**CAREING FOR MATHSHARK**

**Battery Installation**

1. Open the battery compartment door by carefully loosening the screw with a screwdriver.
2. Install two fresh AA alkaline batteries, following the illustration inside the battery compartment.
   - Batteries must be installed with the correct polarity.
   - Only batteries of the same or equivalent type are to be used.
   - Alkaline batteries are preferable.
   - Do not mix old and new batteries.
   - Do not mix different types of batteries: alkaline, standard (carbon zinc), or rechargeable (nickel-cadmium) batteries.
   - Do not use rechargeable batteries.
   - The supply terminals must not be short-circuited.
   - Non rechargeable batteries are not to be recharged.
   - Remove exhausted batteries from the unit.
3. Close the compartment door and tighten the screw.
4. To prevent battery corrosion, it is recommended the batteries be removed from the unit if it is not in use for two weeks.

**Cleaning**

Clean with a damp or dry cloth. Do not immerse MathShark in water. Do not spray any liquid or water on MathShark.

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**MathShark®**

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Why is MathShark an Important Learning Tool?
Mathematics skills are useful throughout our lives. Teaching strategies may change, yet most educators agree that acquiring mathematics skills means learning to:

- apply math skills outside the classroom
- develop problem-solving techniques
- inquire, analyze, and reason mathematically
- communicate mathematically

MathShark’s fast, continuous drill games and instant feedback give students the basic tools they need to reason and problem-solve accurately and effectively—inside and outside the classroom.

SUGGESTIONS FOR USE
MathShark can be useful in many ways. Some suggestions for incorporating MathShark in the home or classroom are listed below:

In the Home
- Have children spend 15-30 minutes on MathShark drill games as part of their homework schedule. The ASSESSMENT chart on pages 10-11 can help parents and children keep track of skills review or mastery.
- Make MathShark a traveling companion—MathShark can fit in a backpack and travel by car, train, bus, or plane.
- Encourage players to keep track of their scores (on the ASSESSMENT chart or another piece of paper) and try to improve their times.
- Challenge family members to a friendly MathShark competition. Players choose a SKILL and a LEVEL and see who gets the best time.
- Substitute MathShark for TV and see what happens!

In the Classroom
- Use MathShark as an individual skill builder. Five or ten minutes with MathShark turns “free time” into a productive learning experience.
- Make MathShark a permanent feature in any Math Learning Center.
- Use MathShark for cooperative learning. Pair students and have them take turns drilling basic math facts or specific skills and keeping a record of their times.
- Use the MathShark ASSESSMENT chart on pages 10-11 to track students’ progress.
- Encourage students to track their own progress by comparing their times for the first game they play at each level with games played after using the drills practice.
MathShark®’s Special Features

**LIGHTS**
A flash of the green light means the answer is correct; a flash of the red light means it is incorrect.

**ON/OFF**
Use this button to turn MathShark ON and OFF.

**LEARNING/CALCULATOR**
Use this button to choose a mode.

**SKILL**
In the LEARNING mode, press one of these buttons to select a skill —ADD, SUBTRACT, MULTIPLY, or DIVIDE.

**NUMERAL BUTTONS**
Use these to input answers.

**DECIMAL BUTTON**
Use this to input a decimal.

**FRACTION BUTTON**
Use this to input a fraction.

**FUNCTION**
Press a key to add, subtract, multiply, or divide.

**CLR**
To change an answer, use the CLR button to erase the most recent number input.

**HELP**
Help offers tips, steps, or alternate ways to look at a problem. Visualization is an important part of mental math. When applicable, MathShark gives learners two ways to look at a problem.

**SCREEN**
Greetings, selection menus, examples, math problems, skill level, and elapsed time appear on the screen. In the LEARNING mode, problems will show in either vertical or horizontal format.

