The following guide will provide an overview of the basic numeracy skills required for first year Nursing students.

If you experience difficulty in answering the sample questions, then please feel free to get in touch with us for tailored one-to-one support.

Contact Details:
Tel: 028 9097 2874  Email: tim.crawford@qub.ac.uk  Web: www.qub.ac.uk/sgc/learning

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1. Place Value

In any number each digit has a different place value. Going from left to right we have Hundreds, Tens, Units, tenths, and hundredths.

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<table>
<thead>
<tr>
<th>H</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
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</table>

There are 10 hundredths in 1 tenth, 10 tenths in 1 unit, 10 units in 1 ten, and 10 tens in 1 thousand.

The numbers AFTER a decimal point represent a fraction of 1.

To move one column to the left e.g. Units to Tens, you x 10.
To move one column to the right, e.g. Hundreds to Tens, you ÷ 100

Example: if we multiply the following number by 10

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it becomes:

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Note what has happened to the decimal point. From 23.45 it has become 234.5, moving 1 place to the right.

The decimal point moves 1 place to the right when multiplying by 10.
The decimal point moves 2 places to the right when multiplying by 100.
The decimal point moves 3 places to the right when multiplying by 1000.
The decimal point moves 1 place to the left when dividing by 10.
The decimal point moves 2 places to the left when dividing by 100.
The decimal point moves 3 places to the left when dividing by 1000.

If you find this difficult to remember, then think of L for less, L for Left.

Ordering Numbers

To determine the highest number start from the left and go through each place value selecting the highest digit(s) until just one number is left.

1 5 . 1 8  
1 4 . 9 4  
1 5 . 3  
1 4 . 0 9

1 5 . 1 8  
1 4 . 9 4  
1 5 . 3  
1 4 . 0 9

1 5 . 1 8  
1 5 . 1 8  
1 5 . 1 8

15.3 is the highest number

Examples to try; find the lowest number in the following questions:

(a) (i) 87.87  (ii) 87.97  (iii) 88.07  (iv) 88.1
(b) (i) 0.23  (ii) 0.2  (iii) 0.32  (iv) 0.3
(c) (i) 624.01  (ii) 642.01  (iii) 624.0  (iv) 624.1

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2. Times Tables

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<td>120</td>
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</table>

TIPS

Try learning by rote.

5 times tables always end in either 5 or 0

You can use your fingers for 9 times tables:

- Hold your hands in front of you with your fingers spread out.
- For 9 X 3 bend your third finger down. *(9 X 4 would be the fourth finger etc.)*
- You have 2 fingers in front of the bent finger and 7 after the bent finger
- Thus the answer must be 27!

One of the best interactive web resources for times tables is BBC Skillwise:

http://www.bbc.co.uk/skillswise/numbers/wholenumbers/multiplication/timestables/index.shtml

Examples to try; using the table above, calculate the following:

(a) 9 x 8  (b) 7 x 12  (c) 6 x 9  (d) 4 x 7  (e) 5 x 11  (f) 3 x 8  (g) 11 x 12

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3. Addition

• Keep the decimal point in the same place.

• If you get a number greater than 10 then write down the number of units and carry the number of tens over to the next column on the left.

\[
\begin{array}{c}
89 \\
+15 \\
\hline
104
\end{array}
\]

\[9 + 5 = 14\]
write down 4 and carry the 1 over

\[104\]

Examples to try:

(a) \[37.4\]

(b) \[78.9\]

(c) \[1300\]

4. Multiplication

• Ignore the decimal point until the end. The rule is that you count the number of decimal places in your question and apply the same number to the answer.

• Carry over tens as before.

• If multiplying by a number with two or more digits, treat them separately, remembering to put one zero on the far right column when multiplying by tens, two zeros for hundreds etc.

\[
\begin{array}{c}
4.2 \\
\times \ 8.1 \\
\hline
\end{array}
\]

\[3360\]—one zero is put down when multiplying by the 8
\[340.2\]—since there is one decimal place in the question, there should be one same in the answer.

Examples to try:

(a) A patient is to receive 2.5 micrograms per kilogram. What dose is required if the patient weighs 79 kilograms?

(b) If one tablet contains 20 milligrams, how many milligrams would 4 tablets contain?

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5. Subtraction

- Keep the decimal point in the same place.
- Borrow 1 from the column on the left if necessary.

\[ \begin{array}{c}
5.2 \cdot 6 \\
- 2.4 \cdot 9 \\
\hline
4.7 \cdot 7
\end{array} \]

Examples to try:

(a) Jamie weighed 4.2 kilograms at birth. By week 2 his weight had dropped to 3.8 kilograms. How much weight had he lost in grams?

(b) What is the difference in kg between 1.6 kilograms and 825 grams?

