PLACE VALUE

1. Frank said that $\frac{97}{1,000}$ can be written as 0.97. Is this correct? If not, justify your reasoning.

He is not correct because 0.97 is 97 hundredths $\left(\frac{97}{100}\right)$.

$\frac{97}{1,000}$ would be 97 thousandths (0.097) instead.

2. Paco has \$300. June has $\frac{1}{10}$ as much money as Paco. She has 10 times as much money as Marie. How much money does June have? How much money does Marie have?

June = \$300 ÷ 10 = \$30

Marie = 10x less than June = \$30 ÷ 10 = \$3.

3. Write in expanded form: **356,940.345**
   How many times greater is the 4 in the tens place than the 4 in the hundredths place?

$(3 \times 100,000) + (5 \times 10,000) + (6 \times 1,000) + (9 \times 100) + (4 \times 10) + \left(3 \times \frac{1}{10}\right) + \left(4 \times \frac{1}{100}\right) + \left(5 \times \frac{1}{1,000}\right)$

40   4   0.4   0.04   , so the 4 in the tens place is 1,000 times
  x10   x10   x10   greater than the 4 in the hundredths place.

4. A number has a 6 in the hundred thousands place. You multiply it by 100.
   In what place will the 6 be in the product? Explain your reasoning.

It will be in the ten millions place because

600,000 x 10 = 6 million

6 million x 10 = 60 million.

The digit moves over two places to the left in the place value chart.

DECIMAL OPERATIONS

5. Estimate the product of the following problems:

4.2 x 5.7	10.72 x 5.3	7.5 x 0.9	3.5 x 6.5
≈ 4 × 6	≈ 11 × 5	≈ 7.5 × 1	≈ 3 × 7 or 4 × 6
24	55	7.5	21 24

6. A customer's purchase receipt from a supermarket showed the following prices for various items. £3.48 , £8.76 , £11.29 , £19.17. <u>Estimate</u> the total cost of the items.

One possible estimate: £3.50 + £9 + £11 + £19

= £3.50 + £39

= £42.50

The items cost about £42.50

7. A motorcycle racer completed three laps in the times shown below.
   - 43.28 seconds
   - 42.8 seconds
   - 41.74 seconds

   What was the total time, in seconds, it took for the driver to complete the three laps?

$$\begin{array}{r} 43.28 \\ + 42.80 \\ \hline 86.08 \end{array} \qquad \begin{array}{r} 86.08 \\ + 41.74 \\ \hline 127.82 \end{array}$$

It took him **127.82 seconds**

8. Kathy has one cat that is 10.6 cm tall. She has another cat that is 6.8 cm tall. How much taller is one cat than the other?

$$6.8 + 0.2 = 7$$
$$7 + 3.6 = 10.6$$

One cat is **3.8cm** taller than the other.

(While the algorithm also works here, it's slightly less efficient due to the multiple regrouping)

9. A living room rug is 5.5 meters long and 2.3 meters wide. Draw and label a model of the rug and use it to solve the problem.

	5	.5 m
2	2×5= **10**	2×0.5= **1**
.3 m	0.3×5 **1.5**	0.3×0.5= **0.15**
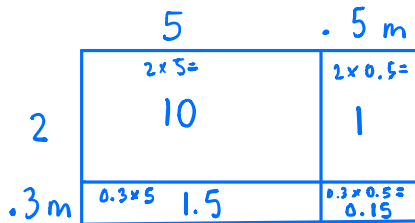
$$11 + 1.5 + 0.15 = 12.65$$

The rug has an area of **12.65m²**

10. Are these good deals or bad deals? Why? *Can you find some good deal/bad deal examples in the real world? If you do, email a photo of it to Mrs. Spurr and Ms. Yeo so we can share them with kids next year!*

circuit city clearance
was: $52⁹⁹
now: $47⁹⁹
you save: $12
model #:
valid:

SAVE MORE THIS SUMMER
ALL 2-LITERS
2/$3³³ 3/$4 4/$5
OR $1.99 EACH

Colour Name: **White**
Item Package Quantity: **1**

1	2
£2.75	£9.98 (£4.99 / Item)

1/3 ▷
RRP: £4.99

Screenshot from James B.

This is a bad deal because you only save $5, not $12!

($53 − $48)

A 2 pack is a good deal since $1.99 × 2 ≈ $4. A 3 pack would cost ≈ $6 if bought individually and a 4 pack would cost ≈ $8 individually, so they're also a good deal.

This is a good deal if you buy one pack but a bad deal if you buy the 2 packs since £2.75 × 2 wouldn't be more than £6 and the 2 packs cost almost £10.

