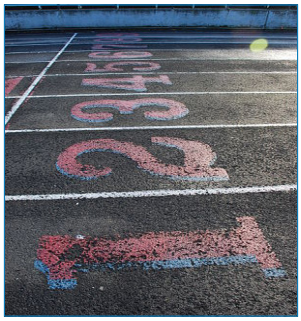
THE COMMISSIONER'S 2022 SUMMER MATH CHALLENGE

Connecticut's Summer Math Passport

Family Learning Movement



THE NUMBERLINE

(adapted from Youcubed At Home)

Students Entering Grades 1 and 2

Draw a number line from 0–10 or 0–20 outside with even spacing. Pick a number to start. Take turns calling out directions like add 3, take away 2, etc. All kids move or hop three spaces to the right, two spaces to the left, etc.

- After each move, notice what number you're on. Where did you start and how many jumps did you make?
- If more than one person is on the numberline, what do you notice about the distance between you and the other player? Is it the same? Is it different? What is the distance? Does this happen every time you all jump? Why or why not? (Make sure you count the spaces between and not the lines!)
- As you call out directions for adding or taking away, include a fun way to move along the spaces such as adding 3 by hopping on one foot for each space, taking away 5 by spinning each space, etc.
- How far away from 10 are you?
- If you are playing with two people, have one stand on a single digit number and the other on the corresponding teen number (e.g., 5 and 15). How far apart are you? Add 2. Now how far apart? What do you notice?

Variations

Draw a number line with spaces in increments of 10 up to 100 (0, 10, 20, etc.) with a little more space between.

- Ask questions such as, "What numbers are between...?"; "Where would 16 go?"; or "Where would 82 go?"
- Or, play Number Riddles. Example: I'm thinking of a number that is greater than 20 but less than 30. What number could it be? Have kids find a spot that matches your riddle and explain why it fits. How far away is their number from 20? From 30?

Students Entering Grades 3 and 4

Draw a numberline outside with wide even spacing with values between 0–1000 counting by 100s, 25s or 50s. Or pick a range of values within 0–1000 such as 200–300 and have the spaces jump by 10s.

- Play Number Riddles. Example: I'm thinking of an even number that is greater than 550 but less than 575 and can be said when counting by tens. What number could it be? Have kids find a spot that matches your riddle and explain why it fits.
- Write three-digit numbers on cards and turn them face-down or have a family member call out a number. Find the best spot on the number line where you think the number belongs, and stand there. Which end is it closest to? Why? Then estimate how many hops or steps it takes to get to that end. Test out your estimation.

Or

Numberline relay: Draw a long unmarked number line with only the end points such as 400–800, or 0–1,000.

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- Write a bunch of three-digit numbers (at least 10) on pieces of paper (index cards, etc.). Mix them all up and put them in a pile on a starting spot away from the numberline.
- Flip up a card and race to place the card where you think the number belongs. Then run back and get another card. This can be played in teams so that kids need to think about where their numbers are being placed compared to their opponents'.

Draw a number line outside with wide, even spacing with values between 0–100. Skip counting by 2s, 5s, or 10s.

- Pick a number to start on. Take turns calling out directions like triple your number or, halve your number. What do you notice about the numbers as you continue to double them? Cut them in half?
- Does the distance between each number change or stay the same? Why do you think so?
- Double, triple, or quadruple your number by hopping, skipping, or jumping along the numberline. Does the distance stay the same between you and the other players? Why or why not?
- What else do you notice when you keep on doubling your numbers? How does it compare to tripling?

Students Entering Grades 5 and 6

Draw a numberline outside with wide even spacing with values between 0–5, marking fractions or decimals between each whole number (e.g., 0, .5, 1, 1½, 2, etc.).

- Pick a number to start on. Take turns calling out directions like add or take away 3.75. What do you notice about the distance between you and your partner when you are both traveling the same distance as the same time? Does the distance between you both stay the same, or change? Why do you think so?
- Take turns calling out directions like triple your number or halve your number. What do you notice about the numbers as you continue to double them? Cut them in half? Cut them into thirds?
- Double, triple, or quadruple your number by hopping, skipping, or jumping along the numberline. Does the distance stay the same between you and the other players? Why or why not?
- What else do you notice when you keep on doubling your numbers? How does it compare to tripling?

Draw a numberline outside with wide even spacing with decimal values of tenths between 0–2.

- Write 2- or 3-digit decimal numbers (0.25, 1.03, 1.57, etc) on cards and turn them face down or have a family member call out a number. Find the best spot on the number line where you think the number belongs, mark it with an X and stand there. Is it closer to 0? 1? 2? How do you know?
- Numberline relay: Write a bunch of 3 digit decimal numbers on pieces of paper (index cards, etc). Mix them all up and put them on a starting spot off the numberline. Flip up a card and race to place the card where you think the number belongs. Then run back and get another card. This can be played in teams so that kids need to think about where the numbers are being placed compared to their opponent's.

Create a coordinate grid rather than a number line by drawing two intersecting number lines at a right angle.

- Decide where to stand and take turns calling out directions either by calling co-ordinate pairs or by adding or subtracting along the x,y (horizontally or vertically).
- What do you notice about your position when you add 1 to each ordered pair? (1,1), (2,2), (3,3)?
- Trace your movements with a different colored chalk. What do you notice?
- What happens if you multiply your ordered pairs?

Create a design on a piece of paper and map it out on your coordinate grid. Have a family member call out the coordinates as you mark the points. Then connect them. You just replicated a giant version of your design!

Treasure Map:
Create a coordinate grid of your yard on a piece of paper. Mark points on your paper grid where you want your treasures to be. Then, place "treasures" or secret messages on points in your yard. They can be notes, plastic eggs, rocks, etc. Then, see if a family member can find your secret treasures by following your coordinate grid.

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Students entering Grade 7:

Grab a jump rope and see how many jumps you can do in 5 minutes each day for a week.

- Record your data in a table.
- Graph your data.
- Write 3 observations from your graph.

For students entering Grade 8:

Find a friend. Take turns to do push-ups for 2 minutes.

- What is the rate for you?
- What is the rate for your friend?
- Do the 2 rates form a proportion?