








KS3: Year 8 - Digestion & Breathing

Balanced Diet

Nutrient	Found in	Used for
Carbohydrates	 Bread, potatoes, cereals	Energy
Proteins	 Meat, eggs, fish	Growth & repair
Lipids (fats & oils)	 Butter, cooking oil, cream	Energy (if run out of carbohydrates)
Vitamins eg. Vitamin A, Vitamin C	 Vegetables, fruit, cereals	Good health
Minerals eg. Calcium, iron	For example: • calcium is found in milk, • iron is found in meat. 	Eg. Calcium - bones & teeth eg. Iron - blood
Fibre	 Vegetables, fruit, cereals	Helps food move through digestive system
Water	 Drinks, watery foods like soup	Chemical reactions

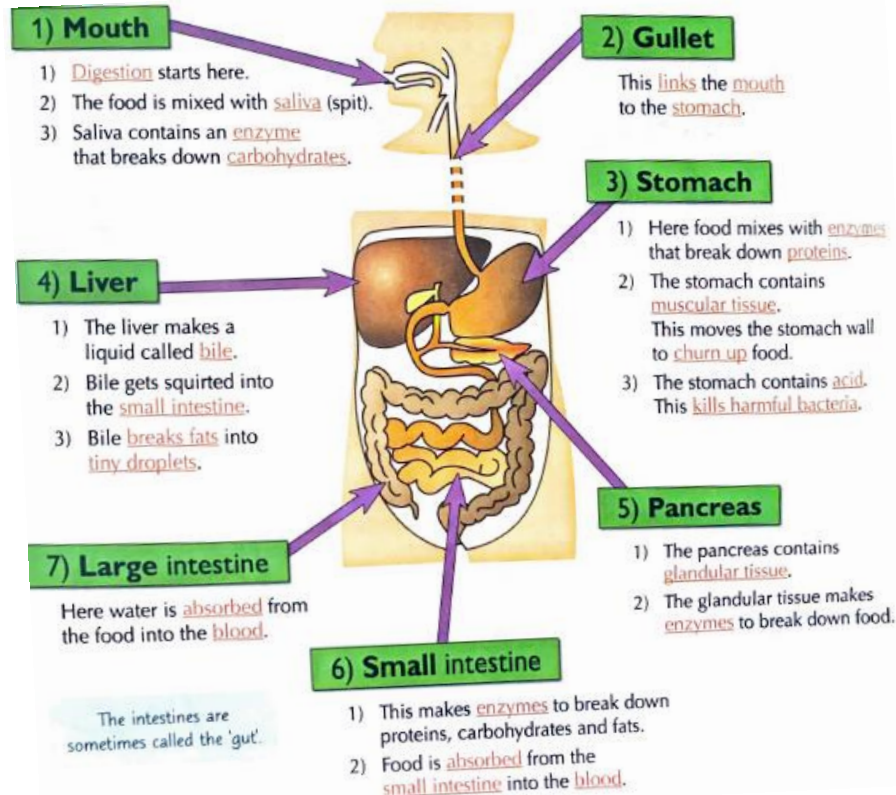
Unbalanced Diet

Obesity - If you take in more energy than you need you put on weight - can lead to health problems eg. Heart disease, diabetes

Starvation - When you don't get enough to eat - can cause slow growth in children

Deficiency Diseases - When people don't get enough vitamins or minerals - eg. Lack of Vitamin C causes scurvy that damages skin and gums

Digestion



Mechanical - eg. chewing, stomach churning
Chemical - uses enzymes to speed up chemical reactions

