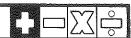
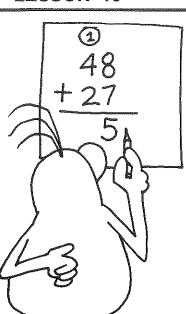
### STARTING AT THE LEFT





When you add with pencil and paper, you usually start at the **right** and work toward the left.

To add in your head, try starting at the **left**.

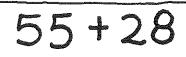
THINK ...

48+27

40 plus 20 is 60, and 8 plus 7 is 15 . . . 60 plus 15 is 75.



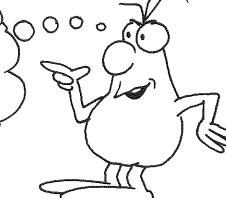
Try this one from the left.



50 + 20 is 70 ...

5 + 8 is 13...

70 + 13 is 83.



TRY THESE IN YOUR HEAD.

Start at the left and add.



- 1. 35 + 49
- **3.** 26 + 47
- **7**. 55 + 29

- **2.** 53 + 28
- 4. 19 + 37
- 8. 44 + 27
- **5.** 15 + 65
- **9.** 19 + 63
- **6.** 47 + 28
- **10.** 36 + 49

THINK IT THROUGH



If this is not a leap year, what is the date of the 100th day of the year?

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MENTAL MATH IN THE MIDDLE GRADES

LESSON 10 STARTING AT THE LEFT

### **POWER BUILDER B**

**11.** 35 + 18 = \_\_\_\_\_

If you think of January 1 as day 1 and December 31 as day 365 (it is not a leap year), what day is May 28?

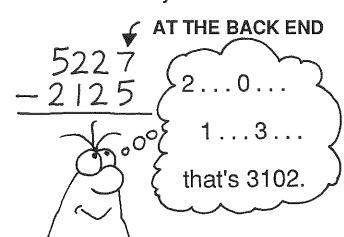


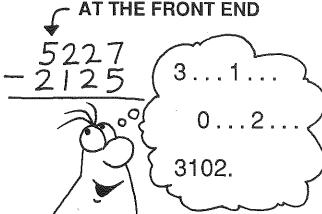
Subtraction problems come in two styles . . .

THOSE THAT NEED REGROUPING

THOSE THAT DON'T NEED REGROUPING

When they don't need regrouping, you can start at either end.





Starting at the front end makes more sense because then you don't have to juggle digits.

### TRY THESE IN YOUR HEAD.

Start at the front end and subtract.



- 1. 47 26
- **3.** 49 18 **7.** 5647 3515
- 2. 84 61
- **4.** 357 135 **8.** 6892 1812
- **5**. 846 715
  - **9.** 7368 4317
- **6.** 947 645 **10.** 4807 1503

THINK IT THROUGH



The difference between two numbers is 10. If the numbers are doubled, what is the difference between them?

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MENTAL MATH IN THE MIDDLE GRADES

LESSON 11 STARTING AT THE LEFT

### **POWER BUILDER B**

THINK IT THROUGH



The difference between two numbers is 25.9

If the numbers are doubled, what is the difference between them?

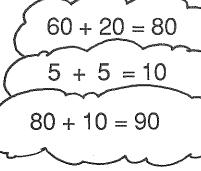
#### **WORKING WITH FIVES**



It's easy to add in your head when both numbers end in 5.

- 1. Add the tens.
- 2. Add the ones.
- 3. Find the total.





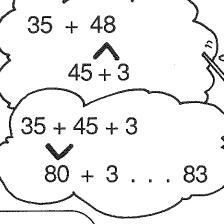
The answer will always end in zero!



Here's a trick to help add numbers in your head . . .

Expand to make them both end in 5 . . . then add what's left over.

# 35 + 48

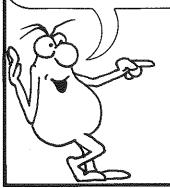




TRY THESE IN YOUR HEAD.

Make both numbers end in 5.

2.



- **1.** 46 + 25
  - 25 3.
- **3.** 55 + 27
- 7. 135 + 26
- **17** + **45 4.** 46 + 15
- 8. 145 + 19
- **5.** 39 + 85
- **9.** 235 + 37
- **6.** 75 + 38
- 10. 55 + 38

THINK IT THROUGH



If you have 3 quarters and 10 nickels, and you spend 1 quarter and 7 nickels, how much money will you have left?

