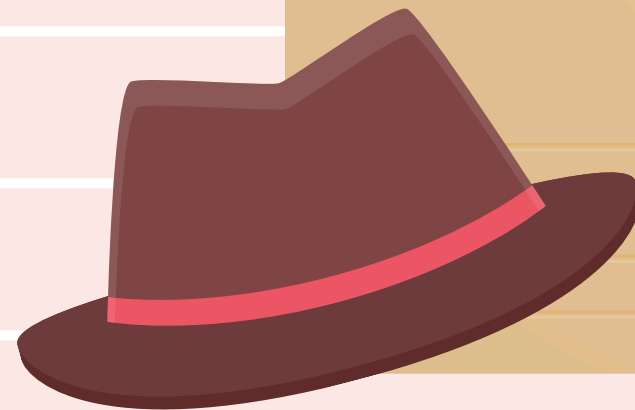




# Even & Odd Detectives

Solving the Mystery of  
Number Patterns

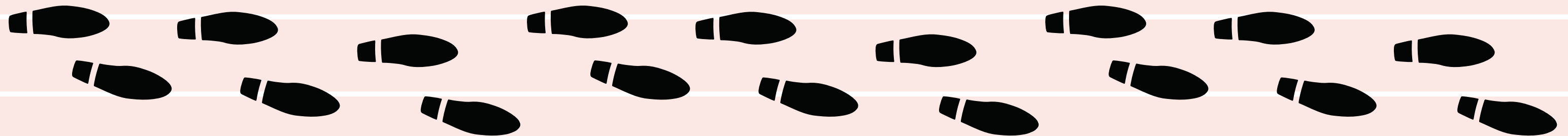


**CASE #47**

# TEKS & ELPS

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- 3.4I - Determine if a number is even or odd using divisibility rules.
- 3.4A - Solve one-step and two-step problems involving addition and subtraction.
- 1.E - Internalize new academic language by using it in meaningful ways.
- 4.F.vii - Use peer and teacher support to enhance understanding.



# Today's Detective Mission



## Objective:

Students will use reasoning and visual models to determine whether the sum or difference of two numbers is even or odd and explain their thinking using mathematical language.

## I Can...

- I **can** tell if a number is even or odd. 🧠
- I **can** predict if a sum or difference will be even or odd before solving. 🔍
- I **can** explain my reasoning using math rules and patterns. 💬





# Agenda / Routine

|  |                                                                                                                                                                                                                              |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | CASE WARM-UP: REVIEW WHAT MAKES NUMBERS EVEN OR ODD.   |
|  | THE CASE BEGINS: LOOK AT MYSTERIOUS NUMBER CLUES AND MAKE PREDICTIONS.                                                                    |
|  | PARTNER INVESTIGATION: USE POM-POMS TO TEST ADDITION AND SUBTRACTION PATTERNS.                                                           |
|  | CLASS CHECKPOINTS: COMPARE CLUES AND DISCUSS OUR DISCOVERIES.                                                                           |
|  | OFFICIAL DETECTIVE CODE: REVEAL AND WRITE THE FINAL EVEN/ODD RULES.                                                                     |
|  | EXIT TICKET & BADGE CEREMONY: REFLECT, SHARE, AND CLOSE THE CASE.                                                                       |
|  | CASE FILE PRACTICE: PROVE YOUR SKILLS INDEPENDENTLY.                                                                                    |



# What Makes a Number Even or Odd?

| Even Numbers                              | Odd Numbers                   |
|-------------------------------------------|-------------------------------|
| Can be split into two <b>equal</b> groups | Always have <b>1 left out</b> |
| Always end in <b>0, 2, 4, 6, 8</b>        | Always end in 1, 3, 5, 7, 9   |
| (●●●●) (●●●●)                             | (●●●●) (●●●●●)                |



- How do you know if 18 is even?
- What clue tells you 27 is odd?

# Case #47: The Partnered Numbers

Strange things are happening when numbers team up.

Your mission:  
uncover the  
pattern and write  
the official Even &  
Odd Rules.

