



Math Madness

**For Every Problem There's a
Solution!**

Third Grade Problem Solving Tournament

Informational Packet

New Salem Elementary School

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MATH MADNESS

FOR EVERY PROBLEM THERE'S A SOLUTION!

Third Grade Team — Welcome to Math Madness!!

What is the purpose of the Math Madness Tournament?

The purpose of our Math Madness Tournament is to prepare, motivate, and challenge our third grade students for the PSSA.

Prepare

- Each problem is presented in a similar format to the open-ended questions on the PSSA.
- Responses are scored using the PSSA format.

Challenge

- Students must show their work and explain their answers.
- Problems are aligned with the eligible content developed by PDE.

Motivate

- Students are working together as members of a team.
- Our slogan is used throughout the tournament to help remind students to keep looking for a solution.
- Everyone is recognized for their participation in the tournament.

When will the Math Madness Tournaments be held?

The building tournament window is between February 7—March 4. This time period places the tournament two or more weeks before the PSSA exams. Students will be exposed to the PSSA format for two weeks, and the week before the PSSA exam will be available for review.

Coordinators from each school may schedule the building tournament around the spring holidays and building events.

The Regional Tournament will be held in April, 2011. We are in the process of determining the exact date with the staff of the Grumbacher Sport and Fitness Center.

What is involved in a Math Madness Tournament at my building?

On each day of the nine-day tournament, students complete one open-ended math problem that is

presented using the PSSA format. Students are given fifteen minutes to solve the problem. Students should show all their math work in the blank space provided on the answer sheet, put their answers in the answer boxes, and explain their work in the explanation box.

Classrooms are divided into **heterogeneous** teams of four students. (If needed, three students may be on a team.) This provides an opportunity for all students to be successful. Teams should develop a team name for the tournament.

There are two team problems and seven individual problems.

- The first and ninth rounds are team problems. Each team works together for fifteen minutes and submits **one** answer sheet for the entire team.
- The second through eighth rounds are individual problems. Each individual works for fifteen minutes and turns in one answer sheet.
- Points earned during team and individual rounds go toward the team's cumulative score. Individual cumulative scores only consist of their individual scores.

After the fifteen minute time period, the teacher collects all the answer sheets. After all papers have been collected, the teacher should review the solution to the problem using student input.

All the answer sheets are collected for scoring. (It is important that all students complete the daily problem before they have an opportunity to discuss the problem with other students.)

What materials will we receive for our Math Madness Tournament?

All materials can be found on the Math Madness website (www.mathmadness.info):

- Master set of 9 open-ended problems
- Sample solution for each problem
- Scoring rubric for each problem (on the second page of each problem)
- Sample Certificate of Participation
- Scoring sheet in Microsoft EXCEL format
- Sample problems to use as practice and preparation

What is the cost of the Math Madness Tournaments?

All of the above materials for the building tournaments will be supplied at no cost to you. Each school will be responsible for generating their own copies. Coordinators for each school have the option of providing awards for the Closing Ceremony, according to their own budget.

Each district will be responsible for providing transportation of their students to the Regional Tournament. There is no fee for attending the Regional Tournament.

How will my student responses be scored?

Due to the growing number of participating schools and scheduling limitations of York College Education students, coordinators at each school will need to organize scorers for their school. York College students will not be provided this year for building tournaments.

Buildings may wish to recruit retired teachers and administrators to help with the scoring.

How are the problems for the Math Madness Tournament created?

A Selection Committee consisting of two third grade teachers and one Specialist reviews problems created by York College students majoring in education.

Is it important to have a Closing Celebration in our building?

Yes! This is the culminating event that provides an opportunity for your students to recognize and celebrate that they are ready for the PSSA.

The Closing Celebration should be held on the last day of the tournament. At New Salem our Closing Celebration involves recognition and encouragement:

- Each student is recognized for his/her participation in the tournament. Classroom teachers hand out a personalized Certificate of Participation to each student.
- The leading classroom teams are recognized.
- The top ten individual winners are also recognized.
- Members from the high school basketball team perform a skit and sign autographs.

Most importantly, the Closing Celebration motivates the students because they know that "FOR EVERY PROBLEM THERE IS A SOLUTION!"

What is the Regional Tournament?

The Regional Tournament will be held in April, 2011 at the Grumbacher Sports and Fitness Center at York College of Pennsylvania. Each participating school will send a team of the top four individual scorers from the building tournament to compete against the other elementary teams.

The teams will complete problem solving activities and computational rounds for points. At the end of the tournament, individual and team winners will be recognized.

Who do I contact if I have any questions regarding the Math Madness Tournament?

Please feel free to call us if you have any questions regarding the Math Madness Tournament. We are excited about this wonderful opportunity to ignite your students' enthusiasm for math.

