8-9 YEARS | WEEK 03

Technology - Algorithms, Crypts & Robotics

1. Algorithms - Identify the steps
2. Algorithms - Write the steps
3. Algorithms - Step-by-step
4. Algorithms - Complete the pattern
5. Algorithm - Build a caterpillar game
6. Crypt arithmetic reference
7. Crypt arithmetic
8. Robotics - Draw a robot
9. Robotics - Robot themed movies
10. Robotics - Upcycled robot
11. Robotics - Robot hand puppet
12. Coding - Pixel art
13. Coding - Pixel art
14. Coding - Pixel art
15. Coding - Pixel art
16. Coding - Pixel art
17. Coding - Pixel art
18. Crypt arithmetic
19. Crypt arithmetic
20. Crypt arithmetic

T: Algorithms - Identify the steps

Who likes to eat a cake? Everybody does! And baking a cake is also equally exciting. Today we will cut and paste the steps for baking a cake in order. Also, describe the steps in one sentence.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

Answer Key: 1. Get all the ingredients 2.. Mix all the ingredients. 3. Add milk to adjust consistency 4. Pour in cake tin. 5. Bake the cake in oven. 6. Decorate the cake.

T: Algorithms - Write the steps

Have you ever been to a picnic with your family? You must have seen how your parents get everything ready for picnic. Food and drinks for everyone, toys for you and your siblings. Can you complete the steps given below for going to a picnic on the beach?

1 Write the things that you would like to take in a picnic basket.

2 What is shown in the picture given alongside? What would you need to build one of those?

3 What would you like to play with at the beach?

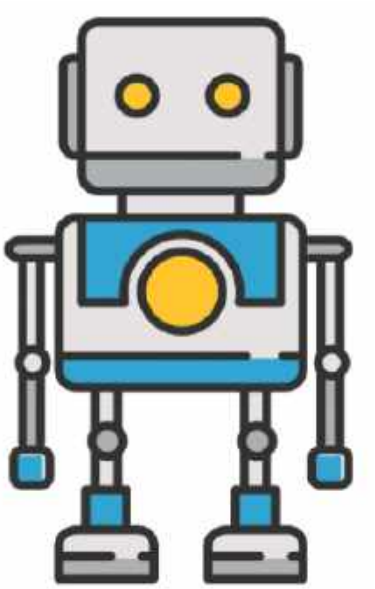
4 What other accessories are needed at the beach?

Answer Key: 1. Apple, frooti, biscuits, chocolates 2. Sand castle, sand castle kit. 3 volleyball, cricket 4. goggles, beach towel, umbrella, sunscreen

T: Algorithms - Step by step

Given below are some steps to make a robot. Read those steps carefully and see if they are correct or not. If not, correct them and write them below.

My robot



1 We are going to make a robot today.

2 As you can see the body of the robot is triangular.

3 So draw a 4 sided triangle.

4 In the middle of his face are his 2 ears.

5 Hands of the robot are hexagonal.

6 Draw oval shaped feet.

7 Your robot is almost ready.

8 As you can see, they have coloured the robot green.

9 If you don't have green colour, you can mix red and yellow colour to make green colour.

10 Tada! Your robot is ready.

Corrected steps

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

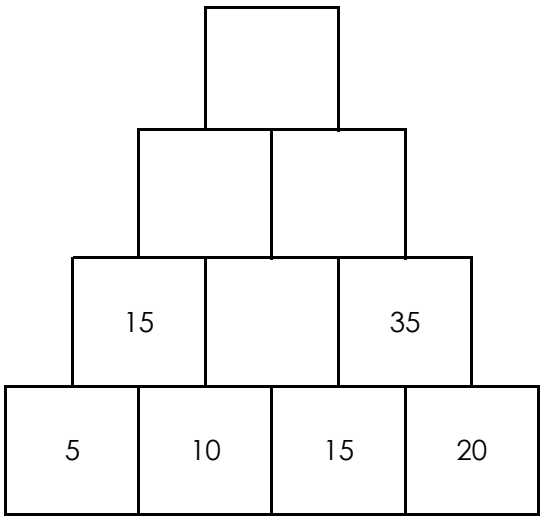
8 _____

Answer Key: 2. Body of robot is polygon shaped. 3. draw a 6 sided polygon. 4 middle of his face are his eyes. 5. hands of robot are rhombus shaped. 6. feet are cuboid shaped. 8. robot's colour is pink. 9. mix yellow and blue to make green.

