04.Drummer robot

1.Introduction

Strange plans to organize a big concert with his classmates,

Recently Strange is struggling with the problem of stage accompaniment.

The concert needs someone who can play Musical Instruments to help with the accompaniment.

Can you help Strange?



Strange

1.Introduction

Today we need to help Strange design an automatic drum beating machine, so that the concert will be more colorful and interesting.



1.Introduction



The drummer robot should have a drum and a drumstick to hit it.

How do we make the drum sound louder?

2.Exploration

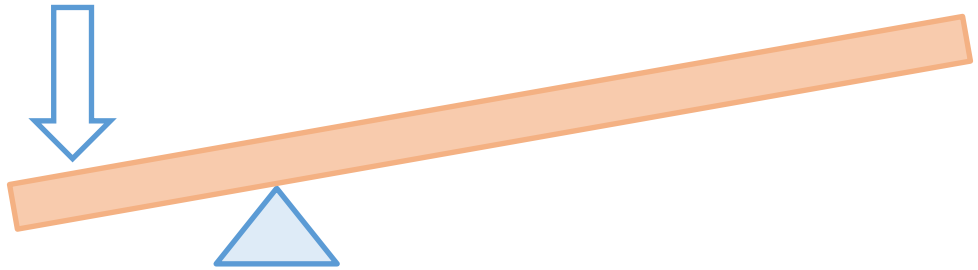


The higher the drum sticks go, the louder the drum beats.
Is there any way to increase the height of the drum sticks?

2.Exploration

We can use the leverage principle.

The resistance/load arm is longer than the power/effort arm. Although it is more strenuous, it also increases the distance of the resistance arm.



3.Construction

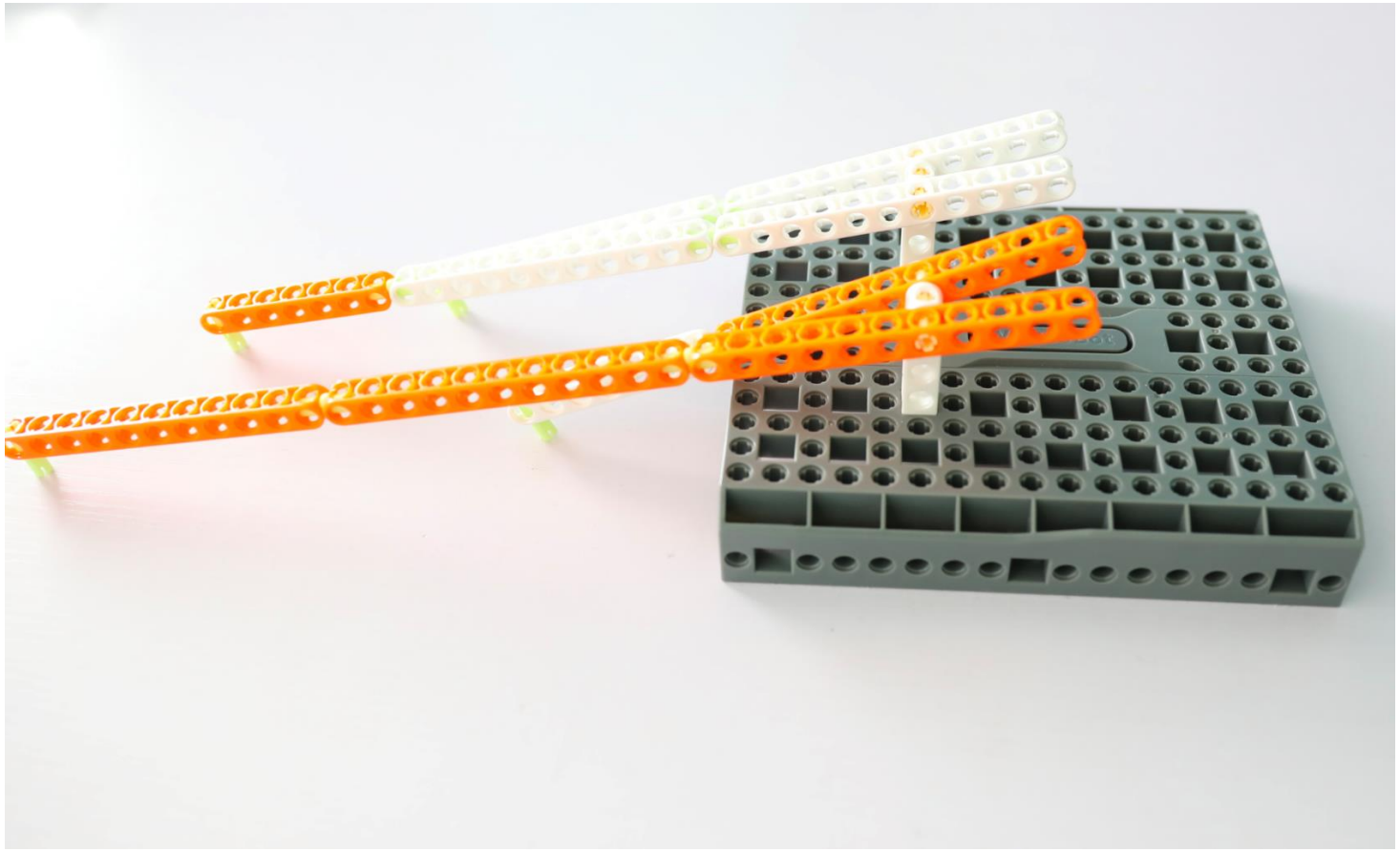
Let's start building the drummer robot.

When you hit the drum, the end of the drumstick moves up and down around your hand.

