Indicator 14 Class Notes by Mrs. Joshi

GCF and LCM with Prime Factorization-(6.NS.4)

Finding Greatest Common Factor (GCF)

- ✓ factors are the numbers we take times another number to get a product
  2x3=6 therefore the factors are 2 & 3
- ✓ GCF is the largest number that divides equally into a set of numbers
- ✓ the GCF will always be a number SMALLER than any of the numbers in the set
- ✓ so the GCF will be **FEWER(or the same #)** than any of the numbers in the set

Using the upside down birthday cake method works well for this sort of factoring...

We work with the numbers we are factoring in an upside down division problem, seeking the factor that works with all the numbers, therefore, knowing our divisibility rules (and multiplication facts) is necessary. For my students I provide a math mini-office that contains both the divisibility rules and a multiplication table, this teaches then to use their resources and also takes the pressure off them to know things by heart and allows me to access if the skill is understood in a more effective manner.

So, the "cake" looks like this...

2	28	56
2	14	28
7	7	14
	1	2

We have a series of questions we ask ourselves about divisibility to find the factors.

- ✓ are they even (use 2)
- ✓ do the end in 5 or 10 (use 5 or 10)
  and so on...

We know our "cake' is finished when our "candles" no longer have any factors in common other than 1

At this point, we have factored out all that we can because 1 and 2 share no factor other than 1....

Now comes the birthday magic, we multiply our "roses" on the outside of our cake to determine our GCF

2	28	56
2	14	28
7	7	14
	1	2

$2 \times 2 \times 7 = \boxed{28}$

GCF = 28

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Greatest Common Factor

How can you find the GCF of a set of numbers?

Keesha is putting together bags of supplies. She has 42 craft sticks and 12 glue bottles. If she puts an equal number of craft sticks and an equal number of glue bottles in each bag, what is the greatest number of bags Keesha can make so that nothing is left over?

Step 1

List and compare all the factors of each number in the set.

Factors of 12: 1, 2, 3, 4, 6, 12

Factors of 42: 1, 2, 3, 6, 7, 14, 21, 42

1, 2, 3 and 6 are factors of both 12 and 42. These are called common factors.

Step 2

Identify the greatest common factor (GCF) of the numbers in the set.

You can see that 6 is the GCF of 12 and 42.

This means that 6 is the greatest number that can be divided evenly into 12 and 42. So, Keesha can make 6 bags.

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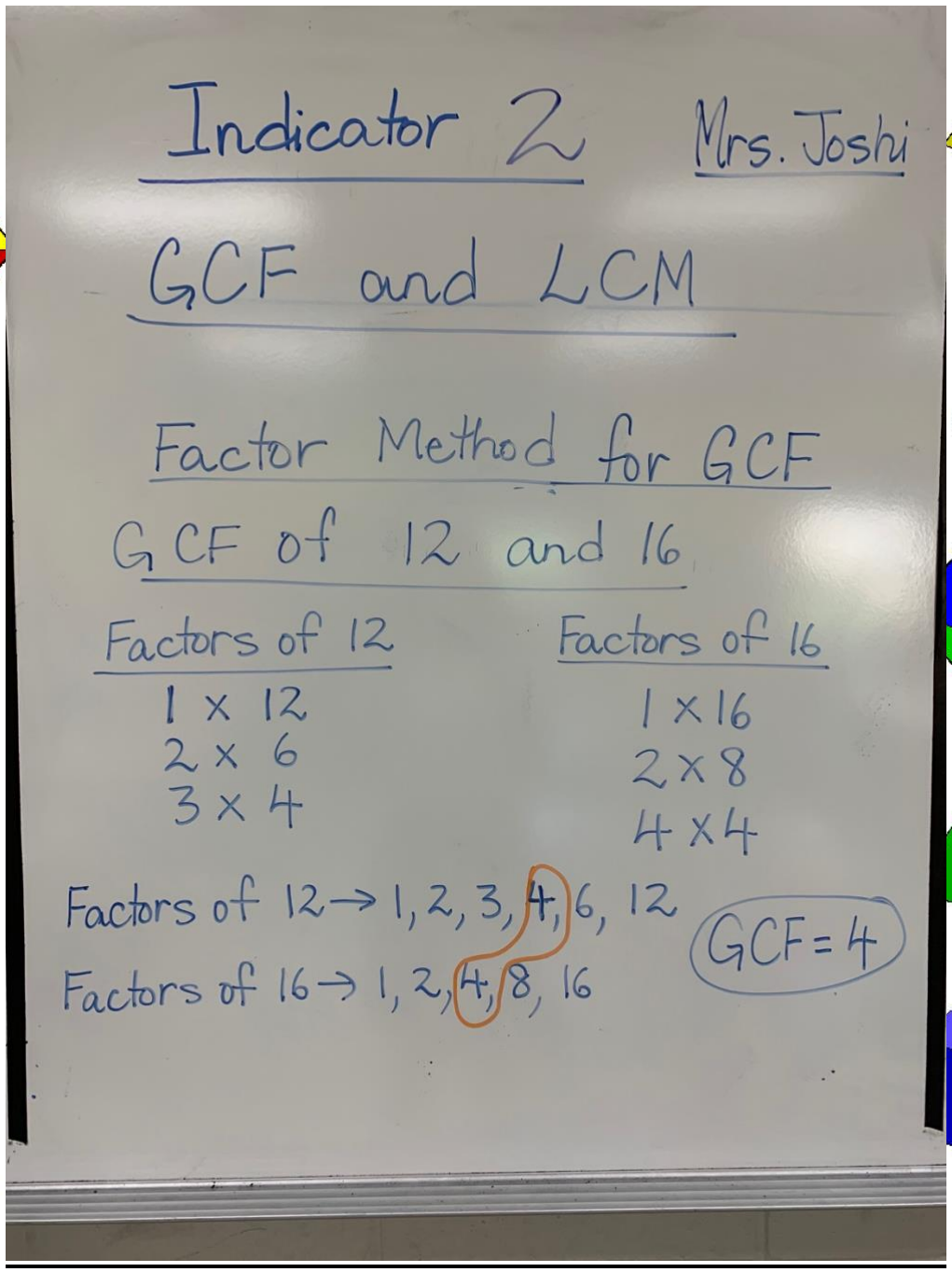
GCF



