Lesson 3 - Intro to Strawbees & Build an Electronic Musical Instrument

By the end of the lesson, students should be able to:

Introduction to Strawbees

- Articulate structures that can be built using Strawbees
- Identify a Strawbee
- Connect Strawbees and straws
- Build a Tetrahedron using Strawbees
- Build a Prism and a Cube using Strawbees
- Students should be able to connect 2 Strawbees together with a third Strawbee
- Students should be able to connect Structures with Strawbees to create a new structure

Build an Electronic Musical Instrument

- Articulate what they have to achieve in the sandbox
- Articulate what are the parameters and constraints of the sandbox
- Articulate what the guidelines are when they encounter difficulty
- Brainstorm, plan or draw out what their project might look like
- Articulate how their project incorporates the criteria listed in the briefing
- Independently work on the concepts
- Help students troubleshoot common problems
- Assist students who are experiencing more difficulty
- Provide direction and ideas for students who are faster or who think they have finished
- Continue working on their projects
- Incorporate any feedback they have received
- Share their creations with the rest of the class
- Be able to articulate how and why they created their project

Version
Date: January 2020
Format: 8 lessons x 2 hours
Important! View speaker notes for details

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Things to note

- 🔌 **Unplugged** = Activities not involving technology (Videos, Kinaesthetic activities etc.)

- 💬 **Discussion** = Get the students to think and respond about a question

- 👫 **Guided** = Demonstration → Instructor does the activity while the student mimics)

- 👐 **Unguided** = Instructor will give the students the task and show what the final result should look like and give the students a certain amount of time to do it by themselves before moving on to "Check for Understanding"

- 🎯 **Check for Understanding** = Instructor will go through the solution with them or get a student to share the solution

- 🚀 **Sandbox** = Free-Play (Students recap what they learnt from the entire day by creating a project)

- 🎁 **Bonus** = This is given to students who are fast-paced

Materials Needed

Per student:

- 1x microbit set
  - 1x microbit
  - 1x usb
  - 1x battery pack
  - 2x AAA batteries
- 1x breakout board set
  - 1x breakout board
  - 1x buzzer
- 1x A4 paper
- 1x Chromebook/Laptop

Per class:

- 6x Box of Strawbees and Straws
- Writing materials

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Frequently Asked Questions

"What if I can't finish the activities for that particular day? "

- In the event that you can't finish all of the activities in the given time, DO NOT rush to finish the concepts and just continue where you left off the next week.
- The bonus activities are for the faster students that have completed the general task that was given to the whole class. You do not need to cover this with everyone.

"How do you know you've been teaching the right way?"

- When students are able to create their sandbox with minimal to no help from you.

Frequently Asked Questions

"What is the purpose of this course?"

- For students to practice applying Python knowledge learnt previously on a micro-controller and build structures with Strawbees to present their creations to tasks given.
- Students also learn more basic coding concepts through Python and use them via computational thinking.

"What is computational thinking?"

- Computational thinking allows us to take a complex problem, understand what the problem is and develop possible solutions. We can then present these solutions in a way that a computer, a human, or both, can understand.

Frequently Asked Questions

"Why must I follow the speaker notes and teach in a certain way? I prefer to freestyle."

- For follow-up purposes as there will be cases where you might be unable to teach your class on a particular day and another instructor will need to cover you.

Frequently Asked Questions

" Can students bring home the Strawbees structure?"

  - No, but they can take pictures of their structures before dismantling them.

" Can students bring home the microbit set?"

  - No, but they can take videos of their projects/ pictures of their structures before dismantling them.

"Can students buy the Strawbees or microbit set?"

  - No.

PYTHON

LEVEL 2

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Attendance Taking

Please ensure that your attendance has been taken at the start of every lesson.

You will need to attain 80% attendance in order to graduate from this course.

Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	...
✔	✔	✔	✔	✔	...

Recap & Agenda

15 min

Today's Lesson

- Introduction to Strawbees

- Create your own Electronic Musical Instrument

Introduction to Strawbees

What are Strawbees?

