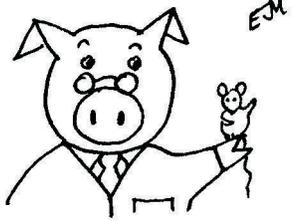


LESSON 1

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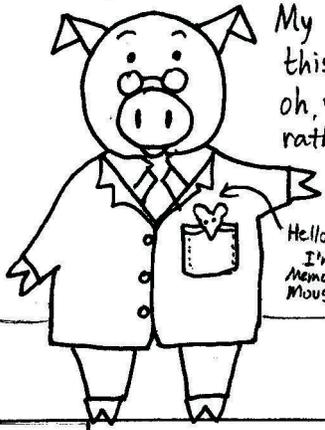
- 1) Professor Pig's lecture on "The Magic Numbers"
- 2) Games
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Prof. Pig



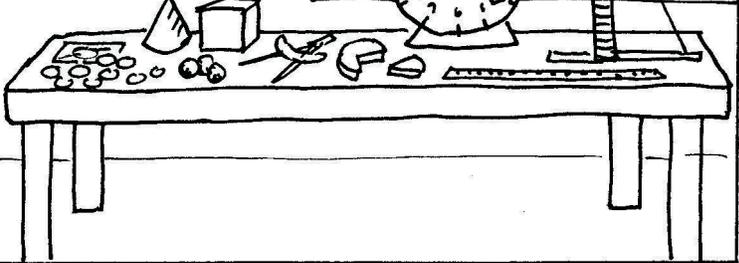
and Memory Mouse

Greetings and good day. So nice to meet you.

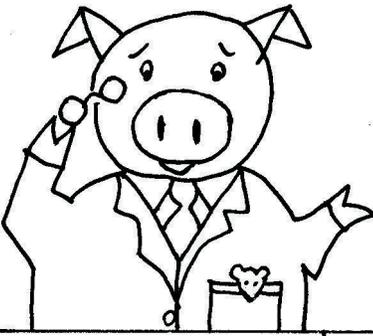


My name is Professor Pig, and this is my math lab. And- oh, yes- please notice my rather tiny assistant.

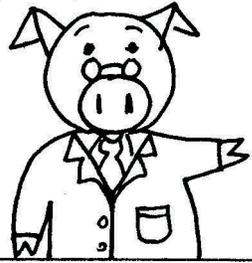
Hello! I'm Memory Mouse!



I assume you have been sent here to be trained as a mathematician? That is good! I can be much help to you. Let us proceed to our lesson!



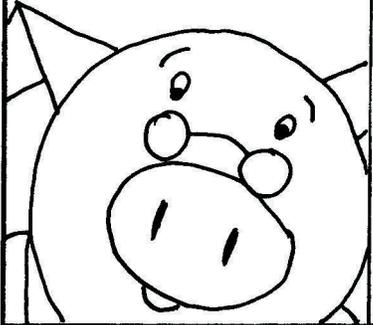
First, I need to test your skills. You need to be able to give the answers (out loud) to these math problems in less than 30 seconds. Get a timer- Ready, Set, go!



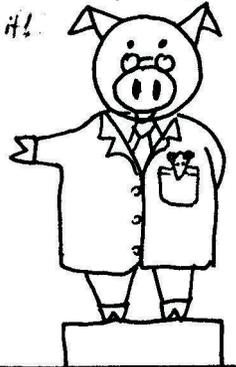
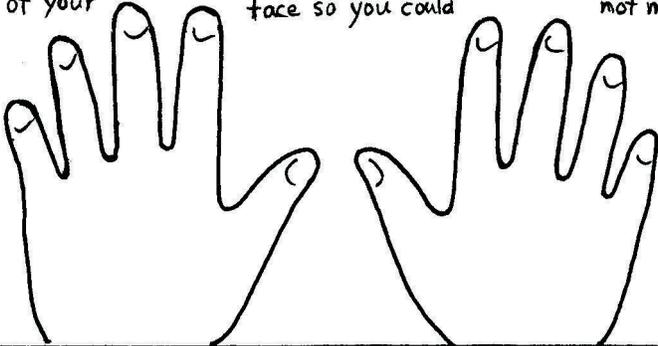
$2+1$	$6+2$
$3+2$	$2+2$
$3+3$	$6+3$
$5+4$	$4+2$
$4+4$	$5+1$
$5+3$	$4+3$

If you can't solve these problems in less than 30 seconds, you might want to practice them more before you go on.

