

# Math Challenge

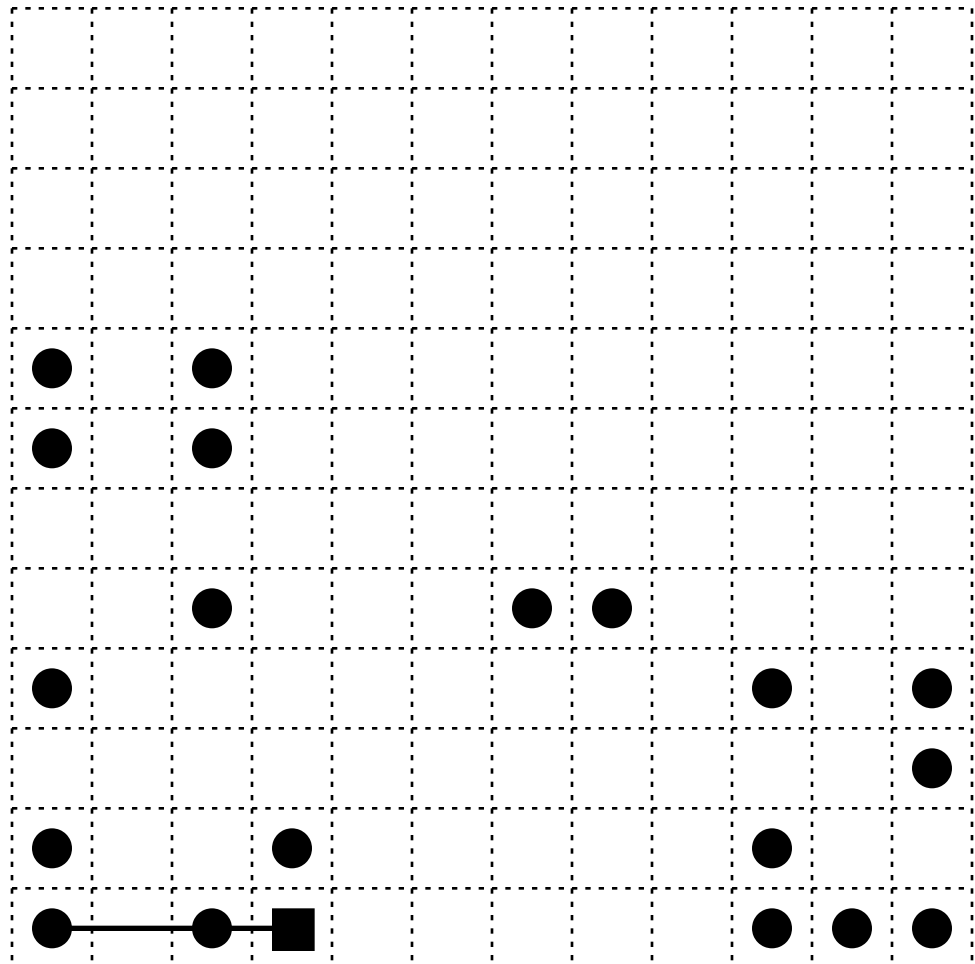


My Name: \_\_\_\_\_

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Start on the square. Draw exactly 11 lines without picking up your pencil to connect all the circles.



Name: \_\_\_\_\_

Natalie has 3 liters of a mixture containing 70% of boric acid. How much water must be added to make the mixture 60% boric acid?

How much water should be added to thirty-two grams of a sixty-nine percent solution of antiseptic to make a 48% solution?

The Christopher and Daniel's Ice Cream store sells ice cream shakes made of ice cream and milk. The milk used has 1% fat and the ice cream has 43% fat. Courtney is in charge of making shakes. Today's mix had a total of 19% fat. If Courtney used 8 quarts of milk, how many quarts of ice cream were used?

Joshua has 4 liters of a mixture containing 45% of boric acid. How much water must be added to make the mixture 40% boric acid?

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Name: \_\_\_\_\_

Get a fidget spinner! Spin it.

I needed to spin \_\_\_\_\_ time(s) to finish.

$$5 \times 11 - 4 \times 9$$

How many centimeters in  
660.7 meters?

How many meters are  
there in 54 kilometers?