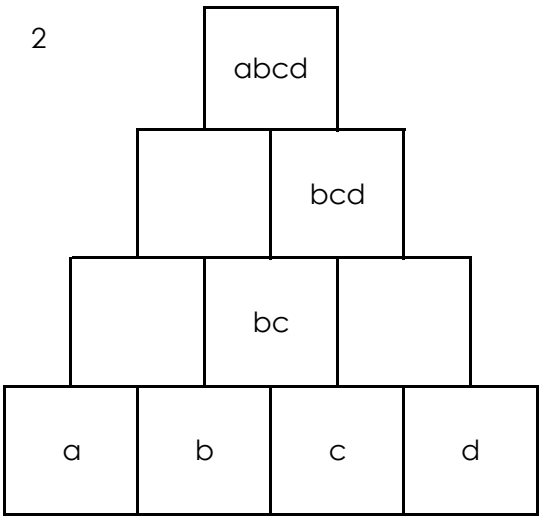
T: Algorithms : Complete the pattern

Some patterns are given below. Observe them and try to complete them.

1

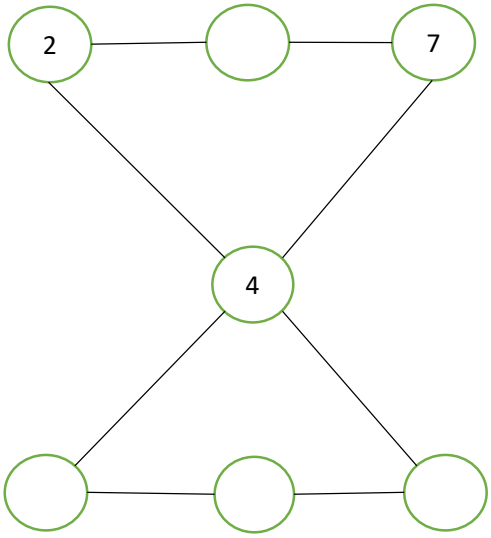


2



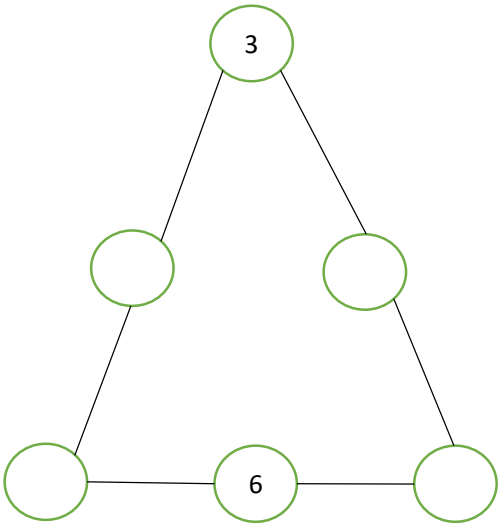
3

In the pattern given below, numbers from 1 to 9 are to be filled and addition of each line should be 12. Also no number should be repeated. So fill the missing numbers.



