

# Contents



## **INTRODUCTION**

Foreword

## **PUZZLES**

Overview Puzzle 1 & Puzzles 1-5  
Overview Puzzle 6 & Puzzles 6-10  
Overview Puzzle 11 & Puzzles 11-15  
Overview Puzzle 16 & Puzzles 16-20  
Overview Puzzle 21 & Puzzles 21-25  
Overview Puzzle 26 & Puzzles 26-30  
Overview Puzzle 31 & Puzzles 31-35  
Overview Puzzle 36 & Puzzles 36-40

## **ASSESSMENT SHEETS**

Puzzles 1-40 (every 5th puzzle)

## **ANSWER KEYS**

Puzzles 1-40

## **GAMES**

Introduction and Games 1-5  
Introduction and Games 6-10  
Introduction and Games 11-15  
Introduction and Games 16-20  
Introduction and Games 21-25  
Introduction and Games 26-30  
Introduction and Games 31-35  
Introduction and Games 36-40

# INTRODUCTION

## **DESCRIBE *CROSS-NUMBER DISCOVERY PUZZLES & GAMES 3.***

Learning math is a lot like doing a jig-saw puzzle. Every well placed jig-saw piece helps you place the next piece, and every well learned math concept helps you learn the next concept. The *Cross-Number Discovery Puzzles and Games* series helps you put the math pieces into place. It begins with the earliest number concepts and follows a developmental framework to grow math understanding one concept at a time. And it does this in a fun way through puzzles and games.

*Cross-Number Discovery Puzzles and Games 3* consists of 40 cross-number puzzles and over 60 corresponding games. The puzzles and games involve early number concepts and are cumulative in nature. Each group of five puzzles and games has similar learning outcomes. This means that the outcomes in 1-5 are the same, the outcomes in 6-10 are the same and so on. Each group of five introduces new pieces of learning. This helps put the math pieces into place.

However, learning math is different than doing a jig-saw puzzle in that once a math concept is introduced, it has to be practiced in order that it stays in place. Each group of five puzzles and games reinforces the number concepts, strategies and skills introduced in earlier puzzles. This helps keep the math pieces in place.

For each group of five puzzles there is an overview and an assessment sheet. For the accompanying games there is an introductory sheet. In the puzzles, new concepts, strategies and skills are often introduced by two questions connected by a bracket. One of the questions is a helper question and can involve a model such as a number line or an array.

For each group of five puzzles there are accompanying games. These games provide practice on the number concepts introduced in the group of five puzzles. The rules for the games are simple and easy to follow and require little explanation. They include games such as: 'I have.., who has..?', bingo games and card games.

## **WHAT IS THE INTENDED GRADE LEVEL?**

This is the fourth resource in the *Cross-Number Discovery Puzzles & Games* series, following *Cross-Number Discovery Puzzles & Games 2*. *Cross-Number Discovery Puzzles & Games 3* is intended for children in Grade 3. However, the puzzles are also suitable for children in higher grades who are still working on the number concepts introduced in this resource.

## **HOW WERE THE PUZZLES & GAMES CHOSEN?**

The puzzles and games are mainly based on the following volume: *Teaching Number: Advancing Children's Skills and Strategies*, 2<sup>nd</sup> edition, Robert J. Wright, James R. Martland, Ann K. Stafford, Garry Stanger, Sage Publications. In this volume, the authors set forth a comprehensive and integrated learning framework for the assessment, learning and teaching of number concepts.

## **HOW CAN I USE THIS RESOURCE IN MY CLASSROOM?**

Teachers can use this resource with an entire class, small groups, or individual children. As there are a number of books in this series, there is a puzzle at the appropriate level for every child. The resource allows teachers to easily differentiate instruction. Since all puzzles have a similar look, each child in the class can be working on a puzzle that is suitable for him or her. The puzzles as well as the games are all reproducible.

The puzzles are also a tool for parental involvement. Through the puzzles, the parents are introduced to models and strategies that can help them support their children with their math learning.

## **HOW CAN THIS RESOURCE HELP MY STUDENTS?**

Because the puzzles and games introduce number concepts one at a time, it is easy to identify how confident a child is with a particular number concept and whether they need more support. The puzzles provide an excellent diagnostic and assessment tool. Not all children in a class are at the same point in their learning, and these puzzles allow teachers to identify how best to help each child and move him or her forward. The accompanying games also provide additional support.

The structure of the puzzles allows children to know what is expected of them and to be successful with little teacher intervention. This is rewarding for the children and builds their confidence. The puzzles are intended to be engaging and fun and help children discover their ability to do mathematics.

## **ARE THE PUZZLES SELF-CORRECTING?**

Because the questions answer both across and down, the puzzles are often self-correcting. Because of this, some questions like 'an even number' will be answered later in the puzzle. While the puzzles are not entirely self-correcting, they are easy and quick for teachers to correct.

# FOREWORD

I am delighted to provide the foreword for this series of challenging, progressive, reinforcement number puzzles. Celia Baron has ingeniously created puzzles at different levels which utilise the key aspects of the Mathematics Recovery Programme. The Mathematics Recovery Programme provides a comprehensive series of work starting with the identification, analysis and reporting on children's numerical knowledge, skills and strategies. The diagnostic assessments lead to the design, implementation and evaluation of teaching interventions both for individuals, small groups and whole classes in differing organizations and contexts.

The lessons in Mathematics Recovery are intensive and challenging, based at the cutting edge of a child's knowledge. There is a great emphasis on problem solving and verbal interaction as the teacher seeks to ascertain the child's strategies. Equally important are the child's explanations as to how they arrived at a solution and how they know they are correct. This leaves little time in the lesson for reinforcement activities.

The bank of number puzzles created by Celia Baron provides teachers, whether of individuals, small groups, or whole classes, with a valuable reinforcing and self-correcting challenge. Careful selection of the range of puzzles will give the child questions that they should be able to meet whilst at the same time providing enjoyment and intrinsic satisfaction. At the same time the puzzles have an in-built logic where the child can see linkages and associations between key topics and the discussion of the completed puzzle with the teacher will reveal these as well as identifying where more work, or practice, is required.

Celia Baron successfully draws upon the concepts of the Mathematics Recovery Programme, and provides educators with exciting tools. The puzzles include number word sequences both forward and backwards, numeral identification, number problems in the four operations, the use of spatial patterns and the employment of empty number line activities.

The puzzles support learning and are a welcome and innovative addition to the field of mathematics education.

James R Martland  
Director, Mathematics Recovery Programme (UK) Ltd

*Jim Martland is a member of the International Board of Mathematics Recovery and Director of the Mathematics Recovery Programme (UK) Ltd. He is Senior Fellow in the Department of Education at the University of Liverpool. In his long career in primary education he has held headships in primary and middle schools and was Director of Primary Initial Teacher Training. In every post he continued to teach and pursue research in early numeracy and deliver professional development courses in the assessment of children's numerical knowledge and strategies.*



SAMPLE.

# Puzzles

At their own level,  
at their own place,  
but at the same time

## OVERVIEW: PUZZLES 1-5

Puzzles 1-5 are the first group of puzzles in *Cross-Number Discovery Puzzles 3*. The following number concepts, strategies and skills are introduced in this group of five puzzles. The outcomes are listed below as they appear in Puzzle 1.

### ACROSS:

**A. Counting-back over the decade**

**C. Determining the number of cents in dimes and pennies**

A question involving money appears in each puzzle. In this first group of puzzles, these questions include pennies, nickels and dimes.

**E. Ordering 3-digit numerals**

**G. Adding from a decade**

**K. Basic subtraction facts - subtracting 0, 1, 2, and 3**

**L. The number of minutes in 1 hour**

A question involving time appears in each puzzle.

**M. Determining the number of dots on visible arrays**

**R. Counting by 100s, off the 100**

**U. Adding two 2-digit numbers without regrouping**

**V. Adding two 2-digit numbers without regrouping**

The use of the empty number line is encouraged throughout the puzzles.