Round 13,408 to the  
nearest thousand.

$$6 \div 3 + 3$$

20, 40, \_\_\_\_\_, 80, 100,

120, 140, 160, 180

If  $a = 8$  and  $b = 7$ ,  
then  
 $4a + b =$

$$\frac{5}{36} \div \frac{1}{9} =$$

(32,768), (4,096),  
(512), (64), (8), (1),  
\_\_\_\_\_,  $\frac{1}{64}$ ,  $\frac{1}{512}$

It's 8:00 a.m. Emma has  
soccer practice today. If  
practice starts at 2:25 p.m.,  
then how much longer until  
soccer starts?

A circle graph has five  
sections. Only four  
sections are labeled. The  
labels are 18%, 19%, 10%,  
and 9%. What should the  
missing section be?

Circle the greatest amount:

44%

0.37

$\frac{6}{25}$

Name: \_\_\_\_\_

The sum of the digits of a two-digit number is 12. The tens digit is three times the ones digit. The difference between the digits is six. What is the number?

The ones digit of a two-digit number is five less than the tens digit. The number is twenty-nine more than five times the sum of the digits. What is the number?

The sum of the digits of a four-digit number is 20. The thousands digit is four less than the ones digit. The tens digit is one more than the ones digit. The hundreds digit is five less than the ones digit. What is the number?

If a two-digit number was doubled, it would be twenty-eight more than the number. The tens digit of the number is twenty-two less than three times the ones digit. What is the number?

Name: \_\_\_\_\_

Fill in the missing numbers. How? The sum of the four surrounding numbers is in the center of each square.

Exactly one of the four numbers has to be one of these numbers:  $8\frac{2}{7}$ ,  $7\frac{2}{9}$ , or  $5\frac{1}{7}$ .

The other three numbers have to all be DIFFERENT and must be from these:  $9\frac{4}{7}$ ,  $2\frac{3}{7}$ ,  $1\frac{6}{7}$ , or  $\frac{5}{7}$ .

	$\frac{5}{7}$		$8\frac{2}{7}$		$7\frac{2}{9}$		$2\frac{3}{7}$	
$1\frac{6}{7}$	$10\frac{1}{7}$	$2\frac{3}{7}$	$13\frac{2}{7}$	$\frac{5}{7}$	$19\frac{23}{63}$	$1\frac{6}{7}$	$13\frac{2}{7}$	$\frac{5}{7}$
	$5\frac{1}{7}$		$1\frac{6}{7}$		$9\frac{4}{7}$		$8\frac{2}{7}$	
$2\frac{3}{7}$	$17\frac{6}{7}$	$\frac{5}{7}$	$12\frac{2}{9}$	$7\frac{2}{9}$	$19\frac{23}{63}$	$1\frac{6}{7}$	$20\frac{3}{7}$	$9\frac{4}{7}$
	$9\frac{4}{7}$		$2\frac{3}{7}$		$\frac{5}{7}$		$\frac{5}{7}$	
$5\frac{1}{7}$	$17\frac{2}{7}$	$1\frac{6}{7}$		$8\frac{2}{7}$	$13\frac{2}{7}$	$1\frac{6}{7}$	$13\frac{2}{7}$	$8\frac{2}{7}$
	$\frac{5}{7}$		$9\frac{4}{7}$		$2\frac{3}{7}$		$2\frac{3}{7}$	
$2\frac{3}{7}$	$13\frac{2}{7}$	$8\frac{2}{7}$	$20\frac{3}{7}$	$\frac{5}{7}$	$10\frac{1}{7}$	$5\frac{1}{7}$	$17\frac{6}{7}$	$\frac{5}{7}$
	$1\frac{6}{7}$		$1\frac{6}{7}$		$1\frac{6}{7}$		$9\frac{4}{7}$	
$9\frac{4}{7}$	$17\frac{2}{7}$	$\frac{5}{7}$	$10\frac{1}{7}$	$5\frac{1}{7}$		$\frac{5}{7}$		$8\frac{2}{7}$
	$5\frac{1}{7}$		$2\frac{3}{7}$		$2\frac{3}{7}$		$1\frac{6}{7}$	

**Name:** \_\_\_\_\_

Twenty-two less than a number is fifty-two.  
What is the number?

