Chapter 13

The Transport Museum

0433CH13

Mystery Matrix

Fill the yellow boxes with 1-digit numbers (multiplicands and multipliers) such that you get the products given in the white boxes.

Fill the remaining white boxes with appropriate products.

×				
	32			
			42	
		45		
			21	

The product of the numbers in each row is given in the orange boxes. The product of the numbers in each column is given in the blue boxes. Identify appropriate numbers to fill the blank boxes.

		56
		54
63	48	

		42
		50
60	35	

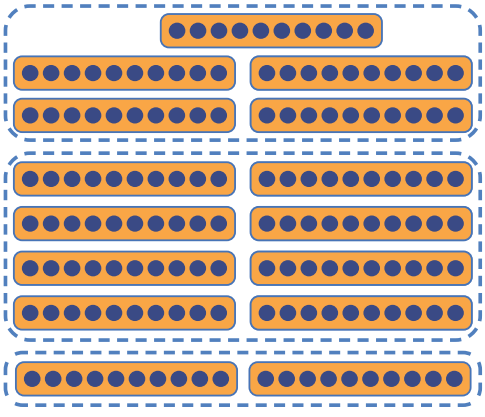
Times-10

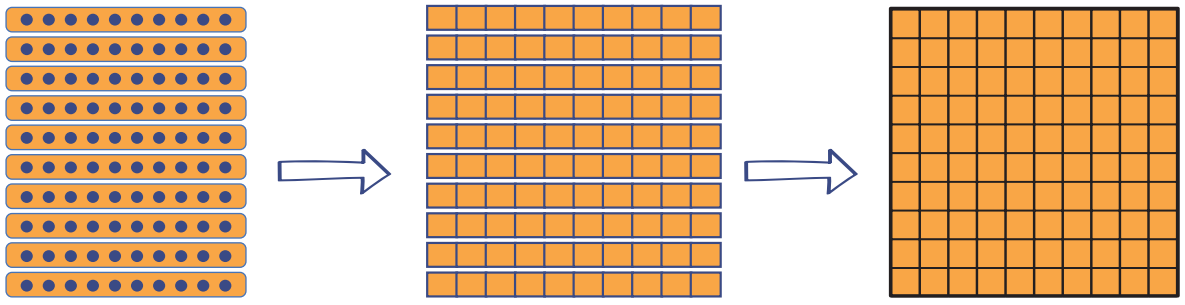
Match each problem with the appropriate pictorial representation and write the answer.

