

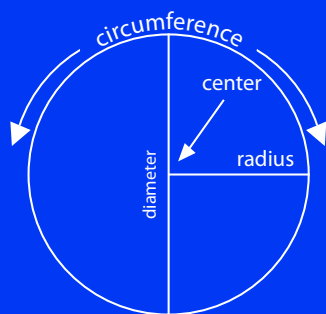
Peer



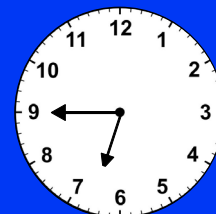
Teacher Manual



Assisted



Learning



Strategies



Math Methods for Grades 2-6

2009 Revised Edition

**Lynn S. Fuchs, Douglas Fuchs,
Kathy Karns, Norris Phillips**

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Dear Educator,

Thank you for your interest in PALS Math. We are pleased to offer you this excerpt to review.

These pages from the **PALS Grades 2 – 6 Math** Manual are provided as a courtesy to allow you to preview a representative sampling of the manual contents. This excerpt includes the following sections:

1. Table of Contents
2. Introduction
3. Training Outline
4. Training Scripts: Lesson 1 – Orientation (*1 lesson out of 5 Training Scripts*)

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Peer-Assisted Learning Strategies

Math Methods for Grades 2-6

**TEACHER MANUAL
2009 Revised Edition**

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Coaching Sheet - Day 4 (for use on Day 2)	T 3CS Day 4
Coaching Sheet - Day 3	T 3CS Day 3

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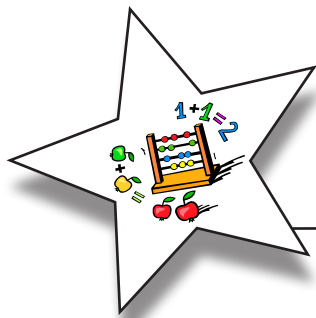
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PALS Rules
PALS Partners
When You Need Help
When You Give Help
Math Strategies



INTRODUCTION

Welcome to Peer-Assisted Learning Strategies (PALS) Math! We are excited that you've chosen to implement PALS. Repeated scientific evaluations of PALS Reading and PALS Math indicate that high-achieving, average-achieving, and low-achieving students, as well as students with learning disabilities, make greater progress in PALS classrooms than their counterparts in non-PALS classrooms.

PALS Reading and PALS Math were approved by the U.S. Department of Education's Program Effectiveness Panel as an effective educational practice. Additionally, PALS Math is listed among the best evidence-supported math programs on the John Hopkins University website, Best Evidence Encyclopedia (BEE).

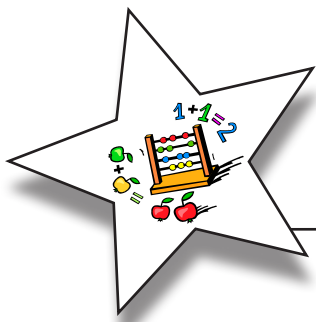
PALS was initially based on Classwide Peer Tutoring (CWPT), developed at Juniper Gardens Children's Project in Kansas City in the late 1970's. Like CWPT, PALS is structured to increase the time students are engaged in academic tasks and to facilitate immediate corrective feedback between peers. PALS Math activities extend beyond CWPT's math facts to address key calculation, concepts, and applications representing the curriculum at Kindergarten, Grade 1, Grade 2, Grade 3, Grade 4, Grade 5, and Grade 6. The activities were designed to be effective, efficient, and user-friendly. After a short training period, PALS students work in pairs on math activities for 30 minutes per session, 2 times a week, for at least 20 weeks.



HOW TO USE THIS MANUAL

This teacher manual provides all the information you need to implement Peer-Assisted Learning Strategies (PALS) with your mathematics class. The student manual provides all the materials needed to prepare PALS folders.

For PALS to run smoothly and result in better achievement outcomes, it is essential that you teach your students each and every principle covered in this manual. Teachers rely on different strategies for using this manual. For example, some teachers study the script and prepare an outline; then, they use that outline to deliver the training in their own words. Other teachers, however, after studying the script, still rely heavily on the wording of the script to deliver the lessons. In either case, it is necessary to **study** the script before delivery; without sufficient study, reading the script seems stilted and is not effective. In all cases, you should deviate from the script to elaborate concepts your students do not seem to understand.



OVERVIEW

Peer-Assisted Learning Strategies (PALS) typically is conducted **twice** each week for at least **20 school weeks**. Each session lasts about **30 minutes**. During each session, all students in the class are paired; each pair works on a skill for which one student requires instruction and the other student can provide good explanations.

SKILLS

Math PALS comprises two major skill areas:

COMPUTATION

- Addition
- Subtraction
- Multiplication
- Division

CONCEPTS AND APPLICATIONS (referred to as Applications throughout the manual)

- Applied computation
- Area and perimeter
- Charts and graphs
- Counting
- Decimals
- Factors
- Fractions
- Geometry
- Grid reading
- Measurement
- Money
- Names of numbers
- Number concepts
- Numeration
- Percentages
- Proportions
- Ratios and probability
- Variables
- Word problems

See pages 26 through 30 for a list of skills available at each grade level.

ACTIVITIES

Math PALS comprises two major activities for each skill area:

COACHING (in which students teach each other math skills)

- During Coaching, students take turns as tutors (Coaches) and tutees (Players). The higher-performing student is the “first Coach” and coaches on the first half of the Coaching Sheet. The lower-performing student is the “second Coach” and coaches on the second half of the Coaching Sheet.
- During Coaching, the teacher monitors student pairs and awards points for good PALS behaviors. Points are recorded on each pair’s Point Sheet.
- Coaching lasts 15-20 minutes.

PRACTICE (a mixed problem-type timed drill that incorporates the type of problem addressed during that day’s Coaching, as well as easier problem types)

- During Practice, each student works individually on a Practice Sheet for approximately 5 minutes.
- Students then switch Practice Sheets with their partner and grade each other’s Practice Sheet.
- Each student earns 1 point for each correctly answered problem. (The maximum score is 25.)
- Each student marks his/her points on the shared Point Sheet. The pair with the highest score collects all the PALS folders.
- Practice lasts approximately 10 minutes.



MATERIALS

Each PALS session requires the following materials for each pair FOR THE COACHING PART OF THE SESSION:

3A1

Adding
Coach's Question Sheet

Look at this sign.

What kind of problem is it?

Where do you start?

- 1. What plus what?
2. Is your answer 10 or more? Do you need to regroup?
If yes, do it.
3. Write your answer.
- ← 4. Where do you move next?

A **Coach's Question Sheet** provides the Coach with a series of short questions and statements to help him/her guide the Player to the problem's solution. The hope is that the Coach and the Player will internalize this task analysis to help solve problems of this problem type.

A **Coaching Sheet** is shared by the Coach and Player. The Coaching Sheet provides multiple examples of the problem type.

For Computation problems, the Coaching Sheet (like the one to the right), is divided into four rows of problems. Each row has an equal number of problems. The first Coach tutors on row 1 using the Coach's Question Sheet to guide the Player. The first Player self talks through each problem on row 2 while the Coach provides corrective feedback.

Then, the pair exchanges roles. The second Coach tutors on row 3 using the Coach's Question Sheet to guide the Player. The second Player self talks through each problem on row 4 while the Coach provides corrective feedback.

