



MATH DITTOS 2:

Fact Controlled

ADDITION & SUBTRACTION

for Special Learners

Version 2.9.3

The **MATH DITTOS 2** series is a unique, fact supported approach to teaching computation. Each page in the series presents a limited number of problems with plenty of workspace. The facts necessary to complete each problem are always presented on the page in a fact reference and practice section.

The **MD2** series currently consists of three "workbooks" published as computer documents in the Adobe PDF format, requiring only the free Adobe Reader. A fourth is under development.

- MATH DITTOS 2: Fact Controlled **ADDITION & SUBTRACTION** for Special Learners teaches addition and subtraction simultaneously using a unique "cluster" approach.
- MATH DITTOS 2: Fact Controlled **MULTIPLICATION** for Special Learners presents multiplication in a careful, step-by-step, fact supported approach.
- MATH DITTOS 2: Fact Controlled **SUBTRACTION** for Special Learners can be effectively used for initial instruction in subtraction with fact support and word problems. It is quite effective for the reteach that older students beginning long division frequently need.
- MATH DITTOS 2: Fact Controlled **DIVISION** for Special Learners is still under development. A few pre-release pages are available for registered users of other MD2 products.

The concept behind the MD2 series is the same one we've used for years in reading, using a "controlled vocabulary." The vocabulary in this context is the basic facts. Each page is limited to only the facts (much like new vocabulary) presented in a fact cluster. The facts are presented, practiced, and applied to computation.

MATH DITTOS 2: Fact Controlled ADDITION & SUBTRACTION for Special Learners (FCAS) is a remedial, "ground-up" reteach of addition and subtraction. It is unique in that it supplies comprehensive fact support. Addition & subtraction facts are presented in 45 "clusters," including the fact and its complement. Practice problems are controlled, or limited, to the clusters shown on each page, allowing for review of the facts, a prompt for unknown facts, and, most importantly, allowing the student to progress operationally even though facts are not mastered. Students who have not, or **can not**, master their facts may continue to learn the processes of addition and subtraction with fact control. While designed specifically with special learners in mind, FCAS is also a valid tool for teaching computation skills to regular education students.

Each regular cluster includes only three digits. For example, cluster 19 is comprised of 3, 4, and 7 only. Students quickly learn to look for the three-number pattern. The 9 short clusters (such as cluster 18, also pictured at the right) use the same three-number pattern.

MATH					15
CLUSTERS 14-19					
Name	Date				
<div> <div>CLUSTER 14</div> <div> $\begin{array}{r} 2 \ 6 \\ +6 \ +2 \\ \hline 8 \ 8 \\ -2 \ -6 \end{array}$ </div> </div>	$\begin{array}{r} 987 \\ -264 \\ \hline \end{array}$	<div> <div>CLUSTER 16</div> <div> $\begin{array}{r} 3 \ 4 \\ +4 \ +3 \\ \hline 7 \ 7 \\ -3 \ -4 \end{array}$ </div> </div>	$\begin{array}{r} 976 \\ -243 \\ \hline \end{array}$	<div> <div>CLUSTER 15</div> <div> $\begin{array}{r} 2 \ 7 \\ +7 \ +2 \\ \hline 9 \ 9 \\ -2 \ -7 \end{array}$ </div> </div>	
$\begin{array}{r} 293 \\ +423 \\ \hline \end{array}$	$\begin{array}{r} 1,180 \\ -938 \\ \hline \end{array}$	$\begin{array}{r} 79 \\ +22 \\ \hline \end{array}$	$\begin{array}{r} 117 \\ -93 \\ \hline \end{array}$	$\begin{array}{r} 722 \\ +248 \\ \hline \end{array}$	
$\begin{array}{r} 362 \\ +428 \\ \hline \end{array}$	$\begin{array}{r} 811 \\ -202 \\ \hline \end{array}$	$\begin{array}{r} 236 \\ +732 \\ \hline \end{array}$	$\begin{array}{r} 910 \\ -708 \\ \hline \end{array}$	$\begin{array}{r} 242 \\ +736 \\ \hline \end{array}$	
$\begin{array}{r} 238 \\ +632 \\ \hline \end{array}$	$\begin{array}{r} 990 \\ -762 \\ \hline \end{array}$	$\begin{array}{r} 459 \\ +322 \\ \hline \end{array}$	$\begin{array}{r} 908 \\ -222 \\ \hline \end{array}$	$\begin{array}{r} 372 \\ +329 \\ \hline \end{array}$	
<div> <div>CLUSTER 16</div> <div> $\begin{array}{r} 2 \ 8 \\ +8 \ +2 \\ \hline 10 \ 10 \\ -2 \ -8 \end{array}$ </div> </div>	$\begin{array}{r} 978 \\ -242 \\ \hline \end{array}$	<div> <div>CLUSTER 18</div> <div> $\begin{array}{r} 3 \ 6 \\ +3 \ -3 \end{array}$ </div> </div>	$\begin{array}{r} 771 \\ -432 \\ \hline \end{array}$	<div> <div>CLUSTER 17</div> <div> $\begin{array}{r} 2 \ 9 \\ +9 \ +2 \\ \hline 11 \ 11 \\ -2 \ -9 \end{array}$ </div> </div>	

