2 Multiply and divide

The Mahatma Gandhi Bus Station at Hyderabad is a very busy bus station. Buses travel to all districts and major cities of Andhra Pradesh from this station.

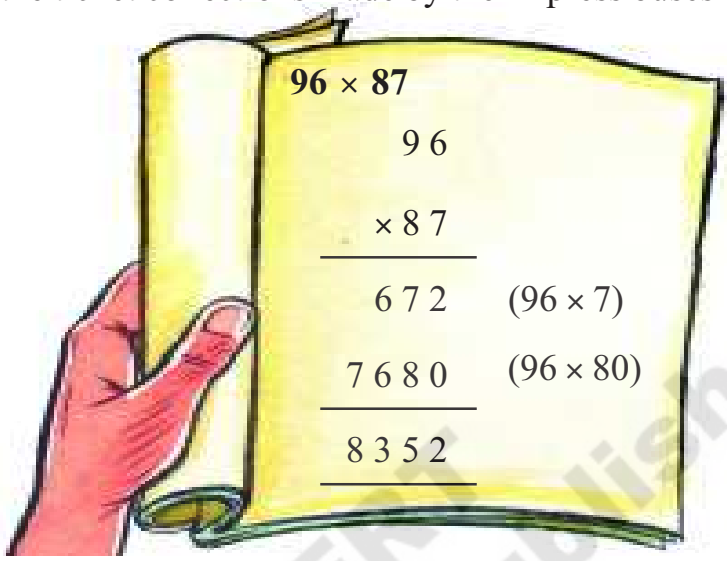
Given below are the bus fares of three different types of buses from Hyderabad to Warangal-

Express	-	₹ 96
Deluxe	-	₹ 135
Indra (air condition)	-	₹ 171

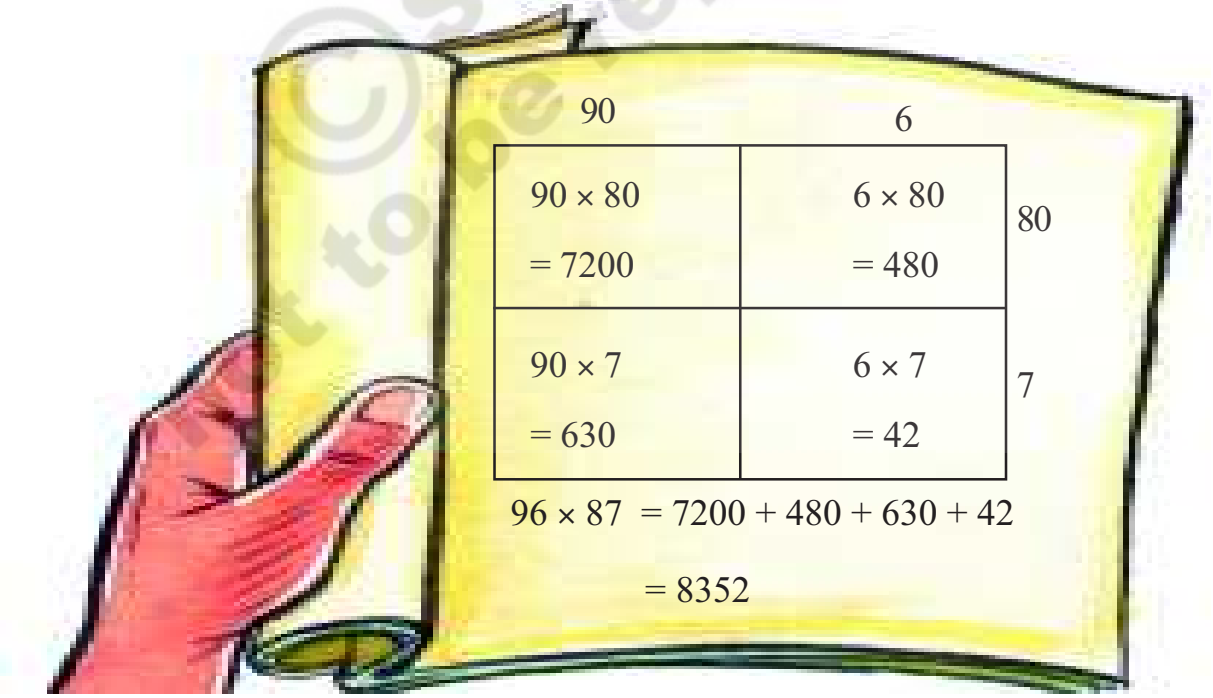
On one day, 87 people purchased Express tickets between 9 and 10 o'clock in the morning. During this time 61 tickets of Deluxe buses and 36 tickets for the air conditioned (Indra) buses are sold.