11. An organic farm opened a kiosk to sell their vegetables.

a) A customer buys 8 cucumbers, 1 pound of tomatoes and 10 zucchini. How much money did he spend?

Vegetable	Price
cucumbers	$0.50 each or $3.75 for a bag of 10
tomatoes	$1.98 for 1lb or $3.55 for 2 lb
zucchini	$0.60 each or $5.59 for a dozen

cucumbers 8 x $0.50 = $4
tomatoes   = $1.98   Total cost of all the
zucchini   10 x $0.60 = $6   vegetables = $11.98

b) Based on the money he spent, show one way the customer could have purchased more vegetables for less money.

He could get more vegetables for less by buying the bag of cucumbers and dozen zucchinis since it would cost $3.75 + $1.98 + $5.59 instead of $4 + $1.98 + $6. (He'd get two more cucumbers and two more zucchini).

12. An artist is selling children's jewelry. Necklaces cost £2.25 each. Bracelets cost £1.50 each. Select all the combinations of necklaces and bracelets that would cost exactly £12.

5 necklaces, 1 bracelet ✗

$(£2.25 \times 5) + £1.50$
$= £10 + £1.25 + £1.50$
$= £11.25 + £1.50$
$= £12.75$

2 necklaces, 5 bracelets ✓

$£2.25 \times 2 = £4.50$
$£1.50 \times 5$
$= (£1 \times 5) + (£0.50 \times 5)$
$= £5 + £2.50$
$= £7.50$
$£4.50 + £7.50 = £12$

3 necklaces, 3 bracelets ✗

$£2.25 \times 3$
$= £6.75$
no need to calculate bracelets because there's no way to make an even dollar amount

4 necklaces, 2 bracelets ✓

$£2.25 \times 4 = £9$
$£1.50 \times 2 = £3$
$£9 + £3 = £12$

WHOLE NUMBER MULTIPLICATION, DIVISION AND ORDER OF OPERATIONS

13. Use the Distributive Property to complete the equation.

559 x 3 = (500 + 50 + 9) x 3
= (500 x __3__) + (50 x __3__) + (9 x __3__)
= __1,500__ + __150__ + 27
= __1,677__

14. Solve using the order of operations: Parentheses, Exponents, Multiplication or Division *(from left to right)*, Addition or Subtraction *(from left to right)*

$8 + \underline{18 \div 9} - 5$
$= \underline{8 + 2} - 5$
$= \underline{10 - 5}$
$= \underline{\underline{5}}$

$3 \times 12 \div 4 + 11$
$= \underline{36 \div 4} + 11$
$= \underline{9 + 11}$
$= \underline{\underline{20}}$

$32 - (4 + 6) \times 2$
$= 32 - \underline{10 \times 2}$
$= \underline{32 - 20}$
$= \underline{\underline{12}}$

$2 + \underline{5 \times 8} \div 2$
$= 2 + \underline{40 \div 2}$
$= \underline{2 + 20}$
$= \underline{\underline{22}}$

$(158 - 12^2) \times 2 + 225$
$= \underline{(158 - 144)} \times 2 + 225$
$= \underline{14 \times 2} + 225$
$= \underline{28 + 225}$
$= \underline{\underline{253}}$

$(15 - 11) + 24 \div 2^3$
$= 4 + 24 \div 2^3$
$= 4 + \underline{24 \div 8}$
$= \underline{4 + 3}$
$= \underline{\underline{7}}$

15. Make the number 24. You can add, subtract, multiply and divide but you don't have to use all four operations. You must each number on the card exactly once. Write your solution with an expression that follows the order of operations. *Here's a website* that has more 24 challenges if you like them!

There are multiple solutions for each card. Here are some examples:

$5 \times 5 - (4 - 3)$
$= 5 \times 5 - 1$
$= 25 - 1$
$= 24$

$(3 \times 4) \times (4 \div 2)$
$= 12 \times 2$
$= 24$

$(4 + 1) \times 6 - 6$
$= 5 \times 6 - 6$
$= 30 - 6$
$= 24$

16. Insert parentheses to make the statements true

$3 + 2 \times 6 - 4 = 10$
$(3 + 2) \times (6 - 4)$
$= 5 \times 2$
$= 10$

$7 + 30 - 5^2 \times 3 = 22$
$7 + (30 - 5^2) \times 3$
$= 7 + (30 - 25) \times 3$
$= 7 + 5 \times 3$
$= 7 + 15$
$= 22$

$64 \div 2 \times 4 \div 2 = 4$
$64 \div (2 \times 4) \div 2$
$= 64 \div 8 \div 2$
$= 8 \div 2$
$= 4$

17. A nursery sells plants in flats. Each flat holds 6 trays and each tray holds 8 plants. The nursery sold 18 flats on Saturday and 21 flats on Sunday. How many plants did the nursery sell in all?