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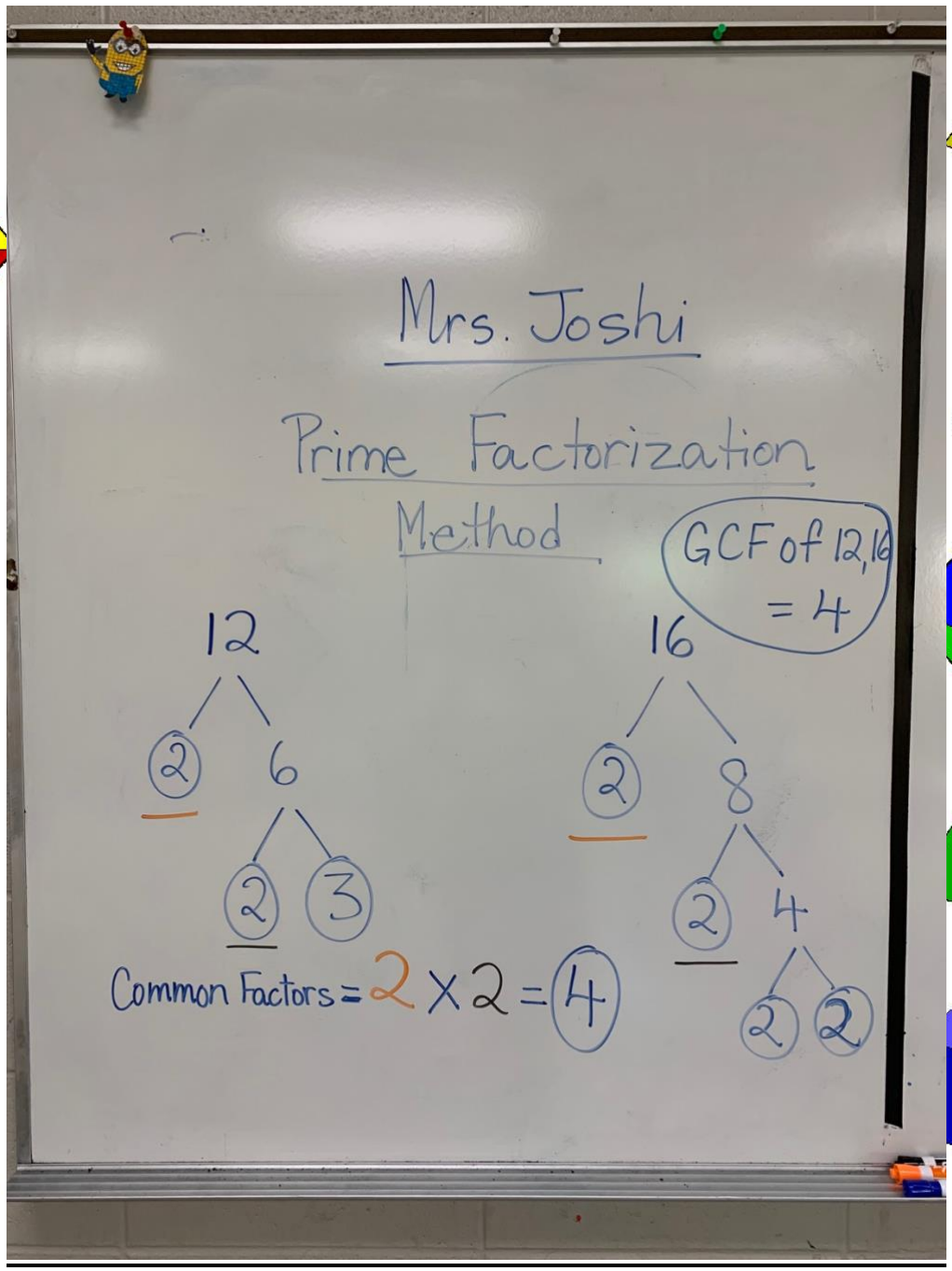
GCF



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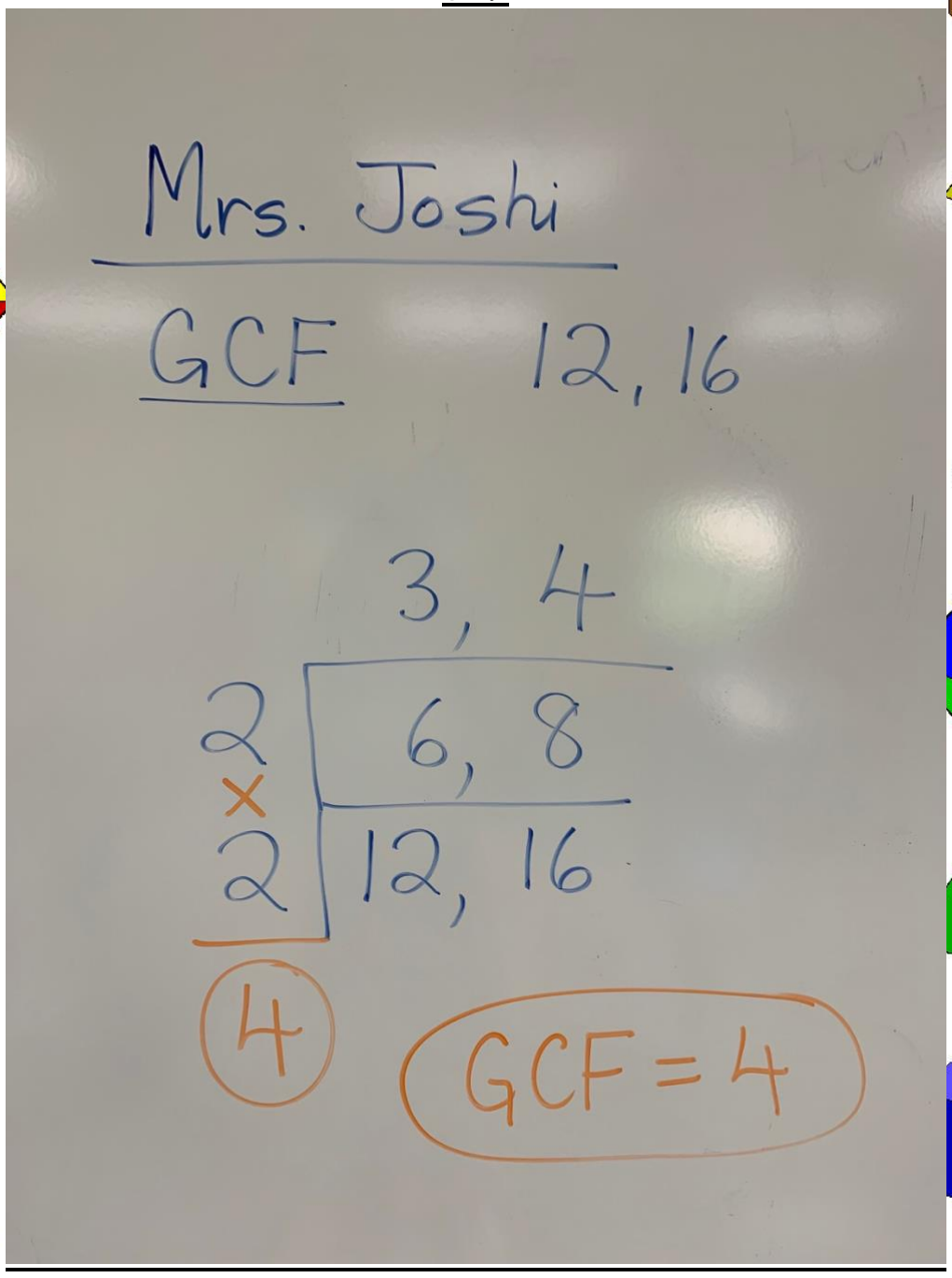
GCF