3A1 Day 1

Adding
Coaching Sheet

Player's Name _____ Date _____

Coach's Name _____

$\begin{array}{r} 35 \\ + 96 \\ \hline \end{array}$	$\begin{array}{r} 682 \\ + 615 \\ \hline \end{array}$	$\begin{array}{r} 375 \\ + 87 \\ \hline \end{array}$
$\begin{array}{r} 735 \\ + 95 \\ \hline \end{array}$	$\begin{array}{r} 486 \\ + 712 \\ \hline \end{array}$	$\begin{array}{r} 900 \\ + 486 \\ \hline \end{array}$
$\begin{array}{r} 556 \\ + 63 \\ \hline \end{array}$	$\begin{array}{r} 82 \\ + 97 \\ \hline \end{array}$	$\begin{array}{r} 28 \\ + 55 \\ \hline \end{array}$
$\begin{array}{r} 290 \\ + 92 \\ \hline \end{array}$	$\begin{array}{r} 75 \\ + 44 \\ \hline \end{array}$	$\begin{array}{r} 671 \\ + 528 \\ \hline \end{array}$

3A1 Day 1

Adding Coaching Answer Sheet

Name _____ Date _____

Scored by _____

$\begin{array}{r} 1 \\ 35 \\ + 96 \\ \hline 131 \end{array}$	$\begin{array}{r} 682 \\ + 615 \\ \hline 1297 \end{array}$	$\begin{array}{r} 11 \\ 375 \\ + 87 \\ \hline 462 \end{array}$
$\begin{array}{r} 11 \\ 735 \\ + 95 \\ \hline 830 \end{array}$	$\begin{array}{r} 486 \\ + 712 \\ \hline 1198 \end{array}$	$\begin{array}{r} 900 \\ + 486 \\ \hline 1386 \end{array}$
$\begin{array}{r} 1 \\ 556 \\ + 63 \\ \hline 619 \end{array}$	$\begin{array}{r} 82 \\ + 97 \\ \hline 179 \end{array}$	$\begin{array}{r} 1 \\ 28 \\ + 55 \\ \hline 83 \end{array}$
$\begin{array}{r} 1 \\ 290 \\ + 92 \\ \hline 382 \end{array}$	$\begin{array}{r} 75 \\ + 44 \\ \hline 119 \end{array}$	$\begin{array}{r} 671 \\ + 528 \\ \hline 1199 \end{array}$

The Coach uses a **Coaching Answer Sheet** to check the accuracy of the Player's responses on the Coaching Sheet.

For Applications problems, the Coaching Sheet (like the one to the right) shows a stop sign to alert students when to shift activities (from the Coach asking questions to the Player self talking) at the end of the first set of problems.



At the end of the second set of problems, a flag prompts students to switch coaching roles. The Coach becomes the Player, and the Player becomes the Coach.



At the end of the third set of problems, another stop sign alerts students to shift activities again (from the Coach asking questions to the Player self talking).

3Ct Day 1

Counting Coaching Sheet

Player's Name _____ Date _____

Coach's Name _____

Fill in the blanks.

28, 30, 32, __, __	36, 39, 42, __, __	50, 60, 70, __, __
18, 21, 24, __, __	55, 56, 57, __, __	44, 45, 46, __, __
75, 80, 85, __, __	90, 92, 94, __, __	10, 20, 30, __, __
81, 82, 83, __, __	72, 75, 78, __, __	78, 80, 82, __, __
60, 63, 66, __, __	6, 8, 10, __, __	35, 40, 45, __, __
85, 86, 87, __, __	20, 30, 40, __, __	95, 96, 97, __, __
30, 40, 50, __, __	27, 28, 29, __, __	65, 70, 75, __, __
45, 50, 55, __, __	77, 79, 81, __, __	20, 30, 40, __, __
51, 54, 57, __, __	66, 69, 72, __, __	94, 96, 98, __, __
93, 94, 95, __, __	87, 88, 89, __, __	15, 20, 25, __, __
22, 24, 26, __, __	55, 60, 65, __, __	46, 49, 52, __, __
17, 18, 19, __, __	18, 20, 22, __, __	42, 45, 48, __, __



3Ct Day 1

Counting Coaching Answer Sheet

Player's Name _____ Date _____

Coach's Name _____

Fill in the blanks.

28, 30, 32, <u>34</u> , <u>36</u>	36, 39, 42, <u>45</u> , <u>48</u>	50, 60, 70, <u>80</u> , <u>90</u>
18, 21, 24, <u>27</u> , <u>30</u>	55, 56, 57, <u>58</u> , <u>59</u>	44, 45, 46, <u>47</u> , <u>48</u>
75, 80, 85, <u>90</u> , <u>95</u>	90, 92, 94, <u>96</u> , <u>98</u>	10, 20, 30, <u>40</u> , <u>50</u>
81, 82, 83, <u>84</u> , <u>85</u>	72, 75, 78, <u>81</u> , <u>84</u>	78, 80, 82, <u>84</u> , <u>86</u>
60, 63, 66, <u>69</u> , <u>72</u>	6, 8, 10, <u>12</u> , <u>14</u>	35, 40, 45, <u>50</u> , <u>55</u>
85, 86, 87, <u>88</u> , <u>89</u>	20, 30, 40, <u>50</u> , <u>60</u>	95, 96, 97, <u>98</u> , <u>99</u>
30, 40, 50, <u>60</u> , <u>70</u>	27, 28, 29, <u>30</u> , <u>31</u>	65, 70, 75, <u>80</u> , <u>85</u>
45, 50, 55, <u>60</u> , <u>65</u>	77, 79, 81, <u>83</u> , <u>85</u>	20, 30, 40, <u>50</u> , <u>55</u>
51, 54, 57, <u>60</u> , <u>63</u>	66, 69, 72, <u>75</u> , <u>78</u>	94, 96, 98, <u>100</u> , <u>102</u>
93, 94, 95, <u>96</u> , <u>97</u>	87, 88, 89, <u>90</u> , <u>91</u>	15, 20, 25, <u>30</u> , <u>35</u>
22, 24, 26, <u>28</u> , <u>30</u>	55, 60, 65, <u>70</u> , <u>75</u>	46, 49, 52, <u>55</u> , <u>58</u>
17, 18, 19, <u>20</u> , <u>22</u>	18, 20, 22, <u>24</u> , <u>26</u>	42, 45, 48, <u>51</u> , <u>54</u>

For Applications problems, the Coach uses a Coaching Answer Sheet to check the accuracy of the Player's responses on the Coaching Sheet.