CLUSTER 19

$$\begin{array}{r} 3 \ 4 \\ +4 \ +3 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \ 7 \\ -3 \ -4 \\ \hline \end{array}$$

CLUSTER 18

$$\begin{array}{r} 3 \ 6 \\ +3 \ -3 \\ \hline \end{array}$$

Initial instruction can be enhanced with any manipulative.

Facts are presented sequentially, omitting the zeros, from the 1+'s to the 9+'s.

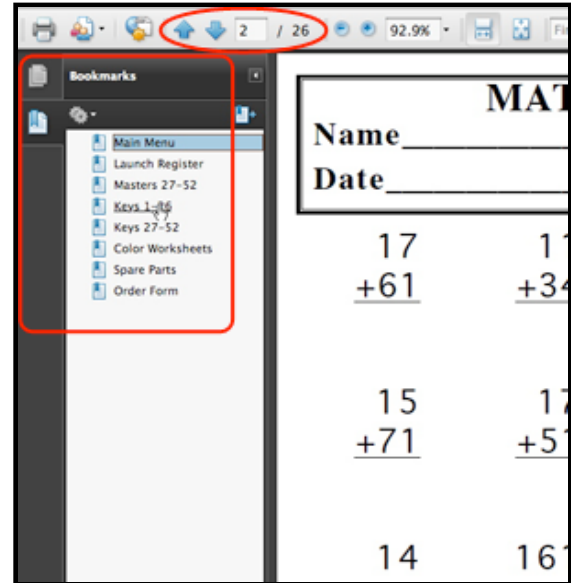
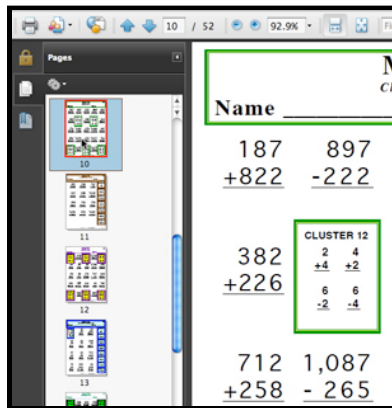
Subtraction facts are included with their addition complement.

After initial fact drill, clusters should be completed and checked **before** completion of the page problems. A quick examination of each page prior to assignment should reveal anything new (ie., carrying, borrowing, long column addition). A set of No Fact pages that follow the cluster fact presentation order are included for checking student performance.

Navigation

To move from section to section (i.e., from blacklines to answer keys) inside MATH DITTOS 2: Fact Controlled ADDITION & SUBTRACTION for Special Learners, use the bookmarks on the left of the Adobe Reader window. Use the up or down arrows

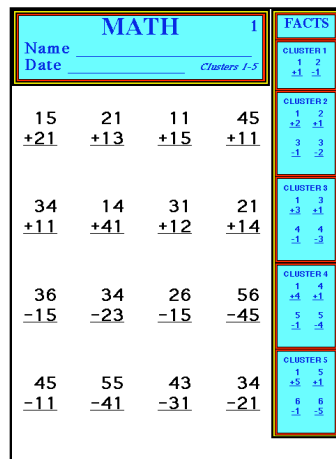
on the toolbar to move from page to page. Within sections, you may also just type in the desired page number and hit return to access a specific page.



