Number Line

- ❏ Kim's Number Line Visual
- ❏ Number Line Petite
- ❏ Class Pointers and Magic Fingers
- ❏ Random Number CDs

Walk the Number Line

The first growth pattern that children meet is counting numbers. A class number line is the most important visual as a classroom tool. Early learners will work with counting forward and backward with counting songs and activities.

To introduce the idea of multiples the teacher will use objects that come in a constant of count to create a picture in the mind's eye. To introduce multiples of two, I recommend playing the game called **The Stand Up Game.** One student stands up. The teacher directs the activity by asking, "How many students are standing?" The relationship between the number of students standing to the number of eyes is made through the meaning of multiplication in groups.

As the game is played the teacher will add a red dot above the multiples of two. Students will add a red dot above the multiples of two on the Number Line Petite (**Number Line Workbook**).

Read **Cat Up a Tree** by John and Ann Hassett to introduce counting in groups of or skip counting with the students. Yellow dots will be added for multiples of five on **Kim's Number Line**. Other books can introduce other skip counting patterns.

A color-coded number line can be used as a larger visual tool for the classroom. This extends the skip counting. For primary students, the number line would start at zero and go to one hundred. For older students, the number line would start at zero and go to one hundred forty four. The number line is color-coded so that all of the multiples of two would have the same colored dot above them. Each different multiple would have a different colored dot above it.

The color patterns are:

2---red (The Stand Up Game)
3---green (The Triangle Game)
4---orange (The Quadrilateral Game)
5---yellow (The Hands Up Game)
6---light blue (The Hexagon Game)
7---neon orange (The Days in a Week Game)
8---neon green (The Spider/Octagon Game)
9---black (The Nonagon Game)
10---navy blue (The Roller Coaster Game)
11---purple (Hendecagon or Undecagon Game)
12---gold star (The Dodecahedron Game)

Students will use the Number Line Petite Mat to do the same color-coding as the dots on the class number line. This tool will be amazing for simplifying fractions.

The standard algorithm for subtraction of large numbers is the borrowing or regrouping method of starting with the ones. Students often refer to this as the "slash and burn" method. By using number reference points or benchmarks, students can make the subtraction situation less stressful. This model is extremely helpful for students who have difficulties with regrouping.

To model this process with students, the teacher needs a transparency of the practice sheet called "Walking the Line." Using the **Decahedron Double Dice**, two numbers are rolled. The big mathematical question is, "What is the difference between the two numbers?" For example:

29   71
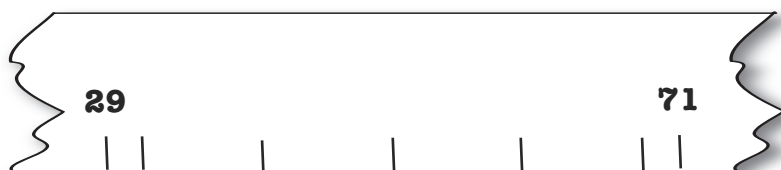
The thinking behind this task is the mental process of dealing with simpler differences and then adding and subtracting around those reference points or benchmarks. If students are using the adding machine tape scraps, they can use the paper clips as number sliders and place the paper clips from the bottom of the number line to mark the reference points or benchmarks.

The class number line will also provide repeated practice with the idea behind this process and can used as a focus activity throughout the week. It is very exciting to watch students get better and better with the mental process and logical thinking skills.

0	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	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144

Questions and Activities for Kim's Number Line

General Number Sense K-2

• What can you tell me about your class number line?
(They should articulate it is a growth pattern.)

• Where does every journey on a number line begin?
(Point of origin, zero.)

• What number is closer to the point of origin on number line? What does that mean?

• What do the colored dots represent?
(They are part of skip counting patterns. Counting in groups.)

• What number comes before ____?

• What number comes after _____?

• What number is between ____ and ____?

• What number is _____ more than _____?

• What multiples of ten is _____ between?

• What is _____ groups of _____?

• _____ plus how many more make _____. (examples = 10)

• _____ minus how many make _____.

