

Sukindi

— LEARNING —

Homework without the hassle

Sukindi is an Australian learning platform that supports Teachers, Parents and Students with an interactive homework app and downloadable resources.



Scan to start your
free 7-day trial

www.sukindi.com.au



Odd & Even Numbers - Year 4

Table of Contents	
Presentation: Odd & Even Numbers	
Display: Odd & Even Properties	
Activity: Parity Sorting Lab	
Game: Parity Path	
Game: Card Flip Parity Battle	
Worksheet 1: Place Value & Parity	
Worksheet 2: Pairing & Remainders	
Worksheet 3: Addition & Subtraction Parity	
Worksheet 4: Multiplication & Division Parity	
Worksheet 5: Flowchart Detectives	
Worksheet 6: Missing Numbers & Investigations	
Quiz: Odd & Even Numbers	
Assessment: Parity Problem Solving	
Rubric: Odd & Even Numbers Unit Rubric	

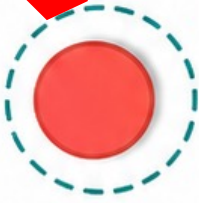


ODD & EVEN NUMBERS

ODD

ODD endings: 1, 3, 5, 7, 9

Odd numbers leave one over.



EVEN

EVEN endings: 0, 2, 4, 6, 8

Even numbers make equal pairs.



+	odd + odd = even	+	odd + even = odd	+	even + even = even
-	odd - odd = even	-	odd - even = odd	-	even - even = even
x	odd x odd = odd	x	odd x even = even	x	even x even = even

PARITY SORTING LAB



Sort each card. Use the ones digit, even pairs or an operation rule to justify your choice.

ODD

1, 3, 5, 7, 9

EVEN

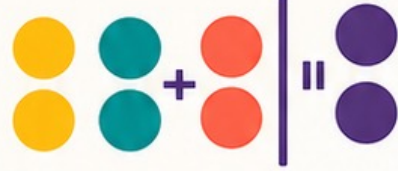
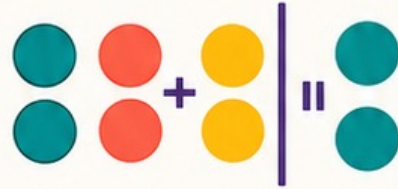
0, 2, 4, 6, 8

PROVE IT

Ones digit: _____

Pairs or remainder: _____

Operation rule: _____



PARITY SORTING CARDS 1

47

128

305

642

1,017

2,460

$$73 + 18$$

$$94 - 27$$

$$6 \times 9$$

$$7 \times 5$$

$$144 \div 12$$

$$63 \div 9$$

PARITY SORTING CARDS 2

89

250

711

936

1,204

3,579

$$46 + 36$$

$$105 - 48$$

$$8 \times 7$$

$$9 \times 11$$

$$180 \div 10$$

$$56 \div 8$$

PARITY SORTING CARDS 3

1,111

2,222

4,305

6,408

7,777

9,990

$$125 + 64$$

$$300 - 127$$

$$12 \times 4$$

$$15 \times 3$$

$$216 \div 9$$

$$132 \div 11$$

PARITY SORTING CARDS 4

Ends in 0

Ends in 7

Two equal
groups

One left
over

Odd + odd

Even + odd

Even – even

Odd – even

Odd × odd

Odd × even

A multiple
of 2

Not a
whole-number
result



PARTY PATH

2 4 6



+ - $\times$



PARITY PATH: RULES & CHALLENGES

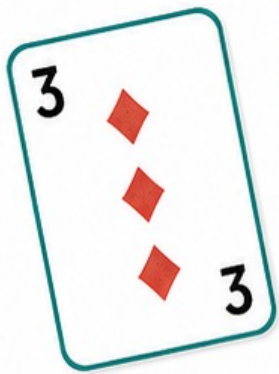


HOW TO PLAY

- 1 Roll the die and move.
- 2 Classify the space as odd or even.
- 3 Explain how you know.
- 4 Stay if correct; move back one if incorrect.
- 5 First to FINISH wins.

CHALLENGE CARDS

 Name the ones digit.	 Show equal pairs.	 State an operation rule.
 Give a matching example.	 Prove it another way.	 Create an odd number.
 Create an even number.	 Give a counterexample.	 Change one digit.
 Make the result odd.	 Make the result even.	 Explain to a partner.



CARD FLIP PARITY



BATTLE



YOU NEED

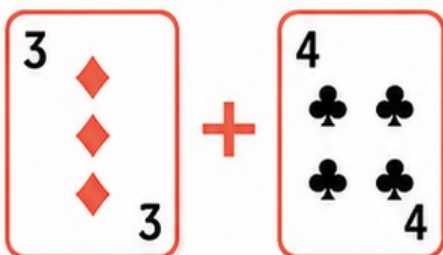
- A standard deck of cards, the Round Record, and two players
- Remove all picture cards. Ace = 1



HOW TO PLAY

- 1 Flip two cards.
- 2 Follow the rule and rule: ADD or MULTIPLY.
- 3 Predict whether the result will be odd or even.
- 4 Calculate the result.
- 5 Score 1 point for a correct result and clear explanation.
- 6 After 10 rounds, the player with the most points wins.

EXAMPLE



$$3 + 4 = 7 \text{ (odd)}$$



EXPLAIN YOUR THINKING

Use one of these sentence stems:

- "I predicted ____ because..."
- "The result is ____, so it is..."
- "This matches the rule..."



CARD FLIP ROUND RECORD



Player: _____

Partner: _____

Cards	Operation	Prediction	Result	Odd/Even	Point
1	ADD				
2	MULTIPLY				
3	ADD				
4	MULTIPLY				
5	ADD				
6	MULTIPLY				
7	ADD				
8	MULTIPLY				
9	ADD				
10	MULTIPLY				

CHALLENGE ROUNDS

1 Make an odd sum.

2 Make an even sum.

3 Make an odd product.

4 Make an even product.



Total points: _____ / 10



Name: _____

Date: _____

PLACE-VALUE PARITY PATTERNS – PAGE 1



Use the ones digit to classify each number. Record the ones digit, then circle ODD or EVEN.

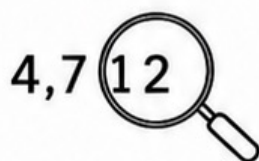
Number	Ones digit	Odd or even?
1. 4,712		ODD / EVEN
2. 9,035		ODD / EVEN
3. 12,680		ODD / EVEN
4. 7,499		ODD / EVEN
5. 100,204		ODD / EVEN
6. 56,701		ODD / EVEN
7. 8,333		ODD / EVEN
8. 1,127		ODD / EVEN
9. 6,906		ODD / EVEN
10. 75,555		ODD / EVEN
11. 820,018		ODD / EVEN
12. 91,432		ODD / EVEN

Explain the ones-digit rule for odd and even numbers in one clear sentence.

Name: **ANSWERS**

Date: _____

PLACE-VALUE PARITY PATTERNS – PAGE 1



Use the ones digit to classify each number. Record the ones digit, then circle ODD or EVEN.

Number	Ones digit	Odd or even?
1. 4,712	2	ODD / EVEN
2. 9,035	5	ODD / EVEN
3. 12,680	0	ODD / EVEN
4. 7,499	9	ODD / EVEN
5. 100,204	4	ODD / EVEN
6. 56,701	1	ODD / EVEN
7. 8,330	0	ODD / EVEN
8. 15,127	7	ODD / EVEN
9. 6,906	6	ODD / EVEN
10. 75,555	5	ODD / EVEN
11. 820,018	8	ODD / EVEN
12. 91,432	2	ODD / EVEN

Explain the ones-digit rule for odd and even numbers in one clear sentence.