MENTAL MATH IN THE MIDDLE GRADES

LESSON 12 WORKING WITH FIVES

### **POWER BUILDER B**

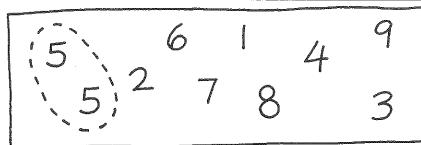
THINK IT THROUGH



If you have 5 quarters and 7 nickels, and you spend 3 nickels, how much money will you have left?

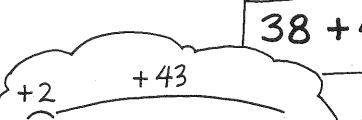


Find the pairs that total 10.



Tens are easy numbers to use.

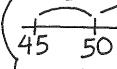
You can "make tens" to make mental addition easier. Here's how . . .





"Make tens" with 38. then adjust the 45.

38 + 45

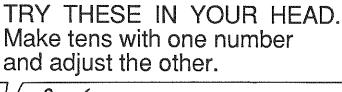


Or "make tens" with 45, then adjust the 38.

+ 33



83





1. 
$$49 + 23$$

7.54 + 39

**THINK IT** THROUGH



Find the sum of the first ten even numbers (counting 0 as the first number). Look for a shortcut.

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MENTAL MATH IN THE MIDDLE GRADES

LESSON 13 TRADING OFF

### **POWER BUILDER B**

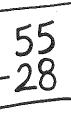
11. 39 + 38 = \_\_\_\_\_

Find the sum of the first ten odd numbers. Look for a shortcut.

### **BALANCING IN SUBTRACTION**



Which problem in each pair is easier? Why?



"Making tens" can help you subtract in your head.

Adding 2 to 28 makes 30. That's easier to subtract. Then I'll adjust 55, too, to balance.

$$\begin{cases} 55 + 2 \to 57 \\ -28 + 2 \to -30 \\ \hline 27 \end{cases}$$

Remember: Adding the same amount to both numbers leaves the difference unchanged!



# TRY THESE IN YOUR HEAD.

Make tens and balance.



# THINK IT THROUGH



Subtract the largest two-digit even number from the largest three-digit even number.

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MENTAL MATH IN THE MIDDLE GRADES

LESSON 14 BALANCING IN SUBTRACTION

### **POWER BUILDER B**



Subtract the smallest three-digit odd number from the smallest four-digit odd number.

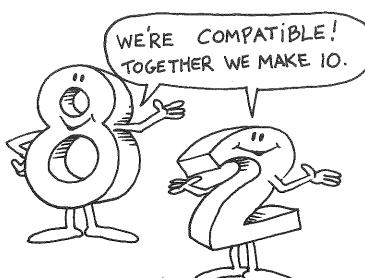
**11.** 93 – 15 = \_\_\_\_\_

#### SEARCHING FOR COMPATIBLES



Two numbers that total a nice "tidy" sum (like 10, or 100, or 1000) are called compatible númbers.

45 and 55 are compatible. So are 360 and 640.



Compatible numbers make mental math easy! Learn to recognize them.

Find compatible pairs.					
4	60	40	71		
56	75	29	30		
44	33	12	67		
96	70	88	25		

Find compatible pairs.					
400	300	550	600		
510	620	250	100		
630	900	700	380		
450	750	490	370		

TRY THESE, USE YOUR HEAD.

Think about compatible numbers.



- 1. On scrap paper, list number pairs that total 100. Write as many as you can in one minute. GO!
- 2. How many different pairs of numbers total 1000?

THINK IT THROUGH



How many different pairs of whole numbers add to 100?

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MENTAL MATH IN THE MIDDLE GRADES

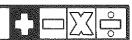
LESSON 15 SEARCHING FOR COMPATIBLES

### **POWER BUILDER B**

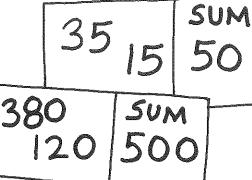
THINK IT THROUGH



How many different pairs of **even** whole numbers add to 100?



When you add compatible numbers, you get a "tidy" sum that is easy to use in your head.