**TOP SECRET**

$$4 + 6 = 10$$

*Both even...  
suspicious result?*

$$7 + 5 = 12$$

*Two odd numbers...  
strange outcome?*

$$8 - 3 = 5$$

*An even and an  
odd mix...  
interesting.*

**CASE #47**



# Detective Partner Rules



**1. Partner A talks first, Partner B listens.**

- Partner A explains their thinking while Partner B records.
- Then switch roles after each case! 



**2. Whisper voices only.**



**3. Keep your eyes on the evidence.**

- Use your pom-poms carefully and stay focused on the clues.



**4. Share your thinking, not just your answer.**

- Real detectives explain why the pattern works.



**5. Respect your partner's ideas.**

- Good detectives listen, question, and build on each other's clues.



# Collecting Evidence: Addition and Subtraction Clues



Math Detectives – Ms. Perez’s Class

## ■ Case Log #47 – Collecting Evidence

*Detective Mission: Discover the pattern between even and odd numbers.*

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Use your blue chips for even numbers and red chips for odd numbers. Work with your detective partner to test each case. Record your results below.

| Case # | Operation   | Numbers | Even or Odd? | Clue / Pattern You Noticed |
|--------|-------------|---------|--------------|----------------------------|
| 1      | Even + Even | 4 + 6   |              |                            |
| 2      | Odd + Odd   | 5 + 7   |              |                            |
| 3      | Even + Odd  | 8 + 3   |              |                            |
| 4      | Even – Even | 12 – 4  |              |                            |
| 5      | Odd – Odd   | 15 – 7  |              |                            |
| 6      | Odd – Even  | 17 – 10 |              |                            |

■ One clue that confused me: \_\_\_\_\_

■ One clue that made sense: \_\_\_\_\_

# Checkpoint #1: Addition Patterns

- What happens when you add two even numbers?
- What about two odd numbers?
- Even + Odd – what's your evidence?



# Checkpoint #2: Subtraction Patterns

- $10 - 4 = ?$

- $11 - 6 = ?$

- $15 - 7 = ?$



Can you predict what the answer will be – even or odd – before solving?





# ● Our Clues So Far

| Operation   | Example | Even or Odd? | Rule (Pattern)     |
|-------------|---------|--------------|--------------------|
| Even + Even | 4 + 6   | Even         | Even + Even = Even |
|             |         |              |                    |
|             |         |              |                    |



What do you notice? Are we ready to write our official rules?

# The Even & Odd Detective Code

Math Detectives – Ms. Perez’s Class

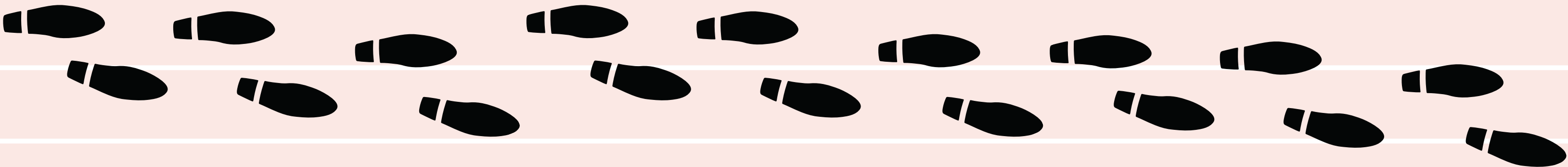
■■■■■ The Even & Odd Detective Code

*Official Rules for Solving Number Mysteries*

Name: \_\_\_\_\_ Date: \_\_\_\_\_

| # | Operation   | Detective Code | Example     |
|---|-------------|----------------|-------------|
| 1 | Even + Even | = Even         | 4 + 6 = 10  |
| 2 | Odd + Odd   | = Even         | 7 + 5 = 12  |
| 3 | Even + Odd  | = Odd          | 8 + 3 = 11  |
| 4 | Even – Even | = Even         | 12 – 4 = 8  |
| 5 | Odd – Odd   | = Even         | 15 – 7 = 8  |
| 6 | Even – Odd  | = Odd          | 10 – 3 = 7  |
| 7 | Odd – Even  | = Odd          | 17 – 10 = 7 |

