20 PRINTABLE
BRAIN GAMES

Middle School • Ages 10–13

THINK • SOLVE • REASON • CHALLENGE

A printable collection of logic puzzles, number challenges, codes, word games and problem-solving activities.

Includes: 20 brain games • answer key • low-prep printable format • international-friendly language

Name: _____	**Date:** _____

1. Logic Sequence

Instructions: Fill in the missing numbers and identify the rule.

Sequence	Missing terms
4, 9, 14, 19, __, __	_____, _____
81, 72, 63, 54, __, __	_____, _____
2, 6, 18, 54, __, __	_____, _____
3, 8, 15, 24, 35, __	_____
100, 50, 25, 12.5, __	_____

Bonus Challenge: Create a sequence using a different rule.

2. Code Breaker

Instructions: Use A=1, B=2, … Z=26 to decode the number sequences.

A. 20–8–9–14–11 → _____

B. 16–21–26–26–12–5 → _____

C. 12–15–7–9–3 → _____

D. Encode THINK → _____

E. Encode SMART → _____

> **Bonus Challenge:** Create a 5-letter secret code word.

3. Magic Square

Instructions: Fill the blanks so every row, column and diagonal has the same total. Use 1–9 once each.

8		**6**
	5	
4		**2**

Magic total = _____

4. Odd One Out

Instructions: Circle the number that does not belong and explain why.

Set	Odd one out	Reason
16, 24, 32, 45	_____	_____
27, 36, 45, 52	_____	_____
11, 22, 33, 44, 56	_____	_____
15, 25, 35, 46	_____	_____
14, 21, 28, 36	_____	_____
31, 41, 51, 62	_____	_____

Bonus Challenge: Find a second possible reason for one set.

5. Letter Maths

Instructions: Solve each mini puzzle.

A. A + A = 10 → A = _____

B. B + 7 = 12 → B = _____

C. 3C = 21 → C = _____

D. DE + DE = 88 → D = _____, E = _____

E. If F=4 and G=7, find F×G + F = _____

> **Bonus Challenge:** Write your own two-letter puzzle.

6. THE NUMBER DETECTIVE

Use all clues to identify the mystery number.

- I am a two-digit number.
- My tens digit is 3 more than my ones digit.
- My digits add to 9.
- I am greater than 40.

Mystery number: _____

Bonus: Write one more clue that is true for your mystery number.

7. Grid Reasoning

Instructions: Arrange 1–9 in the grid. Each row must follow its stated property.

Row 1: three odd numbers		
Row 2: three even numbers		
Row 3: one odd + two even		

Use each number 1–9 exactly once.

Bonus Challenge: How many different valid arrangements can you find?

8. MAKE 100

Use each digit exactly once in each challenge. You may use +, –, ×, ÷ and brackets. **For Challenge A only, make 10 as a warm-up.**

A. Warm-up: 1, 2, 3, 4 → 10

_____

B. 5, 5, 5, 5 → 100

_____

C. 2, 5, 7, 8 → 100

_____

D. 3, 4, 6, 7 → 100

_____

Bonus Challenge: Find a second solution for one challenge.

9. Word Ladder

Instructions: Change one letter at a time. Every step must be a real English word.

A. COLD → WARM

COLD → _____ → _____ → _____ → WARM

B. CAT → DOG

CAT → _____ → _____ → _____ → DOG

Bonus Challenge: Create your own four-step ladder.

10. MATCHSTICK MOVES

Imagine each digit is made from a standard seven-segment digital display. Each line in a digit is one matchstick. Move exactly one matchstick in each equation; do not add or remove matches. The + and – signs are made from two matchsticks.

1) 6 + 4 = 4

My corrected equation: _____

2) 9 – 3 = 3

My corrected equation: _____

3) 3 + 3 = 9

My corrected equation: _____

Sketch your moved matchstick below:

Teacher check: 1) 0 + 4 = 4; 2) 6 – 3 = 3; 3) 3 + 3 = 6.

11. Probability Challenge

Instructions: A bag contains 5 red, 3 blue and 2 green counters.

1. Most likely colour: _____
2. Least likely colour: _____
3. Total counters: _____
4. Probability of blue: _____
5. Probability of not green: _____

Bonus Challenge: What is the probability of two reds in a row without replacement?

12. Mini Sudoku

Instructions: Complete the 4×4 grid so each row, column and 2×2 box contains 1, 2, 3 and 4 once.

1			4
	4	1	
	1	4	
4			1

Bonus Challenge: Time yourself: can you solve it in under 5 minutes?

13. Estimation Station

Instructions: Estimate first, then calculate exactly.

Problem	Estimate	Exact
198 + 304	_____	_____
597 – 202	_____	_____
49 × 6	_____	_____
802 ÷ 8	_____	_____
19.8 + 5.1	_____	_____

Bonus Challenge: Which estimate was closest and why?

14. Seating Puzzle

Instructions: Four friends—Alex, Ben, Casey and Dana—sit in four seats in a row.

Clues:

• Alex sits immediately left of Ben.

• Dana is not at either end.

• Casey sits somewhere to the right of Dana.

Seats: 1 2 3 4

Names: _____ _____ _____ _____

> **Bonus Challenge:** Write a fifth clue that is true.

