School Math

All the activities so far help get kids ready for school math. They all build a sense of what numbers are, and help kids learn to solve problems with numbers and patterns. Once kids get in school, they have to learn some "facts." Addition facts. Subtraction facts. Times tables. They need to know these facts so they can do more things with fractions and decimals and per cents.

All of the card games above are good for learning school math. As well, you can teach your kids to play whatever you like to play—for example, crib or canasta or crazy eights or poker.

The activities on the next pages help with learning and remembering some of those number facts.

Activity 33 A Big Number Walk

This activity will help your child get a mental picture of some big numbers.

- Take a walk around home or school or somewhere your child passes often. Look for buildings or pavements that are made of bricks or concrete blocks, and look for a wall or a section of wall, and count the bricks or blocks.
- Find a part of a building that has about 100 blocks or bricks. It may be a wall, that fences off a yard, or a frame around a window or doorway, or a path to a doorway.
- Find a wall that has about 1,000 bricks or blocks.
- Can you find anything that has 10,000 bricks or blocks?
- Then, when you need a mental picture of a big number, imagine the wall where you found that number of bricks.

Activity 34 The Language of Numbers

The words we use for numbers show something about the parts of the numbers. For example, 16 tells us that the number is 6 plus 10. 17 is 7 + 10 and so on. Here are the numbers in 3 languages. Work with your kids to figure out how the numbers bigger than 10 are connected to the smaller numbers.

English How many?		French Combien?		Hulqu'mi'num Kw'in?	
one	eleven	un	onze	nuts'a'	'apun 'i' kw' nuts'a'
two	twelve	deux	douze	yuse'lu	'apun 'i' kw' yuse'lu
three	thirteen	trois	treize	lhihw	'apun 'i' kw' lhihw
four	fourteen	quatre	quatorze	xu'athun	'apun 'i' kw' xu'athun
five	fifteen	cinq	quinze	lhq'etsus	'apun 'i' kw' lhq'etsus
six	sixteen	six	seize	t'xum	'apun 'i' kw' t'xum
seven	seventeen	sept	dix-sept	tth'a'kwus	'apun 'i' kw' tth'a'kwus
eight	eighteen	huit	dix-huit	te'tsus	'apun 'i' kw' te'tsus
nine	nineteen	neuf	dix-neuf	toohw	'apun 'i' kw' toohw
ten	twenty	dix	vingt	'apun	ts'kw'ush

Do you know the numbers in any other language? How do the words show the relationship between numbers under 10 and from 11 to 20?

Activity 35 Addition Facts: Sums of 10

Make a model to show the sums of 10.

- Lay out 10 counters in a row. The counters could be anything—pennies or macaroni or dice or little cars.

- Move 1 counter over to show 1 + 9 = 10.

- Move another counter over to show 2 + 8 = 10

- Move another counter over to show 3 + 7 = 10

- Continue until you have moved all the counters over to show that 10 + 0 = 10.

Make a poster to show all the sums of 10.

The card game Tens (Activity 30) will give lots of practice with these addition facts.

Activity 36 Addition Facts: Hidden Doubles

When your child can double all the numbers up to 12, that knowledge can help him learn more addition facts easily. You will need 24 counters for this activity. You could use pennies or macaroni or dice or little cars or anything else for counters.

- Use the counters to set up this question for your child: 3 + 5 = ____

- Move 1 of the counters over from the bigger group to the smaller group.

Suddenly, the size of each group is the same, and your child knows the answer because he knows that 4 + 4 = 8. The double was hidden until you moved 1 counter over from the bigger to the smaller group.

- Use the counters to set up another hidden double for your child: 5 + 7 = ____

- Move 1 of the counters over from the bigger group to the smaller group.

Suddenly, the size of each group is the same, and your child knows the answer because he knows that 6 + 6 = 12. The double was hidden until you moved 1 counter over from the bigger to the smaller group.

- Ask your child to use the counters to find some other hidden doubles. She may find 1 + 3, and 2 + 4 and 4 + 6 and 5 + 7 and 6 + 8 and 7 + 9 and 8 + 10 and 9 + 11 and 11 + 13. Write them down as she finds them. Some of these addition facts are

hard to remember, but if you think of them as hidden doubles, they are easy.

- Look at all the hidden doubles you have written down. See if you can see the pattern. For example: 1 + 3. Look at the first number and count: 1, 2, 3. The middle number, the one you DON'T see in the question, is the number you double to get the answer. Another example is 4 + 6. Look at the smaller number and count up: 4, 5, 6. The middle number, the one you DON'T see in the question, is the number you double to get the answer.

Make a poster to show the hidden doubles.

Activity 37 Addition Facts: Nearly Double

Use what you know about doubles to find the answers.