Nageshwar is the ticket seller and he has to record the ticket collections made in every hour. The computers are not working on that day. So he is multiplying in a notebook.

He calculated the ticket collections made by the Express buses like this



He asked his friend Sreedhar to multiply and see whether his product is correct or not. Sreedhara multiplied like this



Has Nageshwar calculated the ticket collection of the Express buses correctly? Discuss the differences in Nageshwar and Sreedhar's methods with your friends .

Nageshwar then calculated the money collected for the Deluxe buses

Cost of one ticket of deluxe bus = ₹ 135

No of passengers that purchased tickets for deluxe bus = 61

Total money collected = 135 × 61

$$\begin{array}{rl} 1\,3\,5 & \\ \times\ 6\,1 & \\ \hline 1\,3\,5 & (135 \times 1) \\ 8\,1\,0\,0 & (135 \times 60) \\ \hline 8\,2\,3\,5 & \end{array}$$

Total money collected for the Deluxe bus tickets = ₹ 8235

Sreedhar checked like this:

100	30	5	
100 × 60 = 6000	30 × 60 = 1800	5 × 60 = 300	60
100 × 1 = 100	30 × 1 = 30	5 × 1 = 5	1

135 × 61 = 6000 + 1800 + 300 + 100 + 30 + 5

= 8235

Now you find the ticket money collected for the Indra buses using both the methods.

Sachin in cricket world

Up to September 2012, Sachin Tendulakar had made 15533 runs in international test cricket and 18426 runs in international one-day cricket. The table given below gives details of the 100s and 50s scored by him in test and one-day cricket in this period.

Type of match	100s	50s
Test cricket	51	65
One-day cricket	49	96

(a) How many runs has Sachin Tendulkar made in 100s in test cricket?

(b) How many runs has he made in 50s in test cricket?

(c) How many runs has he made in 100s and 50s taken together (in test cricket)?

(d) How many runs has Sachin Tendulkar made in 100s in one-day cricket?

(e) How many runs has Sachin Tendulkar made in 50s in one-day cricket?

(f) How many runs other than 100s and 50s has Sachin Tendulkar made in test cricket?

(g) Make more word problems on this question.

Hostel kitchen

The following items were bought by a hostel kitchen for one month-

Item	Quantity (in kgs)	Cost per kg (₹)	Total Cost
Rice	600	25	
Bengal Gram	45	50	
Cooking oil	30	125	
Red gram	15	75	
Ravva	15	25	

(a) What was the total cost of the above items?

(b) Make more word problems on this question.

Chalk box

A box of chalks contains 100 chalks.

(a) 2 boxes will contain _____ chalks

(b) 8 boxes will contain _____ chalks

(c) 16 boxes will contain _____ chalks

(d) 18 boxes will contain _____ chalks

(e) 36 boxes will contain _____ chalks

(f) 72 boxes will contain _____ chalks

If a carton contained 10 such boxes of chalk, it would hold how many chalks?_____

(a) 2 such cartons will contain _____ chalks

(b) 4 such cartons will contain _____ chalks

(c) 6 such cartons will contain _____ chalks

(d) 8 such cartons will contain _____ chalks

(e) 10 such cartons will contain _____ chalks

Try This

1. Observe the pattern and fill in the blanks.

$2 \times 200 = 400$	$2 \times 300 = 600$	$2 \times 400 = 800$
$3 \times 200 = 600$	$3 \times 300 = 900$	$3 \times 400 = 1200$
$4 \times 200 = 800$	$4 \times 300 = 1200$	$4 \times 400 = 1600$
$5 \times 200 = 1000$	$5 \times 300 = 1500$	$5 \times 400 = 2000$
$6 \times 200 =$ ____	$6 \times 300 =$ ____	$6 \times 400 =$ ____
$7 \times 200 =$ ____	$7 \times 300 =$ ____	$7 \times 400 =$ ____
$8 \times 200 =$ ____	$8 \times 300 =$ ____	$8 \times 400 =$ ____

