



# Microbit Robotics Beginner Level 2

## Lesson 7

### Smart Piggy Bank

Presented by Advanced Superlogic Team

# Today's Topic

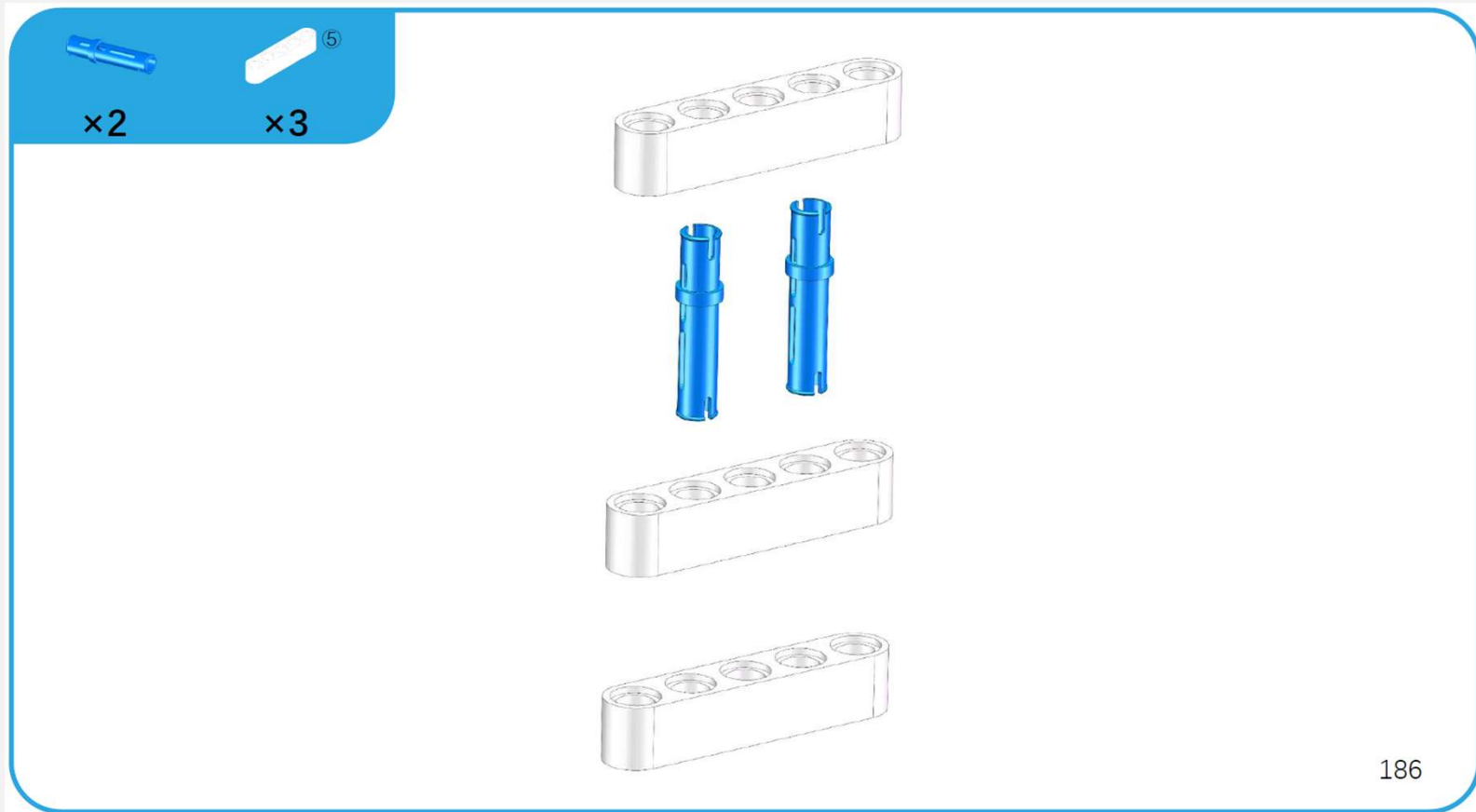
- 1. Build a Smart Piggy Bank with World of Modules**
- 2. Infrared and Digital tube connection method**
- 3. Infrared programming**

## Learning Outcome

- 1. Able to build Smart Piggy Bank with instruction manual**
- 2. Understand Infrared programming work**
- 3. Able to program Smart Piggy Bank**