SUM 140 | SUM 380 160 300 200

All the examples above are compatible pairs.

$$125 + 75$$
  $19 + 31$ 

$$134 + 23$$

$$43 + 7$$

$$72 + 16$$

$$72 + 16$$
  $280 + 20$ 

$$405 + 27$$
  $78 + 22$ 

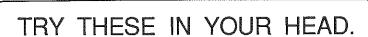
$$78 + 22$$

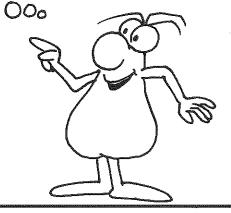
$$131 + 17$$

$$82 + 18$$

Which of these problems contain compatible numbers?

What are the "tidy" sums?





1. Find compatible pairs that total 50.



20

39



37

31

13 11 30

2. Find compatible pairs that total 200.

175

70

95

105

120

145

130 80 55

25

THINK IT THROUGH



Add these numbers:

the largest two-digit number,

the smallest three-digit odd number, the largest one-digit number, and the smallest two-digit odd number.

What do you get?

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MENTAL MATH IN THE MIDDLE GRADES

LESSON 16 SEARCHING FOR COMPATIBLES

### **POWER BUILDER B**

# THINK IT THROUGH



Add these numbers:

the largest odd number less than 60,

the smallest odd number.

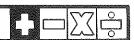
the largest one-digit even number, and

the smallest two-digit even number.

What do you get?

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#### SEARCHING FOR COMPATIBLES



When you have a chain of numbers to add in your head, it's easy if you do it

it one step at a time.

$$130 + 50 + 70 + 20 + 50$$
 $180 + 70$ 
 $250 + 20$ 
 $270 + 50$ 
 $320$ 

Here's another trick to make a chain easy to handle:

Look for compatible pairs.

3. ~ { 200 } -

200 plus 100 is 300, plus 20 is 320. **130** + 50 + **70** + 20 + 50

100

Sa C

TRY THESE IN YOUR HEAD.

Look for compatible pairs.

$$2.45 + 35 + 15$$

$$4. 35 + 30 + 15 + 70$$

9. 
$$40 + 75 + 50 + 60 + 25$$

THINK IT THROUGH



What is the sum of 96, 97, 98, 99, 100, 101, 102, 103, and 104? Look for a shortcut.

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MENTAL MATH IN THE MIDDLE GRADES

LESSON 17 SEARCHING FOR COMPATIBLES

### **POWER BUILDER B**

THINK IT THROUGH



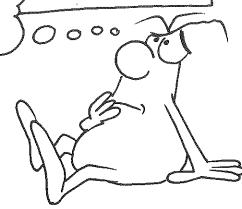
Find the sum of all the whole numbers from 45 to 55 (including both 45 and 55). Be sure to look for a shortcut.



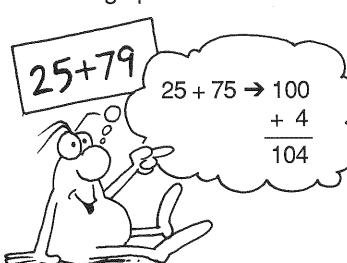
That looks too hard to do in my head!

25 + 79

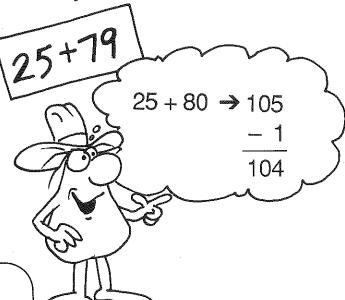
Look for compatible numbers. If they aren't there . . . make your own!



You can do it by breaking up one number . . .



Or you can round up, then adjust the total.



TRY THESE IN YOUR HEAD. Make your own compatible pairs.





7.148 + 50

8. 350 + 72

THINK IT THROUGH



Think of the smallest two-digit odd number. Double it. Add 18. Subtract 15. What is the result?

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MENTAL MATH IN THE MIDDLE GRADES

LESSON 18 MAKE-YOUR-OWN COMPATIBLES

### **POWER BUILDER B**

THINK IT THROUGH



Think of the largest two-digit even number. Subtract 38. Add 25. Subtract 45. Add 15. Subtract 55. What is the result?