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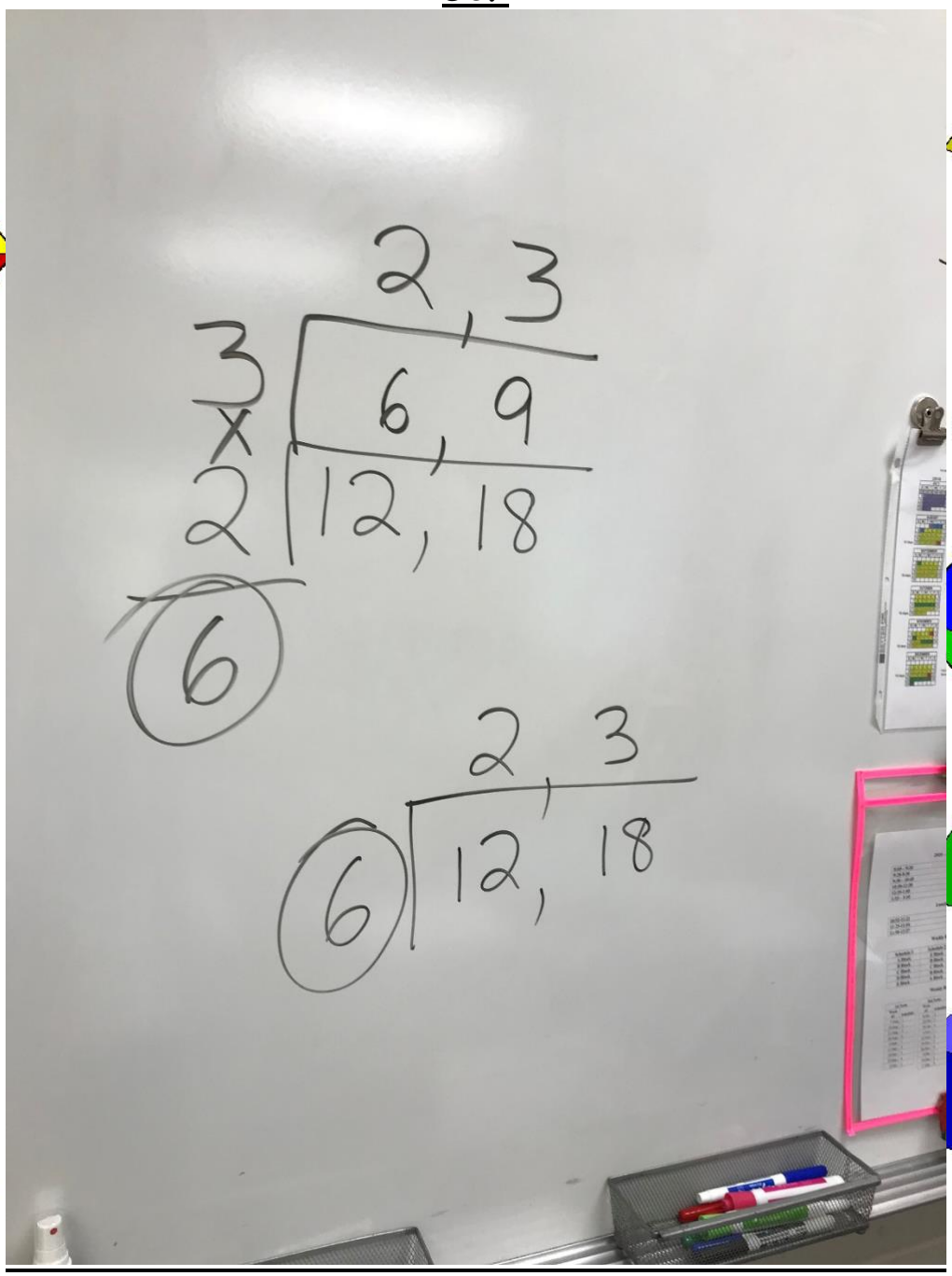
GCF



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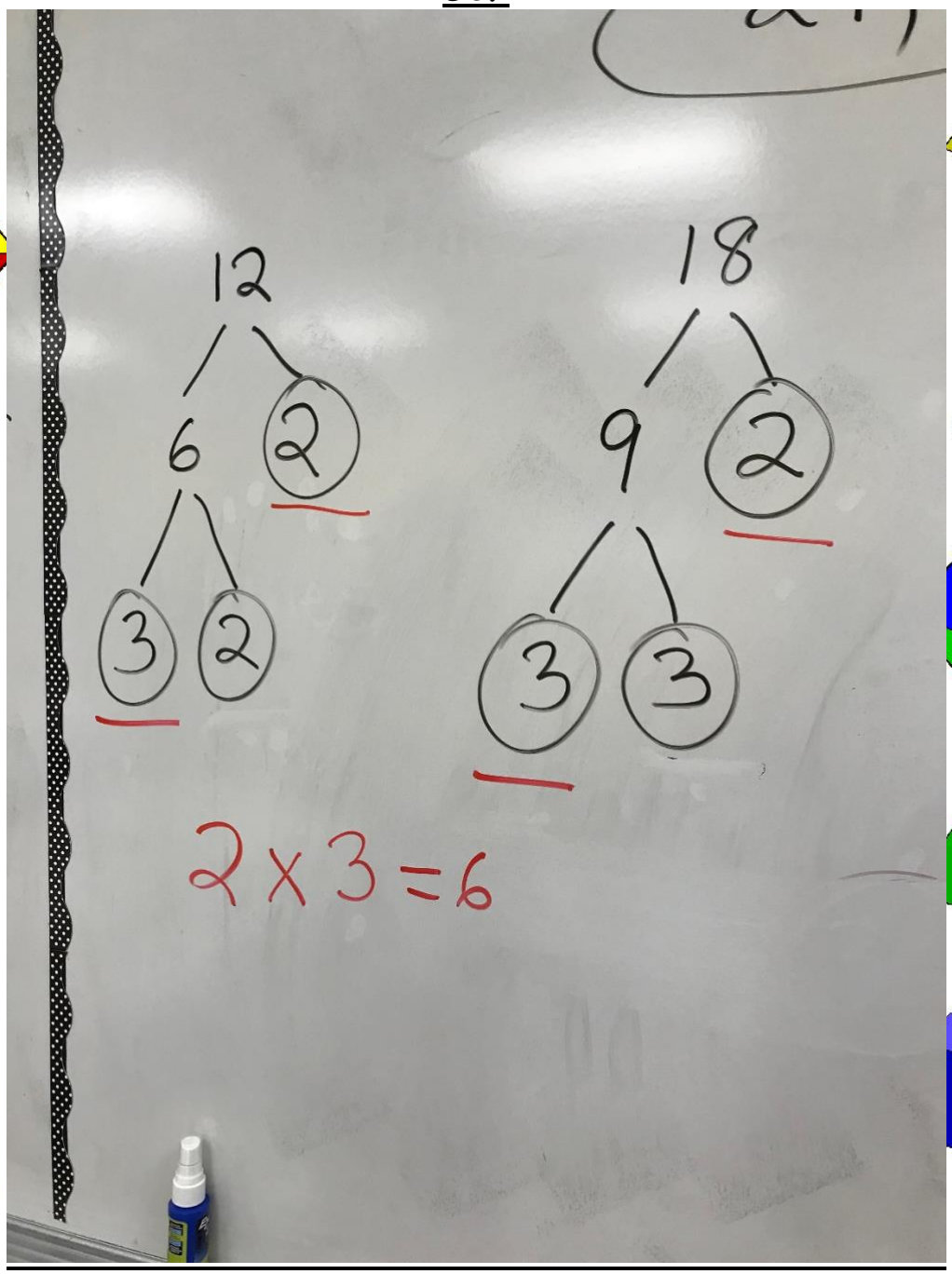
GCF



