

# 101 Math Ideas

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Editor's Note: The following article was submitted for publication under the title "101 Ideas for a Mathematics Department Head". While a few of the ideas might be applicable only to a person with the "Department Head" title, we felt that the number of ideas applicable to any mathematics teacher was sufficient to merit publication. While many of the ideas are perhaps strictly aimed at the large high school, we hope that every reader will find at least one idea that he may pursue. Mr. Woloschuk is Mathematics Department Head at Dr. E.P. Scarlett High School, Calgary.

1. Form a mathematics club - activities for such a club could include field trips to various local institutions and industries.
2. Interview students - priority would be to speak to failures.
3. Accept suggestions from teachers on improving instruction and improving the mathematics department in general.
4. Develop a list of free teaching materials and other resources (speakers) for mathematics education in your area.
5. Arrange student tutorials - extra help beyond class time.
6. Arrange mathematics scholarships and awards.
7. Examine and discuss experimental programs, innovation - for example, different forms of individualized instruction.
8. Conduct a study and write it up. For example, set out the objectives for mathematics education in your school and have the students assess the extent to which objectives have been met. Then do the appropriate analysis and written report.
9. Encourage zone meetings of teachers in order to exchange ideas, examine displays, student projects, new methods and materials. A zone might contain three senior high schools with their respective junior high feeder schools.
10. Discuss course coverage with other teachers.
11. Arrange visitation of other schools.
12. Teach students how to study mathematics. A special NCTM booklet entitled *How to Study Mathematics* can be obtained for this purpose.
13. Examine and discuss various methods of instruction. These methods could be: audio-visual presentations, computer-assisted instruction, communication lessons, creative learning lessons, discovery lessons, enrichment lessons, individualized instruction, laboratory lessons - active learning, mathematical games, small group instruction, student-directed class discussions, teacher lecture.
14. Spend time on teacher professional development at department meetings.

15. Visit E.D.C.I. department at a university, university library, public library, A-V center at school board; screen these centers for ideas and resources.
16. Keep a detailed inventory of equipment and supplies.
17. Encourage teacher involvement in departmental planning.
18. Assess teachers' feelings on new ideas and approaches.
19. Subscribe to mathematics magazines such as *The Mathematics Teacher*, *Delta-K*, *Mathematics Magazine*, and math teachers' journals from neighboring provinces and states.
20. Develop an "Academic Corps" - top students help others.
21. Encourage computer projects.
22. Bring in appropriate personnel to speak on mathematics and computer science programs at universities, SAIT, NAIT, and junior colleges.
23. Develop a testing file - shared by all mathematics teachers.
24. Develop a worksheet file - shared by all mathematics teachers.
25. Facilitate proper program placement of students.
26. If you are the department head, teach some of the less desirable courses.
27. Encourage common examinations in courses.
28. Promote departmental and interdepartmental communication in your school.
29. Give *positive* comments and suggestions to other teachers. Credit should be given when due.
30. Invite teachers into your classes.
31. Consult teachers about courses they would like to teach.
32. Develop a handout, "How to Study Mathematics" and distribute through the department.
33. Develop a mathematics skill test specifically designed to make students *read* directions on examinations.
34. Provide leadership on interpretation of test marks. Discuss departmental mark analysis.
35. Arrange for an A-V orientation for teachers of your staff.
36. Do public library research for games, projects and experiments.
37. Circulate book displays and charts through the department.
38. Design a portable mathematics showcase. This can be built at the school.
39. Encourage coordination with science and other departments in the school.
40. Develop a mathematics laboratory.
41. Develop a mathematics resource center for your school. Involve the library.
42. Why not develop a public relations program in cooperation with the science department?