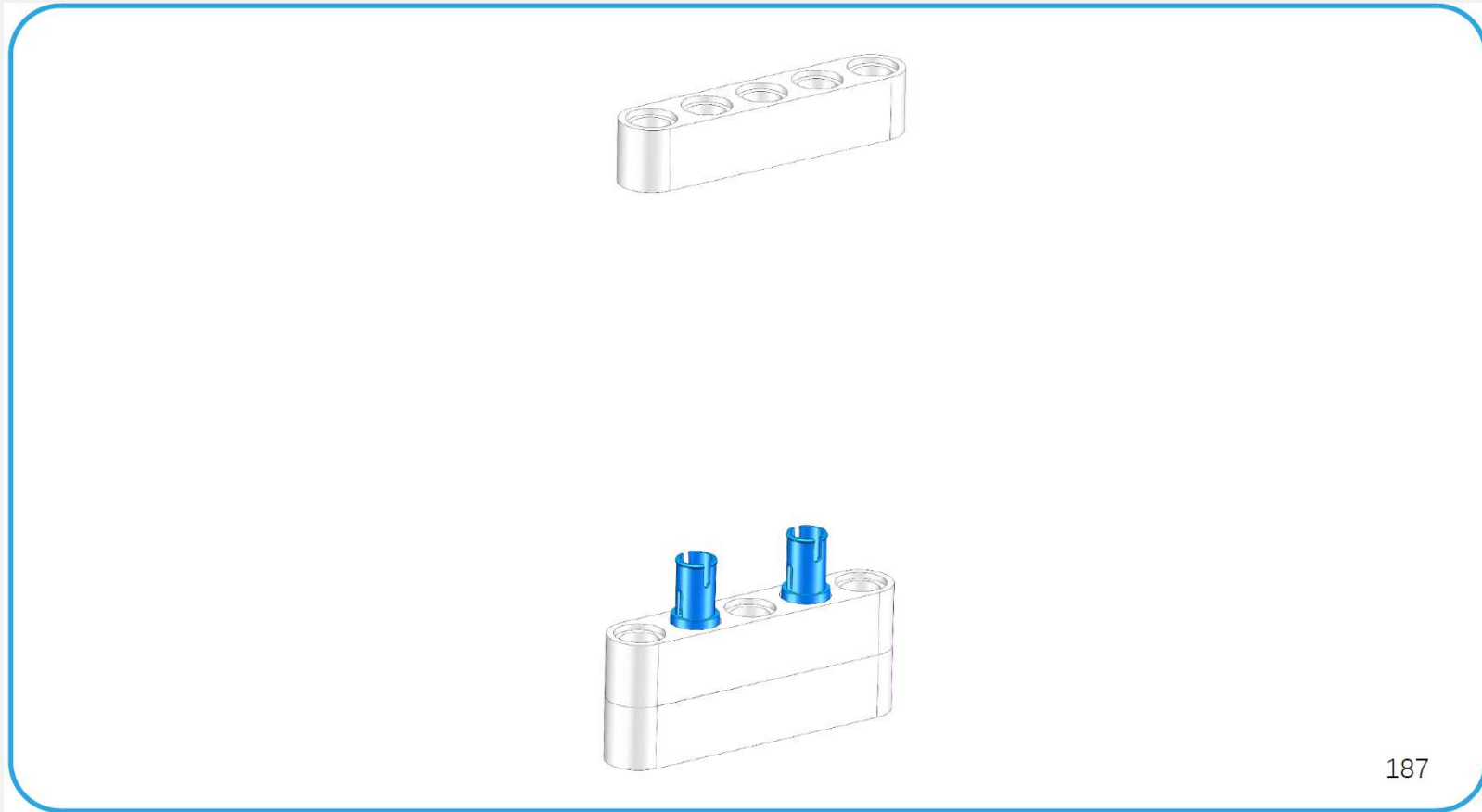
# Smart Piggy Bank

# Step 1



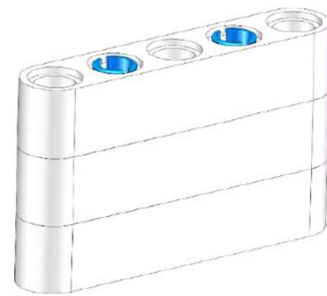
186

## Step 2



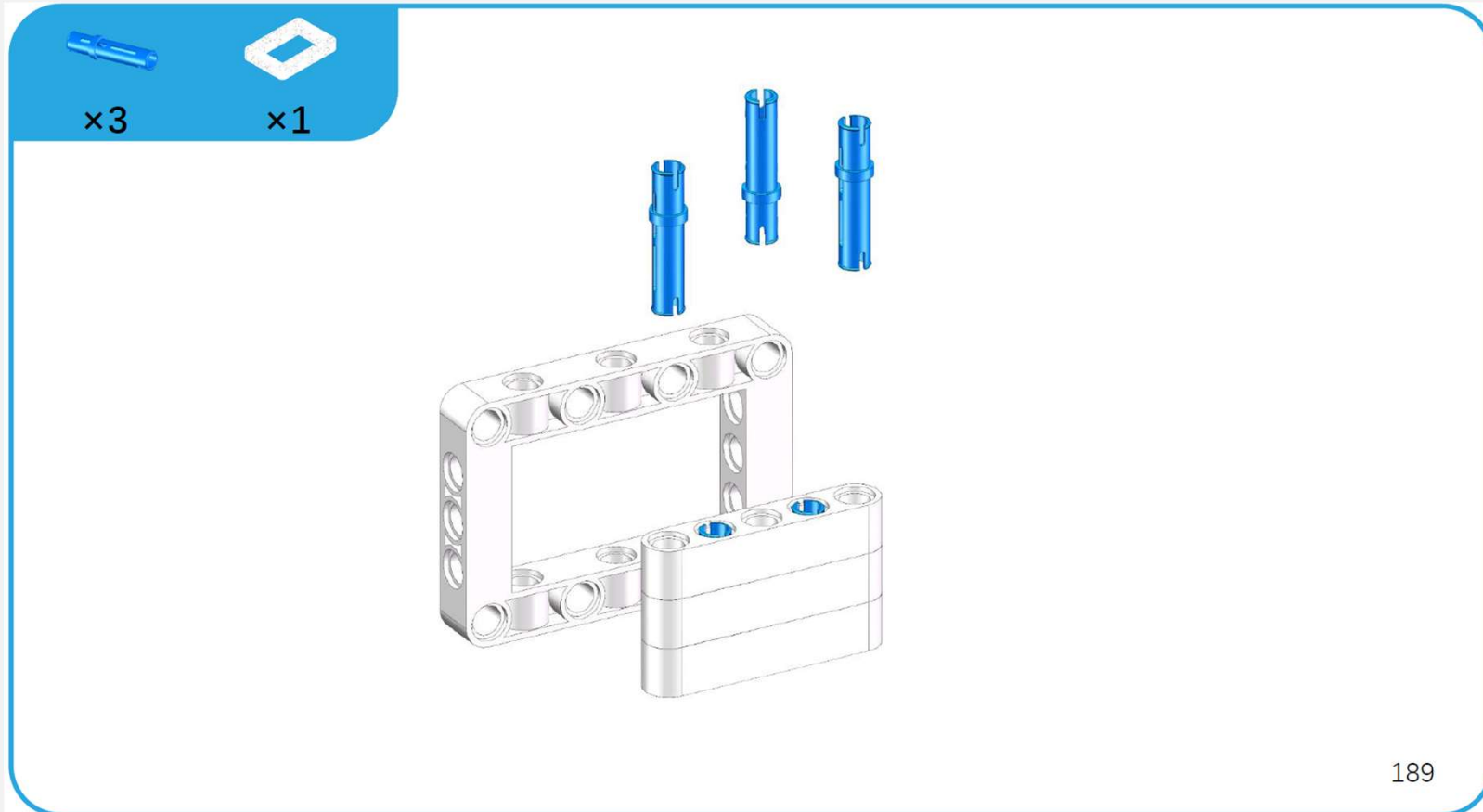
187

## Step 3

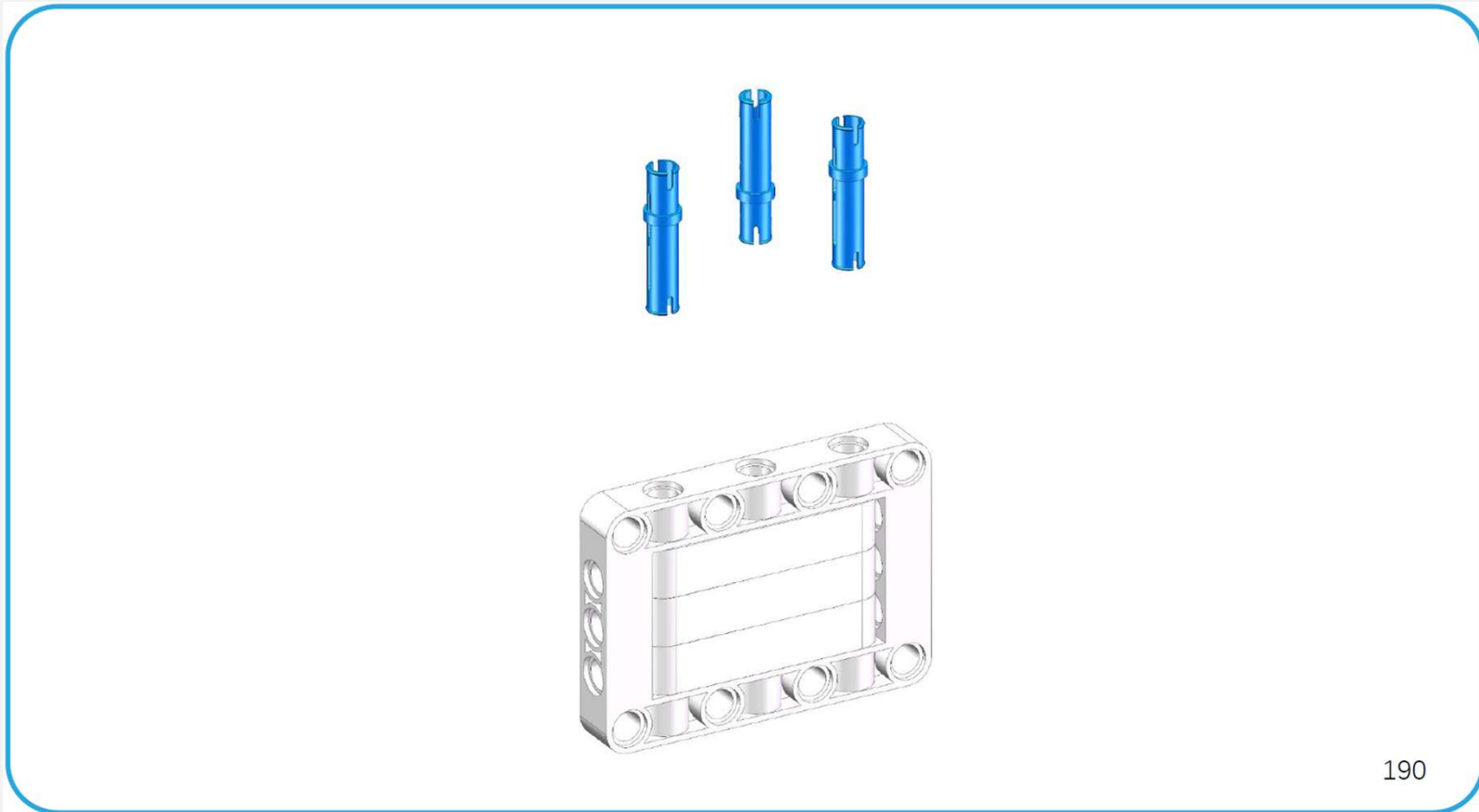


188

# Step 4

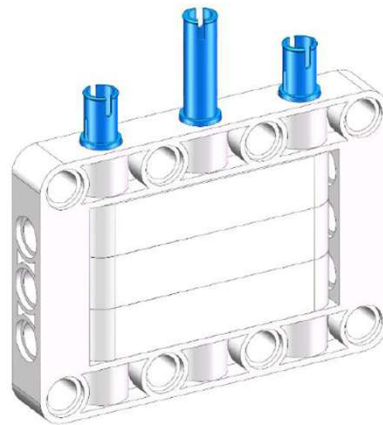


## Step 5



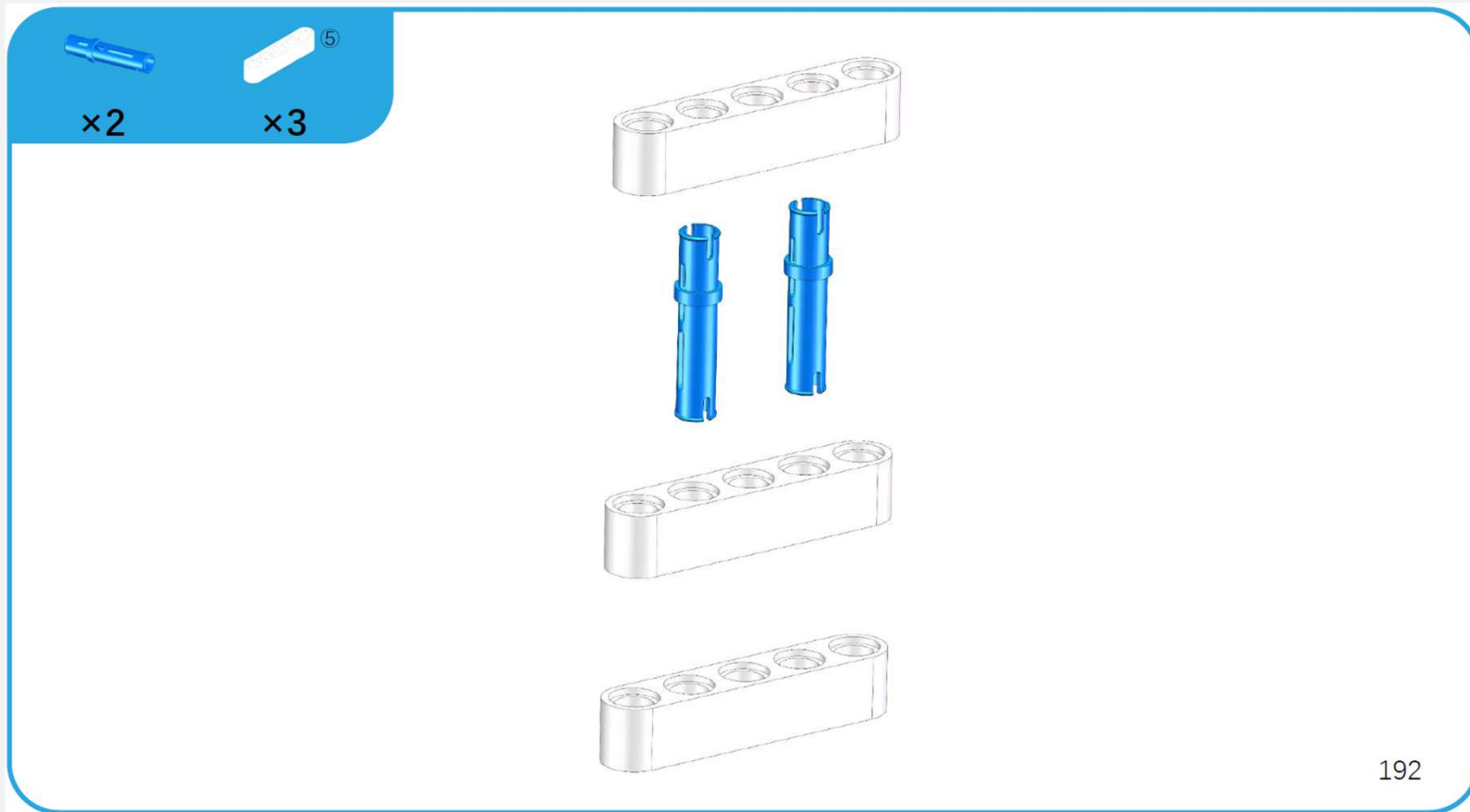
190

## Step 6



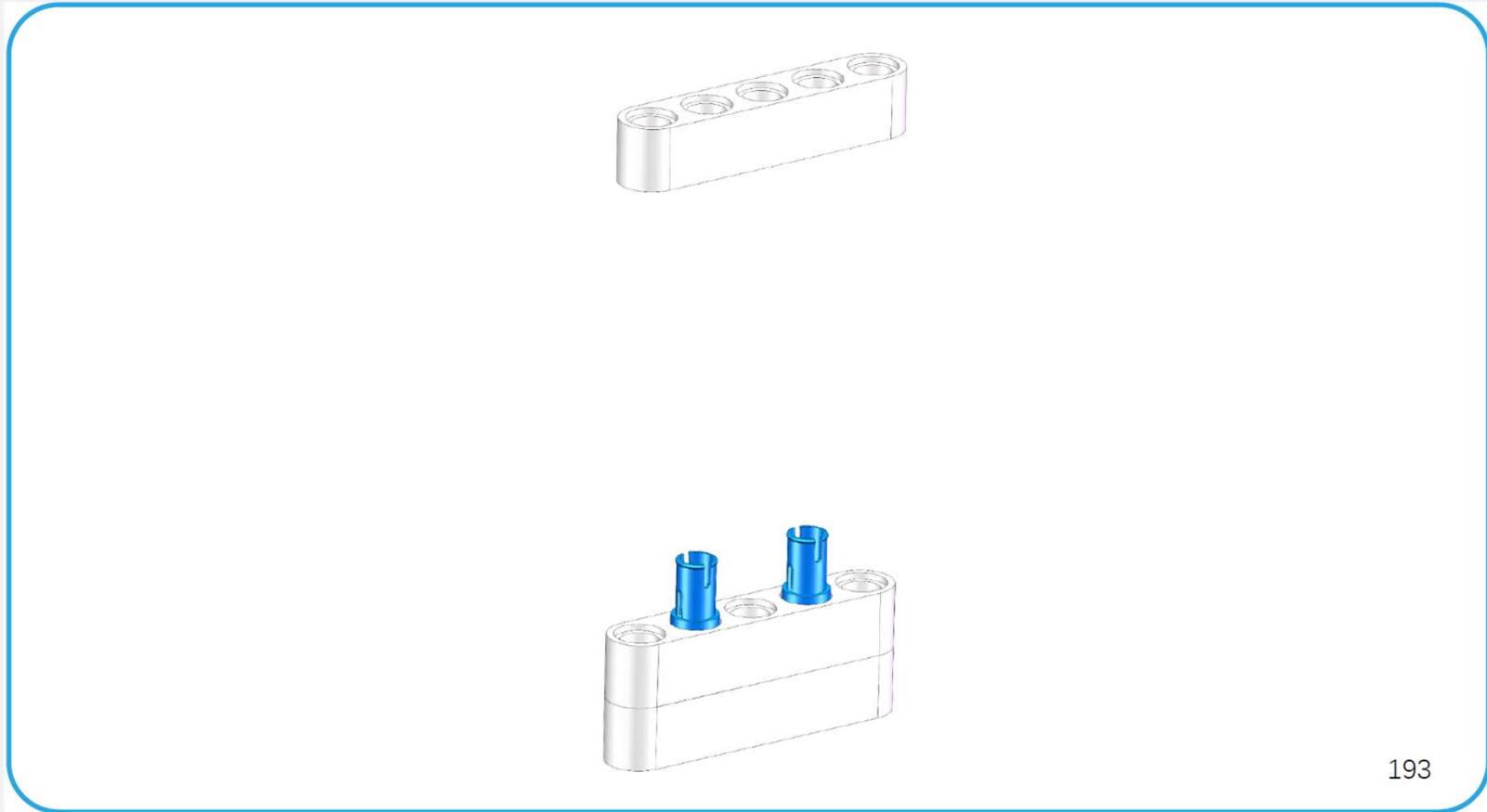
191