### DOWN:

**A. Determining the perimeter**

A question involving perimeter appears in each puzzle. These questions often include repeated addition. The symbol for multiplication appears in Puzzle 21.

**B. Counting by tens and ones**

**D. Adding to a decade**

In this group of puzzles, the number added is less than or equal to 5.

**F. Recognizing patterns that increase by 2**

**J. Saying two numbers after a given 3-digit number**

**P. Choosing the decade a 2-digit number is closer to**

**Q. Counting by tens and ones**

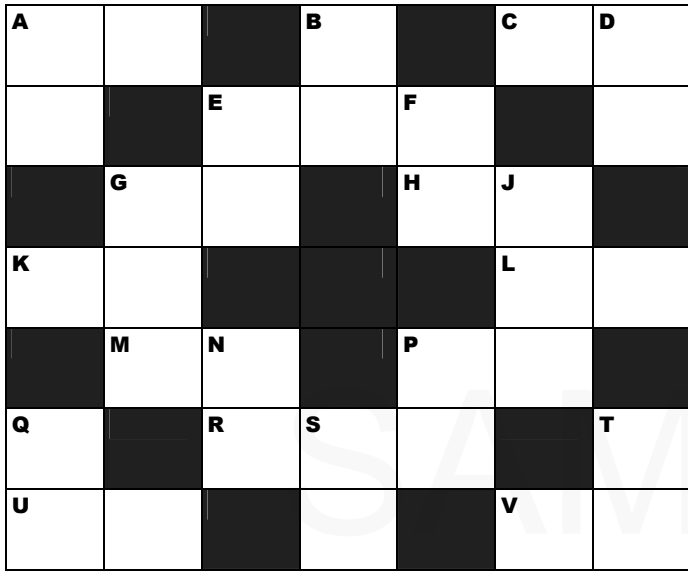
**S. Place-value relationship of tens and ones**

**T. Combining pairs of numbers that add to 10, sum less than 30**

At the end of the puzzles, there are **assessment sheets**, which include two checklists for this group of puzzles. The first checklist charts the progress of students as they work through the questions in Puzzle 5, while the second checklist cross-references the questions in Puzzle 5 to the outcomes in *Teaching Number: Advancing Children's Skills and Strategies*, 2<sup>nd</sup> edition. After the **answer keys**, there are the **games**. Refer to section 1-5 of the games for activities that support the learning of the concepts presented in this group of five puzzles.

*Cross-Number Discovery Puzzles 3* focuses on the basic subtraction facts. These facts are introduced in a logical rather than a numerical order. Puzzles 1-5 introduce the basic subtraction facts with subtrahends of 0, 1, 2, and 3. Students needing more support with these facts can be referred to *Thinking Strategies Subtraction: Building Mastery of Subtraction Facts*. Level 1 of this program deals with these facts.

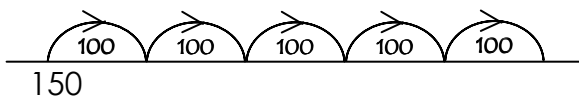
# CROSS-NUMBER PUZZLE 1



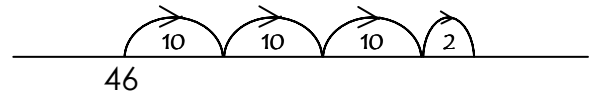
Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

## ACROSS:

- A.  $32 - 5$
- C. The number of cents in 1 dime and 3 pennies
- E. Choose the greatest number:  
425, 245, 452, 254
- G.  $80 + 6$
- H. An odd number
- K.  $8 - 2 = \bigcirc$  ;  $8 - 3 = \square$   
Solve:  $\bigcirc + \square$
- L. The number of minutes in 1 hour
- M. The number of dots in the array
- P. A number greater than 90
- R. The number reached on the last hop



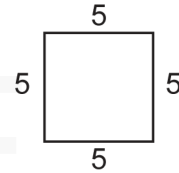
- U. The number reached on the last hop



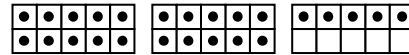
- V.  $46 + 32$

## DOWN:

- A. The perimeter of the square



- B. The number shown by the ten-frames



- D.  $25 + 5$

- E. An even number

- F. The next number in the pattern:

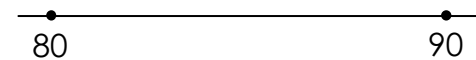
17, 19, 21, 23,

- G. A number between 800 and 900

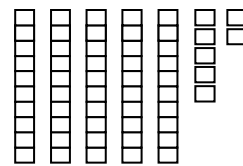
- J. The number that is 2 more than 962

- N. A number between 80 and 90

- P. The decade that 87 is closer to



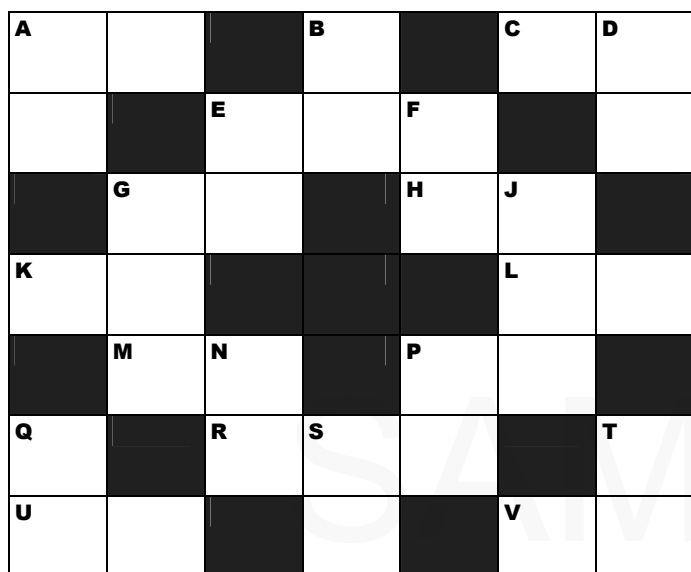
- Q. The number shown by the blocks



- S. The number that means 5 tens and 7 ones

- T.  $5 + 5 + 4 + 6 + 8$

## CROSS-NUMBER PUZZLE 2



Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

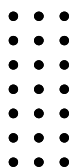
### ACROSS:

A.  $46 - 6$

C.  $9 - 2 = \bigcirc$ ;  $9 - 3 = \square$   
Solve:  $\bigcirc + \square$

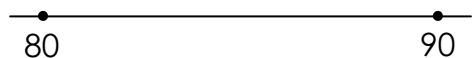
E. Choose the least number:  
386, 638, 368, 683

G. The number of dots in the array



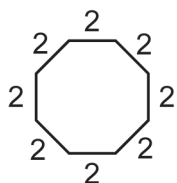
H.  $73 - 6$

K. The decade that 83 is closer to



L.  $4 + 6 + 3 + 7 + 9$

M. The perimeter of the octagon



P. An even number

R. The number that is 2 more than 572

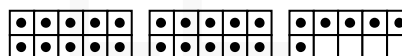
U. The number of cents in 4 dimes and 1 nickel