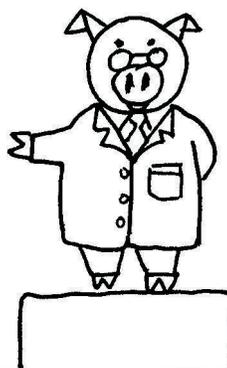
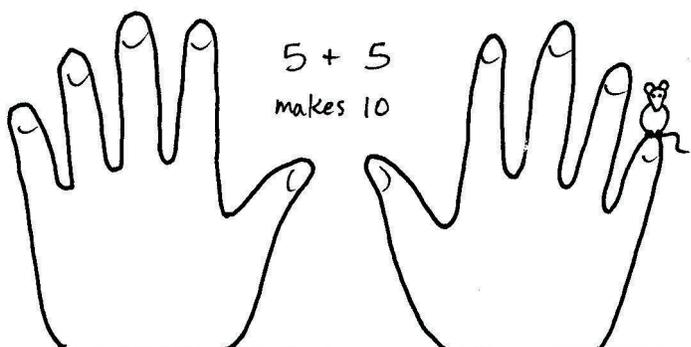
Now, for my first demonstration, I need to borrow your hands. Could you put your hands up? Thank you.



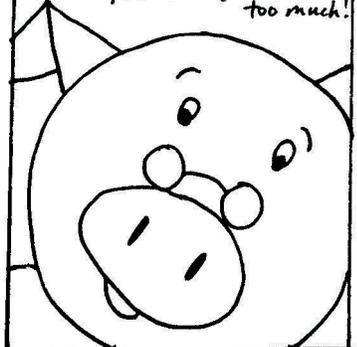
You may have noticed that you have 10 fingers. (You may also have noticed that pigs have no fingers at all - which is very inconvenient for pigs who want to write, or play the violin.) 10 is a very important number. It was put right in front of your face so you could not miss it!



Most everything in math is based on the number 10. Numbers that add up to 10 are also very special. I call them the "MAGIC NUMBERS." Your hands show you one pair of MAGIC NUMBERS: 5 and 5

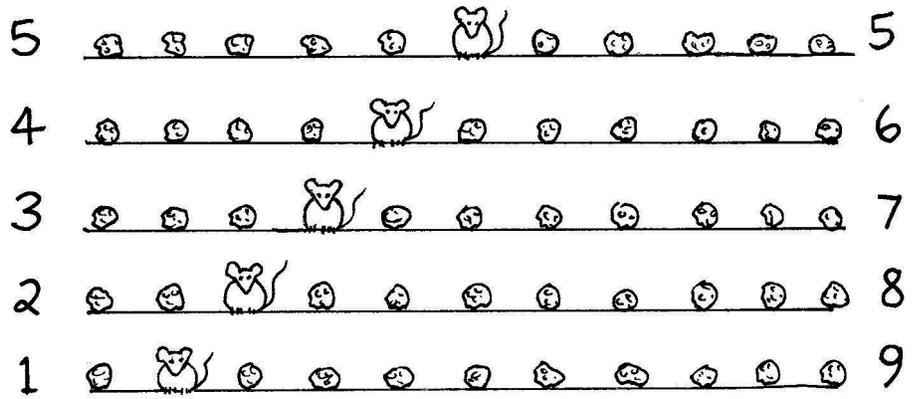


Thank you. You may put your hands down now. Hope Memory Mouse didn't tickle your pinky finger too much!

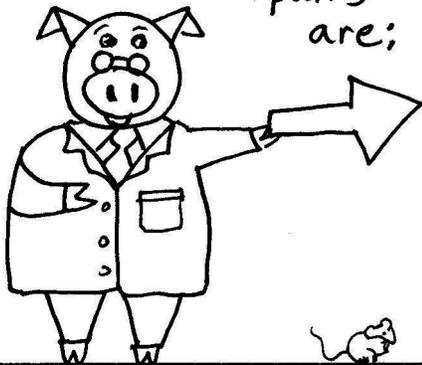


My assistant has been saving cheese crumbs for weeks so that we can demonstrate the MAGIC NUMBERS. You can divide 10 of something in five different ways. Memory Mouse is showing you how, by sitting between the groups in each line. These pairs of numbers add up to 10.

$5+5=10$ $4+6=10$
 $3+7=10$ $2+8=10$ $1+9=10$



The MAGIC NUMBER pairs are;



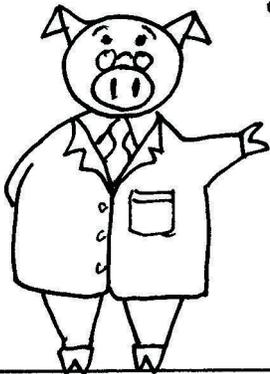
5 and 5
 4 and 6
 3 and 7
 2 and 8
 1 and 9

$5+5=10$
 $4+6=10$
 $3+7=10$
 $2+8=10$
 $1+9=10$

These number pairs always add up to 10. (You can "count on it!")