Enjoy Math Madness!!

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Math Madness

Sample problem

Student _____
Team _____
Score _____ Classroom _____

Kerry has four quarters, two dimes, and five nickels. She wants to buy a stuffed animal that costs \$2.50.

Part A

How much more money does she need to buy the stuffed animal?

ANSWER BOX: (Score: 0 or 1)

A. _____

Part B

Bracelets cost \$1.50 less than stuffed animals. If Kerry's sister buys two stuffed animals and a bracelet, how much money will she need to spend?

ANSWER BOX: (Score: 0 or 1)

B. _____

Part C

Kerry's friend decides she wants to buy some items also. She owes the cashier \$2.35 for her toys and \$0.85 for a neat pencil. If she gives the cashier a \$5 bill, how much money will she receive as change?

Write your answer in the **ANSWER BOX**. (Score: 0 or 1)
EXPLAIN the steps you used to find the correct change. (Score: 0 or 1)

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For Scoring Only!

Specific Eligible Content addressed by this item:

- M3.A.1.3.1 Count a collection of bills and coins less than \$5.00
- M3.A.1.3.2 Compare total values of combinations of coins less than \$5.00
- M3.A.1.3.3 Make change for an amount up to \$5.00 with no more than \$2.00 change given

Score	In response to this item, the student-
4	provides correct answer(s) with clear and complete mathematical procedures shown and a correct explanation, as required by the task. Response may contain a minor "blemish" or omission in work or explanation that does not detract from demonstrating a <i>thorough</i> understanding.
3	provides a response and explanation that are mostly complete and correct. The response may have minor errors or omissions that do not detract from demonstrating a <i>general</i> understanding.
2	provides a response that is somewhat correct with <i>partial</i> understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.
1	demonstrates minimal understanding of the mathematical concepts and procedures required by the task.
0	The response has given no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.

Math Madness, Sample Problem
Sample Solution

Kerry has four quarters, two dimes, and five nickels. She wants to buy a stuffed animal that costs \$2.50.

Part A

How much more money does she need to buy the stuffed animal?

ANSWER BOX: (Score: 0 or 1)

A. \$1.05

$$4 \text{ quarters: } \$0.25 + \$0.25 + \$0.25 + \$0.25 = \$1.00$$

$$2 \text{ dimes: } \$0.10 + \$0.10 = \$0.20$$

$$5 \text{ nickels: } \$0.05 + \$0.05 + \$0.05 + \$0.05 + \$0.05 = \$0.25$$

$$\text{Total: } \$1.00 + \$0.20 + \$0.25 = \$1.45$$

$$\text{Difference: } \$2.50 - \$1.45 = \$1.05$$

Part B

Bracelets cost \$1.50 less than stuffed animals. If Kerry's sister buys two stuffed animals and a bracelet, how much money will she need to spend?

ANSWER BOX: (Score: 0 or 1)

B. \$6.00

$$\text{Bracelet: } \$2.50 - \$1.50 = \$1.00$$

$$2 \text{ stuffed animals \& bracelet: } \$2.50 + \$2.50 + \$1.00 = \$6.00$$

Math Madness, Sample Problem Sample Solution

Part C

Kerry's friend decides she wants to buy some items also. She owes the cashier \$2.35 for her toys and \$0.85 for a neat pencil. If she gives the cashier a \$5 bill, how much money will she receive as change?

Cost: $\$2.35 + \$0.85 = \$3.20$

Change: $\$5.00 - \$3.20 = \$1.80$

Write your answer in the **ANSWER BOX**. (Score: 0 or 1)

EXPLAIN the steps you used to find the correct change. (Score: 0 or 1)

First, I added the cost of the toys and the pencil. My total sum was \$3.20. This means she owes the cashier \$3.20. Next, I saw that she gave the cashier \$5.00. To find the change, I needed the difference of those two amounts. I subtracted \$3.20 from \$5.00 to find the difference of \$1.80. The cashier needs to give her \$1.80 back as change.

ANSWER BOX:

\$1.80

For Scoring Only!