If we imagine the drumstick as a beam, how do we make the beam move up and down?



3.Construction



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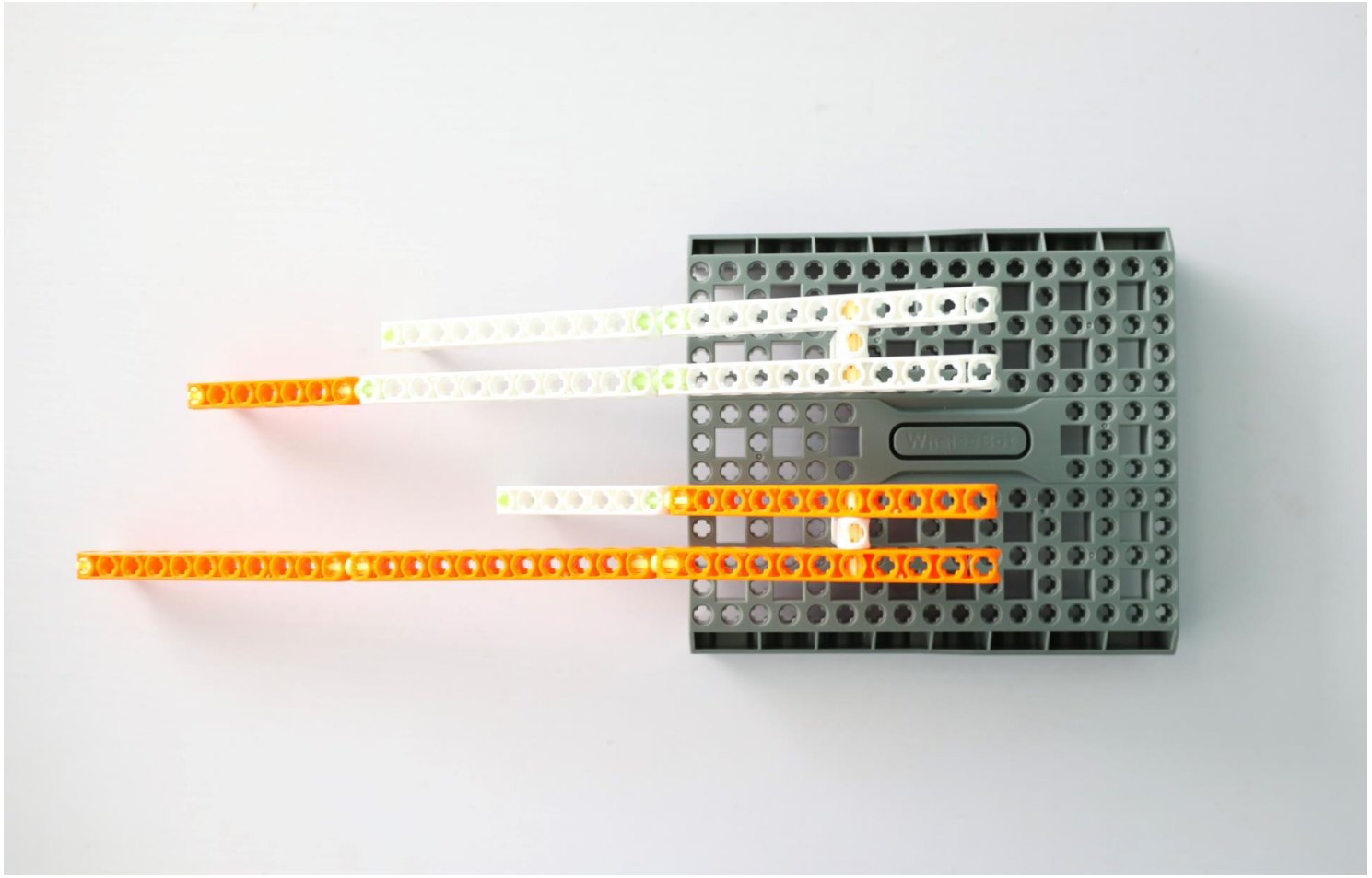

