GCF and LCM
using a Venn Diagram

MIDDLE TENNESSEE MATHEMATICS TEACHERS
2018 ANNUAL CONFERENCE
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Prior Knowledge for GCF and LCM

Factors and Multiples

$1 \times 18 = 18$

$2 \times 9 = 18$

$3 \times 6 = 18$

1, 2, 3, 6, 9, 18 are factors of 18 and 18 is a multiple of 2, 3, 6, 9, and 18

Prime numbers -

Prime numbers have exactly two factors.

$13 = 13 \times 1$

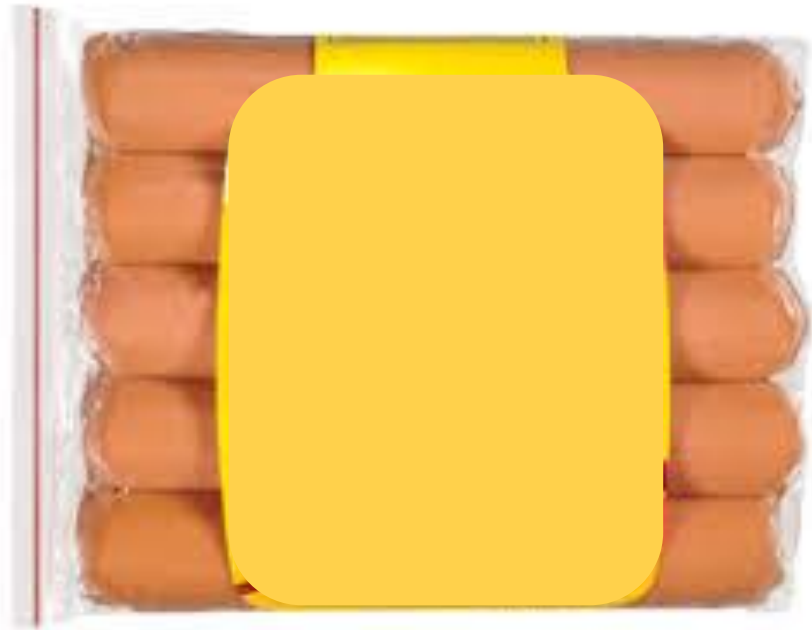**Prime factorization** – factor a number using only prime numbers

$20 = 4 \times 5$

$= 2 \times 2 \times 5$

Finding the GCF and LCM

- Traditional method

- Rainbow method

- Cake method

- Other methods?????

- <u>Hot Dogs versus Hot Dog Buns</u>

There are 10 hot dogs in one package. There are 8 hot dog buns in a package. You are buying hot dogs and buns for a school picnic, and you want the hot dogs and buns to come out even.

What is the fewest number of hot dogs and buns you should buy? How many packages of each will you need?

Should I find the GCF or the LCM?

Jennifer grows beans in rows of 14 while her friend, Joe, plants beans in rows of 15. If both friends have the same number of beans to plant, what is the smallest number that each will have to plant?

To encourage public transportation, Liz wants to give some friends envelopes with bus tickets and subway tickets in them. If she has 20 bus tickets and 15 subway tickets to split equally among the envelopes, and wants no tickets left over, what is the greatest number of envelopes Liz can make?

Bill has two pieces of yarn, one 15 feet long and the other 18 feet long. If he wants to cut them up to produce many pieces of yarn that are all of the same length, with no yarn left over, what is the greatest length, in feet, that he can make them?

Jeff is printing green and yellow forms. He notices that 4 green forms fit on a page, and 9 yellow forms fit on a page. If Jeff wants to print the exact same number of green and yellow forms, what is the minimum number of each form that he could print?

Solve using a Venn Diagram

• Consider a room with dimensions 48 x 56. What is the side of the largest square tile which can tile the room?

• The Earth takes 365 days to orbit the sun. It takes Venus 225 days to orbit the sun. If the Earth and Venus are in perfect alignment with the sun today, how many days until this happens again?

