



# 10-11 YEARS | WEEK 03

## Technology-Coding

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1. Colour coding

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2. Colour coding

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3. Colour coding

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4. Tracing the route

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5. Tracing the route

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6. Tracing the route

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7. Unplugged coding

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8. Unplugged coding

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9. Unplugged coding

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10. Mathematical concepts- algorithm

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11. Coding - Sequences

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12. Coding - Basic terms

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13. Coding - Algorithm

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14. Computers - Cryptic codes

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15. Computers - Binary code

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16. Gadgets - Crack the binary code

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17. Robotics - About robots

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18. Robotics - Robot inspired movies

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19. Robotics - Workshop

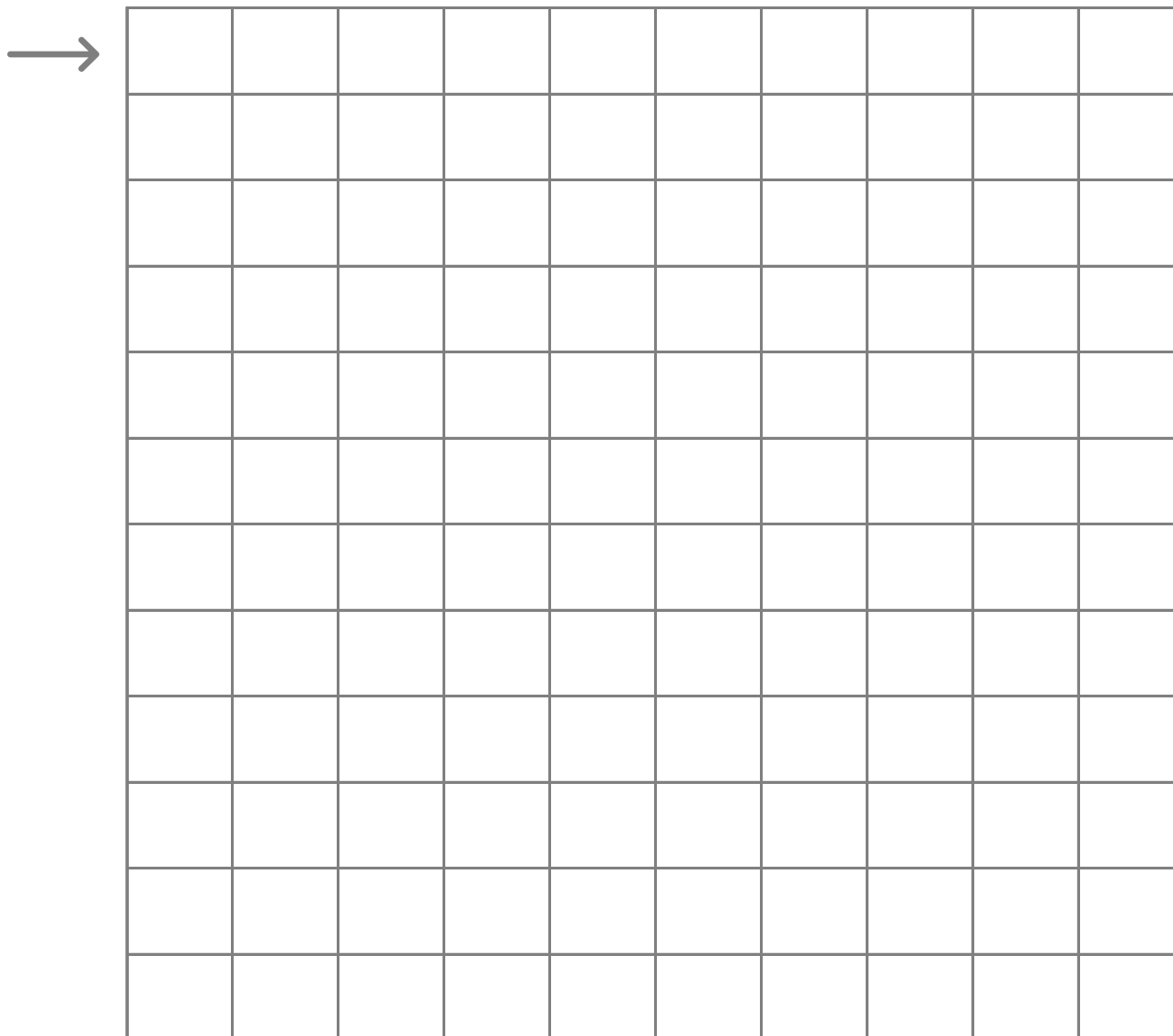
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20. Robotics - Vocabulary



# COLOR CODING

The route has been laid out to navigate the blocks. The arrows show the direction of movement. Trace the path using these arrows in the white boxes. Color the blocks as directed. You can also cut out the arrows from the reference sheet and paste them to trace the route!

