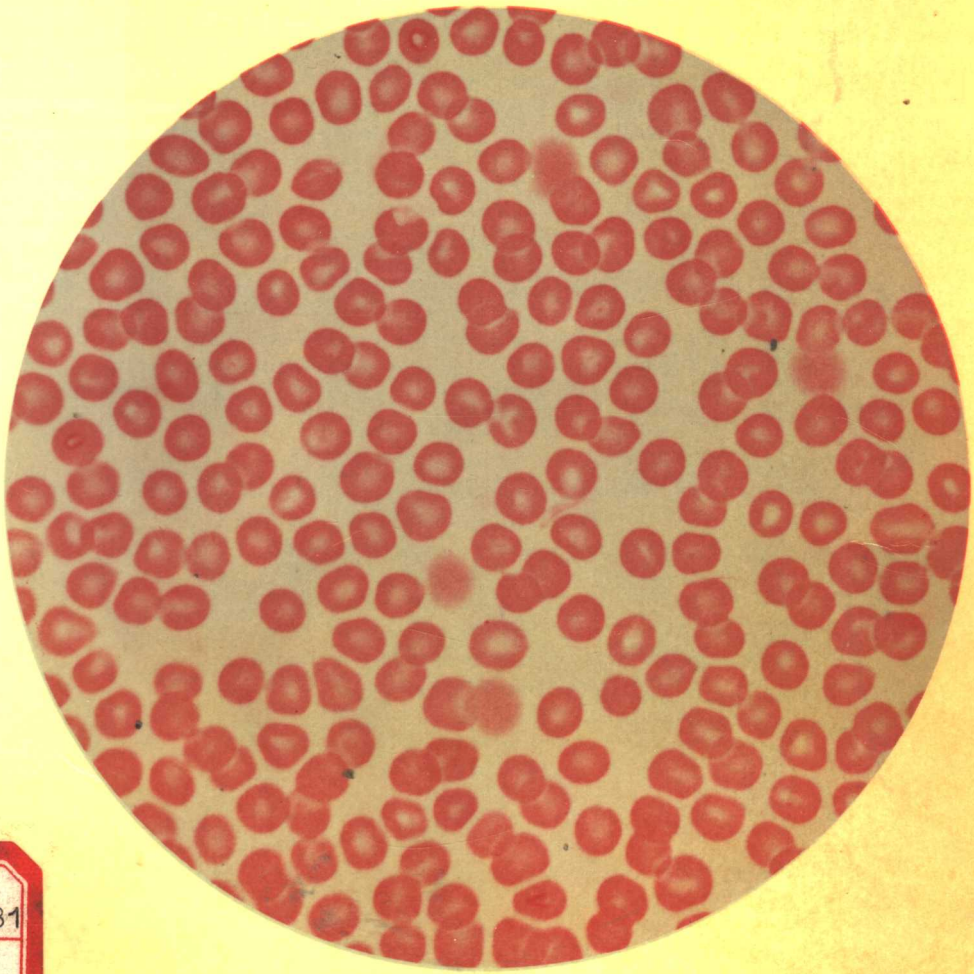
NUCLEUS

English for Science and Technology

MEDICINE

Tony O'Brien

with Jeffrey Jameson and David Kirwan



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ENGLISH FOR SCIENCE AND TECHNOLOGY

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Tony O'Brien
with
Jeffrey Jameson
and
David Kirwan

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T.O'B., J.J. and D.K.