■ I know my rule works because: \_\_\_\_\_

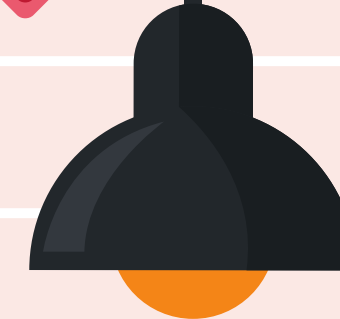


# Can You Crack the Code?

| Equation    | Predict (Even/<br>Odd) | How do you<br>know? |
|-------------|------------------------|---------------------|
| $132 + 245$ |                        |                     |
| $481 - 260$ |                        |                     |
| $327 + 318$ |                        |                     |



# Case Closed: Exit Ticket



Math Detectives – Ms. Perez’s Class

## ■ Case Closed: Exit Ticket

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Prove you’ve cracked the case! Write two equations and predict if the answer will be even or odd — no solving allowed.

| Equation | Predict (Even or Odd) | Explain How You Know |
|----------|-----------------------|----------------------|
|          |                       |                      |
|          |                       |                      |

■ One thing I learned about even and odd numbers today is:

\_\_\_\_\_



I can cite multiple pieces of textual evidence to support both what the text says directly and what I can infer.

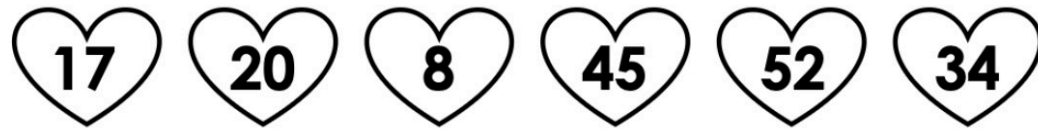


# Independent Case File

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## TEKS 3.4I Odd and Even Numbers Practice #1

1 Izzy cut out hearts and wrote numbers down on each heart.



Which numbers are odd?

- A 17, 20, 45  
B 20, 8, 52, 34  
C 17, 45  
D 17, 20, 8, 45

2 Which statement about the number 72 is true?

- A The number is odd, because the digit in the tens place is odd.  
B The number is even, because the digit in the tens place is even.  
C The number is odd, because it can be divided by 2 evenly.  
D The number is even, because it can be divided by 2 evenly.

3 Which of the following numbers is even?

- A 80  
B 65  
C 73  
D 27

4 Which statement about the sum of 21 and 33 is true?

- A The sum of the numbers is even, because both addends are even.  
B The sum of the numbers is even, because the digit in the ones of the sum is even.  
C The sum of the numbers is odd, because both addends are odd.  
D The sum of the numbers is even, because one of the addends is an even number.

5 Which of the following is NOT an odd number?

- A 71  
B 25  
C 38  
D 57

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6 A number is shown.

528

Which statement about the number is true?

- A The number is even, because the digit in the ones place is even.  
B The number is odd, because the digit in the hundreds place is odd.  
C The number is even, because the digit in the tens place is even.  
D The number is odd, because all three digits are odd.

7 In which list are all the numbers even?

- A 16, 21, 38, 50, 77  
B 13, 27, 49, 61, 89  
C 18, 34, 51, 70, 92  
D 10, 38, 42, 52, 86

8 Edgar collected an odd number of seashells at the beach. Which could be the number of seashells Edgar collected?

- A 190  
B 238  
C 247  
D 184

9 Which two addends have a sum that is divisible by 2?

- A  $231 + 194$   
B  $182 + 290$   
C  $350 + 133$   
D  $394 + 257$

10 Which number is NOT divisible by 2?

- A 174  
B 372  
C 289  
D 418

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11 Which statement about odd numbers is true?

- A All odd numbers end in 1, 3, 5, 7, or 9.  
B All odd numbers end in 0, 2, 4, 6, or 8.  
C Odd numbers are divisible by 2.  
D All odd numbers end in 0, 1, 3, 5, 7 or 9.

12 Cindy wants to make an even number with the three digits shown.



Which shows a number with the digits above that is even?

- A 743  
B 347  
C 473  
D 374

13 Sebastian got an odd number of questions correct on his math test. Which could be the number of questions Sebastian got correct?

