LETTER A

When we count, multiple, divide or do other types of mathematical calculations, we use these ten digits- 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. When writing words, sentences or other types of written communication we use letters like A, B, C, D, E, F, G and so on. However, computers use a different system of representations called "binary code" to communicate all sorts of information. By using a pattern of 0's and 1's over eight spaces or bits, binary code can be used to represent different letters, numbers or symbols that can be used to communicate with other computers or difference forms of modern technologies.

Here is the letter A, capital A, shown in binary code form. 01000001 Notice where the 1 digits fall within the 8 digit sequence. The 1's are in the second and eighth position in the binary code sequence. I wonder what the letter A in binary code would sound like? If we perform the 0's as a silence or rest, and the 1's as a drum sound, it would sound like this!
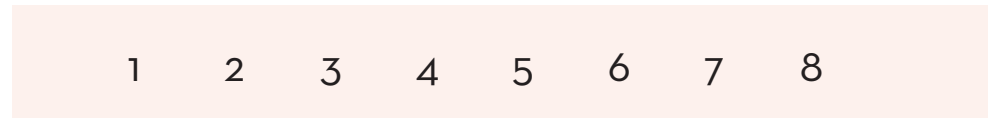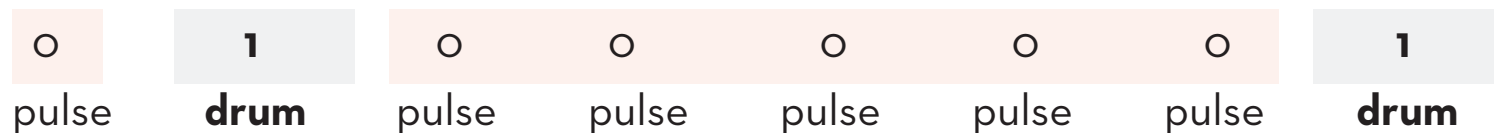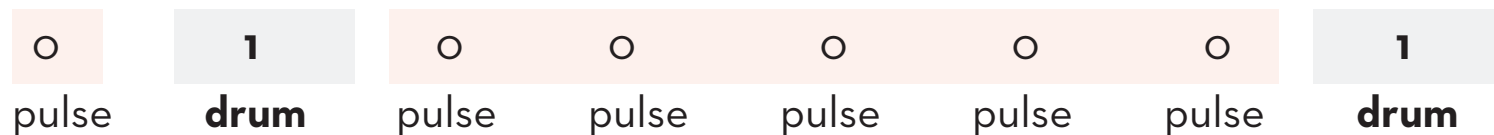
O	**1**	O	O	O	O	O	**1**
	drum						**drum**

Let's do that again.

O	**1**	O	O	O	O	O	**1**
	drum						**drum**
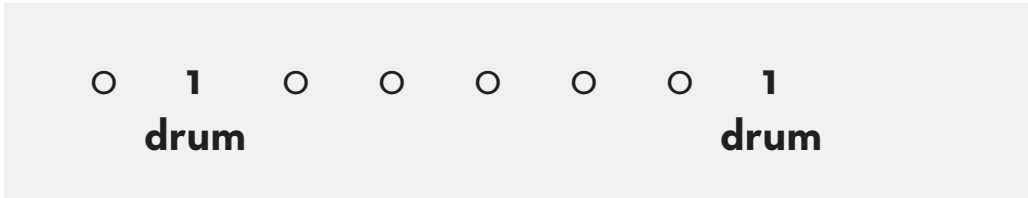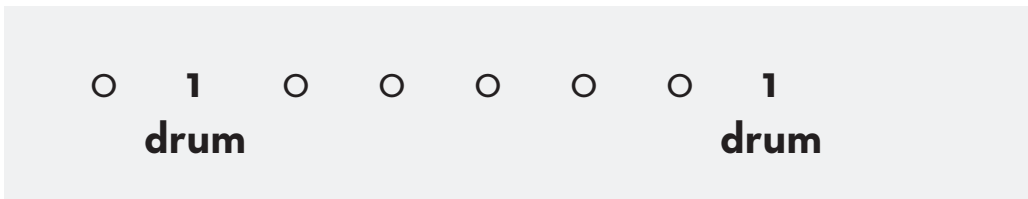
Let's add a steady pulse that will play quietly in the background. Here is the sound of the pulse.

1	2	3	4	5	6	7	8

Put them together and the letter A in binary code repeated two times sounds like this.

O	**1**	O	O	O	O	O	**1**
pulse	**drum**	pulse	pulse	pulse	pulse	pulse	**drum**

O	**1**	O	O	O	O	O	**1**
pulse	**drum**	pulse	pulse	pulse	pulse	pulse	**drum**

Watch a video of Binary Beats in action:

chandra.si.edu/binary/beats

LETTER A

Now it's your turn. Let's use our left hand to quietly keep that steady pulse. I will count you in by saying, "1, 2, ready, and."

