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Introduction

In this resource book, you will find 100 math workouts that support your math curricula. Each workout was designed as a student activity and class discussion for the first two to seven minutes of class. The workouts cover a broad range of mathematics exploration, from critical thinking to pure fun. The workouts are presented in eight units:

1. Whole Numbers
2. Fractions
3. Decimals
4. Integers
5. Number Concepts
6. Sports and Games
7. Logic and Reasoning
8. Mathematics Exploration and Curiosity

Teachers know that workouts are an effective tool in teaching mathematics. Workouts also allow teachers a few valuable minutes for administrative duties (attendance, announcements, etc.) while settling students for the upcoming lesson. Here are some suggestions to help you get the most out of the workouts in this book.

The Daily Workouts Sheet and Sequence

The workouts in this book should be used with the Daily Workouts Sheet on page 8 (or a similar form developed by the teacher). Each Daily Workouts sheet can be used for at least five workouts (six if a graphic activity is used) or approximately one week of activities.

The workout activities can be used with related or unrelated lesson materials. While they are organized by category, you are encouraged to skip around and use the activity that best suits the need for the day. Note: There are several workouts where a prerequisite skill is involved (e.g. finding the least common multiple and common denominators).
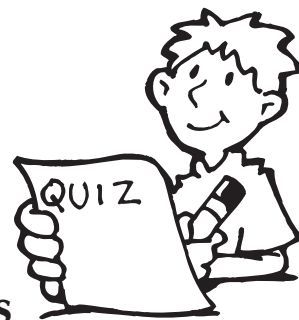
Using the Workouts

Each day's workout should be projected on the overhead screen as students enter the classroom. Once seated, students should immediately begin the activity. You can read or assign a student to read the activity to assist students whose view is obstructed or who are visually impaired. If it is a more complex workout, you should also explain the activity in more detail. The workout activities are designed to last from two to seven minutes. During this time, walk around the classroom to make sure all students are on task and understand the activity. You can also use this time to take attendance, check homework, return/collect papers, make announcements or do other administrative tasks.

At the end of the workout, initiate a discussion about the solution. Ask for volunteers or call on students for responses. Allow one to two additional minutes for related discussion and questions. You could also use an overhead transparency of the solution key to generate discussion.

The last 18 workouts are Time Trials, a series of questions that are meant to be completed in a set amount of time. Time Trials allow students to practice their computation skills and at the same time challenge them to think quickly.

Think Eleven

Workout #3

When a double-digit number is multiplied by 11, the first and last digits of that number remain the same (unless there is a number to be carried). The middle number is determined by adding the two digits together. For example, 23 x 11 = 253 (add 2 + 3 to get 5 for the middle number).

When the sum of the two numbers is ten or greater, carry the one to the hundreds column. For example, 49 x 11 = 539 (4 + 9 = 13, so the one is carried to the hundreds column).
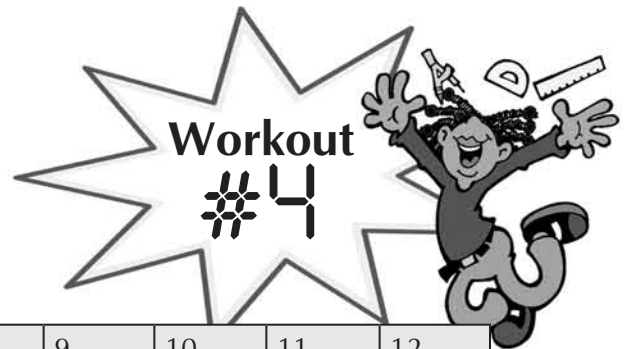
Multiply the following using the method above:

a) 12 x 11 =

b) 18 x 11 =

c) 13 x 11 =

d) 11 x 25 =

e) 11 x 11 =

f) 71 x 11 =

g) 11 x 39 =

h) 11 x 95 =

Oops!

Workout #4

There are 12 mistakes in the multiplication table. Cross out each wrong number and write in the correct answer.