4

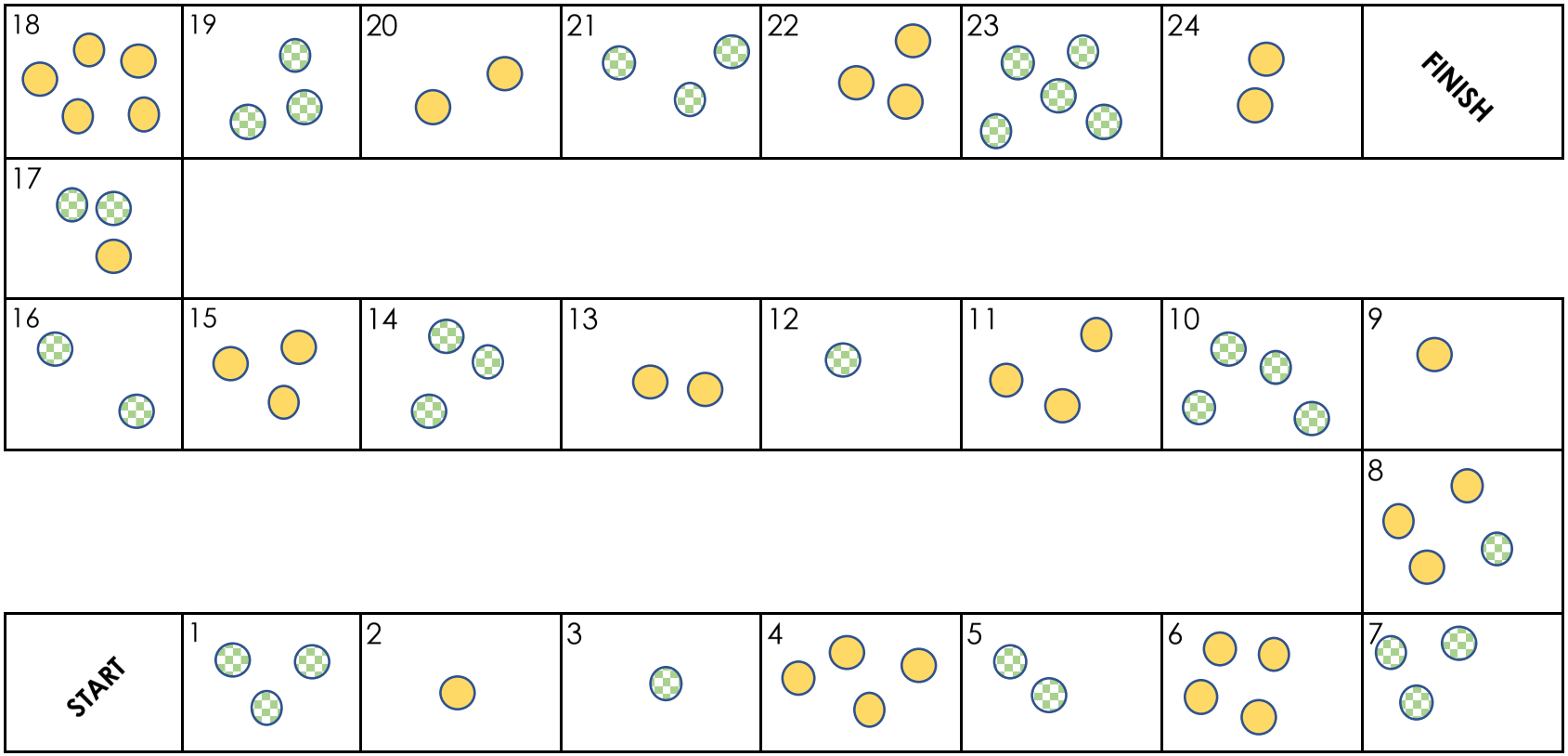
In the magic triangle given below, fill the numbers from 1 to 6 and sum of each side should be 9.



Answer Key: 1. 25, 40, 60, 100 2. ab, cd, abc 3. 2-3-7, 7-4-1, 2-4-6, 1-5-6, 4. 3-4-2, 3-5-1, 2-6-1.

T: Algorithms - Build a caterpillar game

Let us play this fun board game and build our own caterpillar. Using a dice you have to move around the board to collect parts for building a caterpillar. Checked parts are 2 points each and solid parts are 10 points each. So if you collect 5 checked parts, you can exchange them for 1 solid part. At the end, count how many points you have collected and how long is your caterpillar.



CRYPT ARITHMETIC REFERENCE

A cryptarithm is a mathematical puzzle in which the digits have been replaced by letters. In these puzzles; each letter stands for a different digit. 0 is never the first digit of any number. These puzzles may have multiple answers.

A+A+A = BA

Step 1: Look at the letters carefully, "A" can not be 1,2,3. Why?
Step 2: Because three times the sum of the digit is a single digit number but the answer is a two-digit number "BA."
1+1+1=3 ; 2+2+2= 6 ; 3+3+3 =9.
Step 3: So "A" should be one of these digits 4,5,6,7,8, or 9. Why?
Step 4: 4+4+4=12 ; 5+5+5=15; 6+6+6=18; 7+7+7=21;8+8+8=24; 9+9+9=27.
Step 5: Do you know the solution now?
Step 6: The solution is - A =5 & B = 1.