2 × 10 = 2 Tens = _____

5 × 10 = _____ Tens = _____

8 × 10 = _____ Tens = _____



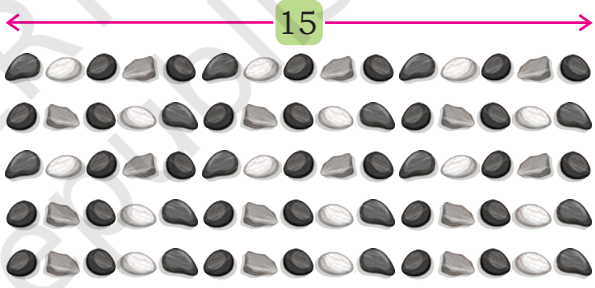


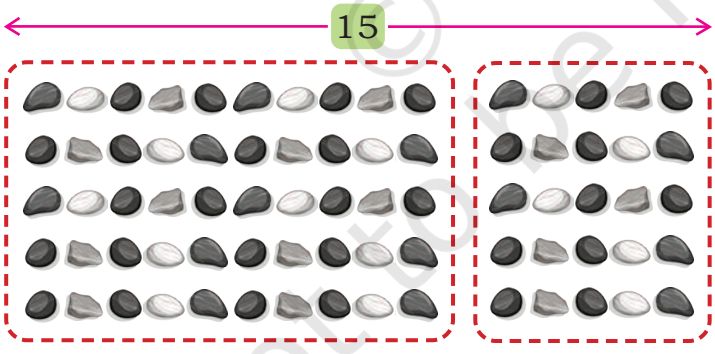
10 Tens 10 Tens 1 Hundred =100

What is 10 × 10 = ____ Tens = _____

Constructing Tables

How many pebbles are there in this arrangement? _____





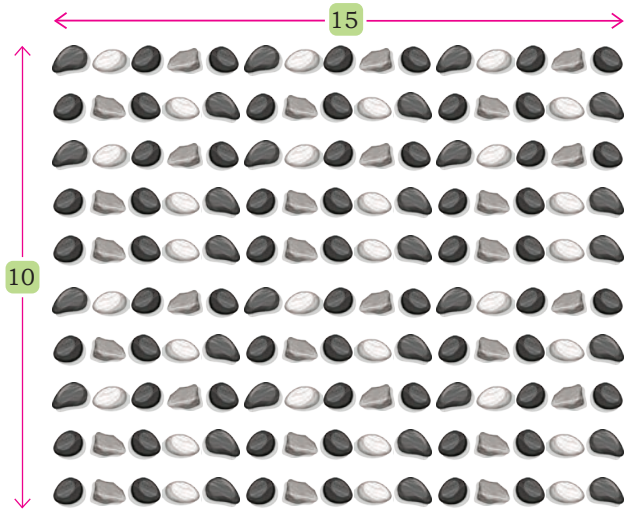
This is a 5 × 15 arrangement. There is an easy way to find this product by splitting the arrangement.

5 × 15 = 5 × 10 and 5 × 5

= _____ + _____ = _____

Recall the times-tables that we created in Grade 3. Now construct a times-15 table. You may use the arrangement given below and split the columns into 10 and 5 for ease of counting, as shown on the previous page.

How can we find 1 ×15, 2 ×15, ... with this?



1 × 15 = ___	6 × 15 = ___
2 × 15 = ___	7 × 15 = ___
3 × 15 = ___	8 × 15 = ___
4 × 15 = ___	9 × 15 = ___
5 × 15 = ___	10 × 15 = ___

1. What patterns do you see in this table?
2. Compare the times-15 table with the times-5 table. What similarities and differences do you notice?

What times-table is this? ____ How did we get this?

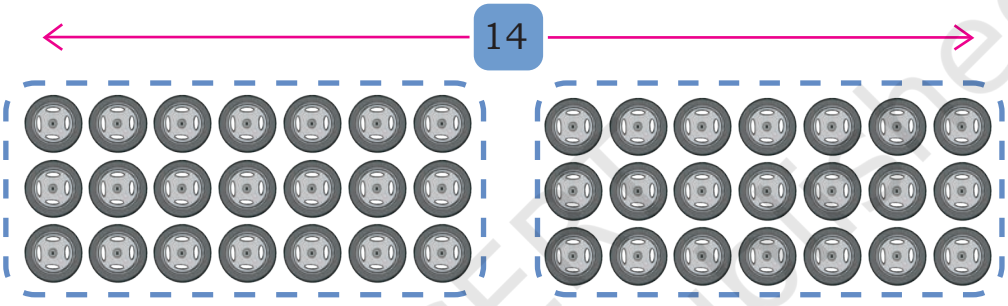
Times - 5	Times - 15
1 × 5 = 5	1 × 15 = 15
2 × 5 = 10	2 × 15 = 30
3 × 5 = 15	3 × 15 = 45
4 × 5 = ___	4 × 15 = ___
5 × 5 = ___	5 × 15 = ___
6 × 5 = ___	6 × 15 = ___
7 × 5 = ___	7 × 15 = ___
8 × 5 = ___	8 × 15 = ___
9 × 5 = ___	9 × 15 = ___
10 × 5 = ___	10 × 15 = ___

15 – 5 = 10
30 – 10 = 20
45 – 15 = 30

3. Construct other times-tables for numbers from 11 to 20, as you did for 15.
4. As you compared the times-5 table with the times-15 table, compare the times-1 table with the times-11 table, the times-2 table with the times-12 table, and so on. Share your observations.

Making tables by splitting into equal groups

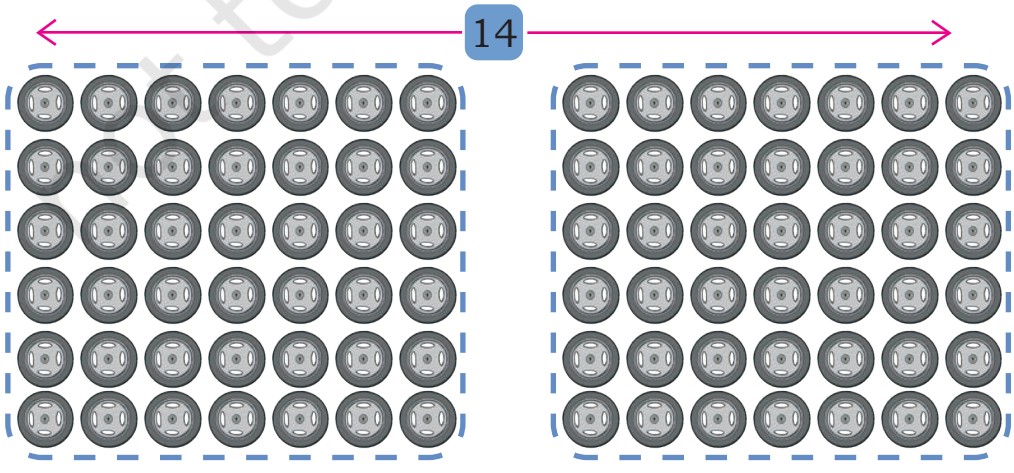
Here is an arrangement of wheels. To count the total number of wheels, Tara splits them into two equal groups.