A whole number is even if its ones digit is 0, 2, 4, 6 or 8; otherwise it is odd.

Name: _____

Date: _____

PLACE-VALUE PARITY PATTERNS — PAGE 2

SECTION A — BUILD THE NUMBER



Write one number that matches each set of clues.

1. A four-digit odd number greater than 5,000 with 2 in the hundreds place.

2. A five-digit even number with 7 in the tens place.

3. The smallest even number you can make using 3, 8, 1 and 6 once each.

4. The greatest odd number you can make using 2, 9, and 6 once each.

SECTION B — ERROR DETECTIVES

Each clue contains an error. Circle the error, then correct it.



1. "3,451 is even because 6 is even."

Correction: _____

2. "12,308 is odd because it has five digits."

Correction: _____

3. "An odd number can end in 0."

Correction: _____

4. "Every four-digit number is even."

Correction: _____

SECTION C — RANGE CHALLENGE

1. Write an odd number between 3,400 and 3,420: _____

2. Write an even number between 8,765 and 8,785: _____

Name: **ANSWERS**

Date: _____

PLACE-VALUE PARITY PATTERNS — PAGE 2

SECTION A — BUILD THE NUMBER



Write one number that matches each set of clues.

1. A four-digit odd number greater than 5,000 with 2 in the hundreds place.

5,201

2. A five-digit even number with 7 in the tens place.

12,374

3. The smallest even number you can make using 3, 8, 1 and 6 once each.

1,368

4. The greatest odd number you can make using 3, 9, 1 and 6 once each.

9,427

SECTION B — FIND THE FAULTY IDEAS

Each claim is incorrect. Circle the faulty idea, then correct it.



1. "6,451 is even because 6 is even."

Correction: **6,451 is odd because its ones digit is 1.**

2. "12,308 is odd because it has five digits."

Correction: **12,308 is even because its ones digit is 8.**

3. "An odd number can end in 0."

Correction: **A number ending in 0 is even, not odd.**

4. "Every four-digit number is even."

Correction: **The ones digit decides parity, not the number of digits.**

SECTION C — RANGE CHALLENGE

1. Write an odd number between 3,400 and 3,420: **3,401**

2. Write an even number between 8,765 and 8,785: **8,766**

PAIRING & REMAINDERS — PAGE 1

Name: _____

Date: _____

Count the pairs. Identify any dot left over, then classify the number.

1. 8 DOTS

○ ○ ○ ○

○ ○ ○ ○

_____ pairs, _____ left over,
so the number is ODD / EVEN.

2. 11 DOTS

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

○
left over

_____ pairs, _____ left over,
so the number is ODD / EVEN.

3. 14 DOTS

○ ○ ○ ○ ○ ○ ○ ○

○ ○ ○ ○ ○ ○

_____ pairs, _____ left over,
so the number is ODD / EVEN.

4. 17 DOTS

○ ○ ○ ○ ○ ○ ○ ○

○ ○ ○ ○ ○ ○ ○ ○

○
left over

_____ pairs, _____ left over,
so the number is ODD / EVEN.

How does making pairs prove whether a whole number is odd or even?

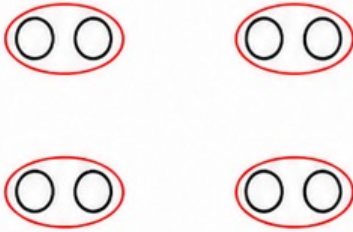
PAIRING & REMAINDERS — PAGE 1

Name: ANSWERS

Date: _____

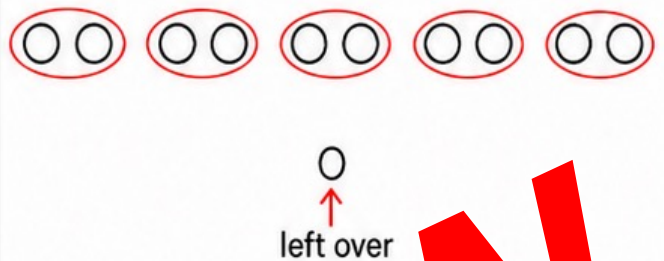
Count the pairs. Identify any dot left over, then classify the number.

1. 8 DOTS



4 pairs, 0 left over,
so the number is ODD / EVEN.

2. 11 DOTS



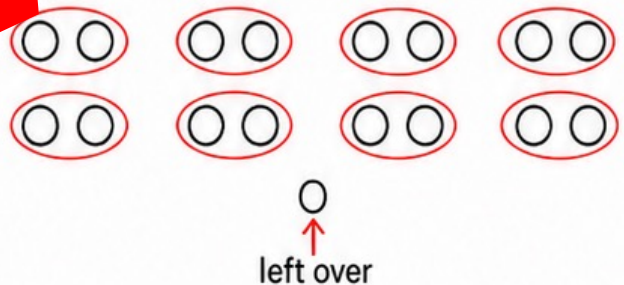
5 pairs, 1 left over,
so the number is ODD / EVEN.

3. 14 DOTS



7 pairs, 0 left over,
so the number is ODD / EVEN.

4. 17 DOTS



8 pairs, 1 left over,
so the number is ODD / EVEN.

How does making pairs prove whether a whole number is odd or even?

Even numbers form complete pairs with none left over. Odd
numbers form pairs with one left over.

PAIRING & REMAINDERS — PAGE 2

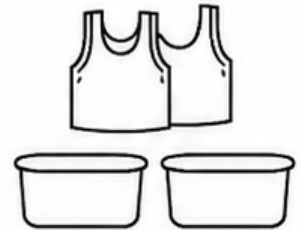
Name: _____

Date: _____

Decide whether the total can be shared into two equal groups.
Circle YES or NO, then prove your decision.

1. A team has 28 sports bibs to share equally between two tubs.

YES / NO



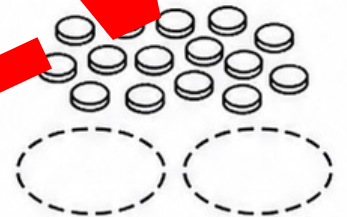
2. A canteen has 35 oranges to place equally on two trays.

YES / NO



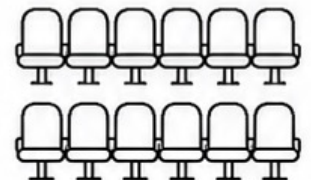
3. A class has 46 counters to split equally between two groups.

YES / NO



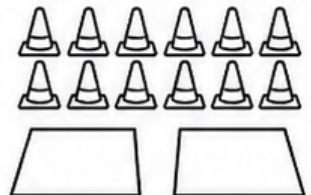
4. The teacher has 17 chairs to arrange in two equal rows.

YES / NO



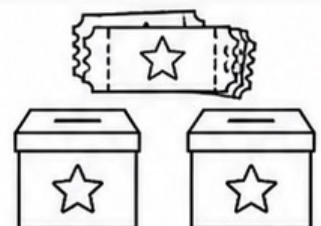
5. A coach has 124 cones to divide equally between two stations.

YES / NO



6. There are 219 tickets to share equally between two prize boxes.

YES / NO



What do all totals that can be split into two equal groups have in common?

PAIRING & REMAINDERS — PAGE 2

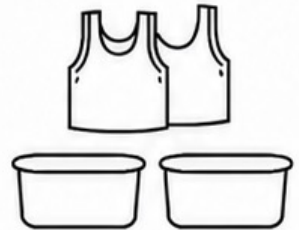
Name: **ANSWERS**

Date: _____

Decide whether the total can be shared into two equal groups.
Circle YES or NO, then prove your decision.