Now, you may be asking yourself, "Self, does it matter if the order of the pairs is reversed? Is $4+6$ the same as $6+4$?" That is an excellent question! The answer is that it does not matter at all which number comes first and which comes second.

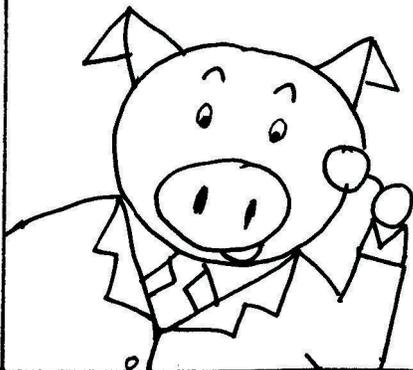


For you math trivia fans, here is a name for this "back and forth" property of addition. It is called THE COMMUTATIVE PROPERTY



$9+1$ is the same as $1+9$
 $8+2$ is the same as $2+8$
 $7+3$ is the same as $3+7$
 $6+4$ is the same as $4+6$
 $5+5$... um ... you'd better be able to figure this one out!

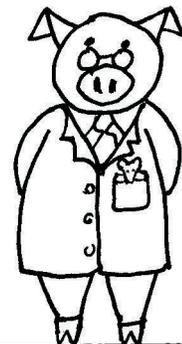
And now for your homework! You are to memorize these MAGIC NUMBERS. And you've got to know $5+5$ already, since it is right in front of your face all the time! So that leaves only 4 pairs to learn. But you've got to know them really, really well. Memory Mouse has prepared lots of games for you, to help you learn the MAGIC NUMBERS.



I think I know them already



And thus ends our first lesson together. I'll see you next time! Until then, learn those MAGIC NUMBERS!





FOR LESSON 1

The 10 Penny Game

You will need:

- 10 pennies



Let the student count the pennies so they are sure there are 10. Have the student cover their eyes or turn away, and put some of the pennies in one of your hands. Let the student look at the remaining pennies. They must then tell you how many pennies are in your hand. (Your student might also enjoy reversing roles and having you guess how many pennies they have taken away. It's up to you whether to give the right answer or not. Just be sure they know to check your answers.)

A Bean Bag Toss Game

You will need:

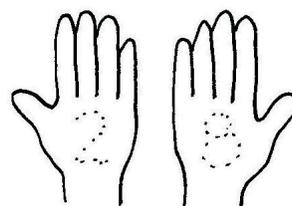
- 10 pennies and a bean bag
(or some similar object that can be tossed safely)



Space the pennies in a long row, leaving anywhere from 6 to 12 inches in between (depending upon how close you will be standing and how large your bean bag is). Define either a real or imaginary line the players must stand behind. Each player must call out one of the Magic Number pairs, then try to land their bean bag so that it demonstrates this pair of numbers. There will be two options of where to throw the bag for each pair (except 5 and 5, of course). If the player accurately tosses the bag, they go again. If not, it is the other player's turn.

Invisible Numbers

This game can be used to learn the Magic Number pairs, or to review other basic addition facts. Have the student hold their hands open with their palms up. Use your finger to trace a number into each hand. Tell the student to add those numbers in their head, then, when they have the answer, clap their hands together right as they say the answer.



Stop and Go Road



You will need:

- a small toy car or animal (Matchbox size)
- cards with single digit numbers on them (you may photocopy the following page and then cut out the pieces, or you can just make your own.

Place the cards in random order, end to end, to form a road. Give the car (or whatever you are using) to the student and have them place it at one end of the road. The student will drive the car down the "number

road,” but when he crosses a number, he must say the number you must add to it to make 10. The car may not go past that number until the correct answer is given. The goal is to eventually have the student be able to keep the car in constant motion from start to finish.

Hint: If you vary the set-up (for example, make it a kangaroo jumping down a path instead of a car going down a road) you won't believe how many times you will be able to get them to play this game! Let your student make up variations for you to try. It's just as beneficial for them to listen and watch as you drive the road, too. You could even do time trials. They could try to beat their personal best, or even beat your record.

