Digit Count and Digit Sum

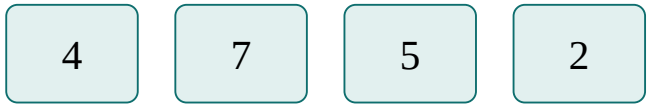
Unit: Number Play - Student Practice Worksheet

Overview: Ms. Rao wrote a list of numbers on the board and asked two very different questions about each one: 'How many digits does it have?' and 'What do its digits add up to?' Kabir kept mixing up the two questions, giving digit sums when asked for digit counts. Anaya found a simple way to never confuse them again: one question counts PLACES, the other adds VALUES.

Practice Questions (30 Total)

Section A - Easy

Q1. Count the digit boxes. What is the digit count of 4,752?



four places

- [ ] **A.** 4
- [ ] **B.** 3
- [ ] **C.** 18
- [ ] **D.** 5

Q2. What does digit count measure?

- [ ] **A.** The sum of the digits
- [ ] **B.** Whether a number is even
- [ ] **C.** How many digits a number has
- [ ] **D.** The value of the last digit

Q3. What is the digit sum of 4,752?

- [ ] **A.** 4
- [ ] **B.** 18
- [ ] **C.** 9
- [ ] **D.** 4752

Q4. The peach bar adds the four digits of 4,752. What is the digit sum?

$$4 + 7 + 5 + 2 = 18$$

- [ ] **A.** 4
- [ ] **B.** 9
- [ ] **C.** 4752
- [ ] **D.** 18

Q5. What does digit sum measure?

- [ ] **A.** How many digits there are
- [ ] **B.** The biggest digit only
- [ ] **C.** The number of even digits
- [ ] **D.** The total of all digits added together

Q6. What is the digit count of 99?

- [ ] **A.** 2
- [ ] **B.** 1
- [ ] **C.** 18
- [ ] **D.** 9

Q7. Compare the two cards. Which card has MORE digits but a SMALLER digit sum?

1,000,000	99
7 digits, sum 1	2 digits, sum 18

- [ ] **A.** 99
- [ ] **B.** They are equal
- [ ] **C.** 1,000,000
- [ ] **D.** Neither has digits

Q8. Can a number with more digits have a smaller digit sum than a number with fewer digits?

- [ ] **A.** No, never
- [ ] **B.** Only for even numbers
- [ ] **C.** Only if both numbers are equal
- [ ] **D.** Yes, this is entirely possible

Q9. What is the digit sum of 1,000,000?

- [ ] **A.** 7
- [ ] **B.** 0
- [ ] **C.** 1000000
- [ ] **D.** 1

Q10. Find the digit count of 123.

- [ ] **A.** 6
- [ ] **B.** 3
- [ ] **C.** 1
- [ ] **D.** 123

Section B - Medium

Q11. The row shows nine 9s. What is the digit sum of 999,999,999?

9 9 9 9 9 9 9 9 9

nine chips, each 9

- [ ] **A.** 9
- [ ] **B.** 99
- [ ] **C.** 18
- [ ] **D.** 81

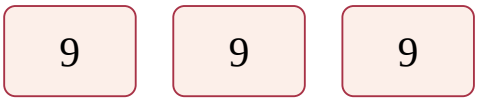
Q12. A number's digit sum is 18. Is the number divisible by 9?

- [ ] **A.** Yes, since 18 divides evenly by 9
- [ ] **B.** No, never
- [ ] **C.** Cannot be determined at all
- [ ] **D.** Only if the number is also even

Q13. Find the digit sum of 308,451.

- [ ] **A.** 18
- [ ] **B.** 21
- [ ] **C.** 24
- [ ] **D.** 6

Q14. The three peach boxes show the largest 3-digit palindrome of nines. What is the maximum digit sum for a 3-digit number?



- [ ] **A.** 27
- [ ] **B.** 18
- [ ] **C.** 9
- [ ] **D.** 999

Q15. Which number has the LARGEST digit sum: 5000, 4321, or 999?

- [ ] **A.** 5000
- [ ] **B.** 999
- [ ] **C.** 4321
- [ ] **D.** They are all equal

Q16. Find the digit count of 308,451.

- [ ] **A.** 5
- [ ] **B.** 7
- [ ] **C.** 6
- [ ] **D.** 21

Q17. The two 5-boxes make 55. Digit count is 2. Digit sum is 10. Which statement matches?

- [ ] **A.** 15: sum equals 2 times 5

- [ ] **B.** 55: sum equals 2 times 5
- [ ] **C.** 500: sum equals 3 times 5
- [ ] **D.** none of those three

Q18. If a number's digit sum is not divisible by 3, what can you conclude about the number itself?

- [ ] **A.** The number must be divisible by 3 anyway
- [ ] **B.** No conclusion is possible
- [ ] **C.** The number must be prime
- [ ] **D.** The number itself is also not divisible by 3

Q19. Find the digit sum of 87,654.

- [ ] **A.** 24
- [ ] **B.** 27
- [ ] **C.** 30
- [ ] **D.** 33

Q20. A 2-digit number has digit sum 17. What could the number be?

