Artbotics with different age groups

**Elementary School**
- Suggestions for workshops with elementary school students:
  - 8 sessions, 1 hour each
  - Prepare students with ideas on what they can do with videos of examples (merry go round, faces with light bulb eyes, etc.)
  - Provide pre-written programs that students can choose from (or slightly adjust programs to fit student projects)
  - Limit what they can use: 1 servo or DC motor, a few lights, 1 distance sensor
  - Limit projects to use a single movement
  - Materials: scissors, foamcore, craft foam, glue guns, beads, popsicle sticks -- Discount School Supply
  - Pre-cut materials to appropriate shapes and sizes
- Review sketches of projects and suggest changes if it's too difficult
- ROBIVES.com -- great site for understanding mechanisms and using simple paper models such as “The Agreeable Sheep”
- Prep and test computers to avoid driver issues
- Simple programming environment: SCRATCH block programming
- Limitations: time, not capability

**Middle School**
- Students do not have as much background knowledge in art or computer science, but are very social with other students, are very self-aware
- Younger middle school students (5th and 6th grade) are more excitable than older students (7th and 8th grade)
- Ways to get both boys and girls interested: add food! Example projects: gumball dispenser, soda machine, etc.
- Exhibiting the work as either a showcase, presentation, or exhibit is very important as students will be more engaged and take pride in their work
- Should be integrated into curriculum rather than a separate after school program, but can be difficult to integrate as it is not an MCAS tested subject
- Artbotics can be used very successfully with special ed students or those on the autism spectrum
- Kelly Powers of AMSA trying to pull in Computer Science Standards so other STEM teachers can use it in their classroom
- Can introduce students to all different kinds of career paths related to robotics, some they might not even be aware of
- Utilize Computer Science Education Week (December) and National Robotics Week (April)

**High School**
- This age group (14-18) contains a diverse set of maturity levels and backgrounds, which must be accounted for; some students have experience with technology already, and some don’t
- After school programs are free from standards so their length is variable, and students are choosing to be there so everyone participating wants to be there
- In school units of Artbotics may have discipline issues, as students are not choosing to take it but rather they must take it
- Good way to bring art to a science class and/or science to an art class and for teachers
to develop and collaborate together

- Some 9th graders are required to do after school programs; this is a good way to infuse some technology into them
- Need more online resources, more sharing of activities
- Need more in-depth and complex examples of code for sensors, motors, etc.
- Video demonstrations may be helpful for more complicated actions, mounting instructions, installation tips, etc.
- More instruction on mechanisms