instructables Pattern Play In Tinkercad Codeblocks Instruction Manual

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instructables

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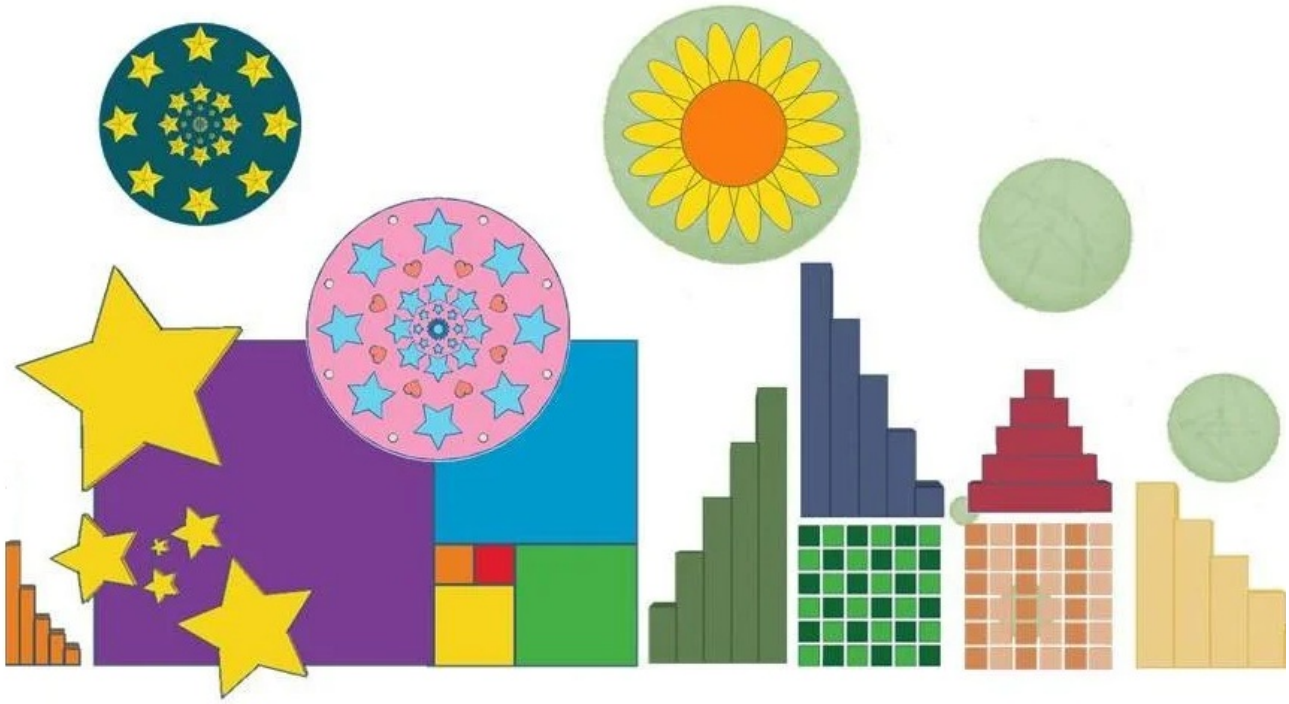


by losc

What is the pattern?
Where do we see patterns? A pattern is something that repeats and repeats. And there are many types of patterns! In this instructable, we start with making some color patterns and number patterns with coding – the Tinkercad Codeblocks! When making those patterns, you may have an optical illusion. No worries! Because you are also making illusion art with patterns. Later, we will introduce a special number pattern which is considered to make your artwork more perfect. Enjoy and have fun!

Remarks

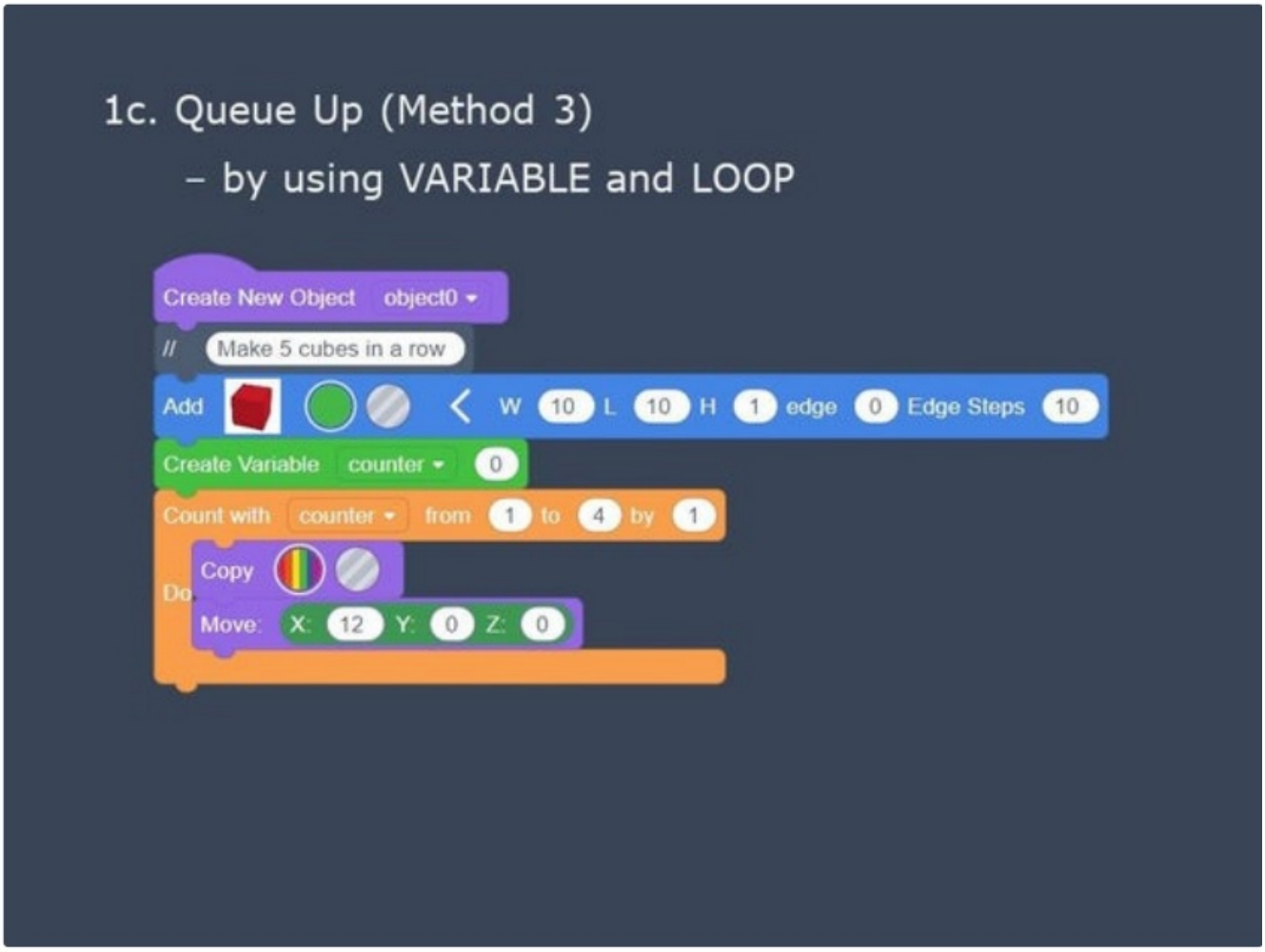
1. Try to keep the code as short as possible
2. The code example is for reference only

