

**THOMSON'S NEW
GRADED SERIES; NEW
MENTAL ARITHMETIC: FOR
PRIMARY DEPARTMENTS**

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Thomson's New Graded Series; New Mental Arithmetic: For Primary Departments by James B. Thomson

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JAMES B. THOMSON

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• NEW

MENTAL
ARITHMETIC:

FOR

PRIMARY DEPARTMENTS

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SUGGESTIONS.

THE following Suggestions are submitted, not as *arbitrary* rules, but as *practical hints*, to be adopted so far only as they meet the wants of the class.

1. The best mode of instruction, is that which most effectually awakens a pupil's *attention*, and *creates* in him a determination to educate himself. Any method; therefore, which does not lead him to *think* and *reason*, is of little or no value, because it fails to *develop* the *elements* of manhood.

2. Beginners in Mental Arithmetic should be furnished with suitable tools, as slates, blackboards, numeral frames, counters, counting boards, etc.,* and *be taught to use* them in learning to count, and in illustrating the elementary combinations and principles of numbers.

3. After children learn to repeat the names of numbers, particular care should be taken that they *comprehend* the meaning of the terms; that they have a correct idea of *more* and *less*; that *eleven*, for example, is more than seven and less than thirteen. Their minds should also be carried forward from *concrete* to *abstract* numbers, and from *particular* to their *universal* application. On being asked the meaning of "three," a child once showed his *third* finger—the one which he had been accustomed to count in the *third* place.

4. Do not attempt to teach *too many things* at one lesson. The attention of children can be kept *active* but a short time

* The "Counting Board" is a new and valuable accession to the apparatus of primary schools. Its length depends upon the size of the recitation room, and the number of pupils in the class. When placed against the wall, its width is usually from 15 to 18 inches; the upper surface is divided into parts by distinct marks or strips of wood; the edges are faced with a plain molding, raised sufficiently to prevent the counters from rolling off. If placed in the middle of the room, it should be twice this width, to allow pupils to stand on either side of it.

without fatigue. As soon as they begin to show signs of weariness, the exercise should be closed.

5. The *Tables* should be carefully illustrated and understood before they are committed to memory. After this the pupil should make them so familiar, that when the combination of any two digits is required, the *result* shall at once flash upon his mind.

6. The language employed in verbal explanations should be *simple* and in *point*, giving just help enough to lead the pupil to discover the principle in question. More than this is not only *useless* but *hurtful*.

7. After a principle has been explained, the pupil should be required to *reproduce* both the *explanation* and the *principle*. This will show whether the point is *understood*, and if understood, will *fix it* in his mind.

8. In recitations special pains should be taken to secure the *attention* of the class, to keep every mind *active*, and *ready* to answer any question proposed. Where listlessness or mischief prevails, recitations are useless.

9. Particular attention should also be paid to the *method* of *solving* and *reciting* problems. It is not enough that a pupil gives the right answer. The steps in the reasoning should be *legitimate*, and the process stated in *correct* language.

10. It is not advisable to require the *same formula* of reasoning in every solution. Any form originated by the pupil is *admissible*, provided it be *logical* and *properly expressed*. There is a choice, however, in the *modes* of analysis, and unquestionably *that form is best*, which is the most *simple*, *clear*, and *concise*. While latitude is allowable in the modes of analysis, pupils should be encouraged to *aim* at the best.

11. In the curriculum of studies for *primary* and *intermediate* classes, Mental Arithmetic is worthy of a more prominent place than it commonly receives. As an *intellectual discipline*, it is confessedly *unsurpassed* by any other branch, and as a *preparation* for the practical duties of life, it is *unequaled*. A thorough knowledge of it is a "ready reckoner," which is at once *reliable*, always *at hand*, and of *universal application*.

MENTAL ARITHMETIC.

PRELIMINARY EXERCISES.

LESSON I.

TO TEACHERS.—The following Lessons assume that the class have an imperfect knowledge of *counting*, and of *elementary numbers*. The object is to show them practically *how many things* each number expresses, and impart to them a *distinct idea of more and less*.