Each PALS session also requires the following materials for each pair FOR THE PRACTICE PART OF THE SESSION:

3A1 Day 1

**Adding
Practice Sheet**

Name _____ Date _____

Scored by _____

A $\begin{array}{r} 73 \\ + 8 \\ \hline \end{array}$	B $\begin{array}{r} 49 \\ + 4 \\ \hline \end{array}$	C $\begin{array}{r} 35 \\ + 9 \\ \hline \end{array}$	D $\begin{array}{r} 14 \\ + 48 \\ \hline \end{array}$	E $\begin{array}{r} 124 \\ + 942 \\ \hline \end{array}$
F $\begin{array}{r} 23 \\ 15 \\ + 10 \\ \hline \end{array}$	G $\begin{array}{r} 316 \\ + 911 \\ \hline \end{array}$	H $\begin{array}{r} 73 \\ - 32 \\ \hline \end{array}$	I $\begin{array}{r} 587 \\ + 15 \\ \hline \end{array}$	J $\begin{array}{r} 164 \\ + 71 \\ \hline \end{array}$
K $\begin{array}{r} 32 \\ 42 \\ + 21 \\ \hline \end{array}$	L $\begin{array}{r} 15 \\ - 12 \\ \hline \end{array}$	M $\begin{array}{r} 93 \\ - 61 \\ \hline \end{array}$	N $\begin{array}{r} 733 \\ + 86 \\ \hline \end{array}$	O $\begin{array}{r} 78 \\ + 39 \\ \hline \end{array}$
P $\begin{array}{r} 98 \\ + 42 \\ \hline \end{array}$	Q $\begin{array}{r} 22 \\ 55 \\ + 22 \\ \hline \end{array}$	R $\begin{array}{r} 94 \\ + 53 \\ \hline \end{array}$	S $\begin{array}{r} 5 \\ 5 \\ + 3 \\ \hline \end{array}$	T $\begin{array}{r} 1 \\ 5 \\ + 9 \\ \hline \end{array}$
U $\begin{array}{r} 38 \\ + 4 \\ \hline \end{array}$	V $\begin{array}{r} 619 \\ + 420 \\ \hline \end{array}$	W $\begin{array}{r} 734 \\ + 15 \\ \hline \end{array}$	X $\begin{array}{r} 88 \\ - 76 \\ \hline \end{array}$	Y $\begin{array}{r} 617 \\ + 601 \\ \hline \end{array}$

For Computation problems, two copies of a 25-problem **Practice Sheet** are used: one for the Coach and one for the Player. Each student works on his/her own.

For Applications problems, two copies of a **Practice Sheet** are used: one for the Coach and one for the Player. Each student works on his/her own. The number of problems on Applications Practice Sheets varies, but the maximum score is always 25 points.

3Me Day 2

**Measurement
Practice Sheet**

Name _____ Date _____

Scored by _____

Write the time. (**BOTH** blanks must be correct to get **1 point**.)

A. 	B. 	C. 	D. 
E. 	F. 	G. 	H. 

Solve. (1 point each)

I. $\begin{array}{r} 11 \\ + 9 \\ \hline \end{array}$	J. $\begin{array}{r} 22 \\ - 17 \\ \hline \end{array}$	K. $\begin{array}{r} 316 \\ + 56 \\ \hline \end{array}$	L. $\begin{array}{r} 13 \\ - 9 \\ \hline \end{array}$	M. $\begin{array}{r} 7 \\ + 8 \\ \hline \end{array}$
N. $\begin{array}{r} 927 \\ + 13 \\ \hline \end{array}$	O. $\begin{array}{r} 9 \\ - 6 \\ \hline \end{array}$	P. $\begin{array}{r} 13 \\ + 8 \\ \hline \end{array}$	Q. $\begin{array}{r} 214 \\ - 38 \\ \hline \end{array}$	R. $\begin{array}{r} 15 \\ + 8 \\ \hline \end{array}$
S. $\begin{array}{r} 17 \\ - 3 \\ \hline \end{array}$	T. $\begin{array}{r} 19 \\ - 4 \\ \hline \end{array}$	U. $\begin{array}{r} 7 \\ + 6 \\ \hline \end{array}$	V. $\begin{array}{r} 21 \\ + 9 \\ \hline \end{array}$	W. $\begin{array}{r} 222 \\ - 37 \\ \hline \end{array}$
X. $\begin{array}{r} 26 \\ + 6 \\ \hline \end{array}$	Y. $\begin{array}{r} 18 \\ - 9 \\ \hline \end{array}$			

3A1

**Adding
Practice Answer Sheet**

Day 1					Day 2				
A	B	C	D	E	A	B	C	D	E
81	53	17	62	1066	106	1	505	90	16
F	G	H	I	J	F	G	H	I	J
48	1227	41	602	235	354	52	30	1282	3
K	L	M	N	O	K	L	M	N	O
95	3	32	819	117	1099	40	177	662	30
P	Q	R	S	T	P	Q	R	S	T
140	99	147	13	15	15	999	99	1179	99
U	V	W	X	Y	U	V	W	X	Y
42	1039	749	12	1218	16	31	1275	80	78

Day 3					Day 4				
A	B	C	D	E	A	B	C	D	E
64	12	106	13	0	32	1459	75	495	11
F	G	H	I	J	F	G	H	I	J
117	73	88	20	751	13	120	13	17	56
K	L	M	N	O	K	L	M	N	O
88	66	820	16	1488	834	621	1494	80	11
P	Q	R	S	T	P	Q	R	S	T
4	316	413	92	1458	138	65	79	61	48
U	V	W	X	Y	U	V	W	X	Y
1368	1168	1	34	175	109	1072	142	1659	412

The Coach and Player share a **Practice Answer Sheet** to check on another's work. Four days of Practice Sheet answers are printed on a single page.

Each PALS session also requires for each pair FOR BOTH PARTS OF THE SESSION:

POINT SHEET																			
Day 1										Day 2									
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80	71	72	73	74	75	76	77	78	79	80
Day 3										Day 4									
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80	71	72	73	74	75	76	77	78	79	80

The Coach and Player share a **Point Sheet**. Four days of Point Sheets are printed on a single page.

Teachers mark points on the Point Sheet for pairs who demonstrate good PALS behaviors during Coaching.

Students mark points on the Point Sheet at the end of the Practice portion of the lesson. Each student marks the number of points they earned on his/her Practice Sheet.



ORGANIZING MATERIALS INTO FOLDERS

PALS materials are organized into folders; the folders should have inside pockets. Two folders are stuffed to provide a pair with four days (i.e., two weeks) of PALS materials. We suggest that teachers prepare a stock of stuffed PALS folders, covering the various skills, at the beginning of the year.

As folders are used for tutoring, some of the materials in the folders will be consumed (the Coaching Sheets, Practice Sheets, and Point Sheet). Consequently, every 2 weeks, those materials need to be duplicated so those folders can be re-stuffed. Teachers can do this duplication and stuffing themselves or have an aide, volunteer, or student complete this preparation. The folder belongs to the skill, **not** any particular pair or student, so that non-consumable materials can stay with the folder over time.

Teachers may laminate the Point Sheets. Students then use a dry-erase marker to mark points during each lesson.

Each pair shares a set of two folders. One folder is labeled “**Coach**”; the other folder is labeled “**Player**.” The Player’s folder is kept inside the Coach’s folder, so the pair gets one set of folders to manage. (See directions below and diagram on following page describing how materials are placed in different parts of each folder.)

DIRECTIONS FOR PUTTING FOLDERS TOGETHER

For each skill set, prepare a Coach’s folder and a Player’s folder. We suggest color coding the folders according to skill to help students find their folders (e.g., blue for addition, red for subtraction, yellow for multiplication, etc.).

Label the outside of both folders with the skill name (e.g., A1) and label the outside of the pair’s folders as “Coach” or “Player.” On the inside of both folders, label the left-hand pocket “Coaching.” Label the right-hand pocket “Practice.”

COACH'S FOLDER

- Staple a copy of the skill's **Coach's Question Sheet** to the back cover.
- In the inside left-hand pocket ("Coaching"), place copies of the skill's **Coaching Answer Sheet** for days 1, 2, 3, and 4.
- In the inside right-hand pocket ("Practice"), place a **Point Sheet**, copies of the skill's **Practice Sheets** for days 1, 2, 3, and 4, and a copy of the skill's **Practice Answer Sheet**.