**ENTER**
Press this button to enter answers in the LEARNING mode or to find the answer in the CALCULATOR mode.

**SKILL**
In the LEARNING mode, press one of these buttons to select a skill —FRACTIONS, DECIMALS, or PERCENTS.

**ON/OFF**
Use this button to turn MathShark ON and OFF.

**LEARNING/CALCULATOR**
Use this button to choose a mode.

**NUMERAL BUTTONS**
Use these to input answers.

**DECIMAL BUTTON**
Use this to input a decimal.

**FRACTION BUTTON**
Use this to input a fraction.

**CLR**
To change an answer, use the CLR button to erase the most recent number input.

**HELP**
The HELP button can also be used to adjust the display CONTRAST on your screen. Turn MathShark on and press HELP during the opening screen. Use the + and – buttons to adjust contrast for maximum visibility. Press ENTER to return to the main menu.
**HOW TO USE MATHSHARK®**

MathShark is two fully functional learning tools in one! Press ON to start MathShark. It will come on in LEARNING mode unless you press CALCULATOR.

**For CALCULATOR**
1. Press CALCULATOR.
2. Input the first number.
3. Press a function key (+ - x ÷).
4. Input the next number.
5. Press ENTER and the answer will show.
7. Press CALCULATOR or CLR to begin a new problem.

**For LEARNING**
1. Press LEARNING if you are in CALCULATOR mode.
2. Select SOUNDS ON or OFF. To silence MathShark’s tones, press CLR at this menu. To hear them, press ENTER and proceed.
3. Choose one of seven skills: ADD, SUBTRACT, MULTIPLY, DIVIDE, FRACTIONS, DECIMALS, PERCENTS.
4. Choose a LEVEL from 1 to 8.

**ADD, SUBTRACT, MULTIPLY, and DIVIDE** begin by drilling basic facts:

- **Level 1**—drills facts for a specific number in sequential order, for example: 1 + 1, 2 + 1, 3 + 1
- **Level 2**—drills facts for a specific number in random order, for example: 4 + 2, 8 + 2, 3 + 2

At Level 1 or Level 2, player chooses NUMBER TO DRILL.

For example: To drill basic multiplication facts for 6, choose MULTIPLY, LEVEL 1, DRILL NUMBER 6.

- **Level 3**—mixes the number facts drilled in random order, for example: 5 + 1, 6 + 4, 2 + 9
- **Levels 4–8**—provide programmed math problems in a skill area in progressive sequence. (See examples in Content by Skill Levels.)
  ADD, SUBTRACT, MULTIPLY on Level 8, and DIVIDE on Levels 7 and 8—introduce pre-algebra skills by having players find the missing number in a math problem.

**DECIMALS, FRACTIONS, and PERCENTS** on Levels 1–8—provide skills practice in increasing difficulty.

5. After choosing SKILL and LEVEL, screen displays EXAMPLES.
6. Press ENTER to start a game, or CLR to choose a different SKILL or LEVEL.
7. First problem appears. Input an answer, then press ENTER. To enter a fraction, use the A/B button. To enter a decimal, use the button.

The HELP button offers a visual clue. The HELP screen might display the problem in another way or provide a hint to getting the correct answer. After using the HELP screen, press HELP again (or CLR or ENTER) to return to the problem screen and ENTER an answer.

8. If the answer is correct, the green light flashes and the correct answer tone plays.
9. If the answer is incorrect, the red light flashes and the incorrect answer beep plays. The correct answer flashes and the problem recycles into the game. Play continues until all 10 problems are answered correctly (even if it takes 50 tries!).
10. At the end of each game, the screen displays a congratulatory message and the elapsed time.

11. Make one of these selections:
   - advance to the NEXT game, press +,*
   - repeat the SAME game, press ENTER.
   - CHANGE skills by returning to the main menu, press CLR. To change levels, press CLR, choose a SKILL, then choose a LEVEL. (To change SKILL during a game, press LEARNING to return to the main menu.)

