



Coding Jingle Dress Dancers GUIDE

CODE

block code accessible
to elementary age +

CULTURE

customizable to
different regalia and
practices

**AISES CONFERENCE
2025 - MINNEAPOLIS,
MINNESOTA**

ELECTRICAL

wiring servo to
microcontroller

CONNECTION

connect STEM and
culture



S U P P L I E S

Electronics

1. Circuit Express Kit
2. 3 alligator clip wires
3. Wire connectors
4. Micro servo



Structure

1. Dancer platform - 3d print
2. Tomato planter wire - local garden store
3. Wire, zip ties or bread ties

Doll

1. Doll Pattern
2. Cotton fill
3. Sewing kit or machine
4. Burlap, canvas or fabric for doll body
5. Dress Fabric
6. Dress Patterns
7. Jingles
8. Ribbon
9. Fabric Marker
10. Fabric glue
11. 7th grandfather teachings and flower pattern stickers (cut on laser or something with scissors)
12. Felt Sticker Sheets
13. Patterns
 - a. Eagle
 - b. Buffalo
 - c. Turtle
 - d. Sasquatch
 - e. Wolf
 - f. Bear
 - g. Beaver
 - h. Flower
14. Yarn



INSTRUCTIONS

Doll Making

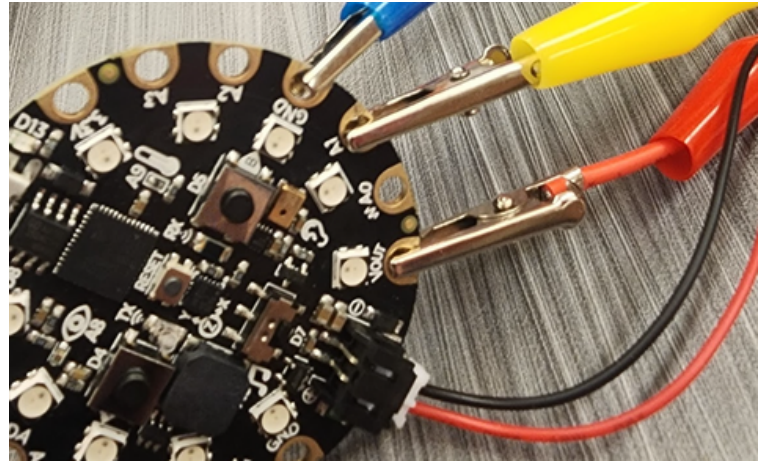
1. Cut out doll pattern
2. Stitch
3. Stuff
4. Finish stitching
5. Hair options
 - a. loose
 - b. Braided yarn
 - c. other?
6. Jingles and outfit decoration



INSTRUCTIONS

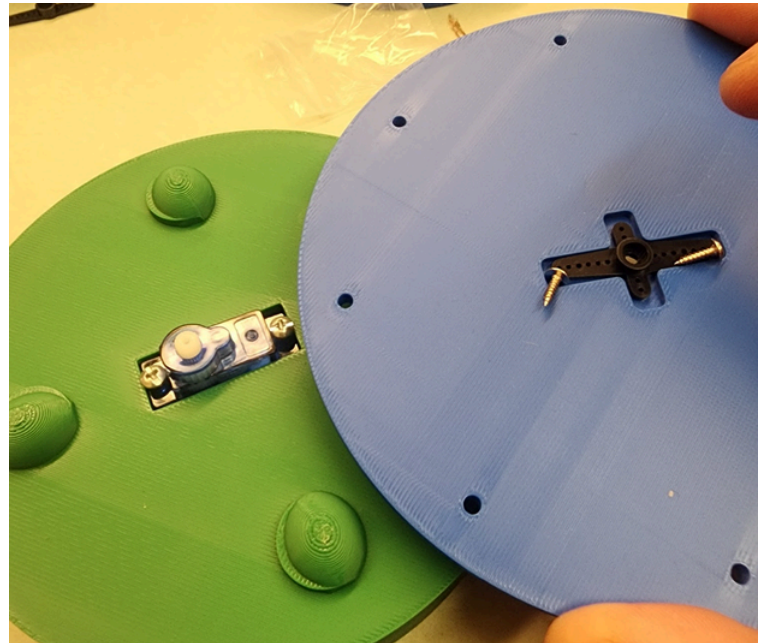
Electronics

1. Red or orange servo wire connects to VOUT. Use alligator clips to clamp onto the correct little gold circle. You will need to connect the servo wire to alligator clip wire.
2. Black or brown servo wire connects to GND
3. Yellow servo wire connects to A1
4. Plug in battery pack to circuit express.