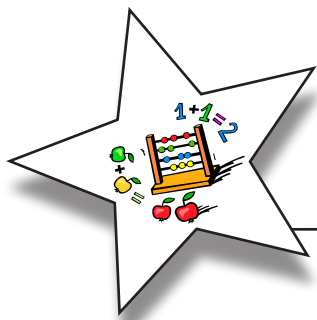
• Coaching Answer Sheets (Days 1, 2, 3, 4)	• Point Sheet • Practice Sheets (Days 1, 2, 3, 4) • Practice Answer Sheet	Coach's Question Sheet (stapled on back) ↙
Coaching	Practice	

PLAYER'S FOLDER

- In the inside left-hand pocket ("Coaching"), place copies of the skill's **Coaching Sheet** for days 1, 2, 3, and 4.
- In the inside right-hand pocket ("Practice"), place copies of the skill's **Practice Sheets** for days 1, 2, 3, and 4.

• Coaching Sheets (Days 1, 2, 3, 4)	• Practice Sheets (Days 1, 2, 3, 4)
Coaching	Practice

Note: Player's folders and Coach's folders are stuffed with identical Practice Sheets.



OTHER MATERIALS

To manage PALS sessions efficiently, you should have all necessary materials assembled and ready.

TEACHER MATERIALS

For training sessions: The materials required for each day of training are listed on the first page of the training script. In the Appendix, masters are provided for all necessary transparencies.

For PALS sessions: To conduct each PALS session, follow the list of directions on the PALS Command Card (provided in the Appendix). We suggest you copy this on card stock and use it until you are sufficiently familiar with the commands so that you no longer need the card.

STUDENT MATERIALS

For training sessions: The materials required for each day of training are listed on the first page of the training script.

For PALS sessions: Two-pocket folders will hold the materials for each skill. Copies of materials are provided in each grade's Student Materials Manual. Students will also need pencils.

MATERIALS TO DISPLAY IN THE CLASSROOM

Copies of materials for ongoing display in the classroom are provided in the Appendix:

1. PALS Bonus Points (PALS Rules)
2. PALS chart showing partners (PALS Partners)
3. Principles for Helping and Explaining (When You Need Help, When You Give Help)
4. Strategies for Providing Mathematical Explanations (Math Strategies)



OVERVIEW OF COACHING ACTIVITIES

During Coaching, the pair works on a **Coaching Sheet** of problems in the skill area to which the pair has been assigned (e.g., adding, subtracting with regrouping, number concepts, charts and graphs). To help the Player with these problems, the Coach uses a **Coach's Question Sheet** that contains a series of questions designed to guide the Player through that type of problem. The Coach's Question Sheets differ by skill. The stronger student is the first Coach; the weaker student is the first Player.

As the first Player works a problem, the Coach makes corrections. The Coach uses the **Coaching Answer Sheet** to check each digit the Player writes. If the digit is correct, the Coach draws a circle around it; if incorrect, the Coach constructs an explanation to help the Player. (During training, teachers use PALS materials to teach their students how to offer and request help and how to construct good explanations.) After the error is corrected, the Coach draws a triangle around it. As the Player works, he/she explains his or her work. If the Coach hears any misconception or if the Player makes an error, the Coach helps the Player by providing an explanation.

$$\begin{array}{r} 1 \\ 35 \\ + 96 \\ \hline (1)(3)(1) \end{array}$$

In this first example, the Player answered each digit correctly, so the Coach circled each digit in the answer. Because the Player answered each digit correctly without any corrections from the Coach, the Coach drew a large circle around the entire problem.

$$\begin{array}{r} 1 \\ 682 \\ + 615 \\ \hline (1)(3)(9)(7) \end{array}$$

In this second example, the Player answered the digit in the ones place incorrectly at first. The Coach helped the Player to correct the digit. After the Player corrected the mistake, the Coach drew a triangle around that digit. The Player answered the rest of the digits correctly, so the Coach circled the digits in the tens, hundreds, and thousands place. Because the Player had at least one triangled (initially incorrect) digit, the Coach did not draw a large circle around the entire problem.

After the first row of problems (for Computation) or when the students get to the first stop sign (for Applications), the Coach puts the Coach's Question Sheet down and allows the Player to work subsequent problems without the ongoing questioning, while the Player explains aloud each step of the problem he/she is completing. As the Player explains aloud, the Coach listens, corrects any misconceptions, and employs the digit-by-digit correction procedure.

When the students finish the second row (for Computation) or gets to the flag (for Applications), they switch roles and repeat the same sequence of activities. The teacher ends Coaching when approximately two-thirds of the pairs in the class have completed their work.

Coaching usually lasts 15 to 20 minutes.



OVERVIEW OF PRACTICE ACTIVITIES

After Coaching, students independently complete practice problems. During Practice, every student completes a mixed-problem **Practice Sheet** containing the problem type just worked on during Coaching, as well as easier types of problems. The students work on these Practice Sheets for 5 minutes or until approximately two-thirds of the class is finished. Students then exchange papers and score each other's Practice Sheets by sharing a **Practice Answer Sheet**. Students circle correct problems (not correct digits) and write the number of correct problems at the top of the sheet. Practice lasts 5 to 10 minutes.

POINTS

Each pair shares a **Point Sheet**. Each point sheet is divided into four rectangles, and labeled as one day of PALS (i.e., Day 1, Day 2, Day 3, or Day 4). During each PALS session, the pair uses the rectangle for the corresponding day.

During Coaching, the teacher circulates through the classroom and awards points (i.e., puts slash marks across numbers on the point sheet) for cooperative PALS behavior and for good explanations and helping skills. A particularly effective method for delivering these points involves:

- (a) awarding points without comment as you witness desired behaviors,
- (b) jotting down reasons for awarding points to particular students, and
- (c) between Coaching and Practice, discussing with the class your reasons for awarding points to particular students.

Teachers can also award bonus points (during training or biweekly sessions) for specific behaviors that they wish to encourage.

After the teacher has completed training in how to deliver good explanations, the teacher should reinforce the use of these strategies with points. Code slashes so that "M" stands for manipulatives, "MM" stands for making marks, "R" stands for real-life examples, and "D" stands for discuss the meaning.

After the grading of the Practice Sheet, each student in the pair awards him/herself one point (i.e., slashes one consecutive number on the Point Sheet) for each correct problem.

At the end of the session, the teacher asks the students to circle the last number on the Point Sheet with a slash through it. This is each pair's total points for the session. The teacher then asks students to raise their hands if the pair has at least 15 points (or some other number that insures that all students will have their hands raised). The teacher then asks the students to keep their hands up if their pair has at least 20 points. The teacher gradually increases the required number of points until only one pair has their hands raised. The class applauds the winning pair, and the winning pair collects the PALS folders.

For example, on Day 1 of a lesson, a pair earned 6 points from the teacher for using soft voices and following directions (marked with a dark slash). The first Player earned 12 points on his Practice Sheet, so he marked 12 additional points on the Point Sheet. The first Coach earned 18 points on her Practice Sheet, so she marked 18 additional points on the Point Sheet. The first Coach circled the last number with a slash (36). The pair earned 36 points for the Day 1 session.