SUN + FUN = SWIM

Step 1: Look at the letters carefully - "N" & "U" can not be 0. Why?
Step 2: Because the sum of N+N & U+U is a different digit.
Step 3: "N" & "U" can be any digit between 1 to 9.
Step 4: Check why this is not possible N =1 and U =6 then 1+1 = 2 and 6+6=12? Why?
Step 5: So make combinations with "N" & "U"; assume N = 2 and U = 3
Step 6: Check "S" & "F" - the sum of single digits makes a two digit number.
Step 7: Assume S=1 & F =9.
Step 8: Can you find the solution now? There can be more than one solution also. S=1; F=9; U= 3; N=2; W=0; I= 6 & M=4.

SUN + FUN = SWIM _____ 132+932= 1064

CRYPT ARITHMETIC

Directions:
1. Each letter represents a different single digit. Zero is never the first digit of any number.
2. If a letter is used more than once, it represents the same digit. The below problems can have more than one solution.
3. One has been completed for you.
4. Refer to the reference sheet to know more about Crypt Arithmetic.

AB + CB
Solution : A = 2 ; B = 6 ; C=3
26+36

BA
62

AB + AB
Solution : A = ___ ; B = ___ ; C=____

CA

AB+ BA
Solution : A = ___ ; B = ___ ; C=____

CC

AB + CB
Solution : A = ___ ; B = ___ ; C=____; D= _____

AAD

AB + CB
Solution : A = ___ ; B = ___ ; C=____; D= _____

ADD

E: Robotics - Draw a Robot

The use of robots has increased working efficiency. They can perform tasks at the fastest speed. Robots can also serve those tasks that are dangerous to human beings. Think of a robot you want to build and draw it in the space given below. You can colour it as well.

E: Robotics - Robot themed movies

Robots that look like humans are called androids, and swarm robots look like insects. Victor Scheinman first designed the electric arm, and it was called PUMA. Let us try to identify the main characters given below from a famous Hollywood robot-based movies and write the name of the characters and describe about the characters.

Name of the character: _____

Describe the character: _____

_____

Name of the character: _____

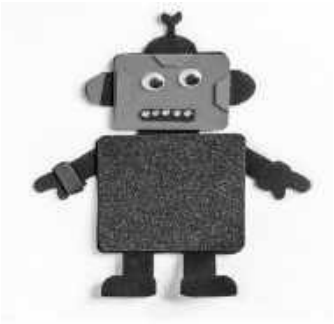
Describe the character: _____

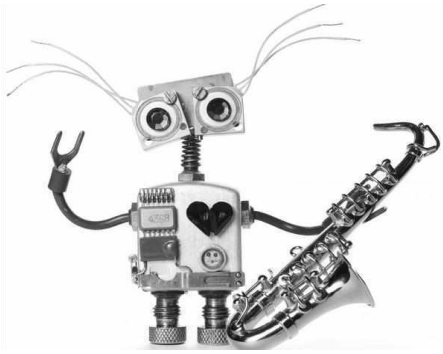
_____

Answer Key: 1.A-X-L, 2.ALITA

E: Robotics - Upcycled robot

Robots are the result of the latest technology and modern engineering. Do you like robots? Let us make a robot using reusable objects available at your home. For this, you can use some foam sheets, nuts, bolts, tins, bottles etc. You can decorate your robots using paint, paint sticks, paper, stones, bottle caps, etc. You can refer to this robot image.



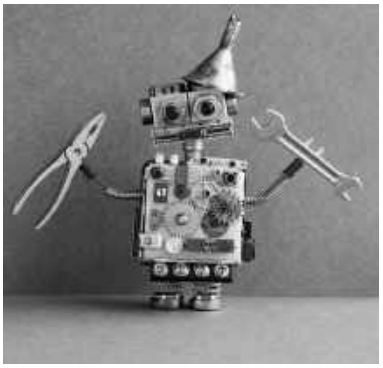


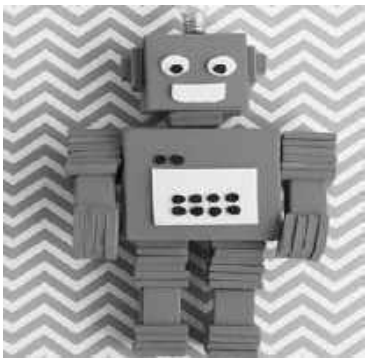
Write down the list of materials you will use to make your robot.
1
2
3
4
5
6
7
8

Write down the steps you followed to create your recycled robot.