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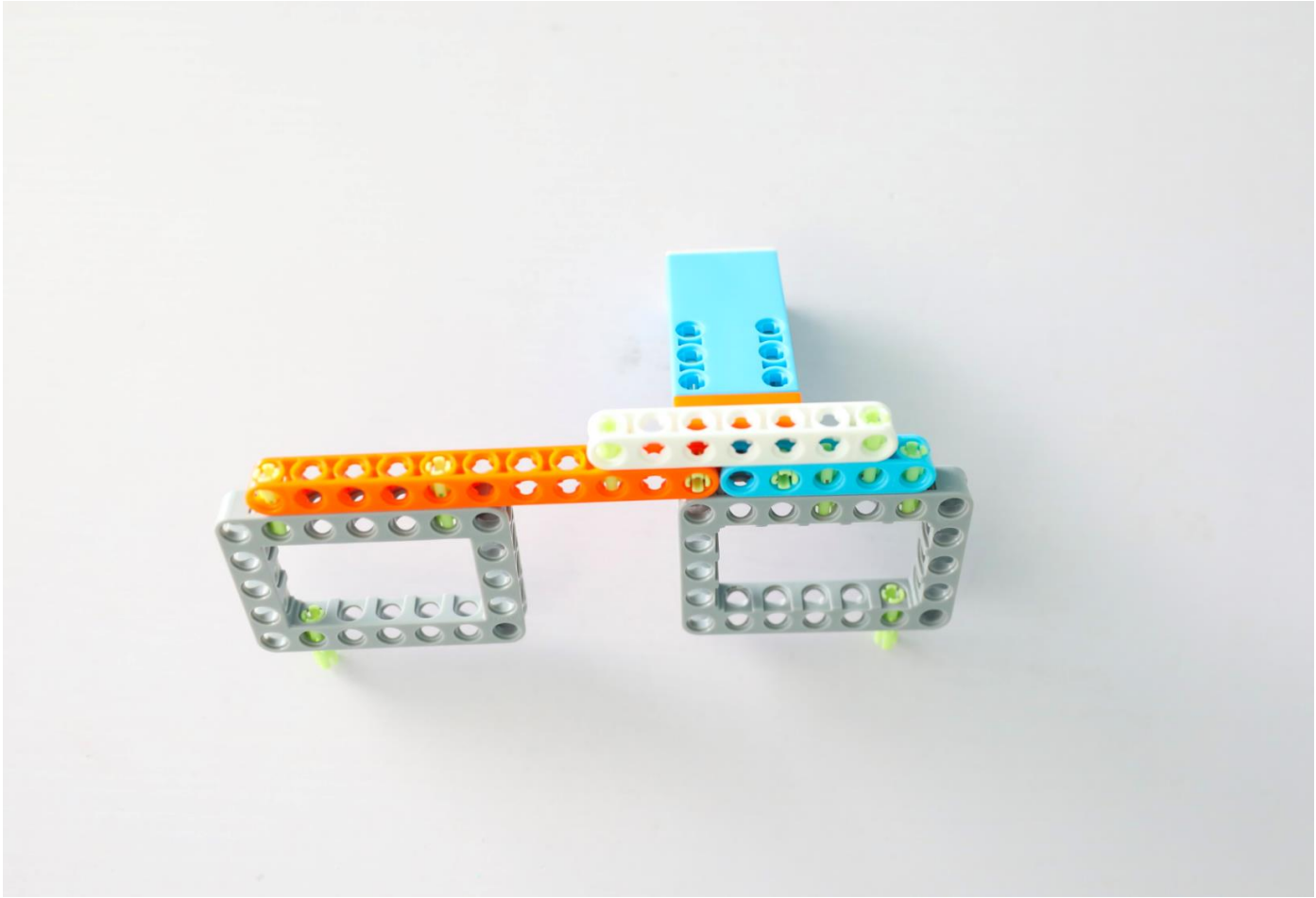

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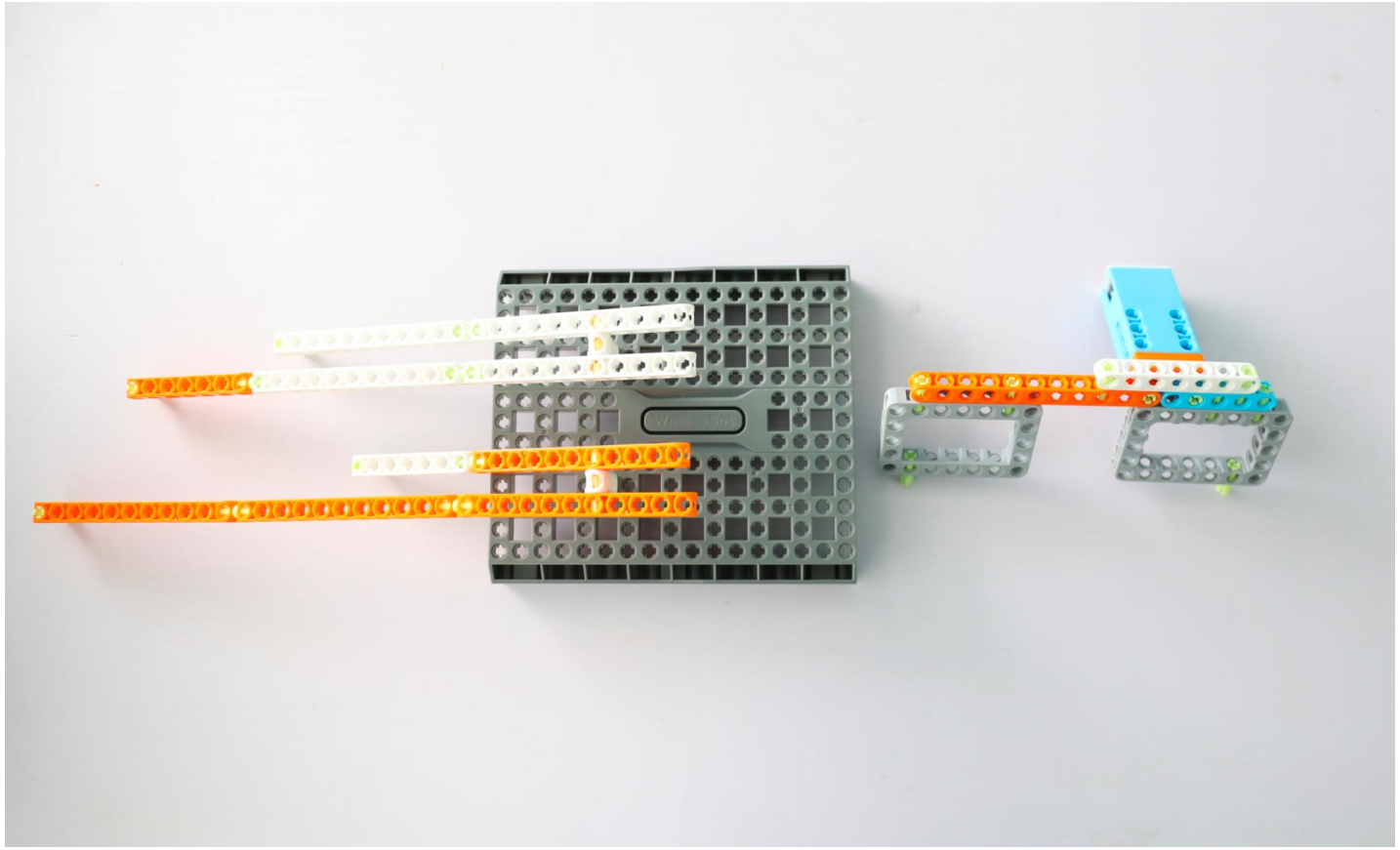

