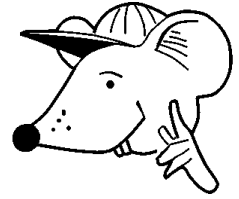


MATHEMATICS



N.S. Yr. 6 P.55

**Understanding division and its
relationship to subtraction and multiplication.**

Equipment

Paper, pencil, ruler

MathSphere

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Concepts

Children should be able to understand the operation of division in its two aspects:

a) Sharing. If **66** sweets are shared between **eleven** people, how many sweets does each person have? This is normally achieved with a philosophy of 'one for you, one for you....'

b) Grouping. If **66** sweets are available, how many people can have **6** sweets each? This is normally achieved by putting the sweets in piles of six and seeing how many piles there are.

They should understand the following words and be able to read and write them:

share, group, divide, divided by, divided into, divisible by, factor, quotient, remainder, inverse

and they should know and recognise the division sign (\div) and its alternative ($/$).

Definitions:

Quotient is the answer to a division sum.

Eg. the quotient of **32** and **8** is **4**.

Factors: The whole numbers that will divide exactly into a number.

Eg. the factors of **30** are **1, 2, 3, 5, 6, 10, 15 and 30**

Notice that the number itself (**30**) is included in the factors. The factors not including the number itself are called **proper factors**.

Inverse: Opposite.

Eg. the inverse of multiplication is division.

Eg. the inverse of addition is subtraction.

Concepts (Continued)

Children should understand the **commutative law** (but, not thankfully, the word itself) as applied to division.

Definition:

Commutative Law. This is simply that if you swap the numbers in a multiplication sum or addition sum, the answer remains the same.

Eg. $25 \times 4 = 4 \times 25$

Eg. $9 + 5 = 5 + 9$

N.B. This is **not true for division**, for example. $40 \div 5$ is not equal to $5 \div 40$!

Children should be able to give a reasonable explanation of how they tackle a given problem. In a group situation this stimulates discussion and draws attention to other methods of solving the same problem.

In general, it is good policy, when discussing methods, to keep the numbers as simple as possible without losing the essential element of the problem.

Unnecessarily difficult numbers cloud the mind when trying to understand a new idea.

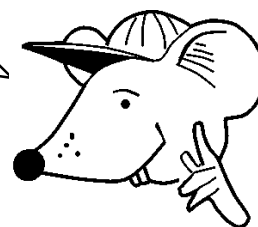
BODMAS

The order in which operations should be performed is determined by the acronym BODMAS (Brackets, of, division, multiplication, addition and subtraction). See our module devoted to this topic for further information and examples.

Did you know that **16.4 divided by 4** is **not** the same as **4 divided by 16.4**?

How can you show this with a calculator?

Try it and see. Discuss this with your teacher or parent.



Which of these are true?

1. $783 \div 9 = 9 \div 783$ 2. $672 \div 2 = 2 \div 672$ 3. $48 \div 24 = 24 \div 48$

Which of these are true?

4. The answer to $37 \div 94$ is greater than 1.
5. The answer to $360 \div 78$ is smaller than 360.
6. The answer to $70 \div 250$ is smaller than 70 and smaller than 1.
7. The answer to $840 \div 84$ is smaller than 1.

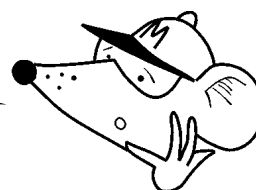


What happens when you divide a number by **1** ?

Can you write down the answers to these sums very quickly?

8. $6.8 \div 1$ 9. $3.4 \div 1$ 10. $12.29 \div 1$ 11. $48.3 \div 1$ 12. $75.6 \div 1$

You cannot divide a number by 0.



Write down which of these questions have an answer and which cannot be worked out. Work out the ones that can be done.

1. $4.8 \div 0$ 2. $93 \div 0$ 3. $0 \div 24$ 4. $0 \div 16.4$

5. $250 \div 0 \times 28$ 6. $18.2 \div 5 \times 6 \div 9 \div 0$ 7. $0 \div 38.4$



Now here's a tricky one!

What happens if you divide **27.3** by **3** and then multiply the answer by **3** ?

How quickly can you work out these sums?

8. $4.8 \div 5 \times 5$ 9. $2\,763 \div 9 \times 9$ 10. $150 \div 6 \times 6$

Is the same true if we multiply first and then divide?