- Use the counters to set up this question for your child: 3 + 4 = ____

- Move 1 of the counters away from the bigger group.

- Do you see the double 3? Push them together to show the total of 6.

- Add the 1 back in, to show 7 in all.

- Set up a harder question: 7 + 8 = ___.

- Move 1 of the counters away from the bigger group.

- Do you see the double 7? Push them together to show the total of 14.

- Add the 1 back in, to show 15 in all.

- Ask your child to use the counters to find some other sums that are nearly doubles. She may find 6 + 5 and 3 + 4 and 8 + 9 and 10 + 11. Write them down as she finds them. Some of these addition facts are hard to remember, but if you think of them as nearly doubles, they are easy.
- Look at all the nearly doubles you have written down. See if you can see the pattern.

a Make a poster to show the near doubles.

Activity 38 Numbers Up and Down

a The game can be used by kids with a range of adding and subtracting skills. The most important thing is to make it fun. Kids can play at a less skillful level by counting out their turns, while parents can model higher level skills by thinking out loud as they take their turn. When the kids are ready, they'll start to use the skills that their parents model.

This game depends totally on luck, with no strategy involved. This means that little kids have as much chance of winning as bigger kids or parents.

- Copy the game board on the next page onto heavy cardboard.
- You will need 1 dice for the easy versions, 2 for the harder versions, and a game piece for each player (could be a coin or a button or anything that will fit on the squares).
- Play: Throw the dice to see who goes first. The player with the highest number starts. The first player throws 1 dice, and moves his game piece forward the number of squares thrown. The next person takes a turn and does the same. The first person to get past 100 wins the game.

Make it easier

Cut the game board off at square 50. The game will be shorter.

Make it harder

Start at square 100, throw the dice, and count down or subtract. First one to get past 1 is the winner.

Use 2 dice for the game. The numbers to count and add or subtract will be bigger.

Use 2 dice of different colours. Each player throws both dice, and moves the game piece forward the number on the white dice and backward the number on the red dice.