1. A team has 28 sports bibs to share equally between two tubs.

YES / NO



$28 \div 2 = 14$ each. No remainder, so 28 is even.

2. A canteen has 35 oranges to place equally on two trays.

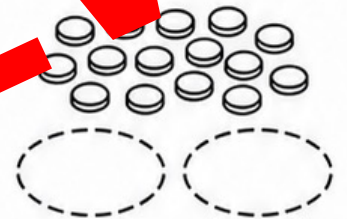
YES / **NO**



$35 \div 2 = 17$ each with 1 left over, so 35 is odd.

3. A class has 46 counters to split equally between two groups.

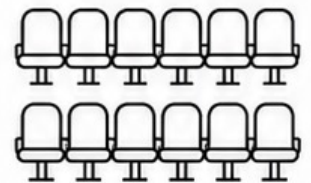
YES / NO



$46 \div 2 = 23$ each. No remainder, so 46 is even.

4. The school has 57 chairs to arrange in two equal rows.

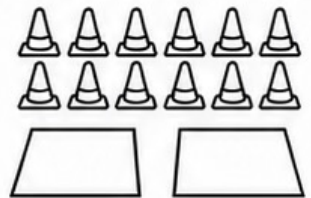
YES / **NO**



$57 \div 2 = 28$ each with 1 left over, so 57 is odd.

5. A coach has 124 cones to divide equally between two stations.

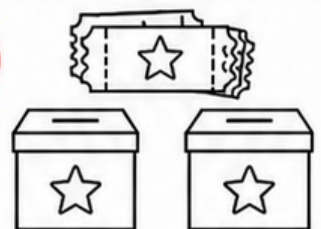
YES / NO



$124 \div 2 = 62$ each. No remainder, so 124 is even.

6. There are 219 tickets to share equally between two prize boxes.

YES / **NO**



$219 \div 2 = 109$ each with 1 left over, so 219 is odd.

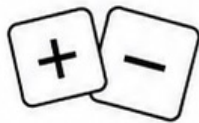
What do all totals that can be split into two equal groups have in common?

They are even, divisible by 2, and have a ones digit of 0, 2, 4, 6 or 8.

ADDITION & SUBTRACTION PARITY — PAGE 1

Name: _____

Date: _____



SECTION A — COMPLETE THE RULES

Write ODD or EVEN in each blank.

odd + odd = _____	odd - odd = _____
odd + even = _____	odd - even = _____
even + odd = _____	even - odd = _____
even + even = _____	even - even = _____

SECTION B — PREDICT, THEN SOLVE

First predict ODD or EVEN without calculating. Then solve and check.

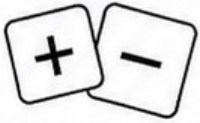
Calculation	Prediction	Result	Odd/Even
1. 37 + 56			
2. 128 + 24			
3. 15 + 209			
4. 645 + 75			
5. 902 - 318			
6. 731 - 246			
7. 560 - 135			
8. 999 - 473			

Which digit is useful when checking the parity of your calculated result?

ADDITION & SUBTRACTION PARITY — PAGE 1

Name: ANSWERS

Date: _____



SECTION A — COMPLETE THE RULES

Write ODD or EVEN in each blank.

odd + odd = <u>EVEN</u>	odd - odd = <u>EVEN</u>
odd + even = <u>ODD</u>	odd - even = <u>ODD</u>
even + odd = <u>ODD</u>	even - odd = <u>ODD</u>
even + even = <u>EVEN</u>	even - even = <u>EVEN</u>

SECTION B — PREDICT, THEN SOLVE

First predict ODD or EVEN without calculating. Then solve and check.

Calculation	Prediction	Result	Odd/Even
1. $37 + 56$	ODD	93	ODD
2. $128 + 244$	EVEN	372	EVEN
3. $315 + 209$	EVEN	524	EVEN
4. $640 + 75$	ODD	715	ODD
5. $902 - 318$	EVEN	584	EVEN
6. $731 - 246$	ODD	485	ODD
7. $560 - 135$	ODD	425	ODD
8. $999 - 473$	EVEN	526	EVEN

Which digit is useful when checking the parity of your calculated result?

The ones digit. It shows whether the whole result is odd or even.

ADDITION & SUBTRACTION PARITY – PAGE 2

Name: _____

Date: _____

SECTION A — SOLVE & CHECK

Predict the parity, solve, then use the ones digit to check.

Calculation	Prediction	Result	Check
1. $247 + 138$			
2. $562 + 349$			
3. $775 + 225$			
4. $846 - 327$			
5. $933 - 518$			
6. $700 - 286$			

SECTION B — EXPLAIN TWO RESULTS

1. Why must $247 + 138$ have an odd result?

2. Why must $846 - 327$ have an odd result?

SECTION C — TEST THE CLAIM

The sum of two consecutive whole numbers is always odd.

Calculate each pair, then decide whether the evidence supports the claim.

$14 + 15 =$ _____

$37 + 38 =$ _____

$102 + 103 =$ _____

1	2	3	4	5	6	...
---	---	---	---	---	---	-----

Conclusion: The claim is TRUE / FALSE because _____

ADDITION & SUBTRACTION PARITY – PAGE 2

Name: **ANSWERS**

Date: _____

SECTION A – SOLVE & CHECK

Predict the parity, solve, then use the ones digit to check.

Calculation	Prediction	Result	Check
1. $247 + 138$	ODD	385	ones digit 5: ODD
2. $562 + 349$	ODD	911	ones digit 1: ODD
3. $775 + 225$	EVEN	1,000	ones digit 0: EVEN
4. $846 - 327$	ODD	519	ones digit 9: ODD
5. $933 - 518$	ODD	415	ones digit 5: ODD
6. $700 - 286$	EVEN	414	ones digit 4: EVEN

SECTION B – EXPLAIN TWO RESULTS

1. Why must $247 + 138$ have an odd result?

247 is odd and 138 is even. odd + even = odd.

2. Why must $846 - 327$ have an odd result?

846 is even and 327 is odd. Even - odd = odd.

SECTION C – TEST THE CLAIM

The sum of two consecutive whole numbers is always odd.

Calculate each pair, then decide whether the evidence supports the claim.

$$14 + 15 = \underline{29}$$

$$37 + 38 = \underline{75}$$

$$102 + 103 = \underline{205}$$

1	2	3	4	5	6	...
---	---	---	---	---	---	-----

Conclusion: The claim is **TRUE** / FALSE because **Consecutive whole numbers are one even and one odd; even + odd is always odd.**

Name: _____

Date: _____

MULTIPLICATION & DIVISION PARITY — PAGE 1

SECTION A — COMPLETE THE MULTIPLICATION RULES

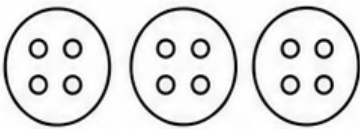
Write ODD or EVEN in each blank.

odd x odd = _____

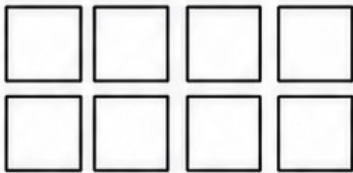
odd x even = _____

even x odd = _____

even x even = _____



EQUAL GROUPS



MULTIPLICATION TILES

SECTION B — PREDICT, THEN SOLVE

Predict the parity from the factors. Then calculate and check.

Product	Prediction	Result	Odd/Even
1. 7 x 9			
2. 12 x 15			
3. 23 x 5			
4. 18 x 27			
5. 31 x 11			
6. 2 x 9			
7. 16 x 24			
8. 45 x 13			

SECTION C — EXPLAIN THE RULE

Why is any whole - number product with an even factor always even?