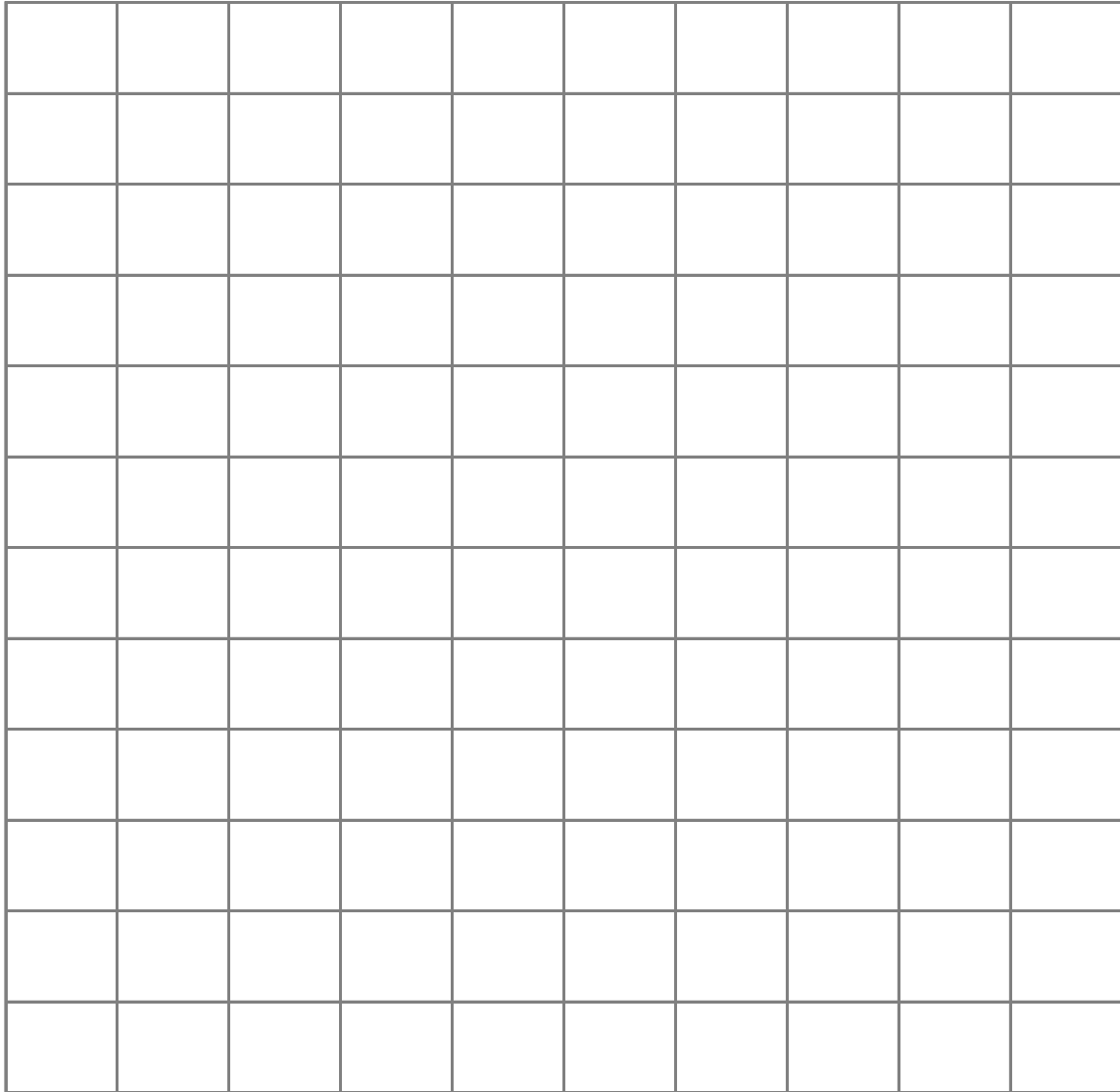


- |   |       |              |    |       |              |
|---|-------|--------------|----|-------|--------------|
| 1 | →     | 4 times      | 6  | ↑     | Color Green  |
| 2 | ↓ ↓ ↓ | Color Orange | 7  | ↓ ↓ ↓ | 2 times      |