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Contents

A Guide to Verbalisation

Numbers

285	two hundred and eighty five
3150	three thousand one hundred and fifty
5038	five thousand and thirty eight
36·3	thirty six point three
36·36	thirty six point three six
0	zero/nought
0·75	zero/nought point seven five
0·05	nought point nought five
$\frac{1}{3}$	a third (one third)
$\frac{1}{4}$	a quarter (one quarter)
$\frac{1}{2}$	a half
15/20	fifteen over twenty (fifteen twentieths)
$<0{\cdot}4$	less than nought point four
$>1{\cdot}0$	more than one point nought
11×10^9	eleven times ten to the power of nine (ten to the ninth)
c 70	about seventy
1:4	one to four

Others (see also Unit 4, ex.1)

37·2 °C	thirty seven point two degrees Centigrade
104 °F	a hundred and four degrees Fahrenheit
26·5%	twenty six point five per cent
120/80 mmHg	one twenty over eighty millimetres of mercury
mmol/l	millimoles per litre
ng	nanogram (a thousand millionth of a gram)
$11 \times 6 \times 3$	eleven by six by three
$C = \frac{1}{3}B$	C equals one third (of) B
H_2CO_3	/eɪtʃ tu: si: əʊ θri:/
$Na(HCO_3)_2$	/en eɪ eɪtʃ si: əʊ θri: tu:/

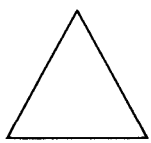
Years

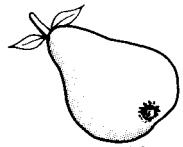
1900	nineteen hundred
1906	nineteen oh six
1984	nineteen eighty four

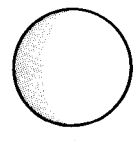
Unit 1 Shapes and Properties

Section 1 Presentation

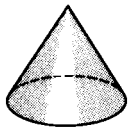
1. Look at these diagrams:


a triangle

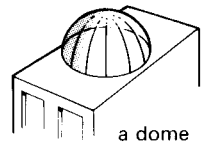

a pear

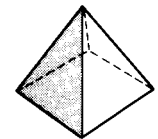

a sphere


a bean

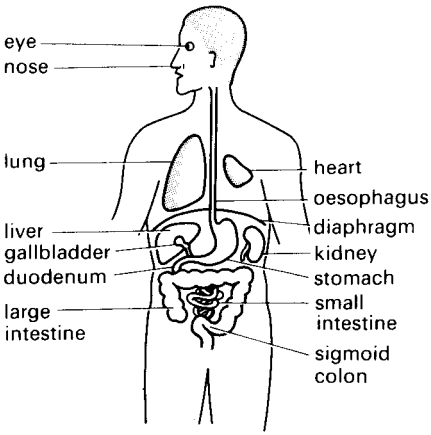

a cone


a tube


a dome


a pyramid

Now look at this diagram and complete the sentences:



Example: The heart *is shaped like* a cone.

a) The eye is shaped like .....
b) The diaphragm .....
c) The kidneys .....
d) The lungs .....
e) The gallbladder .....
f) The oesophagus .....
g) The liver .....
h) The nose .....

2. Look at this example:

The gallbladder is a *pear-shaped* organ.

Complete the sentences with *one* of these words:

kidneys oesophagus duodenum dome-shaped S-shaped

a) The diaphragm is a ..... organ.
b) The sigmoid colon is an ..... organ.
c) The ..... is a C-shaped tube.
d) The ..... are bean-shaped organs.

3. Make six sentences from this table:

The liver is	conical in shape.
The eye is	a long, tubular organ.
The nose is	triangular in shape.
The kidneys are	a small, spherical organ.
The heart is	pyramidal in shape.
The small intestine is	bean-shaped organs.

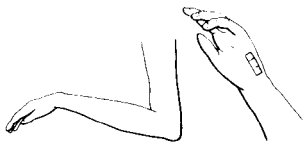
4. From exercises 1–3 find two ways of describing:

a) the heart; the eye; the liver
b) the kidneys; the gallbladder; the diaphragm

Now describe each of the following in two different ways:
c) the oesophagus; the lungs; the duodenum; the sigmoid colon; the small intestine

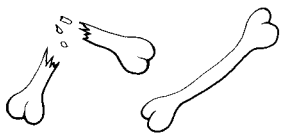
Section 2 Development

5. Look and read:

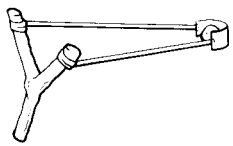


Elastoplast sticks to the skin.
It is *adhesive.*

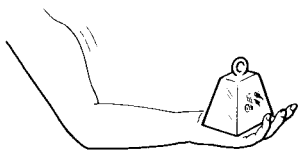
The skin can bend into many shapes.
It is *flexible.*



