

Factors, Common Factors, and HCF

Unit: Playing with Numbers - Student Practice Worksheet

Overview: Ms. Rao asked Anaya and Kabir to split 12 mangoes and 18 mangoes into equal-sized bags, with no fruit left over, using the biggest bag size possible. Kabir listed every way to split 12 alone, and every way to split 18 alone, then hunted for a bag size that worked for both. The biggest number that worked for both piles turned out to have a name: the Highest Common Factor.

Practice Questions (30 Total)

Section A - Easy

Q1. The teal box lists shared factors of 12 and 18. What is the HCF?

12: 1 2 3 4 6 12

18: 1 2 3 6 9 18

shared: 1, 2, 3, 6

- ☐ A. 6
- ☐ B. 3
- ☐ C. 9
- ☐ D. 12

Q2. What is a factor of a number?

- ☐ A. A number that divides it exactly
- ☐ B. Any number bigger than it
- ☐ C. Only the number 1
- ☐ D. A number that never divides it

Q3. List the factors of 12.

- ☐ A. 1, 2, 3, 5, 6, 12
- ☐ B. 1, 2, 3, 4, 6, 12
- ☐ C. 2, 4, 6, 8, 12
- ☐ D. 1, 3, 9, 12

Q4. These four chips all divide 10. Which list is the full factor list of 10?



- ☐ **A.** 1, 2, 4, 5, 10
- ☐ **B.** 2, 5, 10
- ☐ **C.** 1, 5, 10, 20
- ☐ **D.** 1, 2, 5, 10

Q5. What is a common factor of two numbers?

- ☐ **A.** A number that divides only one of them
- ☐ **B.** The sum of the two numbers
- ☐ **C.** A number that divides both of them exactly
- ☐ **D.** The bigger of the two numbers

Q6. Is 5 a factor of 20?

- ☐ **A.** No
- ☐ **B.** Yes
- ☐ **C.** Only sometimes
- ☐ **D.** Cannot be checked

Q7. The two bars split evenly into pieces of 4. Which number is a common factor of 8 and 12?



both split into 4s

- ☐ **A.** 3
- ☐ **B.** 4
- ☐ **C.** 5
- ☐ **D.** 6

Q8. What does HCF stand for?

- ☐ **A.** Higher Common Fraction

- ☐ B. Highest Common Fraction
- ☐ C. Half Common Factor
- ☐ D. Highest Common Factor

Q9. What is the HCF of a number and itself, say 8 and 8?

- ☐ A. 8
- ☐ B. 1
- ☐ C. 0
- ☐ D. 16

Q10. Every whole number is divisible by 1 and by itself. Which two factors does every number always have?

- ☐ A. 0 and 1
- ☐ B. 2 and itself
- ☐ C. 1 and itself
- ☐ D. Only itself

Section B - Medium

Q11. Each mango bag holds 6, and 12 mangoes fill two bags. How many fruits went in each bag?



- ☐ A. 6
- ☐ B. 3
- ☐ C. 9
- ☐ D. 2

Q12. Two numbers have only 1 as a common factor. What does this tell you about their HCF?

- ☐ A. Their HCF is 1
- ☐ B. Their HCF does not exist
- ☐ C. Their HCF is the smaller number
- ☐ D. Their HCF is undefined

Q13. Find the HCF of 20 and 30.

- ☐ A. 5
- ☐ B. 10
- ☐ C. 15
- ☐ D. 20

Q14. The maroon chip is the largest in Anaya's common-factor list. What is the HCF?

1 2 3 4 6

12

- ☐ A. 6
- ☐ B. 4
- ☐ C. 12
- ☐ D. 1

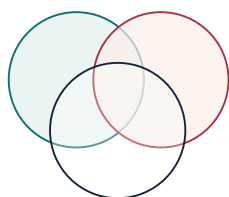
Q15. If one number is a factor of another (like 4 and 16), what is their HCF?

- ☐ A. The smaller number
- ☐ B. The larger number
- ☐ C. Always 1
- ☐ D. Their sum

Q16. Find the HCF of 24 and 36.

- ☐ A. 6
- ☐ B. 8
- ☐ C. 12
- ☐ D. 18

Q17. The three circles for 14, 21 and 35 meet at 7. What is their HCF?



14, 21, 35 meet at 7

- ☐ A. 3

- ☐ B. 5
- ☐ C. 14
- ☐ D. 7

Q18. Find the HCF of 9 and 27.

- ☐ A. 3
- ☐ B. 9
- ☐ C. 27
- ☐ D. 1

Q19. Find the HCF of 15 and 25.

- ☐ A. 3
- ☐ B. 10
- ☐ C. 15
- ☐ D. 5

Q20. List factors of 16 and 24, then pick the largest shared one. What is the HCF?

- ☐ A. 4
- ☐ B. 8
- ☐ C. 12
- ☐ D. 16

Section C - Challenge

Q21. The ribbons are 18 cm and 24 cm. For the longest equal pieces with none wasted, what length?



- ☐ A. 3 cm
- ☐ B. 6 cm
- ☐ C. 9 cm
- ☐ D. 12 cm

Q22. Why must the HCF of two numbers never be bigger than the smaller of the two numbers?

- ☐ A. Because a factor of a number can never exceed that number
- ☐ B. Because HCF is always an even number
- ☐ C. Because the rule is just a convention with no reason
- ☐ D. It actually CAN be bigger sometimes

Q23. Three numbers are 8, 12, and 20. What is their HCF?

- ☐ A. 4
- ☐ B. 6
- ☐ C. 2
- ☐ D. 8

Q24. The two factor rows share only the first number. What is their HCF?