| 3 | → → → | 3 times      | 8  | ←     | Color Yellow |
| 4 | ↓     | Color Blue   | 9  | → → → | 3 times      |
| 5 | ← ←   | 4 times      | 10 | ↓     | Color Red    |



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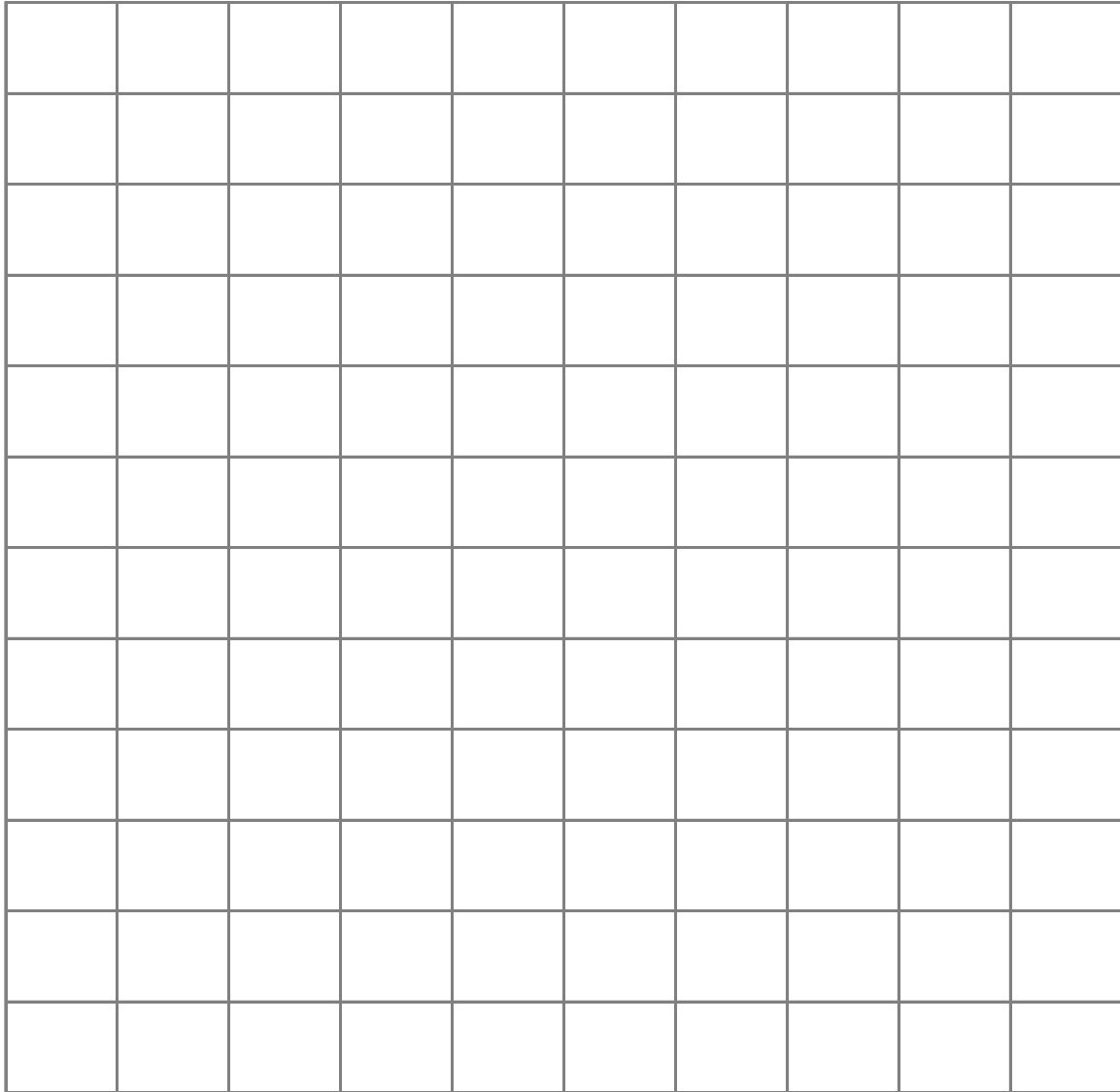