Strawbees.®
THE FUTURE OF LEARNING

What structures did you see in the video?

What other structures can we build with Strawbees?

5 min

Learn about the Two Legged Strawbee

10 min

Introduce the 3bee and 3D shapes

How many triangles can be observed in the Tetrahedron?

10 min

Building more 3D Shapes

What other 3D shapes can you think of?

Try and build
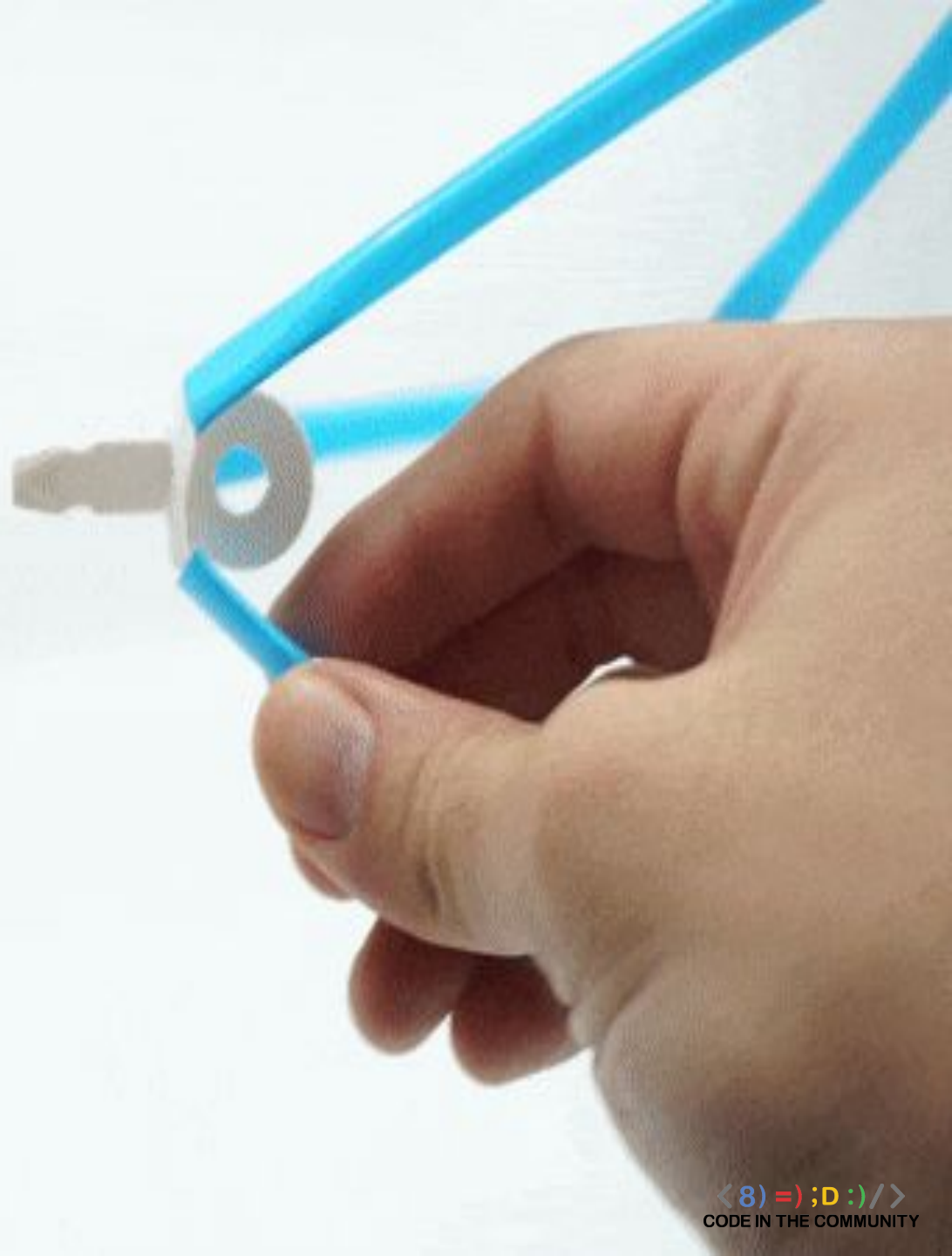# a Prism and a Cube