$3 \times 14 = 3 \times 7$ and 3×7
$= 21 + 21$ = double of 21
$= 42$

Similarly, 6×14 can be obtained by splitting the arrangement into two equal groups.

6 × 14 = Double of 6 × 7
Why?

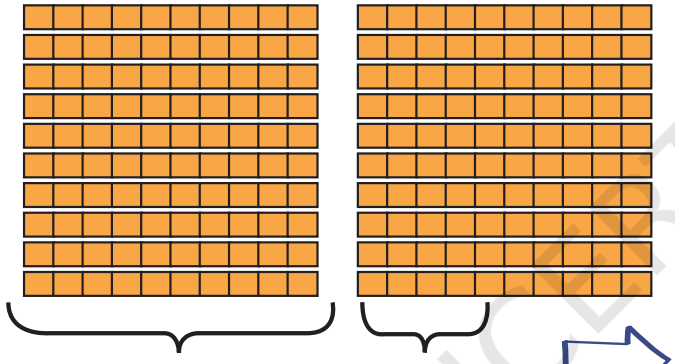


$6 \times 14 = 6 \times 7$ and 6×7
$= 42 + 42$ = double of 42
= 84

We have seen how to calculate 3×14 and 6×14 by splitting and doubling. Can we construct the times-14 table by splitting and doubling? Try!

What other times-tables can be constructed by splitting into equal groups and doubling? Give examples.

Multiples of 10



10 Tens 4 Tens

14×10 = 14 Tens
= 10 Tens + 4 Tens
= 100 + 40
= 140

Find the answers to the following:

a) 15×10 = _____ Tens = _____

b) 16×10 = _____ Tens = _____

c) 19×10 = _____ Tens = _____

d) 20×10 = _____ Tens = _____

10×10 = ____
2 times (i.e., double of) 10×10 = ____

Discuss in grade what happens when we take several groups of 10.

Note for Teachers: Support the learners in understanding multiplication when group size is a multiple of 10. Language of 'tens' is a useful way to think about this.

For example: 16×10 = 16 Tens is 160

16×20 = 16×2 Tens = 32 Tens = 320

Now think and answer the following problems.

30 × 10 = _____ 40 × 10 = _____ 70 × 10 = _____

50 × 10 = _____ 60 × 10 = _____ 80 × 10 = _____

Let us find the number of people who can travel in 26 tempo travellers.
26 × 10 = _____ travellers.

26 × 10 = 26 Tens = 20 Tens + 6 Tens = 200 + 60 = 260

Answer the following questions. Share your thoughts.