1a. Queue Up (Method 1)

– by using ADD and MOVE

1b. Queue Up (Method 2)

– by using COPY and MOVE



Supplies
Tinkercad Codeblocks

Step 1: Make 5 Cubes in a Row

Look at the animation, and try to write the codes by using the following techniques:

1. ADD and MOVE
2. COPY and MOVE
3. VARIABLE and LOOP

Please consider the following information in your programming:

1. The dimensions of the cube are W=10, L=10, H=1
2. The distance between squares is 12

Step 2: Make 5 Rows

Look at the animation, and try to write the codes by using the following techniques:

1. two seperate LOOPS
2. nested LOOPS

2a. Make Rows (Method 1) – by using 2 LOOPS

2b. Make Rows (Method 2) – by using Nested LOOPS

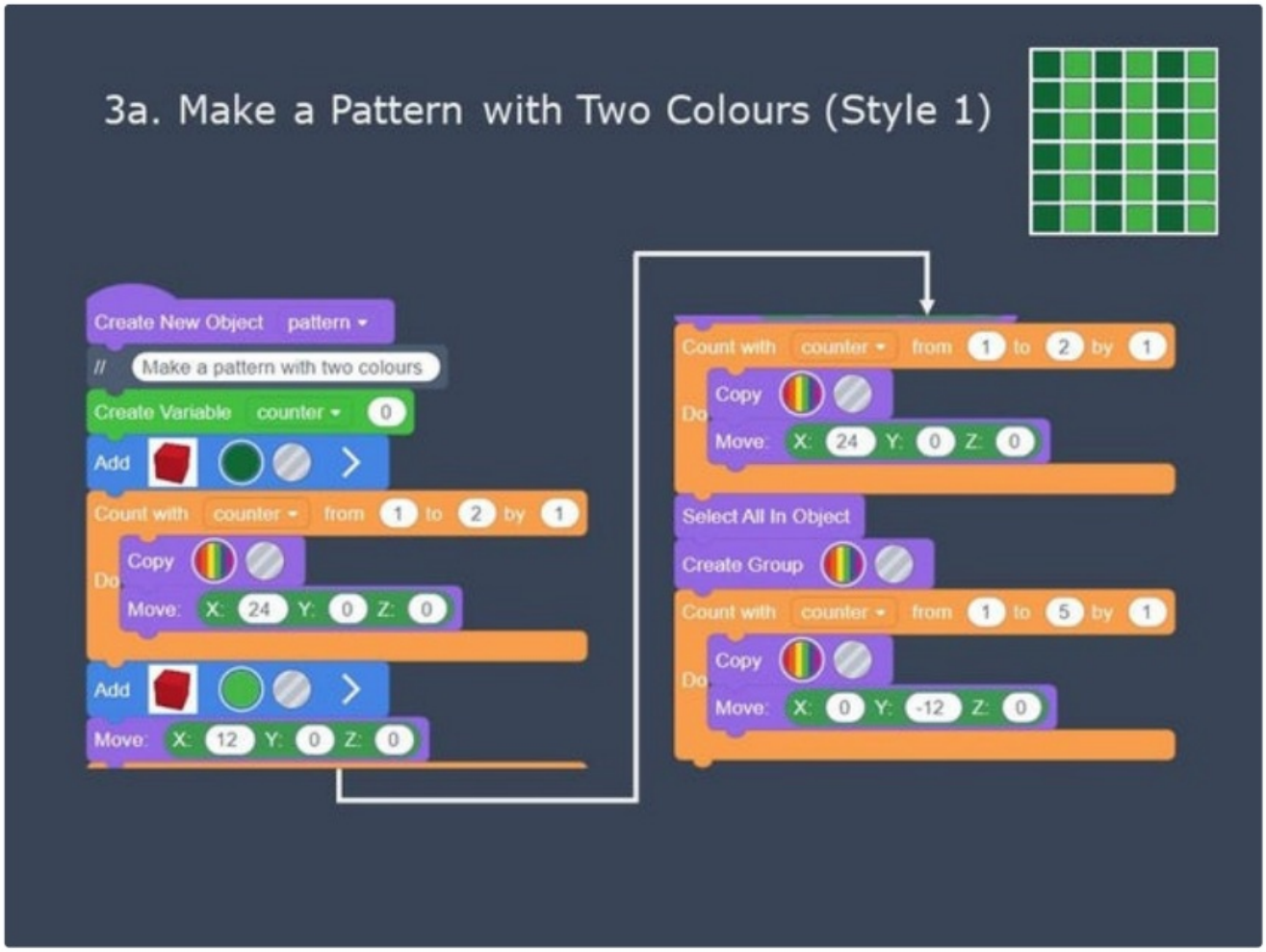
Please consider the following information in your programming:

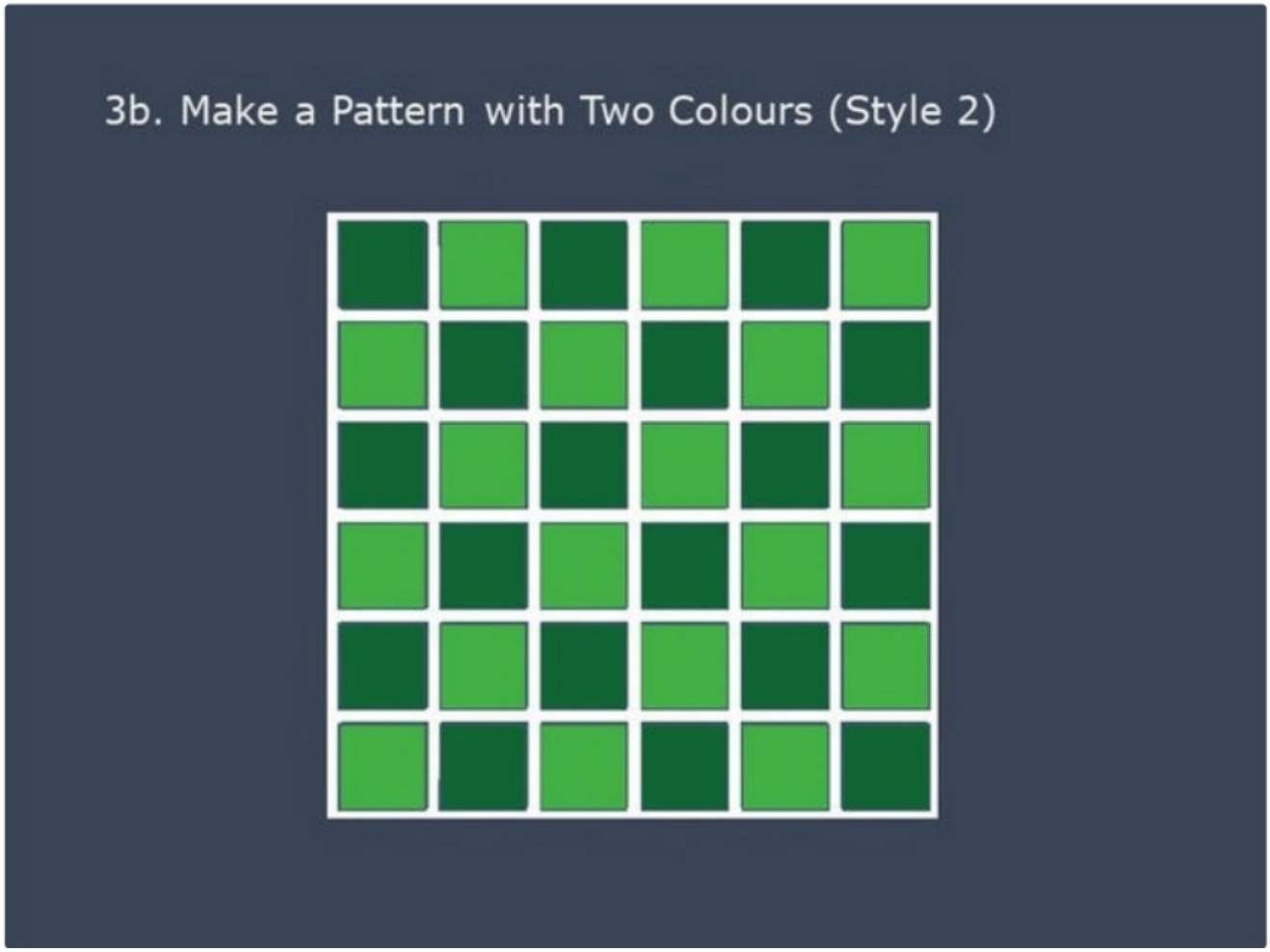
1. The dimensions of the cube are W=10, L=10, H=1
2. The distance between squares is 12

Step 3: Make a Checked Pattern (style 1)

Look at the animation, do you see the illusion? Dark dots seem to appear and disappear at intersections. Try to write the codes. Please consider the following information in your programming:

1. The dimensions of the cube are W=10, L=10, H=1
2. The distance between squares is 12





Step 4: Make a Checked Pattern (Style 2)

Look at the animation, do you see the illusion? Dark dots seem to appear and disappear at intersections. Try to write the codes.
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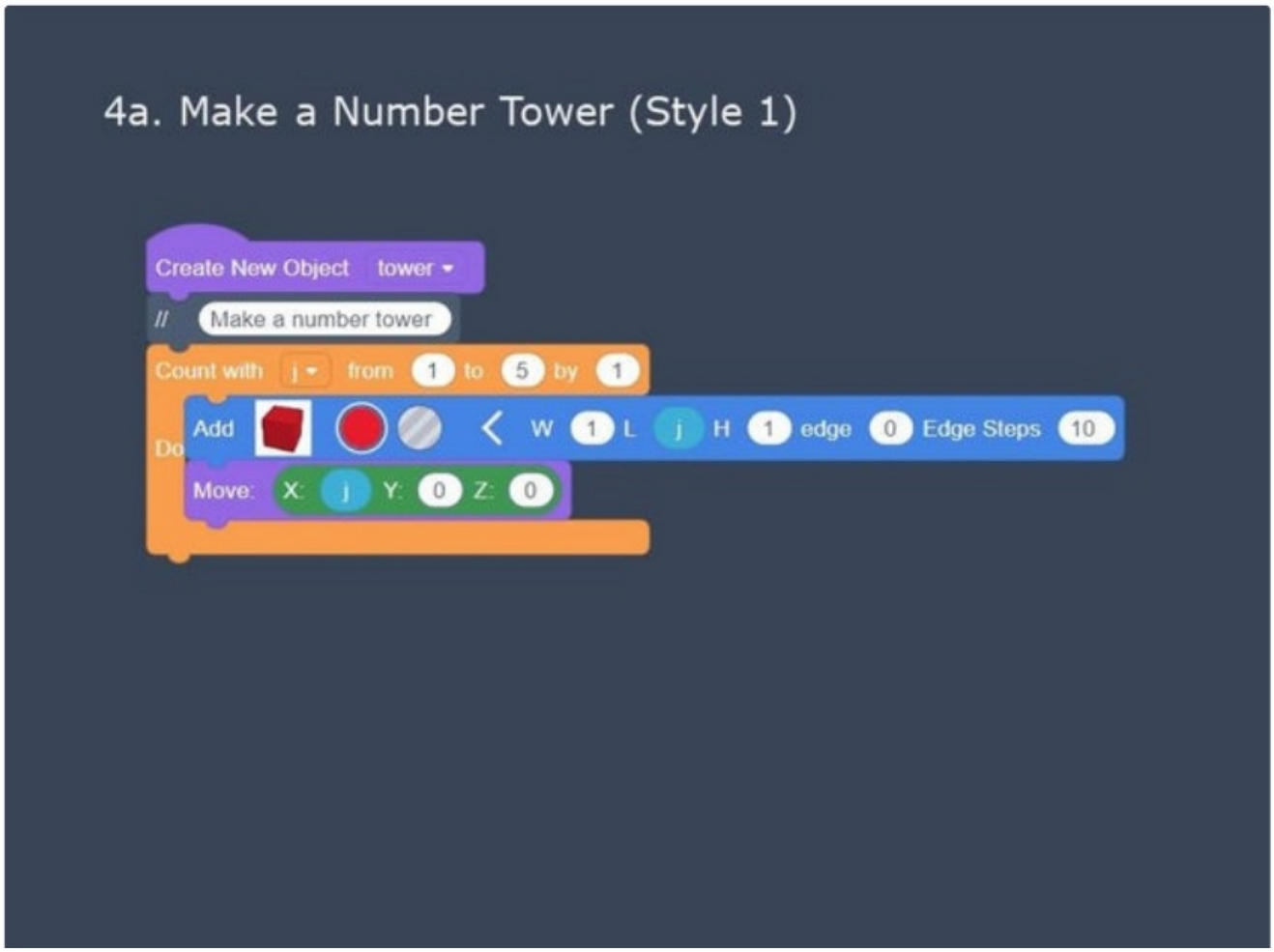
Please consider the following information in your programming:

1. The dimensions of the cube are W=10, L=10, H=1
2. The distance between squares is 12
3. Code example (Please click here)

step 5: Make a Number Tower (Style 1)

What pattern do you see?

- This is a number pattern



- It is in ascending order.
- The difference between the two numbers is 1!
- Look at the animation, and try to write the codes.