Connecting 3D shapes to Build Structures

Connect any two 3D shapes using a one bee

Sandbox
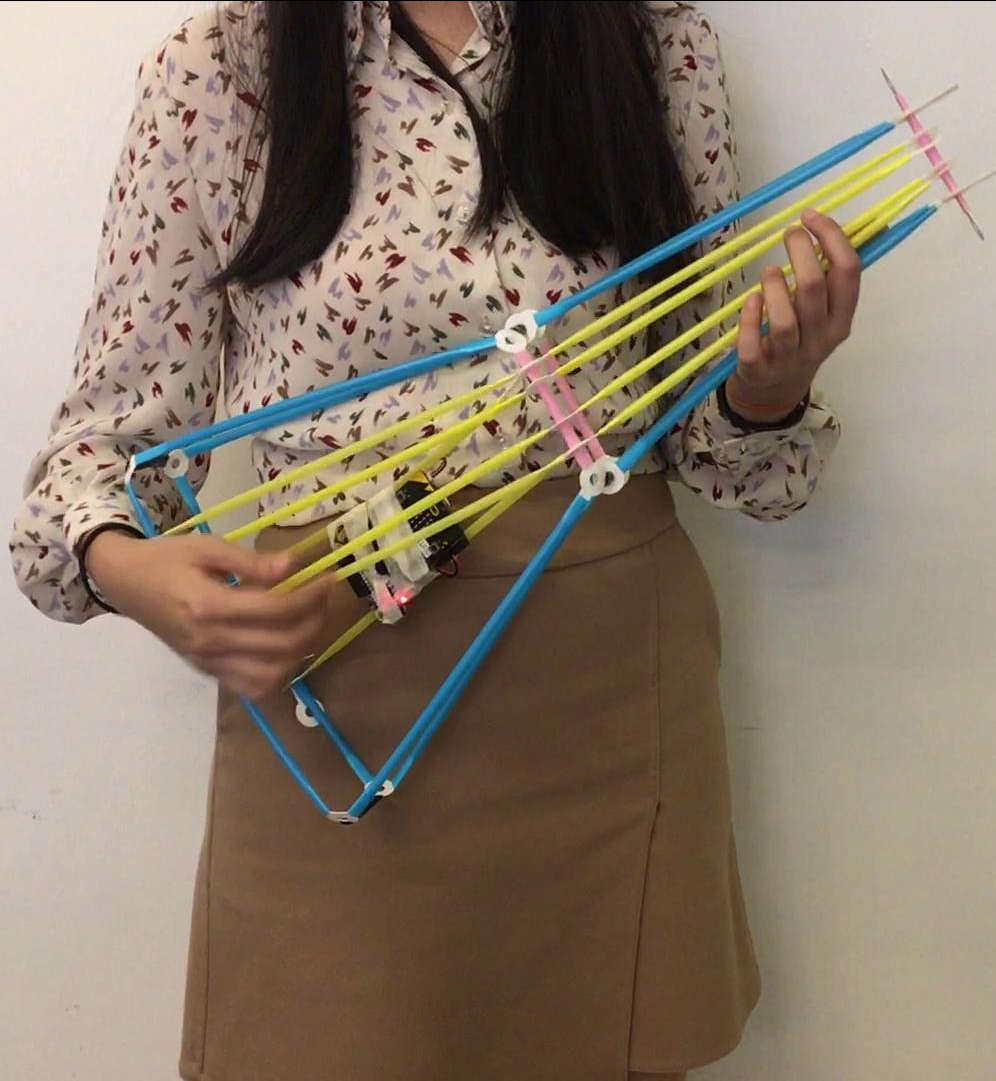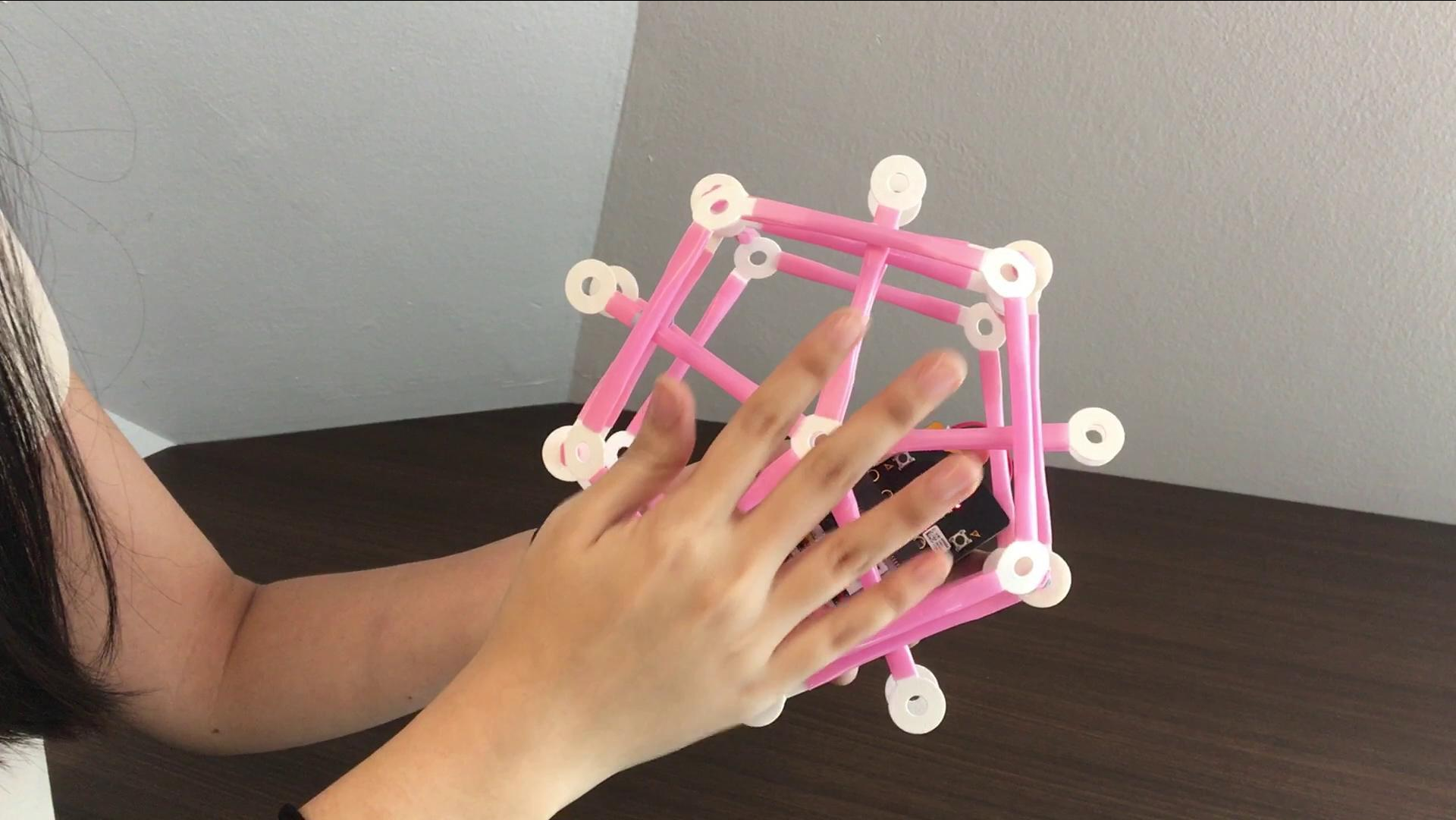
55 min