1	2	3	4	5	6	7	8
pulse	pulse	pulse	pulse	pulse	pulse	pulse	pulse

Our right hand will perform the binary code rhythm. Let's perform the letter A sequence twice.

O **1** O O O O O **1**

drum **drum**

O **1** O O O O O **1**

drum **drum**

Ready to put your two hands together? The left hand keeps the pulse while the right hand performs the binary code rhythm.
For younger students, perform just the right hand binary code rhythm.

O O O O O O O O
LH LH LH LH LH LH LH LH
1 **1**
R H **R H**

O O O O O O O O
LH LH LH LH LH LH LH LH
1 **1**
R H **R H**

LETTER W

This is the letter W, capital W in binary code. 0, 1, 0, 1, 0, 1, 1, 1

The 1's fall in the second, fourth, sixth, seventh and eighth position. Let's perform the binary rhythm in our right hand while keeping the
8-bit pulse in our left hand. Let's perform it two times through.

O	o	O	O	O	O	O	O
LH	LH	LH	LH	LH	LH	LH	LH
	1		1		1	1	1
	RH		RH		RH	RH	RH

O	o	O	O	O	O	O	O
LH	LH	LH	LH	LH	LH	LH	LH
	1		1		1	1	1
	RH		RH		RH	RH	RH
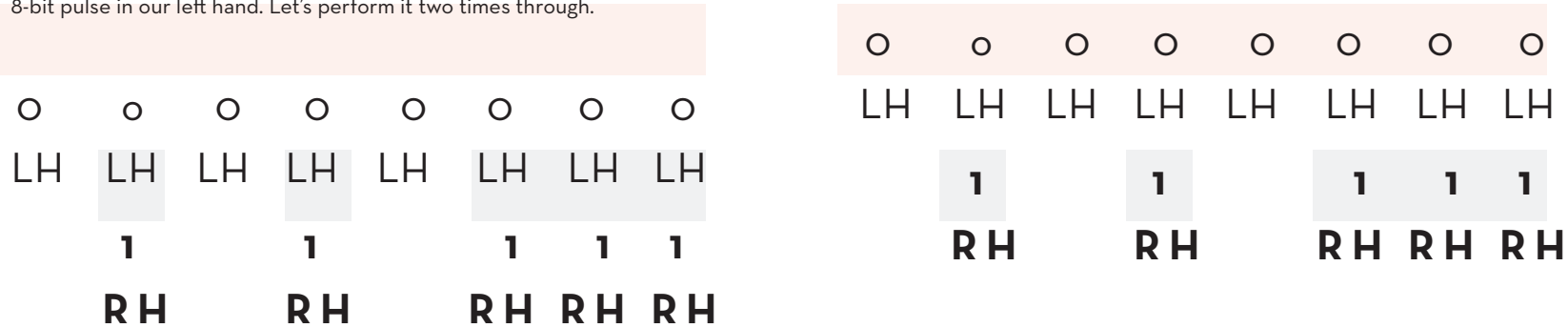
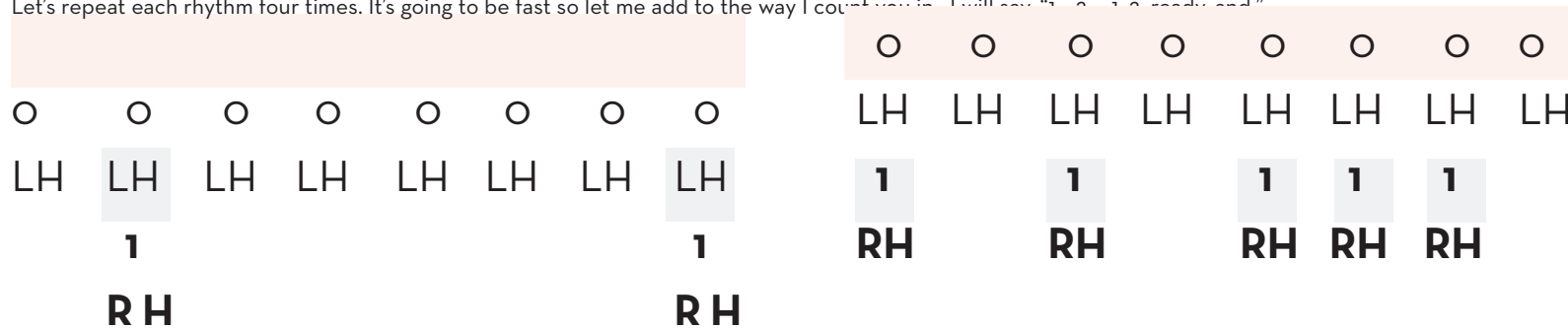Hang on, listen to that going really fast.

