# The Globe Academy

## Eighth Grade Summer Packet

Welcome to your well-deserved summer break. In this packet, there are many different activities.

1. Order of operations puzzle – please
    a. Solve the problems
    b. Cut out the squares
    c. Match the problem to the answer.
    d. Glue the squares onto another sheet of paper
    e. Staple that paper to this packet.
2. A Bridge to School – this is a logic problem. Read over it and try to figure it out. Write your answer on the page. If you aren't sure of the answer, show the work you have done.
3. Multiply by 11 – This shows you a great math shortcut to multiply by 11 (or 22 or 33 or…) Make up some example problems and write them down.
4. Palindromes – this is for fun. Try it.
5. What color is my hat? This one is tricky. Think about it. It is also for fun.

Since I am new to your school, please write your name here. Then, please tell me something interesting about you.

Your name: _____

Something interesting about me is _____

_____

_____

_____

_____

# The Bridge to School

There are four eighth graders who want to cross a bridge. They all begin on the same side. They have 17 minutes to get all of them across to the other side. It is night. There is one flashlight. A maximum of two people can cross at one time. Any party who crosses, either one or two people, must have the flashlight with them. The flashlight must be walked back and forth, it cannot be thrown, etc. Each person walks at a different speed. A pair must walk together at the rate of the slower one.

| Person | Name | Minutes to cross |
|---|---|---|
| 1 | Ima Runner | 1 |
| 2 | Walker Goodclip | 2 |
| 3 | Stephi Time | 5 |
| 4 | Wanda Lott | 10 |

For example, if Ima (1) and Wanda (4) walk across first, 10 minutes have elapsed when they get to the other side of the bridge. If Wanda returns with the flashlight, a total of 20 minutes have passed, and you have failed the mission.

How do they all get across?

# Multiply by 11

Here is an easy way to multiply by 11.
Suppose I want to multiply $53 \times 11$

Two digit numbers

1. Write $53$ this way: 5 _____ 3
2. Add 5+3 and put it in the middle: 5 __8__ 3
3. So, $53 \times 11 = 583$
4. $41 \times 11 = 4$ ____ $1 \ = 451$
5. Use this method to multiply
    a. $17 \times 11 =$
    b. $81 \times 11 =$
    c. $27 \times 11 =$
6. How can I modify my method to multiply? $67 \times 11$
7. Use this to multiply
    a. $67 \times 11 =$
    b. $89 \times 11 =$
    c. $47 \times 11 =$

Three or more digit numbers

8. Does this work for three digit numbers? Four digit numbers? Make up three examples and write them here.

Multiples of 11

9. What about $53 \times 22$? (Hint: $53 \times 22 = 106 \times 11$). Make up three examples and write them here.

# Palindromes

A palindrome is a word, number or phrase that reads the same forwards as it does backwards. For example, these are palindromes (punctuation doesn't count)

RACECAR

MADAM, I'M ADAM

123454321

(Interesting note: The word palindrome comes from the Greek palindromus, which means to run back again.)

1. What is the smallest three-digit palindrome divisible by 18? Can you solve this without a brute force examination of possibilities?

2. Create your own palindrome
    a. Pick a three or four digit number.
    b. Reverse the digits and add it to the original number
    c. Keep doing that until you get a palindrome.
    d. Write down three examples.

3. What did the mathematician say when she was offered cake?

# What color is my hat? (Logic – Tricky)

Three mathematicians are applying for a job. There are five hats, three white, two black. They're lined up, and a hat is placed on each. The first person in line cannot see any hat; the second in line sees only the hat of the person in front of him; the third person sees only the hats of the two people in front of her. The first person to correctly figure out what color hat he has gets the job; you guess wrong and you are sent to the dungeon. Assume these are INTELLIGENT mathematicians, and that they will do the logically correct thing at each stage — if something can be deduced, they will figure it out. After a long pause, the first person, who cannot see any hats, says he knows the color of his hat. What is the color, and how does he know?

4.