

*Sindhu Mathai - PhD project on*  
*“Visual and Verbal literacies in the context of human body systems”*  
*Questionnaires, coding schemes, analysis and results*

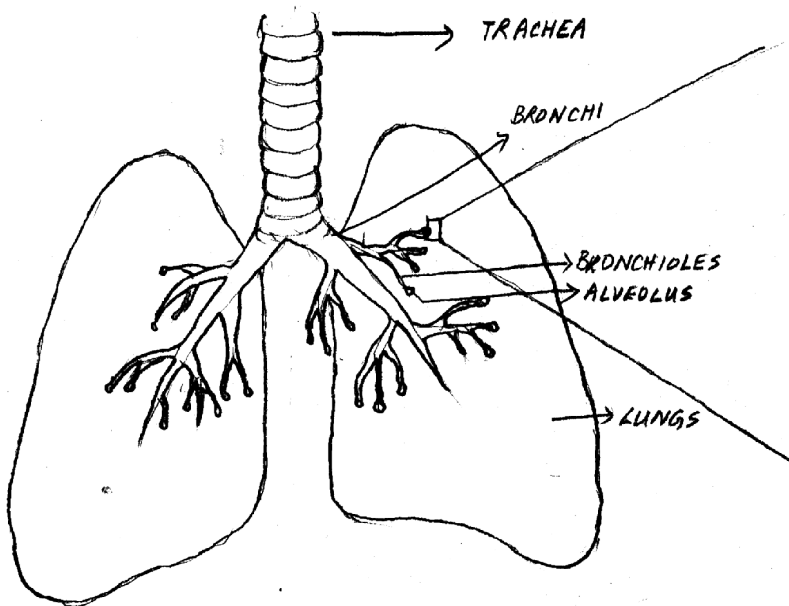
**Respiratory system: Phase 2, Part 3 questionnaire with scores assignation**

Mean scores were calculated by aggregating individual scores for every question. Diagrams have been adapted from (simplified and converted into black and white line drawings) from: Broderick, M. (Ed.) (1994). The Human Body. Time Life's Illustrated World of Science. Hong Kong: Time Life Inc.

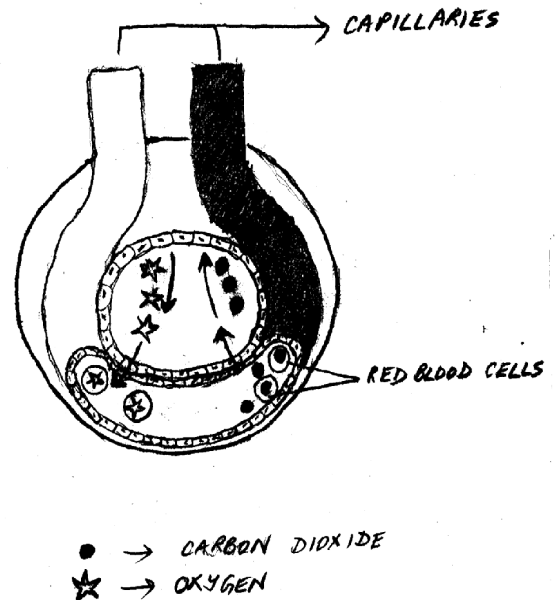
**Task 1**

Go through the diagrams (Fig. 1, 2 and 3) carefully and answer the questions given below them.

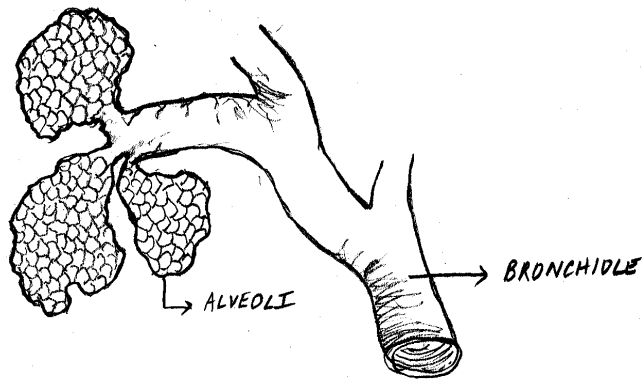
**Fig 1** The trachea, bronchi, bronchioles, alveoli and the lungs



**Fig 2** Exchange of gases between an alveolus and a blood capillary



**Fig 3** An enlarged bronchiole showing the alveoli



**Questions**

1a. Fill up the table given below using the information given in Fig. 1, 2 and 3. Use more paper if you wish (15)

