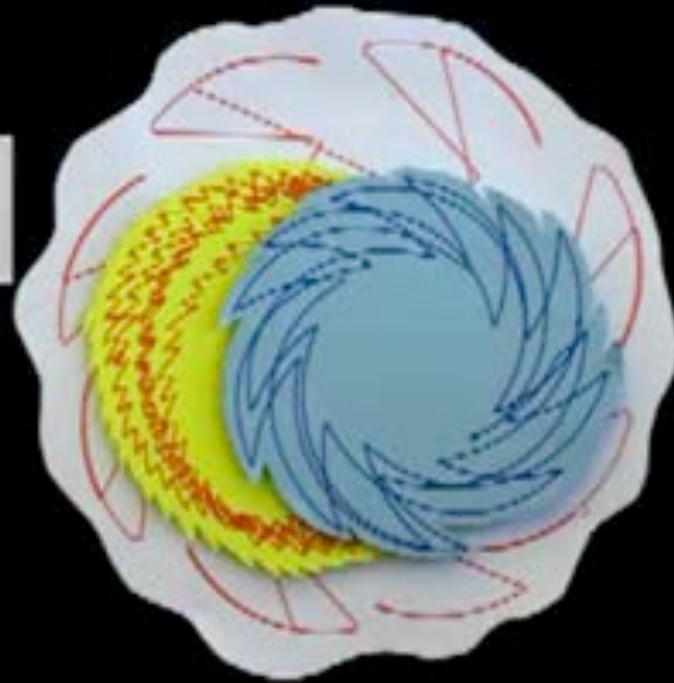
- * Two-dimensional art
 - * Soldering lights and LEDs
 - * Controlling lights (command sequencing, properties)
 - * **Touch sensors (boolean values; if statements)**
- * **Car drawing (continuous rotation motors, looping)**
- * Three-dimensional / two-and-a-half dimensional art
 - * Mechanisms (continuous motion to linear, waving, etc.)
 - * Distance, light, and sound sensors (variable values; ifelse statements, nested if statements)
 - * **Position-based movement (servos, if applicable)**
- * Final projects

Replication: Del Mar High School, San Jose, CA

Driving and Drawing Expanded



**Jacob and
Jorge**



<https://www.youtube.com/watch?v=QZJYVPUGzDU>

Artbotics Replication Curriculum: Woodside Montessori Academy, Millis, MA



- * Two-dimensional art
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 - * Controlling lights (command sequencing, properties)
 - * **Touch sensors (boolean values; if statements)**
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Replication: Woodside Montessori Academy, Millis, MA

Exploring Mechanisms Expanded



<https://www.youtube.com/watch?v=X8x13FYsf5Y>

Artbotics Curriculum: Workshops and Camps, 1-1.5 hours



- * Two-dimensional art
 - * Soldering lights and LEDs
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 - * Touch sensors (boolean values; if statements)
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- * Three-dimensional / two-and-a-half dimensional art
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 - * Position-based movement (servos, if applicable)
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Artbotics Curriculum: Workshops and Camps, 1-1.5 hours



- * Two-dimensional art
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 - * Controlling lights (command sequencing, properties)
 - * Touch sensors (boolean values; if statements)
- * Car drawing (continuous rotation motors, looping)
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 - * Position-based movement (servos, if applicable)
- * Final projects

Artbotics Curriculum: Workshops and Camps, 3 hours



- * Two-dimensional art
 - * Soldering lights and LEDs
 - * Controlling lights (command sequencing, properties)
 - * Touch sensors (boolean values; if statements)
- * **Car drawing (continuous rotation motors, looping)**
- * **Three-dimensional / two-and-a-half dimensional art**
 - * **Mechanisms (continuous motion to linear, waving, etc.)**
 - * **Distance, light, and sound sensors (variable values; ifelse statements, nested if statements)**
 - * Position-based movement (servos, if applicable)
- * Final projects

Content



- * Depending on time frame, using a theme introduces a constraint that pushes creativity and unifies the projects students create
- * Have students work in pairs when technology and/or time limited
- * Keep in mind age group when choosing technology
 - * Lego Mindstorms: elementary to high school
 - * Super Cricket: middle school to college
 - * Arduino: high school to college and beyond

Effective Outreach Components



- * Modular content such that components can be used on their own AND can build on one another
- * Tailor to a variety of age groups to maximize impact
- * Prepare for a variety of timeframes to disseminate
- * Technology options: what's available vs. what's needed
- * Need a curriculum start with? Use ours and expand!

Lego Hardware and Software

- * Lego Mindstorms NXT Kit ~\$300
- * Lego Mindstorms NXT Software ~\$80
- * Lego Mindstorms NXT Home Software = FREE!
- * <http://www.lego.com/en-us/mindstorms/downloads/software/nxt-software/download-software/>
- * Can be purchased in sets of 2, 4, 6, 8, 10, or 12

Lego Hardware and Software

- * Lego Mindstorms EV3 Kit ~\$340
- * Lego Mindstorms EV3 Software ~\$100
- * Lego Mindstorms EV3 Home Software = FREE!
- * <http://www.lego.com/en-us/mindstorms/downloads/software/ddsoftwaredownload/download-software/>
- * Can be purchased in sets of 2, 4, 6, 8, 10, or 12

Craft Materials



- * Building materials can be purchased at any crafts store or online
- * ~\$100 or less, depending on class size
- * Hot glue and sticky tabs are best to allow for easy removal and less damage to Lego pieces
- * **UMass Lowell can make pen holders for any workshop attendees who are interested**

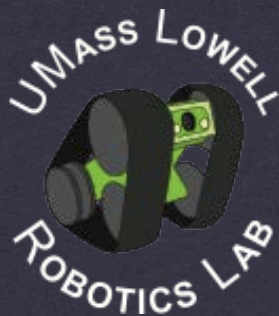
Visit us online for more info!



artbotics.org



legoeducation.us



robotics.cs.uml.edu