Prepared by -Pranjali Patil   L-9 ratio ,proportion and percentage

Pre- activity-Solve let's begin in the textbook.

Let's Begin

Nancy and Jim are looking at the picture that they had clicked on their visit to the countryside.
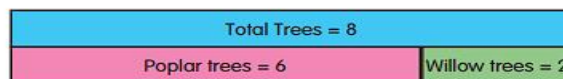
Jim, I can see there are 3 times as many poplar trees as willow trees.

Right, Nancy. After every three poplar trees is a willow tree.

Look at the picture, and answer the following questions.

a Draw a bar model to represent the number of trees you can see in the picture.

Total Trees = 8	
Poplar trees = 6	Willow trees = 2

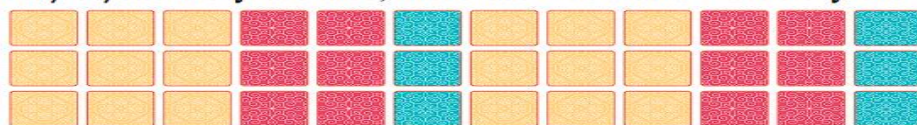**b** Represent poplar trees by P and willow trees by W using bar models. Represent the trees in the same sequence as you see them in the picture.

P	P	P	W	P	P	P	W

Concrete Stage

1 Make a bouquet with flowers. For every 4 yellow flowers, have 3 red and 2 blue flowers.

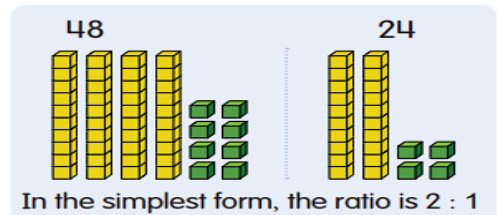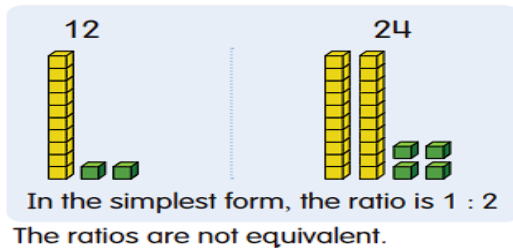2 For every 3 yellow square tiles, there are 2 red and 1 blue square tiles.

i.	How many tiles are there in total?	36
ii.	What is the ratio of yellow tiles to all tiles?	18:36
iii.	What is the ratio of red tiles to all tiles?	12:36
iv.	What is the ratio of blue tiles to all tiles?	6:36
v.	What is the ratio of yellow tiles to red tiles?	18:12
vi.	What is the ratio of red tiles to blue tiles?	12:6
vii.	What is the ratio of red tiles to yellow tiles?	12:18

3) For the plantation drive, one row would have a pot with sunflower plant and 4 pots with roses. Show equivalent ratios for 5 such rows.

Answer: Answer may vary.

4) Use 'Dienes Blocks' to check whether the following ratios are equivalent or not. One has been done for you.

a) 12:24 and 48:24

12	24

In the simplest form, the ratio is 1 : 2
The ratios are not equivalent.

48	24

In the simplest form, the ratio is 2 : 1

b) 9:6 and 27:18
Yes

c) 8:24 and 2:8
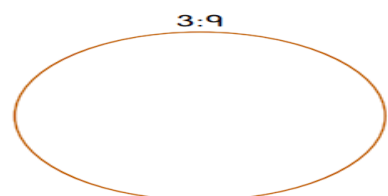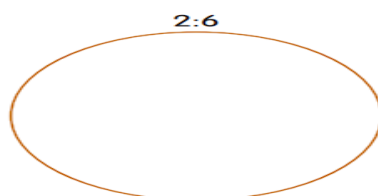No

d) 12:8 and 18:12
Yes

e) 5:7 and 35:49
Yes

f) 5:20 and 20:60
No

g) 24:12 and 48:36
No

Pictorial Stage

1) Draw 🍎 and 🥭 in the given ratio.

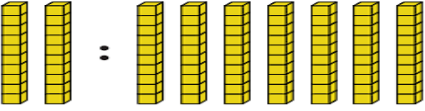| 1:3	2:6	3:9
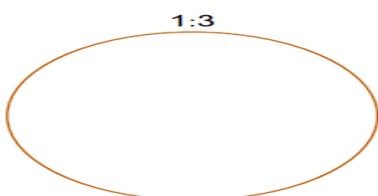
a) Are all the above ratios equivalent? — Yes

b) Which ratio is in the simplest form? — 1:3

c) Can we say 1:3 : : 3:9 ? — Yes

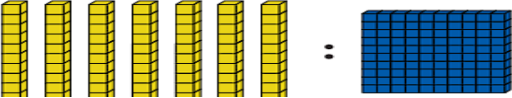**2** **Match the following pictures to the correct bar models showing their simplest forms.**

a

i.

b

ii.

c

iii.

d

iv.