a) 21 × 10 = _____

b) 42 × 10 = _____

c) 65 × 10 = _____

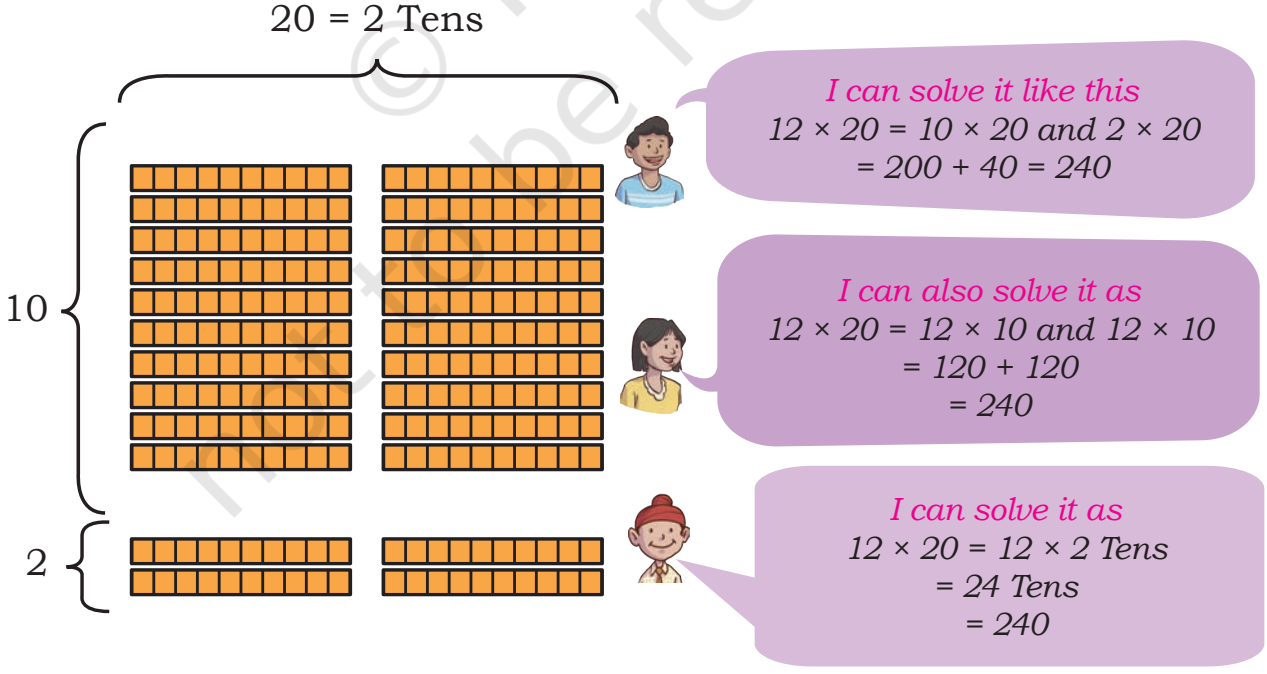
d) 38 × 10 = _____

e) 53 × 10 = _____

f) 87 × 10 = _____

A small bus can seat 20 people. How many people can be seated in 12 buses?

Now let us do 12 × 20.



Solve the following problems. Share your thoughts.

24 × 40 = _____

50 × 60 = _____

13 × 30 = _____

43 × 60 = _____

70 × 80 = _____

A Day at the Transport Museum

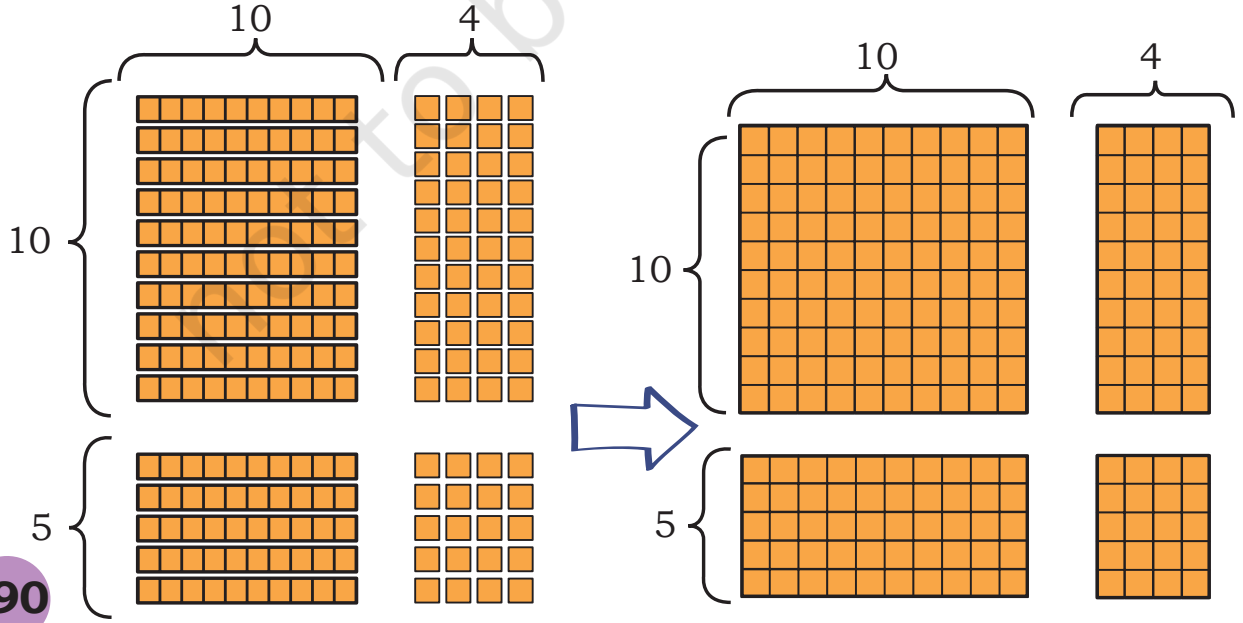
Amala, Raahi and Farzan are visiting the "Transport Museum".