Penny Bowling



You will need:

- 10 pennies and a nickel
- a copy of the bowling pattern page
- clear packaging tape (a strip of tape to cover the math problem section so that you can write on it with crayon or marker and easily wipe it off to use again)

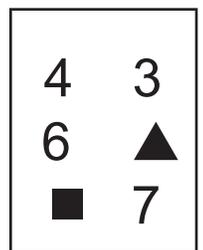
Place the ten real pennies exactly on top of the pictures of the pennies. Put the nickel on the starting circle down below. This is a two-player game. The object of the game is knock the pennies off the triangle by shooting the nickel at them. This is a little like bowling, with the nickel being the ball and the pennies being the pins. Instead of knocking the pins down, they have to be knocked completely out of the triangle. Players can flick the nickel using their thumb and first finger, or they can do a quick slide motion using just the first finger

The first player flicks the nickel so that it hits the pyramid of pennies. He counts how many pennies are completely off the triangle. (They can't be touching the triangle even one little bit!) He picks up these pennies, removing them from the playing surface, counts them, and puts this number in the first box. He does the subtraction, and puts the correct answer in the second box. Then he shoots the nickel again. He again removes any pennies that are completely out of the triangle, counts them, and puts that number in the next box. Then he subtracts again, and this is his final score. Then it is the second player's turn. He follows the same routine. Whoever has the lowest number in the final score box wins that round. It's up to you how many rounds to play.

Flash Card Game

- A copy of the flash card page (last page of this chapter) printed onto white card stock
- A pair of scissors

Copy the pattern onto white card stock, then cut apart the cards. These flash cards aren't like others you may have used. First, they are read right to left, top to bottom. You start with the number or shape in the upper right corner and then read down that righthand column. Then you jump to the top of the left column and read it top to bottom. The card here on the right would be read: "3, triangle, 7; 4, 6, square." Second, you only give your student three seconds to memorize the card. They must remember what was on the card and correctly repeat the numbers and shapes, in order. Don't worry, they can do it! (If they miss, just show them the card for another three seconds and let them try again.)



This game has several benefits. It forces the brain to consolidate information into chunks. The brain will look for ways to make remembering easier, and it will (hopefully) discover that the magic number pairs are just one piece of information, not two separate numbers. The fact that 3 and 7 go together becomes automatic. This is the goal in learning any math fact-- get the brain to think of the math fact as one unit, not separate numbers. Also, the way the cards are read introduces the student to the pattern of doing arithmetic: right to left, top to bottom. Teaching the brain to go right to left (instead of left to read for reading) can be tricky at first. This will ease them right into it. As a bonus feature, it also reviews the names of basic geometric shapes.

Who's Missing?

You will need:

- Additional copies of the number cards used in the Stop and Go Road game. One extra copy is sufficient if you are playing this game with one student, but two or three extra copies will make the game more fun if you are playing with two or more students. (When you lay the cards out there should be enough numbers that the missing number is not easily spotted.)

Cut apart all cards and put them together to form a deck. While the players are watching, remove one card from the deck without showing what it is, and set it aside, face down. The object of the game is to figure out what number is on that mystery card.

Now place all the other cards face up on the table. Remind the players that all these cards will match up as magic number pairs except for the card whose pair has been set aside.

Players will take turns picking up magic number pairs from the table. This continues until there is only one card left on the table. This is the card whose partner has been set aside. Players should be able to guess the number on the mystery card because it is the complement magic number to that last card. Players will be delighted when they guess correctly.

Magic Number Rhyme

For some students, learning through songs and rhymes is essential. If your student has played a lot of these games but still doesn't have the magic numbers cemented into their brain, this might be exactly what they need. Use a musical voice pattern, as you would when reciting something like "1, 2 buckle my shoe."

**The Magic Numbers went to a dance
Wearing pink tutus and baggy sweatpants!
9 and 1 had a lot of fun,
8 and 2 lost a shoe,
7 and 3 twisted their knee,
6 and 4 danced right out the door,
And the "Fivesy" Twins stayed home.**

**The Magic Numbers formed a choir,
But their big debut went a little haywire!
9 and 1 forgot to come
8 and 2 missed their cue,
7 and 3 sang off-key,
6 and 4 made the audience snore,
And the "Fivesy" twins stayed home.**

**The Magic Numbers went out to eat,
With bad table manners and stinky feet!
9 and 1 had nothing but a bun,
8 and 2 ordered elephant stew,
7 and 3 had coffee and tea,
6 and 4 ate an apple core,
And the "Fivesy" twins stayed home!**