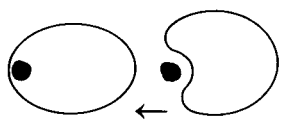
Bones cannot bend.
They are *rigid.*



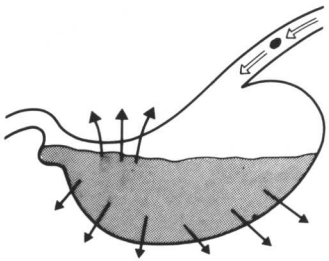
Some tissues can be stretched and then will return to their original shape.
They are *elastic.*



Some organs can stretch or contract by the use of muscles.
They are *muscular.*



Some cells can eat bacteria and destroy them.
They are *phagocytic.*



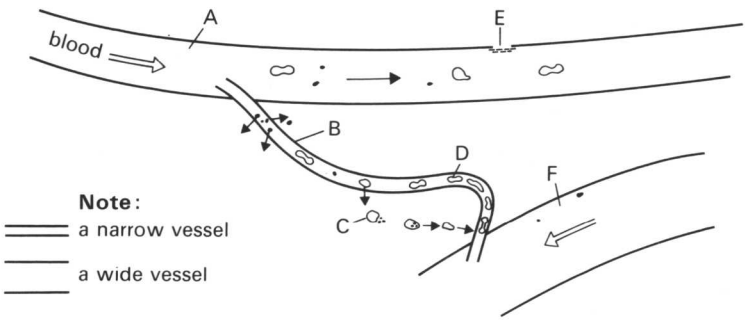
Some cells move around the tissues. They are *motile*.

They move like the amoeba: they have the property of *amoeboid* movement.

Food can pass through the walls of the stomach but not through the walls of the oesophagus.

The walls of the stomach are *permeable*, but the walls of the oesophagus are *impermeable*.

Now look at this diagram of blood vessels:



Complete these sentences and match them with A to F in the diagram:

a) Arteries are long, tubular blood vessels which can bend and stretch, i.e. they are ..... and .....
b) Some cells and molecules can pass through capillary walls. In other words capillaries are .....
c) Some white blood cells (leucocytes) can destroy bacteria, i.e. leucocytes are .....
d) Platelets are very small particles which stick together to stop bleeding, i.e. they are .....
e) Red blood cells (erythrocytes) can bend to get through narrow blood vessels and then spring back into shape. In other words erythrocytes .....
f) Blood cells cannot pass through artery walls. This means that arteries .....
g) Leucocytes can pass through capillary walls. This means that capillary walls are ..... to leucocytes.
h) The leucocytes can move around in the tissues, or, in other words, they .....
i) Veins are wide blood vessels with some muscle tissue in their walls, i.e. veins .....
j) Erythrocytes can not usually pass through capillary walls. In other words, capillary walls are usually .....

6. Using information from exercise 5, complete these tables:

	flexible	phagocytic	motile	adhesive
erythrocytes		×	×	×
leucocytes	√			
platelets	√	×	×	

	permeable	impermeable	muscular	elastic
arteries			√	
capillaries			×	×
veins		√		×

Read these:

Both erythrocytes *and* leucocytes are flexible.
Neither erythrocytes *nor* leucocytes are adhesive.

Leucocytes are phagocytic {*but* / *whereas*} erythrocytes are not.

Leucocytes are phagocytic. Erythrocytes, {*however* / *on the other hand*}, are not.