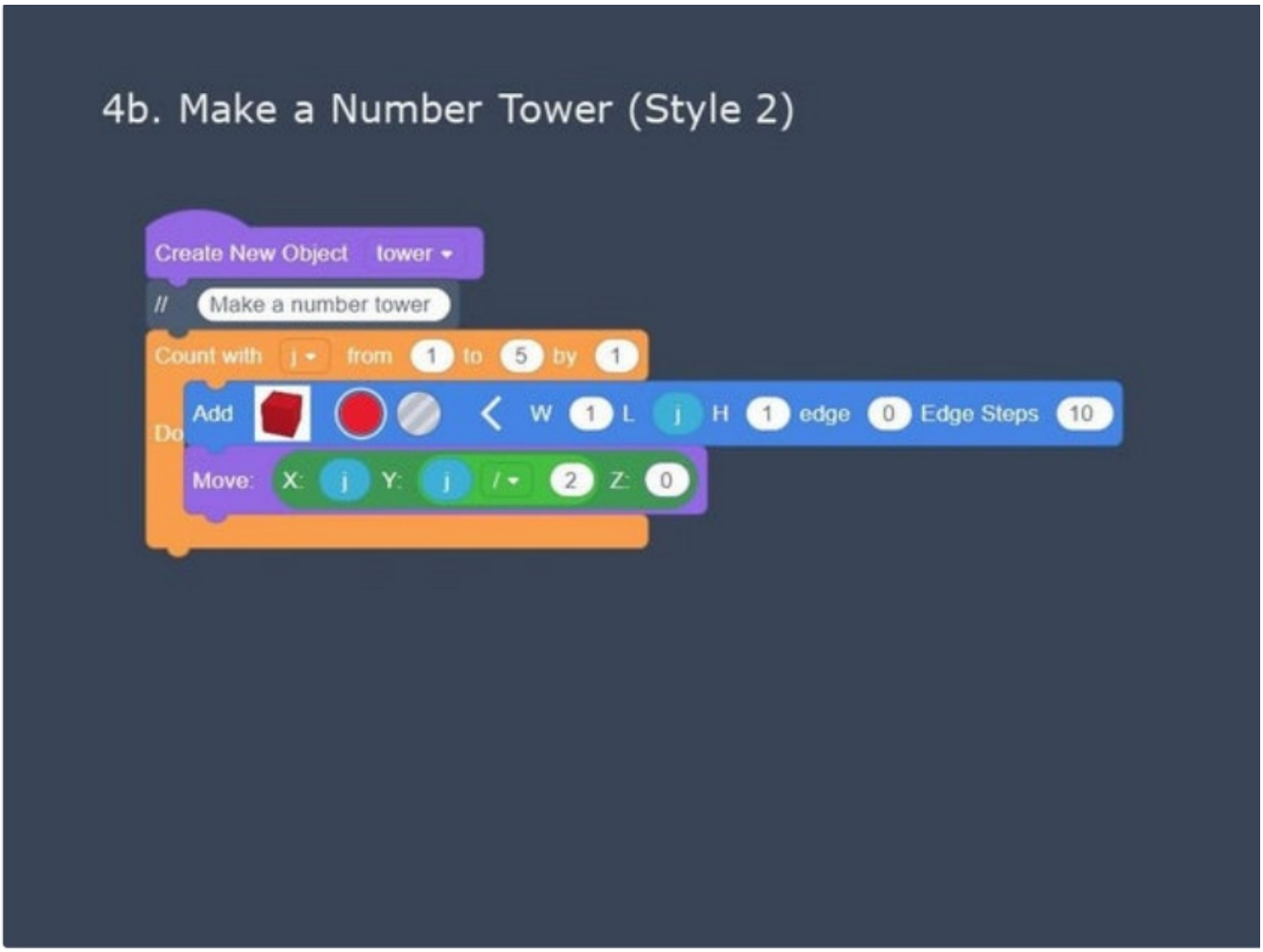
Please consider the following information in your programming:

1. The lengths (L) of the objects are 1, 2, 3, 4 and 5 respectively
2. The width (W) and height (H) remain at 1

Step 6: Make a Number Tower (Style 2)
What pattern do you see?
This number pattern is similar to the previous one, but all objects are aligned on one end Look at the animation, and try to write the codes.

Please consider the following information in your programming:

1. The length (L) of the objects should be 1, 2, 3, 4 and 5 respectively
2. The width (W) and height (H) remain at 1

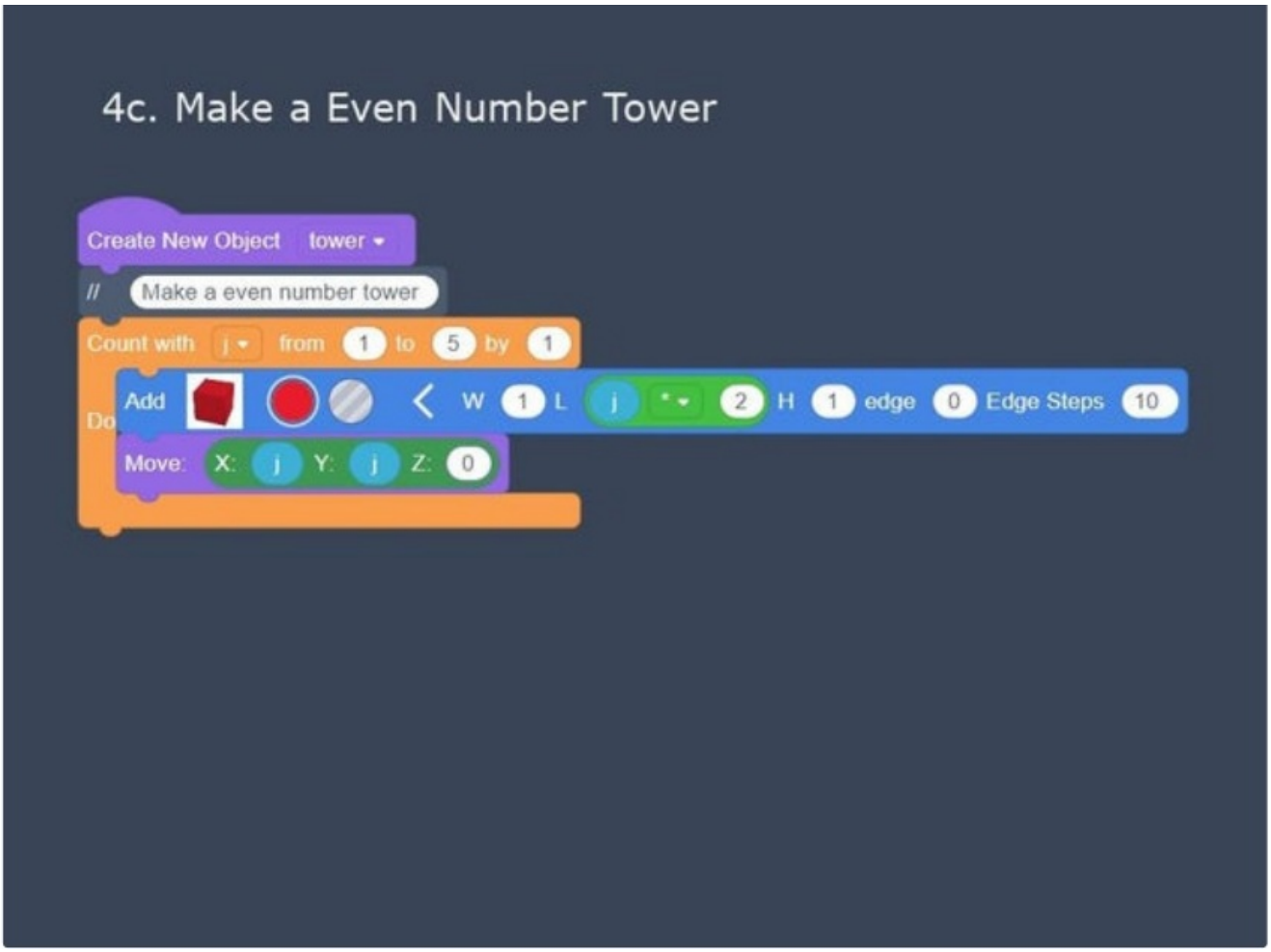


3. All objects should be aligned on one end

Step 7: Make an Even Number Tower

What pattern do you see?