• Let's count by _____ starting at _____.

• Which are farther apart ____ and ____ or ____ and _____?

• Pick a number. Ask students what they know about that number. *(Examples: vocabulary like less than, greater than, skip counting, counting in groups, even/odd, between, before, after, multiples of, coins/bills, etc.)*

Kindergarten Ideas

As students are first learning to count to 100, use the number line to help. Count by ones and count by tens.

Use the number line when first counting forward, starting with any number.

Let students use the number line as a visual when first learning to write the numbers to 20.

Use the number line to illustrate addition and subtraction (3 + 4, start at 3 and move over 4 spaces).

Use the number line to break apart numbers (10 = 3 jumps + 5 jumps + 2 jumps).

Use the number line to find sums to 10 (How many jumps will it take to get to 10 from 6?).

Use the number line to show 11-19 as ten and some ones (12 = 1 jump to 10 and then 2 more jumps).

Use the number line to measure objects. Place an object up to the number line to tell how many units long it is.

Use the number line to compare the lengths of two objects.

First Grade Ideas

Use the number line to show commutative property of addition (to show that 8 + 3 = 3 + 8, have a strip of paper that is 8 units long and one that is 3 units long, show how you can place the 8 unit bar first, then the 3 unit bar to get to 11 OR place the 3 unit bar then the 8 unit bar to get to 11).

Use the number line to show that subtraction is an unknown-addend problem (use the bars like above, show 11- 8 by placing the 8 unit bar on the number line and a finger on 11, ask how many more to get to 11).

The number line is perfect for relating counting to addition and subtraction and for demonstrating strategies such as making 10, decomposing to 10, and creating equivalent but easier or known sums.

Use the number line to determine if equations are true or false (Is 3 + 6 = 4 + 5?).

Use the number line when first comparing two-digit numbers (which is farther to the right on the number line).

Use the number line to illustrate adding a two-digit to a one-digit number and adding or subtracting a multiples of ten.

Second Grade Ideas

Use the number line to illustrate adding and subtracting within 100.

Use the number line to help students visualize adding 10, leading to mentally adding 10.

Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, and represent whole-number sums and differences within 100 on a number line diagram.

Use the number line to solve problems with money (if you have 2 dimes and 3 pennies, how much money? Jump on number line 10, then 10 more, then 3 more, where are you?).

💡 General Number Sense 3-6

What can you tell me about your class number line? How do you use it as a math tools? *(They should articulate it is a growth pattern.)*

What do the colored dots represent? *(They are factors, numbers are multiples.)*

Can you reduce the fraction _____? *(Have them explain the common factors on the number line.)*

Find a number with ___, ___, and ___ as factors. How do you know? Tell me the other factors.

What is the least common factor of ____ and _____?

What is the greatest common factor of _____ and _____?

Pick a number. Ask students what they know about that number. *(You should hear vocabulary like less than, greater than, factors, multiples, even/odd, between, before, after, between what multiples, coins/bills, etc.)*

💡 Third Grade Ideas

Use the number line as one way to illustrate multiplication (3x4 is four jumps of 3).

Use the number line as one way to illustrate division (12 divided by 4--show 12 divided into 4 equal spaces on the number line and there are 3 spaces in each section).

Use the number line to solve for unknowns in multiplication and division problems (3 x ____ =12, ask how many jumps of 3 will take us to 12   OR   4 = ____divided by 3, ask where do we end up if we make 4 jumps of 3 each).

Use the number line to illustrate the commutative property of multiplication. (3 x 5 = 5 x 3, 5 jumps of 3 each lands on 15, just like 3 jumps of 5 each lands on 15).

Use the number line to identify arithmetic patterns (why 4 times a number is always even, why an even number plus an even number or odd plus odd is always even and odd plus even is always odd).

Use the number line as one strategy for rounding to the nearest 10 (use half way points-- 15 is half-way between 10 and 20, so 17 rounds to 20 because it is past the half way point).