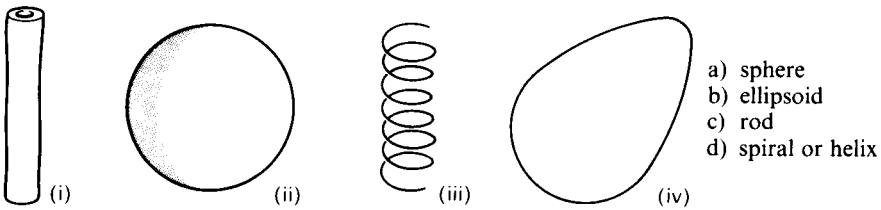
Leucocytes can pass through capillary walls, but veins are impermeable to leucocytes.

Complete these sentences:

a) Both arteries and ..... impermeable.
b) Arteries are elastic blood vessels but .....
c) Capillaries have very thin walls whereas ..... muscular walls.
d) Capillaries are permeable to ..... Erythrocytes, on the other hand, ...
e) Leucocytes can pass through the walls of capillaries. Arteries, however .....
f) Neither ..... are phagocytic.
g) Platelets are ..... erythrocytes are not.
h) ..... do not have the ..... of amoeboid movement. Leucocytes ..... can ..... tissues.
i) Skin is ..... Bone ..... is rigid.

Section 3 Reading

7. Read the passage and label these diagrams:



Bacteria

Bacteria are very small, unicellular organisms. Although there are thousands of different species of bacteria, the individual organisms have one of three general forms: ellipsoidal, or spherical; cylindrical or rod-like; and spiral or helicoidal.

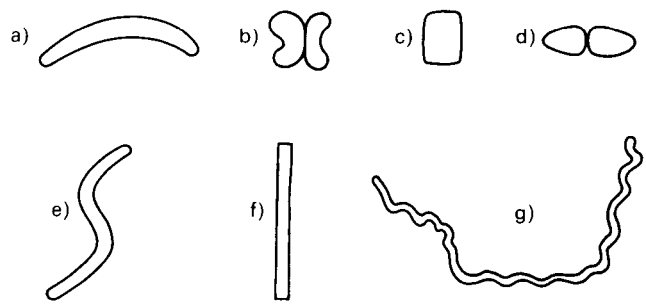
The first type are called *cocci* (singular, *coccus*). They are nearly all spherical or ellipsoidal, but there are some exceptions. The gonococcus and meningococcus, for example, are coffee-bean shaped (e.g. *Neisseria meningitidis*), while the pneumococcus is slightly elongated, so that one end tapers a little (e.g. *Diplococcus pneumoniae*, in which the ends of each pair of cells are bluntly pointed).

The cylindrical bacteria are known as *bacilli* (singular, *bacillus*). Some of these are long and slender (e.g. *Clostridium sporogenes*) while others are short and thick (e.g. *Bacillus megaterium*). The sides may be more or less parallel to each other or the cell may be thicker in the centre and taper toward the end.

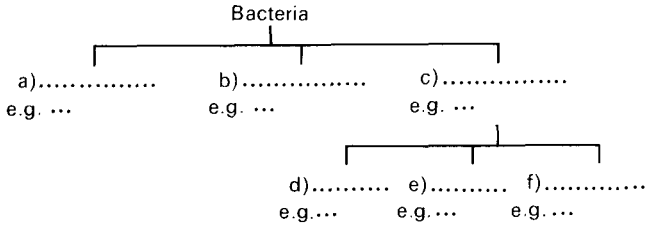
Spiral forms include rods with just enough curvature to give the organism a curved or comma shape (Vibrio), longer rigid rods with several curves or spirals (Spirillum) and long flexible organisms with several or many spirals (spirochaetes).

8. Read the passage again and label the following bacteria:

Diplococcus pneumoniae
Neisseria meningitidis
Clostridium sporogenes
Bacillus megaterium
Vibrio comma
Spirillum volutans
Spirochaeta stenostrepta

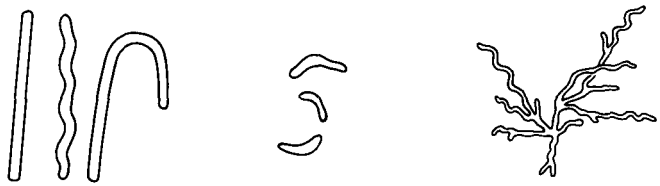


9. Summarise the types of bacteria mentioned in the passage by completing this classification diagram. Give an example of each type:



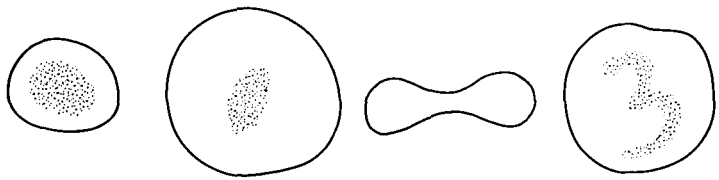
10. Look at these bacteria which have irregular shapes. Describe them.

a) *Saprospira sp.* b) *Caulobacter sp.* c) *Streptomyces sp.*



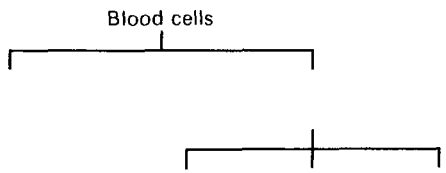
Section 4 Listening

11. Listen to the passage and label these diagrams:



erythrocytes
lymphocytes
polymorphonuclear leucocytes
monocytes

Now complete this classification diagram:



12. Listen to the passage again and choose the correct word(s) in these sentences:

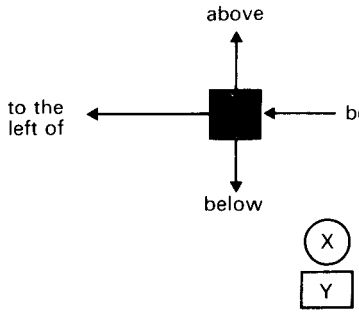
a) Erythrocytes are flexible/rigid and concave/convex.
b) Polymorphonuclear leucocytes are adhesive/phagocytic and amoeboid/elastic.
c) Monocytes are permeable/phagocytic.

13. Describe the four types of cells, using the diagrams in exercise 11 and the information in exercise 12 to help you:

Unit 2 Location

Section 1 Presentation

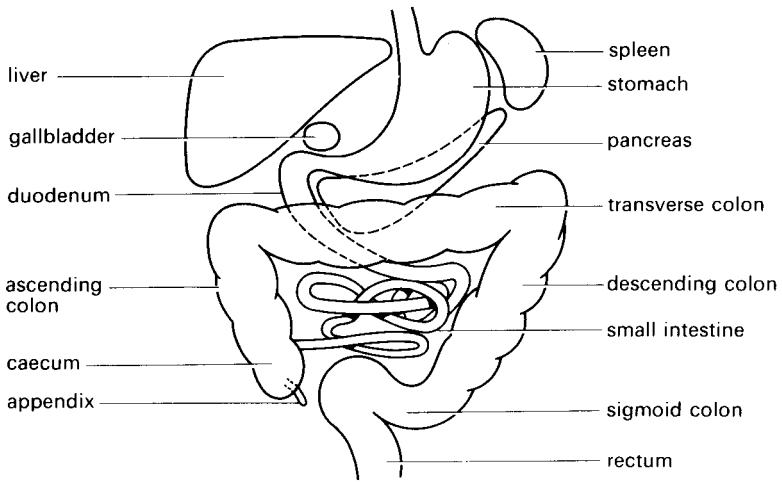
1. Look and read:



X { *lies* / *is located* / *is situated* } *above* Y.

Y *is located below* X.