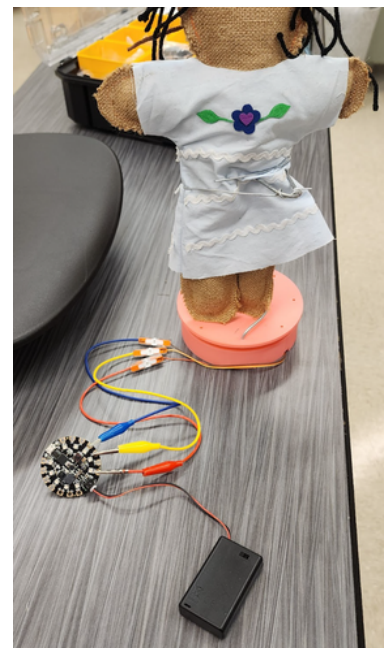
Platform

1. Attach servo to center of the base. Make sure the wires are coming out the bottom and the servo is flat
2. Connect the white servo arm to the indentated side of the platform. Make sure the arm is oriented with the side that fits on servo away from platform.
3. Put the arm and platform onto the servo.
4. Through the top of the platform, secure the servo arm to servo with the tiny screw. Make snug, but do not overtighten.



Stand

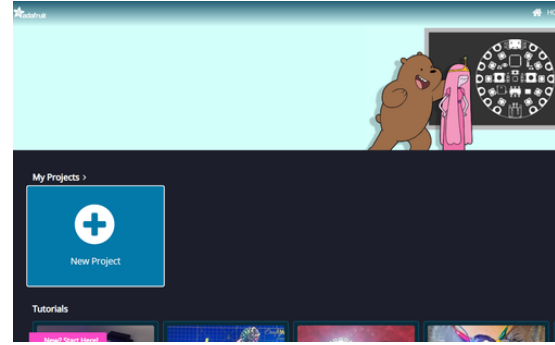
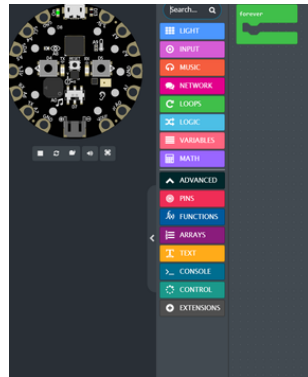
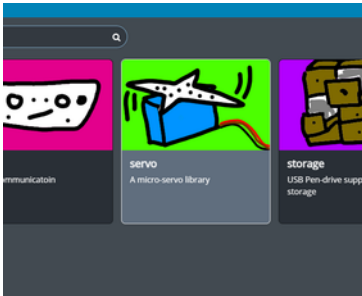
1. Use wire snips to create a stand that is sort of an upside down T.
2. Bend the ends of the upside down T down just at the tip, to fit inside holes in platform
3. Bend the single end at a right angle and then back to make sort of a belt.
4. Attach the wire stand to the platform by putting the bent tips into the outer platform holes.



INSTRUCTIONS

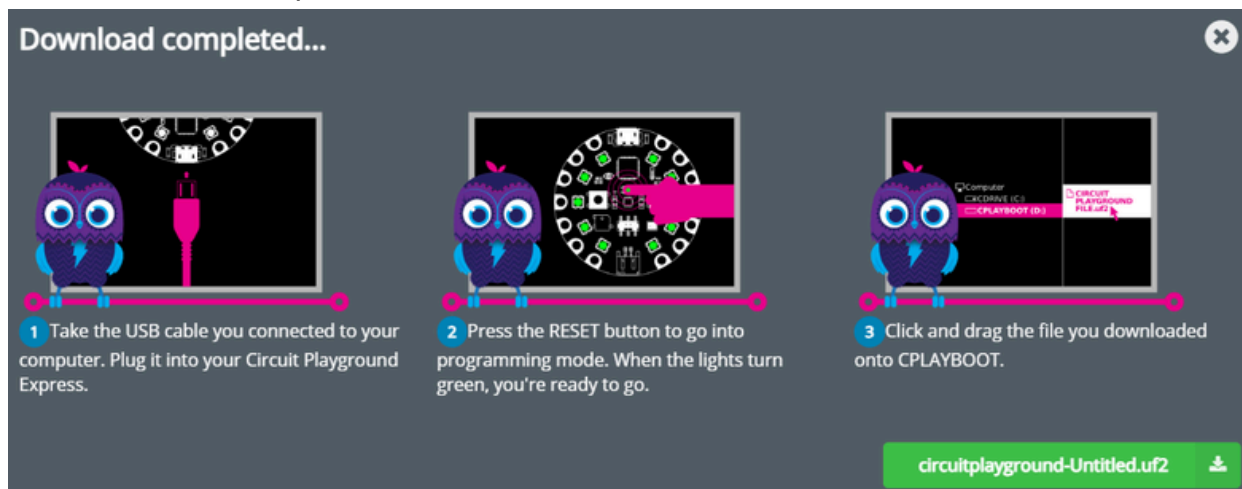
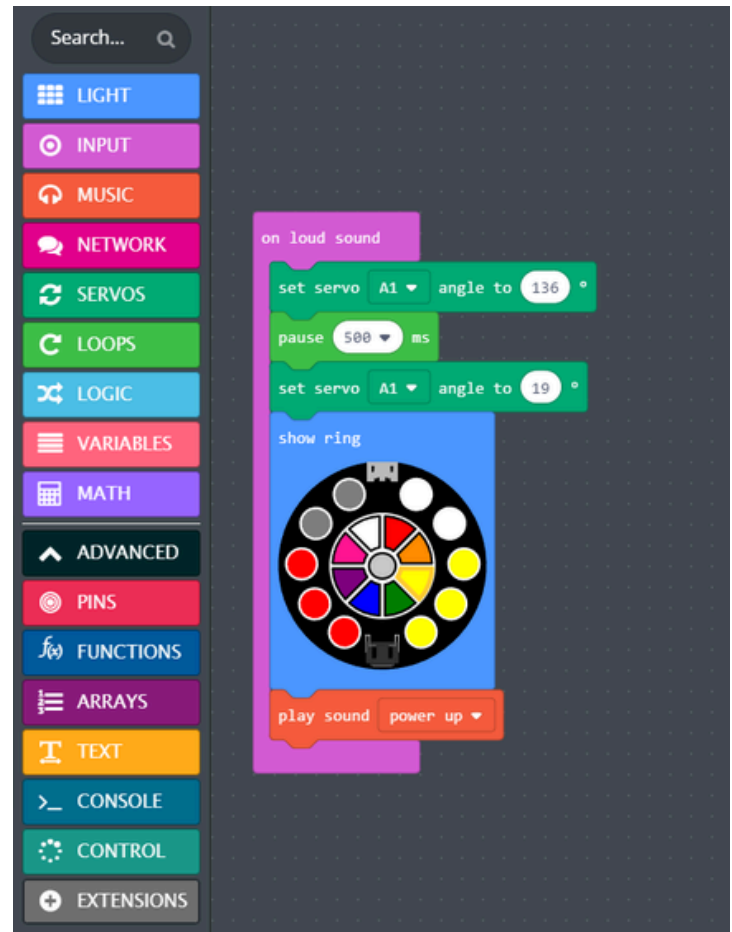
Code Setup