- |   |  |              |    |  |              |
|---|--|--------------|----|--|--------------|
| 1 |  | 6 times      | 6  |  | Color Green  |
| 2 |  | Color Orange | 7  |  | 2 times      |
| 3 |  |              | 8  |  | Color Yellow |
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- |   |  |              |    |  |              |
|---|--|--------------|----|--|--------------|
| 1 |  | 2 times      | 6  |  | Color Green  |
| 2 |  | Color Orange | 7  |  | 2 times      |
| 3 |  | 3 times      | 8  |  | Color Yellow |
| 4 |  | Color Blue   | 9  |  | 2 times      |
| 5 |  |              | 10 |  | Color Red    |









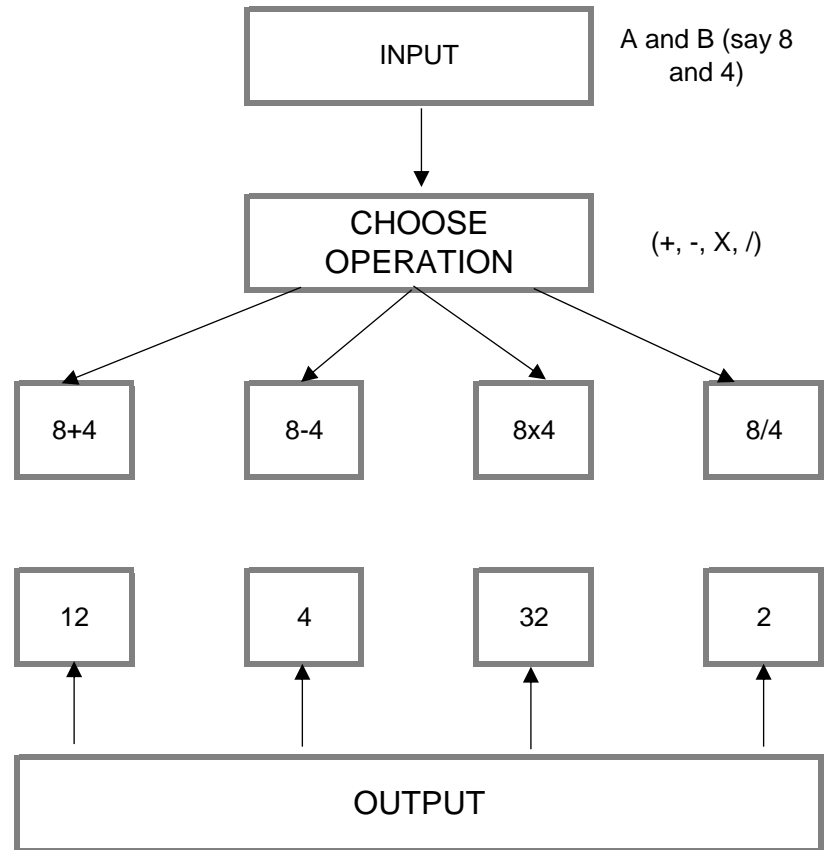
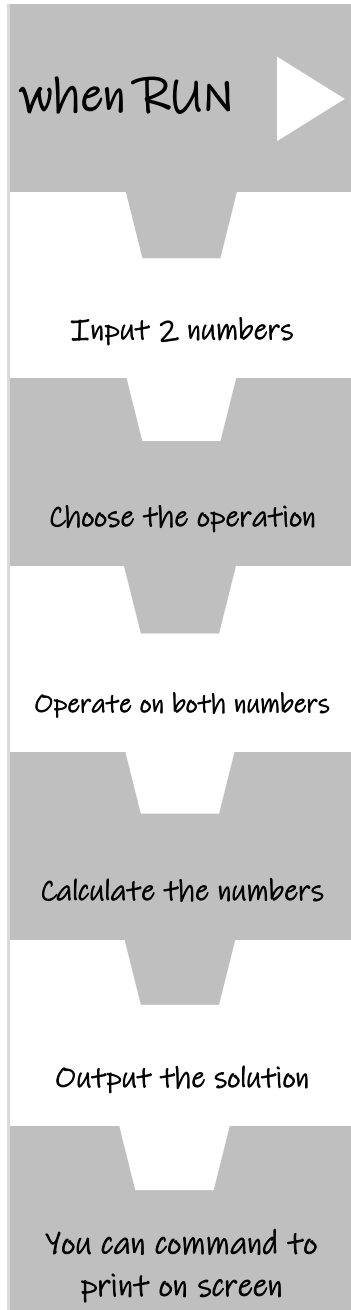