Now complete the sentences below this diagram:

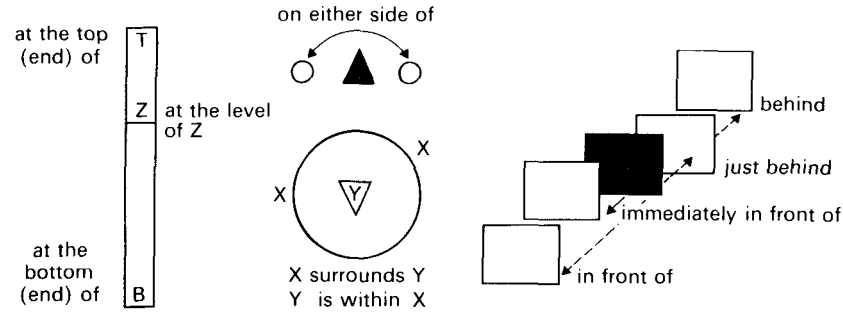


N.B. RIGHT (of the body) LEFT

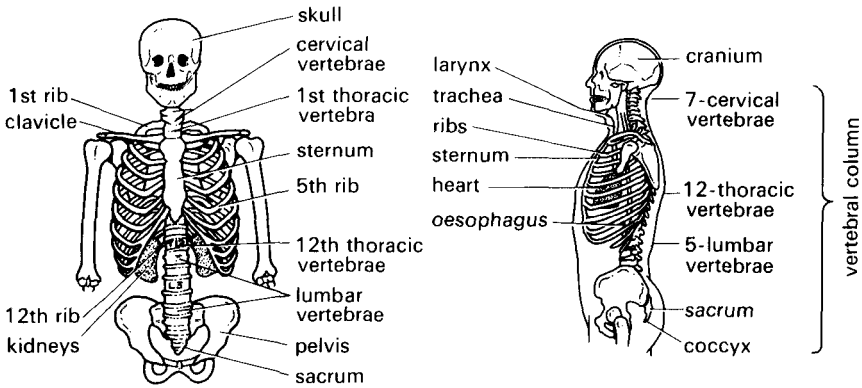
Some organs of the abdomen

a) The stomach lies between the liver and .....
b) ..... is situated above the descending colon.
c) The small intestine is located between ..... and .....
d) ..... is to the right of the spleen.
e) The transverse colon lies ..... the stomach.
f) The stomach is ..... the liver.
g) The liver is ..... the ascending colon.
h) The pancreas is located to the left of .....
i) ..... is situated below the small intestine.
j) The gallbladder lies below ..... and ..... the duodenum.

2. Look and read:



Now complete the sentences below these diagrams:



The skeleton (from the front) The skeleton (from the left side)

a) The heart is situated immediately behind .....
b) ..... lies just in front of the vertebral column.
c) The cervical vertebrae are located at the top end of .....
d) ..... are situated at the bottom end of the vertebral column.
e) ..... lie on either side of the vertebral column.
f) The top of the right kidney is at the level of .....
g) The ribs ..... the heart.

3. Read this example:

sternum – heart

Q. Where *does* the sternum *lie* / Where *is* the sternum *located* } *in relation to* the heart?

A. The sternum lies *just in front of* the heart.

Ask and answer similar questions:

a) sacrum – coccyx
b) rectum – large intestine
c) vertebral column – heart
d) larynx – vertebral column and trachea
e) top of left kidney – 11th rib
f) liver – diaphragm and stomach
g) lungs – ribs
h) duodenum – liver, transverse colon and pancreas

4. Name the organs described here:

a) This is a triangular organ which lies immediately in front of the oesophagus at the level of the 4th to 6th cervical vertebrae.
b) This is a short, curved tube which is located immediately behind and below a wide tubular section of the intestine.
c) This is a flexible organ which lies in the middle of the abdomen just below and behind the stomach, and tapers up to the left.
d) This is a wide tubular section of the intestine which is situated at the bottom end of the ascending colon.

Section 2 Development

5. Read this:

In the study of anatomy many special words and phrases are used to describe the location and position of parts of the body. These terms always refer to a person in the anatomic position.

A person who is standing, facing forward, with arms at the sides and palms turned forward, is in the *anatomic position.*

A *coronal* (or *frontal*) *plane* passes through the body from top to bottom and divides it into front and back sections.

Anterior (or *ventral*) / *Posterior* (or *dorsal*) } means nearer the { *front.* / *back.*

Example: The heart is posterior to the sternum.
a) The heart is anterior to .....