1, 2, 3, 6, 9, 18

1, 5, 25

only 1 sits in both rows

- ☐ A. 18
- ☐ B. 25
- ☐ C. 1
- ☐ D. 5

Q25. Why does Ms. Rao's mango-and-guava bagging problem use HCF and not just any common factor?

- ☐ A. HCF gives the fewest bags, as the largest equal group
- ☐ B. Any common factor works equally well
- ☐ C. HCF has nothing to do with grouping problems
- ☐ D. Smaller common factors always give fewer bags

Q26. If the HCF of two numbers is 1, what does that mean about the numbers?

- ☐ A. They are definitely both prime
- ☐ B. They share no factors bigger than 1 (they are co-prime)
- ☐ C. One of them must be 1
- ☐ D. They cannot be added together

Q27. Both bars are even (greater than 2). Can their HCF ever be 1?



both even, so both split by 2



- ☐ **A.** Yes, always
- ☐ **B.** No, they share factor 2
- ☐ **C.** Only if both numbers are prime
- ☐ **D.** Only if one of them is odd

Q28. Two numbers share exactly the common factors 1, 2, 4, 8, and 16. Can you tell what their HCF is, and is 32 possibly one of the numbers?

- ☐ **A.** HCF is 8; 32 is impossible
- ☐ **B.** HCF is 1; the numbers are unrelated
- ☐ **C.** Cannot determine the HCF from this list
- ☐ **D.** HCF is 16; 32 is possible because 16 divides 32

Q29. Anaya says listing every factor is the only way to find HCF. Is she right?

- ☐ **A.** Yes, there is no other method
- ☐ **B.** No, HCF cannot really be calculated
- ☐ **C.** Only guessing works
- ☐ **D.** No, prime factorisation also works

Q30. A pair of numbers has HCF equal to the smaller number itself. What must be true?

- ☐ **A.** The larger number must be prime
- ☐ **B.** Both numbers must be equal
- ☐ **C.** The smaller number is a factor of the larger number
- ☐ **D.** This situation is impossible

Answer Key

- Q1:** (A) (a) 6. Common factors of 12 and 18 are 1,2,3,6 — the biggest is 6.
- Q2:** (A) (a) A number that divides it exactly, with no remainder.
- Q3:** (B) (b) 1, 2, 3, 4, 6, 12 — each divides 12 exactly.
- Q4:** (D) (d) 1, 2, 5, 10 — each divides 10 exactly.
- Q5:** (C) (c) A number that divides both of them exactly.
- Q6:** (B) (b) Yes. 20 divided by 5 is 4 exactly, with no remainder.
- Q7:** (B) (b) 4. 4 divides both 8 and 12 exactly.
- Q8:** (D) (d) Highest Common Factor.
- Q9:** (A) (a) 8. A number's HCF with itself is always the number itself.
- Q10:** (C) (c) 1 and itself. Every whole number is exactly divisible by 1 and by itself.
- Q11:** (A) (a) 6 — the HCF of 12 and 18, giving the fewest bags.
- Q12:** (A) (a) Their HCF is 1 — when the only shared factor is 1, that IS the HCF.
- Q13:** (B) (b) 10. Common factors of 20 and 30 are 1,2,5,10 — the biggest is 10.
- Q14:** (C) (c) 12 — the largest number in the list of common factors.
- Q15:** (A) (a) The smaller number. Since 4 divides 16 exactly, 4 is itself the largest number dividing both, so it is the HCF.
- Q16:** (C) (c) 12. Factors of 24: 1,2,3,4,6,8,12,24. Factors of 36: 1,2,3,4,6,9,12,18,36. Largest common factor: 12.
- Q17:** (D) (d) 7. Factors shared by 14, 21, and 35 include 1 and 7 — the biggest is 7.
- Q18:** (B) (b) 9. Since 9 divides 27 exactly ($27=9\times3$), 9 is itself the HCF.
- Q19:** (D) (d) 5. Common factors of 15 and 25 are 1 and 5 — the biggest is 5.
- Q20:** (B) (b) 8. Factors of 16: 1,2,4,8,16. Factors of 24: 1,2,3,4,6,8,12,24. Largest common factor: 8.
- Q21:** (B) (b) 6 cm — the HCF of 18 and 24, giving the longest possible equal pieces and so the fewest total pieces.
- Q22:** (A) (a) Because a factor of a number can never exceed that number, the HCF (a common factor of both) can be at most as large as the smaller of the two numbers.
- Q23:** (A) (a) 4. Factors of 8 include 1,2,4,8; of 12 include 1,2,3,4,6,12; of 20 include 1,2,4,5,10,20. The largest shared by all three is 4.
- Q24:** (C) (c) 1. The only number appearing in both factor lists is 1.
- Q25:** (A) (a) Using the HCF gives the fewest possible bags, since a bigger group size per bag means fewer bags are needed overall.
- Q26:** (B) (b) They share no factors bigger than 1 (they are co-prime) — this is possible even for two numbers that aren't prime themselves, like 8 and 9.

Q27: (B) (b) No — two even numbers always share at least the factor 2, so their HCF must be at least 2, never 1.

Q28: (D) (d) HCF is 16 — the largest listed common factor. 32 is a valid candidate since 16 divides it exactly, so it wouldn't disturb the shared factor list.

Q29: (D) (d) No — prime factorisation is another reliable method for finding HCF, alongside listing every factor.

Q30: (C) (c) The smaller number is a factor of the larger number — that's when the smaller number itself is the HCF.

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