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	23	24
3	3	6	9	12	16	18	21	24	27	30	33	36
4	4	8	12	16	20	24	27	32	38	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	34	42	48	54	65	66	72
7	7	14	21	27	35	42	49	56	64	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	28	36	45	54	63	72	81	90	99	106
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	112	132
12	12	26	36	48	60	72	84	96	108	120	132	144

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Solution #3

a)   12 x 11 = 132   (2 +1 = 3)
b)   18 x 11 = 198   (1 + 8 = 9)
c)   13 x 11 = 143   (1 + 3 = 4)
d)   11 x 25 = 275   (2 + 5 = 7)
e)   11 x 11 = 121   (1 + 1 = 2)
f)   71 x 11 = 781   (7 + 1 = 8)
g)   11 x 39 = 429   (3 + 9 = 12, carry the 1 to the hundreds column to equal 4)
h)   11 x 95 = 1045   (9 x 5 = 14, carry the 1 to the hundreds column to equal 10)

Solution #4

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Adding Decimals

Workout #15

Add the problems. Match your answers with the choices on the right to identify the following:

This man is recognized as the first African-American mathematician; he taught himself calculus and trigonometry.

1) 0.29 + 0.5 =
2) 1.2 + 0.12 =
3) 5 + 4.8 =
4) 3.7 + 0.91 =
5) 14.8 + 0.49 =
6) 1.08 + 12 =
7) 8 + 0.8 + 0.88 =
8) 0.19 + 1.9 + 19 =

___ ___ ___ ___ ___ ___ ___ ___
 8   6   1   7   2   3   5   4

Answers

A. 13.08
B. 21.09
E. 15.29
E. 1.32
K. 9.8
N. 9.68
N. 0.79
R. 4.61

Subtracting Decimals

Workout #16

Subtract the problems below. Then match your answers with the choices on the right to identify the following:

This famous inventor helped disabled people with his inventions.

1) 9.8 – 0.9 =
2) 14.1 – 0.25 =
3) 8 – 0.8 =
4) 13.4 – 5 =
5) 5.1 – 0.51 =
6) 0.3 – 0.12=
7) 1 – 0.15 =
8) 2.05 – 0.4 =
9) 13.2 – 0.132 =

___ ___ ___ ___   ___ ___ ___ ___ ___
 9   7   5   1   8   6   4   2   3

Answers

A. 0.18
A. 4.59
D. 13.068
E. 13.85
E. 0.85
K. 1.65
M. 8.4
N. 7.2
N. 8.9

Solution #15

BANNEKER

Benjamin Banneker (1731-1806) is recognized as the first African-American mathematician. He taught himself calculus and trigonometry.

1) 0.79
2) 1.32
3) 9.8
4) 4.61
5) 15.29
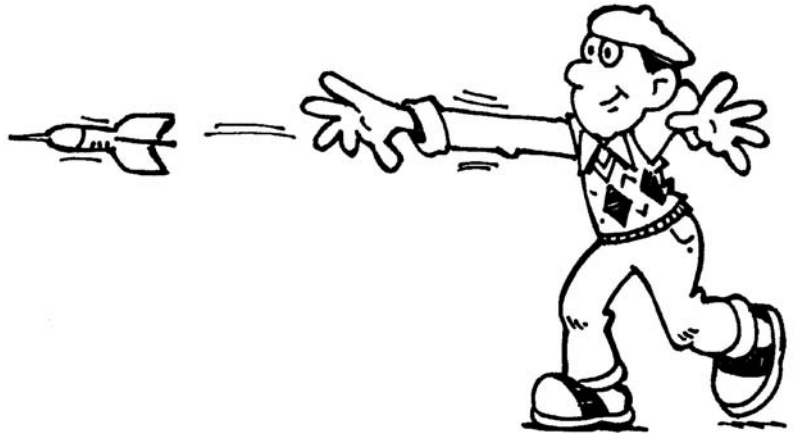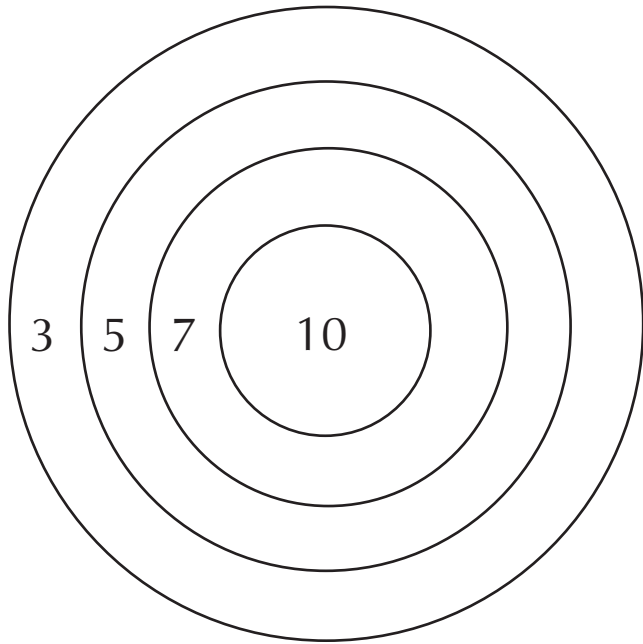6) 13.08
7) 9.68
8) 21.09

