Hands-on Approach to Teaching Decimal and Fraction Concepts

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Blank Number Line

- Complete the Benchmark Fraction/Decimal worksheet
- If you receive a clothes pin with a decimal or fraction on it, please clip it on the blank hanging number line. Do not look at what is on the back of your clothes pin☺

How can these fractions help you?

0 ¼ ½ ¾ 1

What are some of the challenges you have when teaching decimals and fractions?

Order these decimals on a blank piece of paper:

0.6 0.23 0.375 0.1

0.84 0.9 0.005

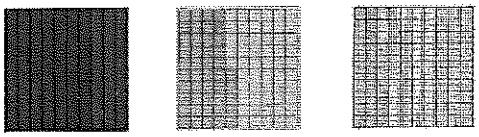
What mistakes might students make when ordering these decimals?

Identify these decimals on the number line.

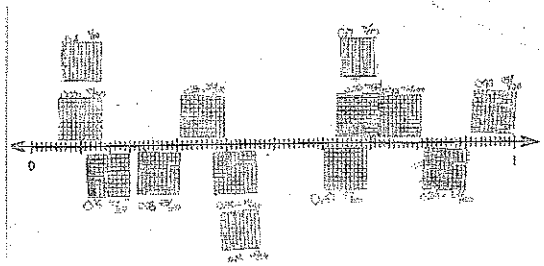
0.6 0.23 0.375 0.1
0.84 0.9 0.005

- How can this help students understand decimal place value?

Using Decimal Squares at your table, locate those decimals on the folding number line or paper number line.

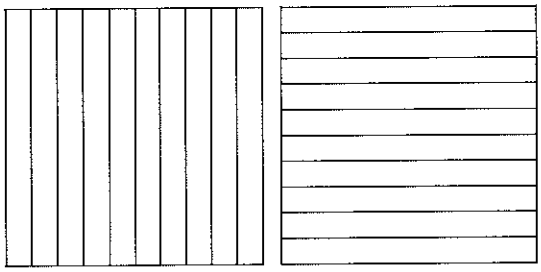


Students can color decimals on a grid that you give them, and then locate them on a class number line.

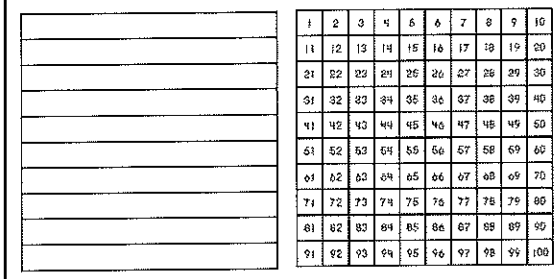


There is a blackline master of these in your packet☺

Have you ever thought of ?



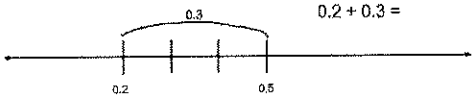
Tenths Relating to Hundredths

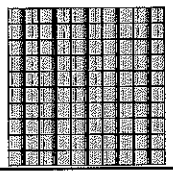


1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

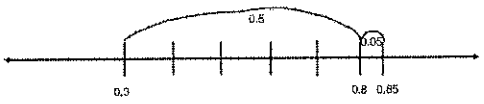
Adding Decimals Using the Number Line

0.2 + 0.3 =

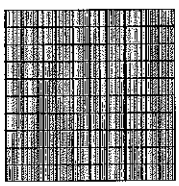




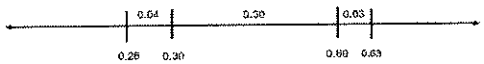
How would you add this? 0.3 + 0.55 =



Use your yellow number line 1st to help you solve the problem and then the thousandths grids.



Now try this: ▸ 0.26 + 0.37



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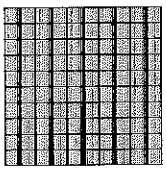


Double Decimal War – Using Decimal Cards

- Each player flips over two cards and adds their two decimal number cards together.
- The player with the larger sum wins the cards for that round.
- Students can use the number lines or grids to help them add.