# Step 7



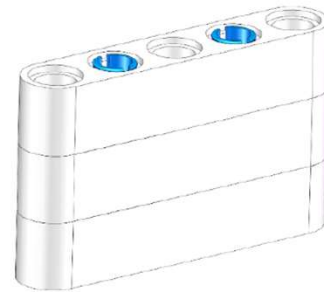
192

## Step 8



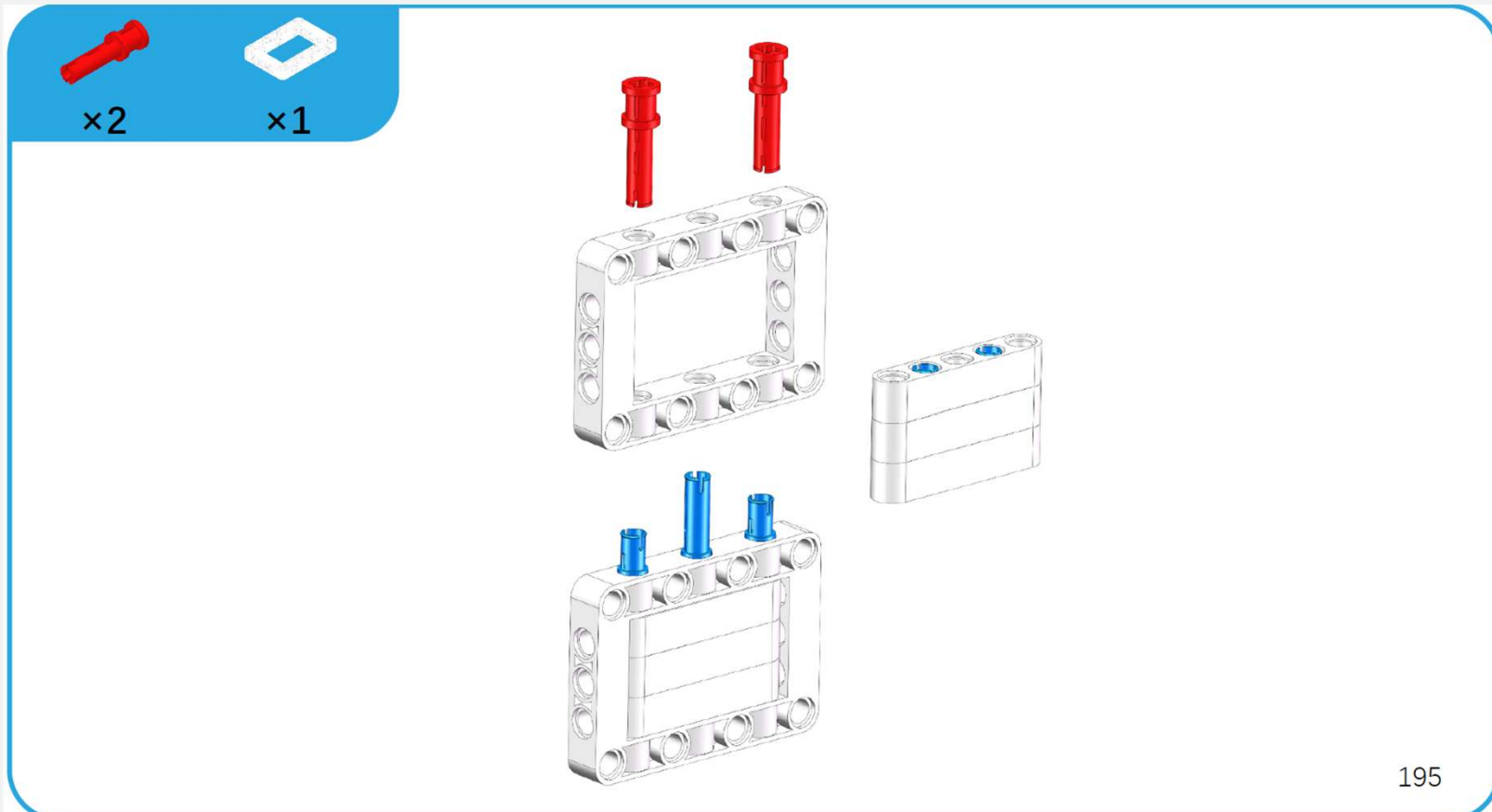
193

## Step 9

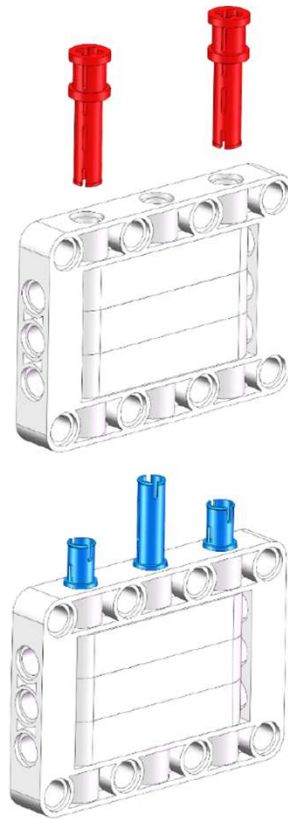


194

# Step 10

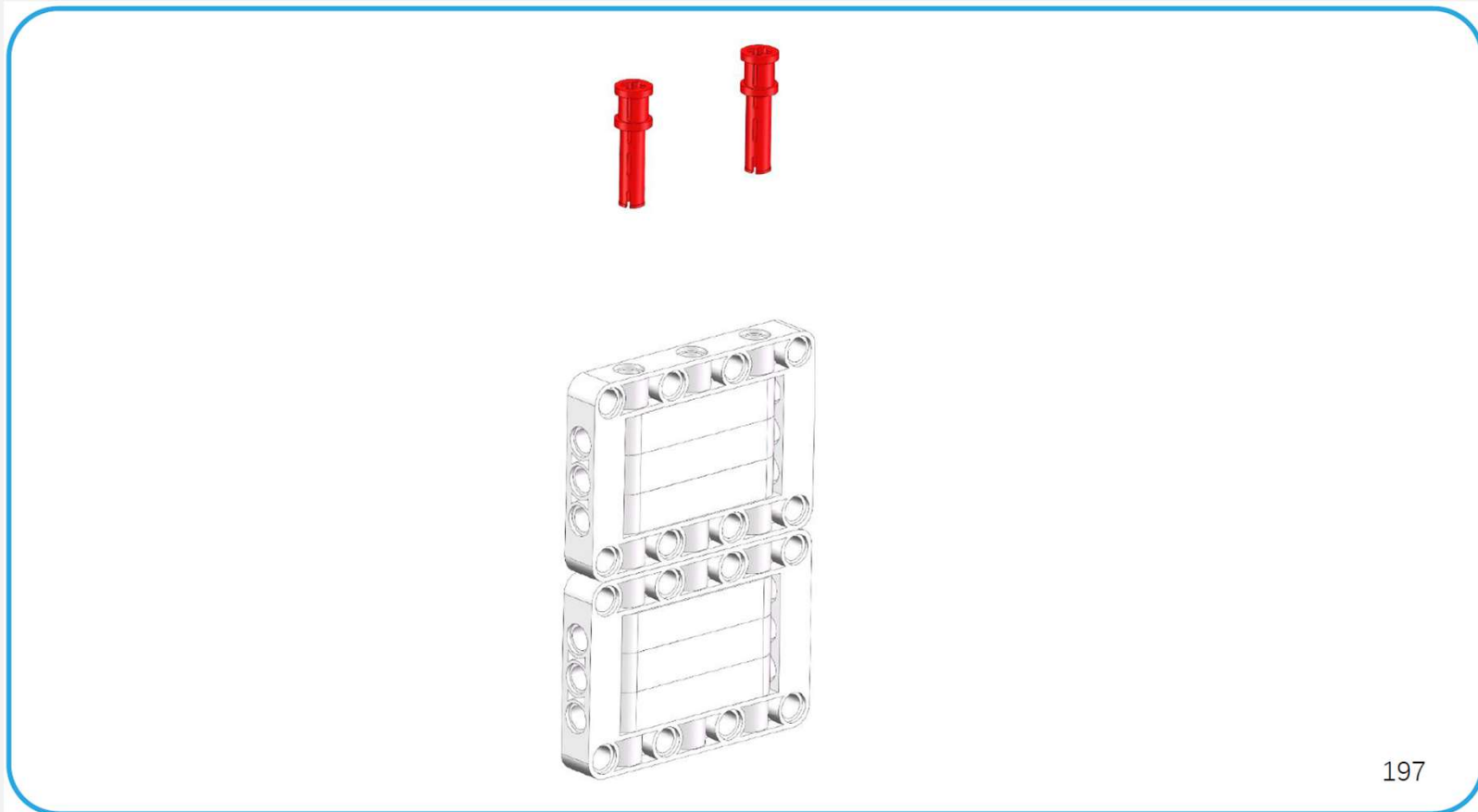


## Step 11



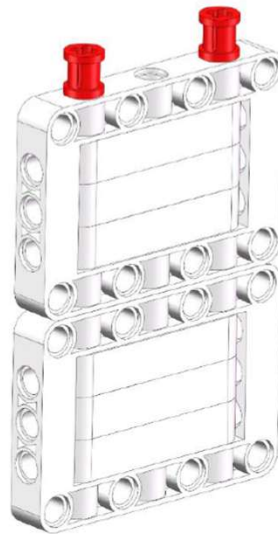
196

## Step 12



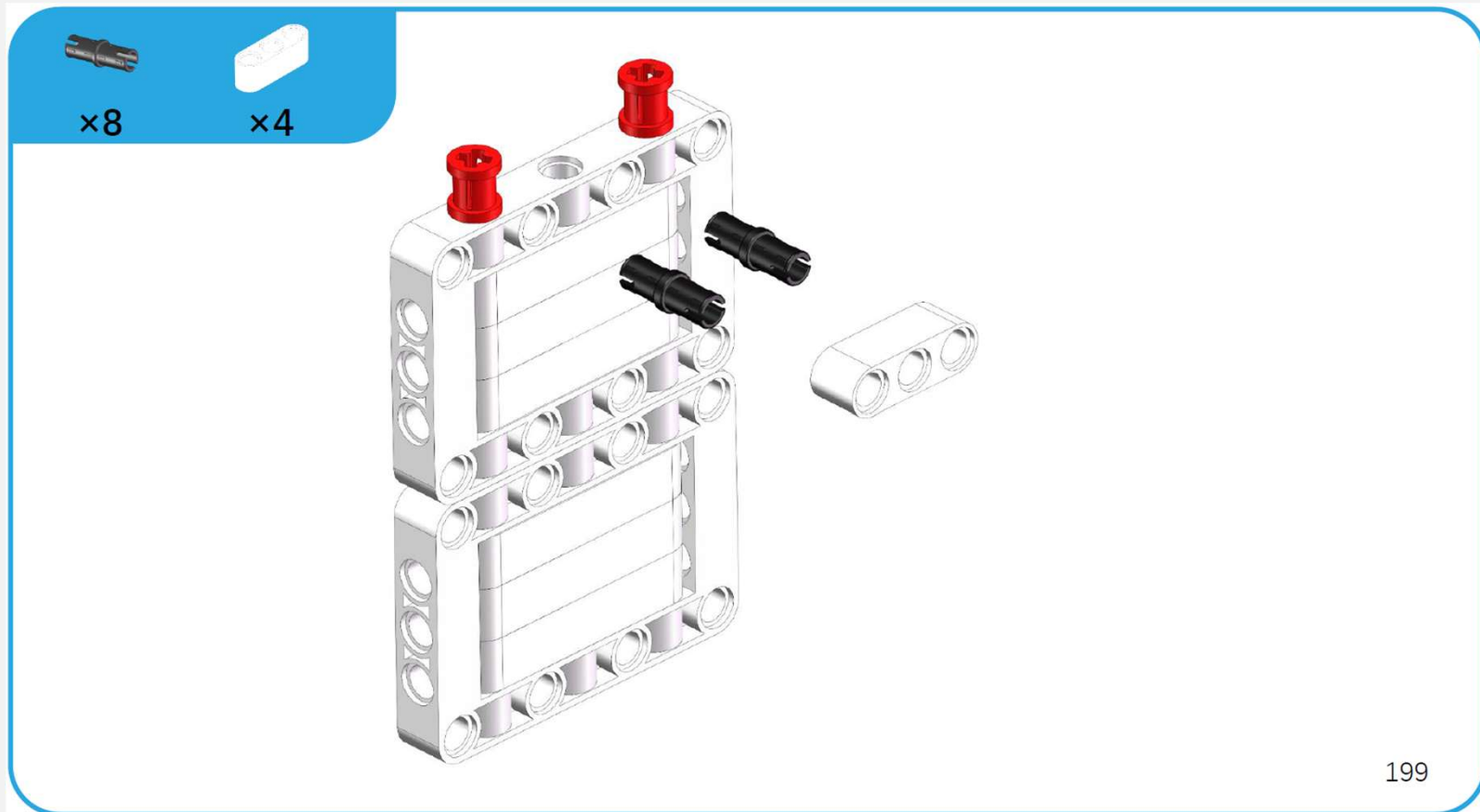
197

## Step 13

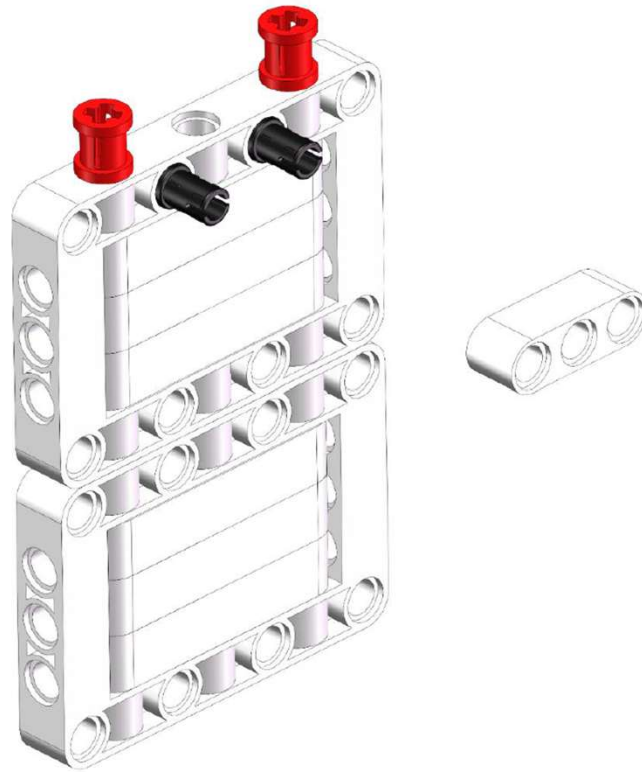


198