Two-fifths of a number equals 20. What is  
the number?

90,000 and 4,000,000 added to  
two-fourths of a number equals 4,121,960.  
What is the number?

40,000 and 5,000,000 added to a number  
is 5,249,039. What is the number?

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Name: \_\_\_\_\_

Isaac drove 240 miles. He drove 39 mph for the first 2 hours and 54 mph for the rest of his drive. How long did he drive at 54 mph?

Last year, Alyssa's speed in a bike race was 7 kph. She finished in 6 hours and 18 minutes. What must be Alyssa's average speed if she is to finish in 2 hours and 56 minutes this year?

Cody can run  $3\frac{1}{7}$  miles in one hour. How many miles can Cody run in forty-five minutes?

Jasmine left early in the morning for a long bike ride. She reached the half point of her ride about two hundred thirty minutes later. She calculated her speed was six mph for the first half of the trip. If she rides the second half at a rate that is eight mph more, how much quicker will the second half be (in minutes)?

Name: \_\_\_\_\_

Write these fractions in order from greatest to least. Then convert each fraction to a decimal and write the decimals in order from greatest to least.

$$\frac{1}{19} \quad \frac{7}{8} \quad \frac{1}{49} \quad \frac{1}{8}$$

a. Write any three consecutive even numbers. Find the sum and divide that sum by 3. What is the remainder?

b. Write any four consecutive even numbers. Find the sum and divide that sum by 4. What is the remainder?

Sara is looking forward to hanging out with her friends, but she can't decide what to wear! Luckily, she has decided on one thing. She knows she wants to wear a crop top tee, a pair of shorts, and something for her feet. She can choose among 10 crop tops and 4 pairs of shorts. For footwear, she has 3 different pairs of sneakers, 3 flip flops, 2 sandals, and 6 shoes. How many different outfits can she make with one crop top, one pair of shorts, and something to walk on?

Anne wrote the following program to convert a temperature in Fahrenheit to Celsius.

```
temp = float(input("Enter temperature in Fahrenheit: "))
celsius = (temp - 32) * 5/9
celsius = round(celsius)
print ("celsius = ",celsius)
```

The program takes an input, then it converts the Fahrenheit to Celsius. Finally, it rounds the number to the nearest integer. What would be printed for these inputs:

a. 80

b. 30



Name: \_\_\_\_\_

Mary lives at the point  $(-8, 16)$ . She wants to go to the closest mall. There are two malls on the map. Mall AA is at  $(-3, 9)$ , and Mall BB is at  $(-5, 16)$ . On the map she can only travel vertically or horizontally, one unit at a time. She cannot go diagonally. So she could go from  $(1,3)$  to  $(1,4)$  or  $(1,3)$  to  $(2,3)$ , but not from  $(1,3)$  to  $(2,4)$ . Which mall is closer to her?

What is the least common multiple for each of the number sets?

The least common multiple of 6 and 11 is \_\_\_\_\_

The least common multiple of 4 and 8 is \_\_\_\_\_

The least common multiple of 9 and 11 is \_\_\_\_\_

The least common multiple of 12 and 18 is \_\_\_\_\_

The least common multiple of 6 and 10 is \_\_\_\_\_

Name: \_\_\_\_\_

		x		+		=	
+		?	B	B			72
+		B	B	A			74
=		A	B	C			91
		26	24	29			

### Equations and Hints:

Each letter is a whole number.

Fill in the equations using the chart:

$$A \times B + C = 91 \quad B + A + \underline{\quad} = 29 \quad \underline{\quad} \times \underline{\quad} + \underline{\quad} = 74$$

$$\underline{\quad} + \underline{\quad} + \underline{\quad} = 24$$

Additional hints:

$$B > 7 \quad A = B + 2$$

### Show Work:

### Solve:

$$? = \underline{\quad}$$

Name: \_\_\_\_\_

For each challenge below, make a fraction by picking any 2 of these numbers: 3, 9, 7, or 6.

a. What is the largest possible fraction you can make?