V.  $89 - 10 - 10 - 10$

### DOWN:

A. The next number in the pattern:  
40, 42, 44, 46,

B. The number shown by the ten-frames



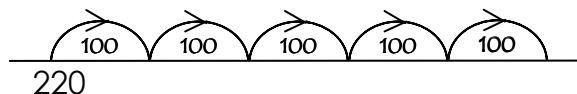
D.  $26 + 4$

E. The number of days in the month of January

F. A number between 80 and 90

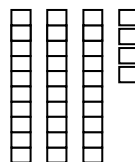
G. A number less than 300

J. The number reached on the last hop



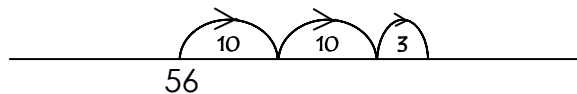
N. An odd number

P. The number shown by the blocks



Q. The number that means 3 tens and 4 ones

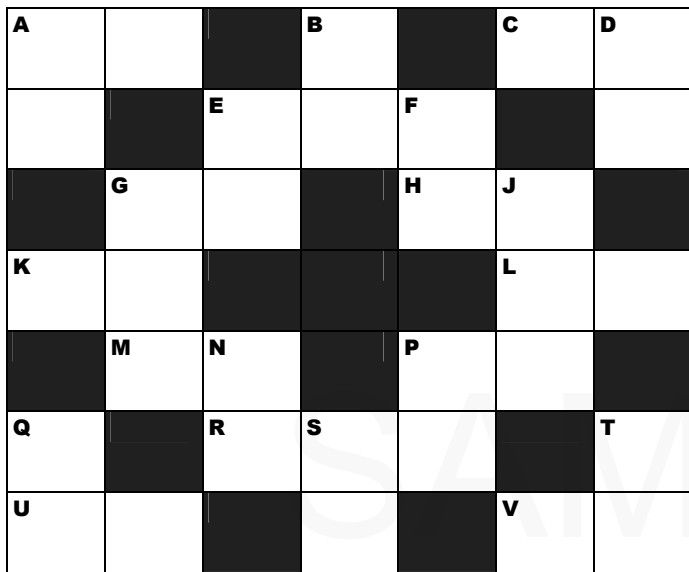
S. The number reached on the last hop



T.  $56 + 23$



# CROSS-NUMBER PUZZLE 3



Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

## ACROSS:

A.  $45 - 6$

C.  $8 - 0 = \bigcirc$  ;  $6 - 0 = \square$   
Solve:  $\bigcirc + \square$

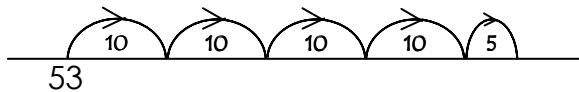
E. A number between 300 and 400

G.  $3 + 7 + 2 + 8 + 6$

H. A number greater than 50

K.  $53 + 45$

L. The number reached on the last hop



M. A number with both digits the same

P. An even number

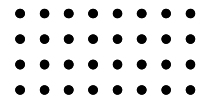
R. The number that is 2 less than 538

U. The number of minutes in 1 hour and 8 minutes

V.  $85 - 10 - 10 - 10 - 10$

## DOWN:

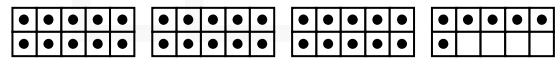
A. The number of dots in the array



B. The next number in the pattern:  
 $40, 50, 60, 70, \square$

D.  $36 + 4$

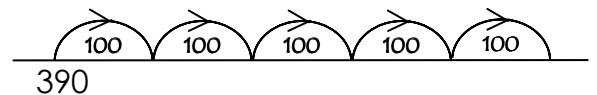
E. The number shown by the ten-frames



F. The number of cents in 7 dimes and 1 nickel

G. Choose the least number:  
 $928, 298, 829, 289$

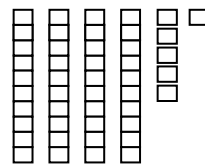
J. The number reached on the last hop



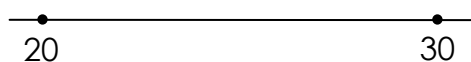
N. An odd number

P. The number that means 4 tens and 6 ones

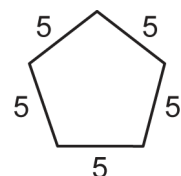
Q. The number shown by the blocks



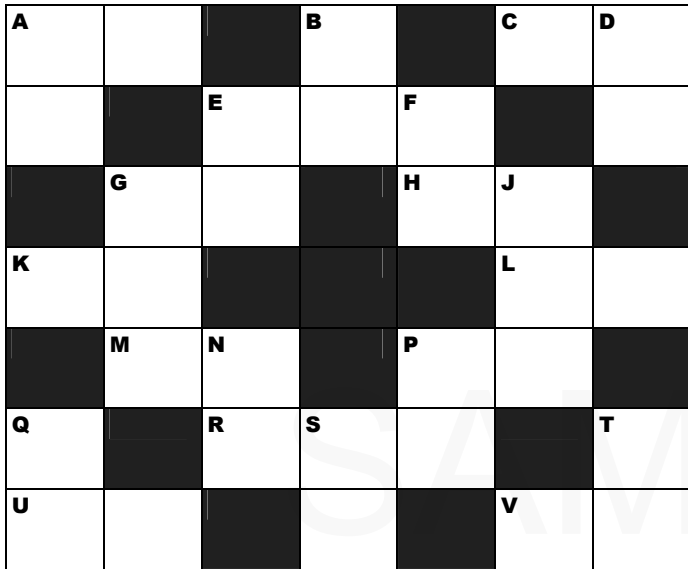
S. The decade that 27 is closer to



T. The perimeter of the pentagon



# CROSS-NUMBER PUZZLE 4



Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

## ACROSS:

A.  $3 + 7 + 6 + 4 + 8$

C. The next number in the pattern:

31, 33, 35, 37,

E. The number that is 2 less than 463

G. An even number

H. The number that means 5 tens and 9 ones

K. The number of cents in 5 dimes and 9 pennies

L.  $56 - 10 - 10 - 10 - 10$

M.  $10 - 3 = \text{○}$  ;  $9 - 3 = \text{□}$   
Solve:  $\text{○} + \text{□}$

P. A number less than 60

R. The number that is two more than seven hundred twenty-eight

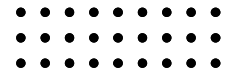
U. The decade that 73 is closer to



V.  $53 - 6$

## DOWN:

A. The number of dots in the array



B.  $64 + 32$

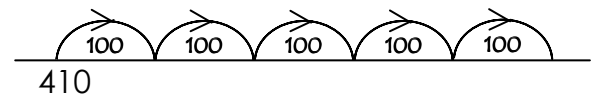
D.  $64 + 10 + 10 + 10 + 2$

E.  $47 - 7$

F. A number between 10 and 20

G. Choose the greatest number: 291, 192, 129, 219

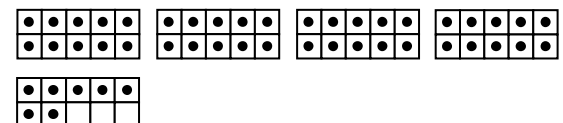
J. The number reached on the last hop



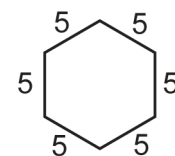
N. An odd number

P.  $47 + 3$

Q. The number shown by the ten-frames

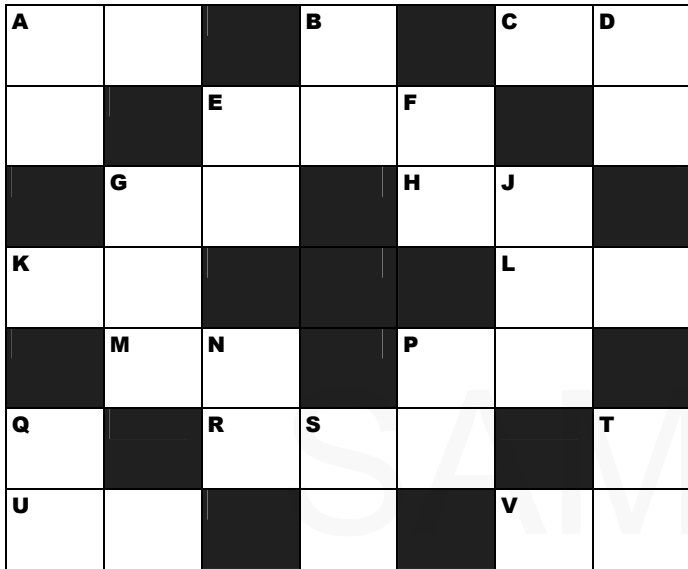


S. The perimeter of the hexagon



T. The number of minutes in 1 hour and 7 minutes

# CROSS-NUMBER PUZZLE 5



Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

## ACROSS:

A.  $88 - 10 - 10 - 10 - 10$

C.  $4 + 6 + 2 + 8 + 3$

E. Choose the greatest number:  
915, 519, 951, 591

G.  $71 - 6$

H. An odd number

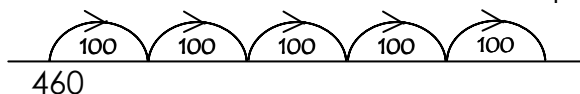
K. The number of days in 1 week  
and 4 days