- This number pattern is in ascending order.
- Pattern Play in Tinkercad Codeblocks: Page 12
- The difference between two numbers is 2.
- Those numbers can be divided by two.
- They are even numbers.
- Look at the animation, and try to write the codes.



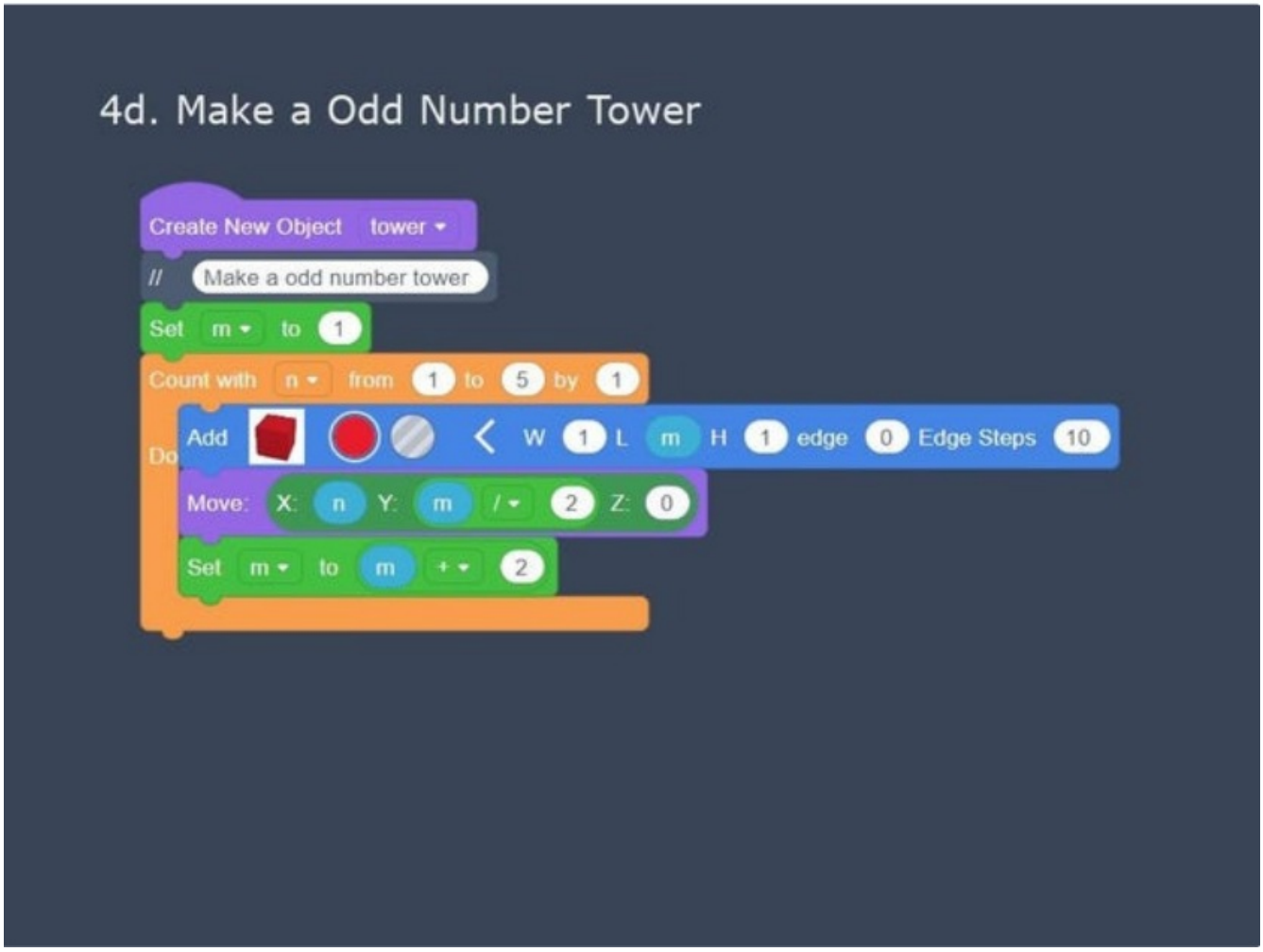
Please consider the following information in your programming:

1. The length (L) of the objects should be 2, 4, 6, 8, and 10 respectively
2. The width (W) and height (H) remain at 1
3. Align one end of all objects

Step 8: Make an Odd Number Tower

What pattern do you see?

- This number pattern is in ascending order
- The difference between the two numbers is 2

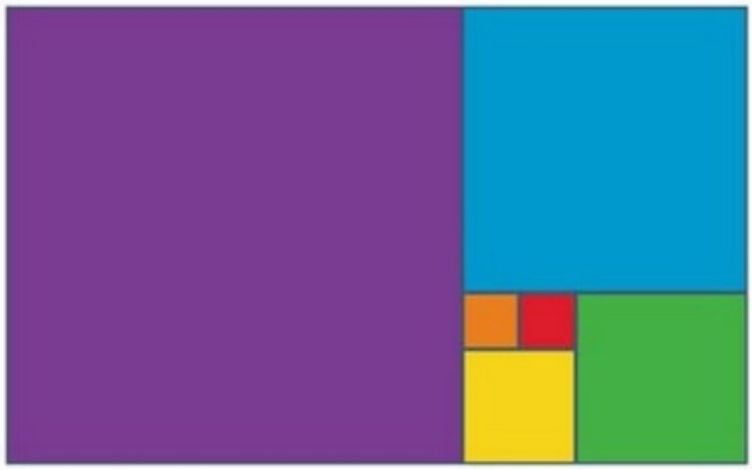


- Those numbers cannot be divided by two.
- They are odd numbers.
- Look at the animation, and try to write the codes.