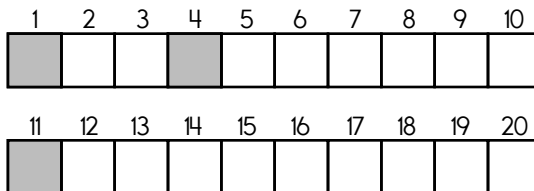
b. Now write a different fraction that is smaller than your largest possible fraction.

c. Subtract (b) from (a).

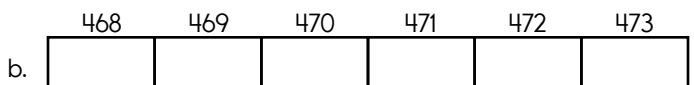
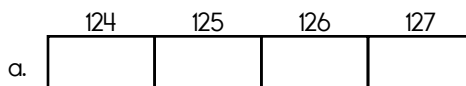
Emily tosses a number cube with the numbers 1 through 6 on it. She tosses it again, takes the sum, and moves that many spots on a board game. What is the probability that she moves exactly six spaces?

Amy bought 19 chocolate bars and various packs of gum for \$117. Each chocolate bar cost \$5, and each pack of gum cost \$7.

She found some old orange and blue wrapping paper. Her sister then did the wrapping. But wait! Her sister forgot if she wrapped all the chocolate bars orange and gum blue, or the other way around. There are more packages of orange. Can you figure out if the orange-wrapped items are chocolate bars or packs of gum?



If this pattern continues, color how these squares would look:



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Name: \_\_\_\_\_

Mary has to add some medicine to her aquarium. Several fish have a fuzzy growth around their mouths. The medicine bottle says to put 0.4 ml for every gallon of water in the tank. She has a 40-gallon tank. How much medicine should she add?

Mr. Physics has just told the class that there is a proportional relationship between cause X and response Y. In fact it is well known (at least on Mr. Physics' planet) that every time cause X goes up three units, response Y goes up five and five tenths units. Knowing this, if cause X increases by 30 units, by how many units will response Y increase? Round your answer to the nearest number of units.

There are 4,211 spectators at the wildcats' game. The weather is rather bad, so this is not even close to the attendance record for the stadium. In fact the attendance record is greater than the day's attendance by 2,014. What is the attendance record?

Mr. Bloop is giving a demonstration using a water trough. This is a device used to observe (among other things) the action of water on sediments. He began with a flow rate of one and two-thirds gallons per minute (gpm) and every thirty seconds he halved the rate. Throughout the demonstration, the students watched small marked stones move down the trough. What was the flow rate (in gpm) after he halved the rate five times? Express your answer as a fraction.

Emily measured the length of her iguana last month and found it was 30.8 centimeters long. She measured it again today and found that some of its tail was missing and now it was only 29.69 centimeters long. By how much was the iguana shorter?

If the perimeter of an equiangular triangle is 27 centimeters, what is the length of one of its sides?

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Name: \_\_\_\_\_

In a simulator used to train astronauts for work in space, Z-Globe was operating a hydrolysis machine to generate oxygen gas from water. Through hydrolysis (the splitting of water into hydrogen gas and oxygen gas by the use of an electric current), 32 grams of oxygen and 5 grams of hydrogen were liberated. What was the mass of the decomposed water?

At the Megalopolis Zoo they make a special feed to provide to their exotic birds. It is (by mass)  $\frac{1}{3}$  super meal,  $\frac{3}{8}$  commercial birdseed, and one-fourth cracked corn. The rest is made up of Nutro Feedofill. How much commercial birdseed is required to make 137 kilograms of the special feed? If the answer is not a whole number, express your answer as a fraction.

Emma went to bat 21 times last season and hit the ball 14 times. This season she went to bat 32 times and hit the ball the same number of times as she did last season. Her hitting percent this season was what percent of last season's? Round your answer to the nearest tenth of a percent.

A sample of a mixture was found to be water, alcohol, and chemical Z in the proportions of 1.8:0.9:0.32. If the sample of the mixture has a mass of 80 grams, what is the mass of chemical Z in the sample?

Which product is closer to zero, the product of  $(65)(-135)$ , or the product of  $(-82)(-49)$ ?

A new crop circle has appeared in Cool Town. It is a rather simple one. It consists of two concentric circles. The largest (outer) circle has a radius of sixty-one meters, and the inner circle has a radius of twenty-one meters. What is the difference between the perimeters of the circles?

