Estimating in Multiplication

If you don't need an exact result, you can estimate. To estimate a multiplication, round some or all of the factors so that it will be easy to multiply *mentally*.

There are no hard and fast rules as to how exactly you should round. The idea is round some of the numbers so that your new rounded numbers are easy to multiply in your head.

Estimate 8 × 189.

189 can be rounded to 200. The estimated product is 8 × 200 = 1,600.

Estimate 42 × 78.

42 ≈ 40 and 78 ≈ 80. The estimated product is 40 × 80 = 3,200.

Estimate 21 × $4.56.

Round the numbers to 20 and $4.50. Multiply in parts:

20 × $4 = $80 and 20 × 50¢ = 1000¢ = $10. Then add: $80 + $10 = $90.

1. Estimate by rounding one or both factors. Don't round both if you can calculate in your head just by rounding one factor!

a. 5 × 69 ≈ ____ × _____ = _____	**b.** 11 × 58 ≈ _____ × _____ = _____	**c.** 119 × 8 ≈ _____ × ____ = _____
d. 27 × 52 ≈ _____ × _____ = _____	**e.** 7 × $4.15 ≈ ____ × _____ = _____	**f.** 8 × $11.79 ≈ ____ × _____ = _____
g. 25 × $42.50 ≈ _____ × _____ = _____	**h.** 9 × 17 ≈ ____ × _____ = _____	**i.** 63 × 897 ≈ _____ × _____ = _____

2. Estimate the cost. Round one or both numbers so you can multiply in your head!

a. 24 chairs at $44.95 per chair ≈	**b.** 512 Popsicles at 19¢ each
c. 210 meters of wire at $1.49 per meter	**d.** Six tennis balls that cost $3.37 each and two rackets that cost $11.90 each.

Example. *If each bus can seat 57 passengers, how many buses do you need to seat 450 people?*

One bus seats 57 passengers.	Ten buses seat 570 passengers.
Two buses seat 114 passengers.	Eight buses seat 8 × 57 passengers.

With how many buses will your answer be 450 or a little more?

This problem could be solved by division (450 ÷ 57) but instead, you can **estimate using multiplication**. Round the number 57 to 60, and quickly calculate:

7 × 60 = 420 and 8 × 60 = 480. It *looks like* 8 buses are needed for 450 people.

However, we need to check it using the exact number 57:
8 × 57 = 400 + 56 = 456, so yes, eight buses is enough for 450 people.

3. Solve the problems using estimation.

a. An advertisement in a newspaper costs $349.
How many ads can Bill buy with $2000?

b. Renting skates at a skating rink costs $2.85 per hour.
How many whole hours can Sandra skate for $25?

c. A can of beans costs $0.29. A bag of lentils costs $0.42.
Estimate which is cheaper: to buy eight cans of beans
or to buy five bags of lentils.

d. Jackie needs to buy 8 ft of string for each of
the 28 students in the craft class.
The string costs $0.22 per foot. Estimate her total cost.