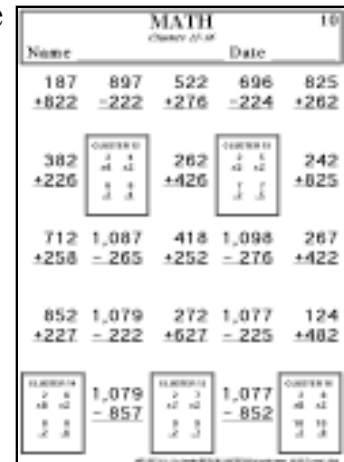
You may also use the thumbnail guide on the left of the page to navigate to specific pages within a section.

What do you get?

Blackline Masters: A set of 52 blackline worksheets is the core of MATH DITTOS 2: Fact Controlled ADDITION & SUBTRACTION for Special Learners. Each page presents students with a set of fact clusters to be completed and checked before attempting the practice problems on the page. Practice problems employ only the facts presented in the clusters on that page.



Color Masters: A matching set of color worksheets with identical numerical content to the blackline masters is also provided. I found that my students who could handle the color on the page seemed more enthusiastic in doing the color pages over the black and white ones.



Answer Keys: A set of full-size answer keys is also provided. Answers are set in red outline type, but will print nicely in black and white if you wish. I keep a couple of printed answer books available for both my use and for student grading.

SPARE PARTS:

This is where I've placed all the extras.

MATH			
Name	Date		
43	63	83	35
+33	+35	+37	+93
28	27	34	93
+63	+43	+84	+34
86	127	108	119
-43	-34	-35	-83
80	119	82	101
-37	-86	-39	-33

“No Fact” pages: Although no clusters appear on these pages, facts are still controlled following the clusters in the regular masters. The no fact pages make a great posttest for each set of facts.

Novelty Pages: These are a few pages where I gave in and jazzed them up a bit. The “Dino” review pages were created to add a bit of zip to the subtraction review pages.

They appear at the end of the spare parts section.

3
+6
Actual size

Small Flashcards: A set of small addition and subtraction flashcard masters are included. There are 18 facts per page. The inverse of each fact is also included (i.e., 2+3, 3+2, and 5-2, 5-3).

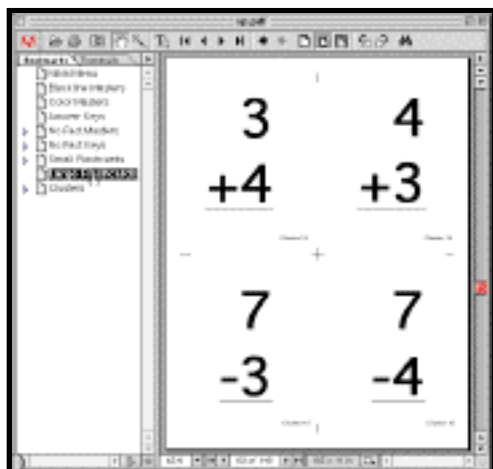
The individual cards cut to approximately 2” x 3”, so that they can easily fit in a student’s pocket. That gives them at least a 50-50 chance of making it home with

the student.

MATH			
Name	Date		
109	698	739	
-87	-375	-232	
22	323	971	
238	90	543	1,181
+732	-32	+335	-239
970	58	878	942
529	897	233	107
+342	-523	+953	-24
871	374	1186	83
237	1,176	248	80
+852	-943	+732	-38
1089	233	980	42
918	869	332	
-325	-332	537	
593	537		

MATH		
NAME	DATE	
1,754	10,000	3,106
-897	-4,601	-1,129
90,183	25,220	80,121
-59,092	-717	-9,037
8,426	46,003	12,715
-4,768	-45,994	-4,815

