

Chapter
13

The Transport Museum



Mystery Matrix

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

×				
	32			
			42	
		45		
			21	

Fill the remaining white boxes with appropriate products.

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						42
		54						50
63	48				60	35		

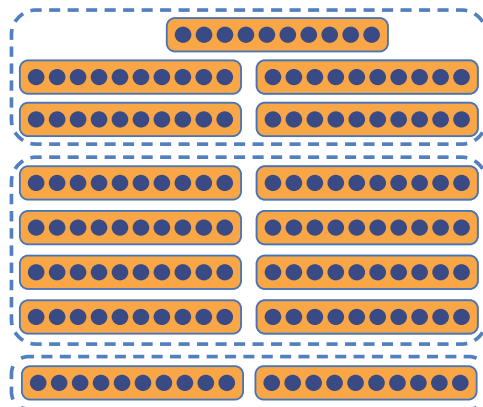
Times-10

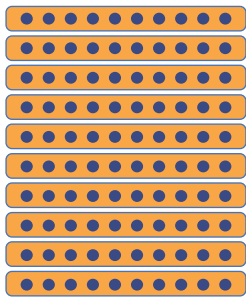
Match each problem with the appropriate pictorial representation and write the answer.

$2 \times 10 = 2 \text{ Tens} = \underline{\hspace{2cm}}$

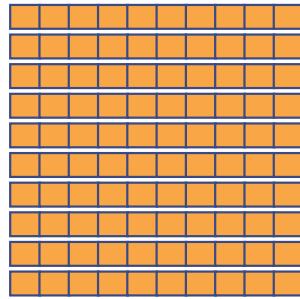
$5 \times 10 = \underline{\hspace{2cm}} \text{ Tens} = \underline{\hspace{2cm}}$

$8 \times 10 = \underline{\hspace{2cm}} \text{ Tens} = \underline{\hspace{2cm}}$

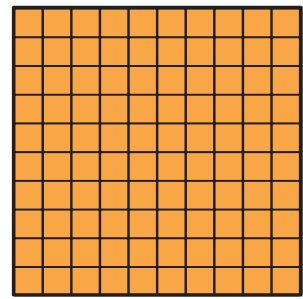




10 Tens



10 Tens

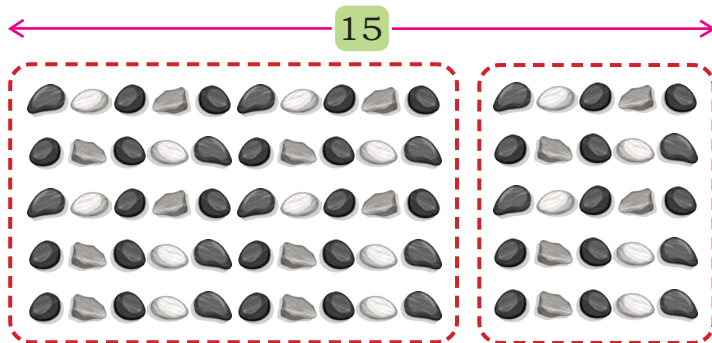
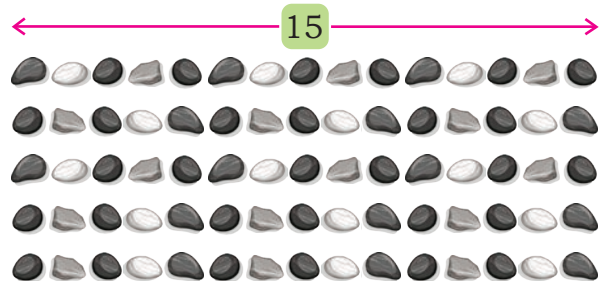