Abstract Stage

Mihir has 7 pairs of jeans, 15 T-shirts, and 3 pairs of shoes. Work out the following questions.

a   Write the ratio of pairs of jeans to pairs of shoes.   7:3

b   Write the ratio of T-shirts to pairs of jeans.   15:7

c   Write the ratio of pairs of shoes to T-shirts.   3:15

d   Work out two equivalent ratios for pairs of jeans to T-shirts.   14:30, 21:45

e   Work out two equivalent ratios for pairs of jeans to total items.

26   56:200/70:250

Learning Ground

9.2 **Number Stories with Ratios**

On Wednesday, the flower show had 255 foreign tourists and a few Indian tourists. For every 3 Indians there were 5 foreign tourists. How many people visited the flower shows on Wednesday?

We can easily do it by representing ratios with bar models.

Step 1: First, draw the ratio.

Indians

Foreign Tourists

Step 2: Identify the value of 1 part.

Indians

Foreign Tourists

255

5 parts in the model have a value of 255.

$255 \div 5 = 51$

What if the foreign tourists were 555? Solve.

Step 1: First, draw the ratio.

Indians

Foreign Tourists
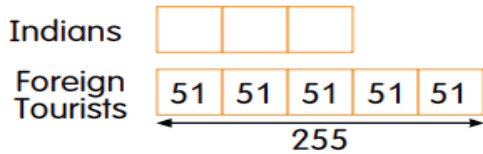
Step 2: Identify the value of 1 part.

Indians

Foreign

So, each part of the model has a value of 51.

Step 3: Work out the value of the intended part.

Indians | | |

Foreign Tourists | 51 | 51 | 51 | 51 | 51 |
255

The number of Indian tourists = 51 × 3

51 × 3 = 153

555

555 ÷ 5 = 111

Step 3: Work out the value of the intended part.

Indians | | |

Foreign Tourists | 111 | 111 | 111 | 111 | 111 |
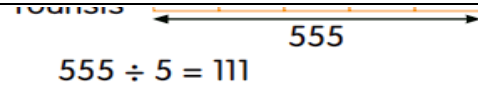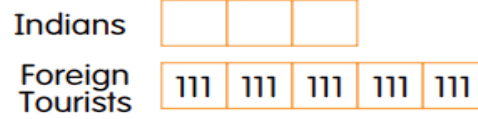
No. of Indian Tourists are

= 111 × 3 = 333

Draw a model and solve.

The weight of the fallen Ashoka tree to the fallen mango tree is 3:2. Together they weigh 600 kg. How much do each of the trees weigh?

Weight of Ashoka tree = 360 kg

Weight of mango tree = 240 kg

In a mixture of 60 litres , the ratio of sunflower oil and olive oil is 2:1. If the ratio were 1:2 , what would be the quantity of the sunflower oil?

If the ratio were changed to 1 : 2, the quantity of sunflower oil would be 20 litres.

In a bag there are seeds of onion , wheat , and tomatoes in the ratio 1:2:3. If they are 30 gm in all , how many grams of each are in the bag?

Onion = 5 g

Wheat = 10 g

Tomato = 15 g

Calculate the amount paid if the discount percentage is as given below. One has been done for you.

Discount Percentage	Bar Model	Discount	Amount Paid
20%		20% of 480 = 96	480 − 96 = 384
40%		40% of 480 = 192	480 − 192 = 288
30%		30% of 480 = 144	480 − 144 = 336
70%		70% of 480 = 336	480 − 336 = 144
90%		90% of 480 = 432	480 − 432 = 48

Fertiliser E

20% off ₹750

20% of 750 = ₹150
Discounted price = 750 − 150
= ₹600

Fertiliser F

10% off ₹1440

10% of 1440 = 144
discounted price = 1440 − 144
= 1296

Concrete Stage

Use 'Hundred Square Grids' to work out the following percentages.

a 25% of 400 100	b 10% of 64 6.4	c 8% of 800 64
d 90% of 780 702	e 75% of 500 375	f 20% of 200 40

Pictorial Stage

Observe the following 100 square grids. The shaded parts of the grids show the percentages of discount. Match them with the correct discount for the given hat.

₹800

a
25%

c
60%

○ i.   ₹160 ○

○ ii.   ₹400 ○

○ iii.   ₹200 ○

○ iv.   ₹480 ○

b
20%

d
50%

Abstract Stage

1   If 10% of a number is 16. work out the following percentages of the same number.

a   5% = 8   b   20% = 32   c   25% = 40   d   50% = 80

e   55% = 88   f   75% = 120   g   90% = 144   h   95% = 152

2   Work out the following questions.

a   For a school council body election, 80% of 785 students voted. Work out the number of students that voted.
   Answer: 628 students voted

b   There were 80 questions in a maths test in which Manan scored 75%. If all the questions carried 1 mark each, work out the number of questions Manan got correct.
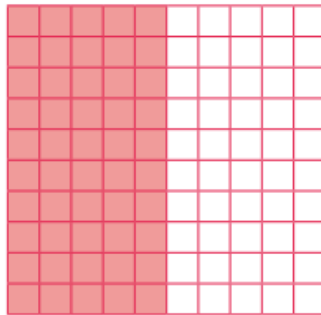   Answer: He scored 60 questions right
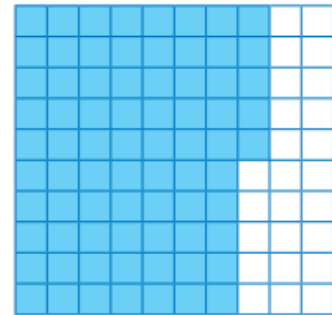
Linking Chain 🔗 EVS