$9 \times 200 =$____	$9 \times 300 =$____	$9 \times 400 =$____
$10 \times 200 =$____	$10 \times 300 =$____	$10 \times 400 =$____
$11 \times 200 =$____	$11 \times 300 =$____	$11 \times 400 =$____
$14 \times 200 =$____	$14 \times 300 =$____	$14 \times 400 =$____
$15 \times 200 =$____	$15 \times 300 =$____	$15 \times 400 =$____
$25 \times 200 =$____	$25 \times 300 =$____	$25 \times 400 =$____
$27 \times 200 =$____	$27 \times 300 =$____	$27 \times 400 =$____
$39 \times 200 =$____	$39 \times 300 =$____	$39 \times 400 =$____
$48 \times 200 =$____	$48 \times 300 =$____	$48 \times 400 =$____
$50 \times 200 =$____	$50 \times 300 =$____	$50 \times 400 =$____

2. Multiply a series of numbers with 500, 600 and 700. What is the pattern that you observe? Is it the same as shown above?

Are they equal?

1. $9 \times 8 =$____
   $8 \times 9 =$____
2. $12 \times 8 =$____
   $8 \times 12 =$____
3. $25 \times 30 =$____
   $30 \times 25 =$____
4. $100 \times 54 =$____
   $54 \times 100 =$____
5. $123 \times 3 =$____
   $3 \times 123 =$____
6. $130 \times 75 =$____
   $75 \times 130 =$____

Take any two numbers of your choice and multiply and see whether the above relationship is true. Do this with as many numbers as you want.

What conclusion can you draw?

Do This

1. Fill in the blanks

(a) $18 \times 19 =$ _____ $\times 18$

(b) $49 \times 10 =$ _____ $\times 49$

(c) $16 \times 56 = 56 \times$ _____

(d) $999 \times$ _____ $= 1 \times 999$

(e) $900 \times 7 = 7 \times$ _____

(f) _____ $\times 145 = 145 \times 99$

Shopping for clothes

Vishnu goes to the shop to buy a shirt for himself.

When he gets into the shop, the shop owner tells him that shirts are available in four colours blue, white, pink and green. Also each colour is available in 3 designs check, stripped and plain. So, How many types of shirts are available in the shop for Vishnu to choose?

Number of colours in which shirts are available = 4

Number of designs in which each shirts are available = 3

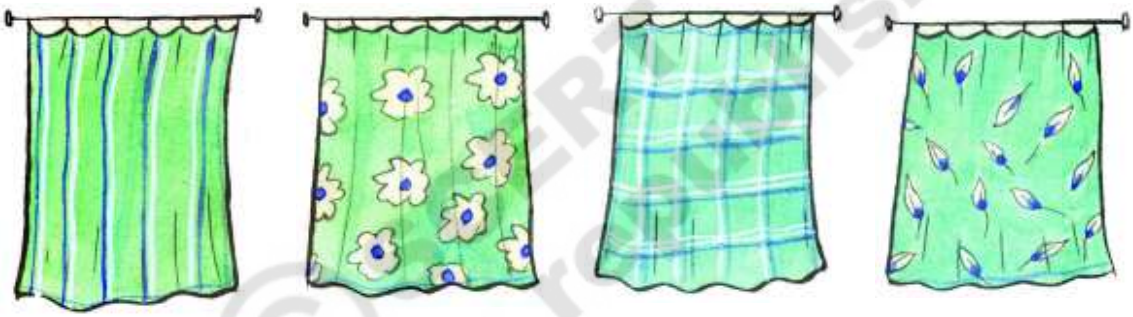
So, total number of shirts that vishnu will choose from = 3x4=12 shirts.

Do This

1. A furniture shop sells both wooden and plastic tables. Both types of tables are available in circular, rectangular and square shapes. Srinivas goes to buy a table for his house. So, from total of how many types of tables will he choose from?