6. Division

- Keep the decimal point in the same place.
- Divide into each digit in turn, from left to right.
- Carry over tens if applicable.
- If dividing by decimals then make into whole numbers by multiplying.
- Simplify fractions by halving (if even), or try ÷ by 3, 5, or 7. This should reduce the need for long division.
- Furthermore, the same number of zeros can be removed in top and bottom numbers in the fraction to aid simplification.

Examples to try:

(a) 225 ÷ 6
(b) 1500 ÷ 250
(c) 1000 ÷ 8

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7. Combined

A baby is to be fed 75mL every 3 hours. How much is this per day?

\[ 24 \div 3 = 8 \quad 8 \times 75 = 600mL \]

Examples to try:

(a) If 5mL contains 100mg, how many milligrams would there be in 20mL?
(b) If a patient is to receive 1500ml over 24hrs, how much is this in mL/hr?

8. Converting Weights

The following diagram can help remind you whether to \( \times \) or \( \div \).

Put in order from smallest to largest, then draw an arrow up with \( \times \) 1000 beside it, and an arrow down with \( \div \) 1000 beside it.

\[ \begin{array}{c}
\text{nanograms} \downarrow \\
\div 1000 \\
\text{micrograms} \\
\text{milligrams} \\
\text{grams} \\
\text{kilograms} \\
\times 1000 \\
\text{milligrams to micrograms} = \times 1000 \\
\text{grams to kilograms} = \div 1000 \\
e.g. \text{568 milligrams to grams} = 568 \div 1000 \text{ (move 3 d.p. to left)}
\end{array} \]

Examples to try:

(a) 45 grams to kilograms
(b) 0.75 grams to milligrams
(c) 0.025 milligrams to micrograms
(d) 650mL to litres

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9. Fractions & Decimals

Learn the following fractions:

\[
\begin{align*}
1/10 &= 0.1 & \text{Therefore} & 6/10 &= 6 \times 0.1 = 0.6 \\
1/5 &= 0.2 & 4/5 &= 4 \times 0.2 = 0.8 \\
1/4 &= 0.25 & 3/4 &= 3 \times 0.25 = 0.75 \\
1/3 &= 0.33 & 2/3 &= 2 \times 0.33 = 0.66 \\
1/2 &= 0.5
\end{align*}
\]

2 of 250 = \frac{2 \times 250}{5} = \frac{500}{5} = 100

When rounding decimals to 1 decimal place, look at the second d.p. and if it is 5 or above then round up, if less than 5 then keep it the same.

For example: 1.274 = 1.3 1.234 = 1.2

When adding decimals, keep d.p. in the same place.
When multiplying decimals, count the number of d.p.’s in the question and apply the same to the answer.

Examples to try:
(a) Find 4/10 of 42
(b) Find ¾ of 420
(c) Find 1/3 of 39.6
(d) 3.333
(e) 0.657
(f) 23.97

Write questions d, e & f correct to 1 d.p.

10. Basic Drug Calculations

Use the following formula:

\[
\frac{\text{Dose required}}{\text{Dose available}} \times \frac{\text{Volume}}{1} = \text{e.g. 240 milligrams is prescribed. The stock dose is 120 milligrams/5mL}
\]

What volume would you give?

Examples to try:
(a) 6 milligrams is required. Stock is 10 milligrams/4mL. What volume is required?
(b) A patient required 10000 units. Stock is 25000 units/mL. What volume is required?

11. Percentages

- Always out of 100
- As a decimal, 0.10 = 10% 0.60 = 60% (use the hundredths column to determine value)

\[
30\% \text{ of } 150 = 30 \times \frac{150}{100} = \frac{4500}{10} = 45
\]

Examples to try:
(a) Work out 20% of 65
(b) A patient is to receive IV Fluids over 8 hours. What % would be administered after 6hrs?
(c) How long would it take to administer 50%?

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ANSWERS

1. Place Value
   (a) (i) 87.87  (b) (ii) 0.2  (c) (iii) 624.0

2. Times Tables
   (a) 72  (b) 84  (c) 54  (d) 28  (e) 55  (f) 24  (g) 132

3. Addition
   (a) 116.3  (b) 1575  (c) 1395

4. Multiplication
   (a) 197.5 milligrams  (b) 80 milligrams

5. Subtraction
   (a) 400 grams  (b) 0.775 kilograms

6. Division
   (a) 37.5  (b) 6  (c) 125

7. Combined
   (a) 400 milligrams  (b) 62.5 mL/hr

8. Converting Weights
   (a) 0.045 kilograms  (b) 750 milligrams  (c) 25 micrograms  (d) 0.65L

9. Fractions & Decimals
   (a) 16.8  (b) 315  (c) 13.2
   (d) 3.3  (e) 0.7  (f) 24.0

10. Basic Drug Calculations
    (a) 2.4mL  (b) 0.4mL

11. Percentages
    (a) 13  (b) 75%  (c) 4 hours

For more information please contact Tim Crawford on 028 9097 2874 or email lds@qub.ac.uk