

HOW TO CODE A SANDCASTLE

Synopsis

Using basic concepts from computer coding like “sequences” and “loops”, Pearl and her trusty rust-proof robot, Pascal, are able to break down their sandcastle problem into small, manageable steps. If they can create working “code”, this could turn out to be the best beach day ever!

Lessons and objectives

Sometimes a problem seems too big to solve. But if we break down the big problem into smaller steps, we can solve it because it is much easier to solve multiple small problems than one big one.

Materials needed

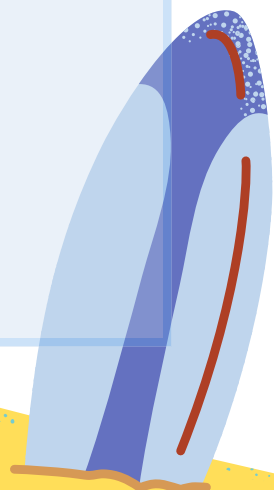
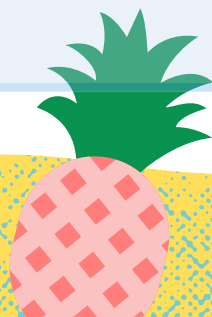
- Lego words print out
- Lego
- Paper
- Alphabet Code print out
- Pencils
- Prestick
- Word Maze
- Elastic
- Beads (3 different colours)
- Binary code sheets
- Scissors

Discussion Questions

1. What problem is Pearl having with building a sandcastle?
2. What instructions does Pearl give Pascal?
3. What problem do they have? Why did their sandcastle break down? What was their solution?
4. What new coding word did you learn today? (Sequence, Loop, Code, If-Then-Else, go over the meanings with the children again).

Activities

1. Vocab Game - Hangman
2. Decode Lego
3. Code Lego
4. Binary beadwork



DECODE LEGO

Lesson focus and goals

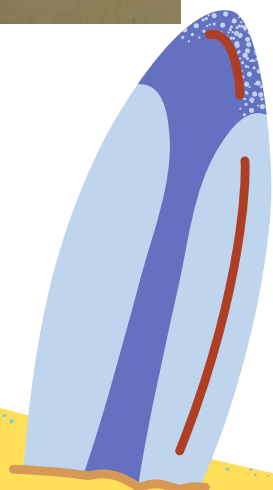
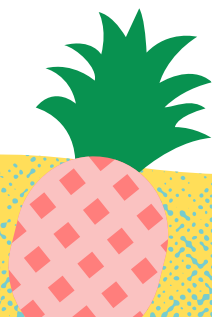
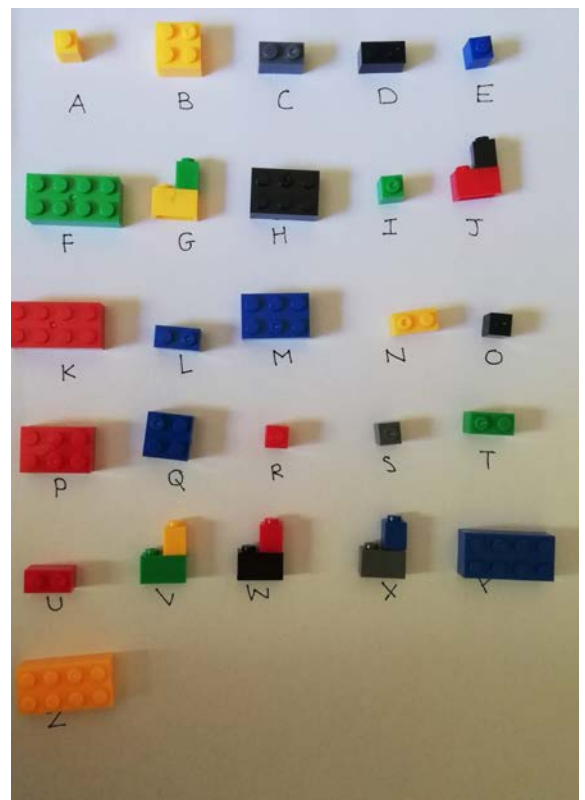
Today the children will use the lego alphabet code to decode lego to make up words. This is a great way to teach the basics of coding while teaching them to think logically.