11. $3.9 \times 5 \div 5$ 12. $83 \times 15 \div 15$ 13. $104 \times 6 \div 6$

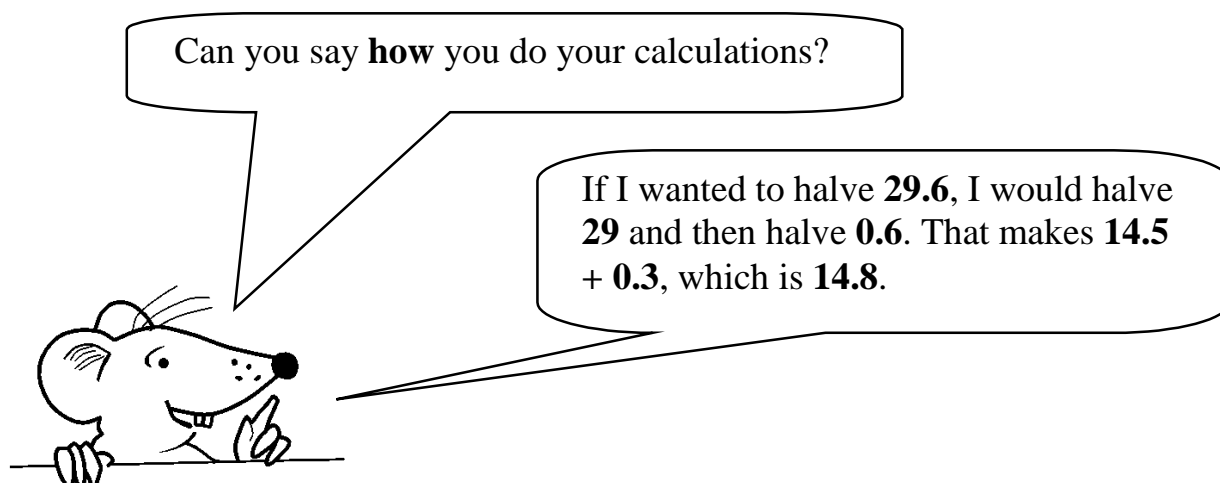
We can use this idea to check our division sums, like this:

$4.8 \div 4 = 1.2$ Check by multiplying 4 by 1.2: $4 \times 1.2 = 4.8$ Yippee!

Work out these sums and check them by multiplying.

14. $8.5 \div 5$ 15. $19.2 \div 6$ 16. $480 \div 24$ 17. $6.8 \div 3.4$

18. $9 \div 0.3$ 19. $6.4 \div 8$ 20. $29.4 \div 7$ 21. $0.88 \div 8$



Say **how** you would do these calculations and then do them:

1. Halve 15.8
2. 9.1 divided by 7
3. Find a fifth of 7 480
4. Share 385 between 5 people.
5. Divide 10 into 9.2.
6. How many groups of 36 can be made from 760 ?
7. How many lengths of 8.5 cm can you make from 90 cm?
8. What are the factors of 98 ?
9. Is 369 divisible by 9 ?
10. Write down four pairs of numbers with a quotient of 4.2.
11. Write down eight pairs of numbers with a quotient of 6.3.

Play a game with a friend. You give your friend a sum like the ones above. Your friend tells you **how** to do it and then works it out. Your friend must not do the sum until they have told you how to do it.

Then it is your friend's turn to give you a sum. Hard work, eh!



We can find a fraction of something using division. Eg. $\frac{1}{5}$ of **8.5**
is the same as **8.5** \div **5**, which is **1.7**.

A fraction is like a division sum.

$\frac{42}{7}$ means **42** \div **7**, which is **6**.



Work these sums out:

1. $\frac{1}{5}$ of 18.5

2. $\frac{1}{7}$ of 4.2

3. $\frac{1}{9}$ of 4 761

4. $\frac{1}{7}$ of 966

5. $\frac{1}{3}$ of 28.5

6. $\frac{1}{8}$ of 204.8

Work these out by dividing:

7. $\frac{39}{3} = \square$

8. $\frac{289}{17} = \square$

9. $\frac{366}{6} = \square$

10. $\frac{4000}{20} = \square$

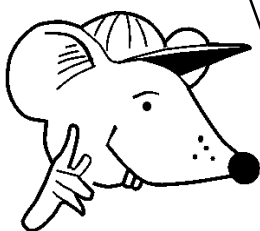
11. $\frac{88}{11} = \square$

12. $\frac{160}{10} = \square$

Quick Question Sheet

Answer these questions.

You need to be **quick**
accurate
neat.



1. Which are true?:

- a) $6.4 \div 2 = 2 \div 6.4$ b) $120 \div 10 \div 5 = 120 \div 5 \div 10$ c) $72 \div 4 = 4 \div 72$
d) A seventh of 10 is 70 e) A fifth of six hundred is one hundred and twenty.

2. Calculate:

- a) $8.5 \div 1$ b) $9.3 \div 1$ c) $7.84 \div 1$
d) $64 - 0.2 - 0.2 - 0.2 - 0.2 - 0.2$ e) $27 - 0.5 - 0.5 - 0.5 - 0.5$

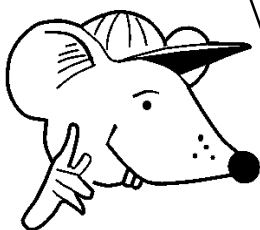
3. Which are true?

- a) $4.2 \div 1$ is greater than 4.2 b) $9.32 \div 1$ is less than 1
c) $6.4 \div 0$ is impossible to calculate. d) $6.3 \times 1.8 \div 1.8 = 6.3$
e) If $4.8 \times 9 = 43.2$, then $43.2 \div 9 = 4.8$
f) If $40.96 \div 6.4 = 6.4$, then $6.4 \times 6.4 = 40.96$

Quick Question Sheet

Answer these questions.