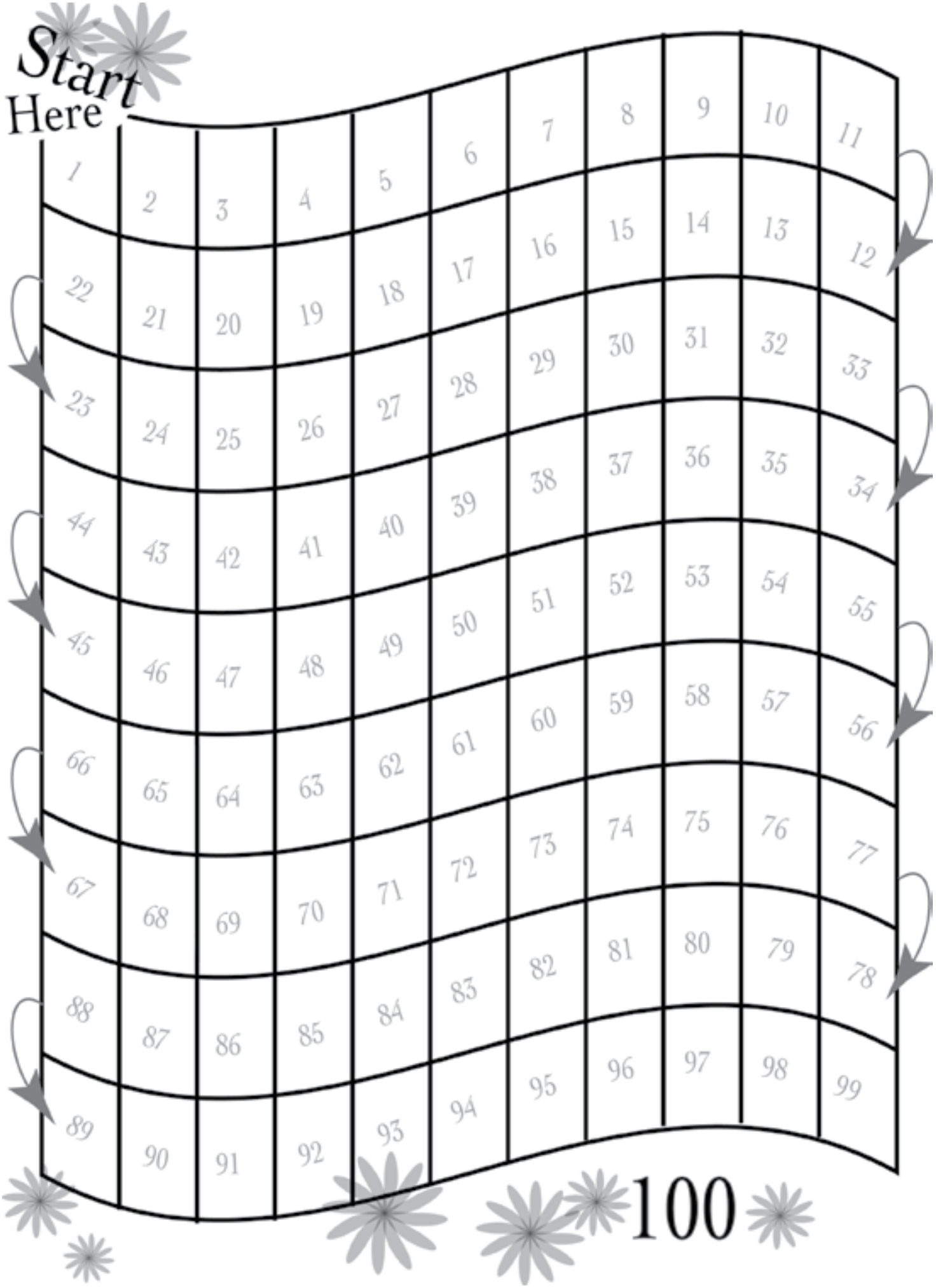
Model higher math skills

Think out loud as you play your turn. Here are some examples.

- If the child is at the level of counting out every play, you might say, "I'm on square 22 and I threw a 5. 2 + 5 is 7. I think I'll land on square 27. Let's see. I'll count 1, 2, 3, 4, 5—and look where I am. I was right!" (And you could be wrong, sometimes, too.)
- If the child can do some adding, but has a hard time with the bigger numbers, show him some strategies by thinking out loud on your turn. Some examples:

  "I'm on square 29 and I threw 11. Let's see. First I'll add the 10. That makes 39. Then I'll add the 1. That's 40. So let me check. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10—that's 39 and 1 more is 40. I was right!"

  "I'm on square 47 and I threw a 9. Let's see. I'll add 10 and subtract 1, and that should be the same as adding 9. Okay, 47 plus 10 is 57, subtract 1 is 56. So let me check. I'll count up. 1, 2, 3, 4, 5, 6, 7, 8, 9—and here I am at 56. I was right!"


Start Here
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

Activity 39 Double, Double...

How many folds can you make?

You will need a large sheet of paper (like the outside sheet of a newspaper).

- Double it over (fold it in half). How many layers are there? Can you tear it along the fold?
- Double it again. How many layers? Can you tear it along the fold?
- Double it again. How many layers? Can you tear it along the fold?
- Keep doubling it and counting the layers. How many doubles will it take before you can't tear it any more? How many layers of paper is that?

How far can you go?

You will need an egg carton and a bag of unpopped popcorn, dried beans, or macaroni. (The smaller the item, the farther you have to count before the cup is too full to hold the next double.)

- Put a piece of popcorn or macaroni or a bean in the first egg cup.
- Double that in the second cup (2 pieces).
- Double that in the third cup (4 pieces).
- Keep on doubling the pieces as you move from cup to cup. How far can you go before the cup is too small to hold all the pieces?

Double the money

See the section on money (Activity 13) for a real-life lesson on doubling.

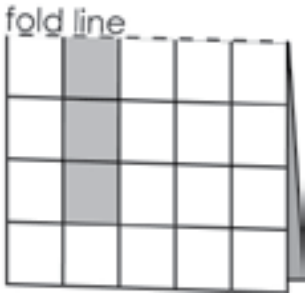
Activity 40 Two Times Table

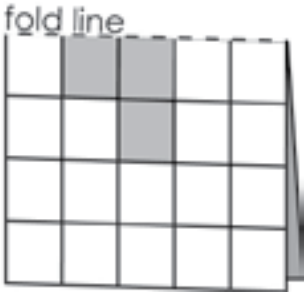
For the two times table, double to get the answer.

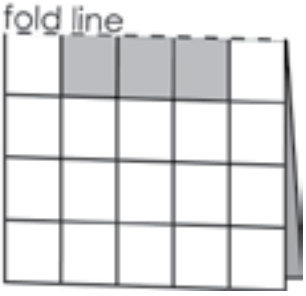
To show the 2 times tables, you will need some sheets of regular graph paper, or the paper on the next page, which has larger squares.

- Fold the paper along any line.
- Colour in 1 square along the fold. Cut out the square, but don't cut along the fold line. Open it up. What do you see? Two squares. $2 \times 1 = 2$. Double 1 is 2.
- Back at the folded paper. Colour in 2 squares along the fold. Cut out the squares. Open it up. What do you see? Four squares. $2 \times 2 = 4$. Double 2 is 4.
- Back at the folded paper. Colour in 3 squares along the fold. Cut out the squares. Open it up. What do you see? Six squares. $2 \times 3 = 6$. Double 3 is 6. And so on.
- Make a display of the cut-outs, each one marked with its number sentence, for example, $2 \times 3 = 6$.

