MATHS FIELD GUIDE · GRADE 5

Multiplication can repeat or scale an amount

OPENING PROBLEM

Does the digit 4 change its value?

Change	Start	Result
× 10	0.045	0.45
÷ 10	0.45	0.045

02 Move between tenths, money and measurement
03 Rules and worked cases
04 Fabric sold by length
05 Compare the models
06 Keep the decimal point tied to the unit
07 Check your reasoning

ILLUSTRATED PROBLEM SHEET

Move between tenths, money and measurement

Scale both quantities in a division by the same nonzero factor. In multiplication, track each factor's place value.

1

$$0.3 \times 0.4$$
$$\downarrow$$
$$3 \text{ tenths} \times 4 \text{ tenths}$$
$$\downarrow$$
$$12 \text{ hundredths} = 0.12$$

Which unit does each small product represent?

A tenth of a tenth is a hundredth. Twelve such pieces give 0.12.

2

$$2.4 \div 0.3$$
$$\downarrow$$
$$24 \text{ tenths} \div 3 \text{ tenths}$$
$$\downarrow$$
$$8 \text{ groups}$$

Why can the quotient exceed 2.4?

It counts groups that are smaller than one whole unit.

3

$$4.8 \div 6$$
$$\downarrow$$
$$48 \text{ tenths} \div 6$$
$$\downarrow$$
$$8 \text{ tenths} = 0.8$$

What does eight count in the second line?

Eight tenths per group. Write the decimal unit back into the answer.

4

Change	Start	Result
× 10	0.045	0.45
÷ 10	0.45	0.045

Does the digit 4 change its value?

Yes. Multiplying by ten moves its value from four hundredths to four tenths.

0.05 × 0.2
0.01.

0.05 ÷ 0.2
0.25.

CHAPTER PROBLEM

Find 0.2 × 0.5. Should it exceed 0.5?

0.1. No: two tenths of 0.5 is smaller than 0.5.

MATHS REFERENCE · GRADE 5

Multiplication can repeat or scale an amount

Multiplying by a whole number can mean equal groups.

Multiplying by a positive number below one takes a part of an amount. We call this scaling.

Cases to recognise

Situation	What to do and why
0.6 × 0.4	Six tenths times four tenths makes 24 hundredths: 0.24.
2.4 × 1.5	One whole lot is 2.4 and half a lot is 1.2. Total 3.6.

Read the model

Repeat decimal amounts

Three groups of 0.4 contain twelve tenths.

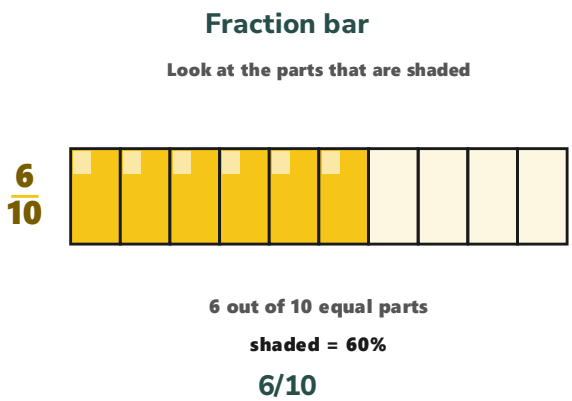
Twelve tenths is one whole and two tenths: 0.4 × 3 = 1.2.



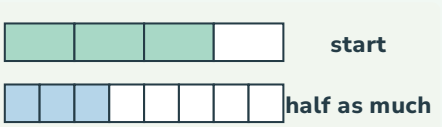
Take a fraction of a decimal

0.5 means one half. So 0.5 × 0.6 means half of six tenths.

Half of six tenths is three tenths: 0.3.



scale Multiply an amount by a factor.
factor A number being multiplied.
product The result of multiplication.



What is half of three quarters?

Split each quarter into two eighths. Taking half leaves three eighths.

WORKED INVESTIGATION

Fabric sold by length

One metre costs ₹24. A piece 1.5 m long consists of one whole metre and another half. Price each part separately.

Look at this part	What it tells you
1 m	₹24
0.5 m	₹12
1.5 m	₹36

Work it through

For 0.25 m, divide the metre price by four. The answer ₹6 is smaller than ₹24 because the length is less than a metre.

Catch the mistake

Multiplying by 1.5 cannot give ₹360 here. The piece is between one and two metres, so its price must be between ₹24 and ₹48.