- A 24  
B 17  
C 8  
D 20

14 A subtraction problem is shown.

431 - 197

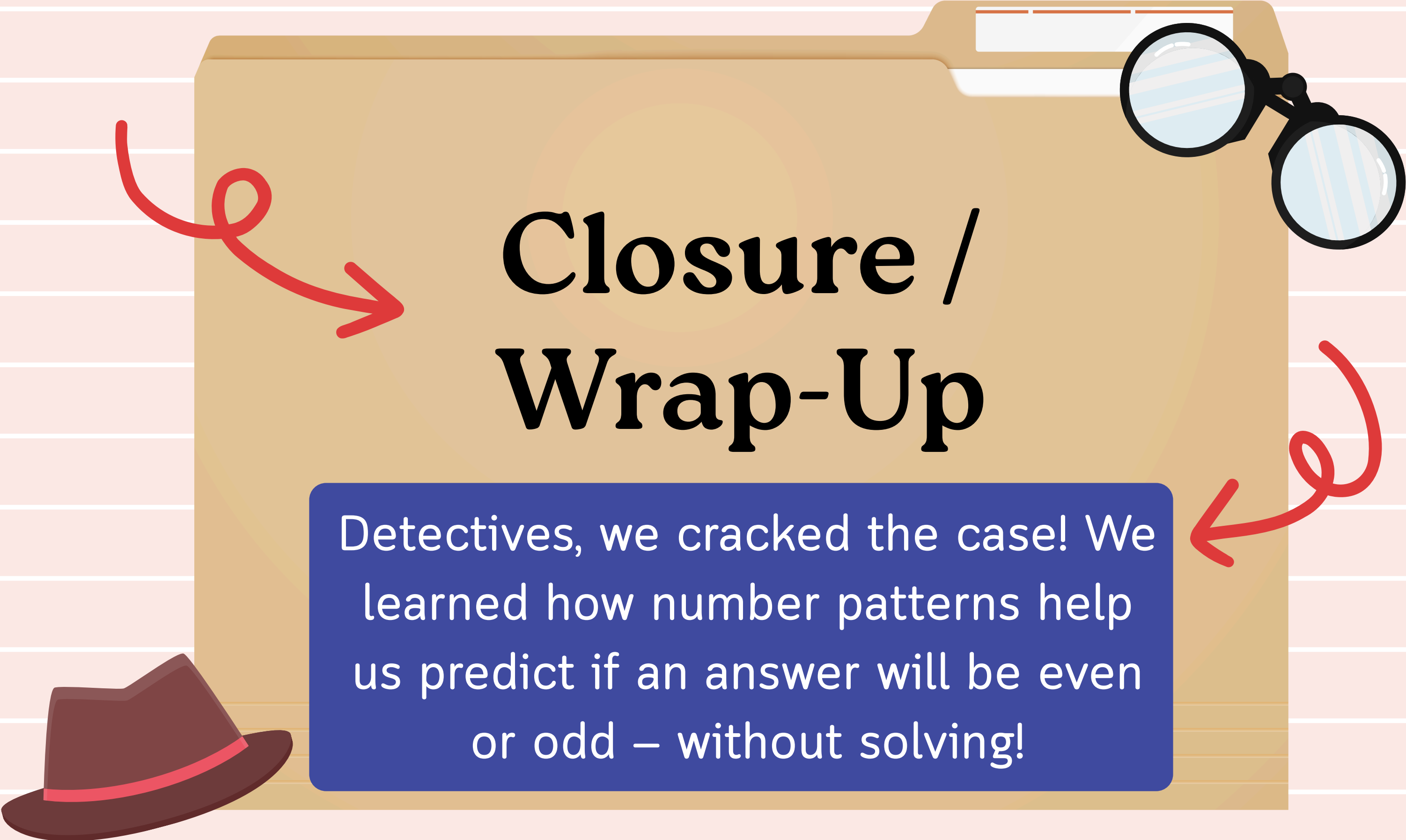
Which statement about the difference between the two numbers is true?

- A The difference between the two numbers is odd, because the digit in the ones place is odd.  
B The difference between the two numbers is even, because the digit in the hundreds place is even.  
C The difference between the two numbers is even, because the digit in the ones place is even.  
D The difference between the two numbers is odd, because the digit in the tens place is odd.

15 Which of the following numbers is odd?

- A 485  
B 794  
C 316  
D 890

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# Closure / Wrap-Up

Detectives, we cracked the case! We learned how number patterns help us predict if an answer will be even or odd – without solving!

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■ I know my rule works because: \_\_\_\_\_