Solution #16

DEAN KAMEN

In 2001, **Dean Kamen** invented the Segway PT, a two-wheeled, self-balancing electric vehicle.

1) 8.9
2) 13.85
3) 7.2
4) 8.4
5) 4.59
6) 0.18
7) 0.85
8) 1.65
9) 13.068

Precise AIM

Place five darts on the dartboard to get a score of exactly 24.

3 5 7 10

UNIT 6 **Sports and Games**

Bowling Anyone?

The following symbols are used to score bowling:

- X = a strike (10 points plus the number of pins knocked down on the next two rolls)
- / = a spare (10 points plus the number of pins knocked down on the next roll)
- — = 0 points

For example:

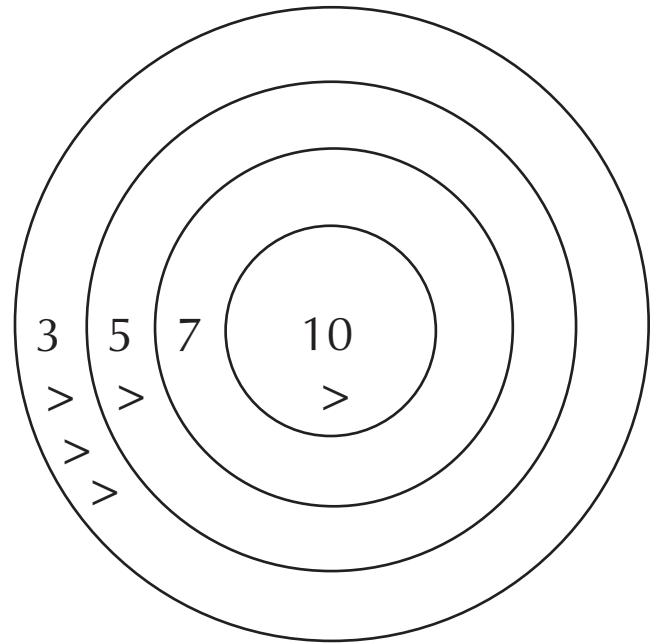| 1	2	3	4	5
X	7 2	9 /	5 /	6 —
19	28	43	59	65

Score the following game of bowling:

1	2	3	4	5	6	7	8	9	10
7 /	8 1	X	5 4	X	X 6 /	X —	9 8	/ 8	

Solution #39

3 – 3-pointers   9
1 – 10-pointer   10
1 – 5-pointer   5
Total   24 points

Solution #40

The score is 167.

1	2	3	4	5	6	7	8	9	10
7 ⁄ 8 1		X 5 4		X	X 6 ⁄		X – 9	8 ⁄ 8	
18	27	46	55	81	101	121	140	149	167

Teaching Tips

Tip #1
Stay Motivated and Connected

Teachers have such an important job. Not only do you have the opportunity to mold and educate young minds, but what you do could have a lasting impact on students' future success in subsequent math courses, in their like or dislike of math in general, and in their perceptions of being successful in math. Your success and the success of your students will depend a great deal on your enthusiasm and excitement for teaching elementary mathematics. This must be evident and maintained through the good times and the challenges that await you, which is not always easy. It is important for you to know what inspires and excites you to want to teach math. Is it the importance of the teacher's role in positively shaping and influencing students' lives and futures? Is it the excitement of planning and presenting an effective lesson, then watching the lights of knowledge and skill turn on in a young person's mind? Is it a fond memory of a great teacher that you had? Is it the desire to make a difference? Is it a combination of these things, or something completely different?