POINT SHEET

Day 1

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

Day 2

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

Day 3

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

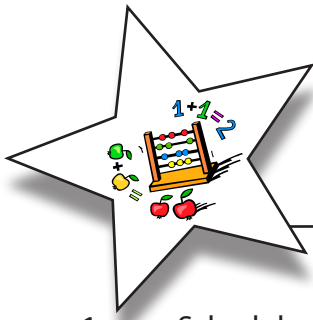
Day 4

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80



PALS SCHEDULE

Week 0	The teacher trains students in the basic PALS process using the training scripts for Lessons 1-5. Classes are trained using the simplest addition skill for their grade level. (It is recommended that the entire class work on the same skill for the first two-week PALS session.) Each training session lasts approximately 30 minutes. Day 5 of training is the first real PALS session (Week 1, Day 1).
Weeks 1-2	The teacher conducts two PALS sessions each week. During PALS, the teacher monitors students' use of the methods, awards points, and provides corrective feedback to ensure that students are following methods as prescribed. Until week 9, the teacher assigns only Computation problem types for PALS.
Week 3	The teacher conducts the 30-minute Helping and Explaining lesson. Then the teacher conducts the PALS session immediately following training, monitors students' use of the helping principles, and provides corrective feedback.
Weeks 3-4	The teacher conducts two Computation PALS sessions each week. The teacher monitors students' use of the helping principles and provides corrective feedback to ensure that students are following prescribed methods.
Week 5	The teacher conducts two or three sessions on Strategies for Giving Mathematical Explanations. These are conducted on consecutive days, and each session takes 30-45 minutes. Immediately following the final session, the teacher conducts a PALS session, and then debriefs students following the PALS session on their use of explanations during PALS.
Weeks 5-8	The teacher conducts two Computation PALS sessions each week. The teacher monitors students' use of the PALS procedures, the helping principles, and the explanations methods.
Week 9	The teacher conducts one training session to teach students how to perform PALS and give mathematical explanations with the Applications problem types. From this point on, teachers can assign both Computation and Applications content for PALS.
Weeks 9-30	The teacher conducts two PALS sessions each week. The teacher monitors students' use of PALS procedures, helping principles, and giving mathematical explanations. The teacher conducts at least one debriefing session, each week following a PALS session, on students' use of the mathematical explanations.



SCHEDULING

1. Schedule a time for PALS to occur twice each week, approximately 30 minutes per session. (e.g., Tuesdays and Thursdays from 9:35-10:05 am)
2. Each week, conduct PALS on the same days and at the same time.
3. Schedule PALS when all students are routinely present. Avoid periods when students are out of class for special lab times or activities.

To keep the PALS sessions to 30 minutes, the teacher uses a timer. The breakdown of the PALS lesson should be as follows:



Coaching (first Coach leading Coaching Sheet):

7-10 minutes



Coaching (second Coach leading Coaching Sheet):

7-10 minutes



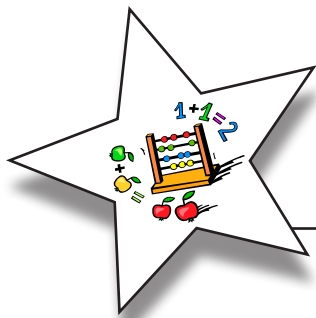
Practice Sheet (students working individually):

5 minutes



Practice Sheet grading and awarding of points:

5 minutes



PAIRING STUDENTS

For PALS, pair each student with a partner. Use whatever assessment information is routinely available to you as the basis for formulating pairs and identifying which skill each pair should work on.

1. Rank order your students in terms of their overall mathematics skills.
2. At the beginning of the school year, when all pairs may need to tutor on only one type of skill (because only a few students have mastered anything but the simplest skills), have all pairs work on the same skill. Pair your highest math student with your lowest math student; pair your second-highest math student with your second-lowest math student; and so on.

	First Coach	Second Coach
Pair 1	Student #1	Student #20
Pair 2	Student #2	Student #19
Pair 3	Student #3	Student #18
Pair 4	Student #4	Student #17
Pair 5	Student #5	Student #16
Pair 6	Student #6	Student #15
Pair 7	Student #7	Student #14
Pair 8	Student #8	Student #13
Pair 9	Student #9	Student #12
Pair 10	Student #10	Student #11

Student #1 is the highest-performing student. Student #20 is the lowest-performing student.

3. After 2-4 weeks of PALS, take your highest-performing quartile of students and identify skills on which you have some available tutors, as well as some children who require help on corresponding skills. Pair students so those students who are close to mastery will master those skills and can become available to tutor on a greater variety of skills.
4. As more students achieve mastery on a greater variety of skills, identify clusters of skills for which you have available tutors and match students who require assistance on those skills. When pairing students, use the same strategy described above in Point #2.
5. Occasionally, teachers will want every student in the class to work for the upcoming two-week PALS interval on the same skill because (a) they have just introduced a skill they want to reinforce or (b) they have identified a skill on which everyone could benefit from a review. When pairing all students on the same skill, follow the strategy described in Point #2 above.

HANDLING ABSENTEES AND UNEVEN NUMBERS OF STUDENTS

Sometimes students are absent or classrooms have uneven numbers of students. Before each PALS session, ask students if any partners are missing. If so, try to place odd students into pairs that make sense. If you need to create a triad, use these procedures.

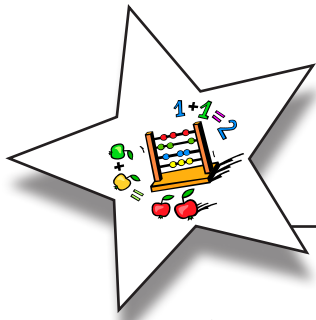
1. If two students are firm on the skill and one student is weak on the skill to be tutored, designate the stronger students both as “first Coaches” and the weaker student as the “second Coach.”
2. If only one student is firm on the skill and the two remaining students are weak on the skill to be tutored, designate the stronger student as “first Coach” and the remaining two students as “second Coaches.”
3. While two students are both Coaches, have them take turns, problem-by-problem, fulfilling this role.
4. While two students are both Players, have the Coach fulfill his/her coaching role with both Players (i.e., correction and helping procedures), but have Players take turns being the one to answer questions or self-talk.

MOVING STUDENTS TO AND FROM PARTNERS

Keep PALS folders in one place in the classroom where students can find materials quickly.

On the blackboard or bulletin board, post a PALS chart. This chart should have three columns. In the first column, list the first Coaches; in the second column, list the corresponding second Coaches; in the third column, list the skill that pair is working on. This PALS chart should last for two weeks (i.e., four PALS sessions).

Ask the second Coaches to stand, get their materials (i.e., a set of folders with the Player’s folder inside the Coach’s folder), and sit next to their partner. You may prefer to have second Coaches stand behind their partners until you make seating arrangements.



SKILLS AVAILABLE BY GRADE LEVEL

The next five pages contain lists of the Math PALS skills and focus of each skill available by grade level. Each listed skill contains four days of lessons. So, each skill should last two weeks.

Computation skills include addition, subtraction, multiplication, and division. Some of these skills will be used during the first few weeks of PALS as the students are learning how PALS works.

Applications skills include a variety of topics from counting to fractions to word problems.

All lessons are available in the grade-appropriate Student Materials Manual. The Computation lessons are placed in the manual from easiest lesson to hardest lesson. The Applications lessons are placed in the manual in alphabetical order.



