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

https://www.youtube.com/watch?v=QZJYVPUGzDU
Artbotics Replication Curriculum:
Woodside Montessori Academy, Millis, MA

- 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: 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
  - 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
Artbotics Curriculum: Workshops and Camps, 1-1.5 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
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!
- 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!


- 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.