# Step 14

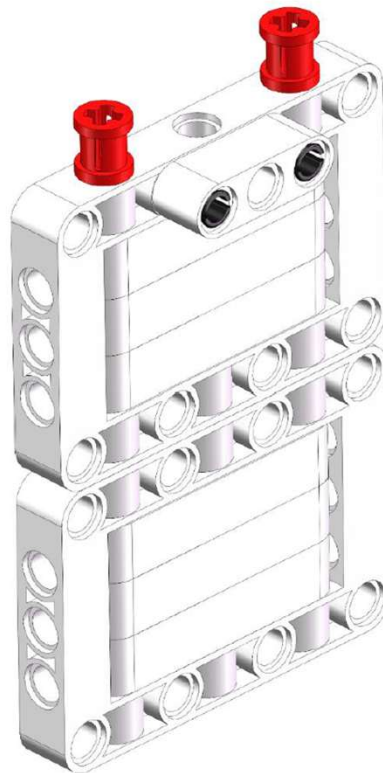


## Step 15



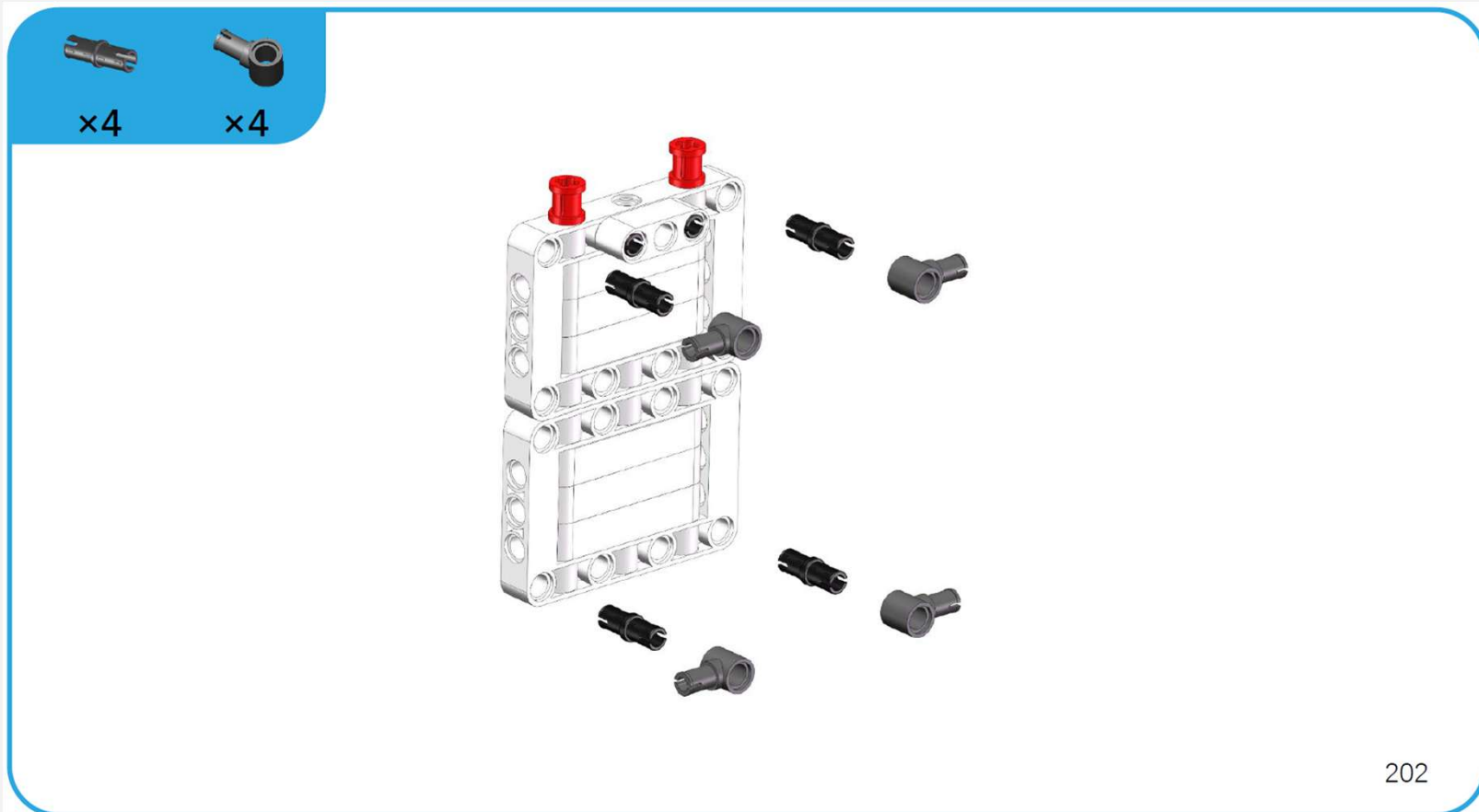
200

## Step 16

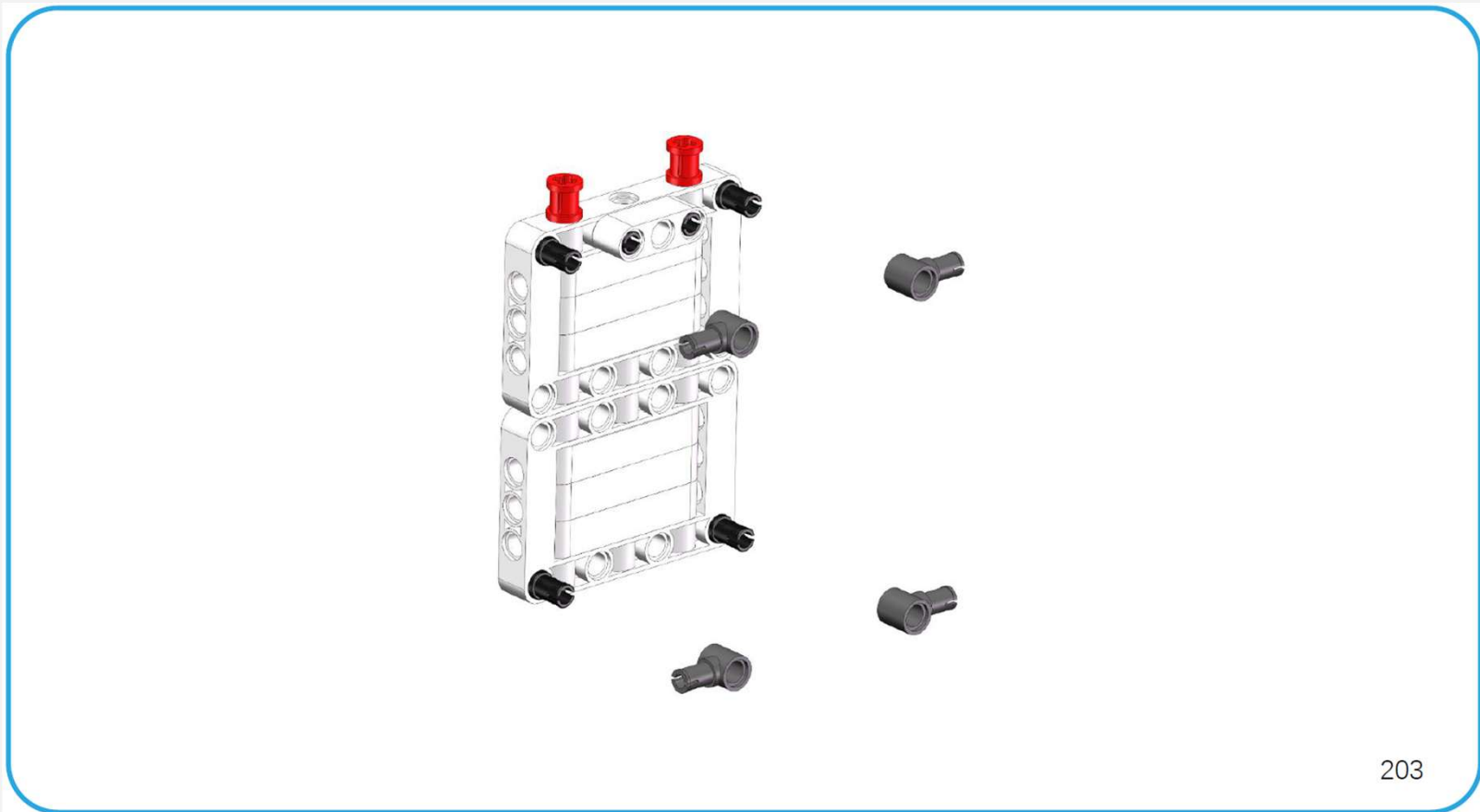


201

# Step 17

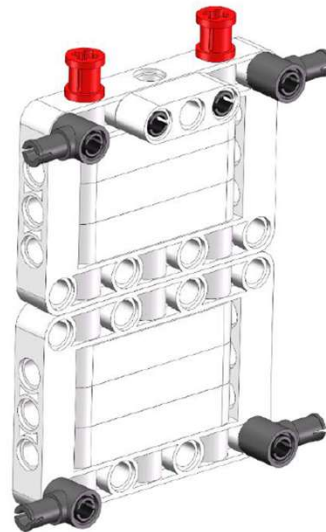


# Step 18



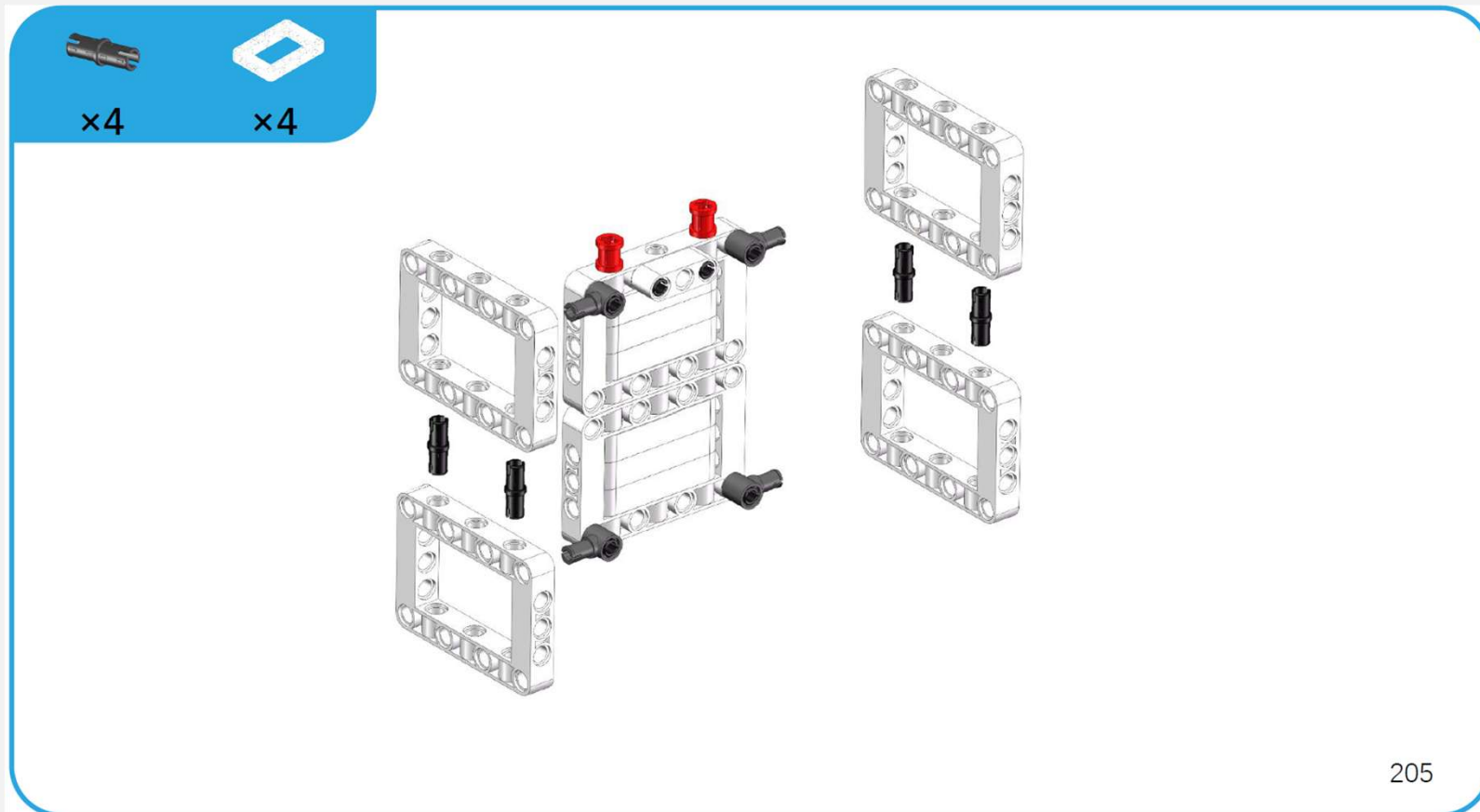
203

## Step 19

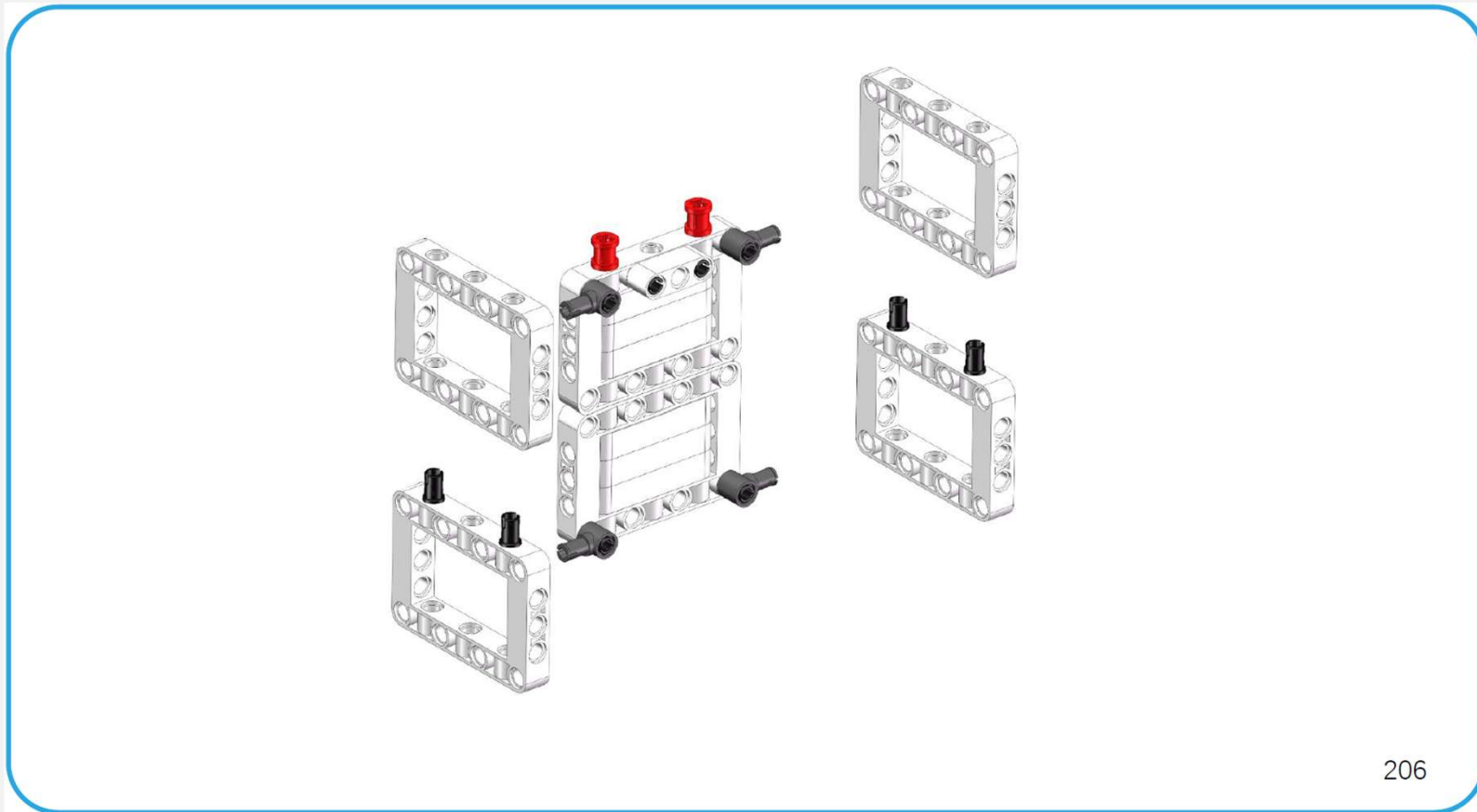


204

# Step 20

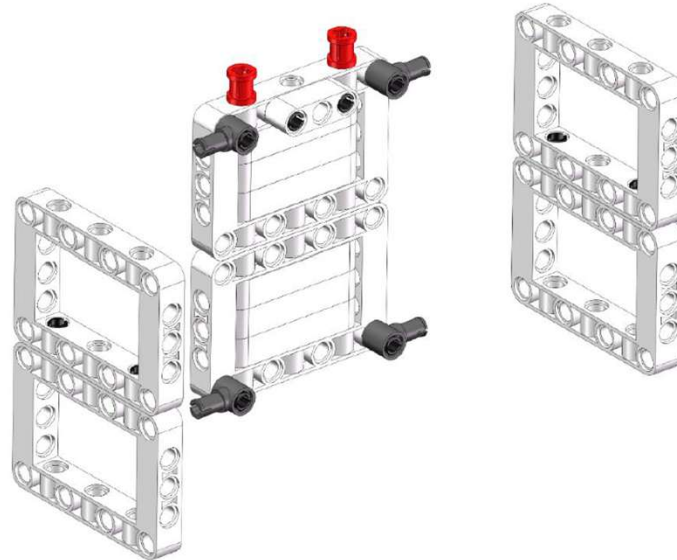


# Step 21



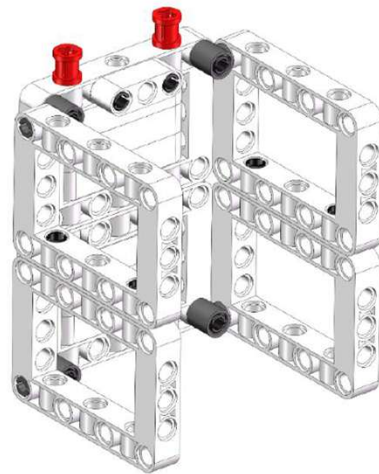