Subtracting Decimals

- What does the word difference mean?
  - The distance between two numbers

Try these subtraction problems:

0.9 – 0.3 =

0.8 – 0.45 =

0.94 – 0.57 =

Rounding Decimals

- Partner work. Rounding decimals to the nearest tenth
- Pick a card and find the two tenths that your number is between on the yellow closed number line, next find the tenth that is closest to that number.

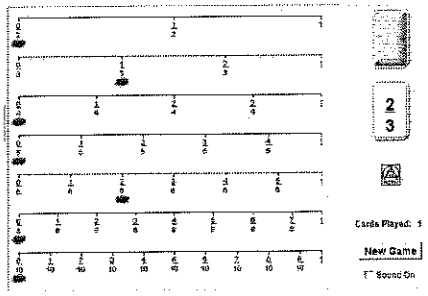
Finding Fractions on the Number Line

- Using the fraction side of the yellow number line, make sure that it is folded showing 0 and 1, try to figure out which two fractions 1/3 is between.
- Now locate where these other fractions are on the closed number line:
- 5/6 2/3 3/4 11/12 1/4

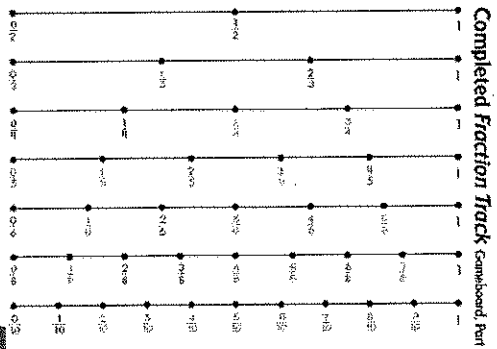
Skip Counting Equivalent Fractions on the Number Line

- Cut a piece of string the size of 1/6 and then lay it on the yellow number line to find all the equivalent fractions that are the same as 1/6. Make a list of fractions that you find are equivalent to 1/6.
- Do the same for 1/3.
- What do you notice?

Fraction Game on Illuminations



Investigation Game



Completed *Fraction Track* Gameboard, Part 1

Smaller to Larger

Investigation Game

You need

- Decimal Cards, Sets A and B (1 set of each for 2 players; 2 sets of each for 3 or 4 players)

Play with a partner or in a small group.

1. Mix together all of the Decimal Cards.
2. Each player draws a 3 × 3 grid for a game mat, with spaces large enough for Decimal Cards to fit inside.
3. Mix the combined deck and place it facedown between the players.
4. Players take turns. On your turn, draw the top card from the pile and decide where to place it on your game mat. The numbers must be in increasing order, from left to right in each row and from top to bottom in each column.
5. If you draw a card that you cannot place because of the numbers already on your game mat, you must keep the card in a pile and lose your turn.

   Example:
   Suppose that after a turn, your game mat looks like this. You draw 0.15 and it cannot be played because 0.375 is already in the lowest place on the board. Put the 0.15 card in your pile of cards that cannot be played.

6. If you are unsure which of two numbers is larger, discuss them with other players.
7. The game is over when each player has filled all nine spaces.
8. The winner is the player who has fewer cards that cannot be played. If no player fills all nine spaces of the gameboard, the player with more cards placed on the gameboard is the winner.

Fraction/Decimal War Game

- Use fraction cards and decimals cards
- Each player flips over a card.
- The player with the larger decimal or fraction card wins both cards.
- Continue to flip over one card each and compare cards until all the cards are gone.
- Player with the most cards at the end of the game wins.

Using Dice or Number Cards to Make Fractions

- Generate 4 numbers
- Example: 4 7 2 9
- Make the least fraction using numbers
- Make the greatest fraction
- Make the least improper fraction
- Make the greatest improper fraction

Benchmark Fractions/Decimals: What's it Closest To?

Place each of the following fractions in the appropriate column in the chart.

Is this fraction close to 0? Close to $\frac{1}{2}$? Close to 1?