L.  $44 + 33$

M.  $44 + 10 + 10 + 10 + 3$

P. An even number

R. The number reached on the last hop



U. The number of cents in 8 dimes  
and 1 nickel

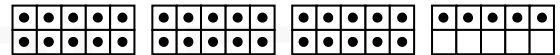
V. The next number in the pattern:

46, 48, 50, 52,

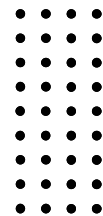
## DOWN:

A.  $35 + 5$

B. The number shown by the ten-frames



D. The number of dots  
in the array



E. A number between 90 and 100

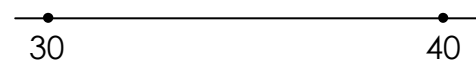
F.  $8 - 3 = \text{○}$  ;  $10 - 3 = \text{□}$   
Solve:  $\text{○} + \text{□}$

G. A number between 600 and 700

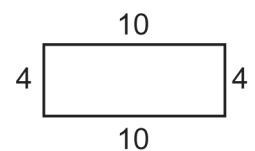
J. The number that is 2 more than  
five hundred sixty-eight

N. A number less than 80

P. The decade that 37 is closer to



Q. The perimeter  
of the rectangle



S. The number that means 6 tens  
and 4 ones

T.  $60 + 4$



# Assessment Sheets

Locating any gaps  
in math understanding

# OUTCOMES

## CROSS-NUMBER PUZZLE 5

QUESTION	NUMBER CONCEPT, STRATEGY AND SKILL	✓
<b>A</b> - across	Decrementing off the decade, by tens	
<b>C</b> - across	Combining pairs of numbers that add to 10, sum less than 30	
<b>E</b> - across	Ordering 3-digit numerals	
<b>G</b> - across	Counting-back over the decade	
<b>K</b> - across	The number of days in 1 week	
<b>L</b> - across	Adding two 2-digit numbers without regrouping	
<b>M</b> - across	Adding two 2-digit numbers without regrouping	
<b>R</b> - across	Counting by 100s off the 100	
<b>U</b> - across	Determining the number of cents in nickels and dimes	
<b>V</b> - across	Recognizing patterns that increase by 2	
<b>A</b> - down	Adding to a decade	
<b>B</b> - down	Counting by tens and ones	
<b>D</b> - down	Determining the number of dots on visible arrays Skip-counting by 4s	
<b>F</b> - down	Basic subtraction facts - subtracting 0, 1, 2, and 3	
<b>J</b> - down	Saying two numbers after a given 3-digit number	
<b>P</b> - down	Choosing the decade a 2-digit number is closer to	
<b>Q</b> - down	Determining the perimeter	
<b>S</b> - down	Place-value relationship of tens and ones	
<b>T</b> - down	Adding from a decade	

Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

**COMMENTS:**



SAMPLE

# Answer Keys

Providing immediate  
feedback to teachers

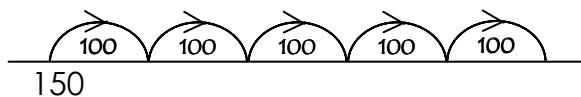
# CROSS-NUMBER PUZZLE 1

A	2	7		B	2		C	1	D	3
	0		E	4	5	F	2			0
		G	8	6		H	5	J	9	
K	1	1					L	6		0
		M	2	N	8		P	9	4	
Q	5		R	6	S	5	0		T	2
U	7	8			7			V	7	8

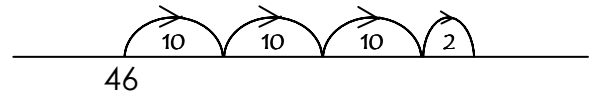
Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

## ACROSS:

- A.  $32 - 5$
- C. The number of cents in 1 dime and 3 pennies
- E. Choose the greatest number:  
425, 245, 452, 254
- G.  $80 + 6$
- H. An odd number
- K.  $8 - 2 = \bigcirc$  ;  $8 - 3 = \square$   
Solve:  $\bigcirc + \square$
- L. The number of minutes in 1 hour
- M. The number of dots in the array
- P. A number greater than 90
- R. The number reached on the last hop



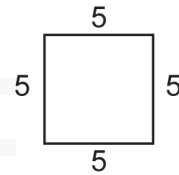
- U. The number reached on the last hop



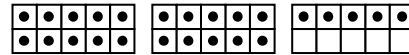
- V.  $46 + 32$

## DOWN:

- A. The perimeter of the square



- B. The number shown by the ten-frames



- D.  $25 + 5$

- E. An even number

- F. The next number in the pattern:

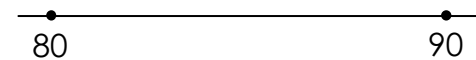
17, 19, 21, 23,

- G. A number between 800 and 900

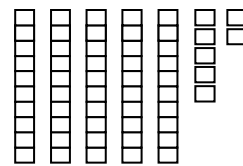
- J. The number that is 2 more than 962

- N. A number between 80 and 90

- P. The decade that 87 is closer to



- Q. The number shown by the blocks



- S. The number that means 5 tens and 7 ones

- T.  $5 + 5 + 4 + 6 + 8$

## CROSS-NUMBER PUZZLE 2

<b>A</b>	4	0		<b>B</b>	2		<b>C</b>	1	<b>D</b>	3	
	8		<b>E</b>	3	6	<b>F</b>	8			0	
	<b>G</b>	2	1			<b>H</b>	6	<b>J</b>	7		
<b>K</b>	8	0						<b>L</b>	2	9	
	<b>M</b>	1	<b>N</b>	6			<b>P</b>	3	0		
<b>Q</b>	3		<b>R</b>	5	<b>S</b>	7	4			<b>T</b>	7
<b>U</b>	4	5			9			<b>V</b>	5	9	

Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

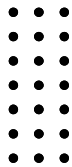
### ACROSS:

A.  $46 - 6$

C.  $9 - 2 = \bigcirc$ ;  $9 - 3 = \square$   
Solve:  $\bigcirc + \square$

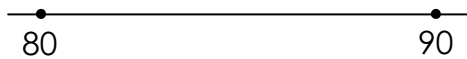
E. Choose the least number:  
386, 638, 368, 683

G. The number of dots in the array



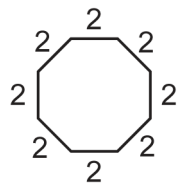
H.  $73 - 6$

K. The decade that 83 is closer to



L.  $4 + 6 + 3 + 7 + 9$

M. The perimeter of the octagon



P. An even number

R. The number that is 2 more than 572

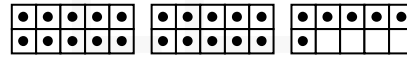
U. The number of cents in 4 dimes and 1 nickel