1 Hundred = 100

What is $10 \times 10 =$ ____ Tens = _____

Constructing Tables

How many pebbles are there in this arrangement? _____

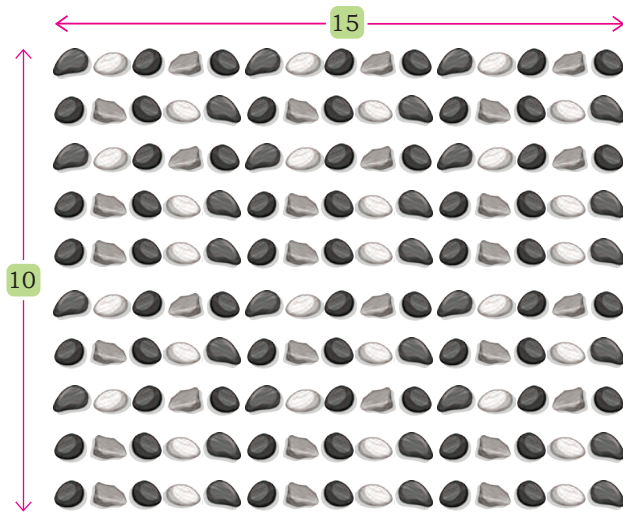


This is a 5×15 arrangement. There is an easy way to find this product by splitting the arrangement.

$$5 \times 15 = 5 \times 10 \text{ and } 5 \times 5 \\ = \text{_____} + \text{_____} = \text{_____}$$

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?



$1 \times 15 = \underline{\quad}$	$6 \times 15 = \underline{\quad}$
$2 \times 15 = \underline{\quad}$	$7 \times 15 = \underline{\quad}$
$3 \times 15 = \underline{\quad}$	$8 \times 15 = \underline{\quad}$
$4 \times 15 = \underline{\quad}$	$9 \times 15 = \underline{\quad}$
$5 \times 15 = \underline{\quad}$	$10 \times 15 = \underline{\quad}$

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?

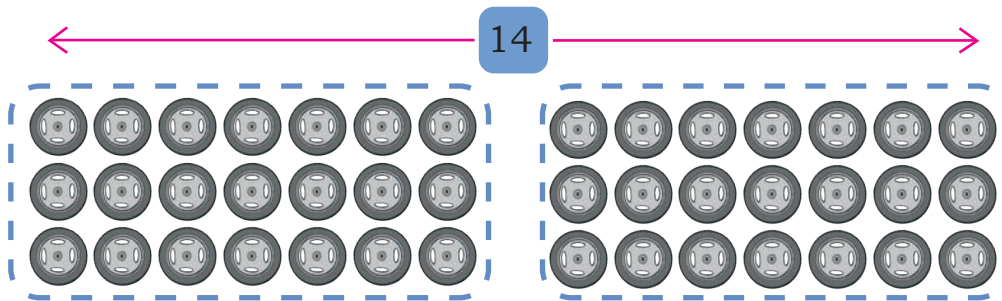
Times - 5	Times - 15
$1 \times 5 = 5$	$1 \times 15 = 15$
$2 \times 5 = 10$	$2 \times 15 = 30$
$3 \times 5 = 15$	$3 \times 15 = 45$
$4 \times 5 = \underline{\quad}$	$4 \times 15 = \underline{\quad}$
$5 \times 5 = \underline{\quad}$	$5 \times 15 = \underline{\quad}$
$6 \times 5 = \underline{\quad}$	$6 \times 15 = \underline{\quad}$
$7 \times 5 = \underline{\quad}$	$7 \times 15 = \underline{\quad}$
$8 \times 5 = \underline{\quad}$	$8 \times 15 = \underline{\quad}$
$9 \times 5 = \underline{\quad}$	$9 \times 15 = \underline{\quad}$
$10 \times 5 = \underline{\quad}$	$10 \times 15 = \underline{\quad}$

$15 - 5 = 10$
$30 - 10 = 20$
$45 - 15 = 30$

- Construct other times-tables for numbers from 11 to 20, as you did for 15.
- 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

