

**A MENTAL ARITHMETIC, ON THE
INDUCTIVE PLAN: BEING AN
ADVANCED INTELLECTUAL
COURSE, DESIGNED FOR COMMON
SCHOOLS AND ACADEMIES**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649046010

A Mental Arithmetic, on the Inductive Plan: Being an Advanced Intellectual Course, Designed for Common Schools and Academies by Benjamin Greenleaf

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Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

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BENJAMIN GREENLEAF

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A
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ADVANCED INTELLECTUAL COURSE,
DESIGNED FOR
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By BENJAMIN GREENLEAF, A.M.,
AUTHOR OF "NATIONAL ARITHMETIC," ETC.

IMPROVED ELECTROTYPE EDITION.

BOSTON:
PUBLISHED BY ROBERT S. DAVIS & CO.

NEW YORK: D. APPLETON & CO., WM. WOOD & CO., AND WM. L. FOLEY & CO.

PHILADELPHIA: J. B. SPENCING AND COMPANY.

COLUMBUS, OHIO: J. H. BILEY & CO.

1865.

PREFACE.

THE great benefits to be derived from the study of Mental Arithmetic have, at length, become universally admitted. This appreciation of the science has given rise to an urgent demand for improved methods of teaching it. The mechanical way of arranging a set of examples to a model, which should give the pupil a solution of the whole, with little or no mental effort, is no longer approved.

The object of this book is, therefore, to furnish a graded course of lessons, fully up to the most approved standards of instruction.

It has been the constant aim of the author, in its preparation, to unfold inductively the science of numbers in such a series of progressive intellectual exercises as should awaken latent thought, encourage originality, give activity to invention, and develop the power of discriminating justly, reasoning exactly, and applying readily results to practical purposes.

Forms of analysis have been introduced throughout the work, as a guide to the learner, but in connection with such examples as shall, nevertheless, give proper scope to his reasoning powers. It will be noticed, as a valuable original feature of this work, that two forms of analysis are given in the first part of the book, one full, and the other abbreviated.

In the notes, aid is furnished more by hints and suggestions than by full and formal solutions, which, if too numerous, might discourage sufficiently persevering effort, and the *all-important habit of self-reliance.*

Percentage and Interest receive full attention, and are treated, for the most part, in an original manner.

The advanced exercises in the fundamental processes of the science, given in the Appendix, constitute another feature peculiar to this work. These will be found not only useful as an intellectual drill, but also exceedingly valuable for preparing the learner to dispense with written operations in business life, to a far greater extent than has hitherto been deemed practicable.

The latter part of the Appendix, although quite brief, is intended to give the plan of the work, with additional models of analysis, and suggestions valuable alike to pupil and teacher.

SUGGESTIONS TO TEACHERS.

THE extent to which the book can be dispensed with by the class, in recitation, should be determined by the nature of the lesson and the attainments of the pupil.

When the book is not used, each question should be repeated by the pupil after the teacher, and the required solution should always be given promptly.

A full form of analysis should be insisted upon at first, but when it has become familiar, a more abbreviated one may be allowed.

No form of solution should be permitted to pass, unless it is neatly expressed, and is entirely accurate.

In general, when a pupil has thoroughly mastered the first fifty pages of this book, he may advantageously enter upon the study of the Common School Arithmetic of Greenleaf's Series, or some other kindred work, and continue the intellectual course in connection with the written.

Classes in higher Arithmetic, and even in Algebra, may often be benefited by a review of the more difficult exercises of this book, in connection with those branches.

MENTAL ARITHMETIC.

LESSON I.

1. John had 1 peach, and his father gave him 1 more; how many peaches did he then have?

SOLUTION. — Since John had 1 peach, and his father gave him 1 more, he then had 1 peach and 1 peach, which are 2 peaches.

2. Susan has 2 books, and Mary has 1 book; how many books have they both?

3. If you had 2 cherries, and I should give you 2 more, how many cherries would you then have?

4. Lucy found 2 pins, and Sarah found 3 pins; how many did they both find?

5. If you should recite 2 lessons to-day, and 4 more to-morrow, how many would you recite in all?

6. A lemon cost 2 cents, and an orange cost 5 cents; how many cents did both cost?

7. Gave for a pencil 2 cents, and for some paper 6 cents; what was the cost of both?

8. On one bush there are 2 roses, and on another there are 7 roses; how many on both bushes?

9. 2 boys and 8 boys are how many boys?