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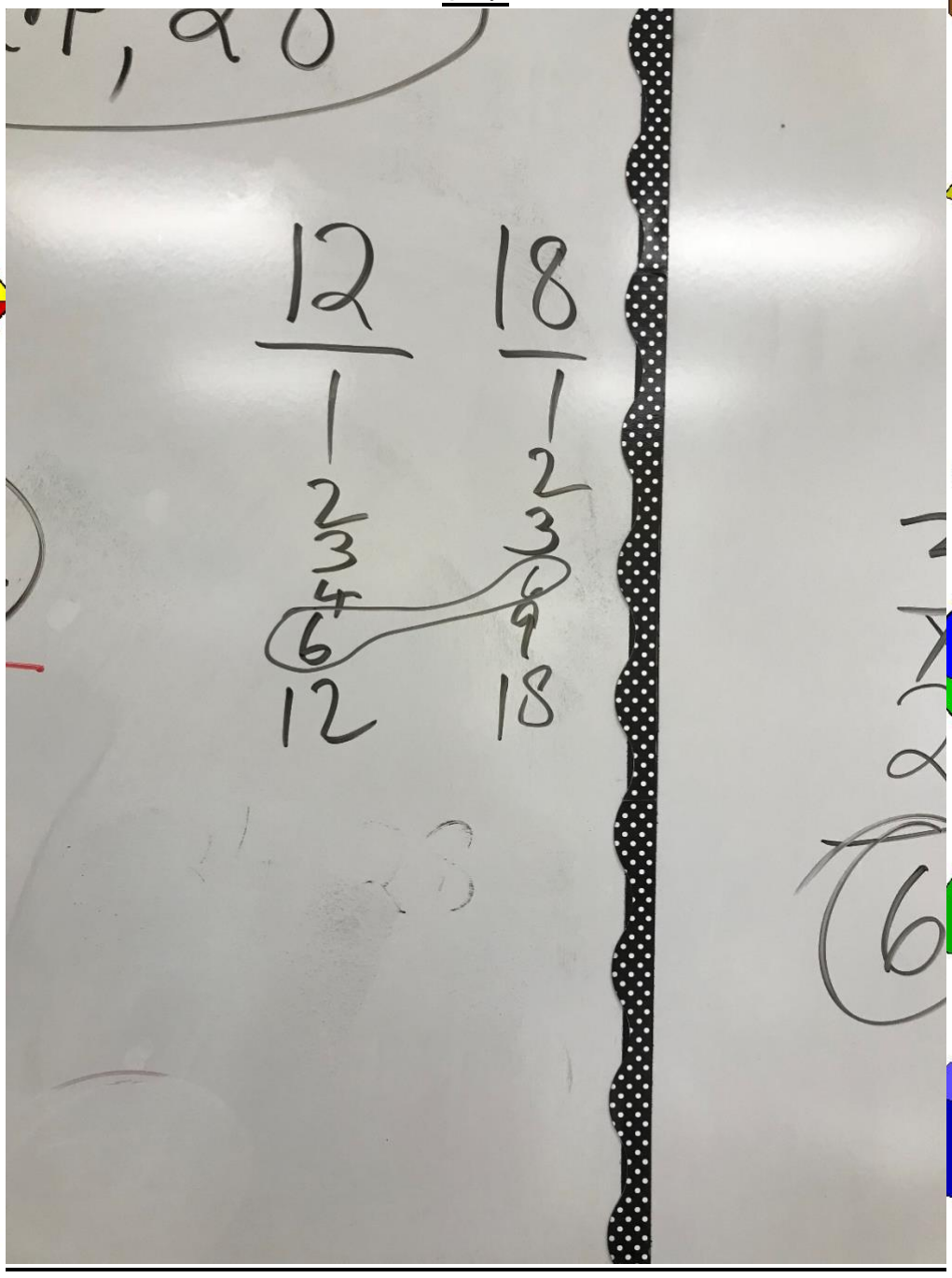

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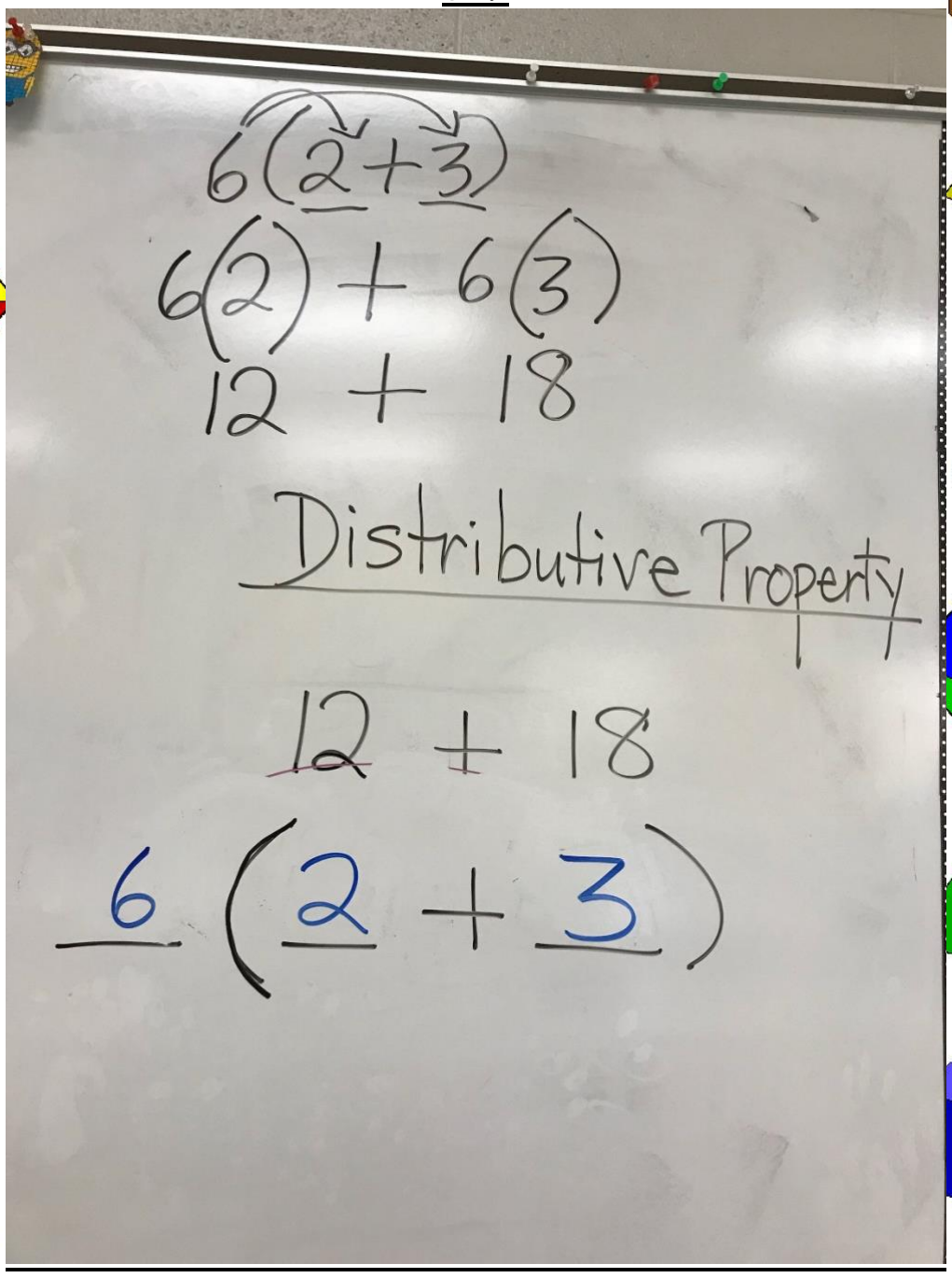
GCF