🚀 **Sandbox**

5 min
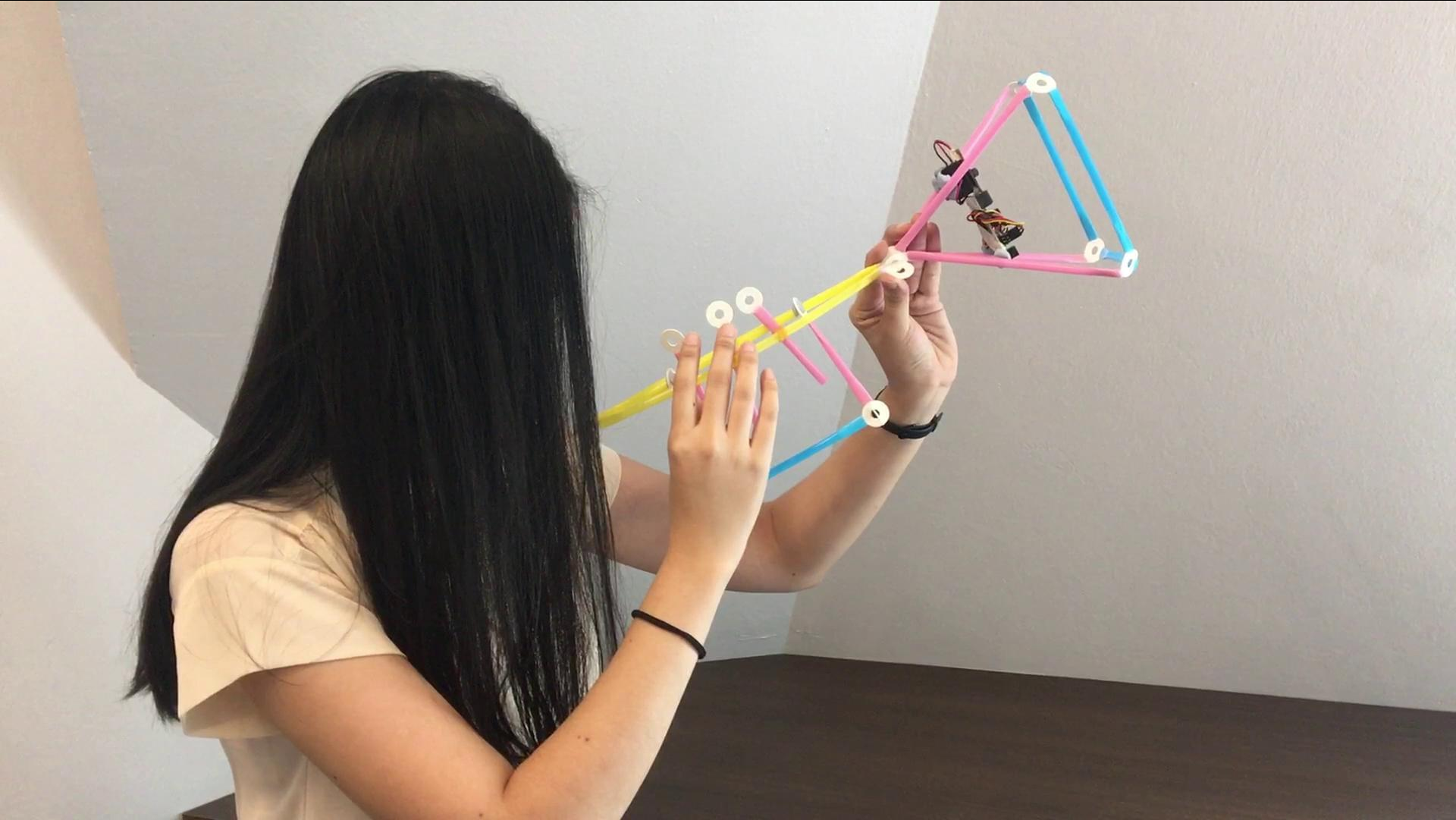
Briefing & Inspiration
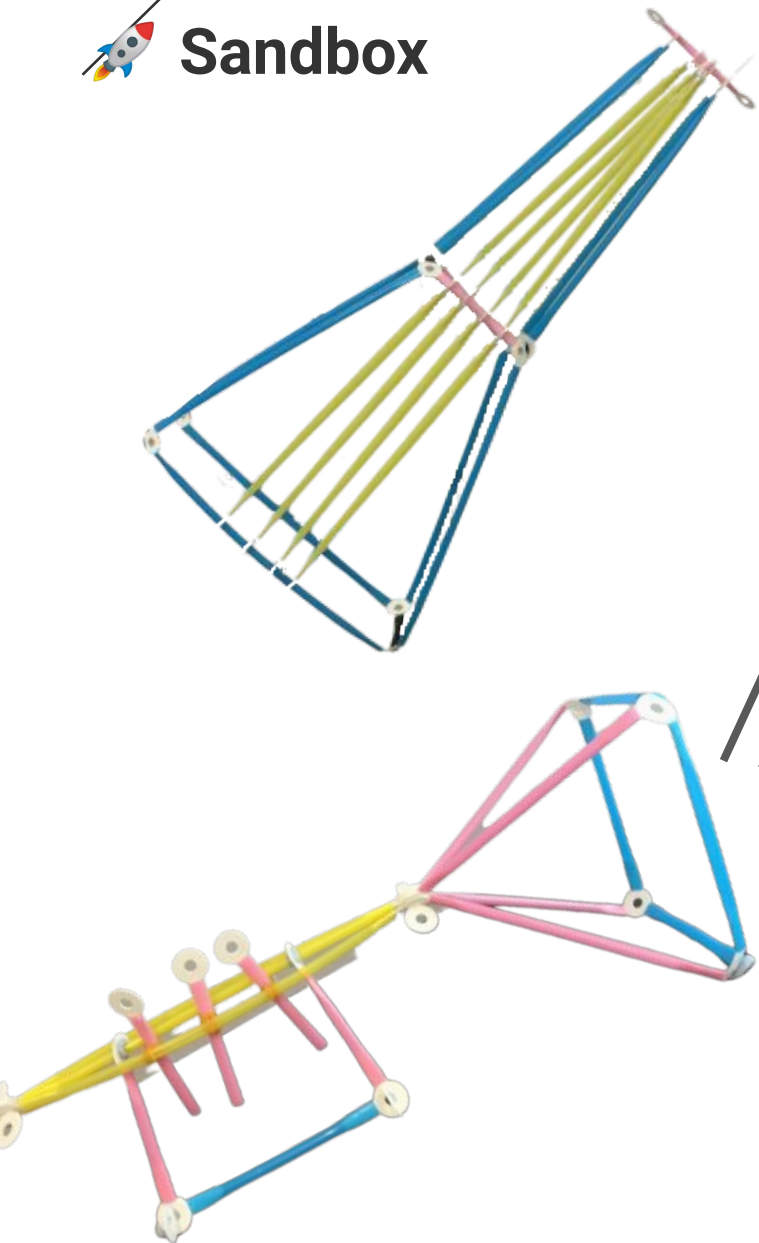
Build an Electronic Musical Instrument

Things to Take Note

You have to

- Use **only** Strawbees to make the structure of your instrument
- Make use of the music project from the previous lesson
- If you encounter any problems, Google it

🚀 **Sandbox**

- **Planning (5 mins)**
- **Making (20 mins)**
- **Help Time (5 mins)**
- **Testing & Iteration (10 mins)**
- **Sharing**

5 min

Planning

5:00

Plan and draw out your Music Instrument

Remember to
- Use **only** Strawbees to make the structure of your instrument
- Make use of the music project from the previous lesson

20:00

Making

🚀 **Sandbox**

5:00

Help & Feedback Time

5:00

Testing & Iteration

💾 **Give your project a name and save it!**

🚀 **Sandbox**

15 min

Sharing

🚀 **Sandbox**

5:00

- **Give your Musical Instrument a name.**

- **What Instrument did you build?**

- **How does the Instrument work?**

- **Which concepts/skills that we've learnt in the past days have you made use of?**

- **How have you made use of these concepts/skills?**

🚀 **Sandbox**

Time for Show-and-Tell

Teardown

10:00