Unit 1 - Lesson 1
Welcome to CSP
bits and bytes

Set Up

https://youtu.be/Xpk67YzOn5w

Activity

Prompt:

Is it a 8 bit or 16 bit (Nintendo)?

Activity

Wrap Up

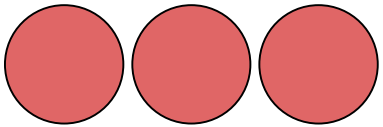
Unit 1 -
Circle Square Patterns

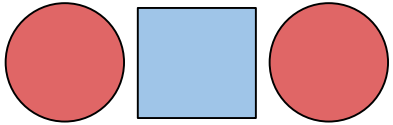
Activity

Prompt:

With a partner, work out how many patterns (made up of circles and squares) you can make with three place values. These patterns could each represent different pieces of information.

Here are two to get you started:

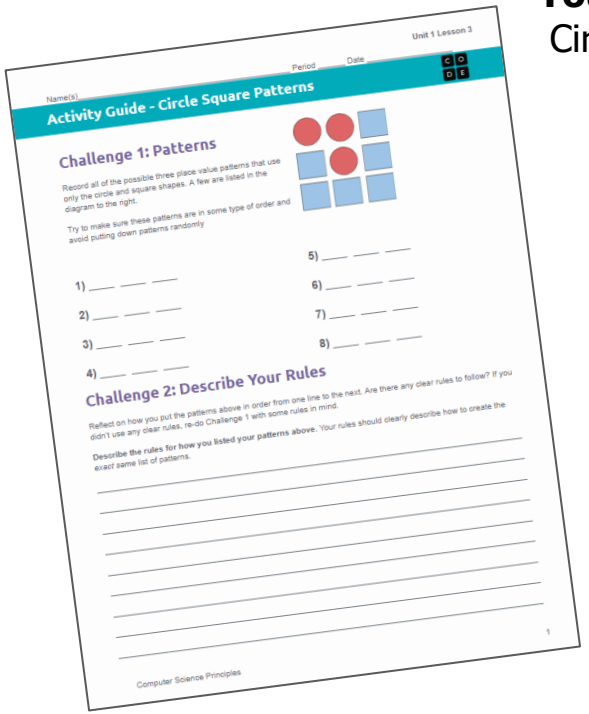




Do This:

Share out your 7th pattern

Circle Square Activity



Unit 1 Lesson 3

Name(s) Period Date

Activity Guide - Circle Square Patterns

Challenge 1: Patterns

Record all of the possible three place value patterns that use only the circle and square shapes. A few are listed in the diagram to the right.

Try to make sure these patterns are in some type of order and avoid putting down patterns randomly

1) ___ ___ ___

2) ___ ___ ___

3) ___ ___ ___

4) ___ ___ ___

5) ___ ___ ___

6) ___ ___ ___

7) ___ ___ ___

8) ___ ___ ___

Challenge 2: Describe Your Rules

Reflect on how you put the patterns above in order from one line to the next. Are there any clear rules to follow? If you didn't use any clear rules, re-do Challenge 1 with some rules in mind.

Describe the rules for how you listed your patterns above. Your rules should clearly describe how to create the exact same list of patterns.

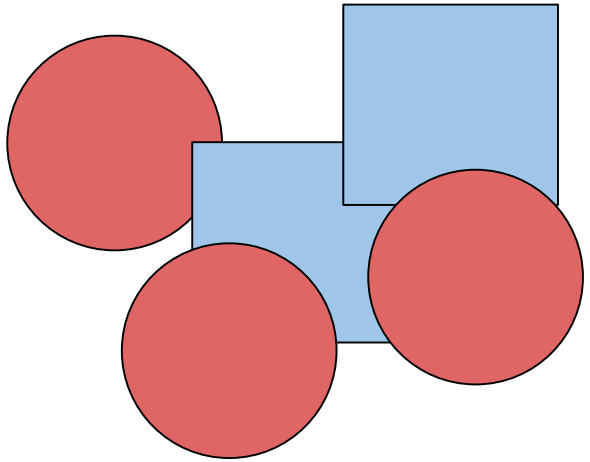
1

Computer Science Principles

You and your partner should have:

Circle Square Patterns - Activity Guide

Shape Cutouts



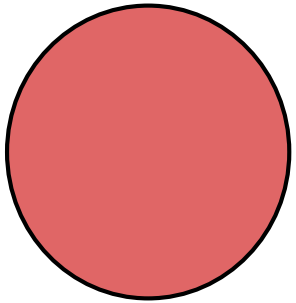
Warm Up

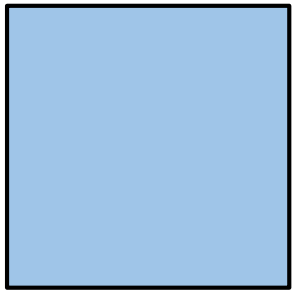
Prompt:

How do we communicate using only two symbols in a computer?

