Here are 15 word problems that involve the concepts of factors, Highest Common Factor (HCF), and Lowest Common Multiple (LCM):

1. Sally has 24 pencils, and she wants to pack them into pencil cases with the maximum number of pencils in each case. What is the maximum number of pencils she can pack in each case?
2. A gardener wants to plant rows of flowers in his garden. He wants each row to have the same number of flowers, and he has 36 flowers in total. What is the maximum number of flowers he can plant in each row?
3. A factory produces two types of boxes, one with a capacity of 24 items and another with a capacity of 36 items. What is the smallest number of items that can be packed into both types of boxes?
4. A teacher wants to distribute 60 storybooks among her students in such a way that each student gets the same number of books. What is the maximum number of students she can distribute the books to?
5. A farmer wants to build a fence around his rectangular field. The length of the field is 36 metres, and the width is 48 metres. What is the minimum length of the fence he needs?
6. Mary is making flower bouquets for her friends. She has 18 roses and 24 lilies. What is the largest number of identical bouquets she can make, with no flowers left over?
7. A school is organising a field trip for 36 students. They want to arrange the students into equal-sized groups for activities. What is the largest number of groups they can form?
8. John is organising a party and wants to buy enough juice boxes for everyone. If each box contains 8 juice packs, and he has 56 guests, how many boxes does he need to buy?
9. A baker has 36 cupcakes and 48 cookies. She wants to arrange them into identical gift baskets. What is the largest number of baskets she can make without any leftovers?
10. A carpenter has wooden planks of lengths 30 cm, 45 cm, and 60 cm. What is the shortest length he can cut these planks into, such that all resulting pieces are of equal length?
11. A company manufactures packets of 24 pens and 36 pencils. What is the smallest number of packets they need to produce to have an equal number of both pens and pencils?
12. A delivery truck can carry 60 boxes of apples and 48 boxes of oranges. What is the maximum number of boxes of fruit the truck can carry without any partial boxes?
13. A teacher wants to arrange her 30 students into rows for a class photo, with the same number of students in each row. What is the maximum number of rows she can have?

14. A student has to cover a rectangular-shaped textbook with plastic wrap. The dimensions of the textbook are 20 cm by 30 cm. What is the minimum amount of plastic wrap needed?
15. A librarian wants to arrange a set of 36 books into equal piles on the library shelves. What is the maximum number of piles she can form

Check your answers

1. The maximum number of pencils Sally can pack in each case is the HCF of 24, which is 12.
2. The maximum number of flowers the gardener can plant in each row is the HCF of 36, which is 36.
3. The smallest number of items that can be packed into both types of boxes is the HCF of 24 and 36, which is 12.
4. The maximum number of students the teacher can distribute the books to is the HCF of 60, which is 60.
5. The minimum length of the fence the farmer needs is the perimeter of the field, which is 2*(length + width) = 2*(36 + 48) = 2*84 = 168 meters.
6. The largest number of identical bouquets Mary can make is the HCF of 18 and 24, which is 6.
7. The largest number of groups the school can form is the HCF of 36, which is 36.
8. The number of boxes John needs to buy is 56 ÷ 8 = 7 boxes.
9. The largest number of baskets the baker can make is the HCF of 36 and 48, which is 12.
10. The shortest length the carpenter can cut the planks into, such that all resulting pieces are of equal length, is the HCF of 30, 45, and 60, which is 15 cm.
11. The smallest number of packets the company needs to produce to have an equal number of both pens and pencils is the LCM of 24 and 36, which is 72 packets.
12. The maximum number of boxes of fruit the truck can carry without any partial boxes is the LCM of 60 and 48, which is 240 boxes.
13. The maximum number of rows the teacher can have is the HCF of 30, which is 30.
14. The minimum amount of plastic wrap needed is the perimeter of the textbook, which is 2*(length + width) = 2*(20 + 30) = 2*50 = 100 square centimeters.
15. The maximum number of piles the librarian can form is the HCF of 36, which is 36.