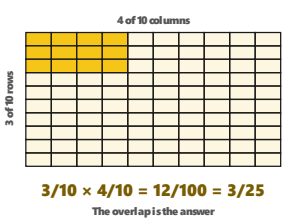
Compare the cases

Tenths times tenths make hundredths

0.3 × 0.4 means three tenths of four tenths.

A whole grid has 100 equal cells. The overlap has twelve cells: twelve hundredths, or 0.12.

Area model



Area model for fraction multiplication

Understand the written shortcut

3 × 4 = 12 counts twelve small cells here, not twelve wholes.

The units explain why the answer is 0.12. Counting decimal places should record that unit change, not replace its meaning.

Change one condition

To price 1.25 m, add the quarter-metre cost to ₹24. The total is ₹30.

⅔ of ¾
↓
2 × 3 over 3 × 4
↓
½

Why is the product smaller than three quarters?

Only two of three equal shares of the starting amount are kept.

MULTIPLICATION CAN REPEAT OR SCALE AN AMOUNT

Compare the models

Multiplying by ten

Ten copies of 0.36 make 3.6.

Every digit takes a place worth ten times as much. In a place-value chart, the decimal point marks the same boundary.

Multiplication does not always make bigger

For a positive starting amount, multiplying by 3 makes it larger.

Multiplying by 0.5 makes it half as large. Multiplying by 1 leaves it unchanged.

Check using bounds

0.3 × 0.4 must be below 0.4 because we take only three tenths of it.

An answer of 1.2 is too large. An estimate can catch a misplaced decimal point.

Explain your reasoning

Four bottles each contain 0.3 L. How much altogether?

1.2 L. Four groups of three tenths make twelve tenths.

Two more worked cases

Situation	Reasoning
₹7.50 per kg for 0.2 kg	A fifth of ₹7.50 is ₹1.50.
A claimed answer to 0.48 × 0.9 is 4.32	A factor below one shrinks 0.48. The product is 0.432.

1½ × 8
↓
8 + 4
↓
12

What does the extra half add?

Half of eight is four. One full eight plus four is twelve.

ILLUSTRATED PROBLEM SHEET

Keep the decimal point tied to the unit

A rupee has one hundred paise. Estimate the size before calculating.

1

₹4.50 + ₹0.75
↓
450p + 75p
↓
₹5.25

Where does the extra rupee come from?

525 paise contains five complete hundreds and 25 paise.

2

Length	Cost
1 m	₹12
0.1 m	₹1.20
0.4 m	₹4.80

Why does the shorter piece cost less?

At the same rate four tenths of a metre costs four tenths of ₹12.

3

₹8.40 ÷ 7
↓
840p ÷ 7
↓
₹1.20

How can you check the share?

Seven shares of 120 paise give 840 paise.

4

₹2.50 × 0.6
↓
250p × 6/10
↓
₹1.50

Why does multiplication give a smaller amount?

The factor is six tenths. The product is six tenths of ₹2.50.

₹0.06
six paise.

₹0.60
sixty paise.

CHAPTER PROBLEM

Explain 0.47 × 10 without saying “just move the point”.

Ten copies make 4.7. Each digit represents ten times its original value.

QUESTION BANK · FOLD OR COVER THE RIGHT COLUMN

Check your reasoning

Try the problem	Solution and reasoning
01 Can 0.7 × 0.8 equal 5.6?	No. Both positive factors are below one. The product is 56 hundredths, or 0.56.
02 ₹10 is shared among four children. Can every share be paid exactly in paise?	Yes. 1000 paise divided by four gives 250 paise each.
03 At ₹18 per metre, what does 2.5 m cost?	Two metres cost ₹36 and half a metre costs ₹9. Together they cost ₹45.
04 Calculate 0.12 × 0.3.	Twelve hundredths times three tenths gives 36 thousandths, or 0.036.
05 A 1.25 kg packet costs ₹80 per kg. Price?	One kg costs ₹80 and a quarter costs ₹20, for ₹100.

Choose between ₹4.80 and ₹48

Ribbon costs ₹12 per metre. A piece measures 0.4 m. Four tenths of ₹12 is four lots of ₹1.20, so the piece costs ₹4.80.

A whole metre costs ₹12. A fraction of a metre must cost less at this price.



Which factor undoes multiplication by ¾?

Its reciprocal, 4/3. The product is exactly one.

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