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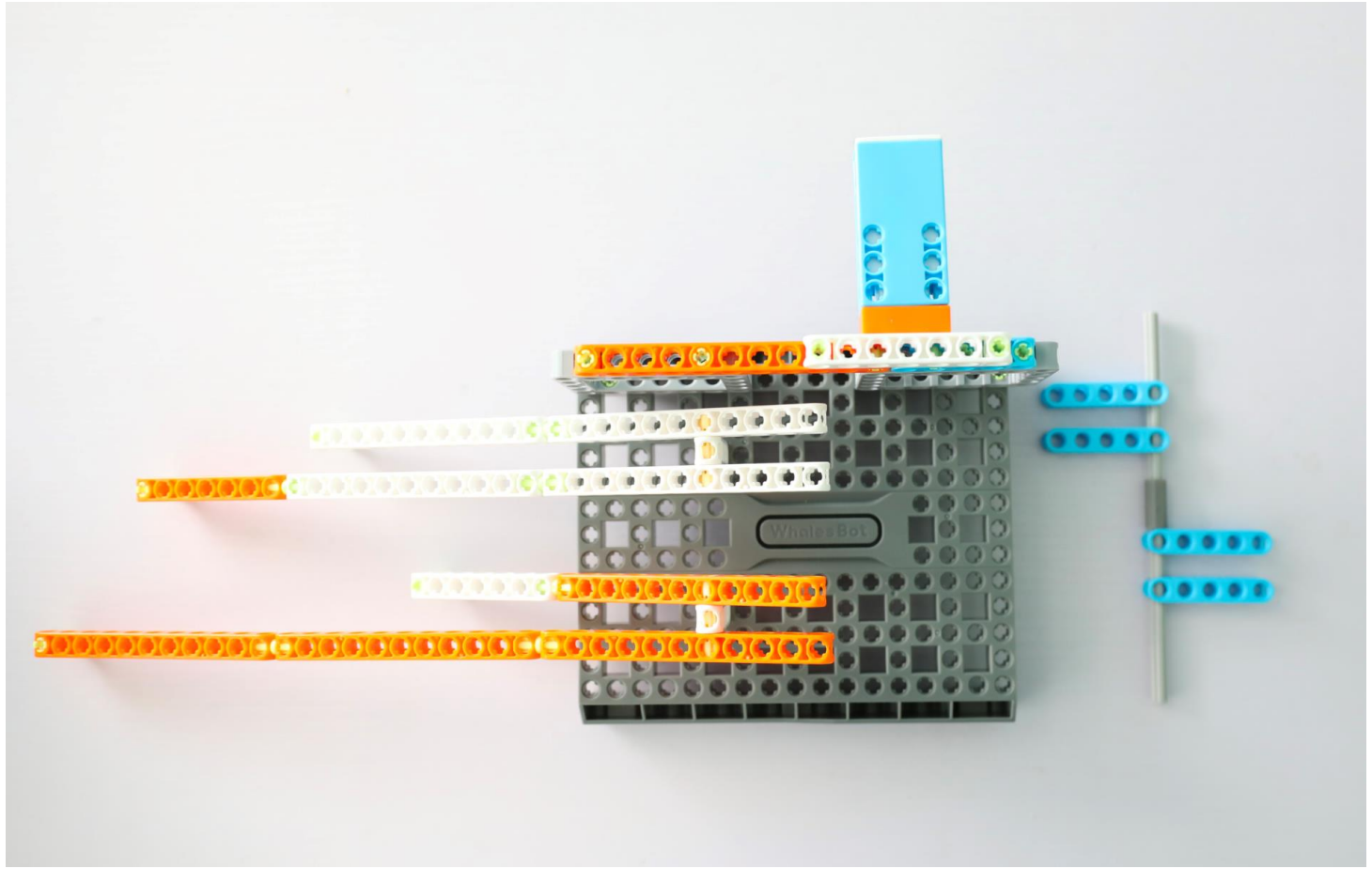