1. On computer, open program
<https://makecode.adafruit.com>
2. Open new project.
3. Add servo extension - click advanced then extensions at the bottom
4. Add servo library



Code the dance

1. Use input to drag in "on loud sound".
2. Movement - Set servo angle 1, pause (loop menu), Set servo angle 2
3. Optional
 - a. Add light
 - b. Add sound
4. Download code - purple button lower left
5. Plug in circuit express to USB port
6. Reset circuit express - might need to hold center button a few seconds
7. Find downloaded file, drag and drop onto circuit express (CPLAYBOOT)



TEST DANCE

1. You can test by clapping your hands.
2. Unplug from computer, make sure battery pack is plugged in and turned on.
3. Enjoy the mini jingle dress dancer.



FUTURE

1. Stand stability - the current stand 3d print files are a 2nd version. It could be improved for easier assembly and better stability.
2. Code complexity - The makecode example is pretty simple and designed for K-6 to code and wire in 15 minute station. Leveling up to a text language or sequence of moves might provide more challenge for older age groups.
3. Electronics - the 3d print files could be improved to provide space for clean wire management, chip safety, battery pack attachment.
4. Electronic textiles - LEDs can be wired to the circuit express. This could add a level to the regalia designs.
5. Mechanical and design complexity - multiple servos, continuous servos and making the doll structure into parts could allow for more complex movements such as duck and dive. There is a tradeoff with a more complex doll structure that integrates servos likely limiting the ability for the students to take the doll home if budget a concern. In our first camp, we used 3d printed doll bodies with a servo integrated at the waist. The dancing went a little smoother, but the children were disappointed to not be taking the dolls home.
6. Drum response - The circuits respond well to hand clapping. The drum sound is intense and finding the right distance away and the structure on which to place the mini dancers can be an experience. The floor seems not effective. A table worked when a distance away from the drum. It also helped when the drum leader experimented with a series of soft beats followed by one loud beat. Perhaps a different electronic board would help such as an arduino or some sort of attachable or adjustable sound sensor.
7. Teachings - It provided a good way for students to choose a grandfather teaching that connected with them as well as to experiment with different flower and regalia designs. At one session, the drum leader was explaining the connection of the community, drum and individual. We can't exactly recall the words, but remember there was a message of the positive effect. There could be an opportunity to look at programming inputs and outputs, comparing that with the drum, community and individual. Discussion could be explored on inputs into our individual lives.
8. Student work - Students developing the project won the MN 8th Congressional District App Challenge. They presented at the capitol building in Washington, DC and their work is on display for a year. See their video and a brief description at <https://www.congressionalappchallenge.us/24-MN08/>. Encourage more youth to submit computer apps to their local congressional leader and represent.
9. Academic standards - this plan was developed for a summer camp. We know this could be incorporated into a curriculum and there are likely academic standards to cite and a lesson plan format to develop. We welcome help.