$\frac{1}{3}$ $\frac{3}{8}$ $\frac{7}{9}$ $\frac{5}{6}$ $\frac{11}{12}$ $\frac{2}{10}$ $\frac{9}{10}$ $\frac{1}{8}$ $\frac{2}{6}$ $\frac{6}{11}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{4}{9}$ $\frac{3}{7}$ $\frac{3}{4}$ $\frac{3}{6}$

Fractions/Decimals Closest to 0	Fractions/Decimals Closest to $\frac{1}{2}$	Fractions/Decimals Closest to 1

Now place these decimals in the appropriate column in the chart:

0.05 0.75 0.853 0.3 0.64 0.25 0.5 0.001 0.7 0.98

Discuss with a partner:

Why did you place $\frac{1}{3}$ in the column that you did?

Why did you place $\frac{7}{9}$ in the column that you did?

Why did you place $\frac{6}{11}$ in the column that you did?

Do you see any patterns among any of the fractions or decimals in each column?

Were there any fractions or decimals that you could not place in a column? Which ones and why?

Place the Fraction or Decimal Cards in the Appropriate Column

Close to 0	Close to ½	Close to 1

If you like this activity, you may want to download the Fraction Cards and Decimal Cards Tenths, Hundredths and Thousandths that I created. You can use these cards with the work mat provided and in lots of other activities. I have written lesson plans for using the cards with a paper number line that shows tenths, hundredths and even thousandths. There are two number lines that you can have students cut into strips and tape together to make one continuous number line from 0-1 and 1-2. The lessons that I have written include:

Lesson that go with the paper number line are:

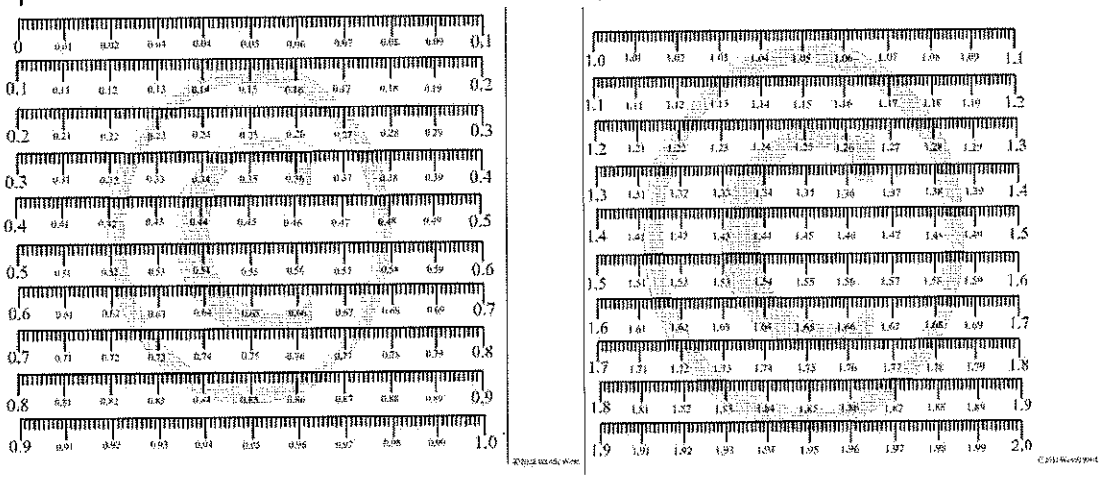
1. Introducing a Paper Number Line
2. Identifying Thousandths on a Paper Number Line
3. Rounding Decimals on a Paper Number Line
4. Adding Decimals on a Paper Number Line
5. Subtractiong Decimals on a Paper Number Line
6. Locating and Writing Fractions that Correspond to the Decimals on a Number Line
7. Writing Equivalent Fracitons on the back of the Paper Number Line
8. Skip Counting to Discover Equivalent Fractions on the Paper Number Line
9. Comparing and Ordering Fractions on a Paper Number Line

These lessons provide hands-on activities and ideas that allow you to lead students in an active exploration of the world of rational numbers. These activities involve students in the exploration of abstract concepts through the use of a number line. These lessons emphasize the Mathematics Process Goals of problem solving, connections, communication and reasoning all using a new representation of a number line which is stressed in the Common Core Standards.