10. A farmer sold a lamb for 2 dollars, and a calf for 9 dollars; how many dollars did he get for both?

11. Alfred caught 8 birds, and Jason caught 1 bird; how many birds did they both catch?

12. James has 3 marbles, and Charles has 2 marbles; how many marbles have they both?

13. A man sold a pig for 3 dollars, and a sheep for 3 dollars ; how many dollars did he receive for both ?
14. Mary has 3 books, and Margaret has 4 books ; how many books have they both ?
15. Edward gave 3 cents for a postage-stamp, and 5 cents for a box of wafers ; how much did both cost ?
16. Eliza is 3 years old ; how old will she be in 6 years, if she lives ?
17. A farmer has 3 cows in one field, and 7 in another ; how many has he in both ?
18. In a class there are 3 girls and 8 boys ; how many pupils are there in the class ?
19. A boy found under one apple-tree 3 apples, and under another 9 apples ; how many did he find in all ?
20. If you have 4 chestnuts in one hand, and 1 chestnut in the other, how many have you in both hands ?
21. Susan had 4 merit marks, and obtained 2 more ; how many did she then have ?
22. George found 4 eggs in one nest, and 3 eggs in another ; how many did he find in both ?
23. A man bought a cord of wood for 4 dollars, and half a ton of coal for 4 dollars ; how much did both cost him ?
24. A lady paid 4 cents for a skein of silk, and 5 cents for a spool of cotton ; how much did she pay for both ?
25. Ella gave 4 cents for candy, and 6 cents for nuts ; how much did she give for both ?
26. Lucy, having given to a beggar 4 cents, found she then had 7 cents left ; how many cents had she at first ?
27. Alfred bought a hook for 4 cents, and a line for 8 cents ; how much did both cost ?
28. A farmer sold 4 cows, and then had 9 left ; how many cows had he at first ?

LESSON II.

1. 1 and 1 are how many ?

ANSWER. 1 and 1 are 2.

2. 2 and 1 are how many ?

3. 2 and 2 are how many ?

4. 2 and 3 are how many ?

5. 2 and 4 are how many ?

6. 2 and 5 are how many ?

7. 2 and 6 are how many ?

8. 2 and 7 are how many ?

9. 2 and 8 are how many ?

10. 2 and 9 are how many ?

11. 3 and 3 are how many ?

12. 3 and 4 are how many ?

13. 3 and 5 are how many ?

14. 3 and 6 are how many ?

15. 3 and 7 are how many ?

16. 3 and 8 are how many ?

17. 3 and 9 are how many ?

18. 4 and 4 are how many ?

19. 4 and 5 are how many ?

20. 4 and 6 are how many ?

21. 4 and 7 are how many ?

22. 4 and 8 are how many ?

23. 4 and 9 are how many ?

24. Abby found 5 pins, and Jane found 1 more ;
how many did they both find ?

25. Ellen had 5 chickens, and her father gave her
2 more ; how many did she then have ?

26. Mary gave 5 cents for tape, and 3 cents for
bread ; how much did she give for both ?

27. George bought 5 marbles, and had 4 given
him ; how many did he then have ?

28. John gave to one schoolmate 5 nuts, and to
another the same number ; how many did he give to
both ?

29. Olive had 5 pins on her cushion, and stuck on it 6 more ; how many did she then have ?

30. If you spend 5 cents, and have 7 cents left, how many had you at first ?

31. 5 oranges and 8 oranges are how many oranges ?

32. Joseph, having lost 5 cents, had only 9 cents left ; how many had he at first ?

33. Gave 6 cents for paper, and 1 cent for a pen ; how much did both cost ?

34. If you had 6 apples, and should have 2 more given you, how many would you then have ?

35. How many slates are 6 slates and 8 slates ?

36. Gave 6 cents for paper, and 4 cents for quills ; how many cents were paid for both ?

37. If you should give 6 dollars for a vest, and 5 dollars for a pair of boots, how much would both cost ?

38. A bookseller sold in one day 6 books, and in another day 6 more ; how many did he sell in all ?

39. A farmer sold 6 sheep, and retained 7 ; how many had he at first ?

40. If a clock cost 6 dollars, and a table 8 dollars, what would be the cost of both ?

41. A farmer has 6 cows in one pasture, and 9 in another ; how many has he in both ?

42. Paid 7 cents for a ruler, and 1 cent for a pencil ; what did both cost ?

43. If a paper of pins cost 7 cents, and a pencil 2 cents, how many cents must be paid for both ?

44. If 7 birds are upon a gate, and 3 upon the ground, how many are there in all ?

45. 7 books and 4 books are how many books ?

46. 7 horses and 5 horses are how many horses ?

47. Laura had 7 needles, and her sister gave her 6 more ; how many did she then have ?