* In ADD, SUBTRACT, MULTIPLY, and DIVIDE on Levels 1 and 2, MathShark will advance to the next LEVEL after the highest drill number is completed. All other levels and skills will repeat continuously until CLR is chosen from the end-of-game menu.

To conserve batteries, MathShark is set to “go to sleep” after 300 seconds, or five minutes. Pressing any button will “wake up” MathShark. When player completes a game after waking up MathShark, the elapsed time at the end will say 300 SECS, the maximum time.
MathShark® Content by Skill Levels

The MathShark Skills Scope and Sequence Chart on pages 20–21 gives an overall look at content in each skill and on each level.

The following pages provide a definition of the content for each skill and level, plus some example problems. You may want to use the examples to introduce a new or difficult concept. You might also want to make a reproducible sheet of problems for practice or for assessment.

For teacher assessment, use the reproducible ASSESSMENT chart on pages 10–11 to keep track of each player’s mastery. Students or parents can use the chart to keep track of individual achievements.

ADD

**Level 1**

Basic addition facts 0–9 in sequential order.
Player selects number to drill.

**Level 2**

Basic addition facts 0–9 in non-sequential order.
Player selects number to drill.

**Level 3**

Basic addition facts 0–9 in non-sequential order.
Drill numbers are randomly mixed.

**Level 4**

Add 2-digit addends to 1-digit addends without regrouping.

**Level 5**

Add 2-digit addends to 2-digit addends without regrouping.

**Level 6**

Add three 1-digit addends.

**Level 7**

Add 2-digit addends to either a 1-digit addend or another 2-digit addend with regrouping.

**Level 8**

Introduces the pre-algebra concept of finding the missing addend (shown as ?). To find the missing addend, subtract the known addend from the sum.

---

You may want to offer one of these suggestions for mental reminders in adding three numbers:
- always add the first two numbers, then add the sum to the third.
- always add the easier two numbers, then add the sum to the third.
<table>
<thead>
<tr>
<th>Level</th>
<th>ADD</th>
<th>SUBTRACT</th>
<th>MULTIPLY</th>
<th>DIVIDE</th>
<th>DECIMALS</th>
<th>FRACTIONS</th>
<th>PERCENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Level 3</td>
<td></td>
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</tr>
<tr>
<td>Level 4</td>
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<tr>
<td>Level 5</td>
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</tr>
<tr>
<td>Level 6</td>
<td></td>
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</tr>
<tr>
<td>Level 7</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Level 8</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Multiply

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic multiplication facts</strong></td>
<td>1–12 in sequential order. Player selects number to drill.</td>
<td>5 x 5 = 25</td>
</tr>
<tr>
<td><strong>Basic multiplication facts</strong></td>
<td>1–12 in non-sequential order. Player selects number to drill.</td>
<td>6 x 5 = 30</td>
</tr>
<tr>
<td><strong>Basic multiplication facts</strong></td>
<td>1–12 in non-sequential order. Drill numbers are randomly mixed. and include multiplication by numbers through 12.</td>
<td>2 x 5 = 10</td>
</tr>
<tr>
<td><strong>Subtract 2-digit numbers from 2- and 3-digit numbers without regrouping.</strong></td>
<td></td>
<td>5 x 3 = 15</td>
</tr>
<tr>
<td><strong>Subtract 2-digit numbers from 2- and 3-digit numbers with regrouping.</strong></td>
<td></td>
<td>9 x 2 = 18</td>
</tr>
<tr>
<td><strong>Multiply 1-digit or 2-digit numbers by a number ending in one or two zeros.</strong></td>
<td></td>
<td>100 x 4 = 400</td>
</tr>
<tr>
<td><strong>Multiply three 1-digit factors.</strong></td>
<td></td>
<td>5 x 6 x 2 = 60</td>
</tr>
</tbody>
</table>

You may want to offer one of these suggestions for mental reminders in multiplying three factors:

- multiply the *first* two factors, then multiply the product by the third.
- multiply the *easier* two factors, then multiply the product by the third.