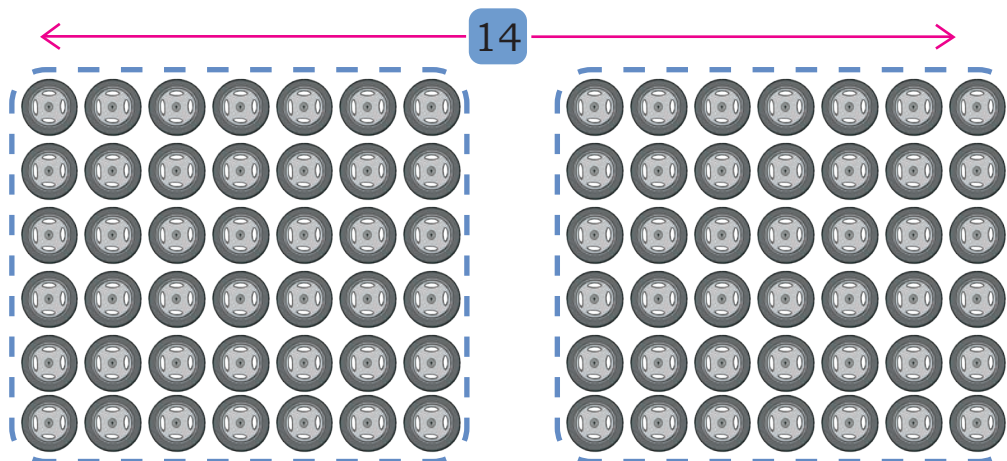
Here is an arrangement of wheels. To count the total number of wheels, Tara splits them into two equal groups.



$$\begin{aligned}
 3 \times 14 &= 3 \times 7 \text{ and } 3 \times 7 \\
 &= 21 + 21 = \text{double of } 21 \\
 &= 42
 \end{aligned}$$

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

$6 \times 14 = \text{Double of } 6 \times 7$
Why?

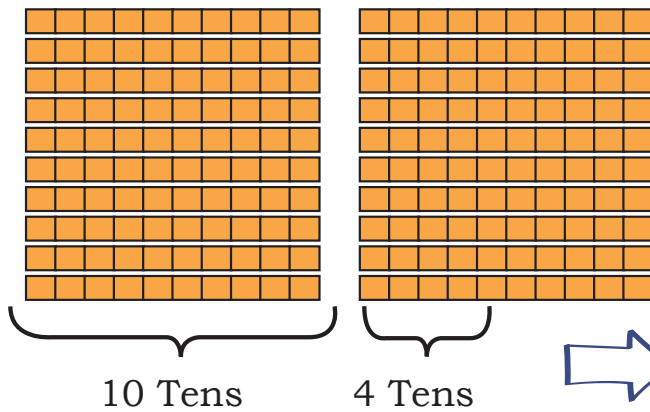


$$\begin{aligned}
 6 \times 14 &= 6 \times 7 \text{ and } 6 \times 7 \\
 &= 42 + 42 = \text{double of } 42 \\
 &= 84
 \end{aligned}$$

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



$$\begin{aligned}
 14 \times 10 &= 14 \text{ Tens} \\
 &= 10 \text{ Tens} + 4 \text{ Tens} \\
 &= 100 + 40 \\
 &= 140
 \end{aligned}$$

Find the answers to the following:

- a) $15 \times 10 =$ ____ Tens = ____ c) $19 \times 10 =$ ____ Tens = ____
 b) $16 \times 10 =$ ____ Tens = ____ d) $20 \times 10 =$ ____ Tens = ____

$$\begin{aligned}
 10 \times 10 &= \text{____} \\
 2 \text{ times (i.e., double of) } 10 \times 10 &= \text{____}
 \end{aligned}$$

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: $16 \times 10 = 16 \text{ Tens}$ is 160

$$16 \times 20 = 16 \times 2 \text{ Tens} = 32 \text{ Tens} = 320$$



Now think and answer the following problems.