Materials Needed

- Lego words print out
- Alphabet Code print out
- Word Maze
- Lego
- Pencils
- Paper
- Prestick

Instructions

- Divide the children into groups of 2 or 3
- Give each group the code printout and some scrap paper.
- Stick up the lego blocks using prestick to make the first word on your instruction sheet. (or you can print out the photo's)
- The first team to decode the word and write it down to show you wins that round. You can then put up the next word.
- If there is time left over you can give them the code word maze to do.



CODE LEGO

Lesson focus and goals

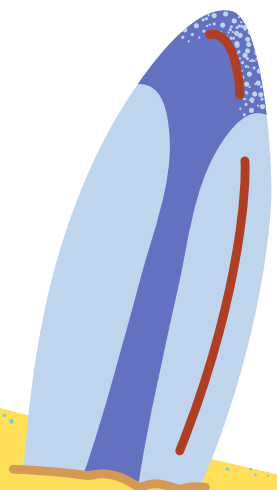
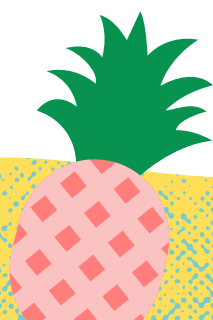
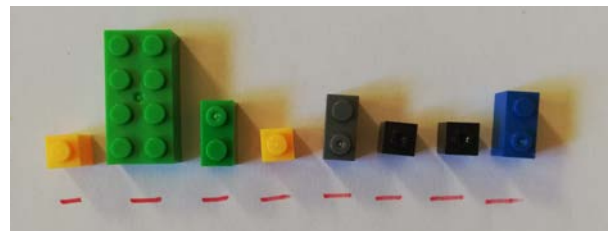
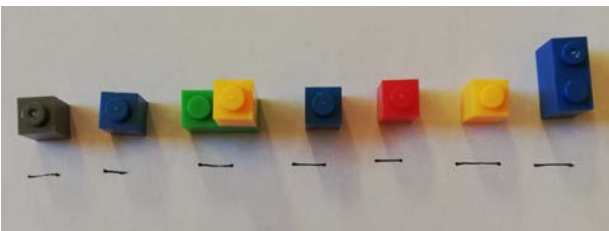
Building on what they learnt yesterday they will now use the code to make a longer sentence.

Materials Needed

- Lego
- Alphabet Code print out
- Paper
- Prestick
- Pencils

Instructions

- Divide the children into 3 groups
- Today the children will use the same codes as yesterday to create their own sentences.
- Using the legos they must follow the code to make up letters.
- Using these letters they can create a sentence.
- They can then swop another team to decode their sentence.



BINARY BEADWORK

Lesson focus and goals

Computers have their own language, they use Binary code this is how computers talk and represent information. Letters, numbers, and pictures.... basically everything you see on the computer is made up of different combinations of 0's and 1's. Today we will be making a bracelet using binary code.

Materials Needed

- Elastic
- Beads (3 different colours)
- Binary code sheets
- Pencils
- Paper
- Scissors

Instructions

- First the children must figure out what they want to code for their binary bracelets.
- Their code can only be 4 letters long so some options could be:
 - the first letters of their name
 - their initials
 - a nickname with 4 letters
 - 4 letter words like: COOL or KIND
- Using the code they should work out on a paper what order the beads should go in. The dark beads should be the 0, the light beads the 1's then the third colour are the spaces between letters: put one spacer at the beginning of your word, one between each letter and 2 at the end.
- If they have time they can decode each other's bracelets.



Character	Binary Code	Character	Binary Code
A	01000001	a	01100001
B	01000010	b	01100010
C	01000011	c	01100011
D	01000100	d	01100100
E	01000101	e	01100101
F	01000110	f	01100110
G	01000111	g	01100111
H	01001000	h	01101000
I	01001001	i	01101001
J	01001010	j	01101010
K	01001011	k	01101011
L	01001100	l	01101100
M	01001101	m	01101101
N	01001110	n	01101110
O	01001111	o	01101111
P	01010000	p	01110000
Q	01010001	q	01110001
R	01010010	r	01110010
S	01010011	s	01110011
T	01010100	t	01110100
U	01010101	u	01110101
V	01010110	v	01110110
W	01010111	w	01110111
X	01011000	x	01111000
Y	01011001	y	01111001
Z	01011010	z	01111010