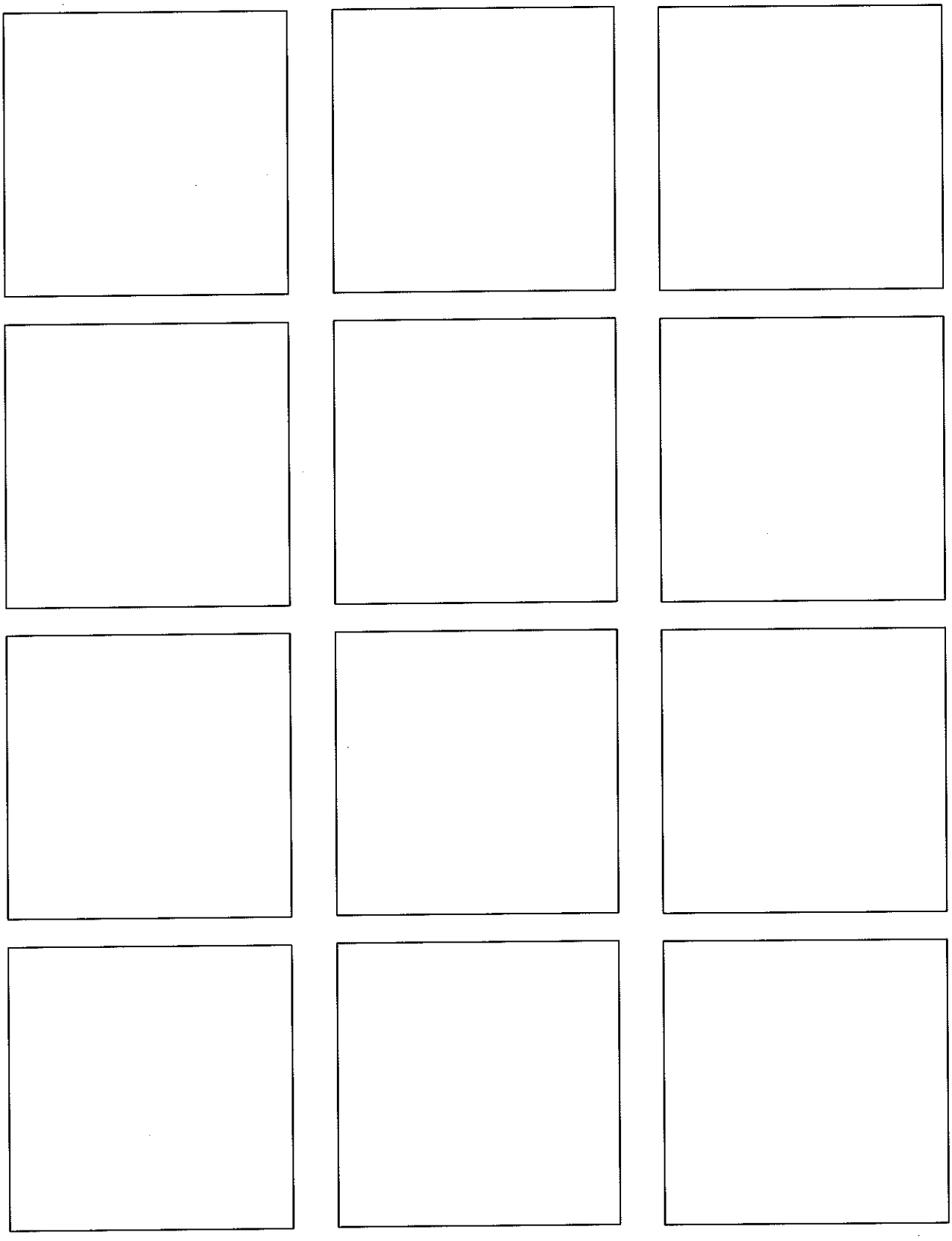
I created these lessons and the paper number line, before my Folding Number Line was manufactured through ETA Hand2Mind.