$30 \times 10 = \underline{\quad}$

$40 \times 10 = \underline{\quad}$

$70 \times 10 = \underline{\quad}$

$50 \times 10 = \underline{\quad}$

$60 \times 10 = \underline{\quad}$

$80 \times 10 = \underline{\quad}$

Let us find the number of people who can travel in 26 tempo travellers.
 $26 \times 10 = \underline{\quad}$ travellers.

$$26 \times 10 = 26 \text{ Tens} = 20 \text{ Tens} + 6 \text{ Tens} = 200 + 60 = 260$$

Answer the following questions. Share your thoughts.

a) $21 \times 10 = \underline{\quad}$

d) $38 \times 10 = \underline{\quad}$

b) $42 \times 10 = \underline{\quad}$

e) $53 \times 10 = \underline{\quad}$

c) $65 \times 10 = \underline{\quad}$

f) $87 \times 10 = \underline{\quad}$

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

Now let us do 12×20 .

$20 = 2 \text{ Tens}$

I can solve it like this
 $12 \times 20 = 10 \times 20 \text{ and } 2 \times 20$
 $= 200 + 40 = 240$

I can also solve it as
 $12 \times 20 = 12 \times 10 \text{ and } 12 \times 10$
 $= 120 + 120$
 $= 240$

I can solve it as
 $12 \times 20 = 12 \times 2 \text{ Tens}$
 $= 24 \text{ Tens}$
 $= 240$

Solve the following problems. Share your thoughts.

$24 \times 40 = \underline{\hspace{2cm}}$

$50 \times 60 = \underline{\hspace{2cm}}$

$13 \times 30 = \underline{\hspace{2cm}}$

$43 \times 60 = \underline{\hspace{2cm}}$

$70 \times 80 = \underline{\hspace{2cm}}$

A Day at the Transport Museum

Amala, Raahi and Farzan are visiting the “Transport Museum”.

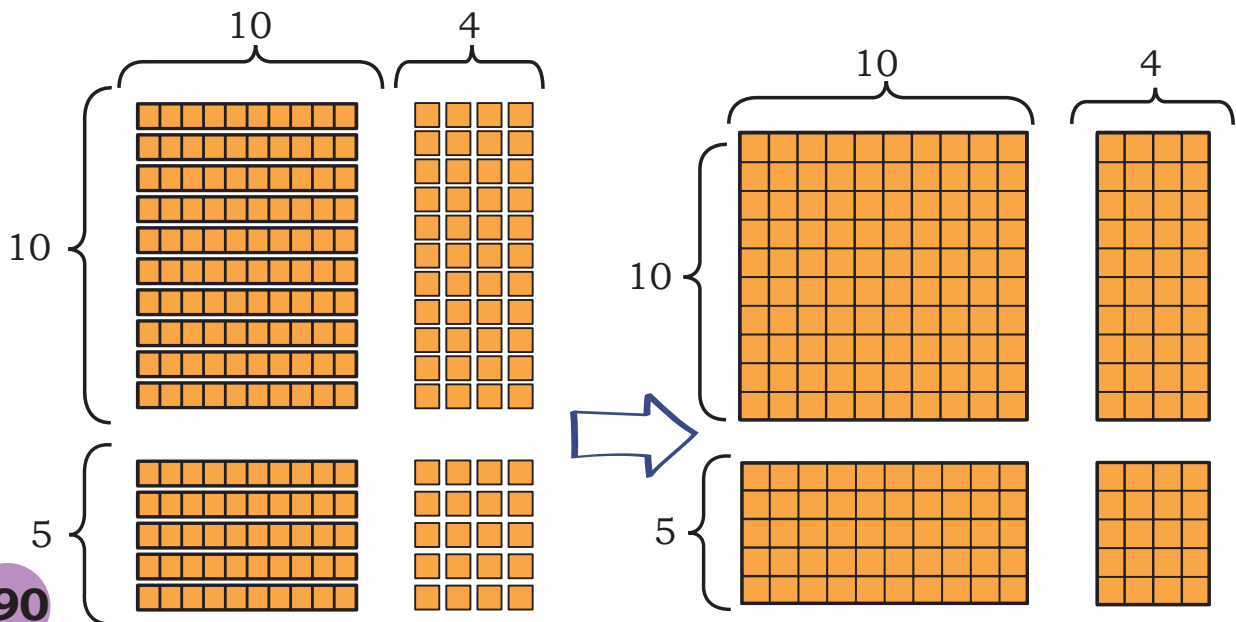
This museum has a collection of different modes of transport used by people in India. It includes several vehicles from the olden days.