Name: ANSWERS

Date: _____

MULTIPLICATION & DIVISION PARITY — PAGE 1

SECTION A — COMPLETE THE MULTIPLICATION RULES

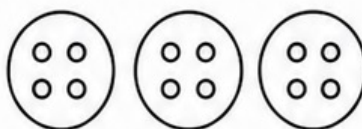
Write ODD or EVEN in each blank.

$$\text{odd} \times \text{odd} = \underline{\text{ODD}}$$

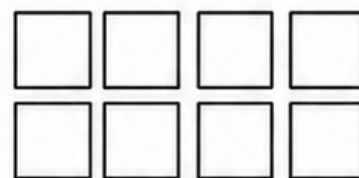
$$\text{odd} \times \text{even} = \underline{\text{EVEN}}$$

$$\text{even} \times \text{odd} = \underline{\text{EVEN}}$$

$$\text{even} \times \text{even} = \underline{\text{EVEN}}$$



EQUAL GROUPS



MULTIPLICATION TILES

SECTION B — PREDICT, THEN SOLVE

Predict the parity from the factors. Then calculate and check.

Product	Prediction	Result	Odd/Even
1. 7×9	ODD	63	ODD
2. 12×15	EVEN	180	EVEN
3. 23×5	ODD	115	ODD
4. 18×27	EVEN	486	EVEN
5. 31×11	ODD	341	ODD
6. 42×9	EVEN	378	EVEN
7. 16×24	EVEN	384	EVEN
8. 45×13	ODD	585	ODD

SECTION C — EXPLAIN THE RULE

Why is any whole-number product with an even factor always even?

An even factor can be arranged in complete pairs.

Repeating those pairs keeps the product in complete pairs,
so the product is even.

MULTIPLICATION & DIVISION PARITY — PAGE 2

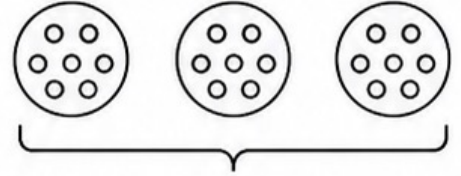
Name: _____

Date: _____

Odd and even describe whole numbers only. If a quotient is not a whole number, parity is NOT APPLICABLE.

SECTION A — WHOLE-NUMBER QUOTIENTS

Calculate each quotient, then classify the whole-number result.



Quotient	Result	Odd/Even
1. $36 \div 6$		
2. $45 \div 5$		
3. $84 \div 7$		
4. $99 \div 9$		
5. $144 \div 12$		
6. $132 \div 11$		
7. $225 \div 15$		
8. $252 \div 14$		

SECTION B — NOT WHOLE NUMBERS

Calculate. If the result is not a whole number, write NOT APPLICABLE.

Quotient	Result	Parity
1. $35 \div 2$		
2. $50 \div 8$		
3. $73 \div 4$		
4. $101 \div 10$		

Why can a decimal quotient not be labelled odd or even?

MULTIPLICATION & DIVISION PARITY — PAGE 2

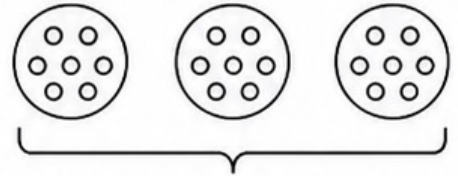
Name: ANSWERS

Date: _____

Odd and even describe whole numbers only. If a quotient is not a whole number, parity is NOT APPLICABLE.

SECTION A — WHOLE-NUMBER QUOTIENTS

Calculate each quotient, then classify the whole-number result.



Quotient	Result	Odd/Even
1. $36 \div 6$	6	EVEN
2. $45 \div 5$	9	ODD
3. $84 \div 7$	12	EVEN
4. $99 \div 9$	11	ODD
5. $144 \div 12$	12	EVEN
6. $132 \div 11$	12	EVEN
7. $225 \div 15$	15	ODD
8. $252 \div 14$	18	EVEN

SECTION B — NOT WHOLE NUMBERS

Calculate. If the result is not a whole number, write NOT APPLICABLE.

Quotient	Result	Parity
1. $35 \div 2$	17.5	NOT APPLICABLE
2. $50 \div 8$	6.25	NOT APPLICABLE
3. $73 \div 4$	18.25	NOT APPLICABLE
4. $101 \div 10$	10.1	NOT APPLICABLE

Why can a decimal quotient not be labelled odd or even?

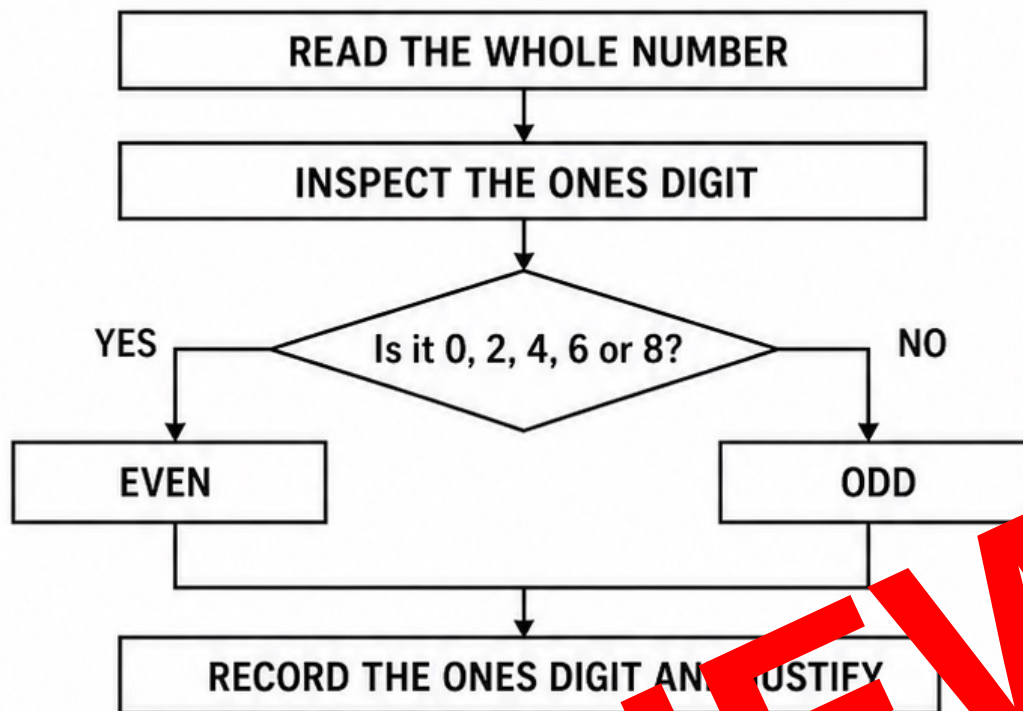
Odd and even are parity labels for whole numbers. A decimal is not a whole number, so the label does not apply.

FLOWCHART DETECTIVES – PAGE 1



Name: _____

Date: _____



Run each number through the flowchart.