Please visit my store: http://www.teacherspayteachers.com/Store/Wendy-West and take the time to rate my activities, and I hope you enjoy them.

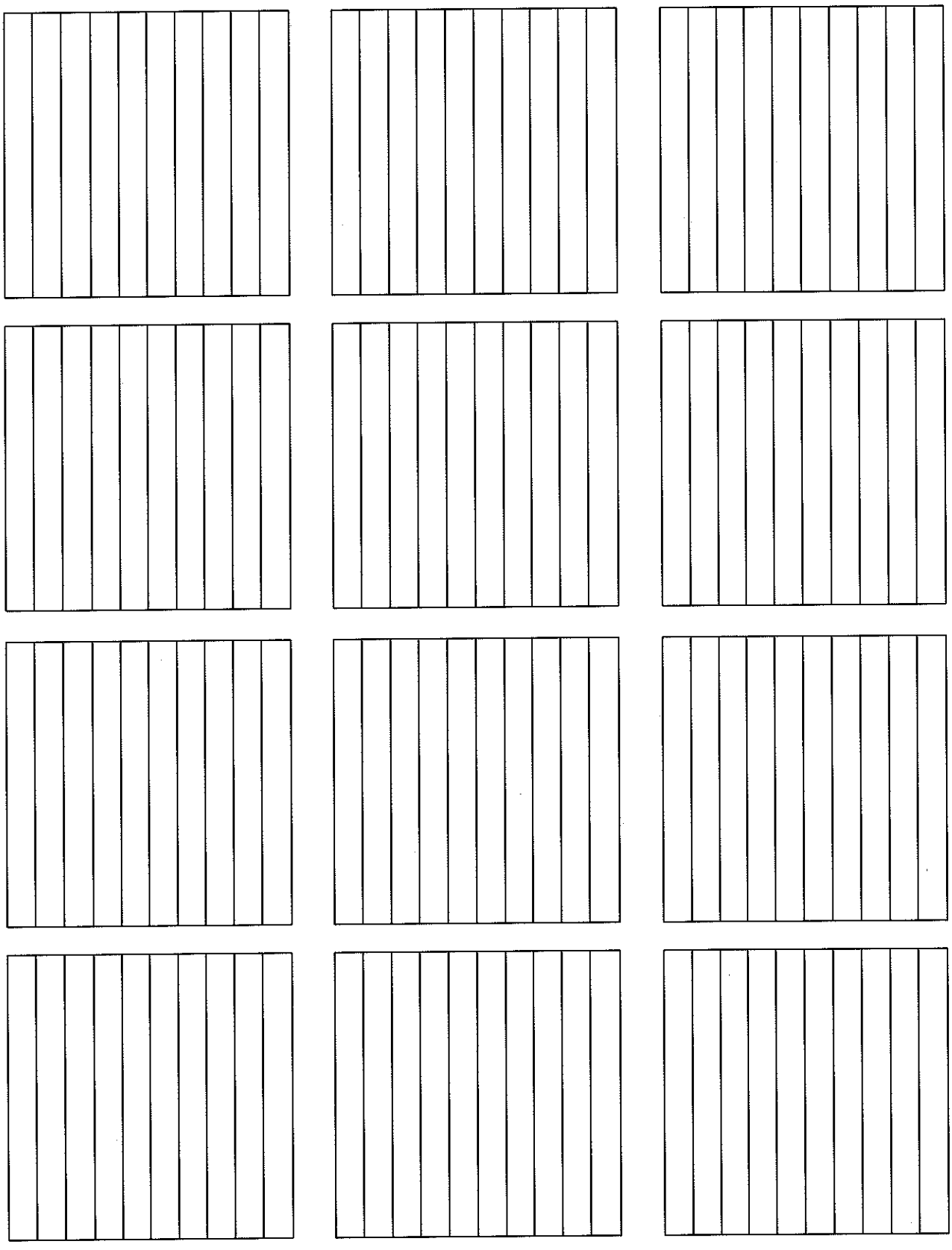
Paper Decimal Number Lines to download from my site:



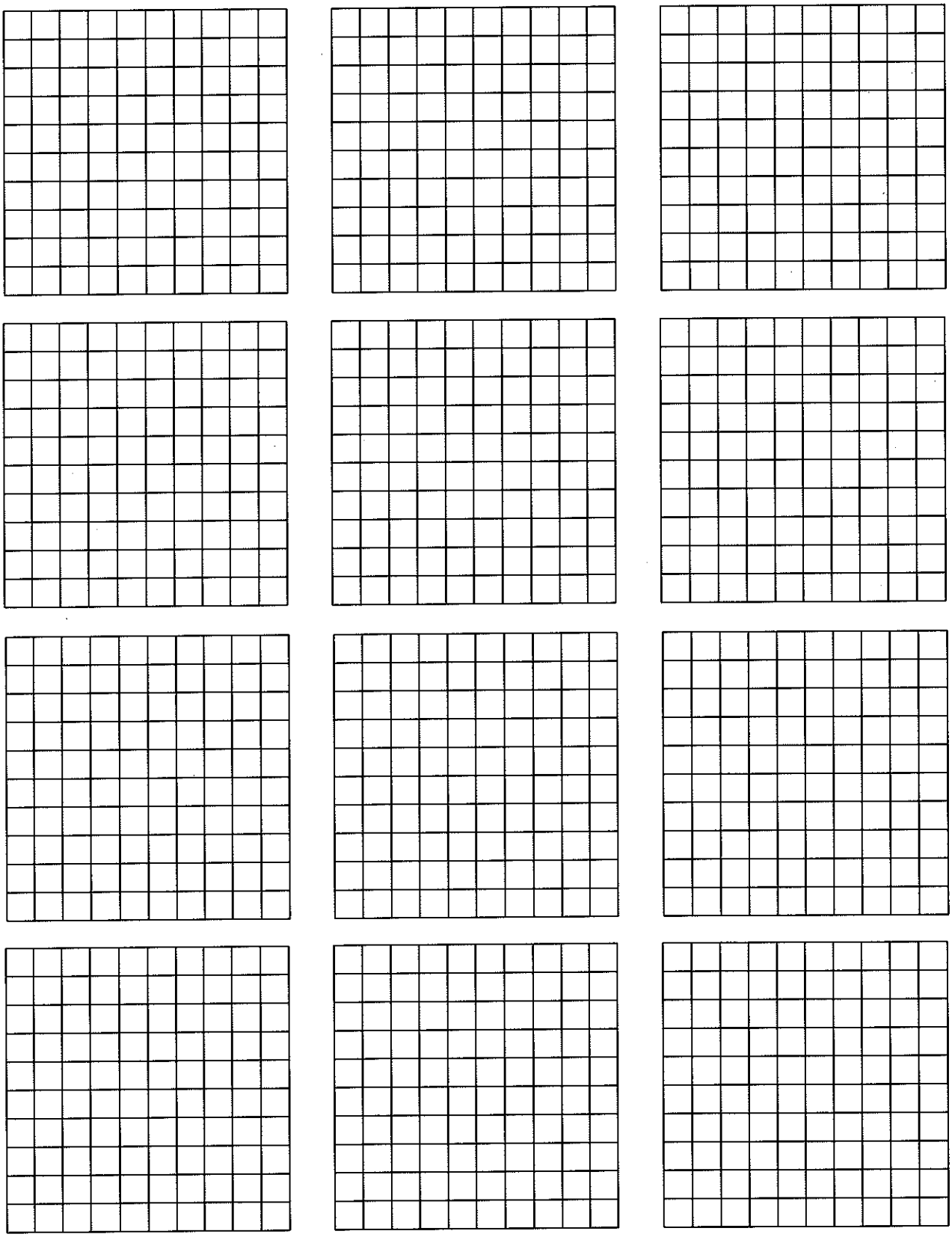
Decimal Squares (wholes)