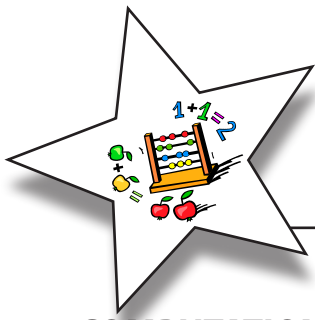
GRADE 2

COMPUTATION

2A1	Adding basic facts	FOCUS Basic facts (0-18)
2A2	Adding without regrouping	1-digit & 2-digit
2A3	Adding with regrouping	1-digit & 2-digit
2S1	Subtracting basic facts	Basic facts (0-18)
2S2	Subtracting without regrouping	1-digit, 2-digit, & 3-digit
2S3	Subtracting with regrouping	1-digit, 2-digit & 3-digit

APPLICATIONS

2AC	Applied computation	Filling in blanks in addition and subtraction problems
2CG	Charts and graphs	Reading and interpreting bar graphs
2Ct	Counting	Counting by increments of 2, 5, or 10
2Fr	Fractions	Writing fractions from shaded figures
2Me1	Measurement	Telling time (to 30 minute intervals)
2Me2	Measurement	Telling time (to 15 minute intervals)
2Mn	Money	Counting picture money (coins)
2NC	Number concepts	Comparing numbers (>, <, =)
2NN	Names of numbers	Word form to number form (1-99)
2WP1	Word problems	Addition, subtraction, and money (1-digit)
2WP2	Word problems	Addition, subtraction, and money (2-digit)



GRADE 3

COMPUTATION

3A1 Adding

3S1 Subtracting with regrouping

3S2 Subtracting with regrouping using zero

3M1 Multiplying basic facts

3M2A Multiplying

3M2B Multiplying

3D1 Dividing basic facts

FOCUS

1-digit, 2-digit, & 3-digit

2-digit & 3-digit

2-digit & 3-digit

Basic facts (0-9)

2-digit $\times$ 1-digit

2-digit $\times$ 1-digit with regrouping

Single digit divisors

APPLICATIONS

3AC1 Applied computation

3AC2 Applied computation

3CG Charts and graphs

3Ct Counting

3De Decimals

3Fr1 Fractions

3Fr2 Fractions

3Me Measurement

3Mn Money

3NC Number concepts

3NN Names of numbers

3WP1 Word problems

3WP2 Word problems

3WP3 Word problems

Round to the nearest 10

Round to the nearest 10; then add or subtract

Reading and interpreting picture graphs

Counting using increments (1 to 10)

Tenths

Writing fractions from picture representations

Comparing fractions ($>$, $<$, $=$)

Telling time (to 5 minute intervals)

Counting picture money (bills & coins)

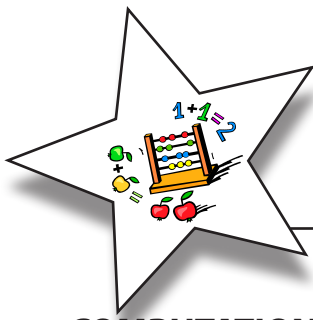
Ordering numbers smallest to largest

Word form to number form (to thousands)

Addition, subtraction, & money

Addition, subtraction, & money

Addition, subtraction, multiplication, & money



GRADE 4

COMPUTATION

4A1	Adding
4S1	Subtracting
4M1	Multiplying basic facts
4M2	Multiplying by one digit
4M3	Multiplying by two digits
4D1	Dividing basic facts
4D2	One-step dividing
4D3	Two-step dividing
4F1	Adding/subtracting basic fractions
4F2	Adding/subtracting mixed fractions

FOCUS

2-digit, 3-digit, & 4-digit with regrouping
2-digit, 3-digit, & 4-digit with regrouping
Basic facts (0-9)
3-digit $\times$ 1-digit
2-digit $\times$ 2-digit
1-digit divisors (0-9)
1-digit divisors with remainders
Two-step with 1-digit divisors
In common denominator form
Plus or minus whole numbers

APPLICATIONS

4AP	Area and perimeter	Geometric shapes
4CG	Charts and graphs	Using picture charts and bar graphs
4De1	Decimals	Finding place value & changing fractions to decimals
4De2	Decimals	Word form to number form
4Fr	Fractions	Numerator/denominator placement, compare ($>$, $<$, $=$)
4GR	Grid reading	Plotting points & naming point coordinates
4Me	Measurement	Telling time and AM vs. PM
4NC	Number concepts	Using place value information to write numbers
4NN	Names of numbers	Word form to number form (to hundred thousands)
4WP1	Word problems	Addition, subtraction, & money
4WP2	Word problems	Addition, subtraction, multiplication, & money
4WP3	Word Problems	Crossing out unnecessary information & rounding



GRADE 5

COMPUTATION

5A1	Adding	FOCUS 2 & 4 addends with regrouping
5S1	Subtracting	5-digit subtraction with regrouping
5M1	Multiplying	3-digit $\times$ 2-digit with regrouping
5D1	Dividing with 1-digit divisor	Three-step dividing with remainders
5D2	Dividing with 2-digit divisor	One-step dividing with remainders
5F1	Reducing fractions	Using factoring
5F2	Renaming fractions	As mixed or improper
5F3	Adding/subtracting fractions	With like denominators
5F4	Adding/subtracting fractions	With unlike denominators
5.1	Adding and subtracting decimals	Lining up & adding zeros (to hundredths)

APPLICATIONS

5AC	Applied computation	1-2: Rounding to nearest ten, hundred, & thousand 3-4: Fill-in the blanks (+, -, $\times$, $\div$)
5CG	Charts and graphs	Picture charts, bar graphs, line graphs and pie charts
5Ge	Geometry	1-2: Area of squares, rectangles, & triangles 3-4: Angles, circumferences, radii, & diameters
5De	Decimals	1-2: Word form to number form 3-4: Rounding to the nearest tenth & whole number
5FF	Fractions and factors	1-2: Find the greatest common factor 3-4: Find LCD and compare (>, <, =)
5Me	Measurement	Converting times, distances, and weights
5Mn	Money	Finding cost & change; writing change in bills & coins
5Nu	Numeration	Word form to number form (to millions)
5WP	Word problems	Addition, subtraction, multiplication & division with whole numbers, fractions, & decimals



GRADE 6

COMPUTATION

6A1 Adding

6S1 Subtracting

6M1 Multiplying

6D1 Dividing

6F1 Adding/subtracting fractions

6F2 Adding/subtracting fractions

6F3 Multiplying and dividing fractions

6.1 Adding and subtracting decimals

6.2 Multiplying decimals

6.3 Dividing decimals

FOCUS

5-digit with regrouping

5-digit with regrouping

4-digit $\times$ 3-digit with regrouping

1, 2, & 3 step; 2-digit & 3-digit divisors

With like denominators

With unlike denominators

With whole numbers & fractions

Lining up and adding zeros (to ten thousandths)

2-digit & 3-digit multipliers with regrouping

Decimals as dividends & divisors; 1 & 2 step

APPLICATIONS

6AC Applied computation

1-2: Rounding whole numbers (to millions)

3-4: Rounding decimals (to ten thousandths)

6CG Charts and graphs

Picture charts, bar graphs, schedules, & pie charts

6Ge Geometry

1-2: Area & volume of triangles & parallelograms

3-4: Identifying segments, angles, polygons, diameters, chords, radii and arcs

6Me Measurement

1-2: Converting times, distances, & weights

3-4: Adding & subtracting distances (with regrouping)