## Page 1 Answers

- 1  $\frac{1}{2}$  liters
- 2 14 grams
- 3 6 quarts
- 4  $\frac{1}{2}$  liters

## Page 2 Answers

## Page 3 Answers

- 1 93
- 2 94
- 3 3287
- 4 28

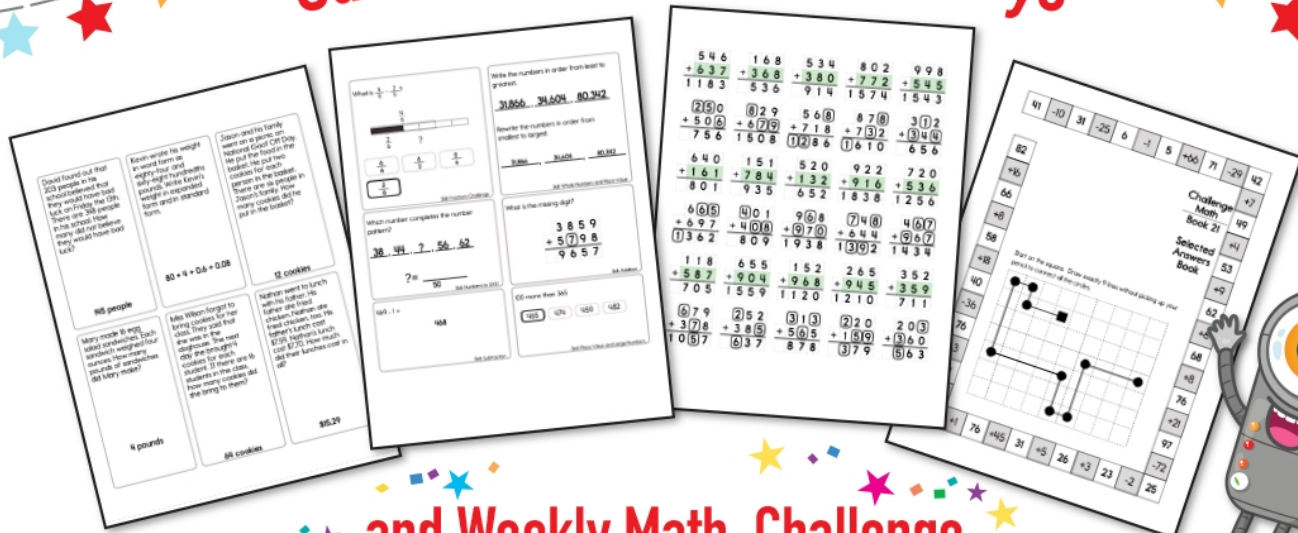
## Page 5 Answers

- 1 74
- 2 50
- 3 63,920
- 4 209,039

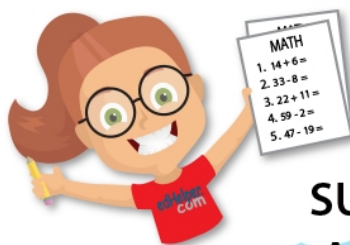
## Page 6 Answers

- 1 3 hours
- 2 Alyssa will need to average 15 kph
- 3  $2\frac{5}{14}$  miles
- 4 The second half would take 99 minutes. It will be about 131 minutes quicker. Anything within a few minutes should be fine. (Distance=46 total miles)