Butterfly Game

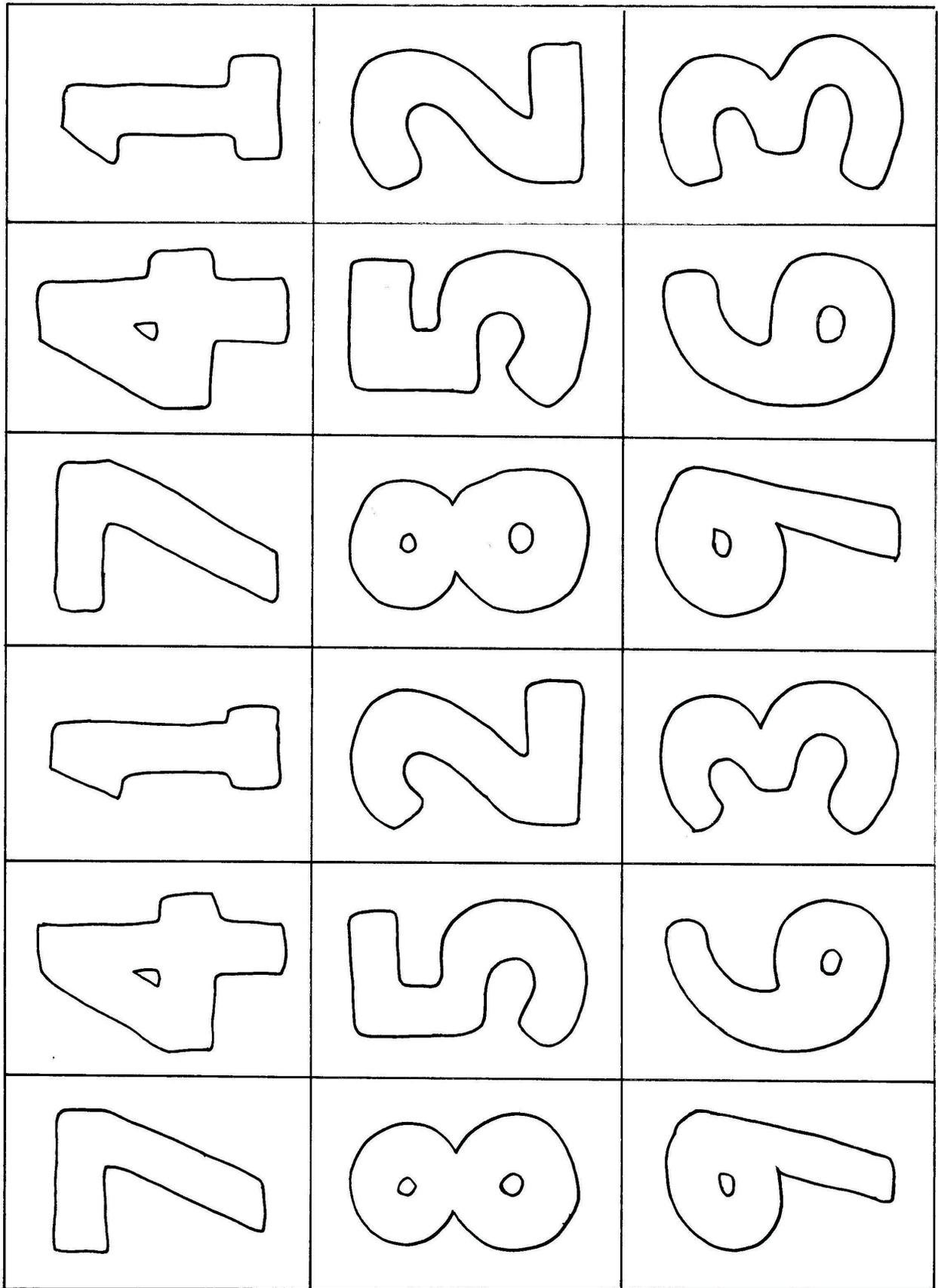
You will need:

- Photocopies of the flowers and butterflies
- Crayons or colored pencils to decorate butterflies (and color flowers if you wish)