Specific Eligible Content addressed by this item:

M3.A.1.3.1 Count a collection of bills and coins less than \$5.00

M3.A.1.3.2 Compare total values of combinations of coins less than \$5.00

M3.A.1.3.3 Make change for an amount up to \$5.00 with no more than \$2.00 change given

Score	In response to this item, the student-
4	provides correct answer(s) with clear and complete mathematical procedures shown and a correct explanation, as required by the task. Response may contain a minor "blemish" or omission in work or explanation that does not detract from demonstrating a <i>thorough</i> understanding.
3	provides a response and explanation that are mostly complete and correct. The response may have minor errors or omissions that do not detract from demonstrating a <i>general</i> understanding.
2	provides a response that is somewhat correct with <i>partial</i> understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.
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MATH GRADE 3 ASSESSMENT - ELIGIBLE CONTENT - 2007

- M3.A.1.1.1 Match word name with appropriate whole number (1-9,999)
- M3.A.1.1.2 Differentiate between and/or give examples of even and odd number (limit to 3 digits)
- M3.A.1.1.3 Compare two whole numbers using $>$, $<$, or $=$ (up to 9,999)
- M3.A.1.1.4 Order set of whole numbers from least to greatest or greatest to least (1-9,999, no more than 4 numbers)
- M3.A.1.1.5 Match a symbolic representation of numbers to appropriate whole numbers (ex. Base ten blocks, H-T-O, etc)
- M3.A.1.2.1 Write fraction that corresponds to drawing or part of set (numerators 1-9, denominators 2-10, no equivalent or improper fractions, or mixed numbers)
- M3.A.1.2.2 Create drawing or set that represents given fraction (num. 1-9, Denom. 2-10, no equiv, improper, or mixed)
- M3.A.1.3.1 Count bills and coins less than \$5.00 (no half dollars) May be shown as 15 cents, 15 c, or \$0.15)
- M3.A.1.3.2 Compare total values of combinations of coins less than \$5.00. (no half dollars)
- M3.A.1.3.3 Make change for amount up to \$5.00 w/ no more than \$2.00 change given (no half dollars)
- M3.A.2.1.1 Represent multiplication as repeated addition multiplication as repeated addition
- M3.A.2.1.2 Demonstrate inverse relationship between addition and subtraction using fact families and/or factors
- M3.A.2.1.3 Identify correct operation to solve word problem (no more than 2 operations using +, - and/or X)
- M3.A.3.1.1 Solve single and double digit addition and subtraction problems with and without regrouping in vert. & horiz. Form
- M3.A.3.1.2 Solve problems involving multiplication through the 9's tables through 9×5
- M3.A.3.1.3 Solve triple digit addition and subtraction problems without regrouping in vert. and horiz. form
- M3.A.3.2.1 Estimate sums & differences of quantities; round 2-digit numbers nearest 10, and 3 digit numbers to nearest 100, before computing (limit to two numbers)
- M3.B.1.1.1 Tell/show time (analog) to the minute
- M3.B.1.1.2 Find elapsed time to increments of 5 mins (limited to 2 adjacent hours)

- M3.B.1.1.3 Identify times of the day and night as AM and PM
- M3.B.1.2.1 Select appropriate unit for attribute being measured
- M3.B.1.2.2 Compare and/or order objects according to length, area, or weight
- M3.B.2.1.1 Use a ruler to measure to the nearest $\frac{1}{2}$ inch
- M3.B.2.2.1 Match object with its approximate measurement (using same system)
- M3.C.1.1.1 Name/identify/describe geometric shapes in two dimensions (circle, rectangle, triangle, pentagon, hexagon, octagon)
- M3.C.1.1.2 Name/identify geometric shapes in three dimensions (sphere, cube, cylinder, cone, pyramid, rectangular prism)
- M3.C.2.1.1 Identify/draw one line of symmetry in a two-dimensional figure
- M3.C.2.1.2 Identify symmetrical two-dimensional shapes
- M3.D.1.1.1 Extend or find a missing element in a pattern of numbers or shapes (pattern must show 3 repetitions - if multiples are used, limit to 2, 3, or 5)
- M3.D.1.1.2 Identify/describe the rule for a pattern shown (pattern must show 3 repetitions - if mult. are used limit to 2, 3, or 5)
- M3.D.2.1.2 Create or match story to given combination of symbols (+, -, x, <, >, =) and numbers
- M3.D.2.1.2 Choose number sentence that matches given story (one operation, + or- only)
- M3.D.2.2.1 Find missing number that makes a number sentence true (1-digit or 2-digit numbers up to 18 using +, -, or x through 9×5)
- M3.D.2.2.2 Identify missing symbol (+, -, =, <, >) that makes num. sent true
- M3.E.1.1.1 Analyze data shown on tables, charts, or bar graphs using concepts of largest, smallest, most often, least often and middle
- M3.E.1.1.2 Describe, interpret and/or answer questions based on data shown in tables, charts or bar graphs
- M3.E.1.2.1 Graph data or complete graph given the data (grid is provided)
- M3.E.1.2.2 Translate information from one type of display to another (ex. Convert tally chart to bar graph) Limit to tally charts, bar graphs, and tables

Information was taken from PA Dept of Ed - Assessment Anchors & Eligible Content
Compiled by Karen Baum