1 flat = 6 trays
1 tray = 8 plants
1 flat = 6 × 8 plants
       = 48 plants
18 + 21 = 39 flats sold

$48 \times 39 = (50 \times 39) - (2 \times 39)$
$= (100 \times 19.5) - 78$
$= 1,950 - 78$
$= 1,872$

	40	8
30	1,200	240
9	360	72

1,200 + 600 + 72
= 1,872

They sold 1,872 plants

18. Maggie's Farm has 380 peaches ready to sell. If 15 peaches fit in each crate, how many crates can be filled?

20 crates = 300 peaches

4 crates = 60 peaches

5 crates = 75 peaches

You can fill __25__ crates with 375 peaches. There will be 5 peaches left over.

19. On a field trip, there should be one adult chaperone for every 9 students. If 164 students are going on the trip, how many adult chaperones are needed? Explain how you found your answer.

$$9\overline{)164}$$ quotient 18 R 2 (-90, 74, -72, 2)

You need __19__ chaperones because 18 would only be enough for some of the kids (2 wouldn't have a chaperone)

20. Chris is saving up to take her whole family (including her grandparents) out to dinner. She wants to save $230 and takes up a dog-walking job. She gets paid $8 for each time she walks her neighbor's dog. How many times will she need to walk the dog?

$$8\overline{)230}$$ quotient 28 R 6 (-160, 70, -64, 6)

She will need to walk the dog __29__ times because if she walks it 28 times, she will be $6 short of her goal.

FRACTION OPERATIONS

21. Dena is biking down a $\frac{3}{4}$ mile bike trail. She stops to talk to a friend after biking $\frac{1}{5}$ of a mile. How much farther does she need to travel?

$$\frac{3}{4} - \frac{1}{5} = \frac{15}{20} - \frac{4}{20} = \frac{11}{20}$$

She still has $\frac{11}{20}$ of a mile to go.

22. A rectangular poster is $\frac{1}{4}$ yard wide by $\frac{6}{7}$ yard tall. What is its area?

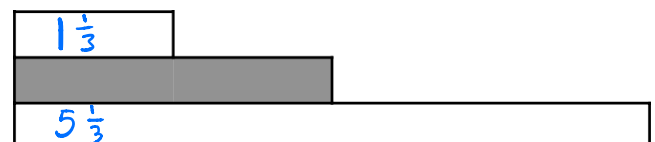$$\frac{1}{4} \times \frac{6}{7} = \frac{6}{28} = \frac{3}{14}$$

23. The shaded area is $2\frac{2}{3}$. The top bar is half the shaded area, the bottom bar is double. What are they worth?
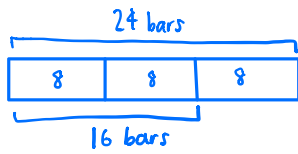
$1\frac{1}{3}$

$5\frac{1}{3}$

$$\frac{1}{2} \text{ of } 2\frac{2}{3} = 1\frac{2}{6} = 1\frac{1}{3}$$

$$\text{double } 2\frac{2}{3} = 4\frac{4}{3} = 5\frac{1}{3}$$
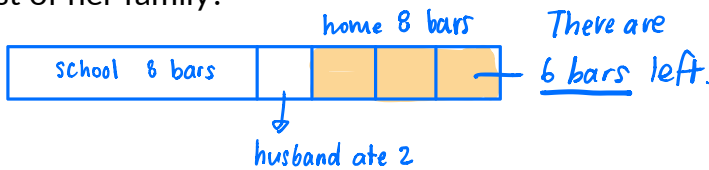
24. Mrs. Jois wants to make a pan of carrot halwa bars.

a) The recipe makes 24 bars, but she only wants to make 16 bars. How much of each ingredient will she need?

24 bars

| 8 | 8 | 8 |

16 bars

So she'll need $\frac{2}{3}$ of all the ingredients.