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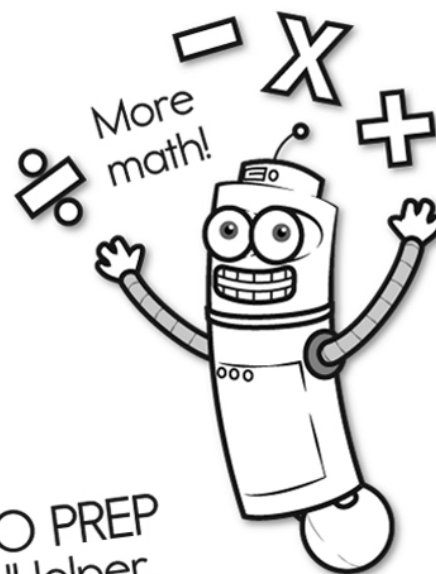
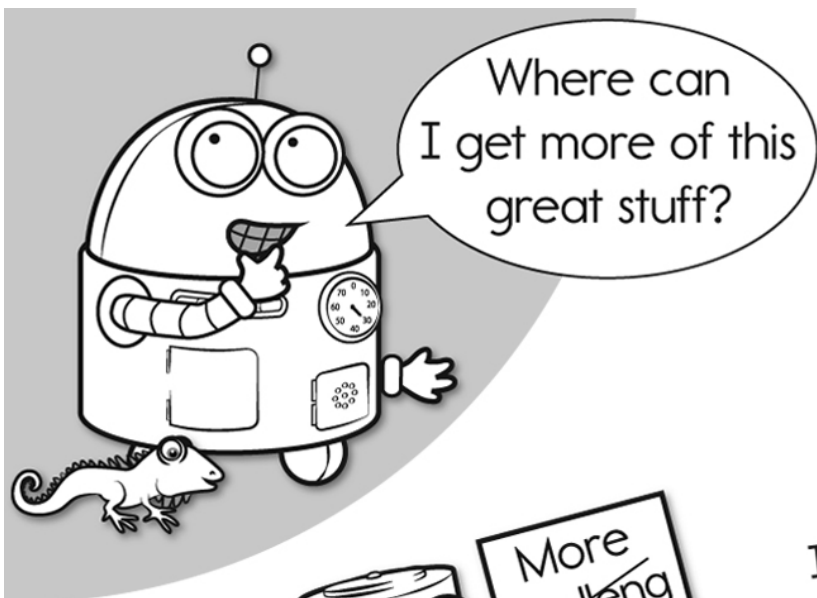


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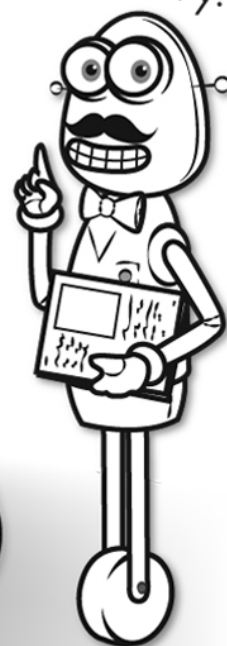


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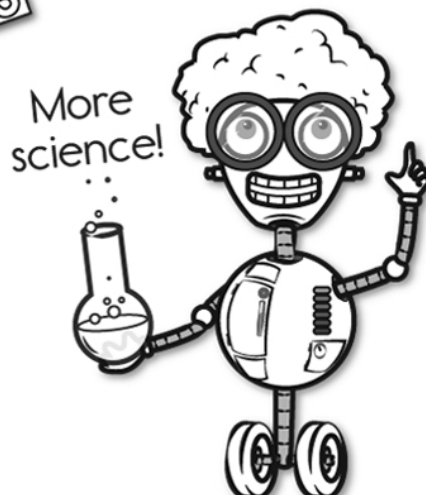
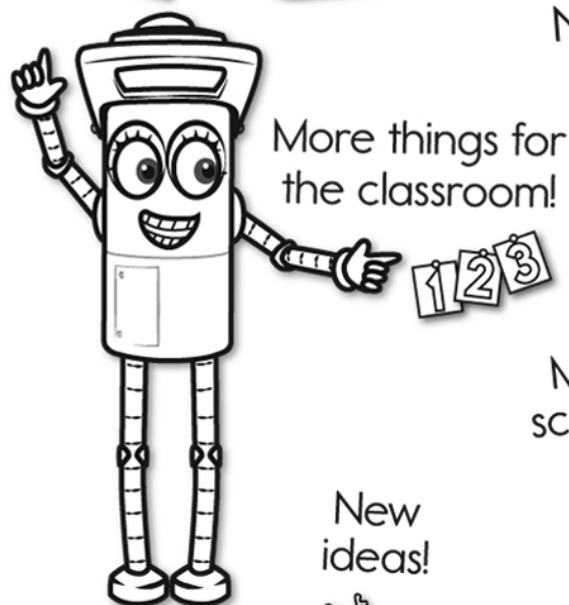
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