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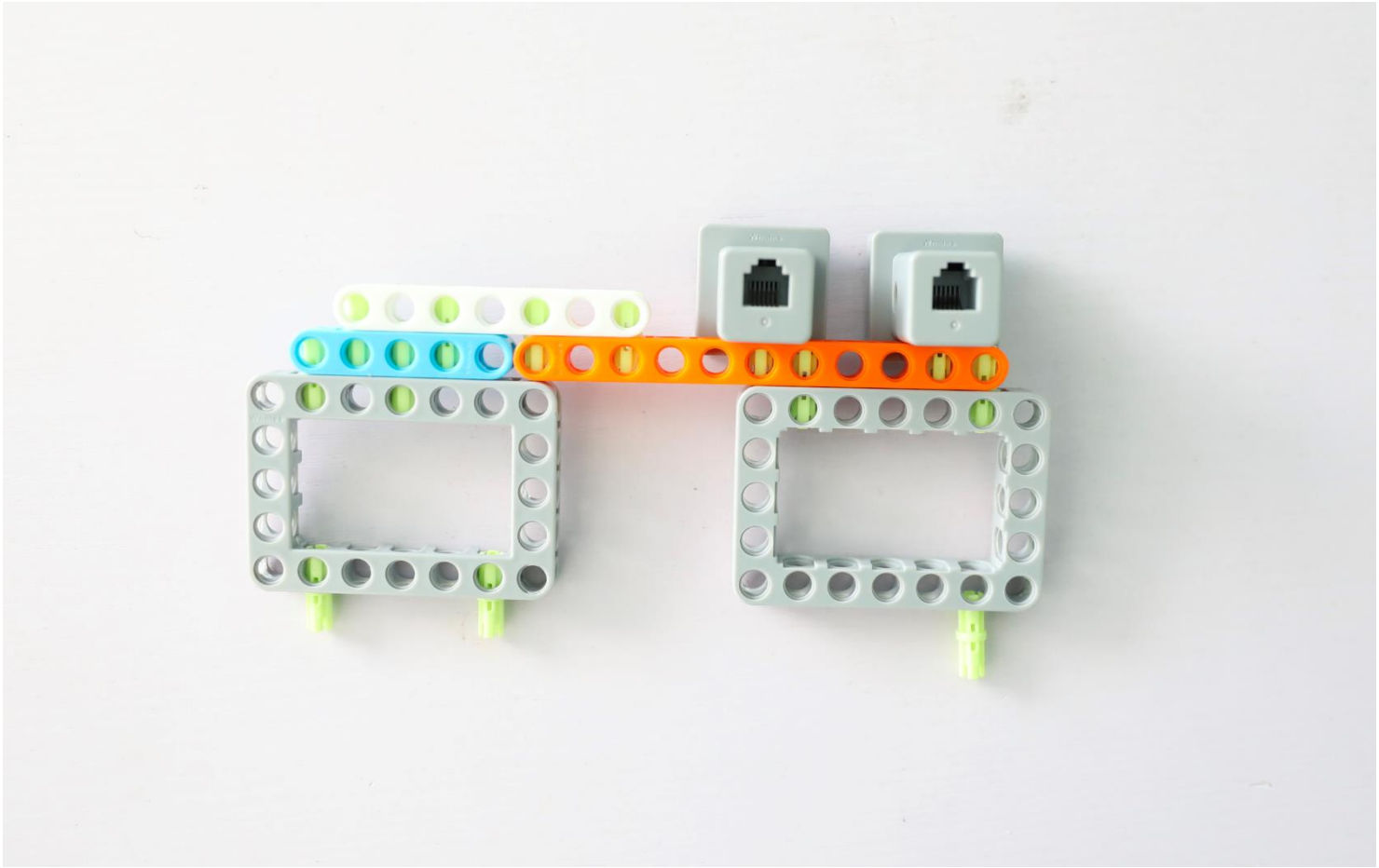

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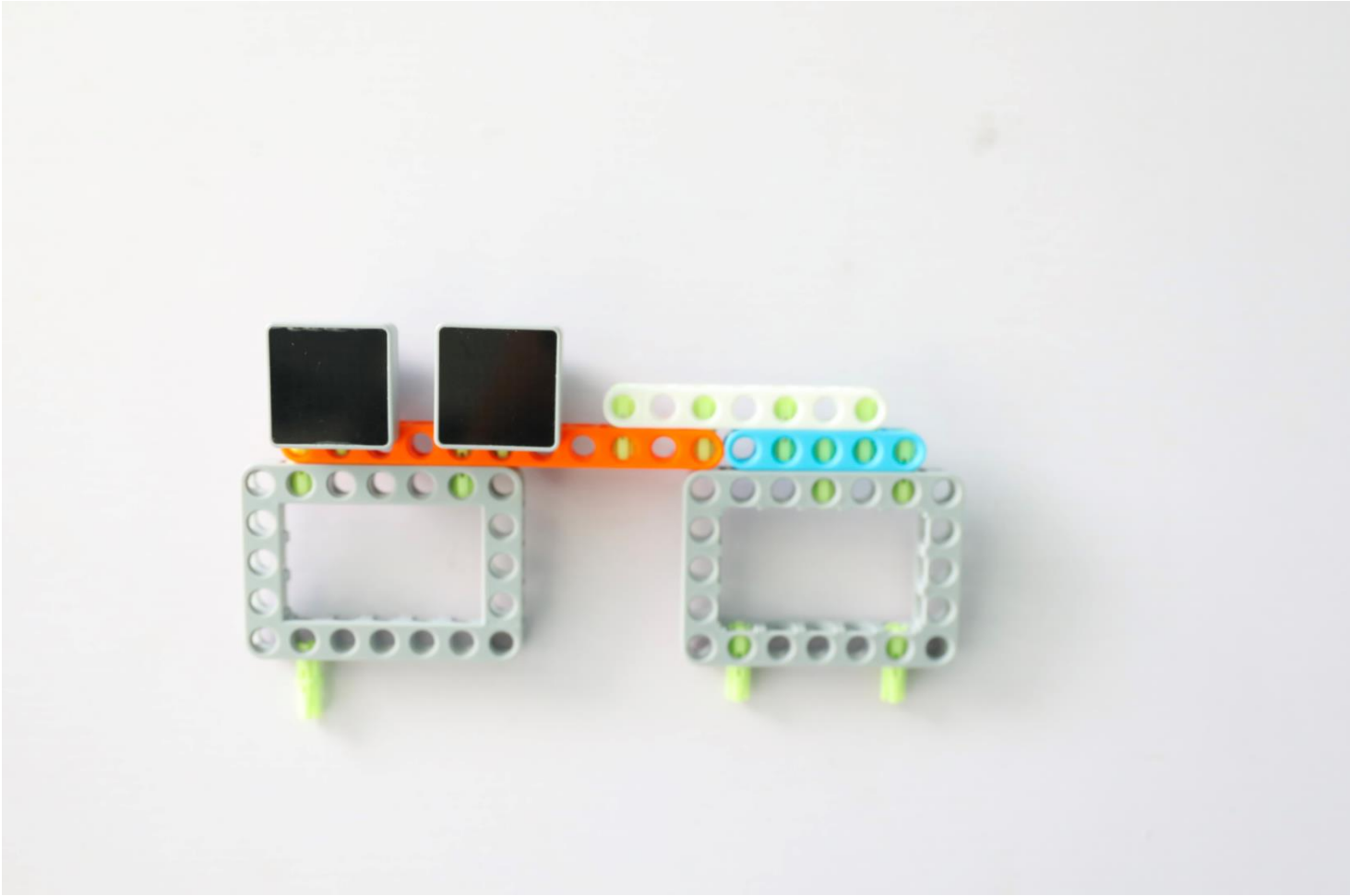