E: Robotics- Robot hand puppet

George Devol created the first robot called the Unimate, which runs digitally. Robots are generally appointed in manufacturing units. Are you interested in making a Robot? Let us try to make a robot hand puppet with the help of something available at home.





Here is an idea to make your Robot hand puppet.

1 Use some old cardboard, foam sheet, old tins, brown paper grocery bags, bolts, nuts, old toys etc.□

2 You can decorate your robots using paint, sticks, paper, bottle caps, play dough etc.

3 Stick a rope on the backside of the robot or insert your hand in the tin and start playing.□

Write down the list of materials you will use to make your Robot hand puppet.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

Can you write down steps on how you make your robot hand puppet?

_____

_____

_____

_____

_____

_____

_____

CODING - PIXEL ART

Let's create pixel art of hidden images ! Pick up your favorite two colors, C1, C2. Color each line as per instructions. Let's see what appears !

7-C1						
1-C1	2-C2	1-C1	2-C2	1-C1		
1-C2	2-C2	1-C2	2-C2	1-C2		
1-C2	5-C1	1-C2				
1-C2	5-C1	1-C2				
1-C1	1-C2	3-C1	1-C2	1-C1		
2-C1	1-C2	1-C1	1-C2	2-C1		
3-C1	1-C2	3-C1				
7-C1						

7-C1						
1-C1	1-C2	1-C1	1-C2	1-C1	1-C2	1-C1
2-C1	1-C2	1-C1	1-C2	2-C1		
1-C1	1-C2	1-C1	1-C2	1-C1	1-C2	1-C1
2-C1	1-C2	1-C1	1-C2	2-C1		
1-C1	1-C2	1-C1	1-C2	1-C1	1-C2	1-C1
2-C1	1-C2	1-C1	1-C2	2-C1		
1-C1	1-C2	1-C1	1-C2	1-C1	1-C2	1-C1
7-C1						

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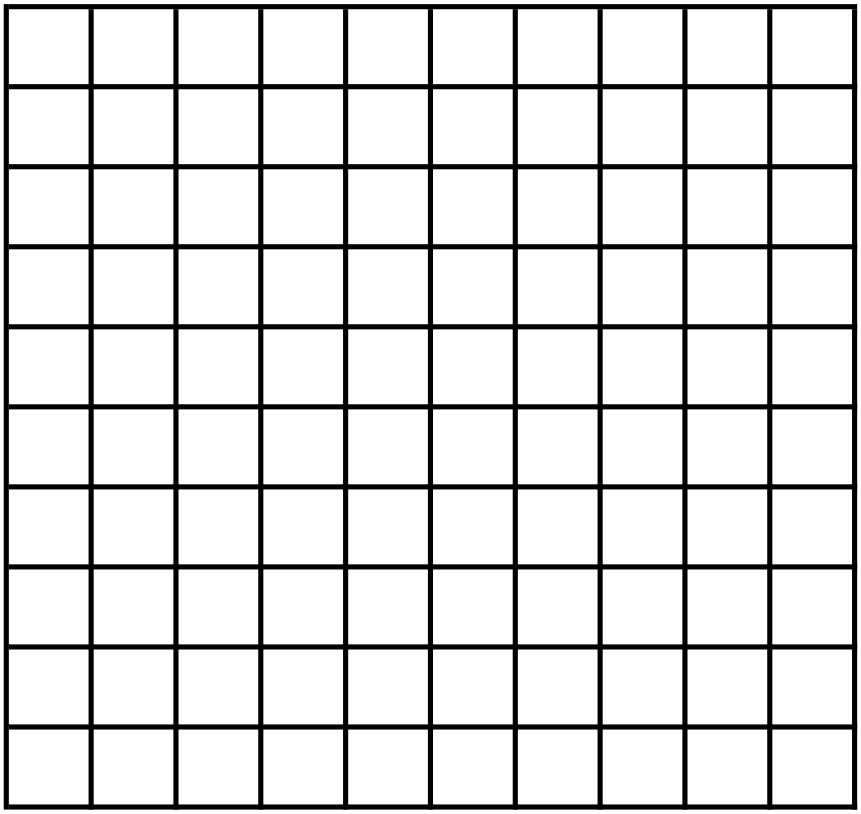