This museum has a collection of different modes of transport used by people in India. It includes several vehicles from the olden days.

Raahi spots a toy train. She figures out that each coach can seat 14 children. The toy train has 15 coaches.

How many children can be seated in the toy train?

We have to find 15 × 14.



×	10	4
10	10 × 10 = 100	10 × 4 = 40
5	5 × 10 = 50	5 × 4 = 20
	150	60
		210

15 × 14 = 100 + 40 + 50 + 20
= 210
In 15 coaches, 210 children can be seated.

She wonders how many coaches will be needed for the 324 children from her school. Remember, each coach can seat only 14 children.

We have to find 324 ÷ 14

No. of children	No. of coaches needed	No. of children remaining
		324
140	10	324 – 140 = 184
140	10	184 – 140 = 44
14	1	44 – 14 = 30
28	2	2

14) 324 (10+10+1+2
−140
184
−140
44
−14
30
−28
2

Total no. of coaches = _____

What do we do with the remaining 2 children? Discuss in grade.

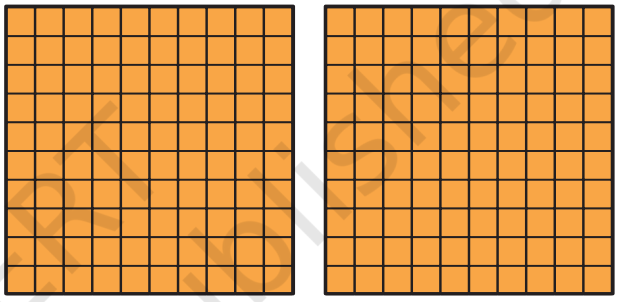
Such remaining number in a division problem is called 'remainder'.

Let Us Solve

Also, identify remainder (if any) in the division problems.

a) 25 × 34
b) 16 × 43
c) 68 × 12
d) 39 × 13
e) 125 ÷ 15
f) 94 ÷ 11
g) 440 ÷ 22
h) 508 ÷ 18

Multiples of 100



2 × 100 = 2 Hundreds = 200

3 × 100 = _____ Hundreds = _____

5 × 100 = _____ = _____

8 × 100 = _____ = _____

10 × 100 = 10 Hundreds = 1000

What happens when we put 10 Hundreds together?

11 × 100 = 11 Hundreds

= 10 Hundreds + 1 Hundred

= 1000+ 100 = 1100

12 × 100 = _____

15 × 100 = _____

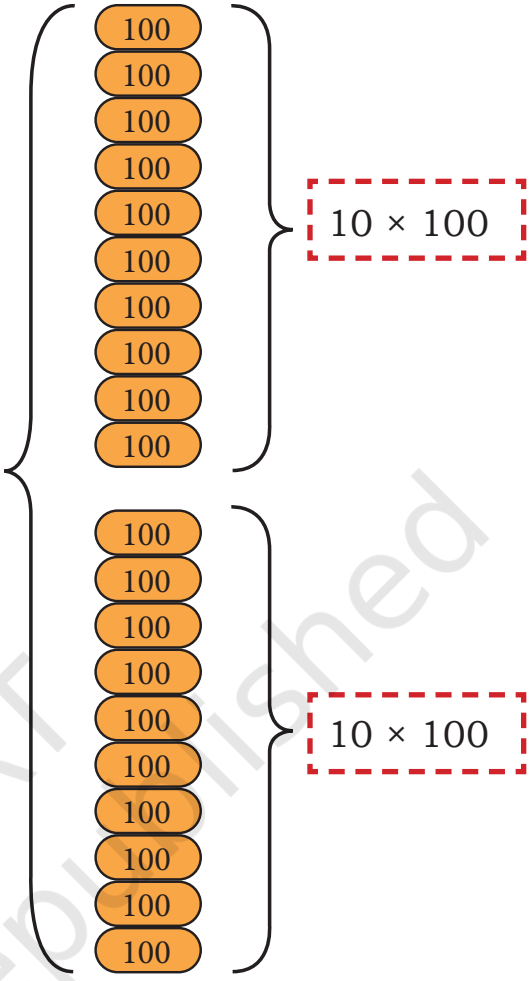
20 × 100 = 20 Hundreds = 2000

27 × 100 = _____

70 × 100 = _____

20 × 100 is
10 × 100 and 10 × 100

10 × 100 is 1000.
So, 20 × 100 is
2 × 1000 = 2000



Now answer the following questions. Share your thoughts.