6Nu Numeration

1-2: Prime or composite

3: Place value (to ten thousandths)

4: Writing decimals; mixed form to number form

6Pc Percentages

Converting fractions, decimals and percentages

6Pp Proportions

1-2: Fill-in the blank

3-4: Word problems

6RP Ratios and probability

1-2: Writing ratios from word problems

3-4: Calculating probability from word problems

6Va Variables

1-2: Writing equations

3-4: Solving equations

6WP Word problems

1 & 2 step; addition, subtraction, multiplication, division, & money

30 - Introduction



TRAINING SCRIPTS

Training Lesson 1 - Orientation

Training Lesson 2 - Practice Coaching

Training Lesson 3 - Self-Talk

Training Lesson 4 - Practice

Training Lesson 5 - Putting It All Together

Helping and Explaining Training

Giving Mathematical Explanations Training

Applications Training



TRAINING OUTLINE

Day 1 – Orientation

- Explain purpose of PALS
- Discuss roles and responsibilities of Coaches and Players
- Introduce Coaching:
 - Demonstrate Coaching procedures on two practice problems using overhead (teacher is Coach; student or aide is Player)
 - Second Coaches get folders and sit with partner
 - Demonstrate procedure on two additional problems using overhead

Day 2 – Coaching

- Review roles and responsibilities of Coach and Player
- Discuss use of Point Sheets
- Discuss PALS Bonus Points given by the teacher
- Explain Coaching procedure for first three problems
- Have 2 or 3 pairs of students model procedure on overhead
- Have each Coach practice their first three problems (on rows 1 and 3)
- Count points; collect folders

Day 3 – Self-Talk

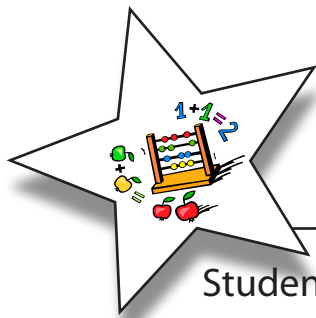
- Review procedure for first three problems
- Review PALS Bonus Points
- Have students do first three problems on row 1
- Explain procedure for second row of problems (“self-talk”)
- Have students practice rest of Coaching Sheet
- Count points; collect folders

Day 4 – Practice

- Give instructions for Practice Sheet
- Have students complete Practice Sheets
- Have students exchange sheets
- Explain scoring procedure
- Have students score sheets
- Explain procedure for students to award themselves points
- Count points; collect folders

Day 5 – Putting It All Together

- Explain layout of folders (which are stuffed for two weeks)
- Read list of instructions from PALS Command Card while students complete all activities



TRAINING

Lesson 1 - Orientation

Students Learn

- How to read Coach's Question Sheet
- How the Coach checks the Player's answers with circles and triangles

<i>Teacher Materials</i>	<i>Student Materials</i>
1. Transparencies: T 2CS - T 6CS (Day 1 Coaching Sheet for A1 for your grade level) T FC (PALS Flow Chart) T 2QS - T 6QS (Coach's Question Sheet for A1 for your grade level) T 2AS - T 6AS (Day 1 Coaching Answer Sheet for A1 for your grade level) 2. List of PALS pairs 3. Overhead projector 4. Transparency pen 5. PALS Manual	1. Folder (1 per pair) with: Coach's Question Sheet on back of Coach folder and nothing inside Player folder with nothing inside 2. Pencils

PREPARATION

- ☆ Create list of PALS pairs. (See page 23 of this manual for more information.)
- ☆ Study script. Pay careful attention to directions for modeling Coaching procedures (page 38 of this script).
- ☆ Prepare folders.
- ☆ Prepare transparencies for your grade level.

GUIDING GRAPHICS



Use
Transparency



Pairs Work
Together

Over the next few days, I'll be explaining a new math activity to you that will help you learn math. It's called PALS (write on the board). I not only want you to become better at math, I also want you to learn how to work together in a friendly, helpful way. Every student in our class will participate in PALS, and every person will be assigned a partner.

There are two jobs in PALS. One job is called Coach; the other job is called Player. The Coach and the Player are both very important jobs. You will do both of these jobs each day of PALS. For PALS to work, both jobs must be done well.

In PALS, what are the two jobs?

STUDENTS: Coach and Player.

That's right, the Coach and the Player. First, let's talk about the job of Coach.

Being a Coach is very important. When you are the Coach, you must be helpful, patient, and fair. You must pay careful attention during PALS and help the Player when he doesn't know the answer. You should also let the Player know when he does well. And finally, when you're the Coach, you must follow the directions for PALS.

Who can tell me what you should do to be a good Coach? (Restate the attributes that are not mentioned.)

STUDENTS: To be a good Coach, I should:

- Be helpful, patient, and fair
- Pay careful attention to the Player
- Help the Player when he doesn't know the answer
- Tell the Player when she does a good job
- Follow the directions for PALS

Good. It's very important to give the Player lots of chances to ask or answer questions. A good Coach not only helps the Player work through problems, he also makes sure the Player really understands what to do. Should the Coach just tell the Player all the answer and work the problems for him?

STUDENTS: No.

That's right. The Coach should make sure the Player is paying attention and getting lots of chances to learn and work through the problems himself.

Now, let's talk about the job of Player. Being a Player is also very important. When you are the Player you must try your best, pay careful attention to the Coach, and follow directions for PALS. A Player should also ask for help whenever he needs it. OK. What are some things a good Player should do?

STUDENTS: The Player should:

- Do the best she can
- Pay careful attention to the Coach
- Follow the directions for PALS
- Ask for help when needed

Good! Two rules help PALS go smoothly: Talk only to your partner, and talk only about math. To whom should you talk?

STUDENTS: Only to my partner.

And about what should you talk?

STUDENTS: Only about math.

Exactly. When talking to your partner, talk only about math. I'll teach you how you can do all of the PALS activities without my help. However, during PALS, if you have any questions or a problem you can't answer, raise your hand just like I'm doing. (Emphasize correct way to raise your arm.) **Then, wait quietly for me to come to your desk. What do you do if you have a question you can't answer?**

STUDENTS: Raise our hands and wait quietly for you to come to our desk.

Right. Now, I'll explain how PALS works in our math class. When I say, "It's time for Coaching," put all of your materials away except your pencil. Who can tell me what you should do when it's time for Coaching?

STUDENTS: Put away all materials except my pencil.

Good. The second thing I will say is, "The list of coaching pairs is posted on the board. Look at the list on the board." Look at the list on the board. Find your name and see whether you are the first Coach or the second Coach. If you're the first Coach, you'll coach first. If you're the second Coach, you'll coach later. When you're not the Coach, you'll be the Player.

Now, find your partner's name. Look around the room to be sure your partner is here today. Are there any partners absent?

*If a partner is absent, assign the student to another pair who is working on the **same** math skill (see Introduction pages 23-24). With groups of three, have the students that share a role (i.e., the two students who are first Coaches or second Coaches) take turns problem-by-problem when they are Coaches and again when they are Players.*

Each day you and your partner will work step-by-step on one type of math problem. Let me show you what I mean by working "step-by-step."

I'll be the Coach, and _____ (choose a capable student, or use an available aide) will be the Player. We'll work through the first two problems on the overhead. _____ (Student or aide) will do one problem correctly and will make a mistake on the other problem.