• On a track for remote-controlled racing cars, racing car A completes the track in 28 seconds, while racing car B completes it in 24 seconds. If they both start at the same time, after how many seconds will they be side by side again
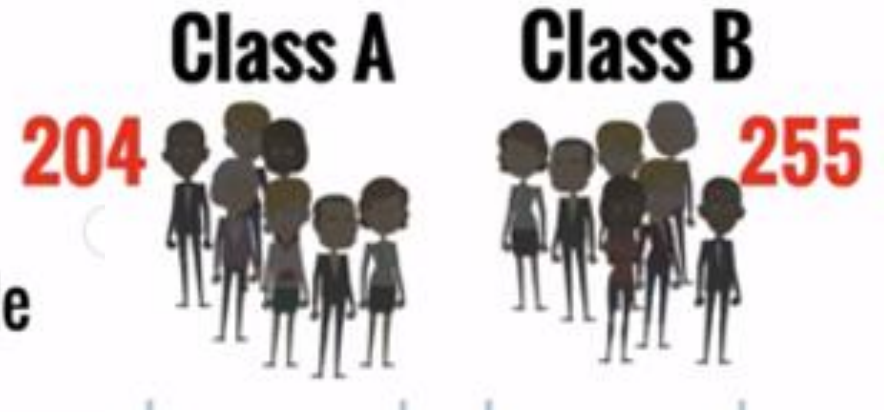
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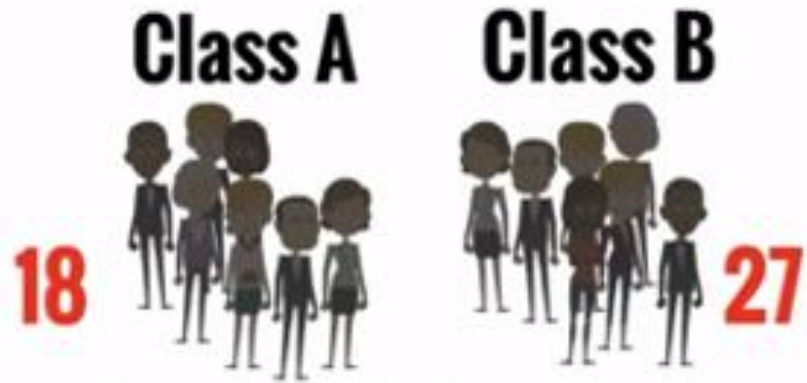
Charlie gets a break every 45 minutes and Jane gets a break every 20 minutes. They just took a break together and it is now 11:00 am. How long will it be before they meet again in the break room?

GCF Contextual Problems

- Shannon is making identical balloon arrangements for a party. She has 32 maroon balloons, 24 white balloons, and 16 orange balloons. She wants each arrangement to have the same number of each color. What is the greatest number of arrangements that she can make if every balloon is used?

- Two wires with lengths of 448 cm and 616 cm are to be cut into pieces of all the same length without remainder. Find the greatest possible length of the pieces.

LCM Contextual Problems

- Boxes that are 12 inches tall are being stacked next to boxes that are 18 inches tall. What is the shortest height at which the two stacks will be the same height?

- Bridget has swimming lessons every fifth day and diving lessons every third day. If she had a swimming lesson and a diving lesson on May 5, when will be the next date on which she has both swimming and diving lessons?

Additional GCF and LCM problems

You visit a model train shop that has two working model
trains. The trains share a station, but they run on separate tracks. One of the trains returns to
the station every 4 minutes. The other returns every 6 minutes. Both trains
just left the station. When will they both return to the station?

Paper cups come in packages of 14. Plastic lids come in packages of 11. What is the smallest
number of cups Lian would need to buy to get the same number of cups as lids?

Hanna is creating party favors with pencils and stickers. She has 10 pencils and 4 stickers, and wants each party favor to include the same combination of pencils and stickers, with none left over. What is the greatest number of party favors she can make?

I am planting 50 apple trees and 30 peach trees. I want the same number and type of trees per row. What is the maximum number of trees I can plant per row?

Luke has 15 packets of sugar and 30 packets of artificial sweetener. He wants to divide them into identical groups, with no packets left over, so that the groups can be distributed to some tables at the restaurant where he works. What is the greatest number of groups Luke can make?

While performing a piece of music, Lesley strikes the cymbals every 6 beats and the triangle is every 8 beats. If she just struck both at the same time, how many beats will pass before she again strikes them at the same time?

Thank you!