

Graphic Arts
Counting Techniques Worksheet

Name

Key

1. 1. A printer is offers 7 designs, 13 color options, and 4 sizes for banners. How many different types of banners can the printer produce?

$$7 \cdot 13 \cdot 4 = \underline{\underline{364}}$$

2. A screen-printer is offering 3 types of hooded sweatshirts with 4 print style options, 2 ink options, and 8 color options. How many different types of hooded sweatshirts can the screen-printer produce?

$$3 \cdot 4 \cdot 2 \cdot 8 = \underline{\underline{192}}$$

3. A printer offers customized wedding invitations with the following options:

Style: 8 choices

Text: 4 choices

Paper: 9 choices

Color schemes: 12 choices

How many different ways can the wedding invitations be printed?

$$8 \cdot 4 \cdot 9 \cdot 12 = \underline{\underline{3456}}$$

4. Pat's Pizza Shack offers customers the choices of crust, sauce, and toppings shown below. How many different combinations of pizza with one sauce and one topping can be made?

Pat's Pizza Shack		
Crust	Sauce	Toppings
Regular	Traditional	Pepperoni
Deep dish	Mushroom	Sausage
Thin	Marinara	Green peppers
		Onions
		Ham

$$3 \cdot 3 \cdot 5 = \underline{\underline{45}}$$

- If Pat's offered a 2-topping pizza option (not repeating a topping), how many different combinations could be made?

$$3 \cdot 3 \cdot 5 \cdot 4 = \underline{\underline{180}}$$

crust sauce top1 top2

5. The Booster Club sells meals at basketball games. Each meal comes with a choice of hamburgers, pizza, hot dogs, cheeseburgers, or tacos, and a choice of root beer, lemonade, milk, coffee, tea, or cola. How many possible meal combinations are there?

a. 10

b. 11

c. 28

d. 30

$$5 \cdot 6 = 30$$

6. There are 10 students participating in a spelling bee. In how many ways can the students who go first and second in the bee be chosen?

a. 1 way

c. 3,628,800 ways

$$10 \cdot 9 = 90$$

b. 90

d. 45 ways

The Department of Motor Vehicles is investigating different license plate designs. They have come up with five designs:

Design 1:	Two letters (A-Z) followed by four numbers (0-9).
Design 2:	Three letters (A-Z) followed by three numbers (0-9).
Design 3:	Three numbers (0-9) followed by three letters (A-Z).
Design 4:	Four numbers (0-9) followed by two letters (A-Z).
Design 5:	Three letters (A-Z) followed by three numbers (0-9), with an image of the state bird on the plate.

All designs allow for the repetition of letters and numbers. The plates are assigned randomly to drivers.

7. Refer to the data above. How many different plates of Design 2 can be issued?

$$26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 = 17,576,000$$

8. Refer to the data above. How many different plates of Design 4 can be issued?

$$10 \cdot 10 \cdot 10 \cdot 10 \cdot 26 \cdot 26 = 6,760,000$$

9. Refer to the data above. The surveillance cameras at a gas station catch a car's license plate when the driver leaves without paying for gas. The cameras show that the beginning of the license plate is CAT. If the license plate is of Design 2, how many license plates fit this description?

$$1 \cdot 1 \cdot 1 \cdot 10 \cdot 10 \cdot 10 = 1000$$

10. A password must have 3 letters (which cannot be repeated), 3 numbers (which can be repeated), and a special symbol (*, #, or @). How many different password combinations can be made?

$$26 \cdot 25 \cdot 24 \cdot 10 \cdot 10 \cdot 10 \cdot 3 = 46,800,000$$

12. How many possible drivers license numbers can be generated in Michigan if the first letter is the letter of the driver's surname followed by nine numbers from 0-9 that can be repeated?

$$26 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 26,000,000,000$$

13. How many possible social security numbers can be generated in the United States? (There are 9 numbers in a social security number, which can be repeated).

$$10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 1,000,000,000$$