2. A shopkeeper sells managalgiri cotton cloth in 8 colours. In each colour there are 3 designs- plain, stripped and with border. Padma goes to the shop to buy material for her suit. So, from total of how many types of dress materials she has to choose?

3. At a curtain shop, curtains are available in 8 colours and 4 designs in each colour-



What is the total number of choices that a customer can choose from?

Price Rise

(a) How many times has the price of sunflower oil gone up in ten years?

(b) How many times has the price of Red gram dal gone up in ten years?

(c) How much more will 8 liters of sunflower oil cost today, than 10 years back?

(d) How much more will 5 kg of Red gram dal cost today, than 10 years back?

Do not find the exact answer. Just estimate!

1. The table given below gives the prices of some essential commodities in 2002 and in 2012.

(a) About how many times have the prices of each of these commodities gone up in the past ten years?

Item	2002	2012	About how many times has the price increased?
Petrol	₹ 35	₹ 72	
LPG	₹ 181	₹ 384	
Mustard oil	₹ 35	₹ 100	
Milk	₹ 12	₹ 30	

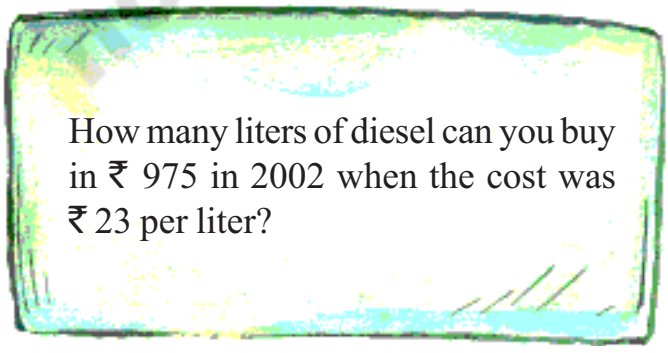
(b) Extend this list by finding out the prices of items of your choice and state about how many times their prices have increased during the period.

2. Sudha earns ₹ 189 in a day and Radha earns ₹ 112 in a day. About how much will each of them earn in 30 days?
3. One meter of Pochampalli cloth cost ₹ 194. About how much will 79 meters of such cloth cost?
4. The cost of a bag of 5 kg wheat flour is ₹ 124. About how much will 42 such bags cost?
5. About how much is the product of 523 and 63?

Do This

1. A farmer harvested 30 bags of paddy. He sold 20 bags for ₹ 400 per bag. He later sold the remaining paddy for ₹ 350 per bag. How much money did the farmer get in all?
2. If one box contains 26 laddoos then how many laddoos will 385 such boxes contain?
3. There are 47 rows of seats in a cinema hall. 29 people can be seated in each row. How many people can be seated in the hall?
4. Cost of a bus ticket from Hyderabad to Nalgonda for a child is ₹ 65 and for an adult it is ₹ 110. Find the total cost of tickets for 3 children and 4 adults?
5. The monthly rent of a room is ₹ 950. How much will the rent for 2 years be?
6. Pravalika is in class 5. She is ten years old. Her father's age is 4 times of her age. Find the age of her father?
7. A garden has 125 rows of trees. In each row there are 75 trees. How many trees are there in the garden?
8. How many weeks are there in 150 days?
9. A bicycle costs ₹ 2850. Ramayya bought 3 bicycles and gave to the shopkeeper ₹ 9000. How much will the shopkeeper give back to Ramayya?

The teacher put this problem on the board-



Estimate the answer before you calculate.

Vanaja did the problem like this-

$$
\begin{array}{r}
10+10+10+10+2 \\
23\overline{)975} \\
\underline{230} \\
745 \\
\underline{230} \\
515 \\
\underline{230} \\
285 \\
\underline{230} \\
55 \\
\underline{46} \\
9
\end{array}
$$

Kunal did it like this-

$$
\begin{array}{r}
20+20+2 \\
23\overline{)975} \\
\underline{460} \\
515 \\
\underline{460} \\
55 \\
\underline{46} \\
9
\end{array}
$$

Sonali did it like this

$$
\begin{array}{r}
42 \\
23\overline{)975} \\
\underline{92} \\
55 \\
\underline{46} \\
9
\end{array}
$$

(a) Are all the answers correct? Discuss the differences in the methods with your friends and teacher.