### Subtract

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic subtraction facts</strong></td>
<td>0–9 in sequential order. Player selects number to drill.</td>
<td>5 – 2 = 3</td>
</tr>
<tr>
<td><strong>Basic subtraction facts</strong></td>
<td>0–9 in non-sequential order. Player selects number to drill.</td>
<td>13 – 8 = 5</td>
</tr>
<tr>
<td><strong>Basic subtraction facts</strong></td>
<td>0–9 in non-sequential order. Drill numbers are randomly mixed.</td>
<td>5 – 3 = 2</td>
</tr>
<tr>
<td><strong>Subtract 1-digit numbers from 2-digit numbers without regrouping.</strong></td>
<td></td>
<td>25 – 4 = 21</td>
</tr>
<tr>
<td><strong>Subtract 2-digit numbers from 2- and 3-digit numbers without regrouping.</strong></td>
<td></td>
<td>654 – 13 = 641</td>
</tr>
<tr>
<td><strong>Subtract 1-digit numbers from 2-digit numbers with regrouping.</strong></td>
<td></td>
<td>43 – 9 = 34</td>
</tr>
<tr>
<td><strong>Subtract 2-digit numbers from 2- and 3-digit numbers with regrouping.</strong></td>
<td></td>
<td>92 – 58 = 34</td>
</tr>
<tr>
<td><strong>Introduces the pre-algebra concept of finding the missing number in subtraction problems.</strong></td>
<td></td>
<td>79 – ? = 23</td>
</tr>
</tbody>
</table>
Level 7

Multiply 2-digit numbers by 1-digit numbers with regrouping.

47 × 3 = 62
58 × 2 = x 6

You might want to encourage players to use their estimating skills at this level. Estimation is a valuable tool in mental math. Remind players to enter the complete answer from left to right.

Level 8

Introduces the pre-algebra concept of finding the missing factor (shown as ?) in multiplication.

33 × ? = 132
? × 47 = 94

To find the missing factor, divide the product by the known factor.

Level 1

Basic division facts 1–12 in sequential order. Player selects number to drill.

2 ÷ 2 = 4 ÷ 2 =

Level 2

Basic division facts 1–12 in non-sequential order. Player selects number to drill.

9 ÷ 3 = 15 ÷ 3 =

Level 3

Basic division facts 1–12 in non-sequential order. Drill numbers are randomly mixed and include divisors through 12.

108 ÷ 12 = 18 ÷ 2 =

Level 4

Divide numbers ending in zero by 10 or numbers ending in two zeros by 100.

560 ÷ 10 = 200 ÷ 100 =

Level 5

3-digit numbers divided by 1-digit numbers without regrouping.

364 ÷ 4 = 339 ÷ 3 =

Level 6

2-digit numbers divided by 1-digit numbers with regrouping.

78 ÷ 3 = 80 ÷ 5 =

Level 7

Introduces the pre-algebra concept of finding the missing divisor (shown as ?).

60 ÷ ? = 3 48 ÷ ? = 6

Level 8

Introduces the pre-algebra concept of finding the missing dividend (shown as ?).

? ÷ 4 = 6 ? ÷ 2 = 32

To find the missing dividend, multiply the two factors.
**DECIMALS**

Before beginning work in the DECIMALS skills, make sure player knows how to use the 📅 button to enter a decimal: enter the whole number, press the 📅 button, then enter the decimal numbers.

**Level 1**  
Add tenths.  
0.2 + 0.3 = 0.4 + 0.6 =

**Level 2**  
Subtract tenths.  
0.3 – 0.1 = 0.8 – 0.6 =

**Level 3**  
Add hundredths.  
0.10 + 0.01 = 0.20 + 0.12 =

Remind players to determine the answer “mentally” and enter the complete answer.

