

### T-Shirt Factory Problems

The third-grade students at Bessie Coleman School are making T-shirts with their first names on them. They plan to buy letters from a craft store and sew them onto the T-shirts. They collected data and made the graph below.

First Names

Number of Letters	Number of Students
1	0
2	0
3	2
4	3
5	8
6	4
7	4
8	2
9	2
10	0
11	0
12	0

Number of Students

Number of Letters

The students worked in groups. All the students with the same number of letters in their first names were in the same group. For example, all the students with four letters in their first names worked in one group. All the students with five letters in their first names worked in another. Each group needed to find out how many letters they would need to make their T-shirts. They also needed to find the total cost for their letters.

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Use the graph to solve the following problems. Show or tell how you solved each problem. Use a number sentence to show your thinking.

- A. Levi, Mara, and John each have four letters in their names. Draw a picture of their three T-shirts with their names on them.

B. How many letters will they have to buy altogether?
- A. How many students have eight letters in their names?

B. How many letters will these students need to buy in order to write all their names on all their T-shirts?
- A. How many students have six letters in their names?

B. How many letters are needed to write all their names on all their T-shirts?
- Each letter costs 10 cents. How much will it cost to buy all the letters for the group with three letters in their names?
- How much will it cost to buy all the letters for the group with five letters in their names?
- A. Which group will need more letters: the group with five letters in their names or the group with seven letters?

B. How many more letters will that group need?
- How much will the letters cost for the group with nine letters?

✓ **Check-In: Question 8**

- A. How many letters are needed to make T-shirts for the whole class?

B. Show or tell how you found your answer.

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Questions 1–8

Solution strategies will vary. Students may use counters, pictures, and number sentences. Possible strategies and number sentences are shown.

- A. Pictures will vary.

B.  $4 + 4 + 4 = 12$  letters or  $3 \times 4 = 12$  letters
- A. 2 students. The bar above L for 8 letters goes up to 2 students.

B.  $8 + 8 = 16$  letters or  $2 \times 8 = 16$  letters
- A. 4 students. The bar above L for 6 letters goes up to 4 students.

B.  $6 + 6 + 6 + 6 = 24$  letters or  $4 \times 6 = 24$  letters
- From the graph, the group with 3 letters has 2 students in it.

$2 \text{ students} \times 3 \text{ letters} = 6 \text{ letters}$

Skip count by 10¢ six times to find the cost of 6 letters: 10, 20, 30, 40, 50, 60¢.

$6 \times 10¢ = 60¢$
- 8 students have 5 letters.

Skip count by 5 eight times:

$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$  letters

$40 \text{ letters} \times 10¢ = 400¢$  or \$4.
- A. The group with seven letters needs  $7 + 7 + 7 + 7 = 28$  letters. The group with five letters needs  $5 \times 8 = 40$  letters. So the group with five letters needs more letters.

B.  $40 - 28 = 12$  letters
- The graph shows there are 2 students in this group. The letters for one shirt cost  $9 \times 10¢ = 90¢$ .

$90¢ + 90¢ = 180¢$  or \$1.80

8. **A.** You will need 144 letters for the whole class.
- B.** Possible student response: I used the graph to make a table showing how many letters each group will need. First I listed the number of letters and then I found out how many letters for each group by multiplying the number of letters by the number of students. I did this for each one until my table was complete.

Then I used the calculator to add up all of the letters to get my answer of 144. I checked my work by adding up all of the numbers and I got the same answer.

$$6 + 12 + 40 + 24 + 28 + 16 + 18 = 144$$

number of letters	letters in group
3	$2 \times 3 = 6$
4	$3 \times 4 = 12$
5	$8 \times 5 = 40$
6	$4 \times 6 = 24$
7	$4 \times 7 = 28$
8	$2 \times 8 = 16$
9	$2 \times 9 = 18$


**Student Activity Book**

**Family T-Shirts (SAB p. 83)  
Questions 1–3**

Responses will vary.

Name \_\_\_\_\_ Date \_\_\_\_\_

**Family T-Shirts**



Dear Family Member:

In class, we solved problems using the number of letters in our first names. Please help your child spell each family member's name on the T-shirts he or she draws for the family. Your child will use these drawings, repeated addition, and other mental math strategies to solve Questions 2 and 3.

Thank you.

- Imagine your family is making T-shirts with their names on them. Draw pictures of all the T-shirts your family will need. Use the back of this page or other paper for your pictures.
- If each letter costs 10¢, how much will the letters for your shirt cost? Explain your solution.
- How much will the letters for all your family cost? Explain how you got your answer.

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