Number	Ones digit	Odd/Even	Justification
1. 72			
2. 145			
3. 308			
4. 1			
5. 104			
6. 3,689			
7. 7,500			
8. 42,017			
9. 90,086			
10. 123,455			

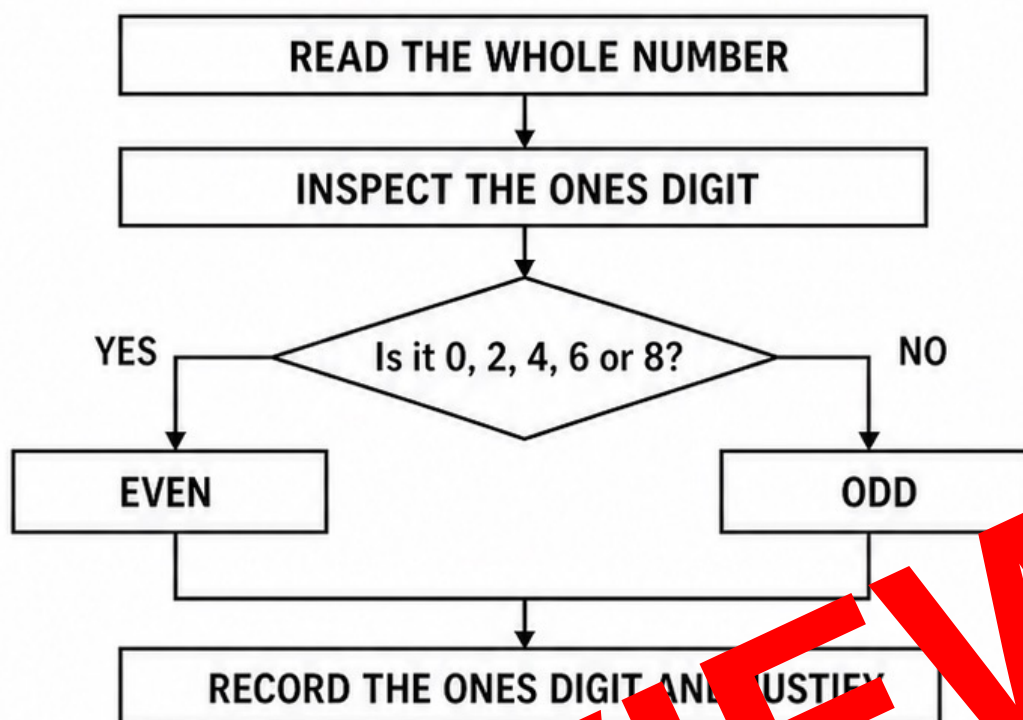
Why can the other digits be ignored when classifying parity?

FLOWCHART DETECTIVES – PAGE 1



Name: ANSWERS

Date: _____



Run each number through the flowchart.

Number	Ones digit	Odd/Even	Justification
1. 72	2	EVEN	ends in 2
2. 145	5	ODD	ends in 5
3. 308	8	EVEN	ends in 8
4. 1	1	ODD	ends in 1
5. 1,204	4	EVEN	ends in 4
6. 3,689	9	ODD	ends in 9
7. 7,500	0	EVEN	ends in 0
8. 42,017	7	ODD	ends in 7
9. 90,086	6	EVEN	ends in 6
10. 123,455	5	ODD	ends in 5

Why can the other digits be ignored when classifying parity?

Every place to the left of the ones is worth a multiple of 10,
which is even. The ones digit decides whether one is left over.



FLOWCHART DETECTIVES — PAGE 2



Name: _____

Date: _____

Each bug report contains a faulty step. Find it, correct the classification and explain.

BUG REPORT 1

"READ 624 → inspected the hundreds digit 6 → classified ODD."

Faulty step: _____

Correct classification: _____

Explanation: _____

BUG REPORT 2

"READ 9,113 → counted four digits → classified EVEN."

Faulty step: _____

Correct classification: _____

Explanation: _____

BUG REPORT 3

"READ 45,218 → inspected the tens digit 8 → classified EVEN."

Faulty step: _____

Correct classification: _____

Explanation: _____

BUG REPORT 4

"READ 70,541 → inspected the ones digit 1 → followed the YES branch → classified EVEN."

Faulty step: _____

Correct classification: _____

Explanation: _____

A correct answer reached by a faulty step still needs to be fixed.



FLOWCHART DETECTIVES — PAGE 2



Name: ANSWERS

Date: _____

Each bug report contains a faulty step. Find it, correct the classification and explain.

BUG REPORT 1

"READ 624 → inspected the hundreds digit 6 → classified ODD."

Faulty step: Inspected the hundreds digit instead of the ones digit.

Correct classification: EVEN

Explanation: 624 ends in 4, and 4 is an even ending.

BUG REPORT 2

"READ 9,113 → counted four digits → classified EVEN."

Faulty step: Counted digits instead of inspecting the ones digit.

Correct classification: ODD

Explanation: 9,113 ends in 3, and 3 is an odd ending.

BUG REPORT 3

"READ 45,280 → inspected the tens digit 8 → classified EVEN."

Faulty step: Inspected the tens digit instead of the ones digit.

Correct classification: EVEN

Explanation: The classification is right for the wrong reason: 45,280 ends in 0.

BUG REPORT 4

"READ 70,541 → inspected the ones digit 1 → followed the YES branch → classified EVEN."

Faulty step: Followed YES even though the ones digit is 1.

Correct classification: ODD

Explanation: 1 is not an even ending, so the NO branch leads to ODD.

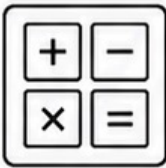
A correct answer reached by a faulty step still needs to be fixed.

MISSING NUMBERS & INVESTIGATIONS – PAGE 1

Name: _____

Date: _____

Write ODD, EVEN or EITHER for the missing number, then give a whole-number example that proves it.



Statement		Missing parity	Example
1.	odd + ____ = even		
2.	odd + ____ = odd		
3.	even + ____ = even		
4.	even - ____ = odd		
5.	odd - ____ = even		
6.	____ x odd = even		
7.	odd x ____ = odd		
8.	____ x even = even		

EITHER means an odd or an even whole number can make the statement true.

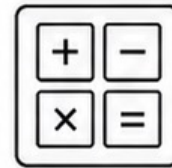
Choose one statement. Explain how the operation rule proves your missing parity.

MISSING NUMBERS & INVESTIGATIONS – PAGE 1

Name: _____ **ANSWERS**

Date: _____

Write ODD, EVEN or EITHER for the missing number, then give a whole-number example that proves it.



	Statement	Missing parity	Example
1.	odd + ____ = even	ODD	5 + 7 = 12
2.	odd + ____ = odd	EVEN	5 + 8 = 13
3.	even + ____ = even	EVEN	6 + 4 = 10
4.	even - ____ = odd	ODD	10 - 5 = 5
5.	odd - ____ = even	ODD	11 - 3 = 8
6.	odd × ____ = even	EVEN	4 × 3 = 12
7.	odd × ____ = odd	ODD	5 × 7 = 35
8.	____ × even = even	EITHER	3 × 4 = 12 or 2 × 4 = 8

EITHER means an odd or an even whole number can make the statement true.

Choose one statement. Explain how the operation rule proves your missing parity.

For statement 6, an odd factor times an odd factor would be odd. The missing factor must be even so the product is even.

Name: _____

Date: _____

MISSING NUMBERS & INVESTIGATIONS — PAGE 2**SECTION A — TEST THE CLAIMS**

For each claim, circle TRUE or FALSE. Give an example if it is true or a counterexample if it is false.

1. The sum of any two odd numbers is even.

TRUE / FALSEEvidence: _____

2. Subtracting an even number from an odd number gives an even result.

TRUE / FALSEEvidence: _____

3. The product of any two odd numbers is odd.

TRUE / FALSEEvidence: _____

4. Dividing an even number by 2 always gives an even quotient.

TRUE / FALSEEvidence: _____
_____**SECTION B — CONSECUTIVE NUMBERS**

Complete each pair, calculate the sum and record its parity.

Consecutive pair	Sum	Odd/Even
20 and 21		
47 and 48		
106 and 107		
999 and 1,000		

**SECTION C — GENERALISE**

The sum of two consecutive whole numbers is _____ because _____.