- [ ] **A.** 71
- [ ] **B.** 62
- [ ] **C.** 44
- [ ] **D.** 89

Section C - Challenge

Q21. The arrows collapse 81 to a single digit. What is the digital root of 999,999,999?

$$81 \rightarrow 8+1 \rightarrow 9$$

- [ ] **A.** 81
- [ ] **B.** 18
- [ ] **C.** 9
- [ ] **D.** 0

Q22. Why can digit count never directly predict a number's actual size compared to another number's digit sum?

- A. Because digit count depends on positions while digit sum depends on values, two independent things
- B. Because digit count is always bigger than digit sum
- C. Because they always give the same answer
- D. There is no real relationship to explain

Q23. What is the SMALLEST number with digit sum exactly 10?

- A. 28
- B. 19
- C. 55
- D. 10

Q24. Both cards show digit sum 9. What does that prove?

- A. This is actually impossible
- B. Only numbers that are equal can match
- C. Only prime numbers can match
- D. Two different numbers can share the same digit sum, like 18 and 27

Q25. Why does the digit-sum divisibility rule work for 9 but the same trick doesn't work for 8?

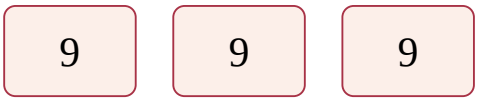
- A. It actually does work identically for 8
- B. Because 8 is smaller than 9
- C. 9 has a special link to powers of 10
- D. Because 8 is an even number

Q26. A 4-digit number has all four digits equal to the same value d. What is its digit sum in terms of d?

- A. d+4
- B. d squared
- C. 4 divided by d

- [ ] **D.** 4d

Q27. Five 9s would fill a 5-digit number the same way these three 9s fill 999. What is the largest digit sum for a 5-digit number?



- [ ] **A.** 50, from 99999
- [ ] **B.** 45, from 99999
- [ ] **C.** 45, from 12345
- [ ] **D.** 25, from 55555

Q28. Why is digit sum considered more useful in maths than digit count?

- [ ] **A.** Digit count is actually more useful
- [ ] **B.** Digit sum feeds directly into real divisibility tests, while digit count is mostly descriptive
- [ ] **C.** Neither measure has any real use
- [ ] **D.** They are equally useless outside puzzles

Q29. Find the digit sum of 123.

- [ ] **A.** 6
- [ ] **B.** 5
- [ ] **C.** 123
- [ ] **D.** 3

Q30. Kabir claims a number's digit sum never exceeds the number itself, except for single-digit numbers where they are equal. Is this generally true?

- [ ] **A.** Yes, digit sum never exceeds the number
- [ ] **B.** No, digit sum is usually bigger than the number
- [ ] **C.** Only true for numbers under 100
- [ ] **D.** Only true for even numbers

Answer Key

Q1: (A) (a) 4. There are four boxes: 4, 7, 5, 2.

Q2: (C) (c) How many digits a number has.

Q3: (B) (b) 18. 4+7+5+2=18.

Q4: (D) (d) 18. The bar shows 4+7+5+2=18.

Q5: (D) (d) The total of all digits added together.

Q6: (A) (a) 2. It has two digits: 9 and 9.

Q7: (C) (c) 1,000,000. Seven digits and sum 1, versus 99 with two digits and sum 18.

Q8: (D) (d) Yes — 1,000,000 has 7 digits and sum 1, while 99 has 2 digits and sum 18.

Q9: (D) (d) 1. Only the leading 1 contributes; all other digits are 0.

Q10: (B) (b) 3. It has three digits: 1, 2, 3.

Q11: (D) (d) 81. Nine chips each worth 9: 9×9=81.

Q12: (A) (a) Yes — if the digit sum divides by 9, so does the whole number.

Q13: (B) (b) 21. 3+0+8+4+5+1=21.

Q14: (A) (a) 27. 9+9+9=27.

Q15: (B) (b) 999. Digit sum 27, versus 5 for 5000 and 10 for 4321.

Q16: (C) (c) 6. Digits: 3, 0, 8, 4, 5, 1.

Q17: (B) (b) 55: sum equals 2 times 5. Digit count 2, digit sum 10 = 2×5.

Q18: (D) (d) The number itself is also not divisible by 3 — the rule works both ways.

Q19: (C) (c) 30. 8+7+6+5+4=30.

Q20: (D) (d) 89. 8+9=17. The others sum to 8.

Q21: (C) (c) 9. Nine 9s sum to 81, then 8+1=9.

Q22: (A) (a) Count measures how many places; sum measures the values in those places.

Q23: (B) (b) 19. 1+9=10, and no smaller positive number has digit sum 10. 10 itself sums to 1.

Q24: (D) (d) 18 and 27 both have digit sum 9.

Q25: (C) (c) Each power of 10 leaves remainder 1 when divided by 9, a property 8 does not share.

Q26: (D) (d) 4d. Four digits each worth d add up to 4 times d.

Q27: (B) (b) 45, from 99999. Five 9s: 9×5=45.

Q28: (B) (b) Digit sum feeds the divisibility tests for 3 and 9.

Q29: (A) (a) 6. 1+2+3=6.

Q30: (A) (a) Yes — digit sum ignores place value, so it cannot beat the number itself.

You've got this! Keep learning and shining! - Ruchi Math Coaching