Kids may want to colour the other half a different colour as it is revealed. It doesn't matter what shape the initial coloured block is, so long as at least 1 square is along the fold. Any of the following will be good:







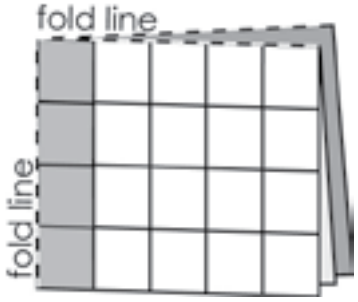
Activity 41 Four Times Table

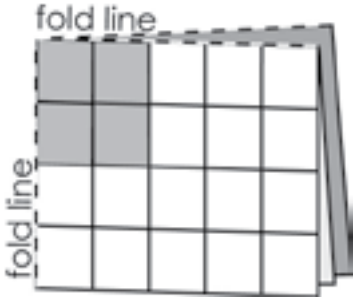
The four times table is double, double!

You will need some regular graph paper, or the paper on the next page, which has larger squares.

- Fold the paper along any line that goes across the page. Then fold again on any line that goes up and down.
- Start at the point of the double fold. Colour in 1 square. Cut out the square, through all the layers. Open the first fold. Double 1 is 2. Colour the 1 square that has just been opened up. Open the second fold. Double again is 4. $4 \times 1 = 4$. Double 1, then double again. Colour the two 1's that have been opened up.
- Back at the flat paper. Double the paper twice, as before. Start at the point of the double fold. Colour in 2 squares. Cut out the squares, through all the layers. Open the first fold. Double 2 is 4. Colour the 2 squares that have just been opened up. Open the second fold. Double again is 8. $4 \times 2 = 8$. Double 2, then double again. Colour the two 2's that have been opened up.
- Back at the flat paper. Double the paper twice, as before. Start at the point of the double fold. Colour in 3 squares. Cut out the squares, through all the layers. Open the first fold. Double 3 is 6. Colour the 3 that have just been opened up. Open the second fold. Double again is 12. $4 \times 3 = 12$. Double 3, then double again. Colour the two 3's that have been opened up. And so on.
- Make a display of the cut-outs, each one marked with its number sentence.

It doesn't matter what shape the initial coloured block is, so long as at least 1 square is on both fold lines:



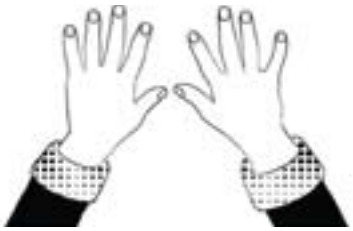


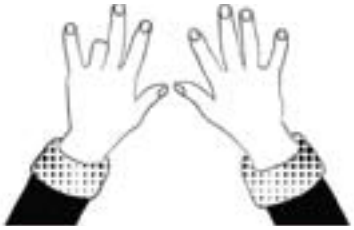
Activity 42 Nine Times Table

Read your hands for the nine times table

The special pattern of the 9 times tables lets us use our fingers to read the answers. Follow the drawings on your own fingers:

Lay your hands flat on the table.





Think about 2 × 9. Start from the left and count each finger. When you get to 2, tuck that finger down. Then you can read the answer to the question. Count the fingers to the left of the finger you tucked in. That is the first digit. Count the fingers to the right of the finger tucked in. That is the second digit. Count your thumbs as fingers. (Never count the finger you tuck in; it just separates the first digit from the second digit.)

Let's do one more, 4 × 9 = _____

Lay your hands flat on the table. Think about 4 × 9. Start from the left and count each finger. When you get to 4, tuck that finger down. Read your hands: 3 to the left of the tucked finger and 6 to the right of the tucked finger. Answer: 36. (Remember not to count what you tuck in; it just separates the first digit from the second digit.) Count your thumbs as fingers.

$5 \times 9 =$ _____

Lay your hands flat on the table. Think about 5×9. Start from the left and count each finger. When you get to 5 (your left thumb), tuck it down. Read your hands: 4 to the left of the tucked thumb, and 5 to the right of the tucked thumb. Answer: 45. (Remember not to count what you tuck in; it just separates the first digit from the second digit.)

Nine Times Table

- **count from the left**
- **tuck**
- **read your hands**

What is 4 x 9?

- Starting from your pinky on your left hand, count to 4. When you reach your 4th finger, tuck it under.
- How many fingers are still sticking out, to the left of your tucked-in finger? (3)
- How many fingers are sticking out to the right of your tucked-in finger (on both hands, and don't forget to include your thumbs!)? (6)
- When you put 3 and 6 side-by-side, you get 36!

  Yes, 4 x 9 is **36**!