Sandy is harvesting his fields. He has partially finished harvesting the below-shaded crops. Help Sandy to work out the percentages of crops he has harvested in the table below. Complete the table.
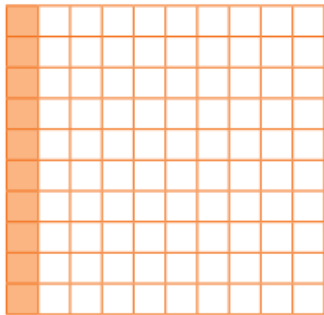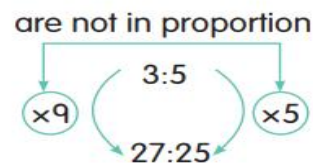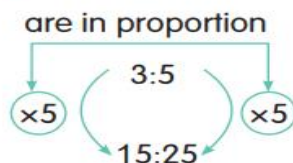
	Paddy	Wheat	Sunflower

	As a fraction	**As a percentage**	**As a ratio**
Paddy	$\dfrac{10}{100}$	10%	10:100/1:10
Wheat	$\dfrac{50}{100}$	50%	1:2
Sunflower	$\dfrac{75}{100}$	75%	3:4

Blooming Questions

Step 1: First, convert 50% into fraction.

1. Identify whether the following ratios are in proportion. Solved examples have been shown.

are in proportion

3:5
(×5) (×5)
15:25

are not in proportion

3:5
(×9) (×5)
27:25

a. 4:3 and 12:9   Yes
b. 10:18 and 30:36   No
c. 4:7 and 14:8   No
d. 6:7 and 30:35   Yes

2. Find 2 different equivalent ratios for the following.

a. 44:66
   22:33; 2:3
b. 10:36
   5:18; 100:360
c. 7:13
   14:26; 21:39
d. 13:15
   65 : 75; 117:135

3 Look at the picture, and work out the ratio of

a number of triangles to the number of circles. [2:3]

b number of squares to all the shapes. [3:8]

c all the shapes to the number of circles. [8:3]
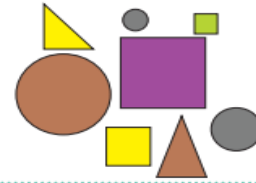
4 Work out the following number stories.

a There are 5 facilitators for every 175 learners. Work out the number of learners if there are 35 facilitators.

Answer: If there are 35 facilitator, there would be 1225 learners.

b The cost of 7 books is ₹350. Find the cost of 5 books.
Answer: The cost of 5 books would be ₹250.

c John bought 20 cupcakes for ₹600. Work out the amount he would need to buy 5 cupcakes.
Answer: The price of 5 cupcakes would be ₹150.

d 40% of the total population of a village consists of senior citizens (age more than 60 years). If the population of the village is 40,000, how many people are less than 60 years of age? Of these, 30% are students. Find the number of students.
Answer: Number of people less than 60 years = 24,000
Number of students in the village is 7,200.

e A man earns ₹24,000 in a month. He spends 10% of it on transport, 25% on food, 10% on medicines, 20% on children's education, 5% on clothes. Find the amount he spends on each. He saves the rest of the amount. Find his savings too.
Answer: The man spends ₹24,00 on transport, ₹6000 on food, ₹2400 on medicine, ₹4800 on children education and ₹1200 on clothes. This saving amount is ₹7200.

f If 17% of a cricket score is 85, what is the total score?
Answer: The total cricket score is 500.

g Sunder travels 75 km daily. He travels 40% of his way by train and the rest by bus. How many kilometres does he travel by bus?
Answer: Sunder travels 45 km by bus.

h Rekha secured 80% in English out of 50 and 65% in Maths out of 100. How many marks in all did she get in both the subjects? What is the percentage of both the subjects together?
Answer: Rekha secured a total of 105 marks in both subjects, and the overall percentage is 70%.

i Vishnu earns a salary of ₹12,000 per month. He saves 15% of it. How much does he spend?
Answer: Vishnu spens ₹10,200 from his salary.

5 Create a number story on the following.

a Ratio and proportion   **b** Percentage

Answer: Answer may vary.

Mental Maths

Work out the following percentages for the number 500.

a 10% = 50   **b** 5% = 25   **c** 15% = 75

d 20% = 100   **e** 25% = 125   **f** 40% = 200

g 50% = 250   **h** 75% = 375   **i** 80% = 400

Post Activity-Find out percentage and ratio of your PT-1 andPT-2 exam.

S.Teacher   H.O.D.   Co-Ordinator   Principal