V.  $89 - 10 - 10 - 10$

### DOWN:

A. The next number in the pattern:  
40, 42, 44, 46,

B. The number shown by the ten-frames



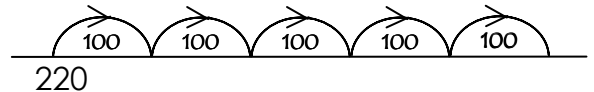
D.  $26 + 4$

E. The number of days in the month of January

F. A number between 80 and 90

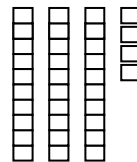
G. A number less than 300

J. The number reached on the last hop



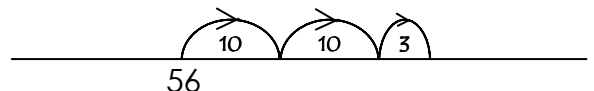
N. An odd number

P. The number shown by the blocks



Q. The number that means 3 tens and 4 ones

S. The number reached on the last hop



T.  $56 + 23$



## CROSS-NUMBER PUZZLE 3

<b>A</b>	3	9		<b>B</b>	8		<b>C</b>	1	<b>D</b>	4
	2		<b>E</b>	3	0	<b>F</b>	7			0
	<b>G</b>	2	6		<b>H</b>	5	<b>J</b>	8		
<b>K</b>	9	8					<b>L</b>	9	8	
	<b>M</b>	9	<b>N</b>	9		<b>P</b>	4	0		
<b>Q</b>	4		<b>R</b>	5	<b>S</b>	3	6		<b>T</b>	2
<b>U</b>	6	8		0		<b>V</b>	4	5		

Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

### ACROSS:

A. 45 - 6

C.  $8 - 0 = \bigcirc$  ;  $6 - 0 = \square$   
Solve:  $\bigcirc + \square$

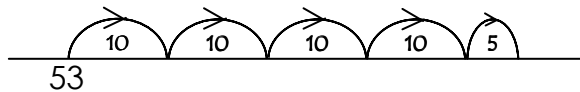
E. A number between 300 and 400

G.  $3 + 7 + 2 + 8 + 6$

H. A number greater than 50

K.  $53 + 45$

L. The number reached on the last hop



M. A number with both digits the same

P. An even number

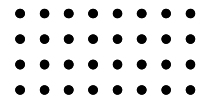
R. The number that is 2 less than 538

U. The number of minutes in 1 hour and 8 minutes

V.  $85 - 10 - 10 - 10 - 10$

### DOWN:

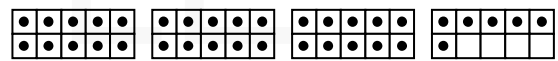
A. The number of dots in the array



B. The next number in the pattern:  
40, 50, 60, 70,

D.  $36 + 4$

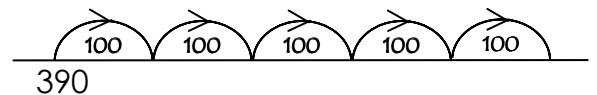
E. The number shown by the ten-frames



F. The number of cents in 7 dimes and 1 nickel

G. Choose the least number:  
928, 298, 829, 289

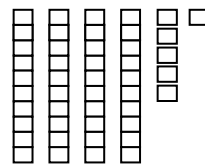
J. The number reached on the last hop



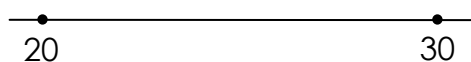
N. An odd number

P. The number that means 4 tens and 6 ones

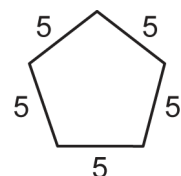
Q. The number shown by the blocks



S. The decade that 27 is closer to



T. The perimeter of the pentagon



# CROSS-NUMBER PUZZLE 4

<sup>A</sup> 2	8		<sup>B</sup> 9		<sup>C</sup> 3	<sup>D</sup> 9
7		<sup>E</sup> 4	6	<sup>F</sup> 1		6
	<sup>G</sup> 2	0		<sup>H</sup> 5	<sup>J</sup> 9	
<sup>K</sup> 5	9				<sup>L</sup> 1	6
	<sup>M</sup> 1	<sup>N</sup> 3		<sup>P</sup> 5	0	
<sup>Q</sup> 4		<sup>R</sup> 7	<sup>S</sup> 3	0		<sup>T</sup> 6
<sup>U</sup> 7	0		0		<sup>V</sup> 4	7

Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

## ACROSS:

A.  $3 + 7 + 6 + 4 + 8$

C. The next number in the pattern:

31, 33, 35, 37,

E. The number that is 2 less than 463

G. An even number

H. The number that means 5 tens and 9 ones

K. The number of cents in 5 dimes and 9 pennies

L.  $56 - 10 - 10 - 10 - 10$

M.  $10 - 3 = \text{○}$  ;  $9 - 3 = \text{□}$   
Solve:  $\text{○} + \text{□}$

P. A number less than 60

R. The number that is two more than seven hundred twenty-eight

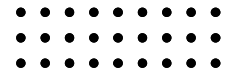
U. The decade that 73 is closer to



V.  $53 - 6$

## DOWN:

A. The number of dots in the array



B.  $64 + 32$

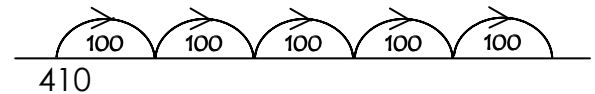
D.  $64 + 10 + 10 + 10 + 2$

E.  $47 - 7$

F. A number between 10 and 20

G. Choose the greatest number:  
291, 192, 129, 219

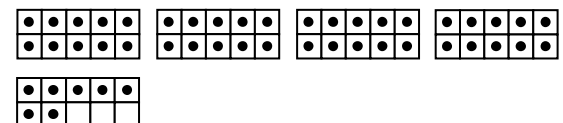
J. The number reached on the last hop



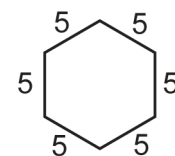
N. An odd number

P.  $47 + 3$

Q. The number shown by the ten-frames



S. The perimeter of the hexagon



T. The number of minutes in 1 hour and 7 minutes

## CROSS-NUMBER PUZZLE 5

<b>A</b>	4	8		<b>B</b>	3	2	<b>D</b>	3
	0		<b>E</b>	9	5	<b>F</b>	1	6
	<b>G</b>	6	5		<b>H</b>	2	<b>J</b>	5
<b>K</b>	1	1					<b>L</b>	7
	<b>M</b>	7	<b>N</b>	7		<b>P</b>	4	0
<b>Q</b>	2		<b>R</b>	9	<b>S</b>	6	0	
<b>U</b>	8	5		4		<b>V</b>	5	4

Cross-Number Discovery Puzzles 3 - © Celia Baron 2013

### ACROSS:

A. 88 - 10 - 10 - 10 - 10

C. 4 + 6 + 2 + 8 + 3

E. Choose the greatest number:  
915, 519, 951, 591

G. 71 - 6

H. An odd number

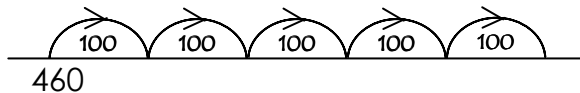
K. The number of days in 1 week  
and 4 days

L. 44 + 33

M. 44 + 10 + 10 + 10 + 3

P. An even number

R. The number reached on the last hop



U. The number of cents in 8 dimes  
and 1 nickel

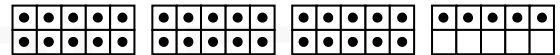
V. The next number in the pattern:

46, 48, 50, 52,

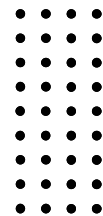
### DOWN:

A. 35 + 5

B. The number shown by the ten-frames



D. The number of dots  
in the array



E. A number between 90 and 100

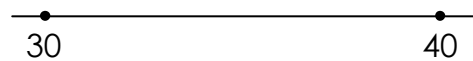
F.  $8 - 3 = \text{○}$  ;  $10 - 3 = \text{□}$   
Solve:  $\text{○} + \text{□}$

G. A number between 600 and 700

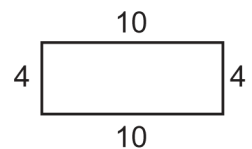
J. The number that is 2 more than  
five hundred sixty-eight

N. A number less than 80

P. The decade that 37 is closer to



Q. The perimeter  
of the rectangle



S. The number that means 6 tens  
and 4 ones

T. 60 + 4



SAMPLE.

# Games

A good and easy way  
to learn, and it's fun!