43. Computer terminal at your school?
44. Discuss homework assignments. Are they functional if too lengthy?
45. Initiate a two-way communication - staff  $\leftrightarrow$  administration.
46. Discuss the "core curriculum" problems, possible changes, and such.
47. Arrange meetings with junior feeder high schools.
48. Participate in MCATA and NCTM. Their conferences are often excellent.
49. Ponder on best possible staff placement and deployment.
50. Mathematics Christmas Tree, Easter Basket, Cornucopia, Valentine.
51. Ensure close communication with guidance personnel in your school.
52. Use calculators (Mathematics 15, 25 or elsewhere).
53. Arrange speakers from banks and industries for your mathematics classes.
54. Encourage student projects - creative constructions, mathematical models, experiments.
55. Have students do mathematics reports from a list of 30 or more mathematical topics. Reports encourage library research in mathematics.
56. Encourage student demonstration lessons on special projects.
57. Exchange information and ideas with the school library.
58. Ask staff members to report on classroom techniques which have proved effective.
59. Arrange a library orientation of teachers and students.
60. Business education department may be willing to do some typing of exams, worksheets for the mathematics department.
61. Discuss strengths and weaknesses of the mathematics programs in your school.
62. Arrange displays and demonstrations related specifically to the application of mathematics such as newspaper articles, concrete objects, charts.
63. Publish a mathematics student magazine.
64. Use local shop facilities to build wooden mathematical models - to be used in classroom instruction.
65. Collect a file of brain teasers to begin classes.
66. Encourage teachers to vary the beginning of a mathematics class period.
67. Conduct workshops using books such as *Freedom to Learn*.
68. Provide a list of varied activities for the Mathematics 15 and 25 programs.
69. Arrange mini-courses in areas not presently covered in our high school curriculum such as computers, topology, non-Euclidean geometry.
70. Stimulate departmental participation in local or provincial curriculum development.
71. Consider mental mathematics for beginning a class in mathematics.
72. Procure filing cabinets with distinct slots for "Hard to Teach" Mathematics classes. These would be used to store assignments.

73. Keep an inventory of course references for teachers.
74. Develop a Mathematics 15 unit entitled "Mathematics in Business and Industry". This can be done by writing businesses for sample problems which demonstrate the applicability of mathematics.
75. Develop evaluative criteria for your department.
76. Publish relevant techniques and activities in the NCTM journal or *Delta-K*.
77. Demonstrate the application of computers.
78. Develop a form letter which can be utilized by any member of the department when he has concern over a particular student. This form letter would be mailed home.
79. Communicate with parents. Have them phone the school when their son or daughter is to be absent.
80. Encourage teachers to phone parents when students are late for class, causing discipline problems, or underachieving.
81. Show students mathematical errors in graphs that are displayed by newspapers and other media.
82. Consider short mathematical quizzes, oral or written.
83. Establish a computer club.
84. Invite guidance, administration and library personnel to attend any of the department meetings.
85. Arrange an agenda a few days before the department meeting. This allows teachers to think about the items of discussion.
86. Expose teachers to the *Self-Evaluation Guide for High Schools - Part IV* - prepared by the ATA.
87. Provide members of the department with a list of important dates and happenings in the school. Do so on a regular basis.
88. Meet on a social basis with your staff.
89. The ATA has a series on the improvement of instruction. One could obtain these and discuss certain sections of them.
90. Provide all members of the department with teachers' editions and solution keys (if available) for the courses they teach.
91. Approach the local media (TV, radio or newspaper) to be at your school at a mathematics public relations night.
92. Conduct small surveys within the school and use the results in teaching statistics.
93. Allow accelerated students to do independent study.
94. Develop a teacher evaluation questionnaire which they may use if they wish.
95. Purchase class sets of slide rules, geometry sets, yardsticks, rulers, Knott's tables.
96. If possible, obtain outdated references and books from your local school board stores.

97. Invite central office personnel to public relations nights at your school.
98. Develop a set of slides that demonstrate the application of mathematics in the construction of your school or nearby building projects.
99. Maintain a positive attitude with students and teachers.
100. Develop summary sheets on certain aspects on the mathematics courses; for example, the various types of factoring can be summarized on one sheet.
101. Be flexible and be prepared to accept educational change.

## *Elementary Ideas*

Elementary Teachers! Are you looking for a drill activity, or for something to give your fast students when they have finished their seatwork? Perhaps one of the following activities would fill the bill exactly. These items have appeared in several NCTM affiliate publications.

### COMBINATIONS

Number combinations appear in the grid vertically, horizontally, and diagonally. If you examine the grid closely, you will find many of the basic facts for addition, subtraction, multiplication, and division. See how many you can find! Insert the correct sign of operation and the equal sign. Do not overlap!

23	9	3	6	81	60	7	12	19	57	76
45	2	3	12	48	6 + 8 = 14	25	33	58		
3	35	18	4	72	42	30	56	3	44	66
15	5	10	9	12	5	28	11	17	35	16
72	38	8	36	6	6	4	27	31	5	1
49	8	80	4	20	11	7	4	9	36	2
64	4	24	8	3	5	15	45	40	3	10
7	13	12	32	35	19	8	3	6	18	3
32	33	28 + 4 = 7	6	9	4	19	21	5	9	45
58	18	40	36	3	7	21	28	36	4	
24	54	37	26	63	13	49	57	20	25	
3	72	17	4	7	6	52	2	26	50	72