# MATHEMATICAL CONCEPTS BASED ON ALGORITHM

Let's understand how robot would work with numbers. Follow the given steps of the algorithm and design inputs and outputs.









	+	-	x	/
(15 , 5)				
(18 , 6)				
(24 , 3)				
(36 , 4)				
(49 , 7)				

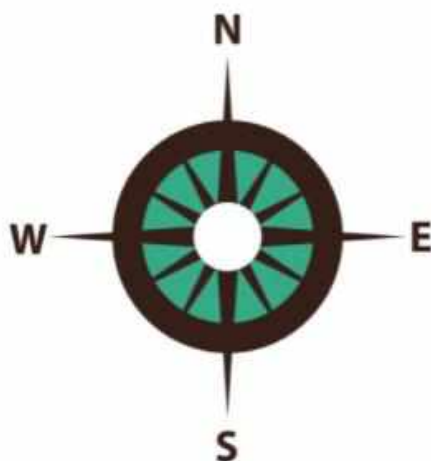
# T: Coding - Sequences



Ask the postman to post the letters in sequential order, starting from house number 1 to 15. He can not move through the bricks. What directions will the postman use to move around the place?

	13	14	15
10	12		
9		1	2
8			3
7	6	5	4

House numbers	Directions (N/S/E/W)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	



# T: Coding - Basic terms



Do you know the basic coding terms used? Unscramble the scrambled words given below based on the clues besides the words.

S.No.	Clues	Scramble word	Unscramble word
1	It is a set of instructions to solve a problem.	glaotmhir	
2	It is a value that is passed into a command or function.	temnraug	
3	It is an expression used for 'true' or 'false' statements.	olobane	
4	An expected error or defect.	gub	
5	A set of related objects with common properties.	sacIs	
6	A written set of instructions using the protocols of a particular language.	ruscoedeoc	
7	It is used to describe a value that cannot change throughout the program.	tascnotn	
8	They are the lists of similar types of data values that are grouped.	rarsya	
9	An unexpected condition encountered during the execution of the program.	cxepentoi	
10	A sequence of instructions are repeated until the condition is met.	oslpo	
11	It defines the lack of any value or a character with no value.	luln	

Answer Key: 1. algorithm, 2. argument, 3. boolean, 4. bug, 5.class, 6. source code, 7.constant, 8. arrays, 9. exception, 10. loops, 11. null.

# T: Coding - Algorithm



An algorithm is a series of instructions to finish a task. A drawing algorithm has to be created to draw the intended picture. The key to creating the algorithm on the left with an example on the right is given below.

Programming key	
→	Step forward
←	Step backward
↓	Move downward
↑	Move upward
⚡	Fill in the square with colours

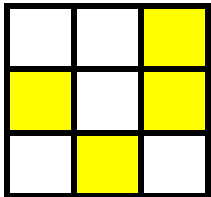
For example:

Step forward, step forward, fill in the square with colours.

The algorithm will be:

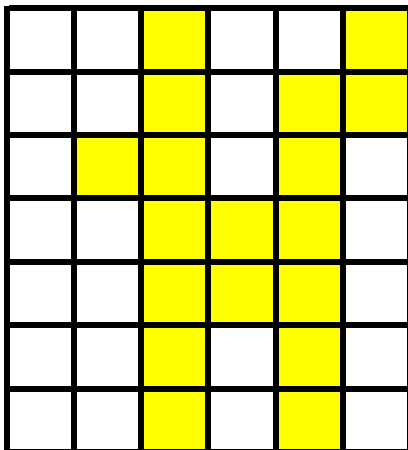


Write the algorithm in the box using the above key and the plain-English text.