Once you have determined the source of your inspiration, use it. Find that quiet place inside of you through a method of your choice (prayer, meditation, yoga, music, motivational speeches, books, etc.), and connect with this source as often as needed. Let's face it, we're all human, and we must rekindle our enthusiasm and drive from time to time. We must also keep exploring new ways to keep the teaching fires burning when our usual methods start to fade. In an ideal situation, all students are motivated and polite with supportive parents. In such situations, teachers may find it easier to display and maintain enthusiasm and excitement. But teaching is not always an ideal situation. Public education today is influenced by a myriad of variables, including societal factors (poverty, single-parent households and discipline), economics, politics, and cultural influences. Students are not always eager to learn, disciplined, or have fundamental math skills. However, these are the students who need an enthusiastic and motivated teacher most of all. If you're in a tough situation, you'll have to dig deep for the constant drive, passion, and energy needed for success.

Get connected other teachers for support. Research shows that all teachers – novice, experienced, and veteran – benefit from a relationship which fosters professional development. If you are a first- or second-year teacher, chances are you've already been placed with a mentor, someone to guide and support your progression as a teacher. If you have not been placed with a mentor, make a request to your content supervisor or school administrator, or seek out a mentor on your own. Most experienced and seasoned veteran teachers would appreciate the opportunity to share their knowledge and wisdom with an eager newcomer. A good mentor should be someone with whom you feel comfortable, someone you can ask the difficult and more practical questions which may not have been addressed in your teacher preparation classes or in staff development activities. No matter your background or level of experience, it is beneficial for all teachers to maintain some kind of professional connection. Such connections can reduce anxiety and burnout while improving the quality of teaching. Getting and staying connected is a win-win situation for all involved, especially your students.

Tip #2
Lesson Planning

Developing lesson plans involves three levels of planning:
1. long-term lesson planning
2. grading period (quarterly or semester) planning
3. daily lesson planning

Long-Term Lesson Planning

Your curriculum guides, achievement standards, course objectives and math department chairperson are the primary resources for developing a long-term lesson plan. The entire school year should be mapped out in terms of units for each grading period. Long-term lesson plans should encompass all curricula requirements and should be developed cognizant of all statewide and district assessments. Adjustments to long-term lesson plans should be made at the end of grading periods, based on instructional achievements and additional needs of your students.

Grading Period Planning

Grading period planning should be documented in a daily planner with specific objectives for the lesson. Plans should be reviewed and revised on a weekly basis, based on instructional achievements and the needs of students.

Daily Lesson Plans

The daily lesson plan is a detailed blueprint describing the essential elements and activities for the lesson. These plans should be reviewed and revised daily, based on instructional achievements and the needs of students. Daily lesson plans should be developed on individual sheets of paper/forms and filed for future use. There are also useful computer programs for developing lesson plans. Lesson Plans for Windows® is one of the most recommended. Effective daily plans contain the following elements in some form or another:

1. **Workout:** Workouts are excellent tools for getting the math lesson started. Workouts can be used to introduce a lesson or as a tool to engage students with various mathematical concepts.
2. **Objective:** The lesson's objective is a specific description of the knowledge or skill that students should learn from the lesson.
3. **Introduction:** The introduction can include several elements:
    a. introducing the concept
    b. review of prerequisite skills
    c. an overview or demonstration of the skill
    d. a discussion of needed supplies and materials
    e. an exercise to grab students' interest and enthusiasm
4. **Instruction:** This is the core of the lesson. Methods of instruction will vary, depending on the topic, student learning styles, teaching styles/methods, student skill level and needs of the students.
5. **Independent and/or Group Practice:** Give students an opportunity to try the skill individually or as part of a group activity. Follow this practice with immediate feedback. Additional instruction/demonstration and independent practice may be needed.
6. **Assessment of Lesson's Effectiveness:** Determine the effectiveness of the lesson and any remaining students' needs. Adjust your daily lesson plan if necessary. There are a number of ways to assess lesson effectiveness, including observing student work, asking questions, having students work problems at the chalkboard, short quizzes, etc.