30 × 100 = _____ 40 × 100 = _____

50 × 100 = _____ 24 × 100 = _____

53 × 100 = _____ 19 × 100 = _____

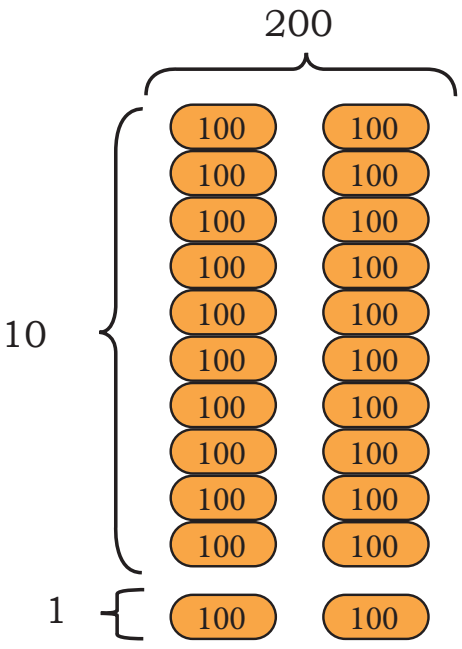
We Know

80 × 100 = 8000

Find

80 × 50 = _____ 40 × 50 = _____

Let us find **11 × 200**



11 × 200 = 10 × 200 and 1 × 200
= 2000 + 200 = 2200

11 × 200 = 11 × 100 and 11 × 100
= 1100 + 1100
= 2200

11 × 200 = 11 × 2 Hundreds
= 22 Hundreds
= 2200

Share what you notice about the answers to these problems.

What do you notice about any number times-100s

11 × 100 = _____ 22 × 100 = _____

11 × 200 = _____ 22 × 200 = _____

Answer the following questions. Share your thoughts.

18 × 100 = _____ 5 × 500 = _____

15 × 200 = _____ 14 × 300 = _____

23 × 200 = _____ 7 × 800 = _____

Note for Teachers: Encourage students to understand the multiplication of a number times-100 by splitting the number of groups in suitable ways. For example, 18 × 100 = 18 Hundreds = 10 Hundreds and 8 Hundreds, that is, 1800. Also, children should be encouraged to see relationships in the answers to two different multiplication problems like the ones above, for example, changing the group size from 100 to 200 or changing the number of groups from 11 to 22.

Find the answers in Set A. Examine the relationships between the problems and the answers in Set A carefully. Then use this understanding to find the answers in Set B.

A

14 × 100 = _____	14 × 10 = _____	14 × 1 = _____
14 × 500 = _____	14 × 50 = _____	14 × 5 = _____
7 × 500 = _____	7 × 50 = _____	7 × 5 = _____
7 × 250 = _____	7 × 25 = _____	7 × 10 = _____

B

30 × 100 = _____	30 × 10 = _____	30 × 1 = _____
30 × 200 = _____	30 × 20 = _____	30 × 2 = _____
15 × 100 = _____	15 × 10 = _____	15 × 1 = _____
15 × 200 = _____	15 × 20 = _____	15 × 2 = _____

C

Answer the following questions

1) 44 × 10 = _____

22 × 20 = _____

2) 16 × 100 = _____

4 × 400 = _____

Amala is fascinated to read this information in the aeroplane section of the transport museum.

"During the COVID-19 pandemic, the Indian Government undertook a massive evacuation of Indians living outside the country, under a mission called Vande Bharat. In the first week, 64 flights carried 152 people each."

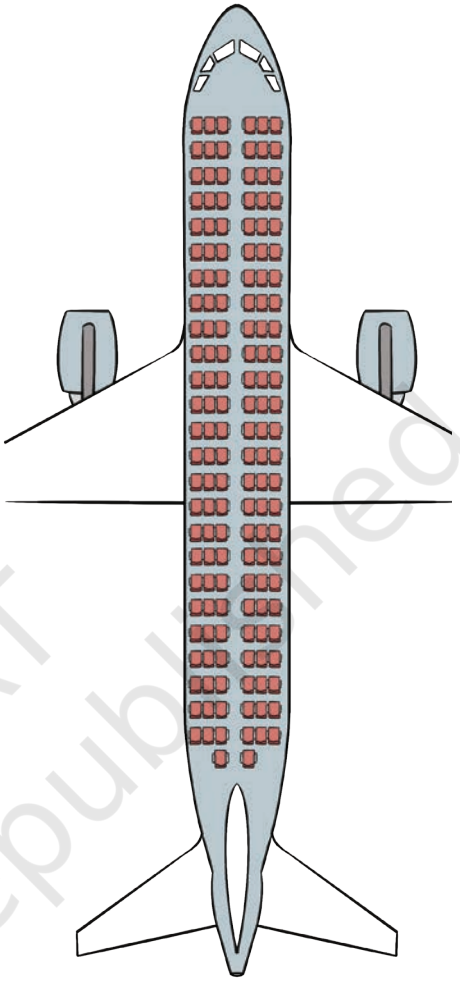
Note for Teachers: Encourage students to understand the patterns in the above problems. Relationships between doubles and halves and multiplication by 10s and 100s should be pointed out.