Step forward, step forward, fill in the square with colours, move downward, step backward, step backward.  
 Fill in the square with colours, step forward, step forward, fill in the square with colours, move downward, step backward, step backward.  
 Step forward, fill in the square with colours, step forward.

Write an algorithm using the key given in the table to draw exactly the image below.



# T: Computers - Cryptic codes



Cryptic codes came into existence to protect the messages for military use. Let us decode the cryptic code using the key in the table below.

	1	2	3	4	5
1	b	c	d	e	f
2	g	h	i	j	k
3	l	m	a/z	n	o
4	p	q	r	s	t
5	u	v	w	x	y

Example:

h	e	l	l	o
22	14	31	31	35

53	22	14	34

55	35	51

22	33	52	14

12	35	34	15	23	13	14	34	12	14

55	35	51

21	33	34

22	33	52	14

33

31	35	45

35	15

15	51	34

53	22	14	34

55	35	51

22	33	52	14

15	51	34

55	35	51

21	33	34

13	35

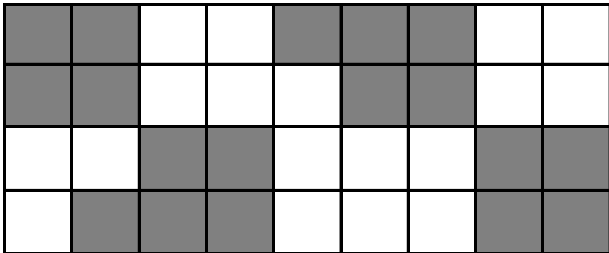
53	35	34	13	14	43	44

Answer Key: When you have confidence, you can have a lot of fun. When you have fun, you can do wonders.

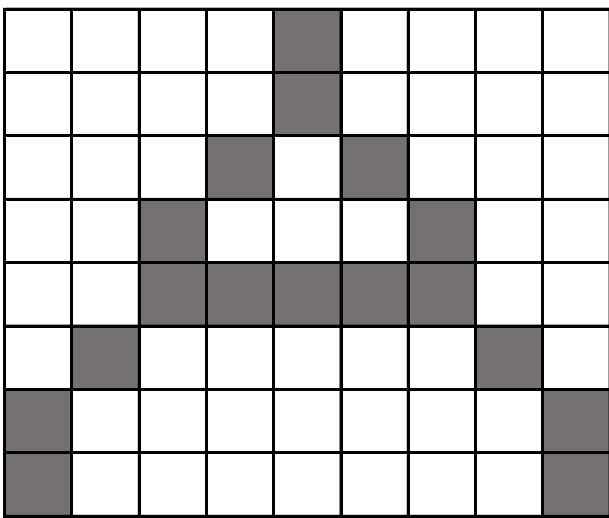
# T: Computers - Binary code



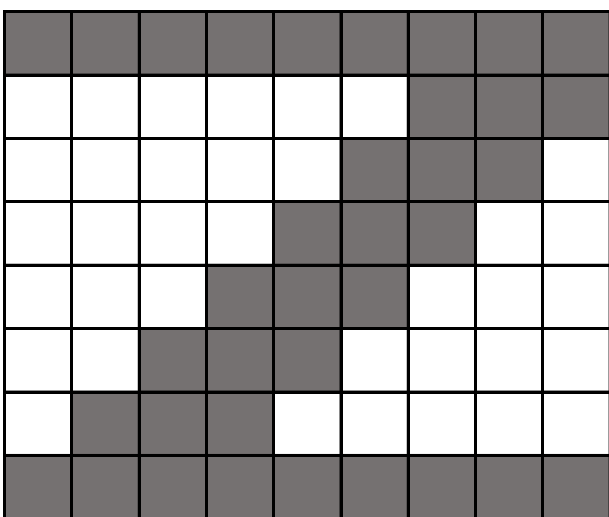
Binary codes are codes of '0' and '1' understandable by the computer. Each bit is either '0' or '1'. Convert the bitmaps to binary codes by writing the binary code for the images in the grids, where '0' represent an unshaded grid and '1' represent a shaded grid. The first one, 'a' is done as a reference.