(b) How many liters of diesel can you buy in with ₹ 2012 when the cost is ₹ 49 per liter? Estimate, before you calculate.

Try This

1. Complete the following table.

Problem	Quotient	Remainder
300 ÷ 100		
425 ÷ 100		
682 ÷ 100		
810 ÷ 100		
905 ÷ 100		
1500 ÷ 100		
4320 ÷ 100		
5002 ÷ 100		
6123 ÷ 100		
7999 ÷ 100		

Krishna Animal Farm

Krishna owns an animal farm. He has 27 cows, 18 buffaloes and 200 chickens in his farm

The table given below gives details about the water and food requirements of each animal and 100 birds per day.

Animal/Bird	Water required (liters)	Food required (kg)
Cow	50	12
Buffalo	65	15
Chickens (per 100)	25	5

(a) How much water does Krishna need to give every day for the animals?

(b) How many kg of grass does he require for the animals in a day?

(c) If 13 cows give 24 liters of milk daily and 14 cows give 29 liters of milk daily then how many liters of milk is obtained each day?

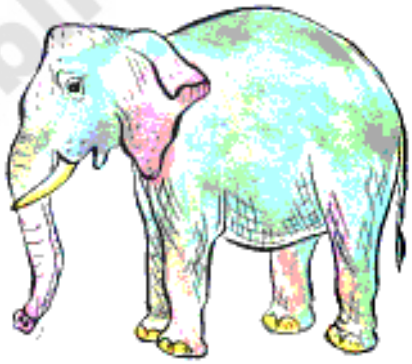
(d) On one day the chickens laid 180 eggs. If these eggs are packed into packets of 6 eggs each then, how many such packets will be made?

(e) If the eggs were packed in packets of 12 eggs each, then how many packets will be made?

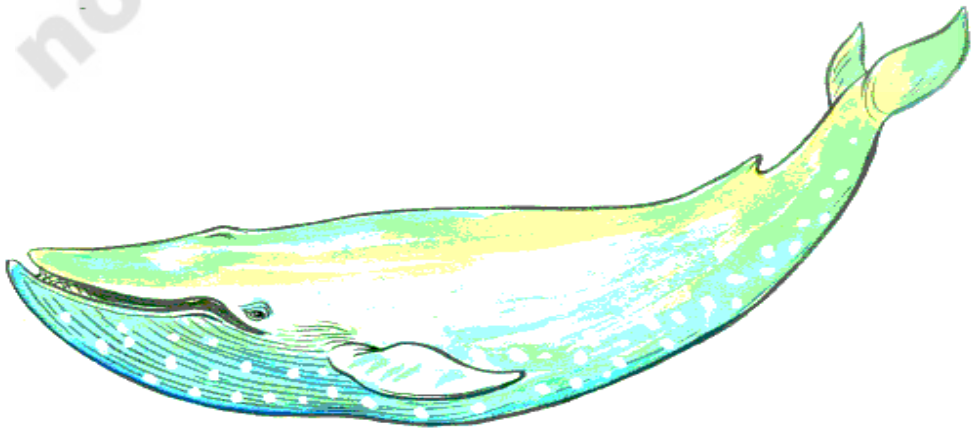
(f) What if there were packets of 30 eggs? Will some eggs remain unpacked? If so, how many?

How much water and food do the heaviest animals in the world require?

(a) An elephant needs 80 liters of water in a day and 150 kg of food. How much water and food does the elephant need in 7 days?



(b) A blue whale drinks 40 times the water and 6 times the food required by an elephant in a day. How much of water and how much of food does a blue whale require?



Do not find the exact answer. Just estimate!

The distance between various towns of Andhra Pradesh is given below-

Sircilla and Kamareddi	52 km
Hyderabad and Vishakhapatnam	513 km
Vijayawada and Warangal	198 km
Parlakimidi and Nandikotkur	697 km
Nalgonda and Guntakal	290 km
Chirala and Anakapalle	352 km
Rayadrug and Mangalagiri	439 km

(a) A car travels 25 km with one liter of petrol. About how many liters of petrol will it need for each journey?