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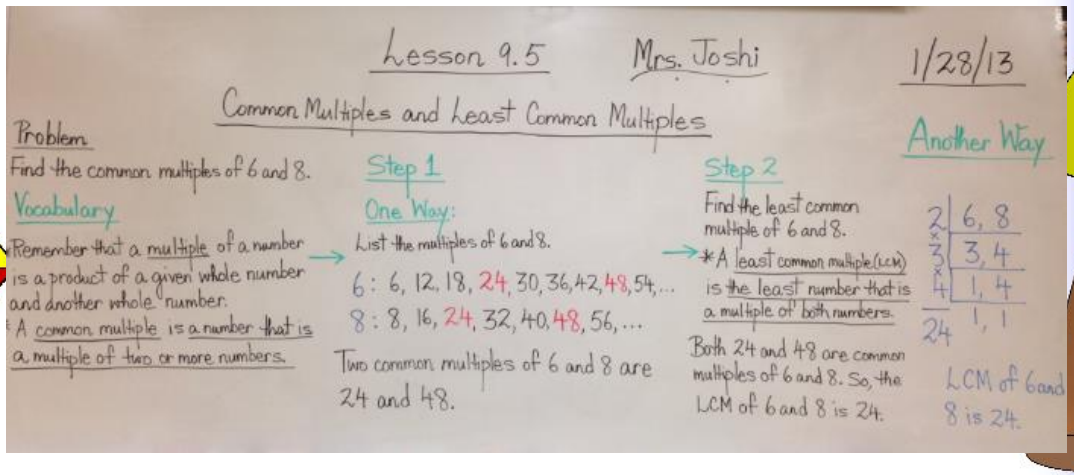
LCM



Lesson 9.5 Mrs. Joshi 1/28/13

Common Multiples and Least Common Multiples

Problem

Find the common multiples of 6 and 8.

Vocabulary

*Remember that a multiple of a number is a product of a given whole number and another whole number.

*A common multiple is a number that is a multiple of two or more numbers.

Step 1

One Way:

List the multiples of 6 and 8.

6: 6, 12, 18, 24, 30, 36, 42, 48, 54, ...

8: 8, 16, 24, 32, 40, 48, 56, ...

Two common multiples of 6 and 8 are 24 and 48.

Step 2

Find the least common multiple of 6 and 8.

*A least common multiple (LCM) is the least number that is a multiple of both numbers.

Both 24 and 48 are common multiples of 6 and 8. So, the LCM of 6 and 8 is 24.

Another Way

2 | 6, 8

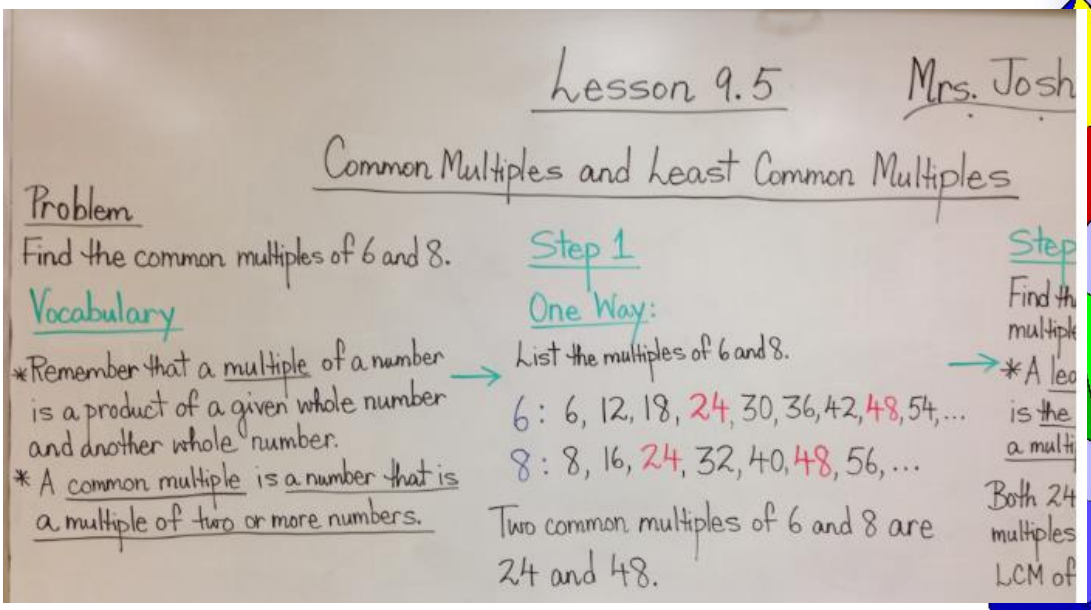
3 | 3, 4

4 | 1, 4

1, 1

2 × 3 × 4 = 24

LCM of 6 and 8 is 24.



Lesson 9.5 Mrs. Josh

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Step 1

One Way:

List the multiples of 6 and 8.

6: 6, 12, 18, 24, 30, 36, 42, 48, 54, ...

8: 8, 16, 24, 32, 40, 48, 56, ...

Two common multiples of 6 and 8 are 24 and 48.

Step

Find th multipl

*A lea is the a multi

Both 24 multiples LCM of

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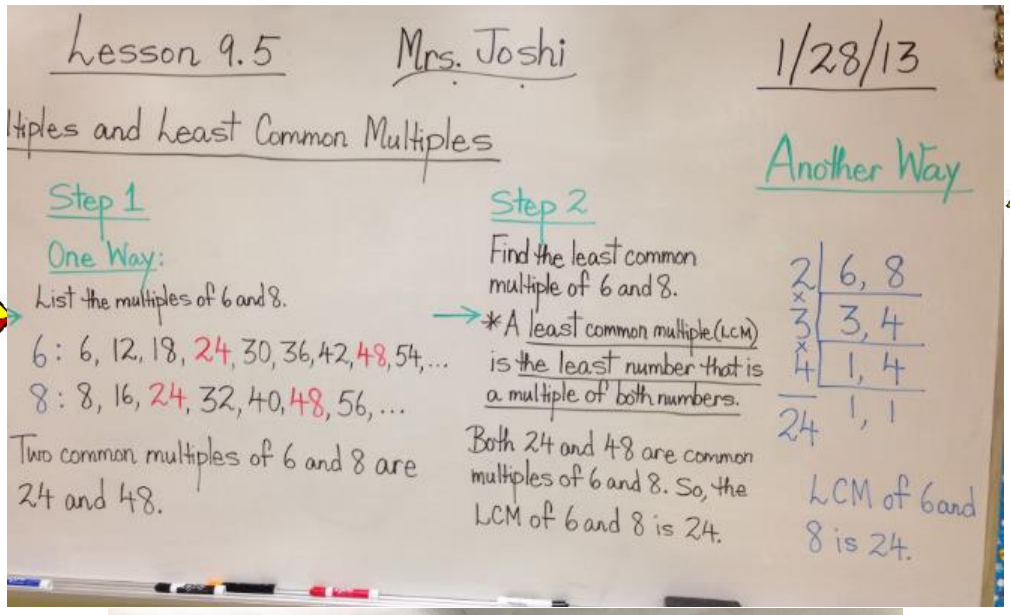