a	1	1	0	0	1	1	1	0	0
b									
c									
d									



e									
f									
g									
h									
i									
j									
k									
l									



j									
k									
l									
m									
n									
o									
p									
q									

Answer Key: b) 110001100, c) 001100011, d) 011100011, e) 000101000, f) 000101000, g) 001010100, h) 001000100, i) 001111100, j) 010000010, k) 100000001, l) 100000001, j) 111111111, k) 000001111, l) 00001110, m) 00011100, n) 00111000, o) 00111000, p) 01110000, q) 01110000 and r) 11111111.

# T: Gadgets - Crack the binary code



Do you like to play riddles? Answer the following questions by cracking the codes using the key given below. Have fun playing!!!

1. I have hands, but cannot hold a thing. Who am I?

01100001	01100011    01101100    01101111    01100011 01101011

2. What has teeth, but cannot chew?

01100001	01100011    01101111    01101101 01100010

3. I use my ears to speak and my mouth to hear. What am I?

01100001	01110000    01101000    01101111    01101110    01100101

## Letters of the alphabet in binary code

a - 01100001	b - 01100010	c - 01100011	d - 01100100
e - 01100101	f - 01100110	g - 01100111	h - 01101000
i - 01101001	j - 01101010	k - 01101011	l - 01101100
m - 01101101	n - 01101110	o - 01101111	p - 01110000
q - 01110001	r - 01110010	s - 01110011	t - 01110100
u - 01110101	v - 01110110	w - 01110111	x - 01111000
	y - 01111001	z - 01111010	

Answer Key: 1. a clock. 2. a comb. 3. A phone.

# E: Robotics - About robots



Have you seen robots? Let us learn about robots by reading the paragraph and answering the following questions below.

## Robots

Robots can be of any shape and size. They can be tall, short, thin or fat. They can be very simple or complicated with a lot of switches and flashlights. Some robots have extending arms and can walk. Others move on wheels or tracks. Some robots are made to look like humans and do human-related activities. They are very different from us, where they cannot see, hear, smell or think by themselves. Some robots can even speak. They cannot laugh or cry and they have no feelings. So, they cannot feel any pain. Robots are just machines with computers to act as brains. They are designed and programmed by humans. Robots make our life easier. They are good at doing hard jobs and can work for long hours without getting tired or bored. Some robots work at the bottom of the sea and in outer space. Scientists are making robots in an advanced way, where in the future, the robots are made to help every homemaker with household chores such as washing clothes, dish washing and floor cleaning.

**Read the above passage carefully and answer the following questions.**

1. List the differences between a human and a robot.

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2. Can machines 'think'? Explain your answer.

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3. What are the similarities between a human and a robot?

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# E: Robotics - Robot inspired movies