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	$10 \times 10 = 100$	$10 \times 4 = 40$
5	$5 \times 10 = 50$	$5 \times 4 = 20$
	150	60
		210

$$15 \times 14 = 100 + 40 + 50 + 20 = 210$$

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 $324 \div 14$

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

$$\begin{array}{r}
 14) 324 \quad (10+10+1+2) \\
 \underline{-140} \\
 184 \\
 \underline{-140} \\
 44 \\
 \underline{-14} \\
 30 \\
 \underline{-28} \\
 2
 \end{array}$$

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

e) $125 \div 15$

b) 16×43

f) $94 \div 11$

c) 68×12

g) $440 \div 22$

d) 39×13

h) $508 \div 18$

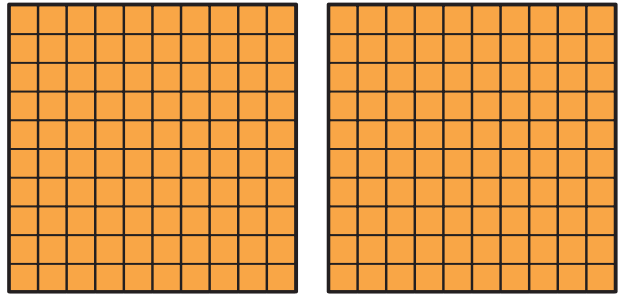
Multiples of 100

$2 \times 100 = 2 \text{ Hundreds} = 200$

$3 \times 100 = \underline{\hspace{2cm}} \text{ Hundreds} = \underline{\hspace{2cm}}$

$5 \times 100 = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

$8 \times 100 = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$



$10 \times 100 = 10 \text{ Hundreds} = 1000$

What happens when we put 10 Hundreds together?



$11 \times 100 = 11 \text{ Hundreds}$

$= 10 \text{ Hundreds} + 1 \text{ Hundred}$

$= 1000 + 100 = 1100$

$12 \times 100 = \underline{\hspace{2cm}}$

$15 \times 100 = \underline{\hspace{2cm}}$

$20 \times 100 = 20 \text{ Hundreds} = 2000$

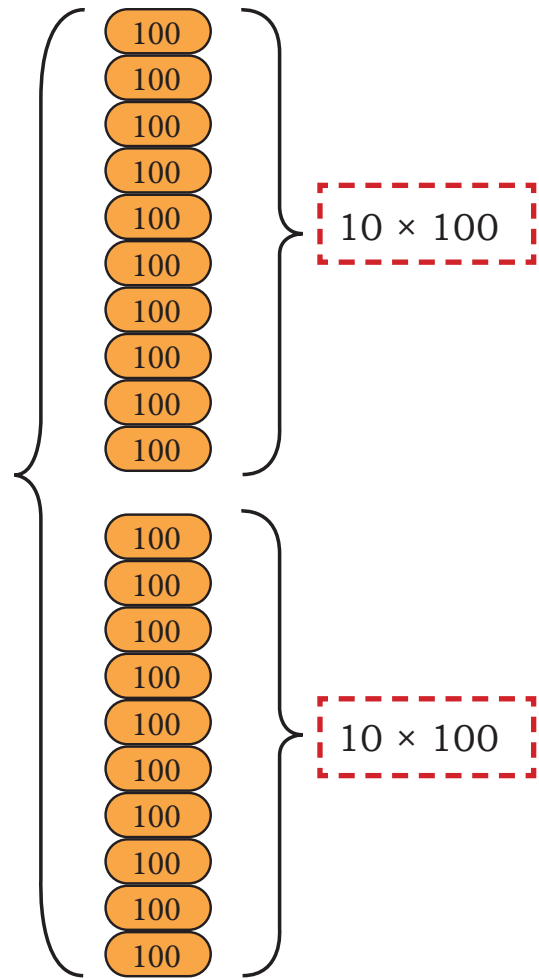
$27 \times 100 = \underline{\hspace{2cm}}$