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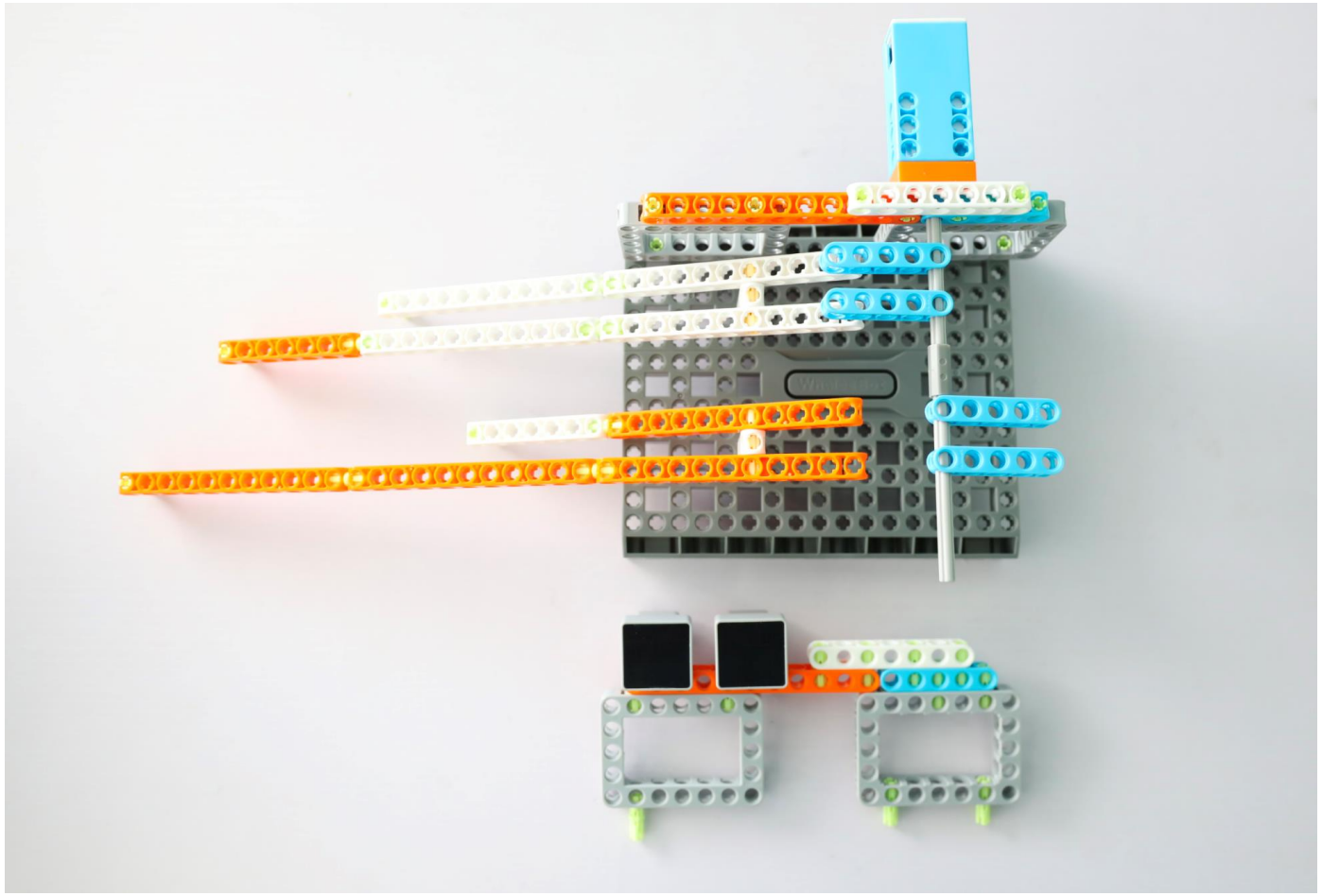