Please consider the following information in your programming:

1. The length (L) of the objects should be 1, 3, 5, 7 and 9 respectively
2. The width (W) and height (H) remain at 1
3. Align one end of all objects

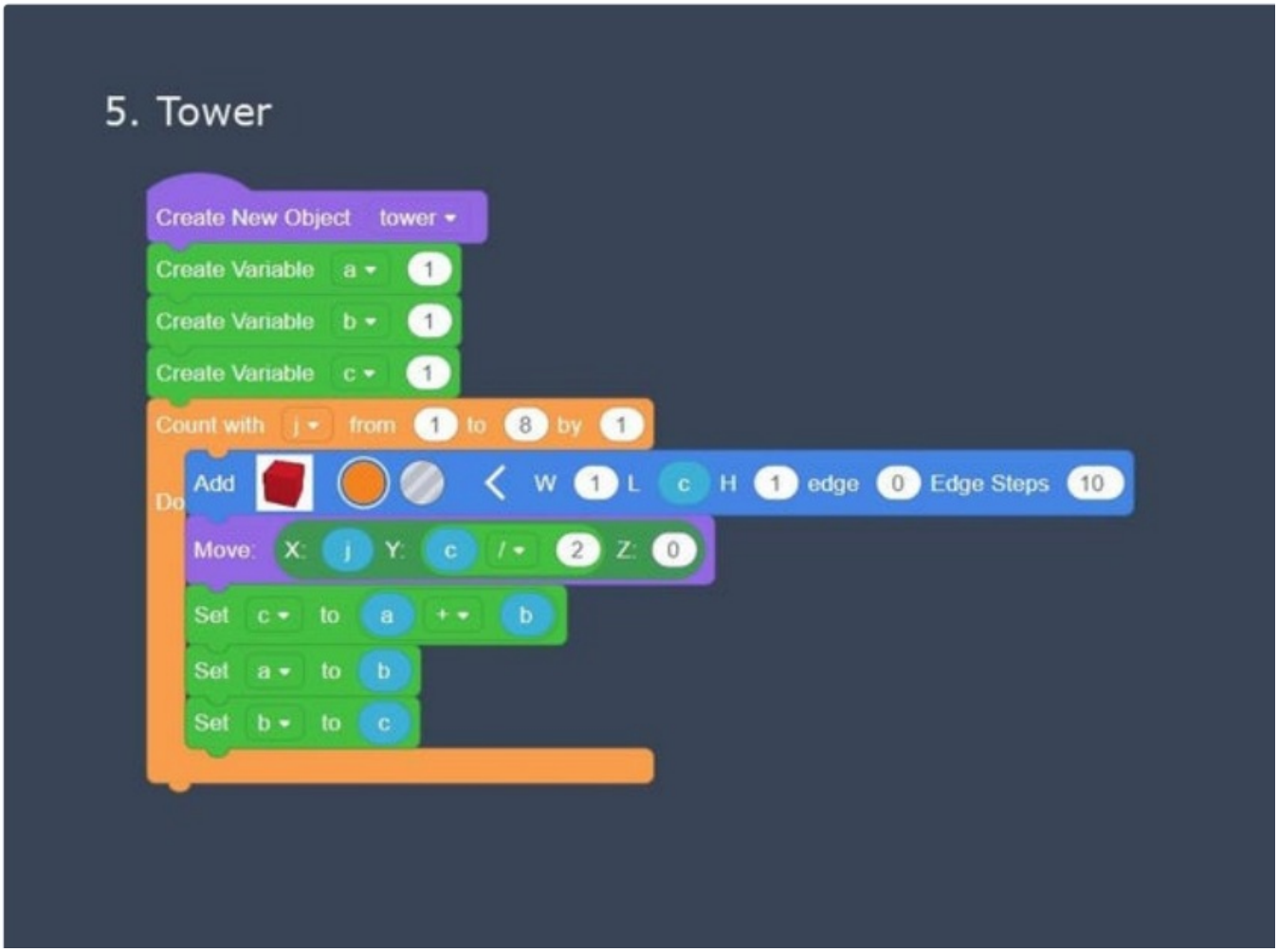
Step 9: Number Pattern – Fibonacci Numbers
0, 1, 1, 2, 3, 5, 8, 13, 21… What pattern do you see?
Pattern Play in Tinkercad Codeblocks: Page 15 This is a special pattern and it is considered to have a golden ratio and a mystical relationship with nature. Maybe you have seen it in daily life.



Do you have any idea what this number pattern is?
This number pattern is called Fibonacci numbers. In this sequence, the next number is the addition of two previous numbers (except the first and second numbers). For example, by adding 3 and 5, we get the seventh number as 8. In the following activities, the Fibonacci numbers will be applied to the programming to make your unique artwork. And let the hidden Fibonacci pattern make your artwork awesome! The above animation shows the drawing of Fibonacci Rectangles, and it is said to be the most beautiful rectangle. This rectangle consists of several squares, in which the square's sides follow the Fibonacci numbers.

Step 10: Make a Tower With Fibonacci Numbers

What pattern do you see?
The tower's length follows the pattern of Fibonacci numbers
Look at the animation, and try to write the codes.



Please consider the following information in your programming:

1. The length (L) of the objects should be 1, 2, 3, 5, 8, 13, 21 and 34 respectively
2. The width (W) and height (H) remain at 1
3. Align one end of all objects
4. Make use of variables and loops to reduce redundant code