T 2CS - T 6CS

Show overhead of the **Day 1** Coaching Sheet for your grade level. Work through the first two problems. The Player does one problem correctly and one incorrectly.

You, as Coach, should use the Coach's Question Sheet and model correction procedures as described on page 18 of the Introduction and below.

DIRECTIONS FOR MODELING STEP-BY-STEP COACHING PROCEDURES:

- **Begin with questions in box at top of Coach's Question Sheet.**
- **Pause for responses after each question.**
- **Pause between each part of the multiple-part questions.**
- **Only go to *if yes* part if Player answers, *yes*.**
- **Do not say *if yes*. Just say part that follows.**
- **Check each digit the Player writes.**
- **Circle each correct digit before going on.**
- **Help Player correct each incorrect digit; then triangle it.**
- **Follow arrow back to #1, until problem is finished.**
- **Circle entire problem if no errors (triangles) occur.**
- **Do not circle problem if any errors were made.**
- **Begin new problems with questions in box at top.**
- **Praise and encourage the Player appropriately.**

Now, who can tell me some of the things I just did as a Coach? (State any answers that students don't mention.)

- STUDENTS:
- Asked questions to be sure Player knew how to do each part
 - Gave Player help when needed
 - Circled each correct digit
 - Circled the whole problem if done correctly
 - Told Players when he/she made an error and helped him/her fix it
 - Put a triangle around digits after they were corrected
 - Didn't circle the problem if any errors were made
 - Gave Player positive feedback.

OK, now I want to show you what you should not do when you're a Coach. I'll be the Coach again and _____ (choose another student) will be the Player. We'll do the next problem on this worksheet.

As the Coach, tell the Player what to do without asking any questions and write the answers yourself without letting the Player participate.

Who can tell me some things I, as the Coach did wrong that time?

Allow students to provide varied responses. Reinforce accurate comments.

That's right. I didn't ask the Player the questions on the Coach's Question Sheet, and I didn't let the Player write any answers. I just told the Player how to do the problem and then did all of the work myself. It's very important to make sure the Player is involved in every step of the problem.

*The next section involves the second Coaches getting the folders.
You may pass out the folders yourself, if that is better for you.*

OK. The next step is very important. During Coaching, you must have a folder, and partners must sit together. Raise your hand if you are the second Coach. (Wait until students have identified themselves.)

If you are the second Coach, you will leave your desk to get the folders for you and your partner. One folder is inside the other folder, so just take one set of folders. All folders are kept _____. (Point out location and arrangement of folders.) After you get the folders, sit down next to your partner.

You may find it easier to have students stand behind their partners until you make seating arrangements.

First Coaches, be sure you understand these instructions, too. You may be the second Coach another time. Are there any questions?

It's important to move quickly and quietly. When it's time to get your folders, how should you move?

STUDENTS: Quickly and quietly.



Pairs Sit
Together

Right. All second Coaches go up now and get one set of folders. Your folder is inside your partner's folder. (While students are getting folders say:) **Second Coaches, sit beside** (or stand behind) **your partner. First Coaches, stay seated.** (Wait until everyone is settled.)

Let's look at the outside of the folders. One says Coach and the other says Player. (Point out label at upper right corner.) **Look back at your assignment on the board. If you are the first Coach, take the folder that says Coach. If you are the second Coach, take the folder that says Player.** (Check for proper distribution of folders.)

Let's look inside the folders. Players' folders are empty today, but will have a Coaching Sheet in them next time. Coaches' folders should have a Coach's Question Sheet on the back of the folder. Open your folder.



TFC

One side of the folder says Coaching and the other says Practice. This is because PALS has two parts: Coaching and Practice. (Show overhead of flow chart.) **We're going to learn about these activities on different days during training. After training, you'll do both Coaching and Practice each day of PALS.**



Now, look at the Coach's Question Sheet on the back of the Coach's folder. (Show overhead of Coach's Question Sheet.)

T 2QS - T 6QS

Raise your hand when you find the Coach's Question Sheet. (Wait for all hands to be raised.) **Place the Coach's Question Sheet where both partners can follow along.**

The Coach will ask each question, starting with the box at the top. The Player will answer each question aloud and work that part of the problem. It is very important that the Coach listens to the Player's answers and watches what the Player is doing. What should the Coach do after he asks a question?

STUDENTS: Listen to the Player's answers, and watch what the Player is doing.

Right. The Coach has an Coaching Answer Sheet to check the Player's answers



*Show overhead of Coaching Answer Sheet and point out answers.
Then, show overhead of Coach's Question Sheet once more.*

T 2AS - T 6AS

When you see an arrow on the Coach's Question Sheet, the arrow means that after you ask the last question, you go back up to where the arrow points and ask the questions again until the problem is finished. What does the arrow tell you to do?

STUDENTS: To go back to where the arrow points and ask the questions again until the problem is finished.



Good. Here is the sample Coaching Sheet like you'll usually find in the Player's folder. (Show overhead of Coaching Sheet again, and refer to the problem that was done correctly.) **This is the sheet that you'll use when it's your turn to be the Player.**

T 2CS - T 6CS

When you're the Coach, you'll check each digit the Player writes on the Coaching Sheet. If the Player writes any digit correctly, the Coach draws a circle around it.

If the Player writes a digit that is incorrect, the Coach tells the Player, in a nice way, that his answer is incorrect. What are some nice ways that a Coach could tell the Player the he made an error?

STUDENTS: (Reinforce appropriate answers such as:)

- That digit is incorrect.
- That's not quite right, but you're close.
- Oops. You made an error.

After the Coach tells the Player that he's made an error, she asks the Player to fix the error. What are some nice ways that a Coach could ask the Player to fix the error?

STUDENTS: (Reinforce appropriate responses such as:)

- Can you fix your answer?
- Try this one again.
- Can you correct your error?

Then, the Player tries to correct the digit. If the Player needs help, the Coach helps him. Coaches, you can help your Player any way you think he'll learn best. Just use your own words. The Coach and Player can also go back through the questions if they need to. Coaches, if you aren't sure how to solve the problem, or how to explain it better to the Player, you should ask for help.

PALS offers a good opportunity for you to provide one-to-one instruction to students or pairs as they ask for help, or as you notice that they need help, while you monitor PALS.

After the digit is corrected, the Coach draws a triangle around it. Be sure to wait until the digit has been corrected before drawing a triangle around it. (Refer to overhead again.) When the problem is completed, the Coach looks to see if the Player had all circles and no triangles. If so, the Coach circles the entire problem. If the Player had any triangles, the Coach doesn't put anything around the problem – he just leaves it the way it is. Do you have any questions?

OK, now I would like one of you to be the Player again (select student), and I'll be the Coach. We'll try these steps on the next two problems. Look at your Coach's Question Sheet and the overhead as we work the problems. _____ (Student) will do one problem correctly and the other problem incorrectly.

You, as Coach, should ask each question while the Player works problems on the Coaching Sheet. Praise the Player for appropriate behavior. Make sure the Player does one problem correctly and makes at least one mistake in the other, so the students can see the correction procedure.

Are there any questions about what the Coaches or Players do (pause)? We're finished for today. Next time, you'll practice Coaching. Thank you for being so patient and cooperative. Everyone, close your folders. Second Coaches, put the Player's folder inside the Coach's folder. _____ (Student) will collect the folders. (Have a student collect the folders.)

Second Coaches, return to your seats.