Use the number line to illustrate multiplying one-digit numbers by multiples of 10 (3 x 20 is 3 jumps of 20).

Use the number line as one way to illustrate equivalent fractions (1/2 = 2/4 = 3/6---1 is the point that divides 2 into two equal parts, 2 is the point that divides 4 into two equal parts, etc.)(2/3 = 4/6---3 is made up of 3 ones and 2 is the second one, 6 is made up of 3 twos and 4 is the second two).

Fourth Grade-Sixth Grade Ideas

Use the number line to show division with remainders (16 divided by 5, 16 sectioned into groups of 5 spaces each, gives you 3 sections with one left over).

Use the number line with dots to determine prime or composite, find factors of a number, and multiples of a number.

Use the number line to generate a number pattern (given the rule "add 3" and a starting number of one).

Use the number line to find common denominators (the least common denominator for 4 and 6 is 12 because that is the first number that has both 4 and 6 as a factor).

Use the empty number line (adding machine tape) for folding fractional parts of one whole.

Use the empty number line (adding machine tape) for folding and labeling equivalent fractions.

Use the empty number line (adding machine tape) for folding and labeling decimals as parts of one whole.

Use the empty number line (adding machine tape) for folding and labeling mixed numbers.

Use the empty number line (adding machine tape) to show the range of multiples of ten from point of origin to 100. Skip count the multiples of ten. Use the Random Number CD from **Powerful Numbers 0-100** to write in numbers that are called. This is rounding readiness.

Use the empty number line (adding machine tape) to show the range of multiples of 100 from point of origin to 1000. Roll the place value dice (ones, tens, hundreds) and record the numbers between the multiples of 100. This is rounding readiness.

Use the empty number line (adding machine tape) to practice making change by counting up.

Use the empty number line (adding machine tape) to show a regrouping alternative with the multiples of tens, hundreds, etc. using the difference between.

Use the empty number line (adding machine tape) to model word/story problems.

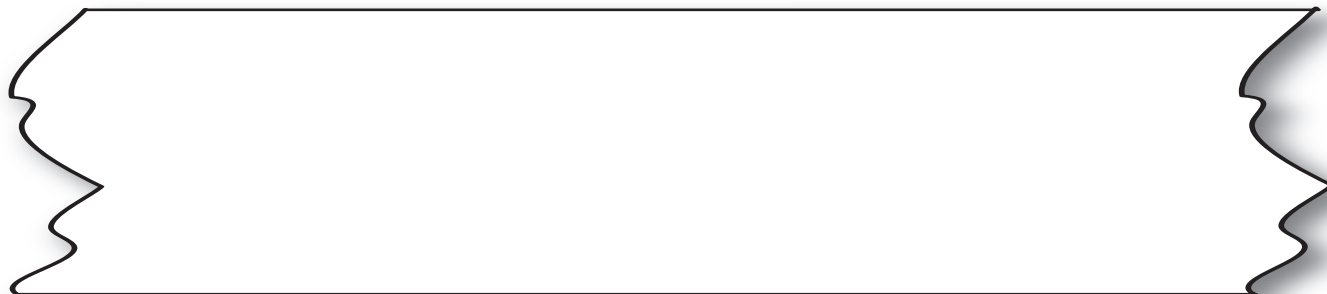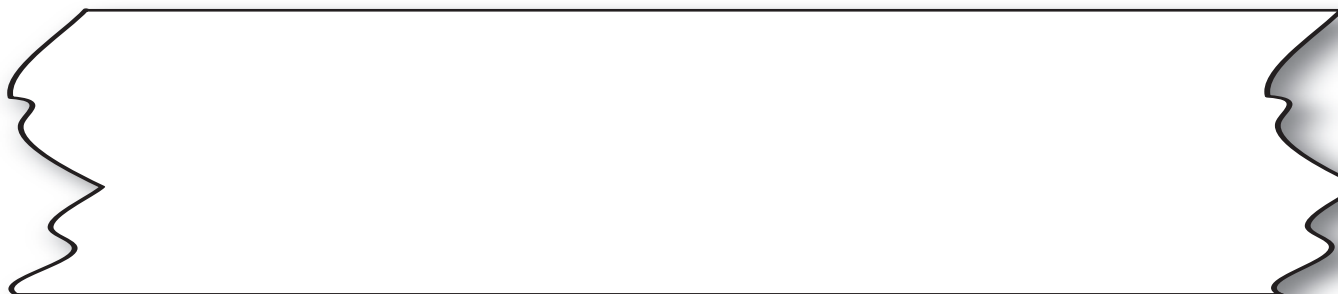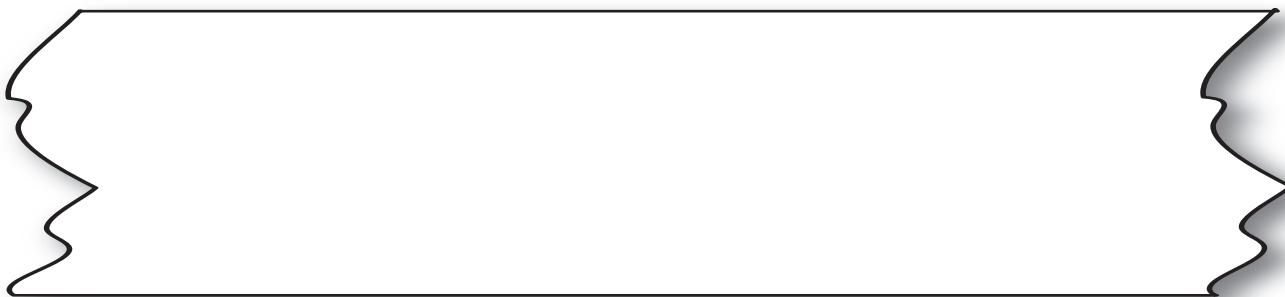Use the empty number line (adding machine tape) to solve elapsed time problems.