$70 \times 100 = \underline{\hspace{2cm}}$

20×100 is
 10×100 and 10×100



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



Now answer the following questions. Share your thoughts.

$30 \times 100 = \underline{\hspace{2cm}}$

$40 \times 100 = \underline{\hspace{2cm}}$

$50 \times 100 = \underline{\hspace{2cm}}$

$24 \times 100 = \underline{\hspace{2cm}}$

$53 \times 100 = \underline{\hspace{2cm}}$

$19 \times 100 = \underline{\hspace{2cm}}$

We Know

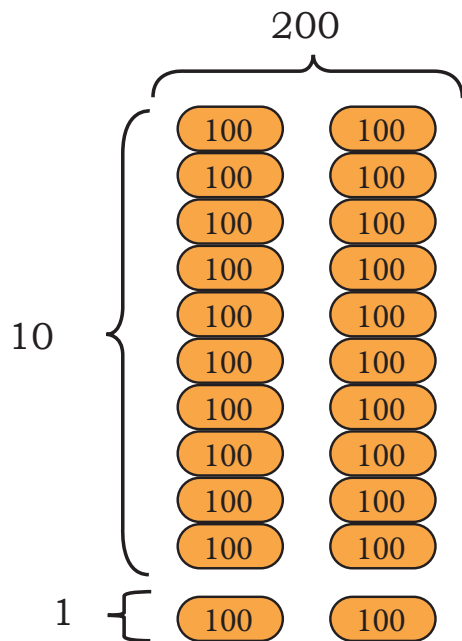
$80 \times 100 = 8000$

Find

$80 \times 50 = \underline{\hspace{2cm}}$

$40 \times 50 = \underline{\hspace{2cm}}$

Let us find 11×200



$$11 \times 200 = 10 \times 200 \text{ and } 1 \times 200 \\ = 2000 + 200 = 2200$$



$$11 \times 200 = 11 \times 100 \text{ and } 11 \times 100 \\ = 1100 + 1100 \\ = 2200$$



$$11 \times 200 = 11 \times 2 \text{ Hundreds} \\ = 22 \text{ Hundreds} \\ = 2200$$

Share what you notice about the answers to these problems.

$11 \times 100 = \underline{\hspace{2cm}} \quad 22 \times 100 = \underline{\hspace{2cm}}$

$11 \times 200 = \underline{\hspace{2cm}} \quad 22 \times 200 = \underline{\hspace{2cm}}$

What do you notice about any number times-100s

Answer the following questions. Share your thoughts.

$18 \times 100 = \underline{\hspace{2cm}}$

$5 \times 500 = \underline{\hspace{2cm}}$

$15 \times 200 = \underline{\hspace{2cm}}$

$14 \times 300 = \underline{\hspace{2cm}}$

$23 \times 200 = \underline{\hspace{2cm}}$

$7 \times 800 = \underline{\hspace{2cm}}$

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, $18 \times 100 = 18 \text{ Hundreds} = 10 \text{ Hundreds and } 8 \text{ Hundreds}$, 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 $14 \times 100 = \underline{\hspace{2cm}}$