Step 11: Make a Sphere With Fibonacci Numbers

What pattern do you see?
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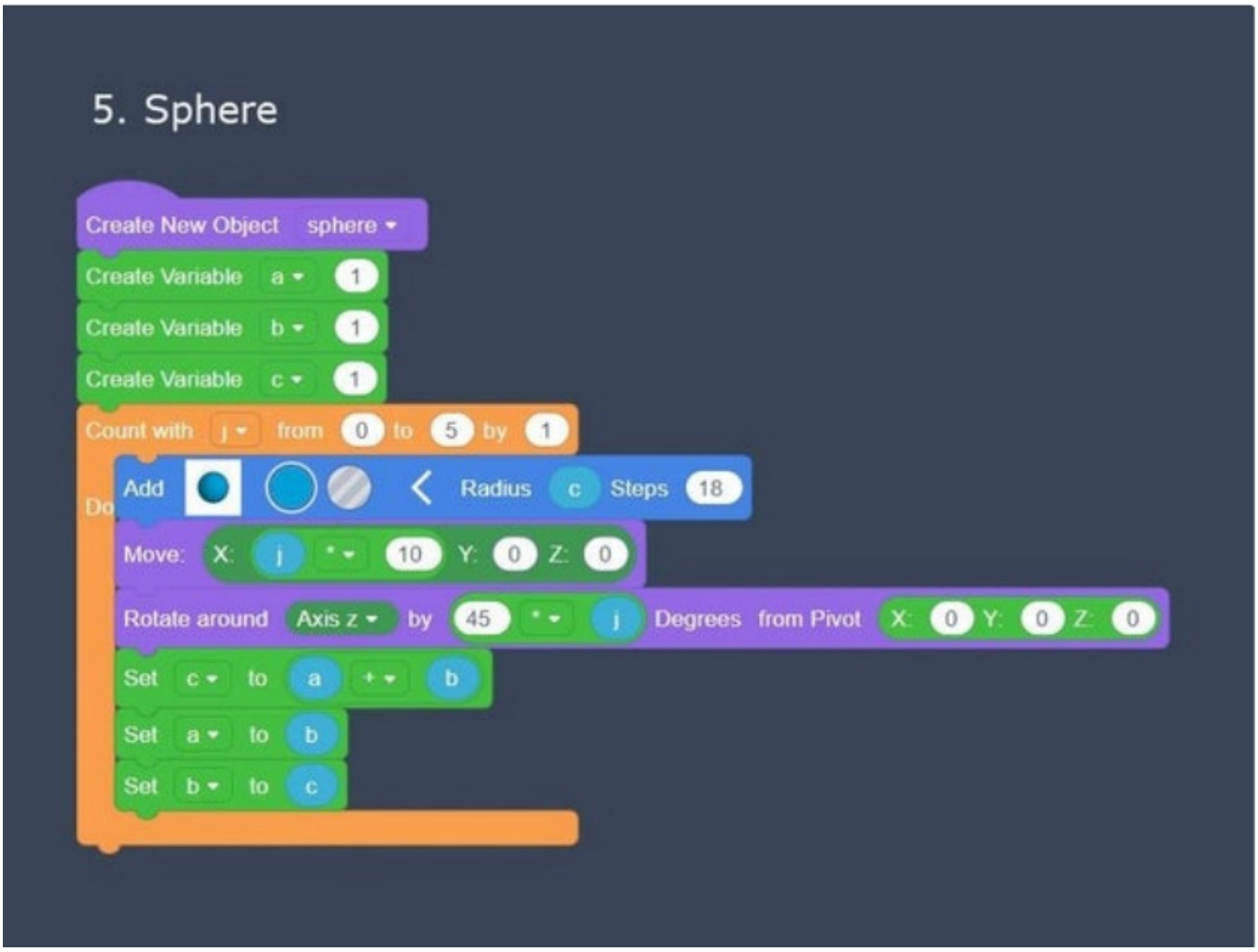
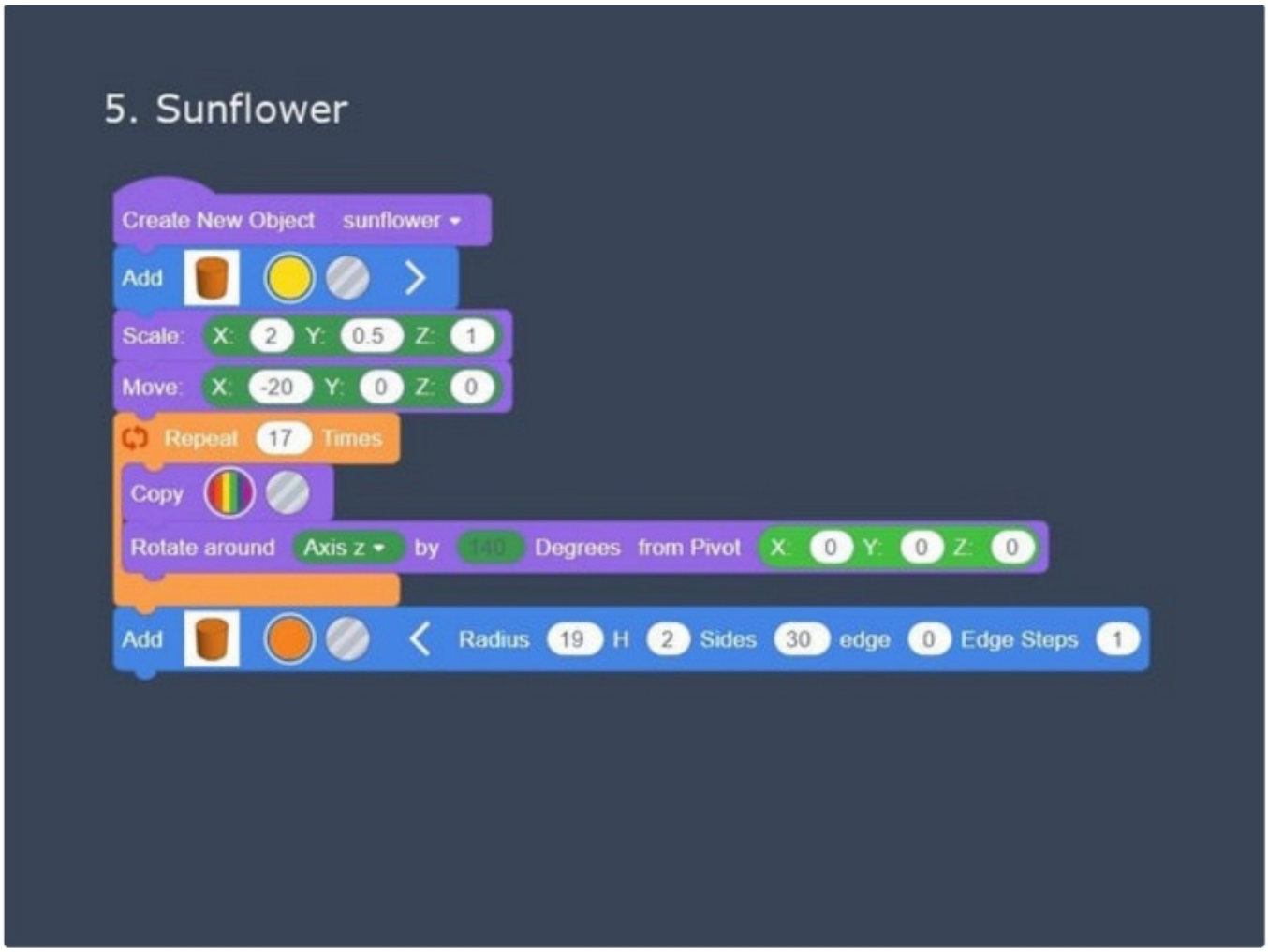
The sphere's radius follows the pattern of Fibonacci numbers
Look at the animation, and try to write the codes.



Please consider the following information in your programming:

1. The radius of the objects should be 1, 2, 3, 5, 8, and 13 respectively
2. Make use of variables and loops to reduce redundant code