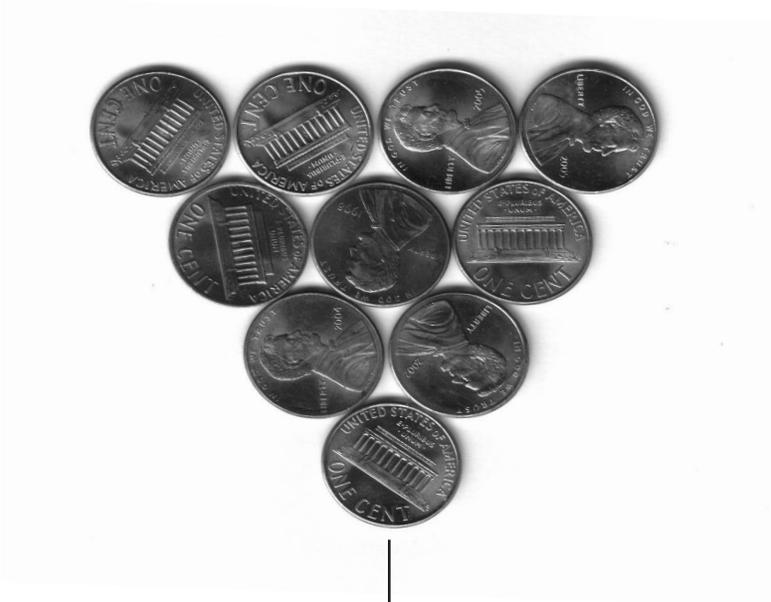
This game is exactly like the Stop and Go Road game, except that you have butterflies and flowers instead of cars and a road. Have your players color their own butterflies. Your butterfly moves from flower to flower but before it can land, it has to say the magic number that goes with the number on the flower.

This game is provided as an “extra” for those students who need more practice. They can always look at the flower types for a hint since the magic number are on similar flowers. Don't be shy about making up your own games, too. You can adapt this basic game to any of your child's interests. If your child likes to draw, have him or her design the cards! You can do rockets going past planets, dinosaurs stomping on things, etc.





PATTERN FOR "STOP AND GO ROAD" GAME - - - COPY ONTO WHITE CARDSTOCK, THEN CUT CARDS APART



10
- <input type="text"/>
<input type="text"/>
- <input type="text"/>
<input type="text"/>

10
- <input type="text"/>
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- <input type="text"/>
<input type="text"/>

5 5 △	5 ● 5	▲ 1 9	● 3 7	■ 9 1	6 ▲ 4
● 2 8	8 2 ▲	5 5 ●	1 ■ 9	7 3 ▲	2 8 ■
6 4 ▲	■ 2 8	● 5 5	● 9 1	4 6 ■	3 ■ 7

PATTERN FOR FLASH CARD GAME. COPY ONTO WHITE CARDSTOCK AND CUT APART CARDS.



MEMORY MOUSE'S MENTAL MATH

These problems should be read out loud to the student. "Mental math" means no paper and pencil allowed. If the problem does not give enough information to be able to solve it, the student should answer, "not enough information."

- 1) A squadron of ten fighter jets went out to meet the enemy. Only one was destroyed. How many returned? (9)
- 2) A herd of wild horses charged down into the valley towards a river. Three made it across the river. How many got left on the other side? (*not enough information*)
- 3) A black rat snake laid seven eggs. Three did not hatch. How many baby snakes hatched out? (4)
- 4) Ten girls were in the room when one of the boys squashed a bug. Six of the girls were totally grossed out and left the room. How many stayed to see what color the bug's blood was? (4)
- 5) Ten boys were in the room when a girl put on perfume. Three of the boys couldn't stand the smell and left the room. How many boys did not mind the smell? (7)
- 6) Two mother rabbits each had four babies. What color were the babies? (*not enough information*)
- 7) A firefly flashed five times, flew around a bit, then flashed five more times. How many times did it flash altogether? (10)
- 8) A CD was dropped on the floor and stepped on. Three of the songs got scratches in them. If the CD had a total of ten songs on it, how many songs still played normally?
- 9) A box of Super-Sugar-O's cereal has enough cereal in to exactly fill eight bowls. If Cameron eats four bowls of Super-Sugar-O's in one morning, can he do the same thing the next day? (yes)
- 10) A pizza we had delivered came cut into eight slices. I ate five of them before you got home. How many are left for you? (3)