2 cups all-purpose flour $\frac{2}{3} \times 2 = \frac{4}{3} = 1\frac{1}{3}$ cups

3 teaspoons double acting baking powder $\frac{2}{3} \times 3 = \frac{6}{3} = 2$ teaspoons

2 cups shredded carrots $1\frac{1}{3}$ cups

1/2 cup whole milk $\frac{2}{3} \times \frac{1}{2} = \frac{2}{6} = \frac{1}{3}$ cup

5 tablespoons sugar $\frac{2}{3} \times 5 = \frac{10}{3} = 3\frac{1}{3}$ tablespoons

1/2 cup raisins $\frac{1}{3}$ cup

one 14-ounce can condensed milk $\frac{2}{3}$ of a can

8 tablespoons unsalted butter, melted $\frac{2}{3} \times 8 = \frac{16}{3} = 5\frac{1}{3}$ tbsp

5 to 7 pods cardamom seeds, crushed $\frac{2}{3} \times 7 = \frac{14}{3} = 4\frac{2}{3}$ between $3\frac{1}{3} - 4\frac{2}{3}$ pods, so probably about 4 pods

1/8 teaspoon ground nutmeg $\frac{2}{3} \times \frac{1}{8} = \frac{2}{24} = \frac{1}{12}$ teaspoon

1/2 cup slivered almonds $\frac{1}{3}$ cup

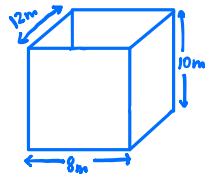→ or just a pinch since you can't really measure $\frac{1}{12}$ of a teaspoon! ◡

b) She brings half of the bars she makes to school to share with the Grade 5 teachers and leaves the rest at home for her family. Her husband eats a quarter of the bars that were left at home. How many bars are left for the rest of her family?

home 8 bars

| School 8 bars | | | | |

husband ate 2

There are 6 bars left.

VOLUME

25. How much sand is needed to fill a pit that is 10 m deep and 8 m wide and 12 m long?

12m, 10m, 8m

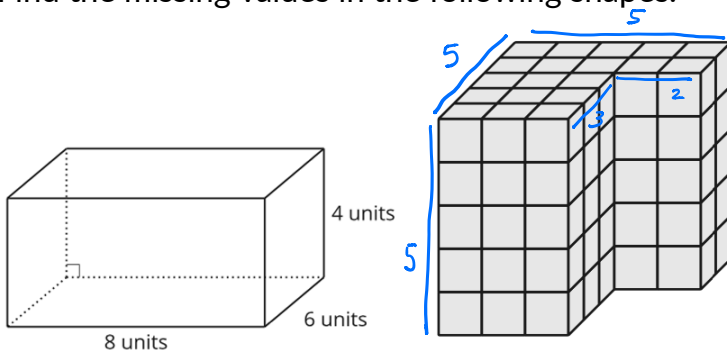$10 \times 8 \times 12$
$= 10 \times 96$
$= 960$

You'll need 960 m³ of sand

26. Andy has 64 one-inch cubes. The cubes measure 1 inch on each edge. How many rectangular prisms, each with different dimensions, can he make using all of the one-inch cubes?

$64 \times 1 \times 1$ $8 \times 8 \times 1$ $4 \times 4 \times 4$
$32 \times 2 \times 1$ $16 \times 2 \times 2$
$16 \times 4 \times 1$ $8 \times 4 \times 2$

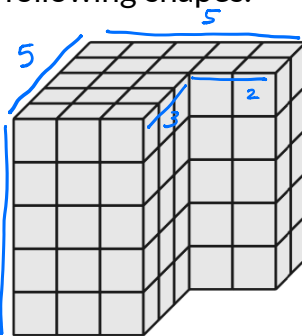He can make 7 different rectangular prisms.
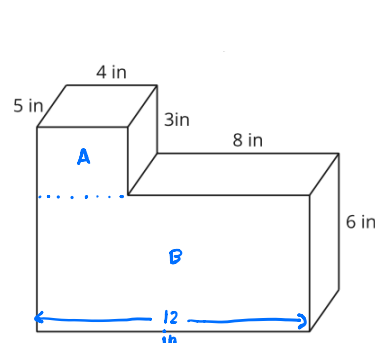
27. Find the missing values in the following shapes.

5, 5, 5, 2, 3 (cubes)

4 units, 8 units, 6 units

4 in, 5 in, 3 in, 8 in, A, B, 6 in, 12 in

Volume 60 unit³, 4 units, 3 units

Volume = __192__ unit³   Volume = __95__ unit³   Volume = __420__ in³   Height = __5__ units

$8 \times 6 \times 4 = 48 \times 4$

Whole shape − missing part
$(5 \times 5 \times 5) - (5 \times 3 \times 2)$
$= 125 - 30$

left prism + right prism
$(5 \times 5 \times 3) + (5 \times 2 \times 2)$
$= 75 + 20$

A: $(5 \times 4 \times 3) + (5 \times 12 \times 6)$
$= 60 + 360$
$= 420$

$3 \times 4 = 12$
$60 \div 12 = 5$