ROW 1 4 → 2 Color Yellow 4 →

ROW 2 4 → 1 Color Blue 1 Color Green 4 →

ROW 3 3 → 4 Color Green 3 →

ROW 4 3 → 2 Color Red 1 Color Blue 1 Color Green 3 →

ROW 5 2 → 6 Color Green 2 →

ROW 6 1 → 2 Color Green 1 Color Blue 5 Color Green 1 →

ROW 7 1 → 8 Color Green 1 →

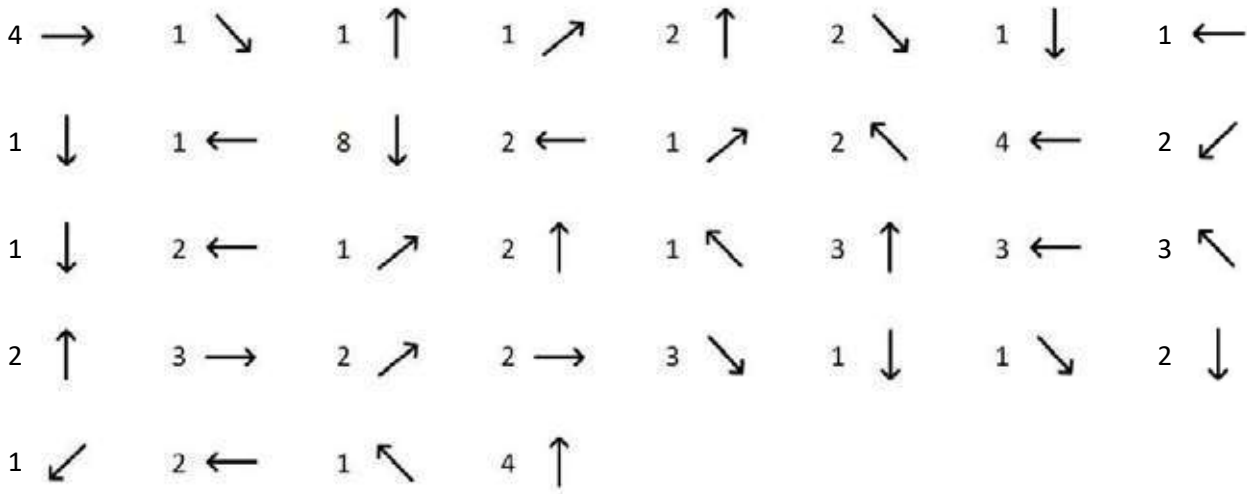
ROW 8 3 Color Green 2 Color Red 2 Color Blue 3 Color Green

ROW 9 4 → 2 Color Brown 4 →

ROW 10 4 → 2 Color Brown 4 →

CODING - PIXEL ART

Let's create pixel art of hidden images ! Pick up your pencil and draw each line as per directions in instructions. Let's see what appears !



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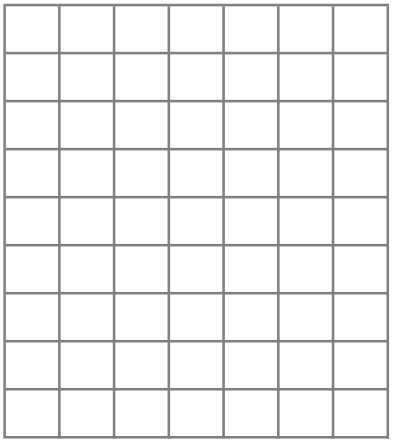
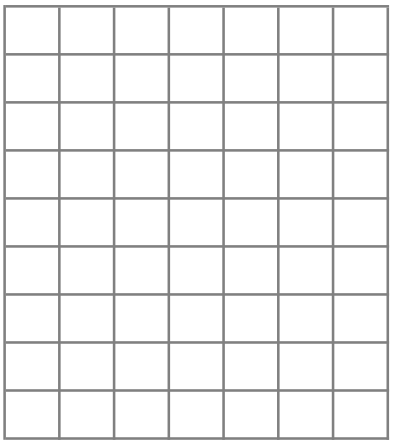
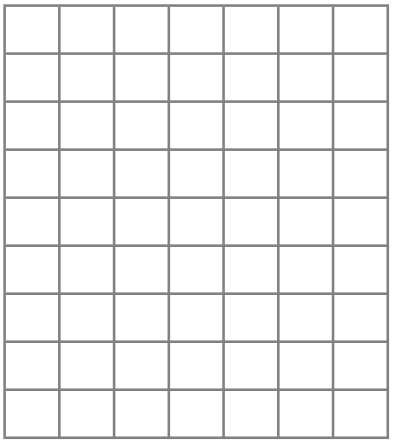