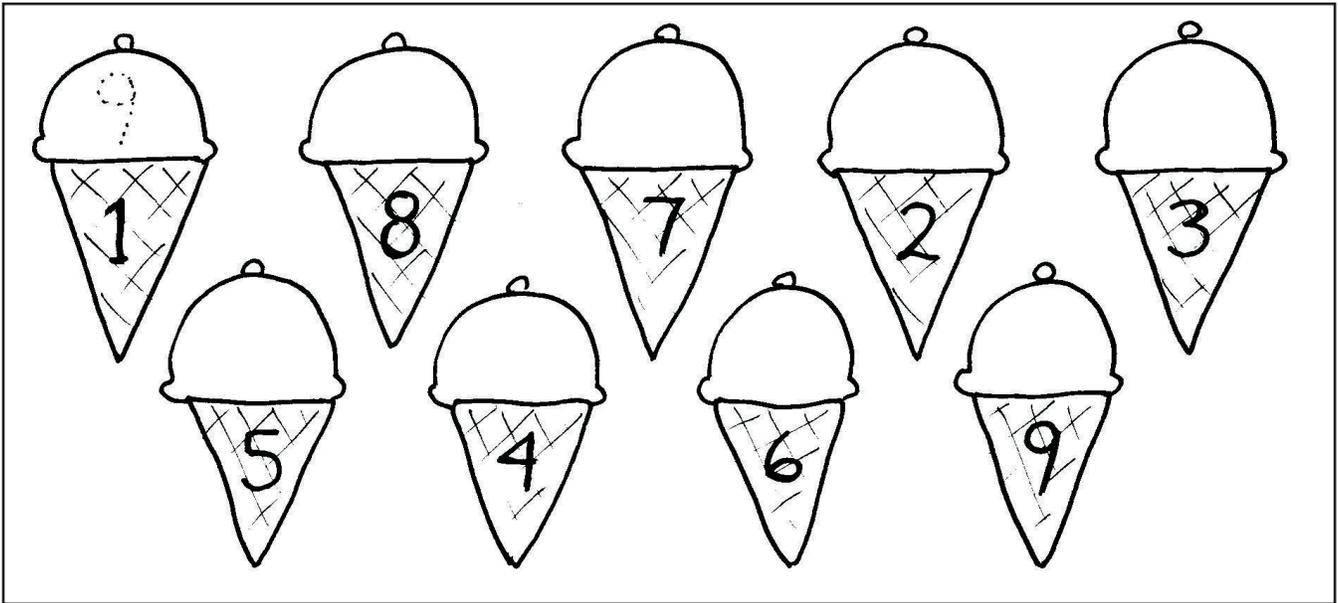
CHALLENGE QUESTIONS:

- 11) There were only two lollipops left in the candy store. If the store had a supply of ten that morning, how many people came in to buy lollipops? Careful with this one! (*not enough information—one person could have purchased 8!*)
- 12) Justin dug a deep hole in his sand box. He measured it to be ten inches deep. He wants to stack five bricks into the hole without the bricks coming out over the top. Each brick is two inches thick. Will the bricks fit? (yes)
- 13) The first prize winner got four dollars, the second prize winner got three, the third prize winner got two and the fourth prize winner got one. How many total dollars did the judges give out to these winners? (10)
- 14) An alien life form was discovered on a faraway planet. It had three heads. On each head were three eyes. How many eyes did the alien have? (9)
- 15) Ten fishermen went fishing. Five of them caught fish. How many caught boots? (*not enough information—they could have caught nothing, or something else*)

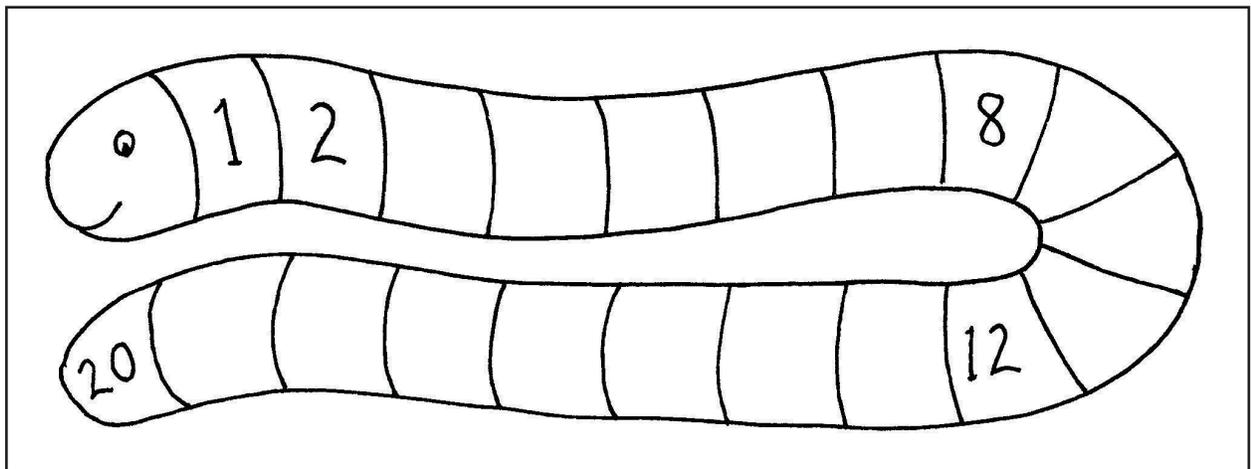
LEVEL ONE WORKSHEET

(You may photocopy this sheet. You could also place it inside a plastic cover sheet and use a dry erase marker or wipe-off crayon.)