Amala wonders how many people travelled the first week of this 'Vande Bharat Mission'.

Help her find the answer.

64 × 152

	100	50	2
60	60 × 100 = 6000	60 × 50 = 3000	60 × 2 =120
4	4 × 100 = 400	4 × 50 = 200	4 × 2 = 8



×	100	50	2
60	6000	3000	120
4	400	200	8
	6400	3200	128
			9728

Farzan notices the famous snake boat from Kerela.

The technique for making these boats is 800 years old. Vallam kali (the snake-boat race) is held during the monsoon season between July and September and concludes with Onam, the harvest festival. These boats are 30 to 35 metres long and can be peddled by 64–128 people.

In a particular race, 960 participants volunteered. Each boat is pedalled by 64 people. How many boats will be needed?

We have to find **960 ÷ 64**

No. of boats	No. of participants	No. of people remaining
		960
10	640	320
5	320	0

64) 960 (10 + 5
−640
320
−320
0

Total no. of boats: 15

Let Us Solve

Also, identify remainder (if any) in the division problems.

a) 237 × 28

b) 140 × 16

c) 389 × 57

d) 807 ÷ 24

e) 692 ÷ 33

f) 996 ÷ 45

Dividing by 10 and 100

A farmer packs his rice in sacks of 10 kg each.

a) If he has 60 kg of rice, how many sacks does he need?

b) If he has 600 kg of rice, how many sacks does he need?

If a sack of rice weighs 100 kg then how many sacks does he need for 600 kg of rice?_____

60 ÷ 10 = _____

600 ÷ 10 = _____

600 ÷ 100 = _____

Find the answers to the following questions. Share your thoughts in grade.

40 ÷ 10 = ____	4 ÷ 2 = ____	400 ÷ 2 = ____
400 ÷ 10 = ____	40 ÷ 20 = ____	400 ÷ 20 = ____
400 ÷ 100 = ____	400 ÷ 200 = ____	400 ÷ 200 = ____

Think and answer. Write the division statement in each case.

1. Manku the monkey sees 870 bananas in the market. Each bunch has 10 bananas. How many bunches are there in the market? _____

2. Rukhma Bi wants to distribute ₹1000/- equally among her 10 grandchildren on the occasion of Eid.
   How much money will each of them get? _____

Let Us Solve

1. The oldest long-distance train of the Indian Railways is the Punjab Mail which ran between Mumbai and Peshawar. Its first journey was on 12 October 1912. Do you know how many coaches it had on its first journey? It had 6 coaches: 3 carrying 96 passengers and 3 for goods.

   a) How many people travelled in each coach on the first journey?

   b) This train has been running for 106 years now. It runs between Mumbai, Maharashtra and Ferozepur, Punjab. It has 24 coaches. Each coach can carry 72 passengers. How many people can travel on this train?

2. Amala and her 35 classmates, along with 6 teachers, are going on a school trip to Goa. They are using the double-decker "hop on hop off" sightseeing bus to explore the city.

   a) 2 people can sit on every seat of the bus. There are 15 seats in the lower deck and 10 in the upper deck. How many seats will they need to occupy? Are there enough seats for everyone?

   b) Find the total cost of the tickets for all children.

   c) What is the cost of the tickets for all teachers?

Ticket price

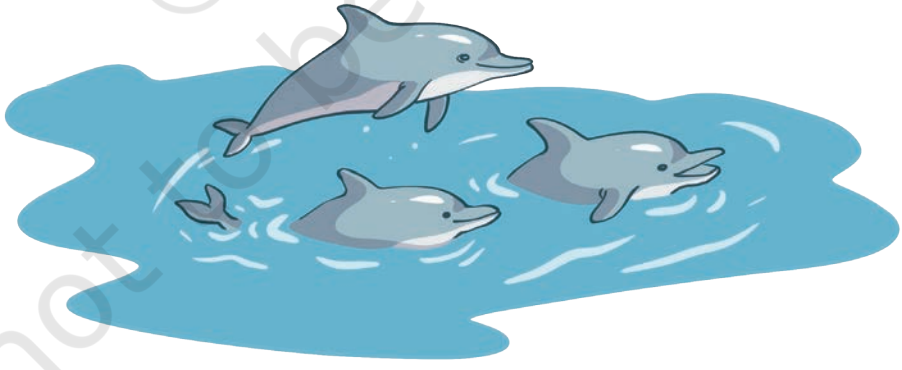
Adult	- ₹899/-
Children	- ₹359/-

3. Kedar works in a brick kiln.

   a) The kiln makes 125 bricks in a day. How many bricks can be made in a month?

   b) Each brick is sold in the market for ₹ 9. How much money can they earn in a month?

