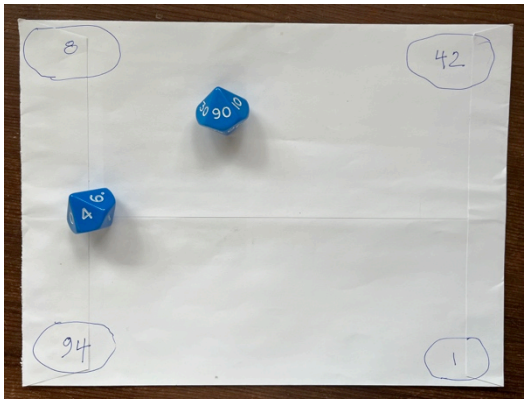
Diffies

Doing diffies reinforces the notion of additive differences—exactly what students have worked with while playing race games, especially in the 2nd half of their race games: the race down to zero. To find the difference between two numbers, you can add up from the little one or subtract down from the big one: your result will be the same.

When they're subtracting, students will often need to borrow/trade/regroup, using either the standard algorithm for subtraction or the base-ten-blocks equivalent, and then check their work with addition.

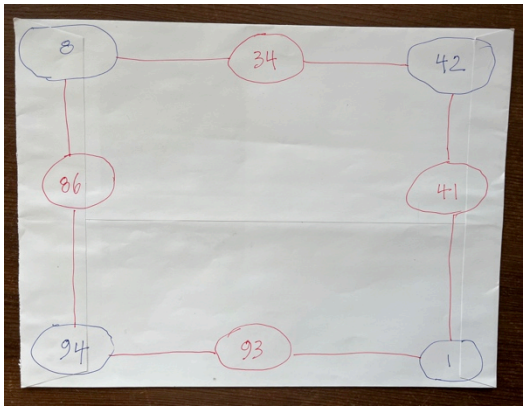
And when they're adding up, students will need to make tens and hundreds and keep track (on paper or in their heads) what it took to get from the lesser number to the greater.[1]



How to do a diffy

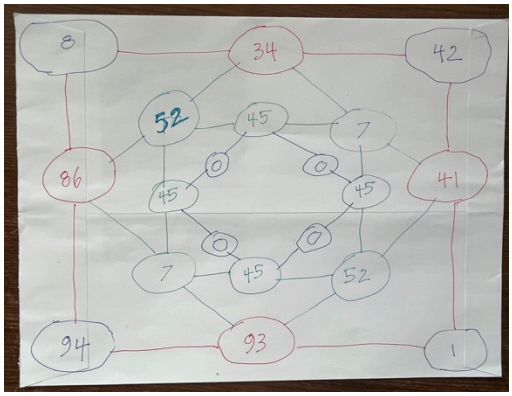
- Get a (rectangular) sheet of paper and put numbers in each of the four corners.

  I use ten-sided dice ones (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) and tens (00, 10, 20, 30, 40, 50, 60, 70, 80, 90) to make sure that those numbers are random. (And kids like to roll the dice too—agency and affect in one random package!)



- Figure out the differences between the corner numbers and put those differences in between, connected with short lines. (You can find the differences either by adding up or by subtracting down.)

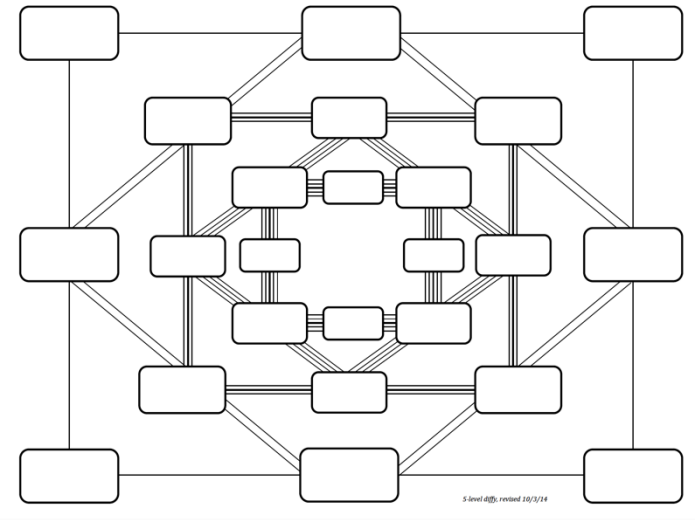
- Then find the differences between the differences, making them into new corners, then finding the differences between those differences, and so on, working your way down difference by difference, shell by shell, until all four of your differences are 0.



- Here's a finished diffy on the right.

[1] Some of the mathematics lurking beneath the routine doing of a diffy is the Trichotomy Law: Given two numbers A and B, one and only one of three things will be true: A = B, A < B, or A > B.

Some kids get their lines tangled and lose the thread (so to speak). So I made a blank diffy with 5 levels that can be used as a template. (If you do enough diffies, you'll notice that they don't always have the same number of levels. Some even have more than 5 levels, but I've found that this template (maybe with an extra level or two at the end will accommodate most diffies.)



For a link to download a blank diffy, go to larrythemathguy.com

You can do diffies with any whole numbers or fractions. I've put some PowerPoint how-to animations on my site *larrythemathguy.com.*

You can probably find them on the home screen or in the Animations section.

3-digit diffies (000-999), probably for grades 2-4

1-20 diffies for grades K and 1

2-digit diffies (00-99)

diffy-mixednums-halves-3rds-6ths

diffy-mixednums-halves-4ths-8ths

Larry Francis, 6/3/2022