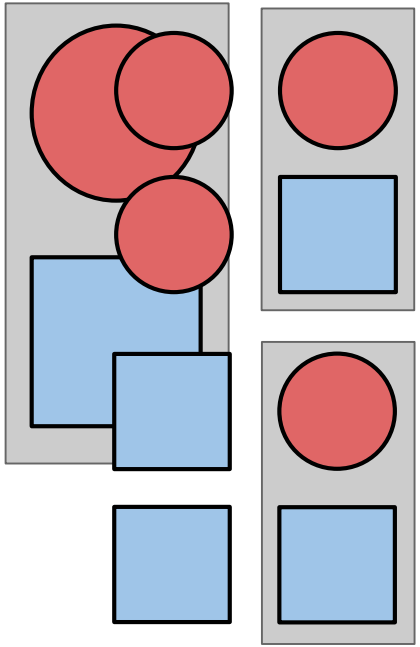
Activity

1 place value = **2** possible patterns



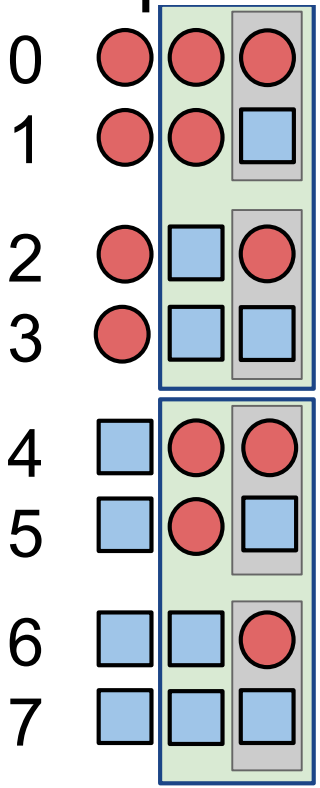


2 place values= 4 possible patterns



3 place values= 8 possible patterns

We can then map our patterns to a numbered list.

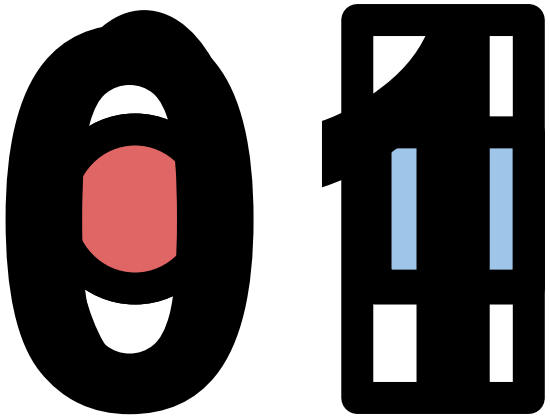


Note: Computer scientists like to start counting at 0!

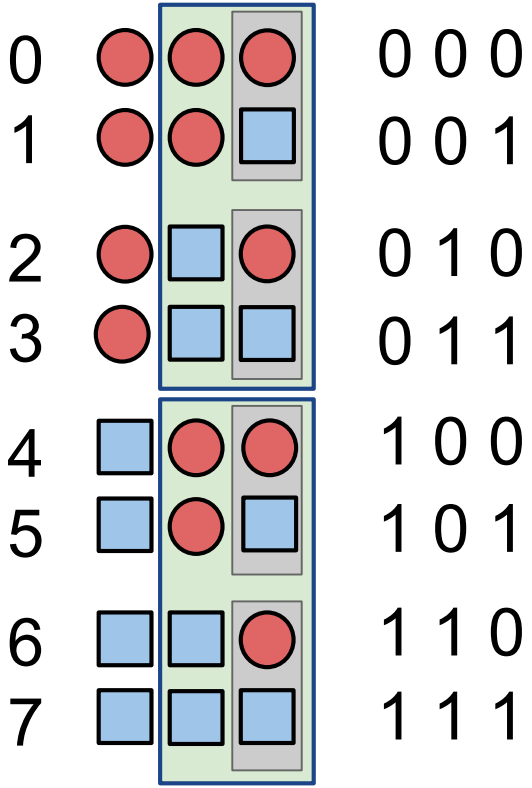
Where is this heading?

...binary...