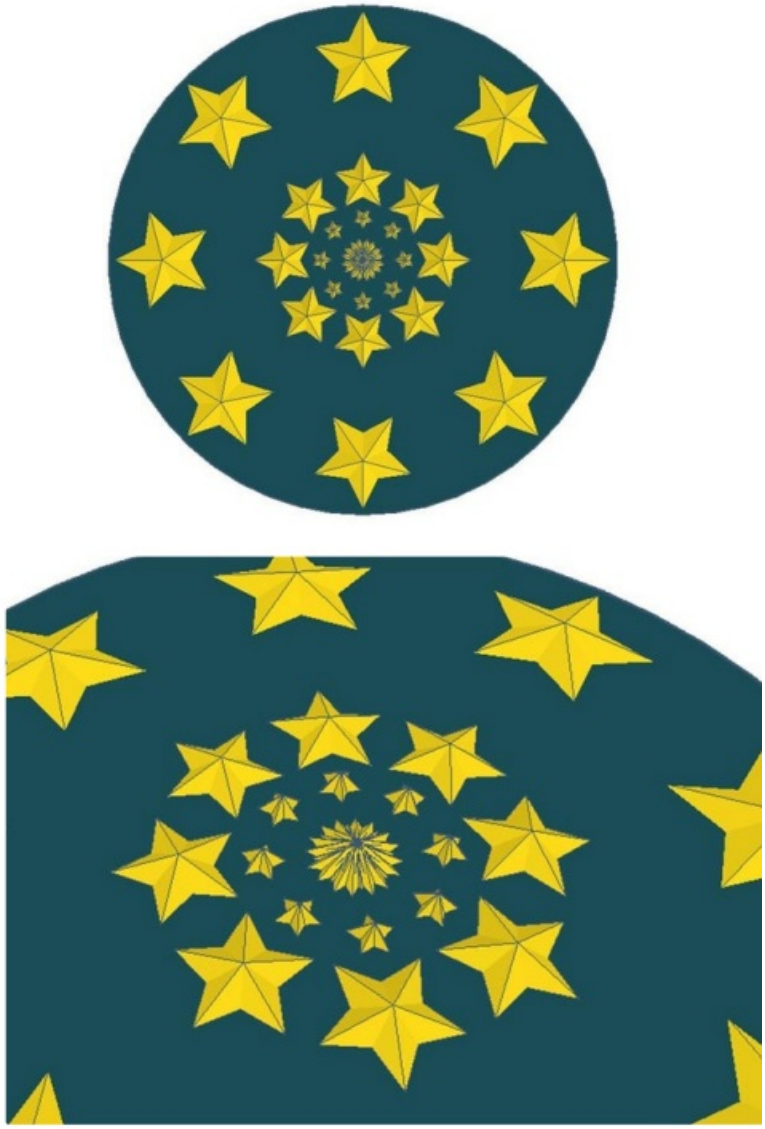
Step 12: Fibonacci Numbers in Nature
The number of sunflower petals is a Fibonacci number. The next petal rotates around 137.5° or 222.5°. This rotation also follows the Fibonacci numbers, and we can make use of the ratio to create some unique artworks (in steps 13 to 15). Here, all examples use 140° as the rotation degree. The rotation ratio of sunflower petals:



Step 13: Example 1: Name Tag
Is there any pattern in this name tag?

What are the hidden Fibonacci sequences?
Fibonacci Rectangle
Pattern Play in Tinkercad Codeblocks: Page 21

Step 14: Example 2: Badge



- Stars (size and rotation)
- Code example (Please click here)
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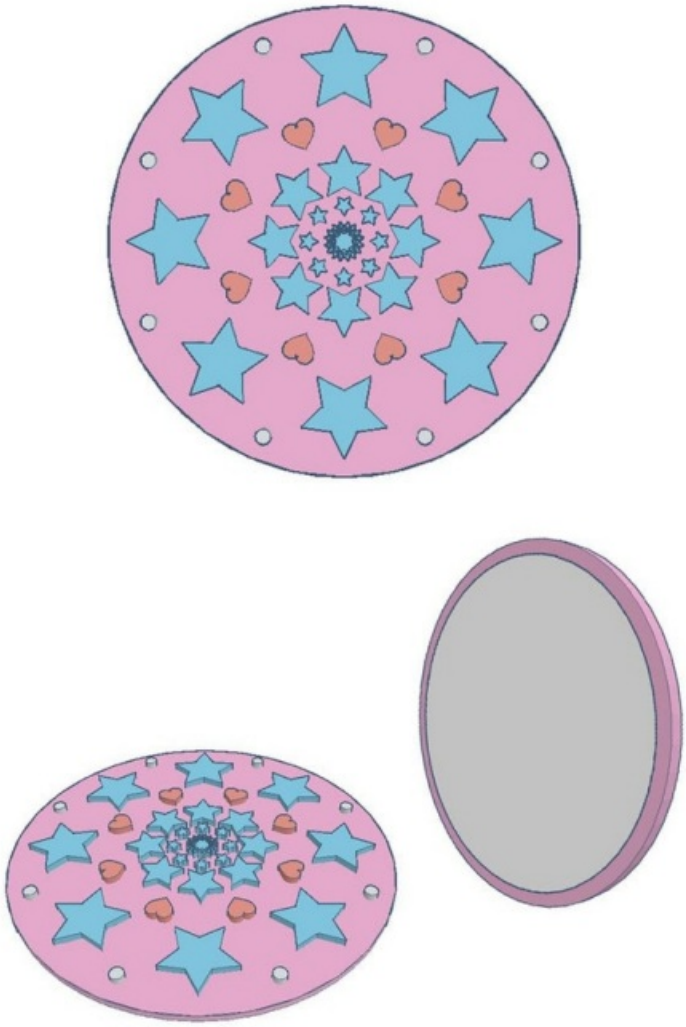
Is there any pattern in this badge?

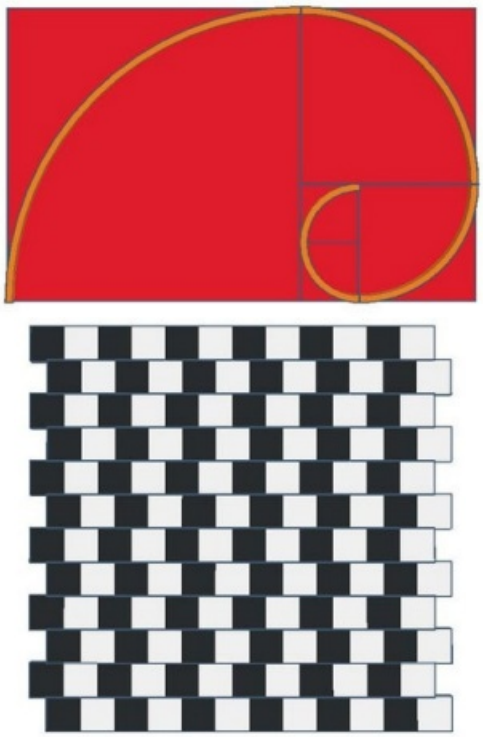
- Stars' size (Fibonacci sequence)
- Stars' rotation (Number pattern)
- Code example (Please click here)

Step 15: Example 3: Pocket Mirror



What are the hidden Fibonacci sequences?
Stars' size (Fibonacci sequence)
Rotation of stars, circles, and hearts (Number pattern) Code example (Please click here)

Step 16: More Examples



Here are some examples. Make Your artwork with patterns. Have fun!

Documents / Resources

	instructables Pattern Play In Tinkercad Codeblocks [pdf] Instruction Manual Pattern Play In Tinkercad Codeblocks, Play In Tinkercad Codeblocks, Tinkercad Codeblocks, Codeblocks

References

- Yours for the making - Instructables
- Losc's Profile - Instructables
- Pattern Play in Tinkercad Codeblocks : 17 Steps (with Pictures) - Instructables
- Codeblocks | Tinkercad
- Codeblock design Name Tag | Tinkercad
- Codeblock design Pocket Mirror | Tinkercad
- Codeblock design Badge | Tinkercad
- User Manual