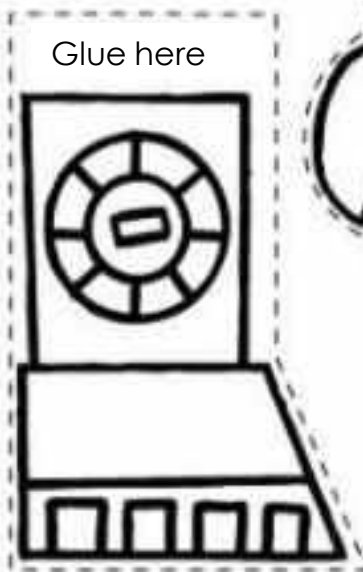
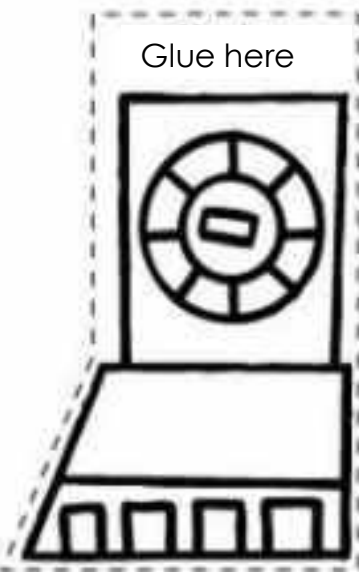
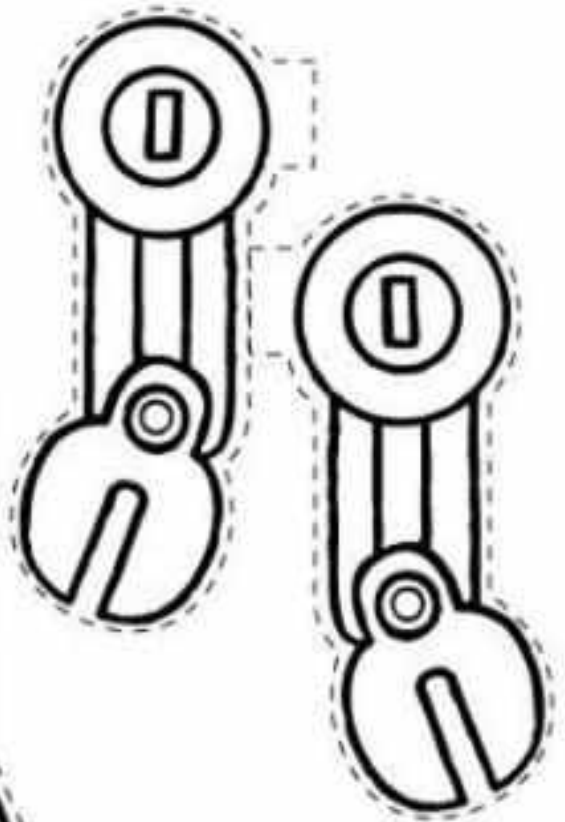
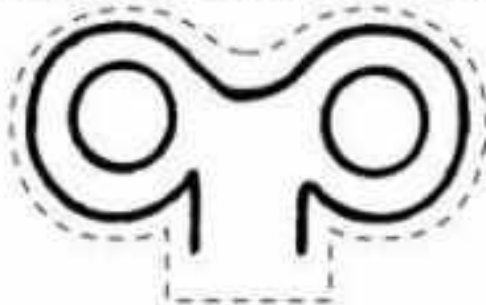
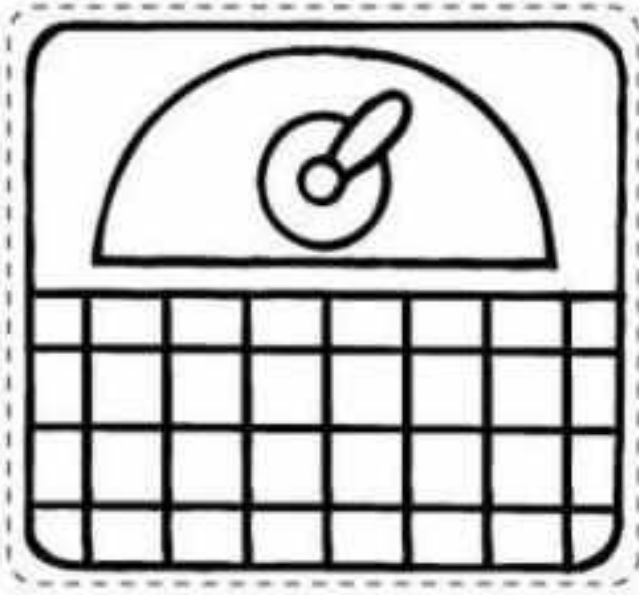
Have you watched any movies related to robots? Create a movie poster for any robot inspired movie that you have watched recently. Include a 'hook' somewhere in the poster in such a way that it grabs people's attention. Make it colourful and get innovative!!!

A large, empty rectangular box with a solid black border, intended for students to draw their movie poster. The box is centered on the page and occupies most of the lower half of the worksheet.

# E: Robotics - Workshop



Let us do an activity in creating a robot. Cut along the dotted lines given below and paste them in the respective positions to make your robot. You can even colour it.



# E: Robotics - Vocabulary



Let us play a word game - 'scrabble'! Write the letters in each box forming a word related to the robot and its activities in such a way that you link them together. How many of these words can you connect? Two words have been done for you. Start thinking!

r	o	b	o	t					
				r					
				a					
				i					
				n					