206

## Step 22



207

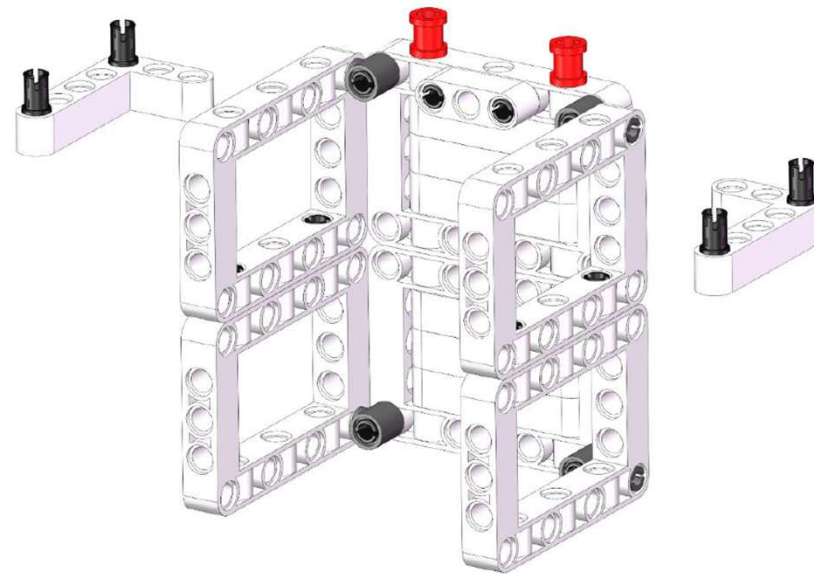
## Step 23



208

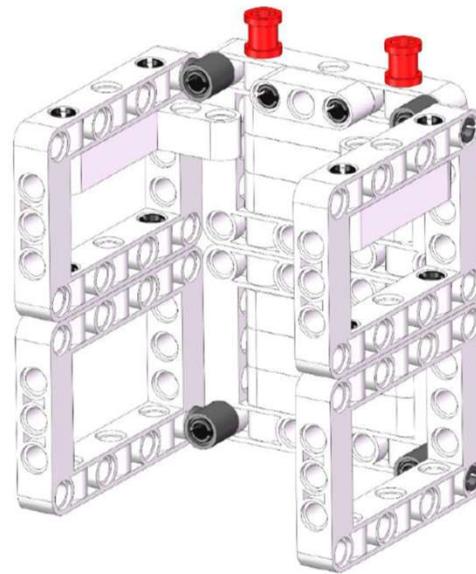


## Step 25



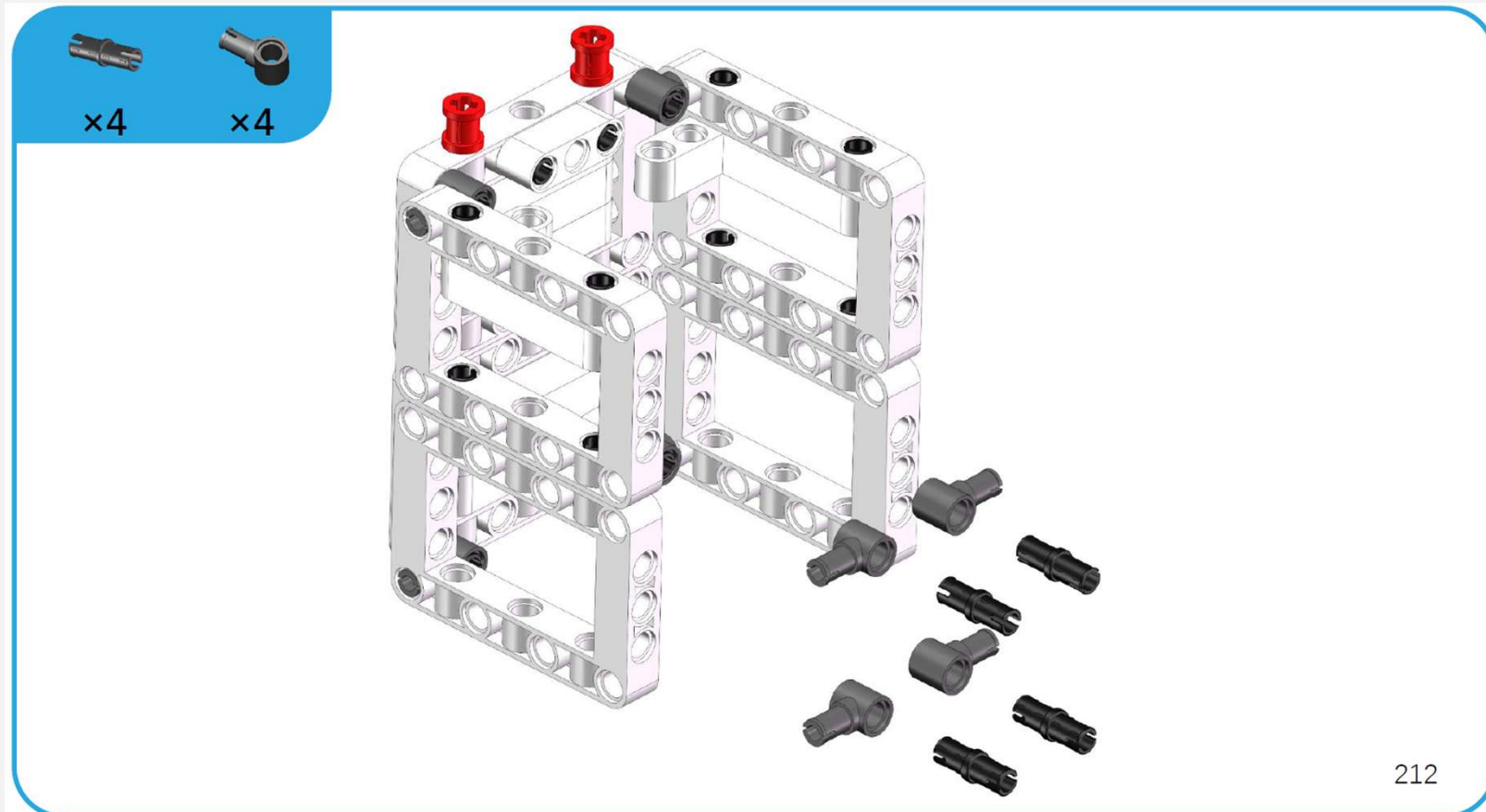
210

## Step 26



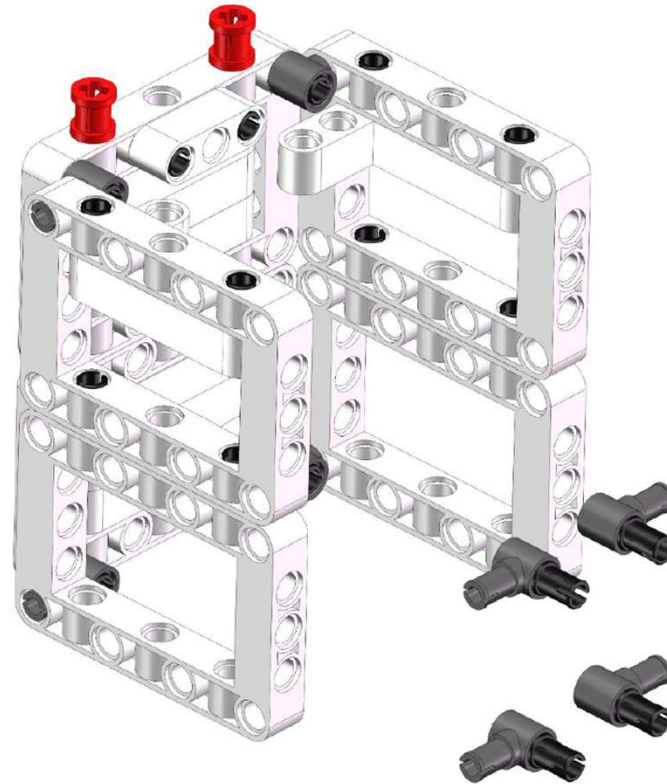
211

# Step 27



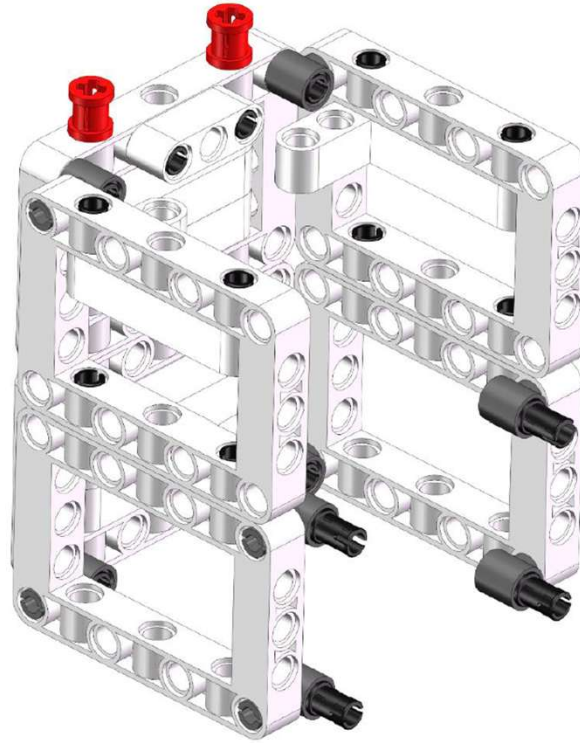
212

## Step 28



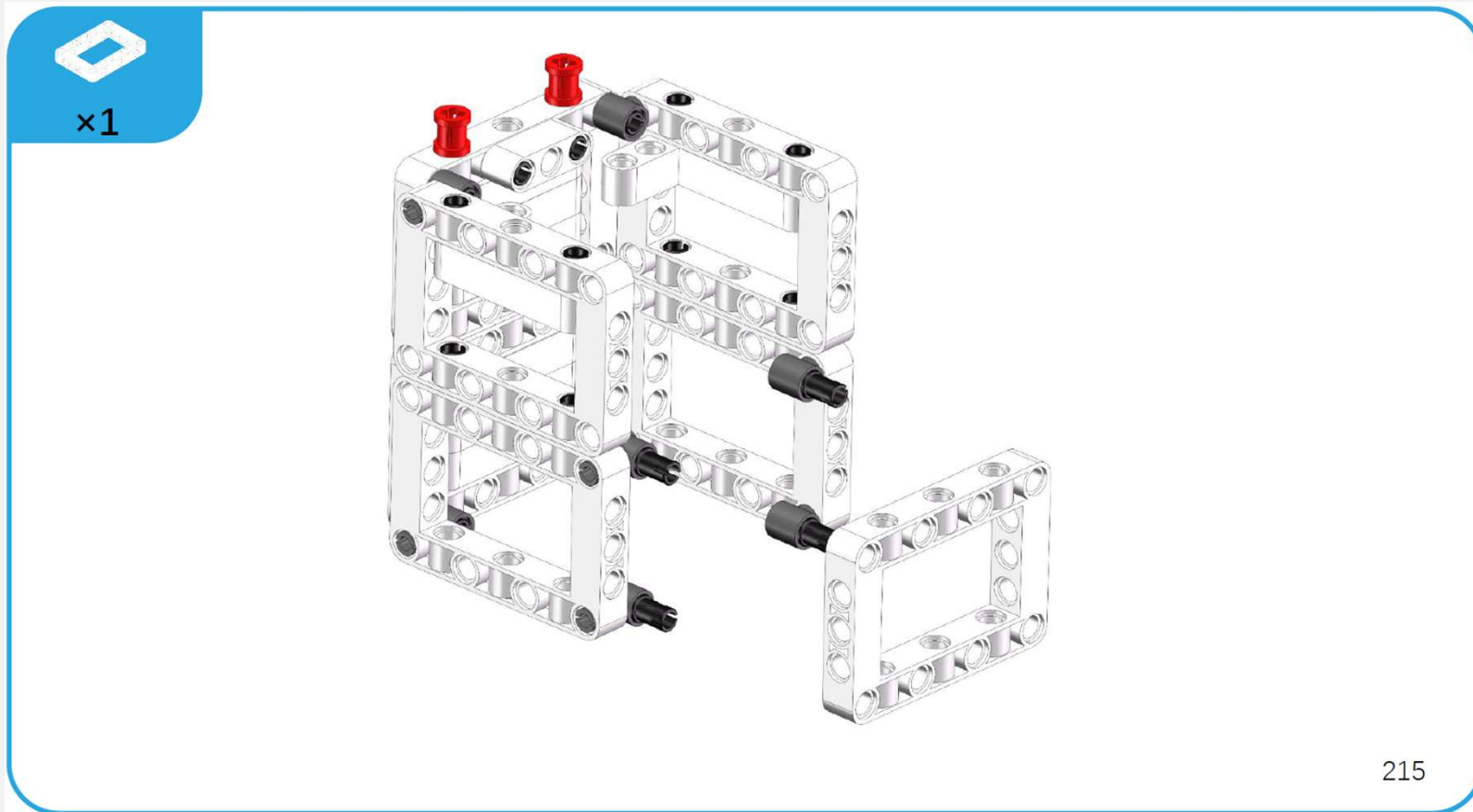
213

## Step 29

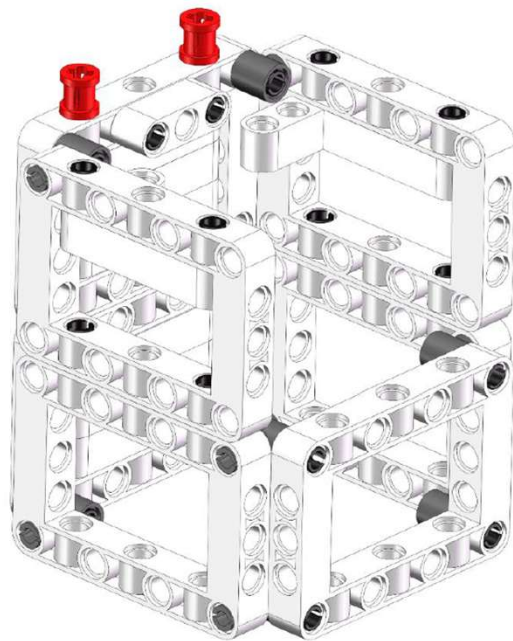