1. How many of these little girls and boys can count? All who can, may hold up a hand.
2. The teacher puts down a counter*, as a book, and asks, "How many books are here?" The class answer, "One book." Putting down another, "How many now?" "Two books." Putting down another, "How many now?" "Three books."
3. Hand me *one* book. Hand me *two* books. Hand me *three* books.
4. Each show me *one* finger. Show me *two* fingers. *Three* fingers. *Four* fingers. *Five* fingers.
5. When you say, one, two, three, four, five, etc., what is it called?


Ans. Counting.

* The teacher is supposed to be furnished with a *Blackboard*, a *Numerical Frame*, and a *box of Counters*; the pupils with *small slates* and *pencils*. For "counters," he may use any convenient portable objects; as, pebbles, bits of paper, pencils, cents, etc. Blocks of one, two, or three cubes, and so on, up to a block of ten cubes, distinctly marked upon it, are also valuable aids.

6. Again, putting down three books and then another, the teacher asks, "How many now?" "*Four* books." Putting down another, "How many?" "*Five* books."

7. The first child may hand me "*one* book." The next "*three* books." The next "*two* books." The next "*four* books." The next "*five* books."

8. Each hold up *two* fingers. *Four* fingers. *Three* fingers. *Five* fingers.

 The thumbs are often regarded as fingers, and in counting may be so considered by the class.

9. Make two straight marks upon your slate; now make another beside these, and count them.

10. Make one more beside these, and count them.

11. Make one more, and count them all.

12. What number comes after *one*? (The class answer in concert.) What comes after *two*? What after *three*? After *four*?

13. *Two* comes after what? *Three* after what? *Four* after what? *Five* after what?

14. What comes before *five*? What before *four*? Before *three*? Before *two*? Before *one*?

15. Count from one to five in concert.

16. Count from five to one backward in concert.

17. How many of the class can express the numbers one, two, three, four, five, by *figures*.

18. Make the figure 1 (one) upon your slates (the teacher writing it upon the blackboard.)

19. Make the figure 2 (two.) The figure 3 (three.) The figure 4 (four.) The figure 5 (five.) Make each of these figures twice more.

LESSON II.

To TEACHERS.—In no case should pupils be permitted to commence a new lesson until familiar with the preceding. The exercises should be varied according to the age and amount of knowledge of the class, and be continued till the object is secured.

1. The teacher making five straight marks upon the blackboard, directs the class to count as he points to each.

2. Placing another mark beside these, he asks, "How many does this make?" The class repeating the number as before. Placing another beside the last, "How many now?" Placing another, "How many?" Placing another, "How many?" Placing another, "How many?"

3. Hold up *six* fingers. Hold up *seven* fingers. Hold up *eight* fingers. *Nine* fingers. *Ten* fingers.

4. Make six straight marks in a line upon your slates. Make seven marks. Eight marks. Nine marks. Ten marks.

5. What comes after *five*? After *six*? After *seven*? After *eight*? After *nine*?

6. Six comes after what? Seven comes after what? Eight? Nine? Ten?

7. One cent and one more are how many? Two cents and one more? Three and one more? Four and one more? Five and one more? Six and one more? Seven and one more? Eight and one more? Nine and one more?

8. What comes before ten? Before nine? Before eight? Before seven? Before six?

9. Show me four fingers. Six fingers. Eight fingers. Ten fingers.

10. Count from one to ten, three times in concert.

11. Count backward from ten to one; as, ten, nine, eight, etc., three times.

12. Write in a neat hand upon your slates the figures 6 (six), 7 (seven), 8 (eight), 9 (nine.)

LESSON III.

1. How many hands have you? How many feet?

2. How many hands and feet counted together?

3. Hold up your right hand:

4. How many thumbs has it? How many fingers?

How many fingers and thumbs?

5. How many fingers and thumbs has your left hand?

6. Clap your hands five times. Six times.*

7. Clap your hands seven times. Nine times.

8. Clap your hands eight times. Ten times.

9. Hold up six fingers. Eight fingers. Seven.

10. Show me three fingers on your right hand, and two on your left.

11. Which is the more, three fingers, or two fingers?

12. Show me four fingers on your right hand, and three on your left.

13. Which is the more, four fingers, or three fingers?

* Children *delight* in having something to do. Simple manual exercises, making marks upon the slate or blackboard, etc., not only please them, but awaken an interest in the study.