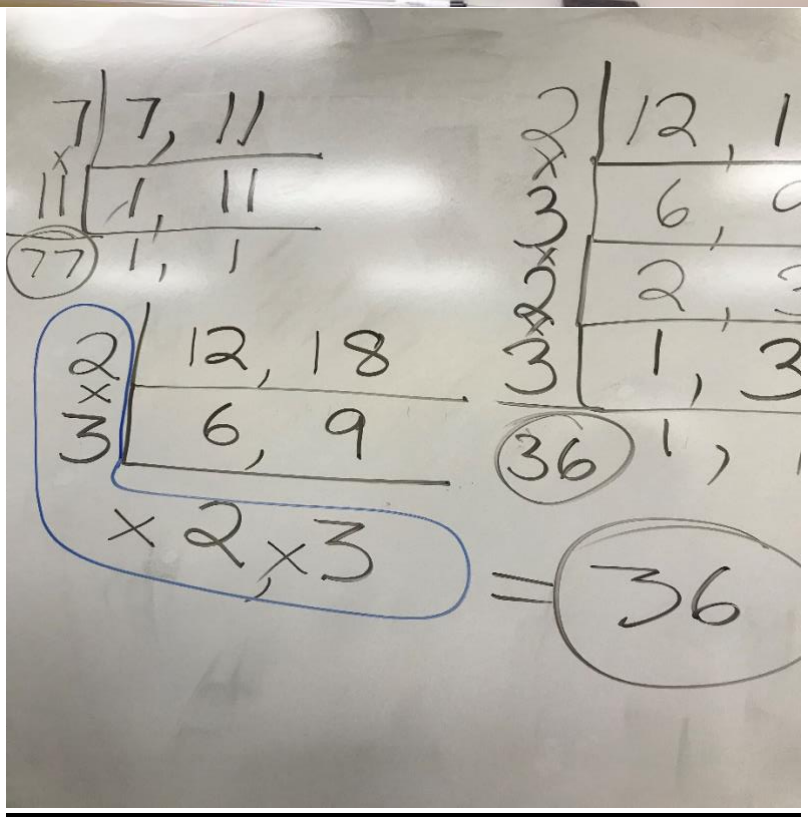

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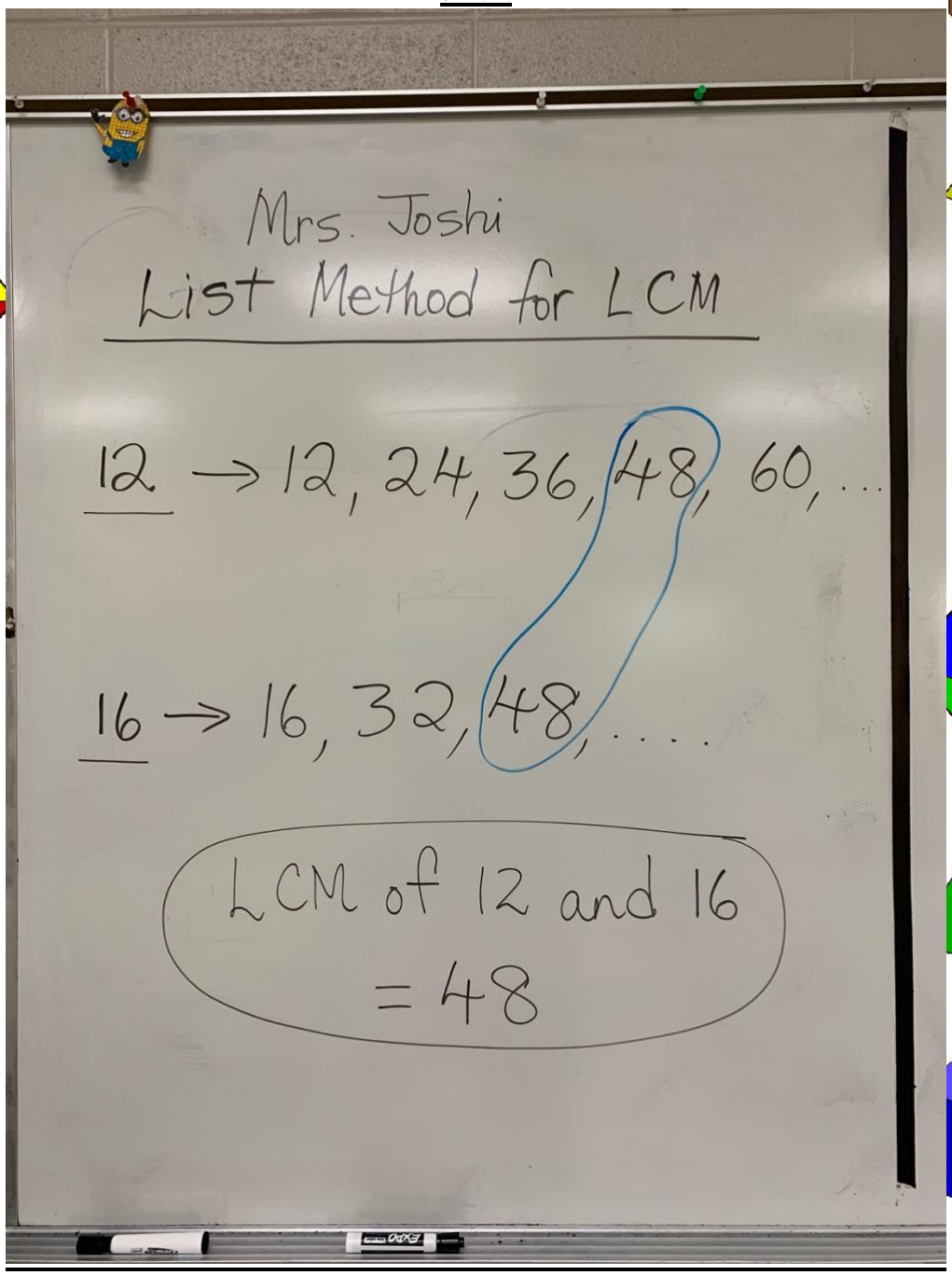
LCM