Fill in the missing MAGIC NUMBERS:



This worm's segments should be labeled in order from 1 to 20. Can you fill in the missing numbers?



Fact practice:

$3 + 4 = \underline{\quad}$

$6 + 2 = \underline{\quad}$

$7 + 1 = \underline{\quad}$

$6 + 3 = \underline{\quad}$

$4 + 2 = \underline{\quad}$

$9 + 1 = \underline{\quad}$

$5 + 3 = \underline{\quad}$

$3 + 2 = \underline{\quad}$

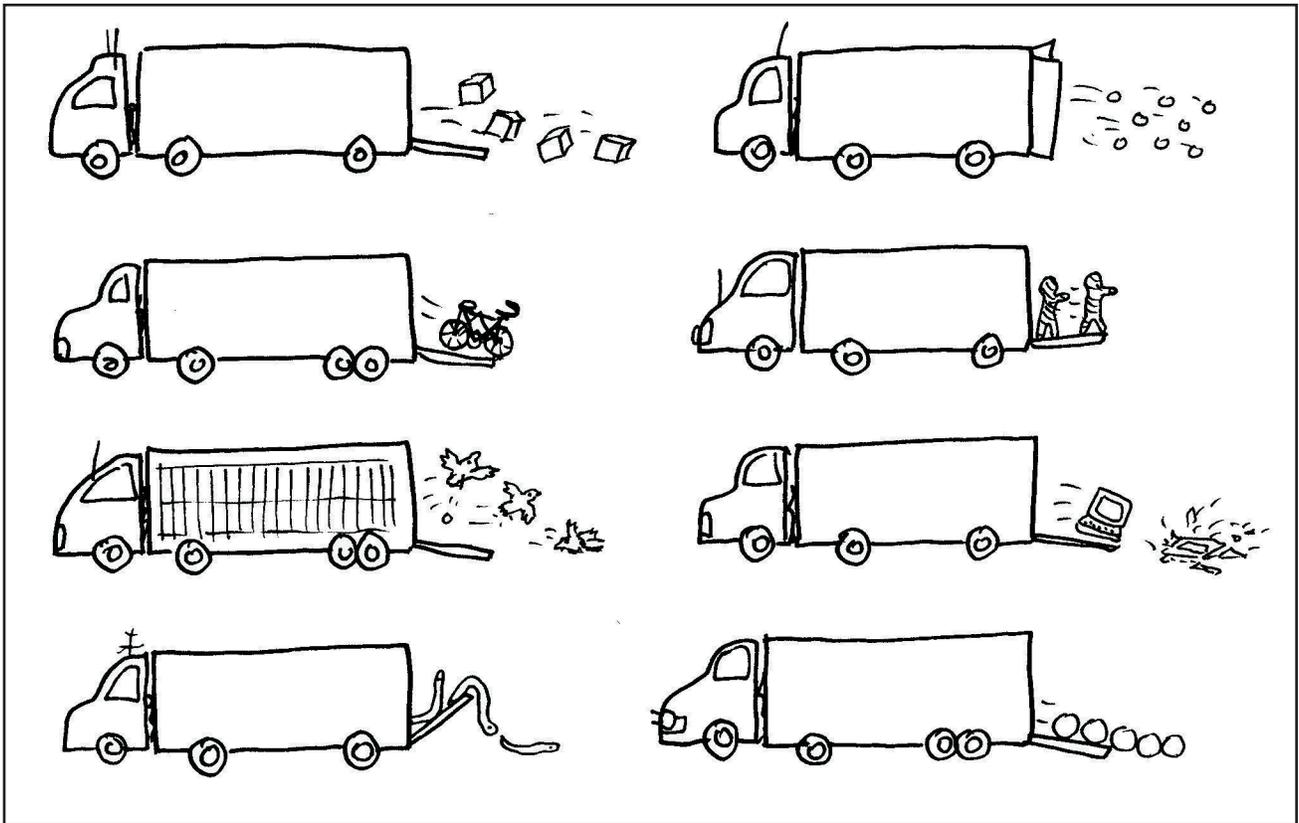
$3 + 4 = \underline{\quad}$

$2 + 7 = \underline{\quad}$

$5 + 2 = \underline{\quad}$

$3 + 3 = \underline{\quad}$

Each truck used to have ten of whatever it was carrying. Looks like there have been some cargo accidents! Write on each truck trailer the number of items it still has inside.



Draw a line from the number on the left to its MAGIC NUMBER pair on the right.