Name: **ANSWERS**

Date: _____

MISSING NUMBERS & INVESTIGATIONS — PAGE 2**SECTION A — TEST THE CLAIMS**

For each claim, circle TRUE or FALSE. Give an example if it is true or a counterexample if it is false.

1. The sum of any two odd numbers is even.

TRUE / FALSEEvidence: **$7 + 9 = 16$. Odd + odd = even.**

2. Subtracting an even number from an odd number gives an even result.

TRUE / **FALSE**Evidence: **$15 - 4 = 11$, which is odd.**

3. The product of any two odd numbers is odd.

TRUE / FALSEEvidence: **$5 \times 7 = 35$. Odd $\times$ odd = odd.**

4. Dividing an even number by 2 gives an even quotient.

TRUE / **FALSE**Evidence: **$2 = 2$, which is even.****SECTION B — CONSECUTIVE NUMBERS**

Complete each pair, calculate the sum and record its parity.

Consecutive pair	Sum	Odd/Even
20 and 21	41	ODD
47 and 48	95	ODD
106 and 107	213	ODD
999 and 1,000	1,999	ODD

**SECTION C — GENERALISE**The sum of two consecutive whole numbers is **always odd** because **consecutive whole numbers are one even and one odd, and even + odd = odd.**

ODD & EVEN NUMBERS ASSESSMENT — PAGE 1

Community Sports Day

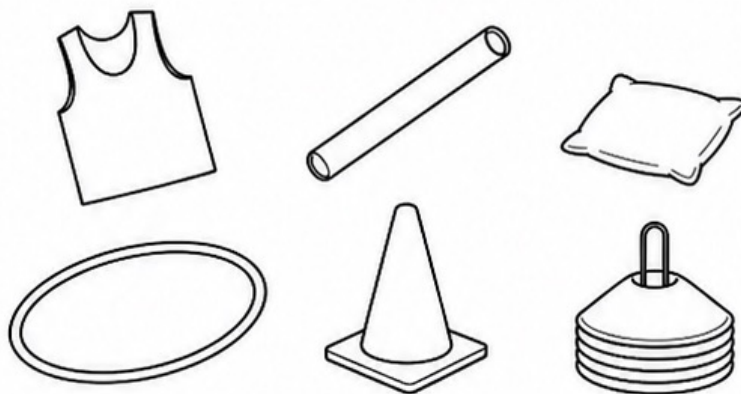
Name: _____

Date: _____

Score: _____ / 20

EQUIPMENT TOTALS

Sports bibs	— 48
Relay batons	— 35
Beanbags	— 62
Hoops	— 27
Cones	— 96
Team markers	— 41



SECTION A — CLASSIFY (6 marks)

Record the ones digit and classify each equipment total as odd or even.

Item	Total	Ones digit	Odd/Even
Sports bibs	48		
Relay batons	35		
Beanbags	62		
Hoops	27		
Cones	96		
Team markers	41		

SECTION B — TWO EQUAL TEAMS (6 marks)

Which totals can be shared equally between two teams? Circle YES or NO and justify with a division fact.

- 48 sports bibs — YES / NO — proof: _____
- 35 relay batons — YES / NO — proof: _____
- 62 beanbags — YES / NO — proof: _____

SECTION C — PREDICT & CALCULATE (8 marks)

Calculation	Parity prediction	Result	Odd/Even
$48 + 35$			
$62 + 27$			
$96 - 41$			
$62 - 48$			

ODD & EVEN NUMBERS ASSESSMENT — PAGE 1

Community Sports Day

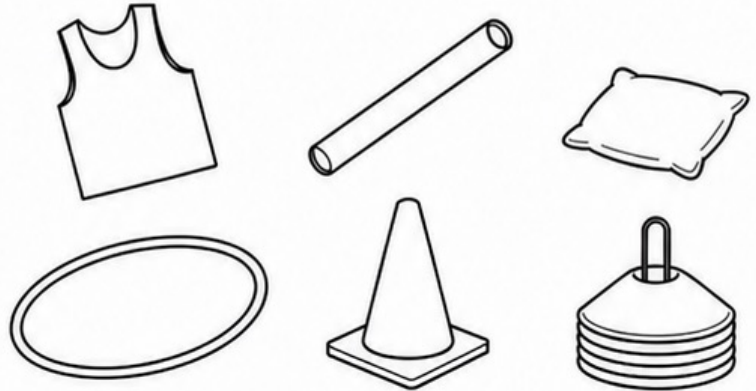
Name: **ANSWERS**

Date: _____

Score: _____ / 20

EQUIPMENT TOTALS

Sports bibs	— 48
Relay batons	— 35
Beanbags	— 62
Hoops	— 27
Cones	— 96
Team markers	— 41



SECTION A — CLASSIFY (6 marks)

Record the ones digit and classify each equipment total as odd or even.

Item	Total	Ones digit	Odd/Even
Sports bibs	48	8	EVEN
Relay batons	35	5	ODD
Beanbags	62	2	EVEN
Hoops	27	7	ODD
Cones	96	6	EVEN
Team markers	41	1	ODD

SECTION B — TWO EQUAL TEAMS (6 marks)

Which totals can be shared equally between two teams? Circle YES or NO and justify with a division fact.

- 48 sports bibs — **YES** / NO — proof: $48 \div 2 = 24$ each.
- 35 relay batons — YES / **NO** — proof: $35 \div 2 = 17$ each with 1 left over.
- 62 beanbags — **YES** / NO — proof: $62 \div 2 = 31$ each.

SECTION C — PREDICT & CALCULATE (8 marks)

Calculation	Parity prediction	Result	Odd/Even
$48 + 35$	ODD	83	ODD
$62 + 27$	ODD	89	ODD
$96 - 41$	ODD	55	ODD
$62 - 48$	EVEN	14	EVEN



ODD & EVEN NUMBERS ASSESSMENT — PAGE 2

Community Sports Day



Name: _____

Date: _____

Score: _____ / 20

SECTION D — MULTIPLICATION & DIVISION (8 marks)

Predict the parity, calculate, then classify each whole-number result.

Calculation	Prediction	Result	Odd/Even
1. 7×9			
2. 18×14			
3. $144 \div 12$			
4. $45 \div 5$			

SECTION E — MISSING PARITY (4 marks)

Write ODD or EVEN for the missing whole number.

1. odd + ____ = even

Example: _____

2. ____ $\times$ odd = even

Example: _____

3. even - ____ = odd

Example: _____

4. odd $\times$ ____ = odd

Example: _____

SECTION F — EXPLAIN THE ERROR (4 marks)

Priya says 1,245 is even because it has an even number of digits.

Explain Priya's error and give the correct classification.

SECTION G — GIVE A COUNTEREXAMPLE (4 marks)

Dividing any even number by 2 gives an even quotient.

Give one counterexample and explain why it disproves the claim.

ODD & EVEN NUMBERS ASSESSMENT — PAGE 2

Community Sports Day



Name: ANSWERS

Date: _____

Score: _____ / 20

SECTION D — MULTIPLICATION & DIVISION (8 marks)

Predict the parity, calculate, then classify each whole-number result.

Calculation	Prediction	Result	Odd/Even
1. 7×9	ODD	63	ODD
2. 18×14	EVEN	252	EVEN
3. $144 \div 12$	EVEN	12	EVEN
4. $45 \div 5$	ODD	9	ODD

SECTION E — MISSING PARITY (4 marks)

Write ODD or EVEN for the missing whole number.

1. odd + ODD = even

Example: $5 + 7 = 12$

2. EVEN $\times$ odd = even

Example: $4 \times 3 = 12$

3. even - ODD = odd

Example: $10 - 3 = 7$

4. odd $\div$ ODD = odd

Example: $35 \div 7 = 5$

SECTION F — EXPLAIN THE ERROR (4 marks)

Priya says 1,245 is even because it has an even number of digits.