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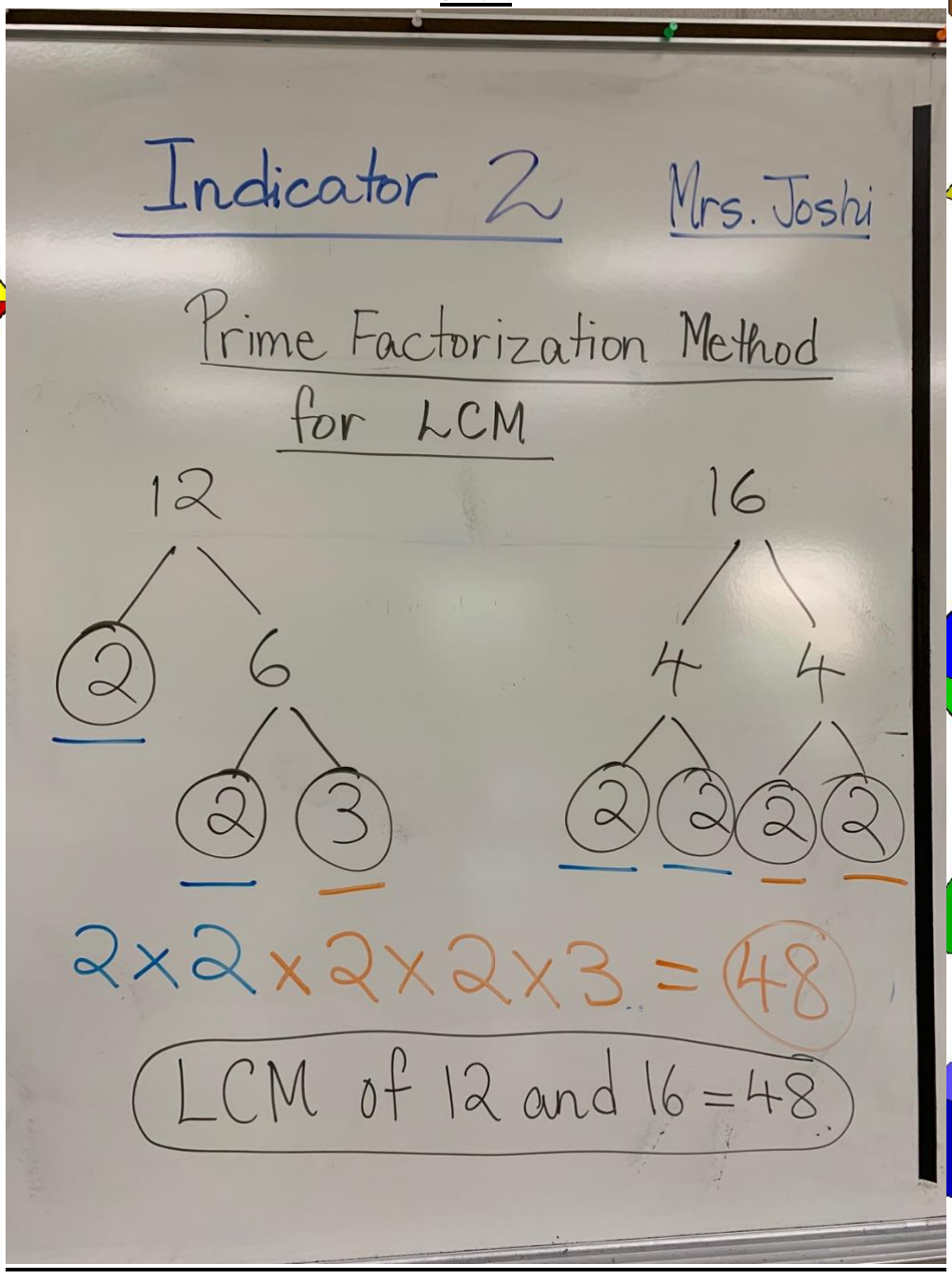
LCM



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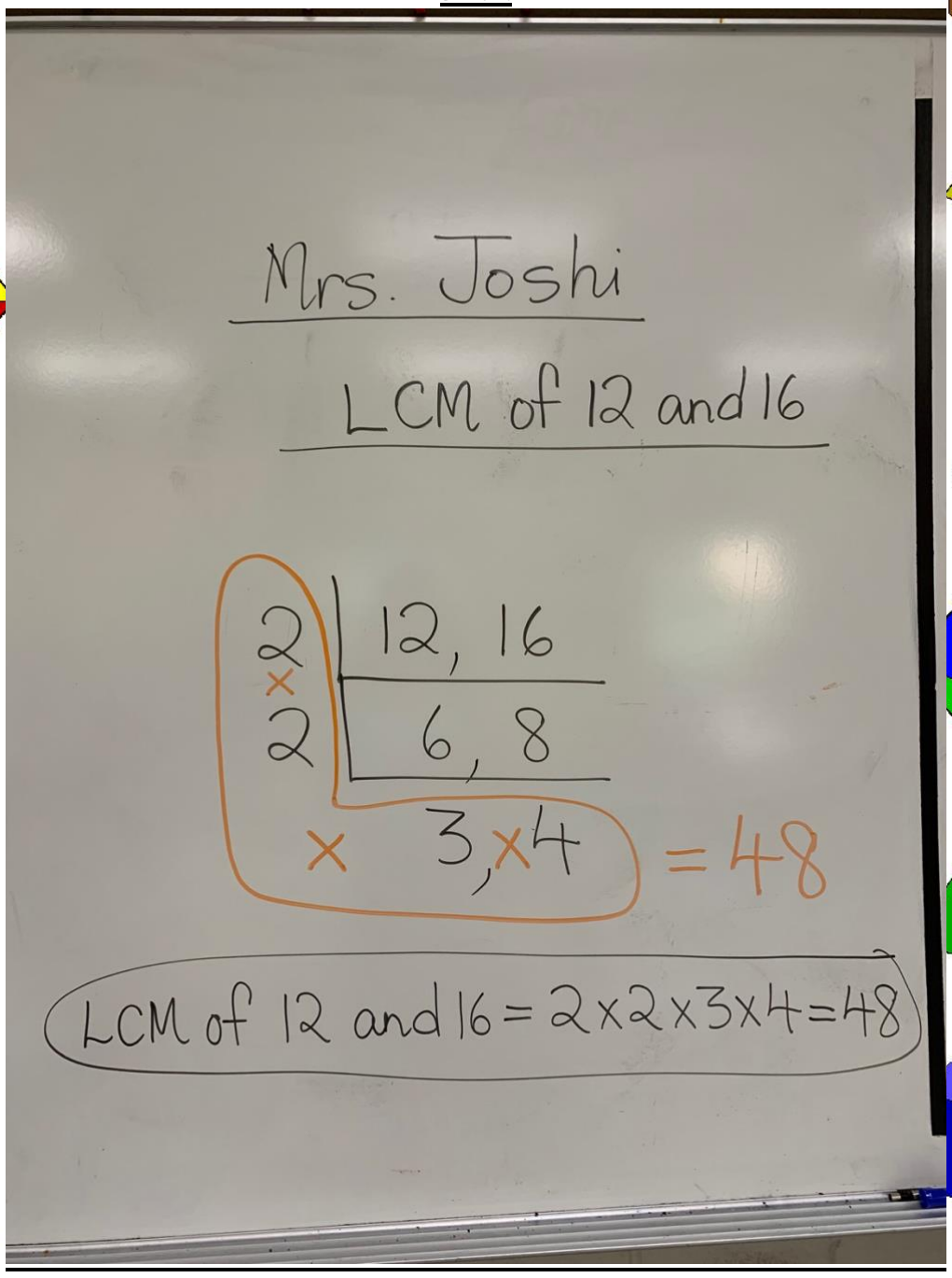
LCM