4. Chilika lake in Odisha is the largest saltwater lake in India. It is famous for the Irrawaddy dolphins. Boats can be hired to go see the dolphins. The trip from Puri includes a bus ride followed by a boat ride. Eight people will be going on the trip.



- A bus ticket from Puri to Satapada costs ₹ 60.
- A two-hour boat ride for 8 people costs ₹ 1200.
- How much money do we need to spend on each person?

5. Find the multiplication and division sentences below. Shade the sentences. How many can you find? Some are done for you.

134	52	30	31	931	10	93	55
5	20	15	15	250	3	33	101
22	1040	450	0	4	26	104	5555
110	100	50	20	1000	60	16	99
44	104	19	3	6	22	132	7
20	6	950	6	6000	30	200	693
808	624	31	14	1200	8	16	24
35	9	525	5	105	62	3200	78

250 × 4 = 1000

50 × 20 = 1000

525 ÷ 5 = 105

_____

_____

_____

_____

_____

_____

6. Solve

a) 35 × 76

b) 267 × 38

c) 498 × 9

d) 89 × 42

e) 55 × 23

f) 345 × 17

g) 66 × 22

h) 704 × 11

i) 319 × 26

j) 459 ÷ 3

k) 774 ÷ 18

l) 864 ÷ 26

m) 304 ÷ 12

n) 670 ÷ 9

o) 584 ÷ 25

p) 900 ÷ 15

q) 658 ÷ 32

r) 974 ÷ 9

Chinnu's Coins

1. Five friends plan to visit an amusement park nearby. Each of them uses different notes and coins to buy the ticket. The cost of the ticket is ₹ 750.

- Bujji has brought all notes of ₹ 200.
- And Munna has brought all notes of ₹ 50.
- Whereas Balu has brought all notes of ₹ 20.
- And guess what, Chinnu has all coins of ₹ 5.
- And Sansu has all coins of ₹ 2.

a) Find out how many notes/coins each child has to bring to buy the ticket.

b) Which of these children will not receive any change from the cashier?

c) How long would the cashier take to count Chinnu's coins?

2. Observe the following multiplications. The answers have been provided.

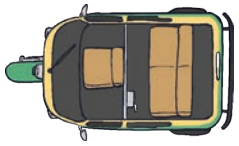
12	11	13	11
× 13	× 14	× 13	× 12
156	154	169	132

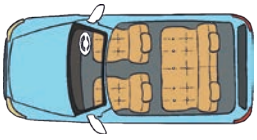
In each case, do you see any pattern in the two numbers and their product? (Hint: Look at the coloured digits!)

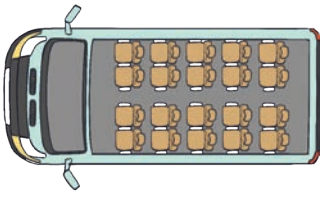
For what other multiplication problems will this pattern hold?

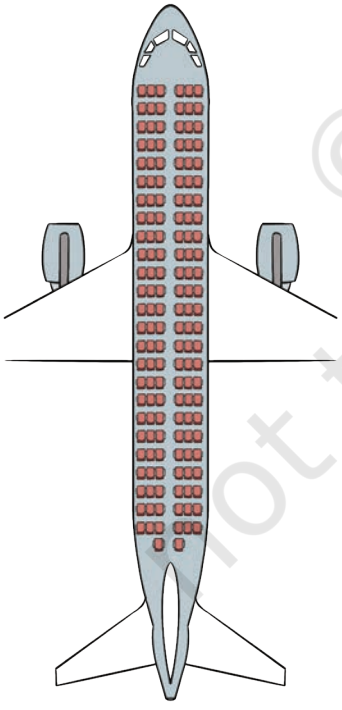
Find 5 such examples.

3. Assume each vehicle is travelling with full capacity. How many people can travel in each of these vehicles? Match them up.









75 Cycles	400
52 Autos	75
103 Cars	4560
20 Minibus	156
30 Aeroplanes	864
15 Train sleeper coaches	412