7-C1		
3-C1	1-C2	3-C1
2-C1	2-C2	3-C1
3-C1	1-C2	3-C1
3-C1	1-C2	3-C1
3-C1	1-C2	3-C1
3-C1	1-C2	3-C1
2-C1	3-C2	2-C1
7-C1		



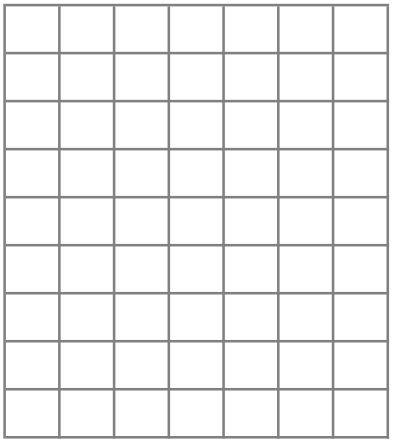
7-C1				
2-C1	3-C2	2-C1		
1-C1	1-C2	3-C1	1-C2	1-C1
5-C1	1-C2	1-C1		
4-C1	1-C2	2-C1		
3-C1	1-C2	3-C1		
2-C1	1-C2	4-C1		
1-C1	5-C2	1-C1		
7-C1				



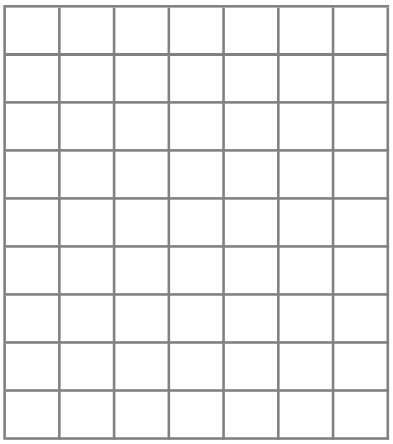
7-C1				
1-C1	5-C2	1-C1		
4-C1	1-C2	2-C1		
3-C1	1-C2	3-C1		
4-C1	1-C2	2-C1		
5-C1	1-C2	1-C1		
1-C1	1-C2	3-C1	1-C2	1-C1
2-C1	3-C2	2-C1		
7-C1				

CODING - PIXEL ART

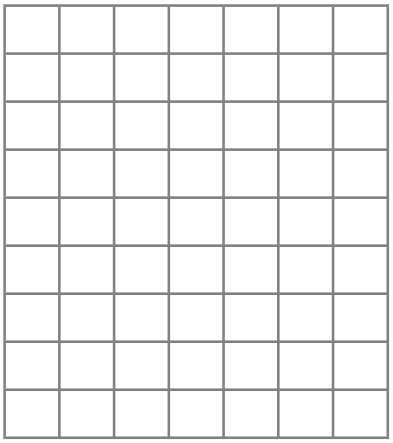
Let's create pixel art of hidden images ! Pick up your favorite two colors, C1, C2. Color each line as per instructions. Let's see what appears !



7-C1				
4-C1	1-C2	2-C1		
3-C1	2-C2	2-C1		
2-C1	1-C2	1-C1	1-C2	2-C1
1-C1	1-C2	2-C1	1-C2	2-C1
1-C1	5-C2	1-C1		
4-C1	1-C2	2-C1		
4-C1	1-C2	2-C1		
7-C1				



7-C1				
1-C1	5-C2	1-C1		
1-C1	1-C2	5-C1		
1-C1	4-C2	2-C1		
5-C1	1-C2	1-C1		
5-C1	1-C2	1-C1		
1-C1	1-C2	3-C1	1-C2	1-C1
2-C1	3-C2	2-C1		
7-C1				



7-C1				
3-C1	2-C2	2-C1		
2-C1	1-C2	4-C1		
1-C1	1-C2	5-C1		
1-C1	4-C2	2-C1		
1-C1	1-C2	3-C1	1-C2	1-C1
1-C1	1-C2	3-C1	1-C2	1-C1
2-C1	3-C2	2-C1		
7-C1				

