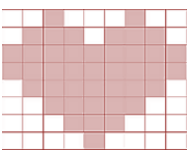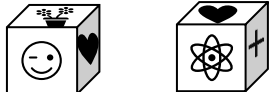# SOLUTIONS

The month of February

February is full of surprises, chocolates and festivities. It has the 100th day of school, Valentine's Day, the Winter Olympics and the Superbowl. Enjoy the challenge!

	Problems	*Answer*
1.	Mrs. Lenderman bought 18 heart shaped balloons to decorate the classroom for her class Valentine's party. While carrying them from her car to the classroom, 3 flew away. How many ballons are left for the class decoration?	*15 [balloons]*
2.	Maria loves to get Valentine's cards from her friends. This year she got 16 cards in all. Seven of those cards were from her neighbors. The rest of the cards came from friends at school. How many cards did Maria get from her friends at school this year?	*9 [cards]*
3.	Tim bought a bag of mini-chocolates to give away in class. He gave two pieces to each of his classmates and had one piece of mini chocolate leftover. If he had 7 classmates, how many mini chocolates were there in the bag?	*15 [mini chocolates]*
4.	Surya is having a Valentine's Day party and his mom bought a bunch of balloons. There are 22 balloons in total but Surya only wants the red and pink ones. So, his mom takes away all 5 orange balloons and all 3 green balloons. How many balloons are left?	*14 [balloons]*
5.	There are 11 heart balloons along the hallway wall. The distance between each heart balloon is 2 feet. How long is the distance from the first balloon to the last balloon at the end of the wall? There are 10 distances between 11 balloons. Since each distance is 2 feet, the distance from the first to the last balloon is 10×2 = 20 feet.	*20 [ft.]*
6.	Surya's mom is putting out candy for the party. She puts out 23 candy kisses, 35 heart shaped lollipops, and 50 candy hearts. Surya eats 3 candy kisses and 5 candy hearts. How many pieces of candy are left? There are a total of 23+35+50 = 108 candies. 108 − (3+5) = 100 candies left.	*100 [candies]*
7.	Emily was making Valentine's bracelets. She took 7 strings and made the following pattern on each string: Red, White, Red, White, Red. Each bracelet is made from one string and 5 beads, and beads of the same color do not touch. How many red beads in all did she use for the seven bracelets? 3 red in each bracelet times 7 bracelets =21 red beads	*21 [red beads]*
8.	It is the day before Valentine's Day and Amy wants to make secret Valentine cards for all of her classmates. She counts the students by the number of desks in the class. Each student occupies one desk. The desks are arranged in a rectangle shape of 4 rows, and there are 7 desks in each row. If she knows that a quarter of the students will be absent on Valentine's day, how many cards should she make so that each student gets one card from her? 4×7 − 7 − 1 = 20 cards as she won't make a card for herself.	*20 [cards]*
9.	Ethan bought lollipops for everyone in his running club. He bought six boxes of lollipops and each box contained 20 lollipops. There are thirty-five students in his running club. If Ethan wants everyone to have an equal number of lollipops, what is the most number of lollipops he can give each student?	*3 [lollipops]*

10.	Nikhil is building a heart out of 1 by 1-inch squares as shown in the picture. How many times bigger will the heart be, if he uses 3 by 3-inch squares? _Each square will be 9 times bigger, thus the whole heart (area) is 9 times bigger._	*9 times bigger*
11.	One of the 6 stickers shown was placed on each of the six faces of a cube: Look at the cube given in 2 positions. Which sticker is on the face opposite to the candy sticker?	♥ *heart*
12.	Amy, Betty, Cindy, and Dolores are standing in line to get raffle prizes. The four prizes are: a doll, a ball, a sticker, and a puzzle. Each girl got a different prize. We know the following: • The first girl in line did not get a doll or a ball. • Cindy was not last in line, and she got the puzzle. • Amy who was standing behind Betty and in front of Cindy, did not get the ball. Where was Dolores standing in line and what prize did she get? _According to the last statement Betty was first, Amy second, Cindy third, Dolores last. Cindy got the puzzle, Betty got the sticker, Amy got the doll, thus Dolores got the ball._	*Dolores was last (fourth) and got a ball*
13.	George and his friends went to the 'Escape Room' to celebrate Valentine's Day. In the Escape Room, they solved Valentine-related puzzles. They found 5 boxes in the shape of hearts and 5 different keys. Each key only unlocks one of the boxes. In the worst-case scenario, how many trials do they need to do in order to open all of the boxes? _They'll try all 5 keys on the first box. One will open it, they'll try 4 of the keys left on the next box, 3 on the next, 2 on the next, the last one will be opened with whatever key is left. 5+4+3+2+1= 15._	*15*
14.	Each of the twenty-eight students in a 5th grade class prepared exactly one Valentine card for each other. How many Valentine cards were created in this class? _28×27 = 756 cards._	*756 Valentine cards*
15.	Ben is feeling generous and spends $416 for four Valentine's day presents at the Mall. What is the greatest possible amount of money Ben could spend on one gift, if the cost of each gift is in whole dollars, without cents? _$416 - $3 = $413._	*$413*
16.	This year the Super Bowl LII is held on February 4th, 2018. What year was the first Super Bowl held? Hint: Find out what Roman numeral LII represents. _LII means 52nd Superbowl game. 2018 – 52 + 1 = 1967_ _Or 19 games from 2000 till 2018. Therefore, 52 – 19 = 33 more game before 2000; 2000 – 33 = 1967._	*1967*
17.	When written as month/date/year, the date February 2nd, 2018, has three 2's (0**2**/0**2**/**2**018). What is the latest date in 2018 that has more 2's when written in the form of month/date/year?	*12/22/2018*
18.	For the 100th day of school celebration, students took part in a Cupcake contest. Five students were selected for the final round. In how many ways could the top three winners be selected if there are no ties? _For the first prize it could be any of the 5 candidates, for the second place any of the 4 candidates, for the last place any of the three candidates. 5×4×3=60 ways_	*60 ways*