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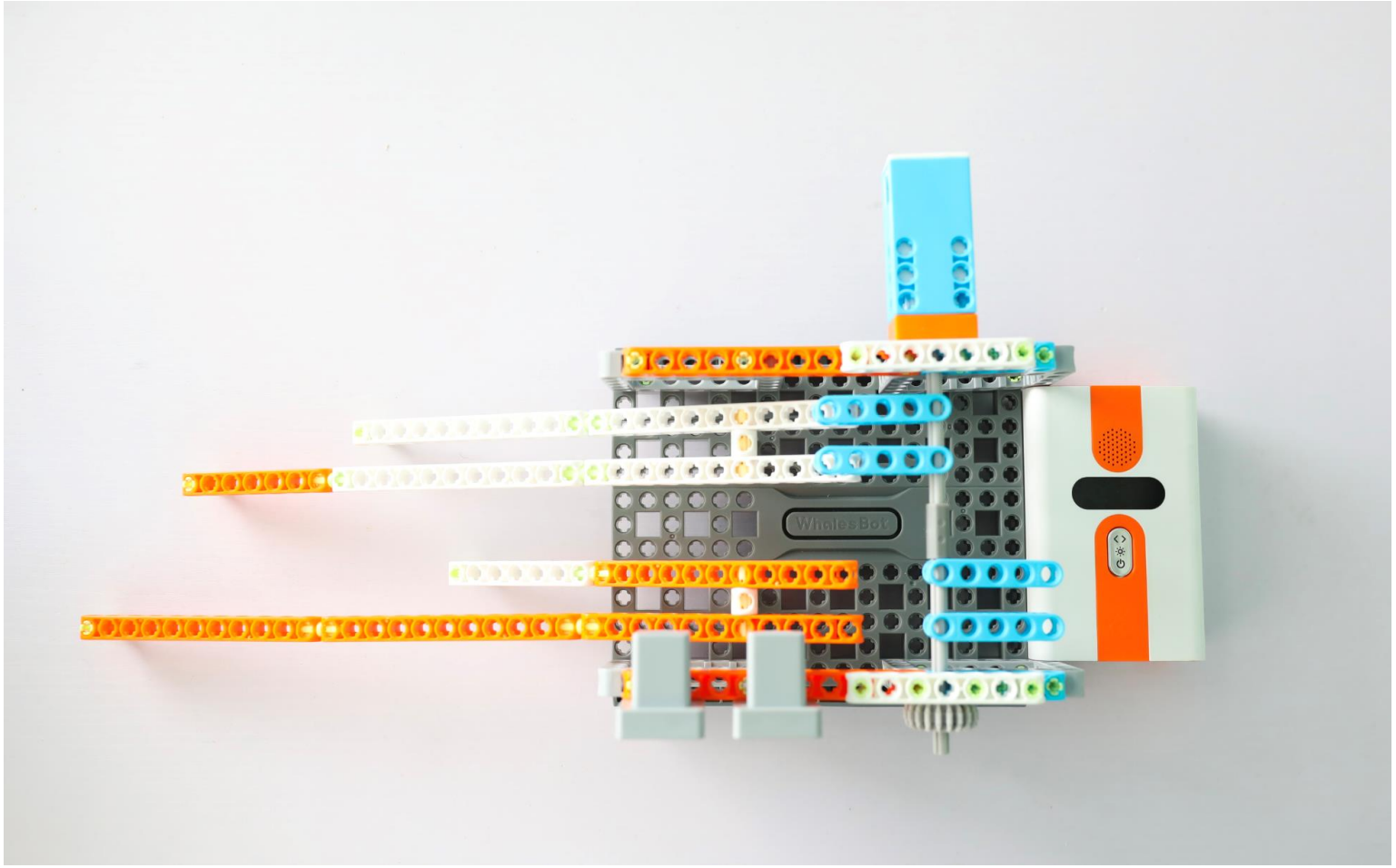


3.Construction

Connect the motor to port A.
Connect the emotion screen to port 1 and 2.

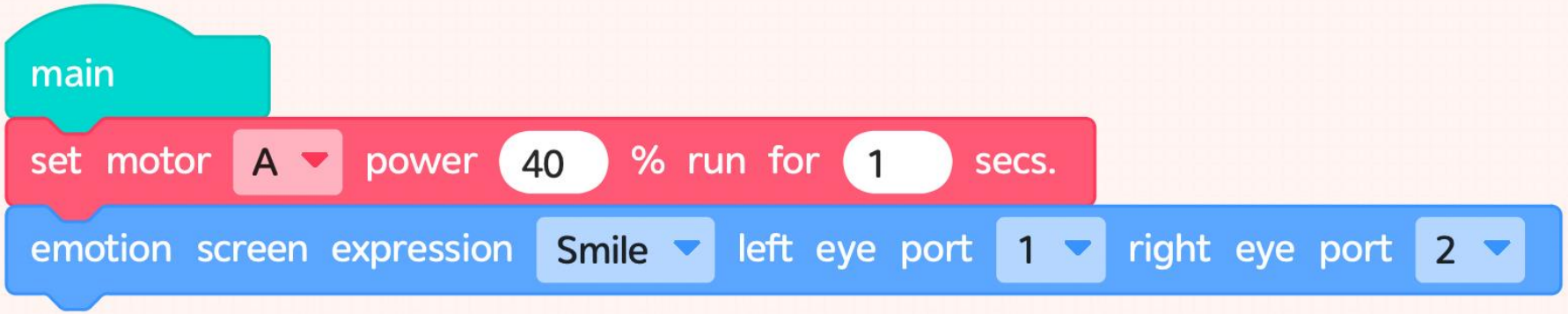


4.Coding

The four sticks have different lengths, so they beat at different times.
In the first task, control the sticks to hit four rhythms in turn, and make the emotion screen display a smiling face.