Absorption

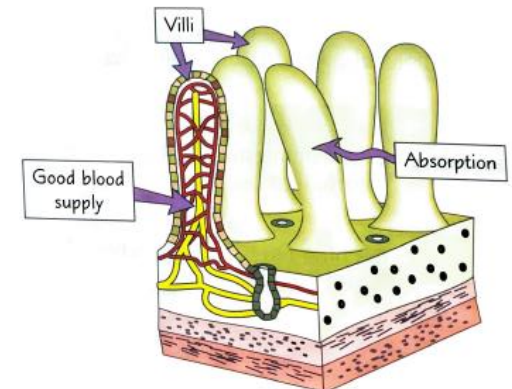
1. Big food molecules cannot fit through the small intestine wall
2. **Enzymes** break up the big molecules into small molecules
3. The small molecules pass through the small intestine wall into the blood
4. They travel round the body to where they are needed

Adaptations of Small Intestine

The small intestine is lined with finger-like projections called villi

They are perfect for absorbing food because they have:

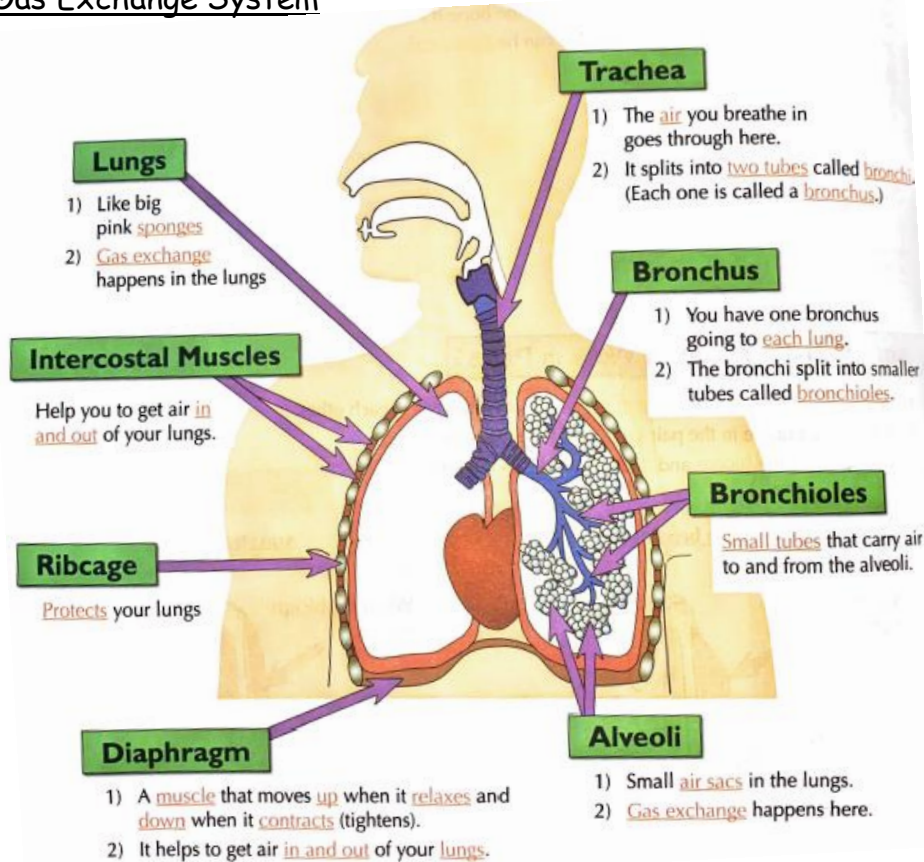
- Thin outer layer of cells
- Good blood supply
- Large surface area