214

# Step 30

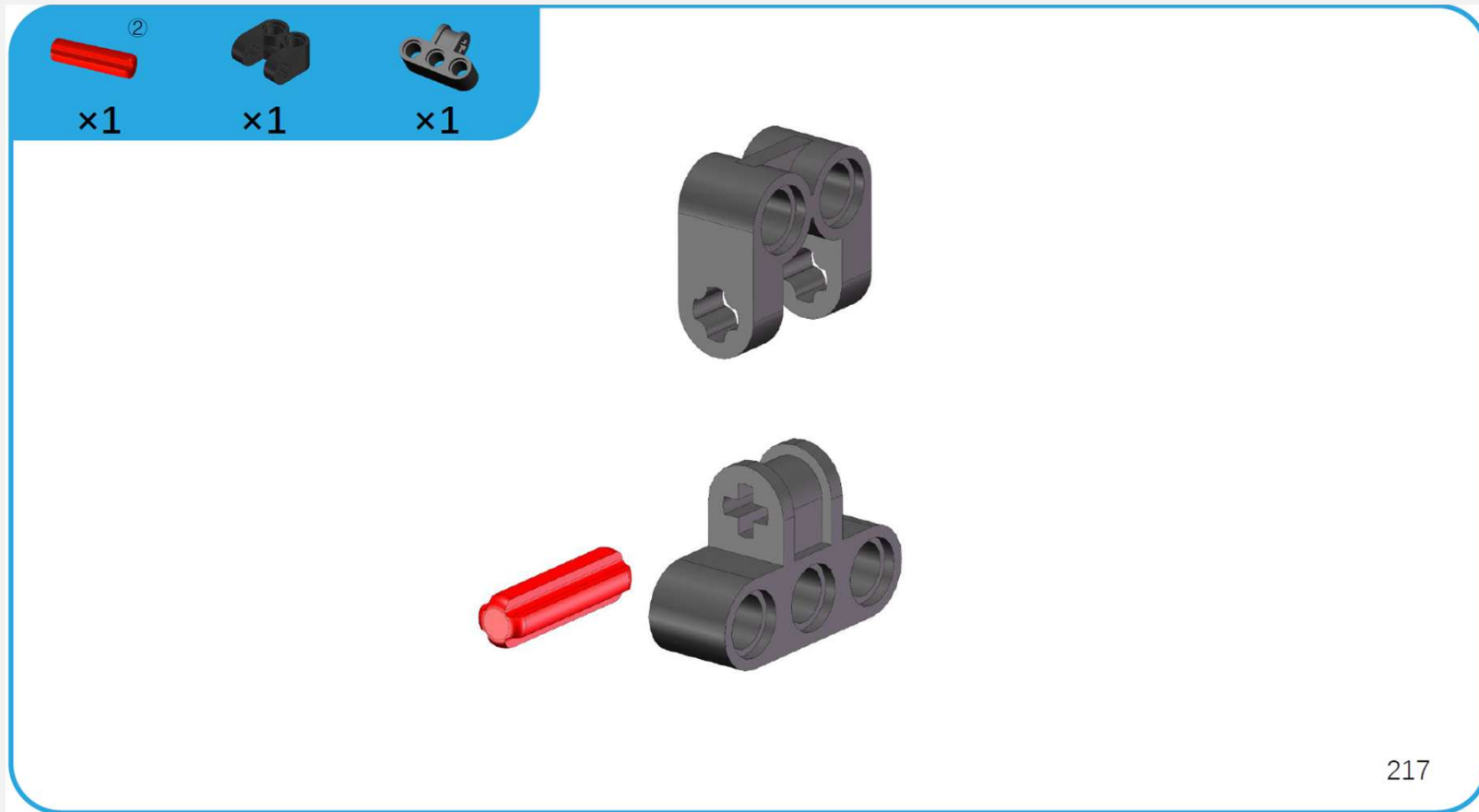


## Step 31

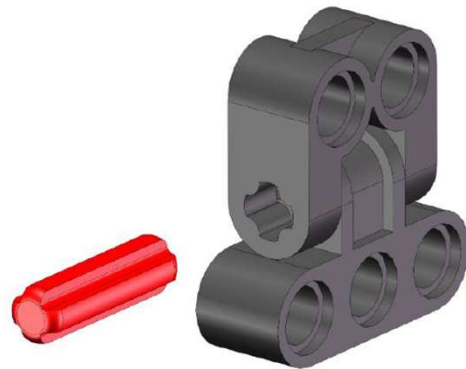


216

## Step 32

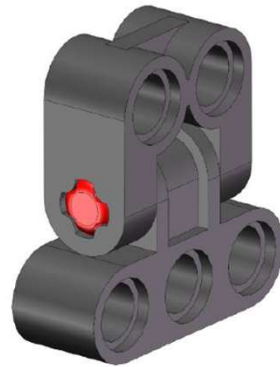


## Step 33



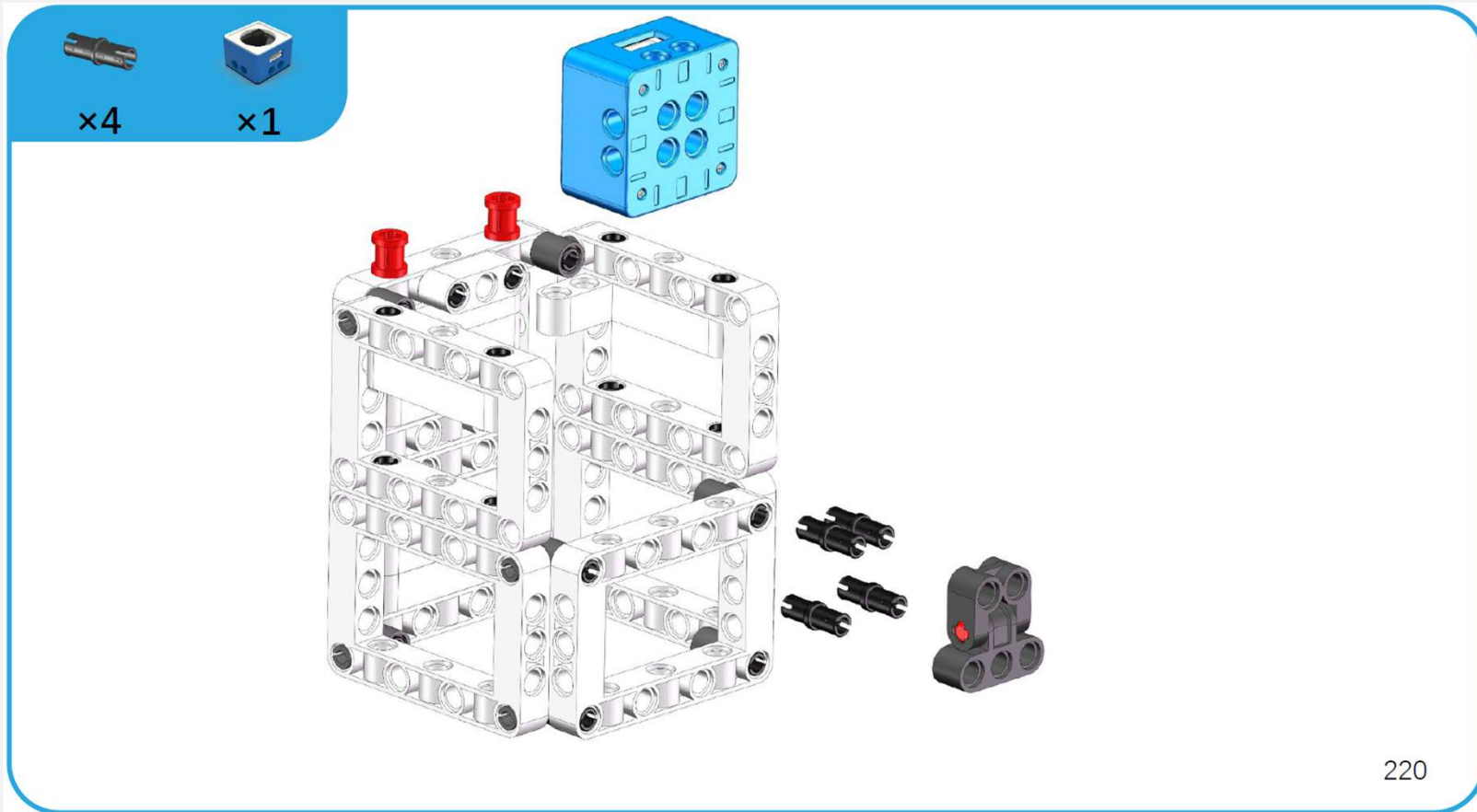
218

## Step 34



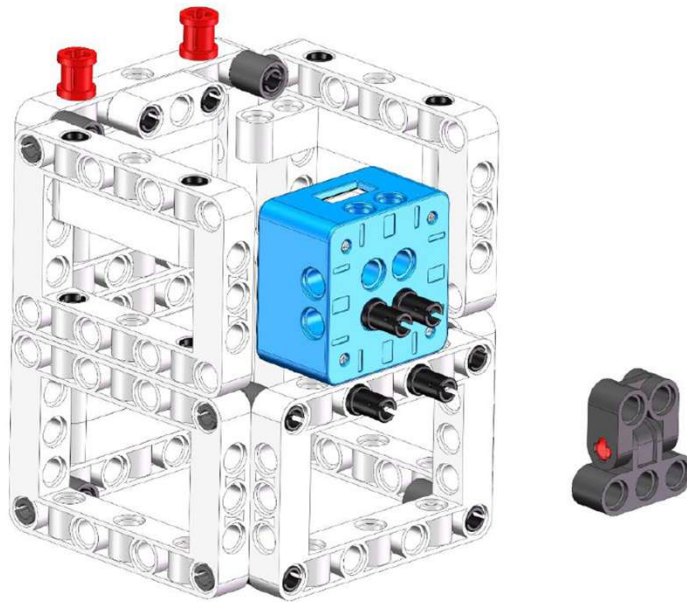
219

# Step 35



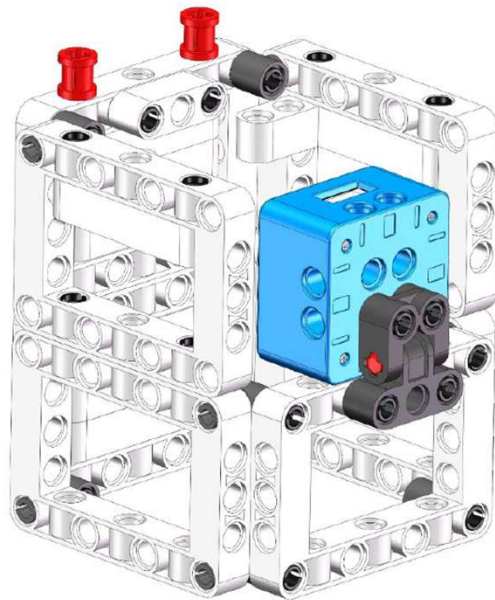
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## Step 36