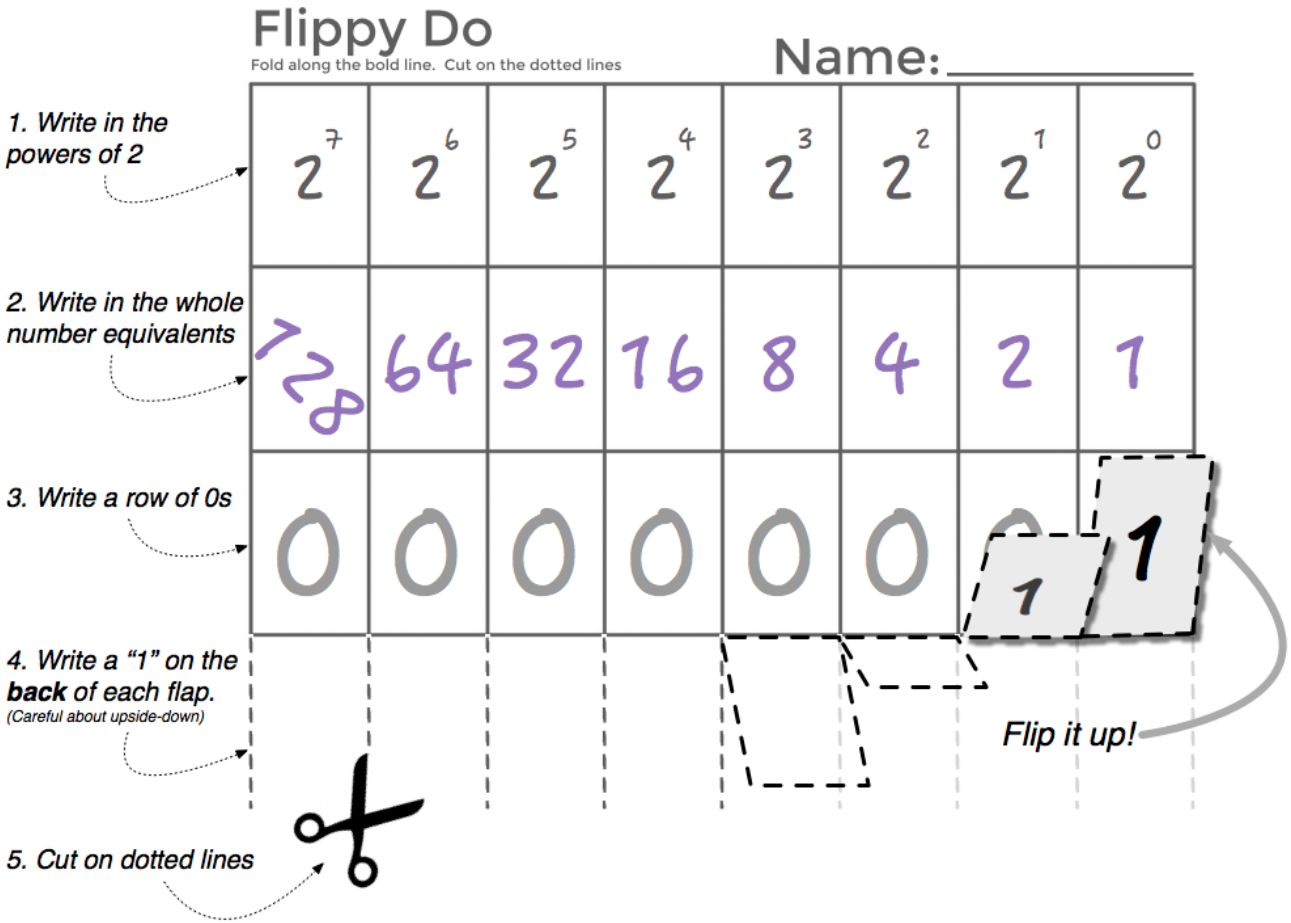
“Binary” is a number system with 2 shapes...



Making Organized Lists -> Counting in Binary



Make Your Flippy Do!



Each place value represents one "**bit**" (binary digit). A bit can be a zero or a one.

Your flippy do has 8 bits...

which together make...

1 byte

Try Out Your Flippy Do!

Represent these decimal numbers in binary

- 7
- 20

Represent these binary numbers in decimal

- 0001 0010
- 0001 1111

Wrap Up

Decimal number: a base 10 number with ten possible different digits

0 1 2 3 4 5 6 7 8 9

10^1	10^0
10	1
2	**3**

Same number represented two different ways.

← Decimal

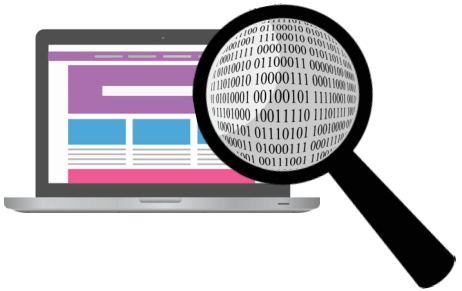
Binary →

Binary number: a base 2 number with two possible different digits

0 1

2^4	2^3	2^2	2^1	2^0
16	8	4	2	1
1	**0**	**1**	**1**	**1**

Bit: A contraction of "Binary Digit"; the single unit of information in a computer, typically represented as a 0 or 1



Byte: 8 bits `10010101`

Readmore

https://www.khanacademy.org/computing/computers-and-internet/xcae6f4a7ff015e7d:digital-information/xcae6f4a7ff015e7d:limitations-of-storing-numbers/a/number-limits-overflow-and-roundoff