**Level 4**  
Subtract hundredths.  
0.28 – 0.14 = 0.34 – 0.22 =

**Level 5**  
Add decimals greater than 1.  
1.13 + 0.42 = 3.34 + 0.13 =

**Level 6**  
Subtract decimals greater than 1.  
4.24 – 0.12 = 8.83 – 7.70 =

**Level 7**  
Multiply with decimals.  
2 x 0.2 = 0.10 x 0.10 =

**Level 8**  
Divide with decimals.  
0.25 ÷ 5 = 0.28 ÷ 0.07 =

---

**FRACTIONS**

Before beginning work in the FRACTIONS skills, make sure player knows how to use the A/B button to enter a fraction: enter the numerator, press the A/B button, then enter the denominator.

**Level 1**  
Simplify fractions. Once players have learned to simplify fractions in LEVEL 1, all answers for LEVELS 2-8 must be simplified.

\[
\frac{4}{16} = \frac{90}{100} =
\]

**Level 2**  
Add fractions with like denominators, answers not over 1.

\[
\frac{1}{8} + \frac{2}{8} = \frac{1}{3} + \frac{1}{9} \\
\frac{1}{6} + \frac{4}{6} = \frac{1}{3} + \frac{1}{9}
\]

As FRACTIONS levels advance, remind players to use this 3-step process:
1. Input their answer as a fraction, but do not press ENTER.
2. Look at the fraction and ask: “Can it be simplified?”
3. If the answer is “yes,” players can use CLR to erase their answer and input it again in simplified form.

**Level 3**  
Subtract fractions with like denominators.

\[
\frac{3}{4} - \frac{2}{4} = \frac{5}{9} - \frac{5}{6} \\
\frac{3}{7} - \frac{1}{7} = \frac{-4}{9} - \frac{-3}{6}
\]

**Level 4**  
Add fractions with unlike denominators.

\[
\frac{1}{3} + \frac{3}{6} = \frac{1}{2} + \frac{1}{6} \\
\frac{3}{5} + \frac{1}{10} = \frac{1}{4} + \frac{2}{3}
\]

To add and subtract unlike fractions, rename the fractions as equivalent fractions with common denominators.
**Level 5**

Subtract fractions with unlike denominators.

\[
\frac{1}{3} - \frac{1}{6} = \frac{3}{5} - \frac{1}{10} =
\]

**Level 6**

Multiply fractions with unlike denominators.

\[
\frac{1}{2} \times \frac{2}{3} = \frac{5}{8} \times \frac{2}{3} \\
\frac{1}{5} \times \frac{1}{10} = \frac{1}{4} \times \frac{1}{6}
\]

To multiply unlike fractions: first multiply the numerators (top numerals in the fraction); then multiply the denominators (bottom numerals in the fraction), and simplify.

**Level 7**

Multiply fractions and whole numbers.

\[
\frac{3}{4} \times 4 = 5 \times \frac{1}{5} =
\]

To multiply a fraction by a whole number, write the whole number as a fraction: \(4 = \frac{4}{1}\). Then, as in Level 6, first multiply the two numerators, then the denominators.

**Level 8**

Divide fractions and whole numbers.

\[
\frac{3}{4} \div \frac{1}{8} = 4 \div \frac{1}{2} =
\]

To divide fractions, invert the second number (the divisor), then multiply.

**PERCENTS**

**Level 1**

Write percents as equivalent fractions.

24% = 13% =

**Level 2**

Write percents as equivalent decimals.

76% = 99% =

**Level 3**

Find 1% or 10% of whole numbers.

10% of 25 = 1% of 100 =

**Level 4**

Find 25%, 50%, or 100% of whole numbers.

25% of 200 = 50% of 150 =

**Level 5**

Find 5%, 20%, or 75% of whole numbers.

5% of 200 = 75% of 400 =

**Level 6**

Find percentages ending in zero (excluding 10%, 20%, and 50%) of whole numbers with zero after the first numeral.

40% of 40 = 90% of 600 =

**Level 7**

Complete the math sentence by finding the missing number.