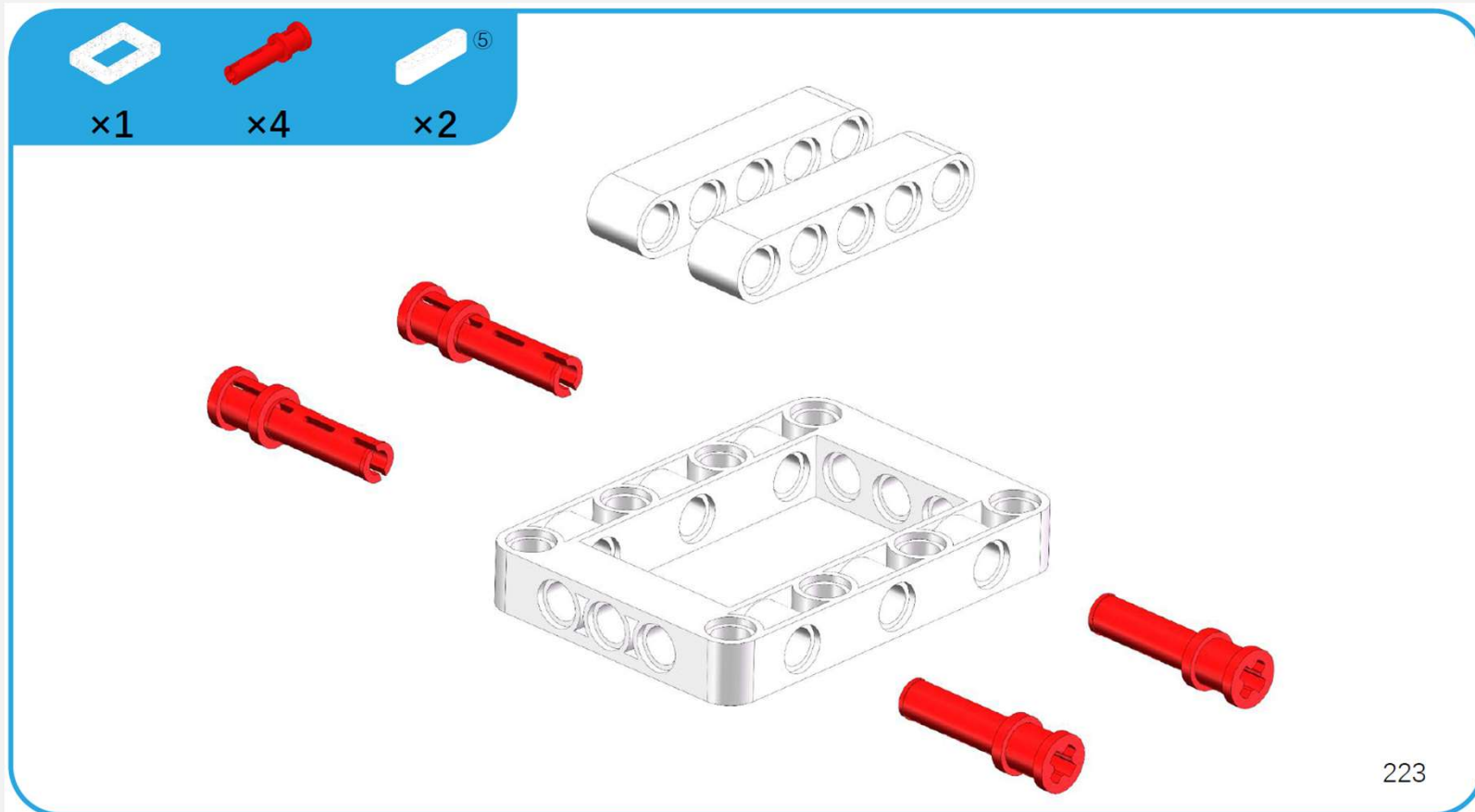
221

## Step 37



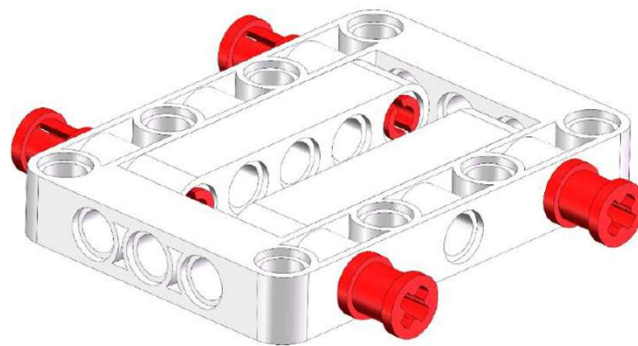
222

# Step 38



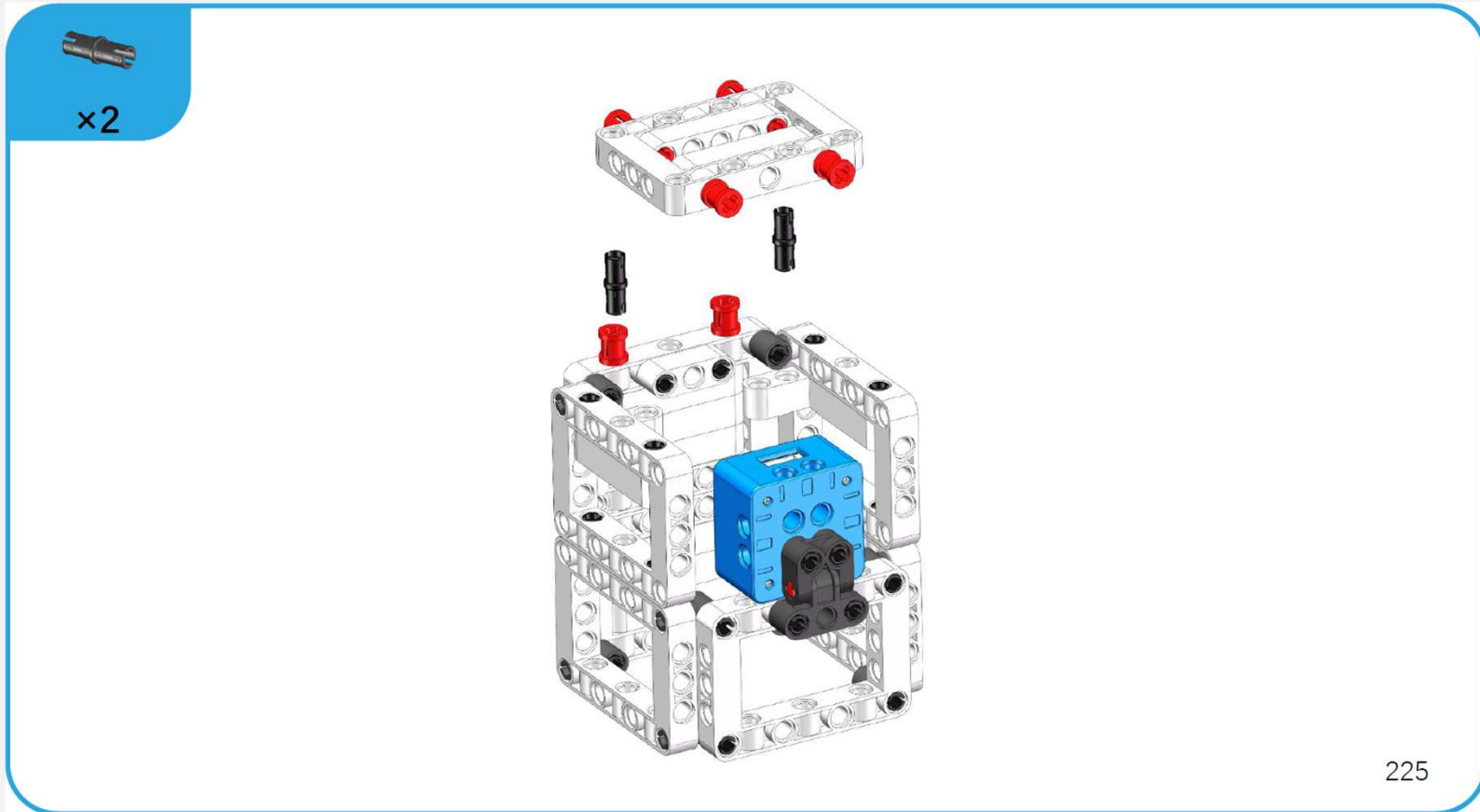
223

## Step 39



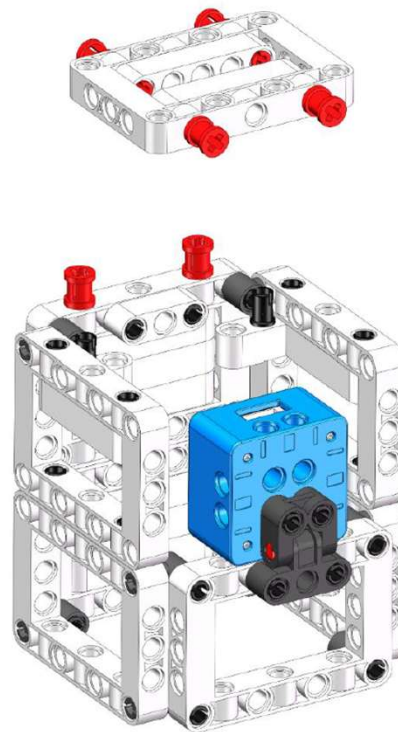
224

# Step 40



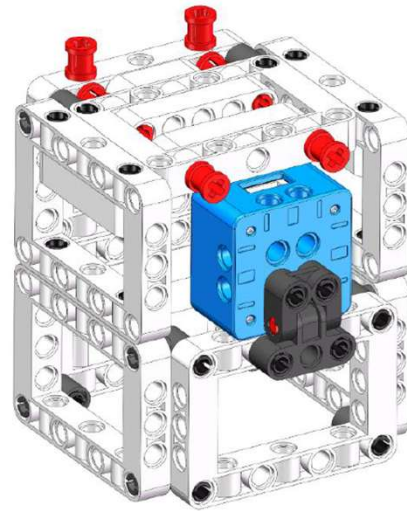
225

## Step 41



226

## Step 42



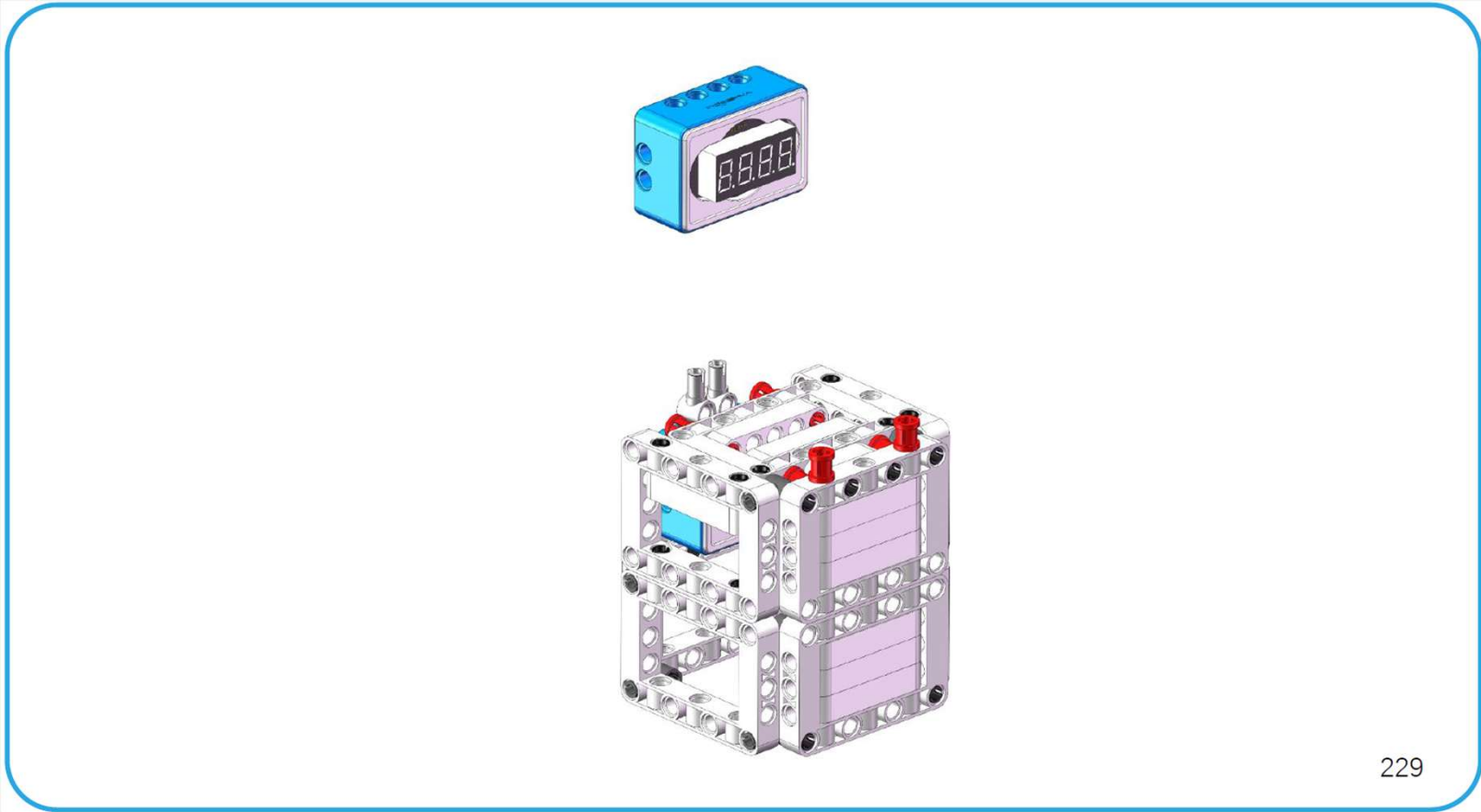
227

# Step 43

The diagram illustrates the assembly of a digital display onto a white Technic frame. A legend in the top-left corner shows a grey connector (x2) and a blue digital display (x1). The display is shown being positioned above a grey connector that is already attached to the top of the frame. The frame itself is a rectangular structure made of white Technic beams and connectors, with red pins visible on top.

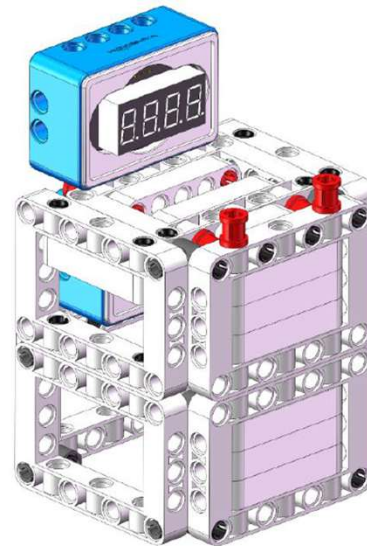
228

# Step 44



229

## Step 45

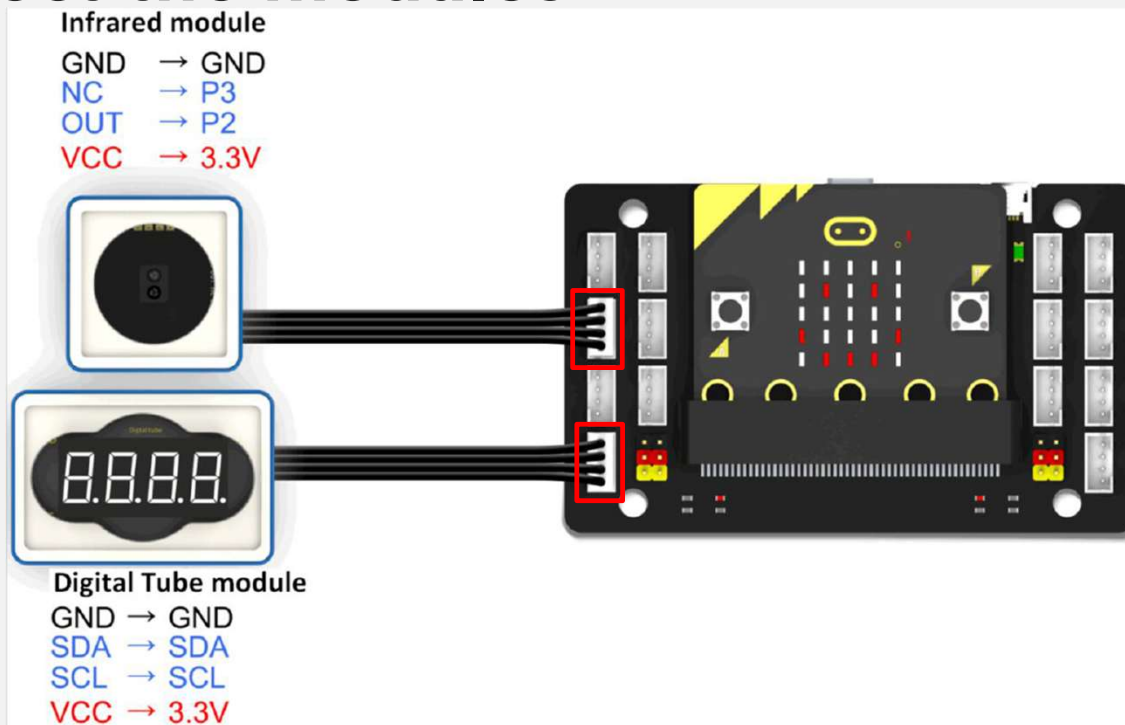


**30 Points**

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# Wire Connection

## Connect the modules



Let's **connect** the module like this.

10 Points

# MakeCode Programming

<https://github.com/YahboomTechnology/Module-World>.

And

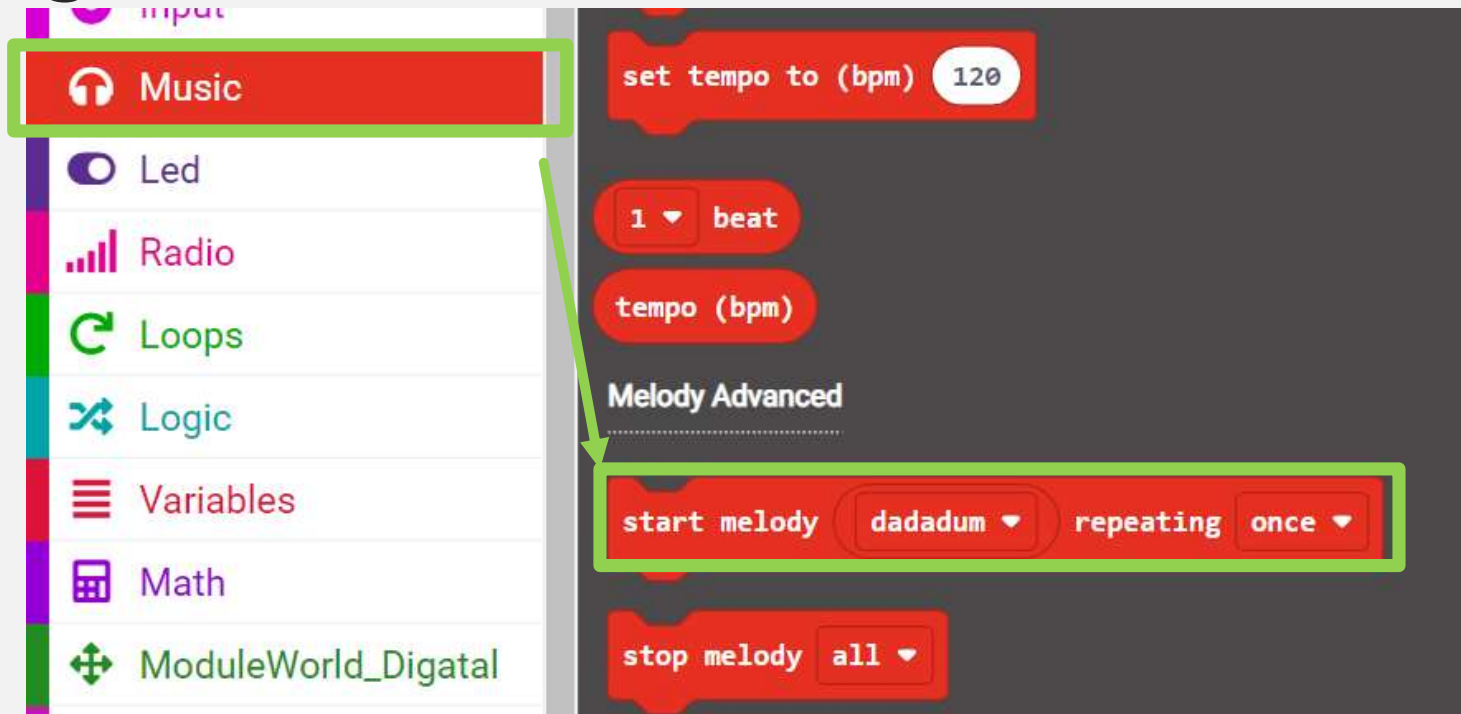
<https://github.com/YahboomTechnology/tm1650>

Or search **[YahboomTechnology/Module-World](#)** in the extension block

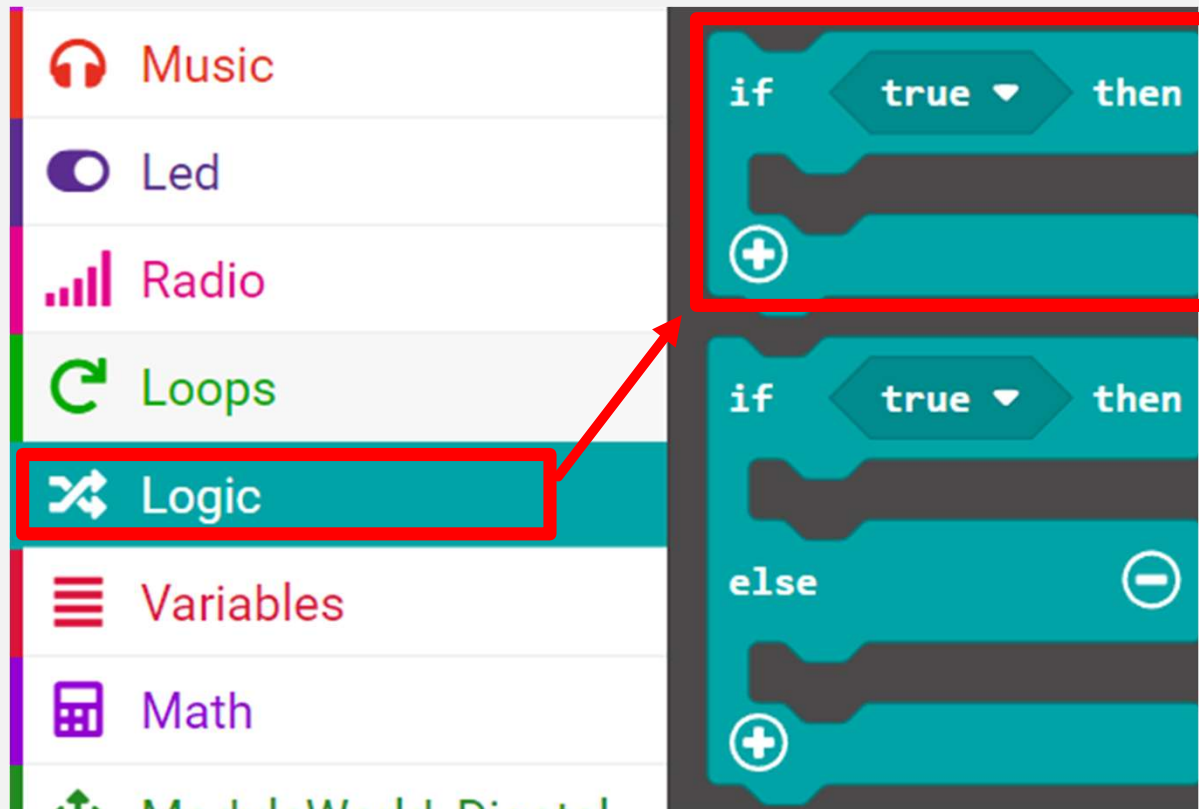
And

**[YahboomTechnology/tm1650](#)** in the extension block

# Coding - Music

A screenshot of the Scratch Music coding interface. On the left is a vertical menu with categories: Music (highlighted with a green box), Led, Radio, Loops, Logic, Variables, Math, and ModuleWorld\_Digatal. On the right is a workspace with several red code blocks: "set tempo to (bpm) 120", "1 beat", "tempo (bpm)", "Melody Advanced" (a section header), "start melody dadadum repeating once" (highlighted with a green box), and "stop melody all". A green arrow points from the "Music" category in the menu to the "start melody" block.

