

How Many M&Ms?

A 10-ounce bag of Valentine's Day M&Ms is shown.



Nutrition Facts		Amount/serving	% Daily Value*	Amount/serving	% Daily Value*
10 servings per container		Total Fat 5g	6%	Total Carbohydrate 21g	8%
Serving size 1 oz (28g/about 32 pieces)		Saturated Fat 3.5g	18%	Dietary Fiber <1g	3%
Calories per serving 140		Trans Fat 0g		Total Sugars 18g	Includes 17g Added Sugars 34%
		Cholesterol <5mg	1%	Protein 1g	
		Sodium 20mg	1%	Vitamin D 0mcg 0% • Calcium 30mg 2% • Iron 0.5mg 2% • Potassium 0mg 0%	
<small>*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.</small>					
<small>INGREDIENTS: MILK CHOCOLATE (SUGAR, CHOCOLATE, SKIM MILK, COCOA BUTTER, LACTOSE, MILK FAT, SOY LECITHIN, SALT, NATURAL FLAVOR), SUGAR, CORNSTARCH, LESS THAN 1% OF: CORN SYRUP, DEXTROSE, COLORS (INCLUDES RED 40, RED 40 LAKE, YELLOW 6 LAKE, BLUE 1, YELLOW 6, BLUE 1 LAKE, YELLOW 5, YELLOW 5 LAKE, BLUE 2 LAKE, BLUE 2, CARNAUBA WAX, GUM ACACIA). ALLERGY INFORMATION: CONTAINS MILK AND SOY. MAY CONTAIN PEANUTS.</small>					
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Kevin, Lola, Johann, and Poppy eat an entire 10-ounce bag of M&Ms together. Johann ate twice as many M&Ms as Lola, 16 more M&Ms than Kevin and 7 fewer M&Ms than Poppy. How many M&Ms did Kevin eat?

$$\text{🍫} + \text{🌸} = 27$$

$$\text{💌} - \text{💗} + 4(\text{🍫} + \text{🌸}) = 93$$

$$\text{🍫} + \text{🌸} = 43$$

$$\text{💗} + \text{💗} + \text{💗} = 39$$

$$\text{🌸} + \text{💌} + \text{🍫} + \text{💗} = ?$$

When is Valentine's Day?

Ms. Smith's class has class parties on Halloween (October 31st) and Valentine's Day (February 14th). If either of those dates falls on a Saturday or Sunday, the party will be held on the Friday before the holiday.



One year, there were exactly 4 Thursdays and 4 Sundays in October. On what day of the week did the Valentine's Day party fall later that school year?

Ms. Smith has been having class parties for all 27 years of her teaching career. In how many of those years would you expect the Valentine's Day party to have fallen on a Friday?

If the Halloween party is on a Friday, what is the probability that the Valentine's Day party is also on a Friday? Justify your answer.



Figure 1



Figure 2



Figure 3

The first three figures of a visual pattern of sweethearts are shown.

- What do you notice about the pattern? What do you wonder?
- What would Figure 4 look like? Describe it in words or draw a picture.
- How many sweethearts are in Figure 5? How do you know?
- Write a rule for the number of sweethearts in Figure n . Prove that your rule works.
- Can you come up with an alternate way to write the rule for the number of sweethearts in Figure n ? Show why this rule also works.

Valentine's Day M&Ms come in 4 colors: white, light pink, dark pink, and red. The colors are not evenly distributed. Approximately 20% of the Valentine's Day M&Ms are white, 27% of the M&Ms are light pink, 23% of the M&Ms are dark pink, and 30% of the M&Ms are red.



Suppose you are blindfolded and get to choose any number of M&Ms from a vat of M&Ms (the vat has thousands and thousands of M&Ms in it). If you select exactly 5 M&Ms and they are all white you get \$100. If you select 6 M&Ms and at least 5 of them are white, you get \$95. If you select 7 M&Ms and at least 5 of them are white, you get \$90. This pattern continues. For each additional M&M you take, your prize for having selected at least 5 white M&Ms decreases by \$5.

How many M&Ms would you select? Justify your strategy using words, pictures, tables, equations, etc.

Bonus questions:

Would your strategy change if the prizes were awarded for choosing at least 5 *red* M&Ms? If so, how?

Would your strategy change if prizes were earned for choosing at least 4 white M&Ms (with the same original rules of getting \$100 if you select only 4 M&Ms total and the prize decreasing by \$5 for every additional M&M selected)? If so, how?

Would your strategy change if the original rules stayed the same but prizes started at \$1000 and continued to decrease by \$20? If so, how?