<b>Organ</b>	<b>Its location in the respiratory system</b>	<b>Its structure (its appearance, similarity to a familiar everyday object or geometric shape, etc.)</b>	<b>Its role or function in the respiratory system</b>
Trachea			
Bronchi			
Bronchioles			
Alveoli			
Lungs			

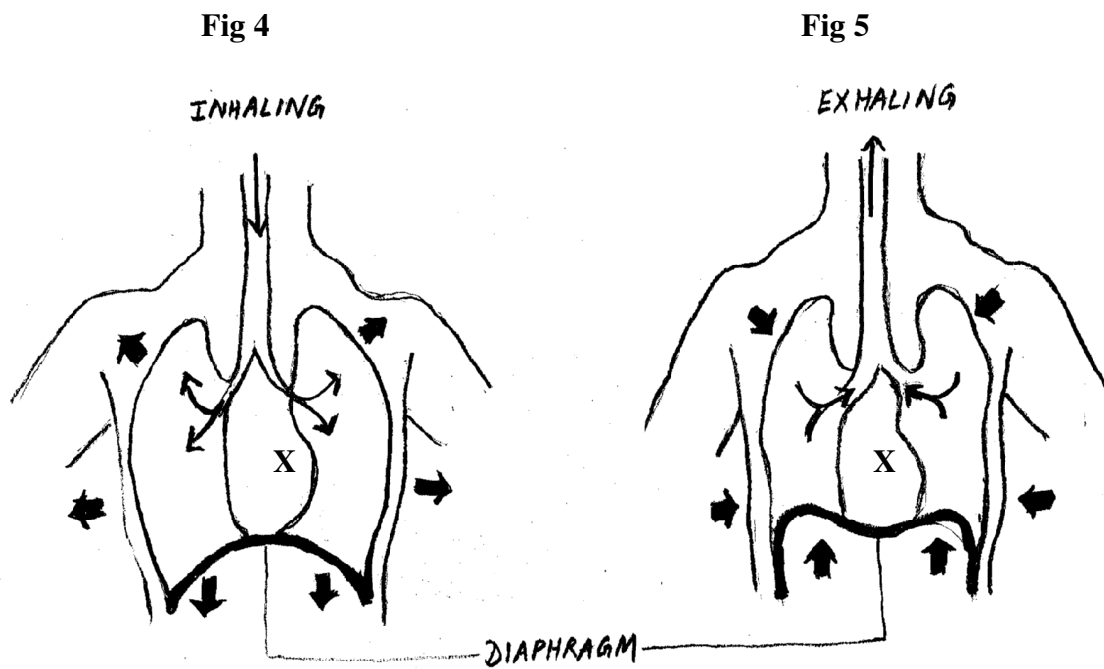
Fig.2 shows an enlarged alveolus, with its cross-section showing the exchange of gases between a capillary and an alveolus. From the figure:

- 1b. What do you understand by the term “exchange of gases”? (1)
- 1c. What is a capillary? Why is it present in the alveolus? (1)
- 1d. Where is the Oxygen shown in the figure coming from? Where is it going to? (2)
- 1e. Where is the Carbon-dioxide coming from? Where is it going to? (2)

(continued on next page)

**Task 2**

Fig. 4 and Fig. 5 show the processes of inhalation and exhalation.



2a. What are the changes that take place during both the processes. Use the table below for your answers. Use more paper if you wish (4).

Organ	Changes that happen while breathing in (inhalation)	Changes that happen while breathing out (exhalation)
Lungs		

Diaphragm		
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2b. Why do you think there is a curved region in the lower part of the left lung in both Fig. 4 and Fig. 5 (the region marked 'X')? (1)

### Respiratory system Part 3

#### Nature of questions and criteria for expected responses

Q No	Mean Score	Max score	Nature of question	Criteria for expected responses
1a	0.74	15	location, structure and function of organs in the respiratory system	structure can be read off from diagram, others from prior knowledge
1d	0.54	2	role of Oxygen	prior knowledge
1b	0.48	1	meaning of term 'exchange of gases'	some inferencing from figure, can be read off from diagram
1e	0.45	2	role of Carbon dioxide	prior knowledge
2a	0.45	4	changes during inhalation, exhalation	can be comprehended from diagram, but also known from prior knowledge
2b	0.28	1	position of heart	read off from diagram
1c	0.19	2	what is a capillary?	prior knowledge

#### Mean scores and Standard deviations for passages in Part 3 of the respiratory system

Passage no.	Mean score	Standard deviation
Passage 1	0.48	0.26
Passage 2	0.37	0.28

#### Wilcoxon's tests between mean scores across passages in Part 3 of the respiratory system

Tests done between	Z scores	Significance level
<b>Part 3</b>		
passage 1 and 2 (total scores)	-3.004	0.003