? % of 100 = 50 ? % of 100 = 25

**Level 8**

Complete the math sentence by finding the missing number.

100% of ? = 234 25% of ? = 4
# MathShark®

## Skills Scope and Sequence Chart

<table>
<thead>
<tr>
<th>Level</th>
<th>ADD</th>
<th>SUBTRACT</th>
<th>MULTIPLY</th>
<th>DIVIDE</th>
<th>DECIMALS</th>
<th>FRACTIONS</th>
<th>PERCENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong></td>
<td>Basic facts, selected number, sequential</td>
<td>Basic facts, selected number, sequential</td>
<td>Basic facts, selected number, sequential</td>
<td>Basic facts, selected number, sequential</td>
<td>ADD tenths</td>
<td>Simplify fractions</td>
<td>Write equivalent fractions</td>
</tr>
<tr>
<td><strong>Level 2</strong></td>
<td>Basic facts, selected number, non-sequential</td>
<td>Basic facts, selected number, non-sequential</td>
<td>Basic facts, selected number, non-sequential</td>
<td>Basic facts, selected number, non-sequential</td>
<td>SUBTRACT tenths</td>
<td>ADD fractions with like denominators</td>
<td>Write equivalent decimals</td>
</tr>
<tr>
<td><strong>Level 3</strong></td>
<td>Basic random facts, non-sequential</td>
<td>Basic random facts, non-sequential</td>
<td>Basic random facts, non-sequential</td>
<td>Basic random facts, non-sequential</td>
<td>ADD hundredths</td>
<td>SUBTRACT fractions with like denominators</td>
<td>Identify 1% or 10% of whole numbers</td>
</tr>
<tr>
<td><strong>Level 4</strong></td>
<td>2-digits plus 1-digit, no regrouping</td>
<td>2-digits minus 1-digit, no regrouping</td>
<td>2-digits by 1-digit, no regrouping</td>
<td>Dividing with zeros</td>
<td>SUBTRACT hundredths</td>
<td>ADD fractions with unlike denominators</td>
<td>Identify 25%, 50%, or 100% of whole numbers</td>
</tr>
<tr>
<td><strong>Level 5</strong></td>
<td>2-digits plus 2-digits, no regrouping</td>
<td>2-digits or 3-digits minus 2-digits, no regrouping</td>
<td>1-digit or 2-digits by factors with zero</td>
<td>3-digits divided by 1-digit, no regrouping</td>
<td>ADD decimals greater than 1</td>
<td>SUBTRACT fractions with unlike denominators</td>
<td>Identify 5%, 20%, or 75% of whole numbers</td>
</tr>
<tr>
<td><strong>Level 6</strong></td>
<td>Three 1-digit addends</td>
<td>2-digits minus 1-digit, with regrouping</td>
<td>Three 1-digit factors</td>
<td>2-digits divided by 1-digit, with regrouping</td>
<td>SUBTRACT decimals greater than 1</td>
<td>MULTIPLY fractions with unlike denominators</td>
<td>Find percents in numbers ending with zeros</td>
</tr>
<tr>
<td><strong>Level 7</strong></td>
<td>2-digits plus 1-digit and 2-digits plus 2-digits, with regrouping</td>
<td>2-digits or 3-digits minus 2-digits, with regrouping</td>
<td>2-digits by 1-digit, with regrouping</td>
<td>Find the missing divisor</td>
<td>MULTIPLY with decimals</td>
<td>MULTIPLY fractions and whole numbers</td>
<td>Find the missing percentage</td>
</tr>
<tr>
<td><strong>Level 8</strong></td>
<td>Find the missing addend</td>
<td>Find the missing subtrahend or minuend</td>
<td>Find the missing factor</td>
<td>Find the missing dividend</td>
<td>DIVIDE with decimals</td>
<td>DIVIDE fractions and whole numbers</td>
<td>Find the missing number</td>
</tr>
</tbody>
</table>