Number Line Petite 0-30

21 22 23 24 25 26 27 28 29 30
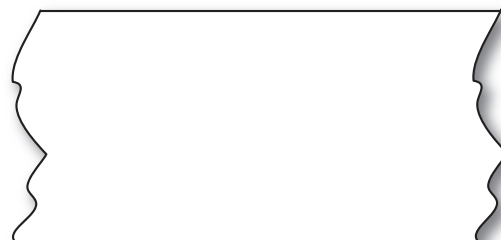
11 12 13 14 15 16 17 18 19 20

0 1 2 3 4 5 6 7 8 9 10

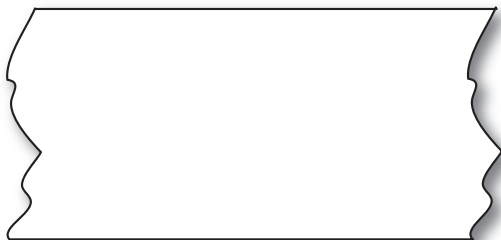# Torn Number Lines
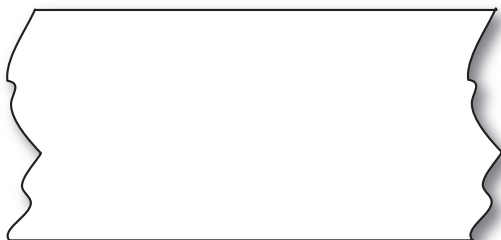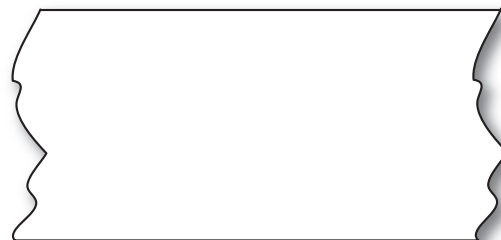
Torn Number Lines