+1	-2	+2
-1	+3	-1
+3	-4	+1
-4	+5	-2
+5	-6	+3
-6	+7	-4
+7	-8	+5
-8	+9	-6
+9	-10	+7
-10	+11	-8
+11	-12	+9
-12	+13	-10
+13	-14	+11
-14	+15	-12
+15	-16	+13
-16	+17	-14
+17	-18	+15
-18	+19	-16
+19	-20	+17
-20	+21	-18
+21	-22	+19
-22	+23	-20
+23	-24	+21
-24	+25	-22
+25	-26	+23
-26	+27	-24
+27	-28	+25
-28	+29	-26
+29	-30	+27
-30	+31	-28
+31	-32	+29
-32	+33	-30
+33	-34	+31
-34	+35	-32
+35	-36	+33
-36	+37	-34
+37	-38	+35
-38	+39	-36
+39	-40	+37
-40	+41	-38
+41	-42	+39
-42	+43	-40
+43	-44	+41
-44	+45	-42
+45	-46	+43
-46	+47	-44
+47	-48	+45
-48	+49	-46
+49	-50	+47
-50	+51	-48
+51	-52	+49
-52	+53	-50
+53	-54	+51
-54	+55	-52
+55	-56	+53
-56	+57	-54
+57	-58	+55
-58	+59	-56
+59	-60	+57
-60	+61	-58
+61	-62	+59
-62	+63	-60
+63	-64	+61
-64	+65	-62
+65	-66	+63
-66	+67	-64
+67	-68	+65
-68	+69	-66
+69	-70	+67
-70	+71	-68
+71	-72	+69
-72	+73	-70
+73	-74	+71
-74	+75	-72
+75	-76	+73
-76	+77	-74
+77	-78	+75
-78	+79	-76
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+81	-82	+79
-82	+83	-80
+83	-84	+81
-84	+85	-82
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-86	+87	-84
+87	-88	+85
-88	+89	-86
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+93	-94	+91
-94	+95	-92
+95	-96	+93
-96	+97	-94
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-100	+101	-98
+101	-102	+99
-102	+103	-100
+103	-104	+101
-104	+105	-102
+105	-106	+103
-106	+107	-104
+107	-108	+105
-108	+109	-106
+109	-110	+107
-110	+111	-108
+111	-112	+109
-112	+113	-110
+113	-114	+111
-114	+115	-112
+115	-116	+113
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+147	-148	+145
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+153	-154	+151
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+185	-186	+183
-186	+187	-184
+187	-188	+185
-188	+189	-186
+189	-190	+187
-190	+191	-188
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-194	+195	-192
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+255	-256	+253
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+257	-258	+255
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+259	-260	+257
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+261	-262	+259
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+269	-270	+267
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+271	-272	+269
-272	+273	-270
+273	-274	+271
-274	+275	-272
+275	-276	+273
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+277	-278	+275
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+279	-280	+277
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+291	-292	+289
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-298	+299	-296
+299	-300	+297
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+309	-310	+307
-3		

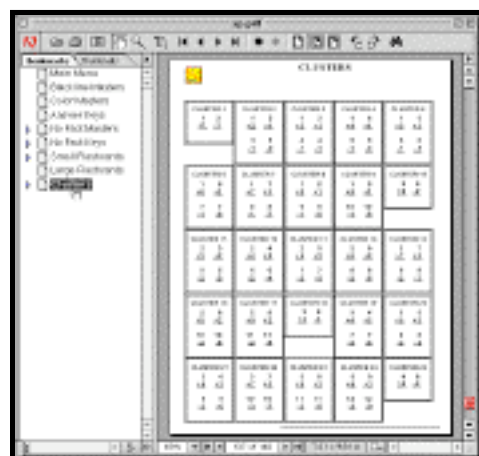


Large Flashcards: The large flashcard masters have just 4 facts per page. They're excellent for group drill and instruction.

I print our flashcards on heavy cardstock and laminate them. I've found that anything lighter, and the kids can read the answers through the cards!

Clusters: I've included the 45 addition and

subtraction clusters on which MATH DITTOS 2: Fact Controlled ADDITION & SUBTRACTION for Special Learners is based. They may serve as an additional resource.



Some personal observations

These materials were originally created when I began teaching special education in 1994. After years of teaching mostly regular education, I took my school's LD job for a change-of-pace/new challenge. I had no money to purchase appropriate materials, few supplies, a hostile principal, and what my kids needed simply didn't exist on the market anyway. These pages are the result of that experience.

The series is designed to give fact support and to present just a few practice problems so that students won't be overwhelmed by the usual page of 25-30 itty-bitty problems with no work space. At times the series may be used with little initial instruction. It really wasn't designed as a programmed material or tutorial. It was designed to give achievable, meaningful practice/seatwork for students after direct instruction had taken place. The old truism of "Teach, Practice, and Apply" holds true here. I find when my kids performance falls off, I have often forgotten the "Teach" part and have gone directly to "Practice!"

Legal Stuff

(Otherwise known as a software license!)

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The MATH DITTOS 2 series is available at:
<http://www.mathdittos2.com/>

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The original versions of the first three MATH DITTOS 2 workbooks were written on a 33 MHz Macintosh Performa 575. It sported a 13" screen and a whopping 36 MB of RAM!



12/20/2009