$14 \times 500 = \underline{\hspace{2cm}}$

$7 \times 500 = \underline{\hspace{2cm}}$

$7 \times 250 = \underline{\hspace{2cm}}$

$14 \times 10 = \underline{\hspace{2cm}}$

$14 \times 50 = \underline{\hspace{2cm}}$

$7 \times 50 = \underline{\hspace{2cm}}$

$7 \times 25 = \underline{\hspace{2cm}}$

$14 \times 1 = \underline{\hspace{2cm}}$

$14 \times 5 = \underline{\hspace{2cm}}$

$7 \times 5 = \underline{\hspace{2cm}}$

$7 \times 10 = \underline{\hspace{2cm}}$

B $30 \times 100 = \underline{\hspace{2cm}}$

$30 \times 200 = \underline{\hspace{2cm}}$

$15 \times 100 = \underline{\hspace{2cm}}$

$15 \times 200 = \underline{\hspace{2cm}}$

$30 \times 10 = \underline{\hspace{2cm}}$

$30 \times 20 = \underline{\hspace{2cm}}$

$15 \times 10 = \underline{\hspace{2cm}}$

$15 \times 20 = \underline{\hspace{2cm}}$

$30 \times 1 = \underline{\hspace{2cm}}$

$30 \times 2 = \underline{\hspace{2cm}}$

$15 \times 1 = \underline{\hspace{2cm}}$

$15 \times 2 = \underline{\hspace{2cm}}$

C Answer the following questions

1) $44 \times 10 = \underline{\hspace{2cm}}$

$22 \times 20 = \underline{\hspace{2cm}}$

2) $16 \times 100 = \underline{\hspace{2cm}}$

$4 \times 400 = \underline{\hspace{2cm}}$

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.



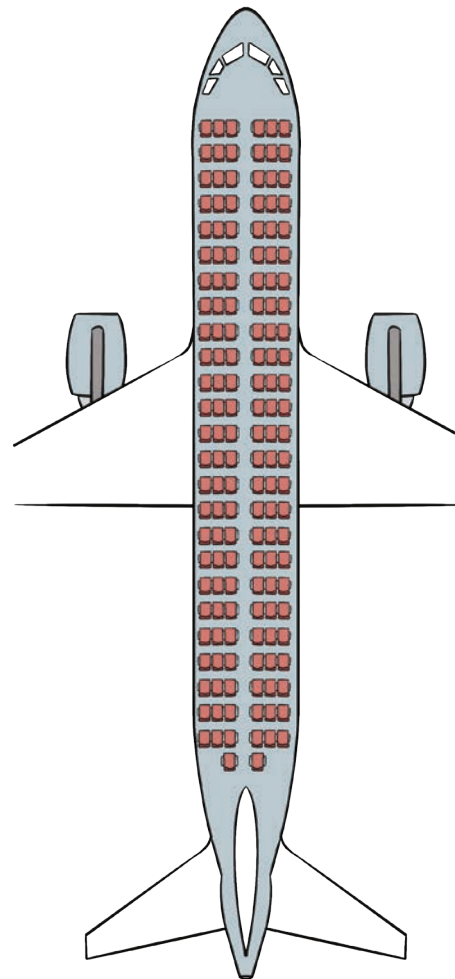
Amala wonders how many people travelled the first week of this 'Vande Bharat Mission'.

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 $960 \div 64$

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

$$\begin{array}{r}
 64 \overline{) 960} \quad (10 + 5) \\
 \underline{-640} \\
 320 \\
 \underline{-320} \\
 0
 \end{array}$$

Total no. of boats: 15



Let Us Solve

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

a) 237×28

d) $807 \div 24$

b) 140×16

e) $692 \div 33$

c) 389×57

f) $996 \div 45$

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? _____

$60 \div 10 = \underline{\hspace{2cm}}$

$600 \div 10 = \underline{\hspace{2cm}}$

$600 \div 100 = \underline{\hspace{2cm}}$

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

$40 \div 10 = \underline{\quad}$

$4 \div 2 = \underline{\quad}$

$400 \div 2 = \underline{\quad}$

$400 \div 10 = \underline{\quad}$

$40 \div 20 = \underline{\quad}$

$400 \div 20 = \underline{\quad}$

$400 \div 100 = \underline{\quad}$

$400 \div 200 = \underline{\quad}$

$400 \div 200 = \underline{\quad}$

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.