Divide and multiply

(a) $4 \times 25 =$ _____
$100 \div$ _____ $= 25$

(b) $8 \times 25 =$ _____
_____ $\div 8 = 25$

(c) $2 \times 50 =$ _____
$100 \div 2 =$ _____

(d) $4 \times 50 =$ _____
$200 \div$ _____ $= 50$

(e) $75 \times 2 =$ _____
$150 \div$ _____ $= 75$

(f) $75 \times 4 =$ _____
$300 \div$ _____ $= 4$

(g) $125 \times 4 =$ _____
_____ $\div 4 = 12\ 5$

(h) $125 \times 8 =$ _____
$1000 \div 8 =$ _____

The teacher has put this division problem on the board-

$50 \div 3 = ?$

Lata did like this-

$$\begin{array}{r} 15 \\ 3\overline{)50} \\ 3 \\ \hline 20 \\ 15 \\ \hline 5 \end{array}$$

Bhagya did like this-

$$\begin{array}{r} 16 \\ 3\overline{)50} \\ 3 \\ \hline 20 \\ 18 \\ \hline 2 \end{array}$$

Lata and Bhagya started arguing. Both felt that their answers were correct. They checked their divisions as follows.

Both multiplied the divisior with the quotient and then added the remainder to the product.

Lata's checking of division

$3 \times 15 + 5$

$= 45 + 5$

$= 50$

Bhagya's checking of division

$3 \times 16 + 2$

$= 48 + 2$

$= 50$

Both Bhagya and Lata got answers that were equal to the dividend, 50. So, both continued to argue that their answers were correct.

Now can you say who has divided correctly? Discuss with your friends, why Lata and Bhagya have got different quotients?

Can the remainder be more than the divisor?

Try This

1. Some of the divisions given below are incorrect. Identify them and discuss the reasons for the mistakes with your friends.

```
  11
4)404
 4
 04
  4
  0

  05
4)25
 0
 25
 20
  5

  14
3)312
 3
 012
  12
  0

  50
12)602
 60
 002
  0
  2

  81
9)729
 72
 009
  9
  0
```

```
  100
9)908
 9
 08
  0
  8

  101
8)809
 8
 09
  8
  1

   58
13)774
  65
  124
  104
   20

   43
22)963
  88
  83
  66
  17
```

2. Entry ticket for an exhibition for a child is ₹ 6 for and an adult is ₹ 10. If a family spends ₹ 58 for tickets. How many children and adults are there in that family?

3. Chandana counted 32 wheels of some buses and cars. If a bus have 6 wheels, car have 4 wheels. How many buses and cars were there?

Magic division

Write a 3 digit number, which have consecutive digits _____.

Example : 456

Divide it by 3 _____

Is it exactly divisible by 3?

Try with some more consecutive digits by dividing with 3.

Exercise

1. Valli took a loan of ₹ 9750 for farming purposes. She has to pay it back in equal amounts in 6 months. How much will she has to pay every month?
2. 936 apples were plucked from an orchard in day. They were packed into 12 boxes and sent to the market for sale. If each box contained an equal number of apples then how many apples were they in each box?
3. When the apples reached the market, each apple was sold for ₹ 14. How much would each box be sold for?
4. How many dozen bananas are there in 216 bananas?
5. How many 100s are there in 771? How much is remaining?
6. How many 1000s are there in 7645? How much is remaining?
7. How many minutes are there in a day?
8. How many seconds are there in an hour?
9. If you read 8 pages in a day, how many days will it take you to read 120 pages?
10. There are 21 children in class 1, 24 children in class 2, 32 children in class 3, 30 children in class 4 and 18 in class 5 of Annaram Primary School. The daily cost of mid-day meal for each child is ₹ 4. What is the daily cost of mid-day meal for the school? What is the monthly cost of mid-day meal for the school?
11. A roll of Mangalgiri cloth contains 79 m of cloth and a roll of Pochampali cloth contains 56 m of cloth. The Mangalgiri cloth is sold for ₹ 128 a meter and the Pochampali cloth is sold for ₹ 217 a meter. If both the rolls are sold by the shopkeeper within the month, then how much money has he received on their sale?