Torn Number Lines
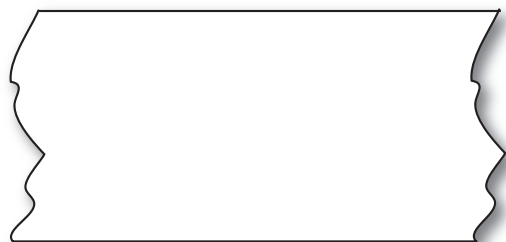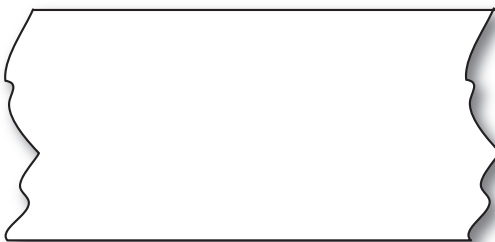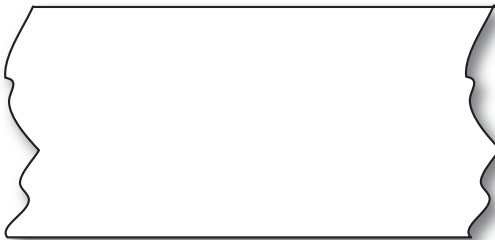
Alien Tens

Ron Brown
Skip Counting

Alien tens!

10	20		30		
40	50		60	70	
80	90		100	110	120

I'm an alien from outer space,
Doin' my tens right in their place.

10	20		30		
40	50		60	70	
80	90		100	110	120

I'm an alien from outer space,
And now I know my tens
Right in their place.

In Between

Ron Brown
Mighty Math

What's in between?
What's in between?
Can you find the numbers in between?

On the number line,
Can you find, the numbers in between?

What's in between 3 and 5?
It's a 4
Let's try some more.

What's in between 11 and 15?
12, 13, and 14
Those are the numbers in between.

What's in between?
What's in between?
Can you find the numbers in between?

On the number line,
Can you find, the numbers in between?

What's in between 21 and 30?
22, 23, 24, 25, 26, 27, 28, 29
These are the numbers in between.

What's in between?
What's in between?
Can you find the numbers in between?

On the number line,
Can you find, the numbers in between?

What Comes After 10? (Numbers 11-20)

Ron Brown
Rock Your Math Class

What comes after 10?
Just sing along,
You'll remember them.

11 12 13 14 15 16 17 18 19   20

These are the numbers after 10.

What comes after 10?
Just sing along,
You'll remember them.

11 12 13 14 15 16 17 18 19   20

These are the numbers after 10.

Dance and Count to Twenty

Ron Brown
K-1 Math Songs

Let's dance to the numbers,
The numbers now.
Everybody dance with the numbers now.
Get your hips moving with the numbers now.

Let's dance and count our numbers now.
Dance and count to twenty now.

1 2 3 4 5 6 7   8

9 10 11 12 13 14   15

16 17 18 19   20

Let's dance to the numbers,
The numbers now.
Everybody dance with the numbers now.
Get your hips moving with the numbers now.

Let's dance and count our numbers now.
We can count to twenty now.

Walk the Line!

I keep a close watch on this number line
I keep my eyes wide open all the time.
I notice all the dots – they are a sign.
The turn is mine, I'll walk the line.

I find math very, very easy to be true.
I find myself with facts when days are through.
Yes, I'll admit the digital root for you.
The turn is mine, I'll walk the line.

I keep my eyes peeled on our math.
From addition to division is our path.
I'd rather add instead of take a bath.
The turn is mine, I'll walk the line.

All the dots keep me on their side.
My love for math I'll never, ever hide.
Digital root I'd even turn the time.
The turn is mine, I'll walk the line.

I keep a close watch on this number line
I keep my eyes wide open all the time.
I notice all the dots – they are a sign.
The turn is mine, I'll walk the line.

(This famous song by Johnny Cash was rewritten by two amazing teachers! The first teacher was Marsha Williams from Toronto, Ontario who wrote the first paragraph with her students. The second teacher who finished this with her class was Janeen Tope-Lehn from Tangent, Oregon. I am so appreciative to them for their creativity!)