Explain Priya's error and give the correct classification.

The number of digits does not decide parity. The ones digit is 5, so 1,245 is odd.

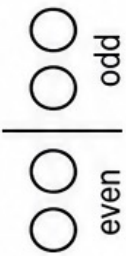
SECTION G — GIVE A COUNTEREXAMPLE (4 marks)

Dividing any even number by 2 gives an even quotient.

Give one counterexample and explain why it disproves the claim.

6 is even, but $6 \div 2 = 3$, which is odd. One counterexample proves the claim is false.

ODD AND EVEN NUMBERS UNIT RUBRIC

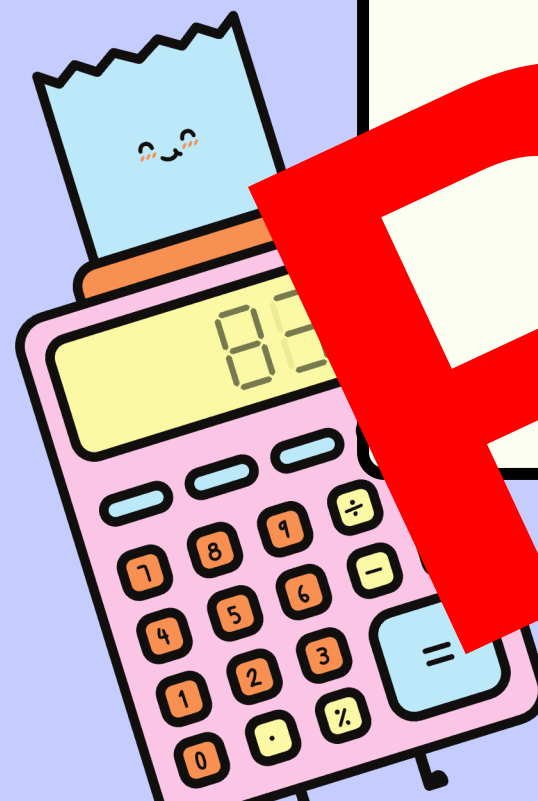
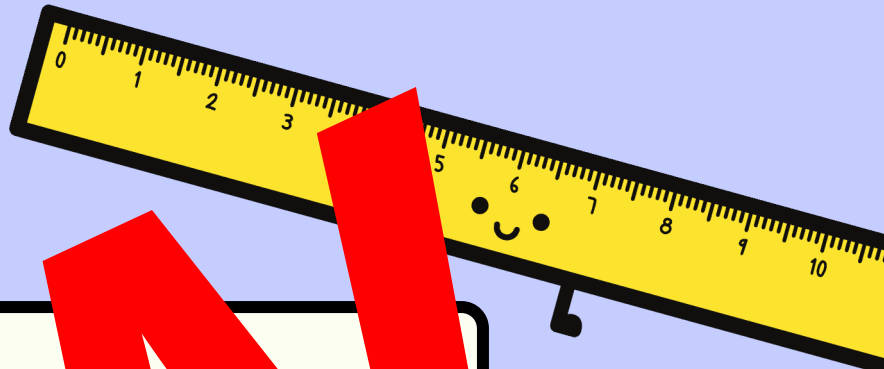
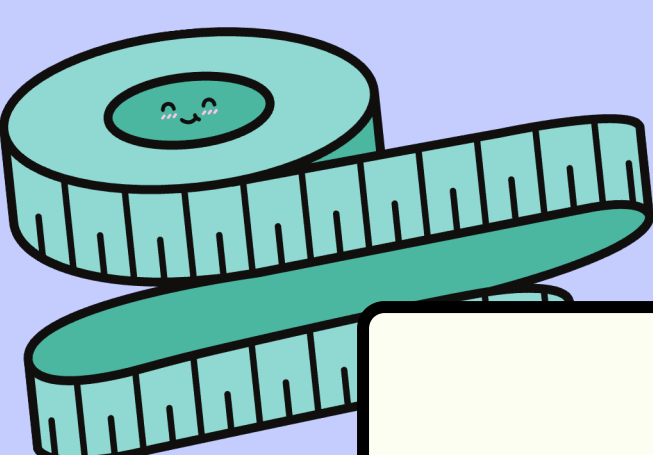


Student: _____ Teacher: _____ Date: _____

CRITERIA	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
CLASSIFY NUMBERS	Classifies inconsistently.	Classifies numbers with support.	Classifies whole numbers using the ones digit.	Classifies complex numbers and results accurately.	Generalises and checks classifications independently.
EXPLAIN WITH EVIDENCE	Gives little relevant evidence.	Uses a partial or correct example or model.	Uses ones digits, pairs or remainders evidence.	Connects more than one form of evidence.	Builds a clear general proof and tests it.
USE OPERATION PROPERTIES	Does not yet apply parity rules.	Applies some rules with prompts.	Applies addition, subtraction and multiplication rules.	Predicts parity before calculating and checks.	Explains why rules work and notes division limits.
SOLVE PARITY PROBLEMS	Needs substantial support to begin.	Solves familiar one-step tasks.	Solves more complex parity problems accurately.	Solves missing-number and multi-step tasks.	Creates efficient solutions and valid counterexamples.
COMMUNICATE REASONING	Reasoning is unclear or incomplete.	Uses some mathematical words.	Explains steps in correct mathematical language.	Justifies conclusions clearly and logically.	Communicates precise, connected generalisations.

Overall achievement: _____

Feedback: _____



PREVIEW

**Odd & Even
Numbers**

Learning Focus

We are learning to explain and use the properties of odd and even numbers.

Success criteria:

- classify whole numbers as odd or even
- justify a decision using pairs or the ones digit
- predict the parity of a sum before calculating
- state a rule and explain whether it always works



What Makes a Number Even

An even whole number can be split into two equal groups with nothing left over.

$$12 = 6 + 6$$

12 objects make 6 complete pairs.

Because every object has a partner, 12 is even.



What Makes a Number Odd?

An odd whole number leaves one object without a partner when paired.

$$13 = 6 + 6 + 1$$

13 objects make 6 complete pairs and 1 is left over.

The single remainder shows that 13 is odd.



The Ones-Digit Test

Look only at the ones digit.

EVEN endings: 0, 2, 4, 6, 8

ODD endings: 1, 3, 5, 7, 9

This works because every group of ten can be arranged into five complete pairs.



Multi-Digit Numbers

All place values to the left of the ones digit do not change the parity.

7,846 is even because the ones digit is 6.

52,319 is odd because the ones digit is 9.

103,070 is even because the ones digit is 0.



Quick Check

Classify each number before discussing your reasoning.

427 2,308 6,915

10,042 37,601 8,000

Classify one number. Explain its parity using both the ones digit and pairing.



Addition Properties

even + even = even

odd + odd = even

even + odd = odd

Why? Two left-over ones can make a new pair, but one left-over one cannot.



Predict Before You Add

$$246 + 318$$

Even + even predicts an even result

$$246 + 318 = 564 \text{ — even } \checkmark$$

$$375 + 129$$

Odd + odd predicts an even result.

$$375 + 129 = 504 \text{ — even}$$



Subtraction Properties

even - even = even

odd - odd = even

even - odd = odd

odd - even = odd

Subtraction follows the same parity pattern as addition when the result is a whole number.