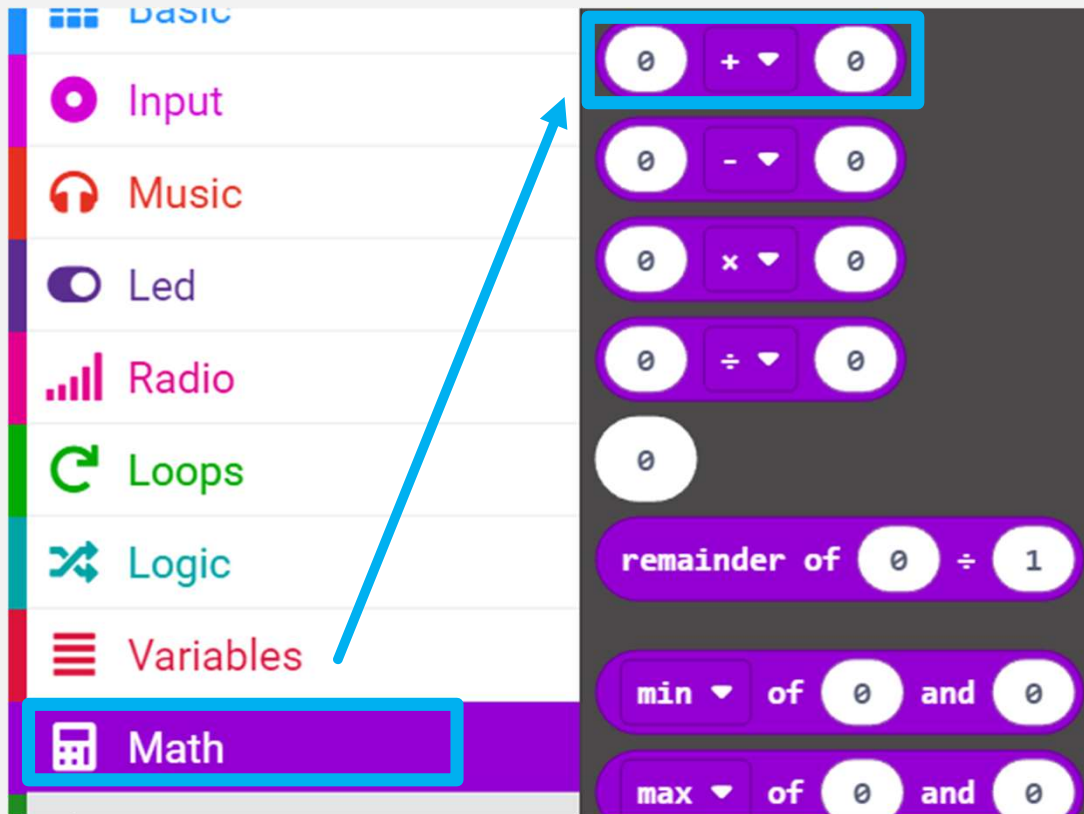
# Coding - Logic



## Coding - Variables

The image shows a coding interface with a left sidebar and a main workspace. The sidebar contains several categories: Music, Led, Radio, Loops, Logic, and Variables. The Variables category is highlighted with a blue box. An arrow points from this box to the main workspace. The main workspace contains two red blocks: 'set score to 0' and 'change score by 1'. Below these blocks is a section titled 'Your Variables' which contains a dropdown menu with 'score' selected. The 'set score to 0' block and the 'score' dropdown are also highlighted with blue boxes.

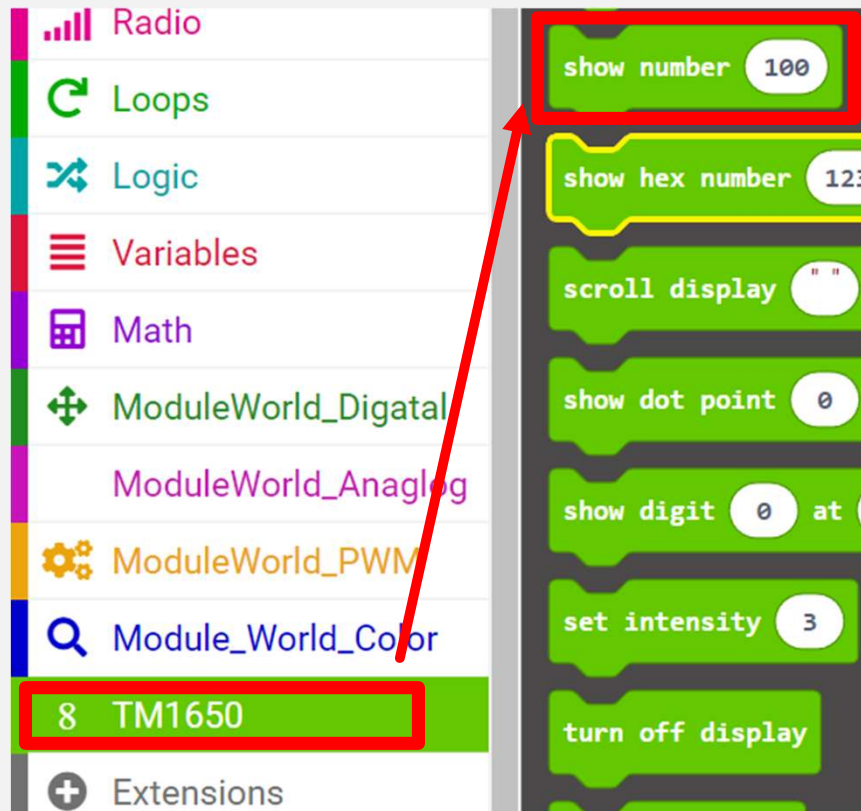
# Coding - Math



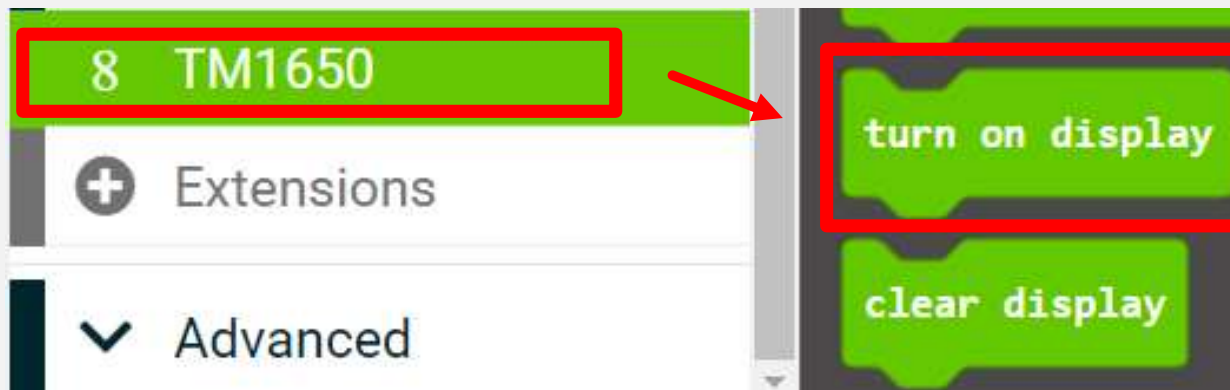
## Coding - ModuleWorld\_Digatal



# Coding - TM1650



## Coding - TM1650



# Coding - Combination

```

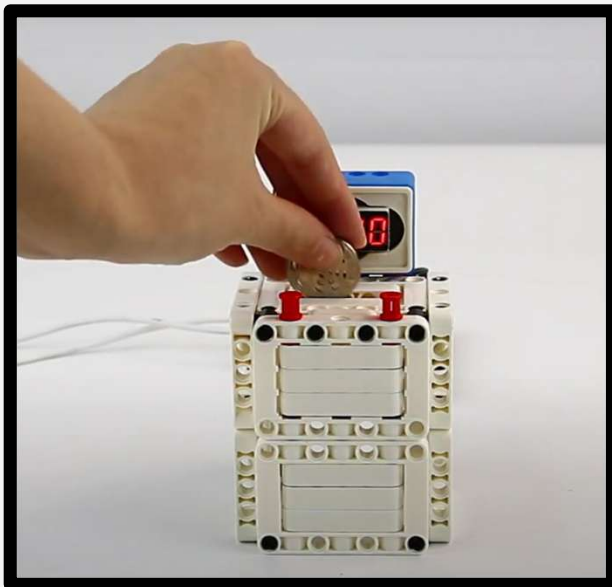
on start
  turn on display
  set score to 0
  show number score
  
```

```

forever
  if IR pin P2P3 value Obstacle then
    set score to score + 1
    start melody ba ding repeating once
    show number score
    pause (ms) 100
  
```

## Phenomenon

After the program is downloaded successfully. The digital tube displays **0000**. After dropping the coin into the piggy bank, the main board will **start** counting the number of coins and **display** the value on the digital tube



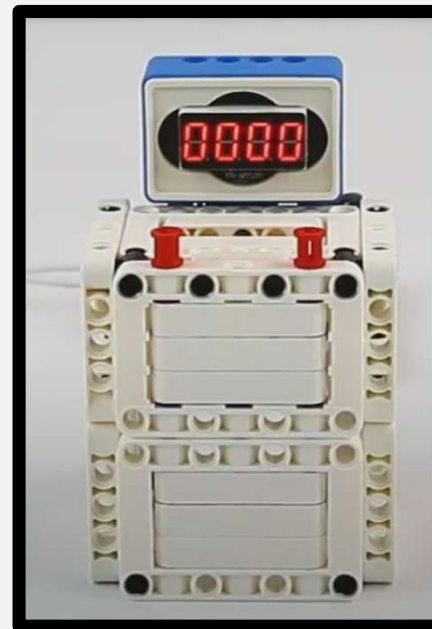
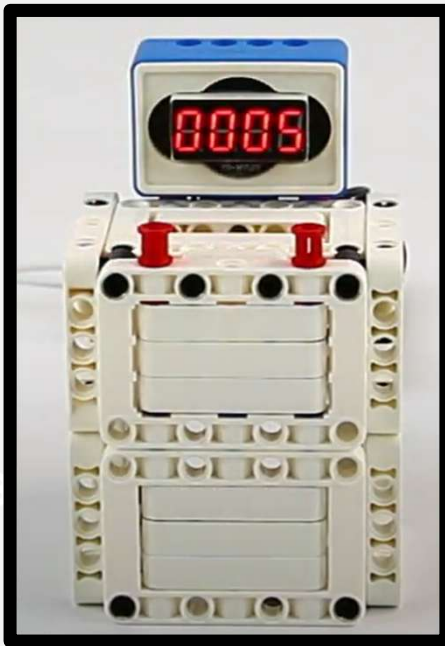
**30 Points**

# CHALLENGE

## for : Lesson 7

# L7 - Challenge 1

After the program is downloaded successfully. Build a way to **take** all the coins and **reset** the counter when a **button is pressed**.

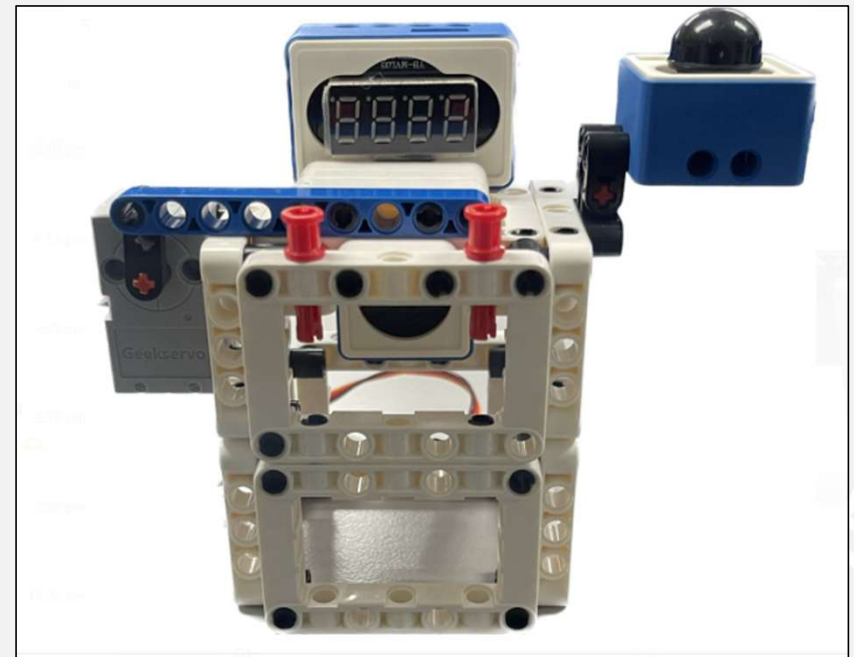


**30 Points**

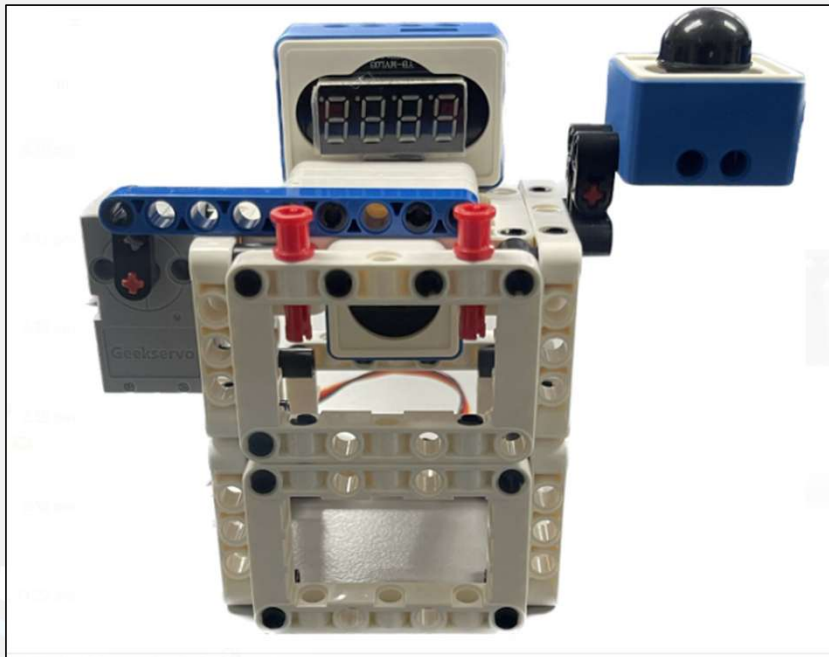
# L7 - Challenge 2

Build a gate using servo to open the piggy bank for withdrawal, make a button as a trigger to open.

**30 Points**



# L7 - Challenge 3



## Creative Time!

**You can now redesign your piggy bank to the form you like, you can try to add some sensors and servos and add some parts to make your piggy bank with multi-functions.**

**Then present to your teacher.**

**30 Points**