# CROSS-NUMBER DISCOVERY GAMES 3

*The order of Cross-Number Discovery Games follows the same order as that of Cross-Number Discovery Puzzles, with games 1-5 supporting the concepts introduced in puzzles 1-5. The games in each of the sections are repetitive and simple to learn. Detailed instructions for the games and an explanation of the outcomes they address are provided in the introductions to each of the sections. As the following games are most likely familiar to teachers, instructions for them are provided just once below.*

**Face-off** is a game for 2-4 players. All the cards are dealt to the players and each player places his/her cards face-down in a pile. Each player then turns over the top card of his/her pile and states the number shown on the card. The player with the greatest number is the winner of the round and takes the cards. Play continues in this manner until one player has won all the cards. If the game ends before that, the player with the greatest number of cards wins the game. Note: A variation of this game is to have players take turns before each round stating whether the greatest or least number will win that round.

**Fish** is a card game for 2-4 players. To start, 5 cards are dealt to each player and the remaining cards are placed face-down in a pile on a table. If a player has 2 matching cards, he/she sets these cards aside. After players have set aside their matches, they take turns asking the player to their left for a card that matches one in their hand. If the player to the left has the matching card, he/she must give it to the asking player who can then ask for another card. If the player to the left does not have a matching card, the player takes the top card from the pile on the table. The player with the greatest number of matches at the end of the game is the winner.

**Snap** is a card game for 2 players. The cards are placed face-down in 1 or 2 piles on a table depending on the nature of the game. The card(s) from the top of the pile(s) is(are) turned over. The first player to call out the answer takes the card(s). The player with the greater number of cards at the end of the game is the winner. Note: When choosing two players to play this game, make sure both understand the concepts involved or play will be too one-sided.

**Concentration** is a card game for 2-4 players. To begin, 20 cards (10 pairs) are placed face-down on a table in 4 rows and 5 columns. The first player turns over 2 cards. If they are a match, the player keeps the cards. If they are not a match, the player places the cards back face-down on the table and play goes to the next player. The player with the greatest number of cards at the end of the game is the winner.

There are a few score sheets that are required for a number of the games. They are included after this introduction.

## ADDING AND SUBTRACTING SCORE SHEET

QUESTION	WORK	WINNER

# LEAST SUM OR DIFFERENCE SCORE SHEET

NUMERALS	NUMBER SENTENCE	WORK	WINNER
		SAMPLE	

# TARGET NUMBER SCORE SHEET

NUMBER CHOSEN	NUMBER SENTENCE	WORK	FINAL NUMBER



# CROSS-NUMBER GAMES 3: PUZZLES I-5

## I-5A.PLACE-VALUE CARDS TO THOUSANDS

This face-off game consists of 39 place-value cards. These cards support understanding our decimal number system. For example, to show that the number 5678 means 5 thousands, 6 hundreds, 7 tens and 8 ones, place the card showing 600 on top of the card showing 5000 to form the number 5600. Next, place the card showing 70 on top of these cards to form the number 5670. Finally, place the card showing 8 on top of these cards to form the number 5678.

This is a game for 2 players. Two sets of the 39 cards are required. The cards are placed face-down on a table in 4 piles; thousands, hundreds, tens and ones. Before each round, one player chooses whether the greater or lesser number will win that round. Players choose the top card from each pile, placing the cards on top of one another, and reading their 4-digit number. The player with the greater or lesser number takes the cards. The player with the greater number of cards after 9 rounds wins the game.

## I-5B.TENS AND ONES, NO REGROUPING

This game consists of 40 cards representing the numbers 1 to 40 in groups of tens and ones. No regrouping is involved.

These cards can be used to play the games described in the Introduction to Cross-Number Games 3.

## I-5C.COUNTING BY TENS AND ONES WITH HUNDREDS CHART

This is a target-100 game. Two hundred charts, one with numerals and the other one without numerals are provided. Also required are blocks in groups of tens and ones as well as a 6-sided number cube labeled with a 1 on four sides and a 10 on the other two sides. The game provides practice with counting up to 100 with tens and ones.

This is a game for 2-4 players. Players take turns rolling the number cube and choosing the number of blocks rolled. When players have 10 blocks, they can exchange them for one block of ten. The first player with 100 blocks wins the game. Players can track their scores on either the hundred chart with numerals or the one without numerals.

## I-5D.NUMBER BOUNCE

This is the first of 8 number bounce games. One is provided for each group of five puzzles. This number bounce game consists of 35 cards. It provides practice in finding one, two and three more than a number, as well finding one, two and three less than a number. The numbers are between 1 and 1000.

Number bounces can be played by an entire class, small groups or individual students. When playing this game with an entire class, give each student one or two cards. Ask the student who has the card with the number 1 to begin. The student reads that he/she has the number 1 and asks for the next number on his/her card. The student who has the card with that number reads his/her card and asks for the next number. The game continues in this manner until all the cards are read. The last card will ask for the number 1. When this game is played by individual students, have the students place the first numbers on the cards in order to make locating them easier.

### **I-5E.ADDING TO A DECADE, 0-5**

This four-in-a-row game consists of 32 cards and 4 game boards. Bingo chips are also required. This game provides practice in finding a missing addend to a decade number. The missing addends are from 0 to 5. Ten-frames can be provided for support.

This is a game for 2-4 players. Players choose one of the 4 game boards. The cards are scattered face-down on a table. In turn each player chooses a card, names the missing addend and places a bingo chip on **one** of these missing addends on his/her game board. If none of these missing addends is available on his/her game board, the player forfeits that turn. The first player with a complete row or column wins the game.

### **I-5F.ADDING AND SUBTRACTING**

This is the first of 8 adding and subtracting games. One is provided for each group of five puzzles. This face-off game consists of 14 cards and a score sheet. The game provides practice with the addition and subtraction questions in Puzzles 1-5. The score sheet for the adding and subtracting games is included in the Introduction to Cross-Number Games 3.

This is a game for 2 players. Each player is given a score sheet. The cards are scattered face-down on a table. Before each round, one player chooses whether the greater or lesser answer will win the round. Players choose a card, and complete the number sentence on their score sheet. The player with the greater or lesser answer wins the round. The player with the greater number of wins after 7 rounds wins the game.

### **I-5G.BASIC SUBTRACTION FACTS, SUBTRACTING 0-3**

This is the first of 8 basic subtraction games. One is provided for each group of 5 puzzles. This game consists of 40 cards and provides practice with subtracting 0-3 (subtrahends of 0-3).

These cards can be used to play the games described in the Introduction to Cross-Number Games 3.

### **I-5H.FINDING THE PERIMETER**

This face-off game consists of 20 cards. The game supports the understanding of perimeter as well as provides practice with skip-counting. A 6-sided number cube labeled 1, 2, 3, 4, 5, and 10 is also required.

This is a game for 2 players. The cards are scattered face-down on a table. Before each round, one player chooses whether the greater or lesser perimeter will win the round. Players then choose a card and roll the number cube. The number cube indicates the length of each side of the polygon on the card chosen. Players then find the perimeter of their polygons. The player with the polygon who has the greater or lesser perimeter takes the cards. The player with the greater number of cards after 10 rounds wins the game.