Predict Before You Subtract

$$4,812 - 729$$

Even - odd predicts an odd result.

$$4,812 - 729 = 4,083 \text{ — odd } \checkmark$$

$$965 - 438$$

Odd - even predicts an odd result.

$$965 - 438 = 527 \text{ — odd } \checkmark$$



Multiplication Properties

even $\times$ even = even

even $\times$ odd = even

odd $\times$ even = even

odd $\times$ odd = odd

A product is odd only when both factors are odd.



Predict Before You Multiply

$$27 \times 14$$

Odd $\times$ even predicts an even product.

$$27 \times 14 = 378 \text{ — even } \checkmark$$

$$35 \times 9$$

Odd $\times$ odd predicts an odd product.

$$35 \times 9 = 315 \text{ — odd } \checkmark$$



Division Needs Care

Odd and even describe whole numbers.

$48 \div 6 = 8$, so the quotient is even.

$45 \div 5 = 9$, so the quotient is odd.

$45 \div 2 = 22.5$, which is not a whole number.

Don't label 2 as odd or even.



Missing-Number Reasoning

odd + ? = even

The missing number must be odd.

Example: $13 + 7 = 20$.

even $\times$ 2 = even

It is impossible. Any product with an even factor is even.



A Reliable Decision Process

1. Check that the value is a whole number.
2. Inspect the ones digit.
3. If needed, imagine pairing the object into two.
4. For an operation, use the rule from the particular rule.
5. Calculate and use the ones digit to check.



Parity Investigation

Choose four consecutive whole numbers.

- predict the parity of each number
- add the first and fourth numbers
- add the two middle numbers
- compare both sums
- repeat with a new set

What pattern can you explain?



Consecutive Numbers and Claims

Consecutive whole numbers alternate odd, even, odd, even.

Claim: The sum of two consecutive numbers is always odd.

Example: $28 + 29 = 57$

Can you explain why? Try to find a counterexample before deciding.



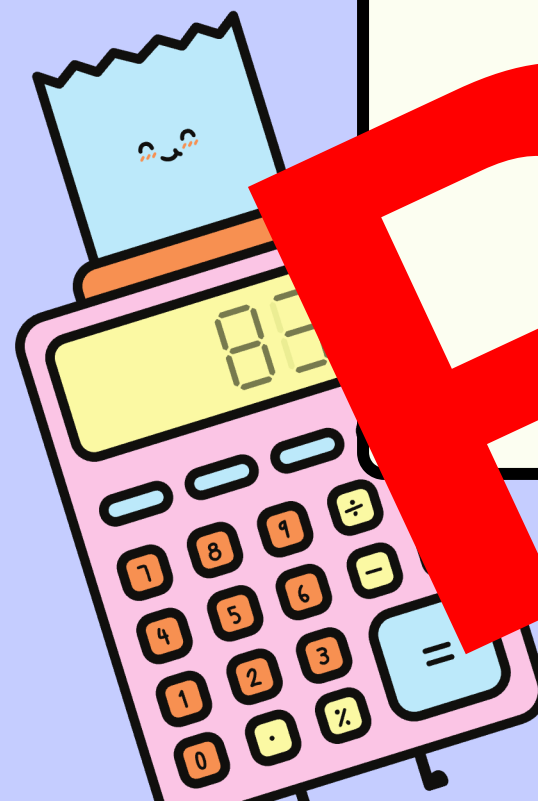
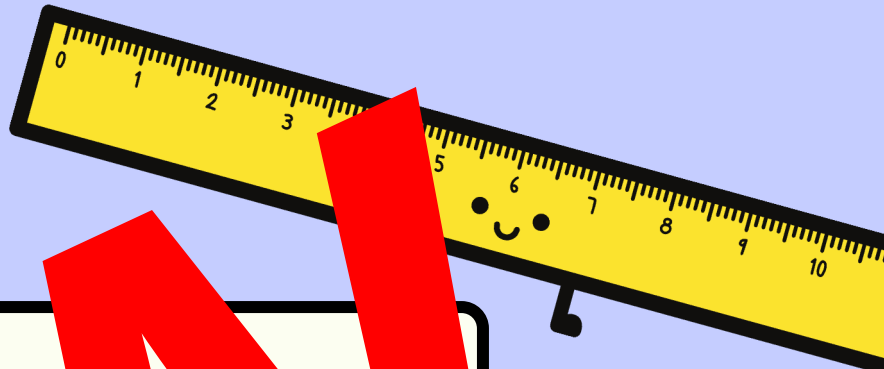
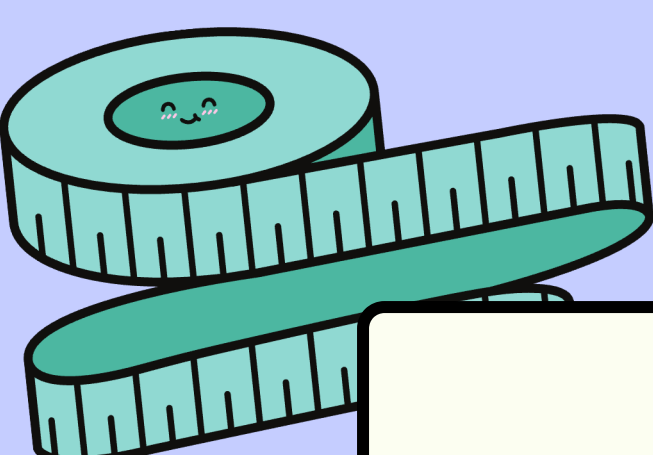
Key Ideas

- Even numbers form complete pairs; odd numbers leave one out
- The ones digit decides the parity of a whole number.
- Addition, subtraction and multiplication follow simple rules
- A product is odd only when both factors are odd
- Predict, calculate, then check





Well Done!



Odd & Even Numbers Quiz

PREVIEW

Question 1

Which statement correctly classifies 3,748?

- A. Odd because 7 is odd
- B. Even because the last digit is 8
- C. Odd because the digits total
- D. Even because it is greater than 1,000



Answer 1

B. Even because the ones digit is 8.

A whole number ending in 2, 4, 6, or 8 is even.



Question 2

True or false?

Every whole-number multiple of 2 is even.

PREVIEW



Answer 2

True.

A multiple of 2 can be arranged into complete pairs with nothing left over.



Question 3

Explain why 5,231 is odd.

Use the ones digit or the idea of pairs in your explanation.

PREVIEW



Answer 3

The ones digit is 1, so 5,231 is odd.

If 5,231 objects were paired, one object would be left over.



Question 4

What is the result of odd + odd always?

- A. odd
- B. even
- C. zero
- D. possible red



Answer 4

B. even

The two left-over ones join to make one complete pair.

PREVIEW



Question 5

True or false?

An even number plus an odd number is even.

PREVIEW



Answer 5

False.

Even + odd = odd. One object removed without a partner.



Question 6

Predict the parity of $4,812 - 729$.

- A. odd
- B. even
- C. neither
- D. impossible to predict



Answer 6

A. odd

Even - odd = odd.

$4,812 - 729 = 4,083$ which ends in 3.



Question 7

Write one three-digit odd number between 460 and

How do you know it is odd?



Answer 7

Possible answers: 461, 463, 465, 467, 469, 471, 473, 475, 477.

Each answer has an odd digit.



Question 8

What is the result of odd $\times$ even always?

- A. odd
- B. even
- C. zero
- D. possible red



Answer 8

B. even

Any product with an even factor is even.

PREVIEW



Question 9

True or false?

$45 \div 2$ is an even number.

PREVIEW



Answer 9

False.

$45 \div 2 = 22.5$. Odd and even describe whole numbers, so the label does not apply.



Question 10

Complete the statement:

odd + ? = even

State the missing part and give an example



Answer 10

The missing number must be odd.

Example: $13 + 7 = 20$.

Odd + odd = even





Well Done!