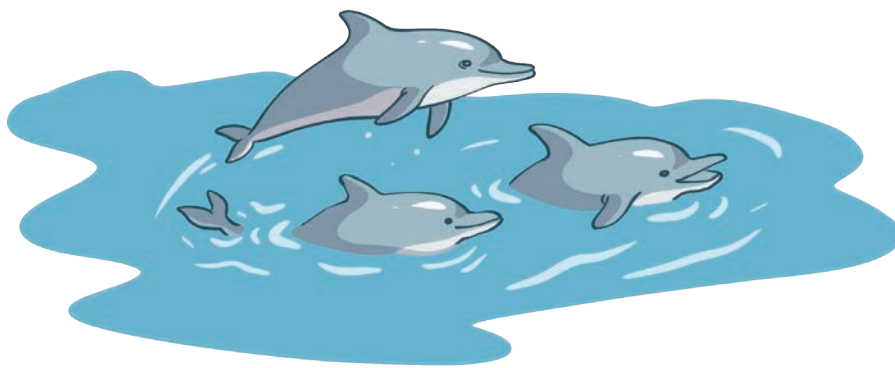
- a) 2 people can sit on every seat of the bus. There are 15 seats in the lower deck and 10 in the upper deck. How many seats will they need to occupy? Are there enough seats for everyone?
- b) Find the total cost of the tickets for all children.
- c) What is the cost of the tickets for all teachers?

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

$$250 \times 4 = 1000$$

$$50 \times 20 = 1000$$

$$525 \div 5 = 105$$

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) $459 \div 3$

k) $774 \div 18$

l) $864 \div 26$

m) $304 \div 12$

n) $670 \div 9$

o) $584 \div 25$

p) $900 \div 15$

q) $658 \div 32$

r) $974 \div 9$

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.

- Find out how many notes/coins each child has to bring to buy the ticket.
- Which of these children will not receive any change from the cashier?
- How long would the cashier take to count Chinnu's coins?

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

$$\begin{array}{r} 12 \\ \times 13 \\ \hline 156 \end{array}$$

$$\begin{array}{r} 11 \\ \times 14 \\ \hline 154 \end{array}$$

$$\begin{array}{r} 13 \\ \times 13 \\ \hline 169 \end{array}$$

$$\begin{array}{r} 11 \\ \times 12 \\ \hline 132 \end{array}$$

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.



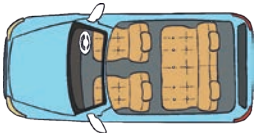
75 Cycles

400



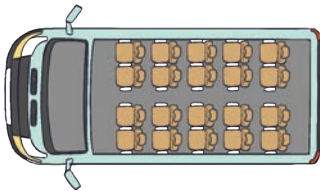
52 Autos

75



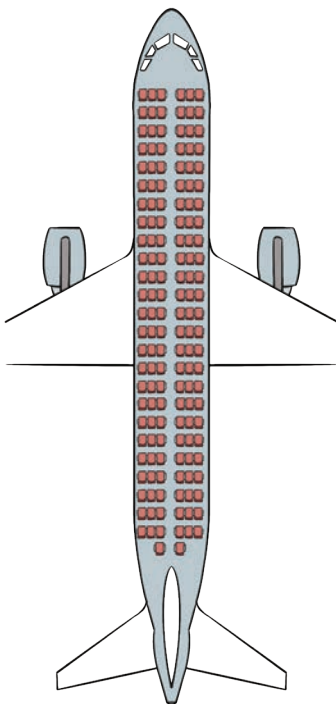
103 Cars

4560



20 Minibus

156



30 Aeroplanes

864

15 Train sleeper coaches

412