You need to be **quick**
accurate
neat.



1. Fill in the boxes:

a) $6.4 \div 2 = \square$ b) $3.6 \div 6 = \square$ c) $8\,800 \div \square = 800$

d) $5.6 \div 4 = \square$ e) $64 \div 4 = \square$ f) $9.2 \div \square = 4.6$

g) $430 \div \square = 43$ h) $8.2 + (\square \div 13) = 10.2$

2. Using a calculator, fill in the boxes.

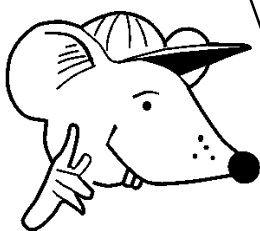
a) $6082.2 \div 9.3 = \square$ b) $\square \div \square = 5.6$

c) $\square \div 7.3 = 2\,336$ d) $1\,498.5 \div \square = 99.9$

Quick Question Sheet

Answer these questions.

You need to be **quick**
accurate
neat.



1. Which are true?:

- a) $7.8 \div 6.3 = 6.3 \div 7.8$ b) $15.2 \div 9 \div 4 = 4 \div 9 \div 15.2$ c) $71.2 \div 6 = 6 \div 71.2$
d) One sixth of 8.4 is 1.4 e) One eighth of 2.4 is 0.3

2. Calculate:

- a) $10.9 \div 1$ b) $16.3 \div 1$ c) $71.4 \div 1$
d) $8.5 - 0.5 - 0.5$ e) $73 - (0.1 \times 10)$

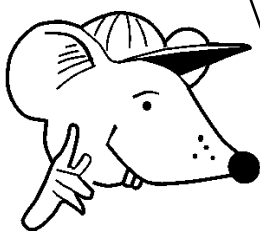
3. Which are true?

- a) $40.3 \div 1$ is smaller than 1. b) $8.4 \div 1$ is greater than 76.
c) $0 \div 94 = 0$ d) $69 \div 0 = 69$
e) If $4.8 \times 9.1 = 43.68$, then $43.68 \div 9.1 = 4.8$
f) If $44.89 \div 6.7 = 6.7$, then $6.7 \times 6.7 = 44.89$.

Quick Question Sheet

Answer these questions.

You need to be **quick**
accurate
neat.



1. Fill in the boxes:

a) $40.5 \div 5 = \square$

b) $9.4 \div 2 = \square$

c) $6\,500 \div \square = 3\,250$

d) $7.7 \div 11 = \square$

e) $\frac{1}{8}$ of 96 = \square

f) $\frac{1}{7}$ of $\square = 23$

g) $8.4 \div 7 - \square = 1$

h) $94 + (\square \div 6) = 95.1$

2. Using a calculator, fill in the boxes.

a) $33411.8 \div 6.2 = \square$ b) $\square \div \square = 7.7$

c) $\square \div 1.2 = 4.9$ d) $31\,860 \div \square = 88.5$

Answers

Page 4

1. False 2. False 3. False 4. False 5. True 6. True 7. False
8. 6.8 9. 3.4 10. 12.29 11. 48.3 12. 75.6

Page 5

1. No answer 2. No answer 3. 0 4. 0 5. No answer 6. No answer
7. 0 8. 4.8 9. 2 763 10. 150 11. 3.9 12. 83 13. 104 14. 1.7
15. 3.2 16. 20 17. 2 18. 30 19. 0.8 20. 4.2 21. 0.11

Page 6

1. 7.9 2. 1.3 3. 1 496 4. 77 5. 0.92 6. 21 7. 10
8. 1, 2, 7, 14, 49, 98 9. Yes (41)
10. Any four pairs such as 16.8 and 4. 11. Any eight pairs such as 44.1 and 7.

Page 7

1. 3.7 2. 0.6 3. 529 4. 138 5. 9.5 6. 25.6 7. 13 8. 17 9. 61
10. 200 11. 8 12. 16

Page 8

1. a) False b) True c) False d) False e) True
2. a) 8.5 b) 9.3 c) 7.84 d) 63 e) 25
3. a) False b) False c) True d) True e) True f) True

Page 9

1. a) 3.2 b) 0.6 c) 11 d) 1.4 e) 16 f) 2 g) 10 h) 26
2. a) 654 b) Any two eg $44.8 \div 8$ c) 17 052.8 d) 15

Page 10

1. a) False b) False c) False d) True e) True
2. a) 10.9 b) 16.3 c) 71.4 d) 7.5 e) 72
3. a) False b) False c) True d) False e) True f) True

Page 11

1. a) 8.1 b) 4.7 c) 2 d) 0.7 e) 12 f) 161 g) 0.2 h) 6.6
2. a) 5 389 b) Any two, eg $123.2 \div 16$ c) 5.88 d) 360