The W binary code rhythm reminds me of that song from Guardians of the Galaxy.
Oo ga oo ga oo ga cha ka   Yeah, it's not just me, right? You hear it.

Let's put two binary code rhythms together. You can choose the rhythm you would like to perform. If you are with another person, each take a different
letter and perform together.

I will use two different drum sounds. The snare drum for W and a higher-pitched wood bloc for the letter A.
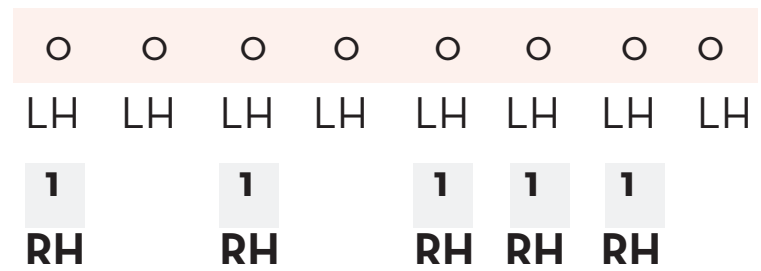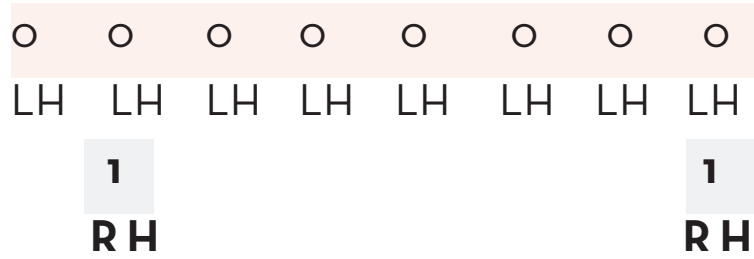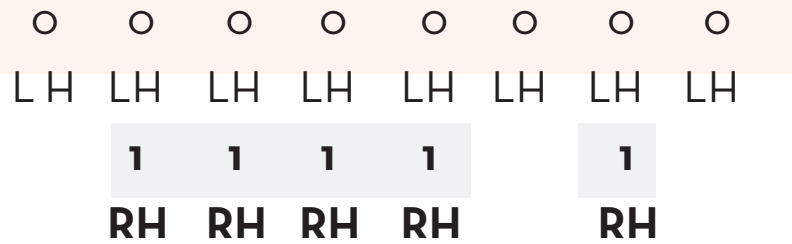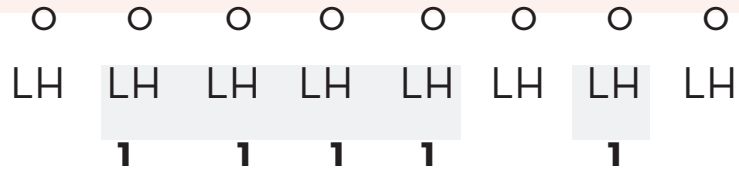
Let's repeat each rhythm four times. It's going to be fast so let me add to the way I count you in. I will say "1, 2, 1, 2, ready, and."

O	O	O	O	O	O	O	O
LH	LH	LH	LH	LH	LH	LH	LH
	1						1
	RH						RH

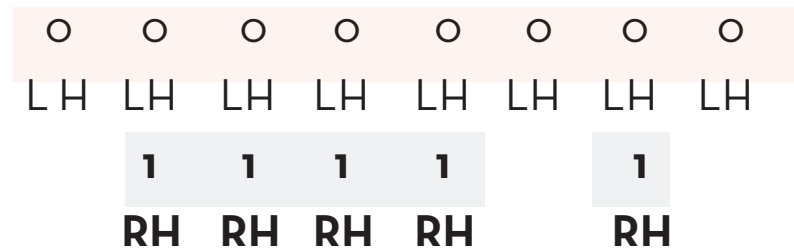| O	O	O	O	O	O	O	O
LH	LH	LH	LH	LH	LH	LH	LH
1		1		1	1	1	
RH		RH		RH	RH	RH	

LETTER Z

This is the letter z, lower case z in binary code. 0, 1, 1, 1, 1, 0, 1, 0

The 1's are in the second, third, fourth, fifth and seventh spot of the sequence. Let's perform

O O O O O O O O

LH LH LH LH LH LH LH LH

   1 1 1 1 1

O O O O O O O O

L H LH LH LH LH LH LH LH

   1 1 1 1   1

RH RH RH RH   RH

O O O O O O O O

LH LH LH LH LH LH LH LH

  1   1

R H   R H

O O O O O O O O

LH LH LH LH LH LH LH LH

 1   1   1 1 1

RH   RH   RH RH RH

    RH RH RH RH

RH

To close out our video, let's combine all three letters, A, W, and lower case z in binary code rhythm. I will use a snare drum for

O O O O O O O O

L H LH LH LH LH LH LH LH

   1 1 1 1   1

RH RH RH RH   RH