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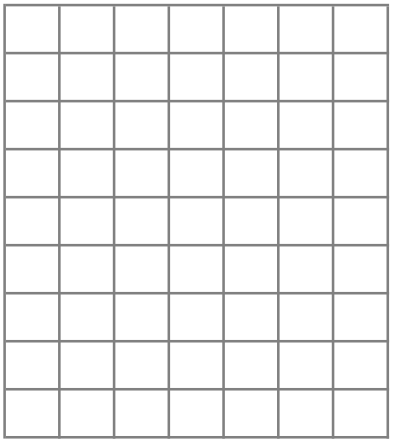
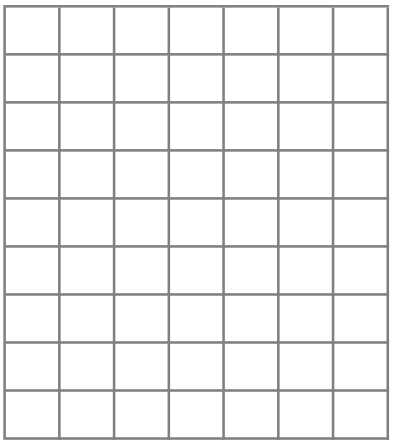
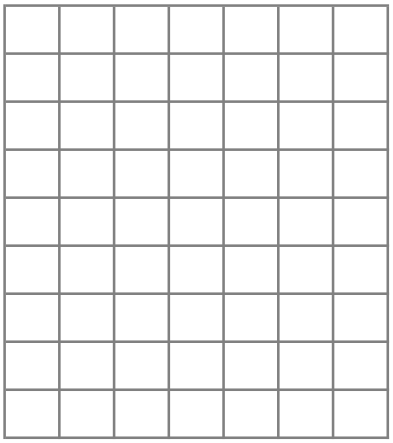


7-C1
1-C1 5-C2 1-C1
5-C1 1-C2 1-C1
4-C1 1-C2 2-C1
3-C1 1-C2 3-C1
2-C1 1-C2 4-C1
2-C1 1-C2 4-C1
2-C1 1-C2 4-C1
7-C1



7-C1
2-C1 3-C2 2-C1
1-C1 1-C2 3-C1 1-C2 1-C1
1-C1 1-C2 3-C1 1-C2 1-C1
2-C1 3-C2 2-C1
1-C1 1-C2 3-C1 1-C2 1-C1
1-C1 1-C2 3-C1 1-C2 1-C1
2-C1 3-C2 2-C1
7-C1



7-C1
2-C1 3-C2 2-C1
1-C1 1-C2 3-C1 1-C2 1-C1
1-C1 1-C2 3-C1 1-C2 1-C1
2-C1 4-C2 1-C1
5-C1 1-C2 1-C1
4-C1 1-C2 2-C1
1-C1 3-C2 3-C1
7-C1

CRYPT ARITHMETIC

Directions:
1. Each letter represents a different single digit. Zero is never the first digit of any number.
2. If a letter is used more than once, it represents the same digit. The below problems have unique solutions.
3. One has been completed for you.
4. Refer to the reference sheet to know more about Crypt Arithmetic.

HOP + HOP	FROG
Solution : H=6; O=0; P=4; F=1; R=2; G=8	
604+604	1208

ON + ON	UP

I + WE	FUN
Solution :	

I + DO	IT
Solution :	

SUN + FUN (hint : F=8; U=6)	SWIM
Solution :	

CRYPT ARITHMETIC

Directions:
1. Each letter represents a different single digit. Zero is never the first digit of any number.
2. If a letter is used more than once, it represents the same digit. The below problems can have more than one solution.
3. One has been completed for you.
4. Refer to the reference sheet to know more about Crypt Arithmetic.

A x A	BA
Solution : A=6; B=3	
6 x 6	36

A x AB	CA
Solution :	

A x BB	CAD
Solution :	

AA x BB	DADC
Solution :	

ABC x 9	BDA
Solution :	

CRYPT ARITHMETIC

Directions:
1. Make crypt arithmetic puzzles by yourself along with solutions in the below boxes. Ask your family members or friends to solve them. Follow the rules to make these puzzles.
Rule 1: Each letter represents a different single digit. Zero is never the first digit of any number.
Rule 2: If a letter is used more than once, it means the same digit. The below problems can have more than one solution.
2. Refer to the reference sheet to know more about Crypt Arithmetic.

Solution :	

Solution :	

Solution :	

Solution :	

Solution :	