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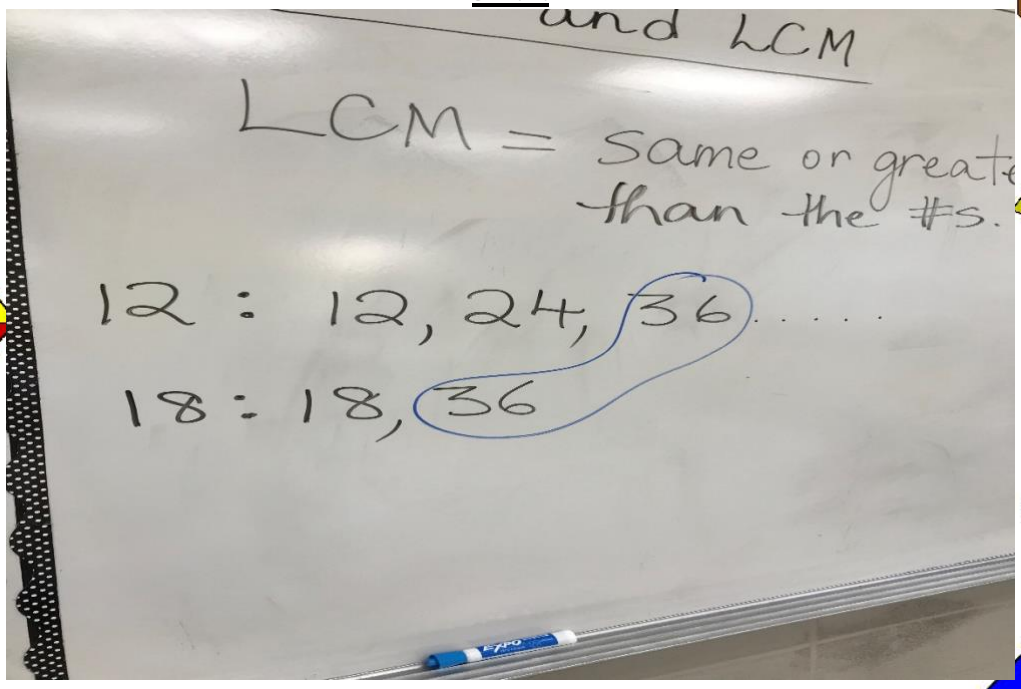
LCM



Finding Least Common Multiple

- ✓ multiples are the product when we multiply numbers together

  2x3=6 therefore the multiple is 6
- ✓ LCM is the smallest number that is a product (or multiple) of the numbers
- ✓ the LCM will always be a number LARGER than any of the numbers in the set
- ✓ so the LCM will be **MORE(or the same #)** than any of the numbers in the set

we use the exact same method as above with just a bit of a tweak...

2	28	56
2	14	28
7	7	14
	1	2

I tell the kiddos to draw an L (using some imagination that the red mark looks like an L) and all the numbers they circled...the "roses" and the "candles" are what we multiply together to get the LCM

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So, the LCM is found by this equation....

$$2 \times 2 \times 7 \times 1 \times 2 = 56$$

so the LCM is 56

Upside down Cake Method....

Step 1:

Think of any number than divides evenly into both...

Ex. 1 $\square$ | 48 18

Divide each term by that number!!

Ex. 1 2 | 48 18

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Put the answer after you divide under the cake!

Ex. 1 $2\overline{)48\ \ 18}$

$24\ \ 9$

Make a new cake and check to see if there is another number than will divide into both terms.

Ex. 1 $2\overline{)48\ \ 18}$

$\square\overline{)24\ \ 9}$

Make a new cake and check to see if there is another number than will divide into both terms.

Ex. 1 $2\overline{)48\ \ 18}$

$3\overline{)24\ \ 9}$

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Nothing divides into 8 and 3, so you are done!!

Now to use this information to find the LCM/GCF

Ex. 1 | 2 | 48 18
| 3 | 24 9
8 3

GCF:

Multiply the numbers that you divided out together… this is your GCF!!

**Mult. The numbers in the box!

Ex. 1 | 2 | 48 18
| 3 | 24 9
8 3

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GCF:

Multiply the numbers that you divided out together… this is your GCF!!

**Mult. The numbers in the box!

Ex. 1 | 2 | 48 18

| 3 | 24 9

8 3

3 • 2 = 6

GCF: 6

LCM:

We use the same information, only now we multiply all the number not inside the cake!!

Ex. 1 | 2 | 48 18

| 3 | 24 9

8 3

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LCM:

We use the same information, only now we multiply all the number not inside the cake!!

Ex. 1 | 2 | 48 18

| 3 | 24 9

8 3

LCM = 2 • 3 • 8 • 3

LCM = 144

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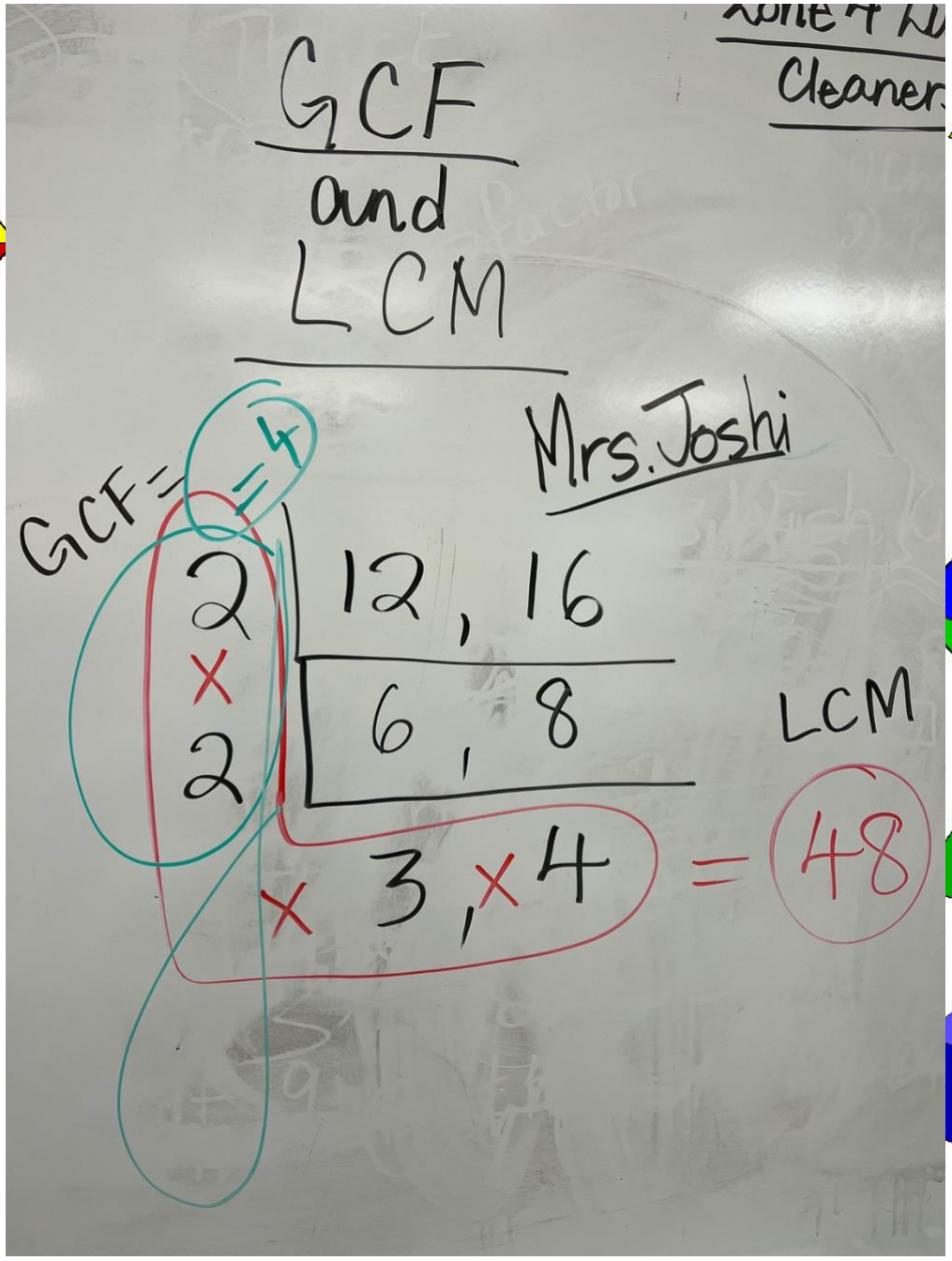

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