

Mental Mathematics at All Levels

Builds Number Sense and Reduces Calculator Dependence

NCTM recommends balanced instructional programs, including both significant, appropriate calculator-based investigations and non-calculator work. Keep in mind, if students have never been asked to solve problems without calculators and if they have not learned calculator-free strategies, then mental math will never be an option they choose.

Students who calculate mathematics mentally become

- o more flexible thinkers,
- o liberated from calculator dependence,
- o confident in doing mathematics, and
- o more apt to use multiple approaches when problem solving.

Mental Math Illustrations . . .

K When counting by 1's, what comes after 6?

1 $3 + 5 + 5$ equals what number?

2 What number comes next in the sequence 2, 5, 8, 11, 14, ?

3 What is the perimeter of this rectangle?



4 $4 \times 32 = ?$

5 Evaluate $4n + 5$ when $n = 2$.

6 What is 85% of 40?

7 A shirt is on sale for 20% off the original price of \$15. What is the sale price without tax?

8 Write $(5^4)^2 5^{-3}$ in exponential form.

Alg 1 Solve $3x + 1 = 13$.

Geo..... What is the exact length of the hypotenuse of $45^\circ - 45^\circ - 90^\circ$ triangle that has a leg of 4 cm?

Alg 2 Find $\log_2 \frac{1}{8}$

Sample Mental Math Routine

Step ❶ Teacher presents a problem orally (or by writing it on the board)

Step ❷ Students **FIND** the answer mentally and record answer using their response device.

Step ❸ Students **HIDE** the answer.

Step ❹ Students **SHOW** the answer.

Tips:

In elementary, the teacher models the same process as above. The teacher shows and says the answer to the class giving immediate feedback. The teacher can quickly tell instantly whether all students are participating and whether they have the correct answer.

Keep the mental math routine pace lively and nonthreatening. Three to five minutes daily is all that is needed.

Generally this is a time to collect information rather than stopping to reteach a skill. As students get older and the mental calculations are more complex, provide techniques and strategies for making the problem easier. Encourage students to share their strategies.

Response cubes for grades K, 1, and 2:

Number cubes can be made easily from $3/4$ " and 1" wooden cubes ordered from The Math Learning Center, 800-575-8130.

Each student needs four cubes:

2 ones cubes ($3/4$ ")

2 tens cubes (1").

The numbers on the faces are 0 to 5 and 5 to 10. This will allow students to find numbers up to 99 or even 100 if you display 10 on the tens cube and zero on the ones cube. The larger cube reinforces place value for the tens.