15. Number Pyramid

Instructions: Each box is the sum of the two boxes directly below it.

Top: [_____]

Middle: [_____] [_____]

Bottom: [4] [7] [3] [5]

Bonus Challenge: Create a new pyramid with different bottom numbers.

16. Hidden Maths Words

Instructions: Find the listed maths words horizontally, vertically or diagonally.

A	**N**	**G**	**L**	**E**	**P**	**Q**	**R**
S	**U**	**M**	**T**	**R**	**I**	**X**	**Y**
C	**F**	**R**	**A**	**C**	**T**	**I**	**O**
D	**I**	**V**	**I**	**D**	**E**	**N**	**N**
P	**E**	**R**	**I**	**M**	**E**	**S**	**T**
M	**U**	**L**	**T**	**I**	**P**	**L**	**Y**
E	**Q**	**U**	**A**	**L**	**S**	**B**	**C**
P	**L**	**U**	**S**	**M**	**I**	**N**	**U**

Find: ANGLE • SUM • FRACTION • DIVIDE • PRIME • MULTIPLY • EQUAL • PLUS

17. LATERAL THINKING

Read carefully—these questions are designed to make you think differently.

1. A farmer has 17 sheep. All but 9 run away. How many remain?
Answer: _____

2. You have 3 apples and take away 2. How many do you have?
Answer: _____

3. A clock takes 5 seconds to strike 5 times. How long is the time from the first strike to the last strike?
Answer: _____

4. If you overtake the person in second place, what place are you in?
Answer: _____

Bonus Challenge: Write your own trick question.

18. Data Detective

Instructions: Study the table and answer the questions.

Student	Books read
Ari	6
Bea	9
Chen	4
Diego	7
Eva	9

1. Who read the most? _____
2. Total books? _____
3. Range? _____
4. Mean average? _____

Bonus Challenge: What fraction of the total books were read by Bea?

19. Algebra Balance

Instructions: Find each unknown using inverse operations.

Equation	Value
x + 17 = 42	**x = _____**
y – 13 = 25	**y = _____**
4a = 36	**a = _____**
b ÷ 5 = 7	**b = _____**
2c + 6 = 20	**c = _____**

Bonus Challenge: Write an equation whose answer is 18.

20. Ultimate Brain Challenge

Instructions: Solve all four and show your reasoning.

1. I am a two-digit number. I am divisible by 3 and 5. My digits add to 9. What am I? _____

2. A number is multiplied by 4, then 6 is added. The result is 34. What is the number? _____

3. A rectangle has perimeter 30 cm. Its length is 9 cm. What is its width? _____

4. You have 24 cards. You give 1/3 to a friend and then 1/4 of the remaining cards to another friend. How many are left? _____

Bonus Challenge: Score: _____ / 4. Give yourself an extra point for clear reasoning.

ANSWER KEY

1. 24, 29; 45, 36; 162, 486; 48; 6.25.
2. THINK; PUZZLE; LOGIC; THINK = 20-8-9-14-11; SMART = 19-13-1-18-20.
3. 8 1 6 / 3 5 7 / 4 9 2. Magic total = 15.
4. 45; 52; 56; 46; 36; 62. Accept clearly explained alternative reasoning where valid.
5. A=5; B=5; C=7; DE=44, so D=4 and E=4; F×G+F=32.
6. 54.
7. Multiple valid arrangements; accept any arrangement using 1–9 once and satisfying the row properties.
8. Answers vary; accept any valid construction using each listed digit once.
9. Example: COLD→CORD→CARD→WARD→WARM; CAT→COT→COG→DOG. Other valid ladders accepted.
10. Solutions depend on numeral style; accept any correct one-match transformation.

ANSWER KEY • CONTINUED

11. Probability Challenge: Red; green; 10; 3/10; 8/10 (4/5). Probability of two reds without replacement = 2/9.

12. Mini Sudoku: 1 2 3 4 / 3 4 1 2 / 2 1 4 3 / 4 3 2 1.

13. Estimation Station: Exact answers = 502; 395; 294; 100.25; 24.9. Estimates vary.

14. Seating Puzzle: Alex, Ben, Dana, Casey.

15. Number Pyramid: Bottom 4, 7, 3, 5 → 11, 10, 8 → 21, 18 → 39.

16. Hidden Maths Words: ANGLE, SUM, FRACTION, DIVIDE, PRIME, MULTIPLY, EQUAL, PLUS.

17. Lateral Thinking: 9; 2; **5 seconds** (four intervals of 1.25 seconds); second place.

18. Data Detective: Bea and Eva; 35; range 5; mean 7; Bea's share = 9/35.

19. Algebra Balance: x=25; y=38; a=9; b=35; c=7.

20. Ultimate Brain Challenge: 45; 7; 6 cm; 12 cards.

Correction notes

6. The Number Detective = **63** (tens digit 6, ones digit 3; 6 is 3 more than 3, and 6+3=9).
8. Make 100, Challenge A is now a warm-up: 1+2+3+4=10. Challenge B: (5+5)×(5+5)=100.
17. Five strikes create four equal time intervals. If the total time is 5 seconds, the first-to-last interval is 5 seconds, not 2.5 seconds.

BRAIN GAME CHAMPION
Awarded to: _____
for completing the 20 Brain Games Challenge!