**I-5A**  
**PLACE VALUE CARDS**  
**TO THOUSANDS**

~ 39 CARDS ~

Cross-Number Games 3 - © Celia Baron 2013

1 0 0 0

Book 3: 1-5A

2 0 0 0

Book 3: 1-5A

3 0 0 0

Book 3: 1-5A

4 0 0 0

Book 3: 1-5A

0 0 0

Book 3: 1-5A

1 0 0

Book 3: 1-5A

2 0 0

Book 3: 1-5A

3 0 0

Book 3: 1-5A

4 0 0

Book 3: 1-5A

0 0

Book 3: 1-5A

1 0

Book 3: 1-5A

2 0

Book 3: 1-5A

3 0

Book 3: 1-5A

4 0

Book 3: 1-5A

0

Book 3: 1-5A

1

Book 3: 1-5A

2

Book 3: 1-5A

3

Book 3: 1-5A

4

Book 3: 1-5A

5 0 0 0

Book 3: 1-5A

5 0 0

Book 3: 1-5A

5 0

Book 3: 1-5A

5

Book 3: 1-5A

6 0 0 0

Book 3: 1-5A

6 0 0

Book 3: 1-5A

6 0

Book 3: 1-5A

6

Book 3: 1-5A

7 0 0 0

Book 3: 1-5A

7 0 0

Book 3: 1-5A

7 0

Book 3: 1-5A

7

Book 3: 1-5A

8 0 0 0

Book 3: 1-5A

8 0 0

Book 3: 1-5A

8 0

Book 3: 1-5A

8

Book 3: 1-5A

9 0 0 0

Book 3: 1-5A

9 0 0

Book 3: 1-5A

9 0

Book 3: 1-5A

9

Book 3: 1-5A

**1-5B  
TENS AND  
ONES, NO  
REGROUPING**

~ 40 CARDS ~

*Cross-Number Games 3 -  
© Celia Baron 2013*



Book 3: 1-5B

1 ten  
and  
2 ones

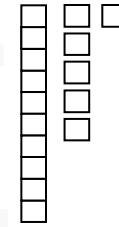
Book 3: 1-5B

$$10 + 2$$

Book 3: 1-5B

12

Book 3: 1-5B



Book 3: 1-5B

1 ten  
and  
6 ones

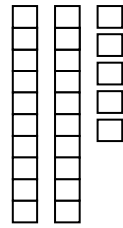
Book 3: 1-5B

$$10 + 6$$

Book 3: 1-5B

16

Book 3: 1-5B



Book 3: 1-5B

2 tens  
and  
5 ones

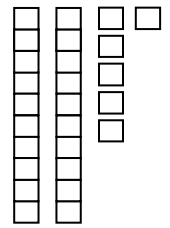
Book 3: 1-5B

$$20 + 5$$

Book 3: 1-5B

25

Book 3: 1-5B



Book 3: 1-5B

2 tens  
and  
6 ones

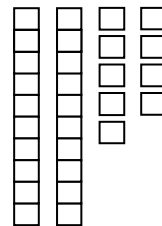
Book 3: 1-5B

$$20 + 6$$

Book 3: 1-5B

26

Book 3: 1-5B



Book 3: 1-5B

2 tens  
and  
9 ones

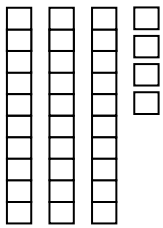
Book 3: 1-5B

$$20 + 9$$

Book 3: 1-5B

29

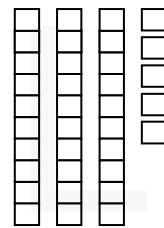
Book 3: 1-5B



3 tens  
and  
4 ones

$$30 + 4$$

34



3 tens  
and  
5 ones

$$30 + 5$$

Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

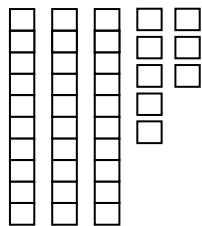
Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

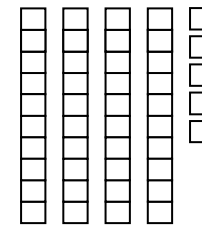
35



3 tens  
and  
8 ones

$$30 + 8$$

38



4 tens  
and  
5 ones

Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

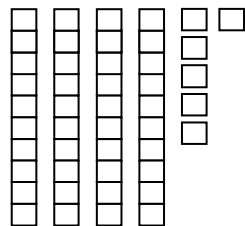
Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

$$40 + 5$$

45



4 tens  
and  
6 ones

$$40 + 6$$

46

Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

Book 3: 1-5B

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
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

		S	A	M	P	L	E		



**I-5D**  
**NUMBER  
BOUNCE**

~ **35 CARDS** ~

Cross-Number Games 3 -  
© Celia Baron 2013

I have

**I**

Who has

**2** more than **499**?

Book 3: 1-5D

I have

**50I**

Who has

**I** less than **685**?

Book 3: 1-5D

I have

**684**

Who has

**I** more than **829**?

Book 3: 1-5D

I have

**830**

Who has

**3** more than **297**?

Book 3: 1-5D

I have

**300**

Who has

**2** less than **75I**?

Book 3: 1-5D

I have

**749**

Who has

**3** less than **I02**?

Book 3: 1-5D

I have

**99**

Who has

**I** more than **II0**?

Book 3: 1-5D

I have

**III**

Who has

**2** less than **40I**?

Book 3: 1-5D

I have

**399**

Who has

**I** less than **960**?

Book 3: 1-5D

I have

**959**

Who has

**3** more than **478**?

Book 3: 1-5D

I have

**48I**

Who has

**2** more than **700**?

Book 3: 1-5D

I have  
**702**

Who has  
**3** less than **201**?

Book 3: 1-5D

I have  
**198**

Who has  
**1** more than **999**?

Book 3: 1-5D

I have  
**1000**

Who has  
**1** less than **600**?

Book 3: 1-5D

I have  
**599**

Who has  
**3** more than **897**?

Book 3: 1-5D

I have  
**900**

Who has  
**2** less than **570**?

Book 3: 1-5D

I have  
**568**

Who has  
**3** less than **900**?

Book 3: 1-5D

I have  
**897**

Who has  
**2** more than **899**?

Book 3: 1-5D

I have  
**901**

Who has  
**1** less than **487**?

Book 3: 1-5D

I have  
**486**

Who has  
**1** more than **59**?

Book 3: 1-5D

I have  
**60**

Who has  
**1** more than **359**?

Book 3: 1-5D

I have  
**360**

Who has  
**1** more than **859**?

Book 3: 1-5D

I have  
**860**

Who has  
**2** less than **400**?

Book 3: 1-5D

I have  
**398**

Who has  
**3** more than **199**?

Book 3: 1-5D

I have  
**202**

Who has  
**2** more than **619**?

Book 3: 1-5D

I have  
**621**

Who has  
**3** less than **381**?

Book 3: 1-5D

I have  
**378**

Who has  
**1** less than **1000**?

Book 3: 1-5D

I have  
**999**

Who has  
**2** more than **598**?

Book 3: 1-5D

I have  
**600**

Who has  
**3** more than **828**?

Book 3: 1-5D

I have  
**831**

Who has  
**3** less than **217**?

Book 3: 1-5D

I have  
**214**

Who has  
**2** less than **482**?

Book 3: 1-5D

I have  
**480**

Who has  
**3** less than **751**?

Book 3: 1-5D

I have  
**748**

Who has  
**3** more than **698**?

Book 3: 1-5D

I have  
**701**

Who has  
**2** more than **248**?

Book 3: 1-5D

I have  
**250**

Who has  
**3** less than **4**?