4.Coding


main
set motor A power 40 % run for 1 secs.
emotion screen expression Smile left eye port 1 right eye port 2

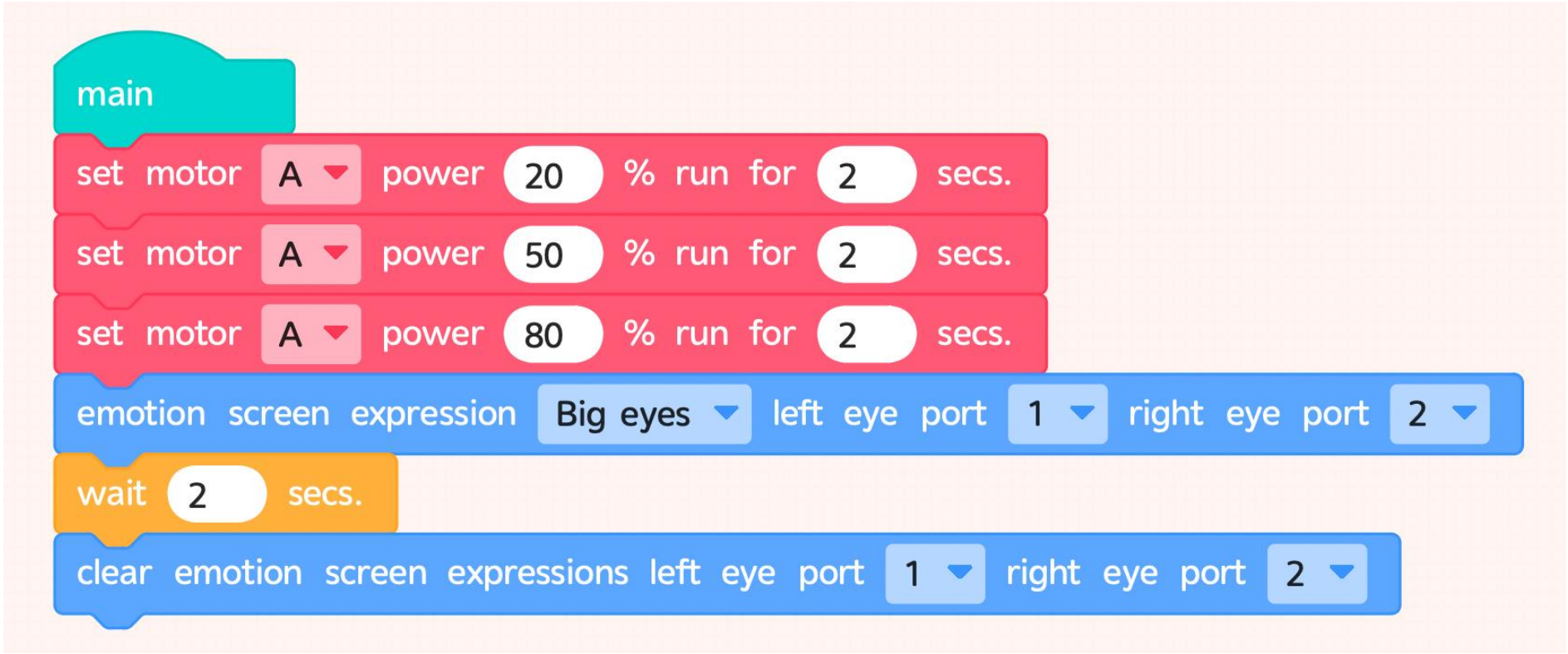
4.Coding

The drummer robot starts with slow speed, then medium speed and lastly fast speed to beat the drum for 2 seconds respectively.

After completing beat the drum, the emotion screens display big eyes for 2 seconds.



4.Coding


main
set motor A power 20 % run for 2 secs.
set motor A power 50 % run for 2 secs.
set motor A power 80 % run for 2 secs.
emotion screen expression Big eyes left eye port 1 right eye port 2
wait 2 secs.
clear emotion screen expressions left eye port 1 right eye port 2

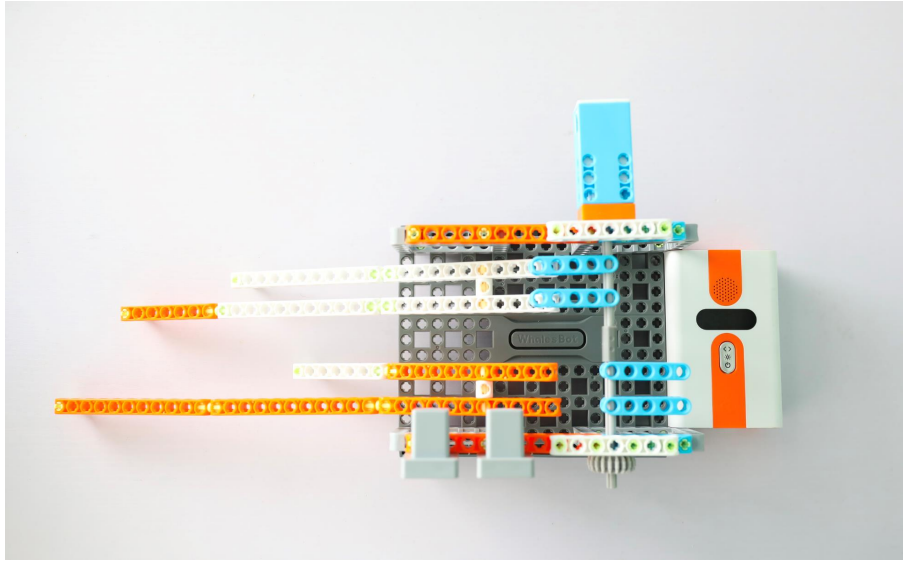
5.Evaluation

How many times does the drummer robot hit the drum surface when the motor turns around?





6.Challenge



Reinforce the drum sticks if they are getting loose after some time.

Amend the start time, angle of the motor or other possible mechanism independently to produce different rhythms