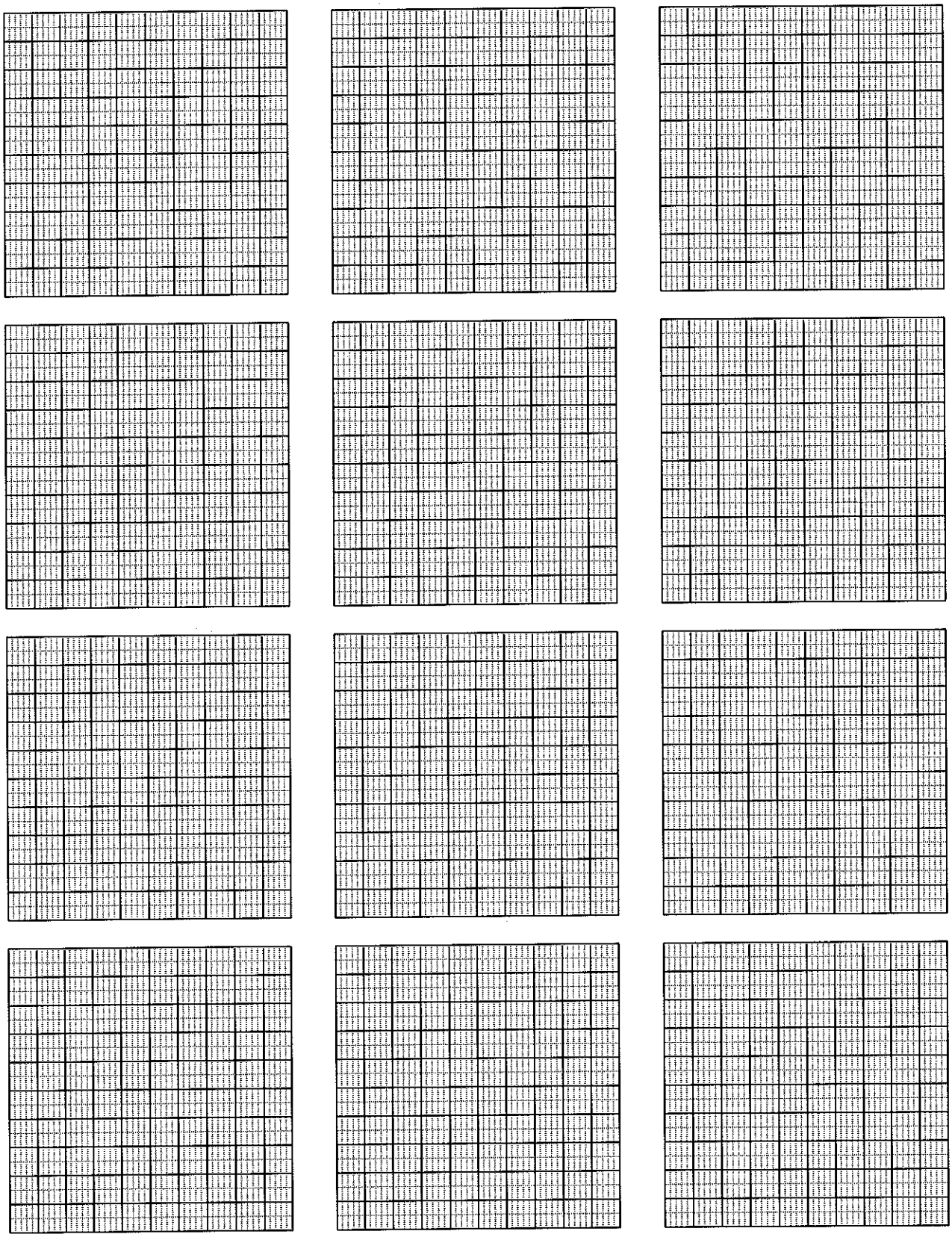
Decimal Squares (tenths)



Decimal Squares (hundredths)



Decimal Squares (thousandths)



Adding and Subtracting Decimals Using an Open Number Line

Adding:

0.2 + 0.3=

0.3 + 0.55 =

0.26 + 0.37 =

Subtracting:

0.9 – 0.3 =

0.8 – 0.45 =

0.94 – 0.57 =