Book 3: 1-5D

3	2	5	1
4	3	2	0
1	5	4	3
5	0	1	2

Book 3: I-5E

0	1	5	3
3	4	2	1
5	0	3	2
2	5	4	1

Book 3: I-5E

1	5	2	4
3	0	5	1
5	2	1	3
2	3	4	0

Book 3: I-5E

4	0	3	1
5	1	2	3
1	5	4	2
3	2	0	4

Book 3: I-5E

**I-5E**  
**ADDING TO A DECADE, 0-5**

~32 CARDS~

Cross-Number Games 3 - © Celia Baron 2013

$$5 + \square = 10$$

Book 3: I-5E

$$15 + \square = 20$$

Book 3: I-5E

$$25 + \square = 30$$

Book 3: I-5E

$$35 + \square = 40$$

Book 3: I-5E

$$45 + \square = 50$$

Book 3: I-5E

$$55 + \square = 60$$

Book 3: I-5E

$$6 + \square = 10$$

Book 3: I-5E

$$36 + \square = 40$$

Book 3: I-5E

$$66 + \square = 70$$

Book 3: I-5E

$$76 + \square = 80$$

Book 3: I-5E

$$86 + \square = 90$$

Book 3: I-5E

$$96 + \square = 100$$

Book 3: I-5E

$$7 + \square = 10$$

Book 3: I-5E

$$17 + \square = 20$$

Book 3: I-5E

$$27 + \square = 30$$

Book 3: I-5E

$$37 + \square = 40$$

Book 3: I-5E

$$47 + \square = 50$$

Book 3: 1-5E

$$57 + \square = 60$$

Book 3: 1-5E

$$8 + \square = 10$$

Book 3: 1-5E

$$58 + \square = 60$$

Book 3: 1-5E

$$68 + \square = 70$$

Book 3: 1-5E

$$78 + \square = 80$$

Book 3: 1-5E

$$88 + \square = 90$$

Book 3: 1-5E

$$98 + \square = 100$$

Book 3: 1-5E

$$9 + \square = 10$$

Book 3: 1-5E

$$19 + \square = 20$$

Book 3: 1-5E

$$29 + \square = 30$$

Book 3: 1-5E

$$89 + \square = 90$$

Book 3: 1-5E

$$99 + \square = 100$$

Book 3: 1-5E

$$10 + \square = 10$$

Book 3: 1-5E

$$50 + \square = 50$$

Book 3: 1-5E

$$90 + \square = 90$$

Book 3: 1-5E

**1-5F**  
**ADDING AND SUBTRACTING**

~ 14 CARDS ~

Cross-Number Games 3 - © Celia Baron 2013

$$79 + 5$$

Book 3: 1-5F

$$80 + 6$$

Book 3: 1-5F

$$65 + 5$$

Book 3: 1-5F

$$86 + 4$$

Book 3: 1-5F

$$52 + 24$$

Book 3: 1-5F

$$56 + 21$$

Book 3: 1-5F

$$45 + 33$$

Book 3: 1-5F

$$230 + 100 + 100$$

Book 3: 1-5F

$$210 + 100 + 100$$

Book 3: 1-5F

$$93 - 5$$

Book 3: 1-5F

$$84 - 5$$

Book 3: 1-5F

$$86 - 6$$

Book 3: 1-5F

$$93 - 20$$

Book 3: 1-5F

$$98 - 30$$

Book 3: 1-5F

**I-5G  
BASIC  
SUBTRACTION  
FACTS,  
SUBTRACTING  
0-3**

**~ 40 CARDS ~**

*Cross-Number Games 3 -  
© Celia Baron 2013*

$3 - 3$

Book 3: I-5G

$2 - 2$

Book 3: I-5G

$1 - 1$

Book 3: I-5G

$0 - 0$

Book 3: I-5G

$4 - 3$

Book 3: I-5G

$2 - 1$

Book 3: I-5G

$3 - 2$

Book 3: I-5G

$1 - 0$

Book 3: I-5G

$5 - 3$

Book 3: I-5G

$4 - 2$

Book 3: I-5G

$3 - 1$

Book 3: I-5G

$2 - 0$

Book 3: I-5G

$6 - 3$

Book 3: I-5G

$5 - 2$

Book 3: I-5G

$4 - 1$

Book 3: I-5G

$3 - 0$

Book 3: I-5G

$7 - 3$

Book 3: I-5G

$6 - 2$

Book 3: I-5G

$5 - 1$

Book 3: I-5G

$4 - 0$

Book 3: I-5G



$8 - 3$

Book 3: I-5G

$7 - 2$

Book 3: I-5G

$6 - 1$

Book 3: I-5G

$5 - 0$

Book 3: I-5G

$9 - 3$

Book 3: I-5G

$8 - 2$

Book 3: I-5G

$7 - 1$

Book 3: I-5G

$6 - 0$

Book 3: I-5G

$10 - 3$

Book 3: I-5G

$9 - 2$

Book 3: I-5G

$8 - 1$

Book 3: I-5G

$7 - 0$

Book 3: I-5G

$10 - 2$

Book 3: I-5G

$9 - 1$

Book 3: I-5G

$8 - 0$

Book 3: I-5G

$10 - 2$

Book 3: I-5G

$10 - 1$

Book 3: I-5G

$9 - 0$

Book 3: I-5G

$10 - 1$

Book 3: I-5G

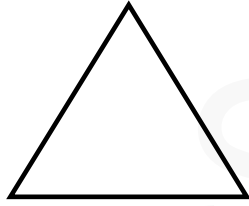
$9 - 0$

Book 3: I-5G

**I-5H  
FINDING THE  
PERIMETER**

**~ 20 CARDS ~**

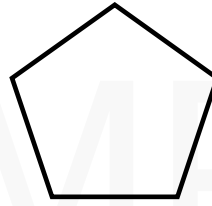
*Cross-Number Games 3 -  
© Celia Baron 2013*



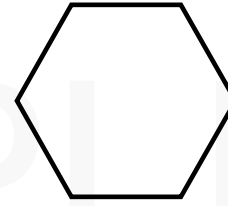
Book 3: 1-5H



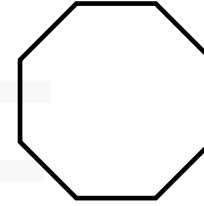
Book 3: 1-5H



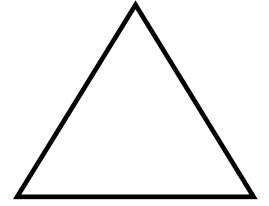
Book 3: 1-5H



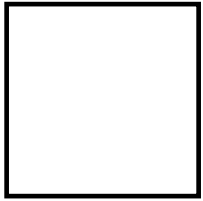
Book 3: 1-5H



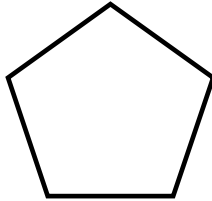
Book 3: 1-5H



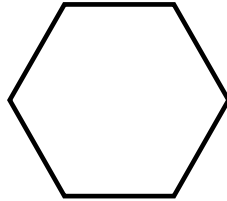
Book 3: 1-5H



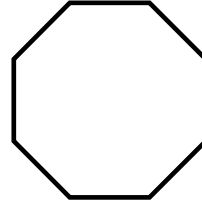
Book 3: 1-5H



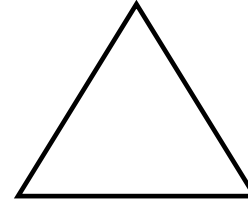
Book 3: 1-5H



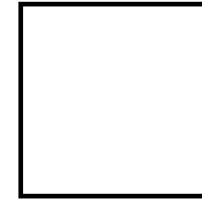
Book 3: 1-5H



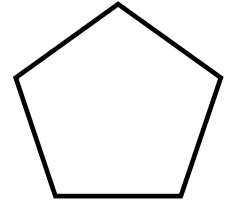
Book 3: 1-5H



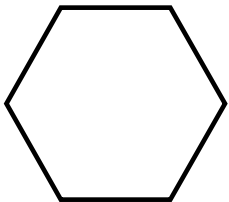
Book 3: 1-5H



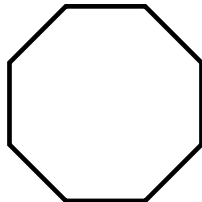
Book 3: 1-5H



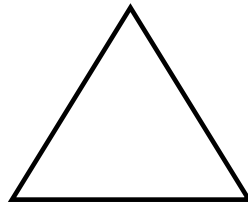
Book 3: 1-5H



Book 3: 1-5H



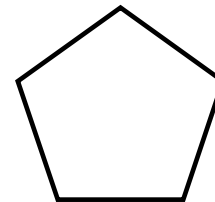
Book 3: 1-5H



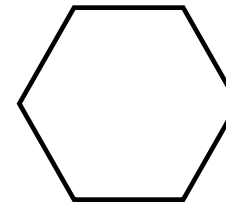
Book 3: 1-5H



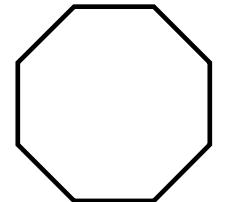
Book 3: 1-5H



Book 3: 1-5H



Book 3: 1-5H



Book 3: 1-5H