Level 4-5	Level 5-6	Level 7+
1. What are carbohydrates used for in the body?	1. What problems can be caused by obesity?	1. How are nutrients absorbed into the blood stream?
2. What is protein used for in the body?	2. Which nutrients are needed in the diet to provide energy?	2. Explain how mechanical and chemical digestion occurs in the mouth
3. What is obesity?	3. How is the small intestine adapted to absorb nutrients?	3. Why is it important to eat a balanced diet?
4. What disease is caused by a lack of vitamin C?	4. What happens to food in the small intestine?	4. What is the role of bile in the digestive system?
5. Give two ways in which the small intestine is adapted to absorb nutrients.	5. What is scurvy?	5. How do enzymes help break down food molecules?
6. What happens in the large intestine?	6. Why is fibre important in the diet?	6. Why do foods we eat need to be digested?
7. What happens in the stomach?	7. What types of foods contain carbohydrates?	7. Make a list of the parts of the digestive system that food passes through, in order.
8. What is mechanical digestion?	8. Why is calcium important in the diet?	8. What happens if you do not eat a balanced diet on a regular basis?
9. What does saliva contain?	9. What is the role of the pancreas?	9. Where do different types of enzymes act in the digestive system?
10. What are the projections called in the small intestine?	10. What does bile do?	10. Why does the stomach contain a strong acid?

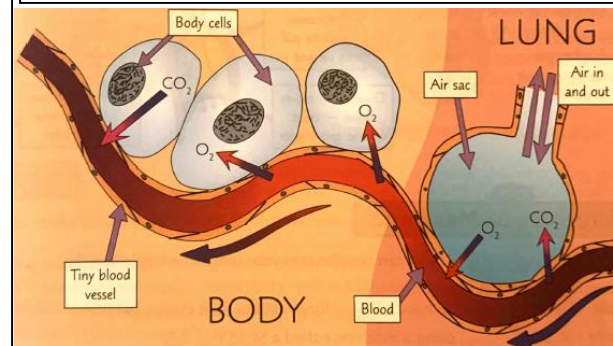
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Gas Exchange System



Gas Exchange & The Lungs

1. Your body needs oxygen for respiration
2. It also needs to get rid of carbon dioxide (a waste product of respiration)
3. Oxygen is found in the air
4. Air is breathed into the lungs
5. Oxygen moves from the air into the blood in the lungs
6. Carbon dioxide moves out of the blood. It is then breathed out.
7. This is gas exchange



Adaptations

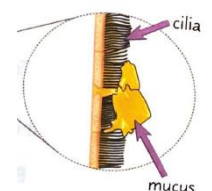
- They are moist
- They have a good blood supply
- The alveoli (air sacs) give the lungs a large surface area

Exercise

When you exercise you breathe faster and more deeply
 This delivers more oxygen to your muscles for respiration
 It also removes more carbon dioxide

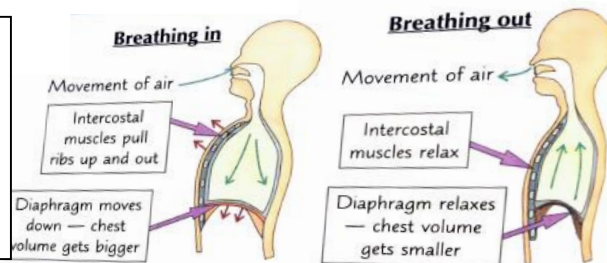
Smoking

Tar in cigarette smoke covers the cilia (little hairs) in your airways
 Cilia normally move mucus out of your airways
 Damaged cilia cannot do this properly.
 Mucus sticks in your airways and makes you cough more



Breathing

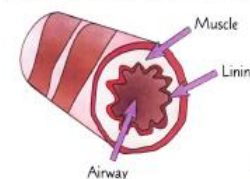
Volume increases →
 Pressure decreases
 → Air rushes in



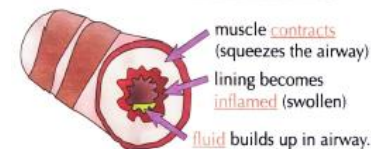
Volume decreases →
 Pressure increases →
 Air rushes out

Asthma

A bronchiole BEFORE asthma attack



A bronchiole DURING asthma attack



These changes make it hard to breathe.

Level 4-5	Level 5-6	Level 7+
1. What is the diaphragm?	1. How are the lungs adapted for gas exchange?	1. Make a list of the parts of the lungs that air passes through, in order.
2. Where does gas exchange happen in the lungs?	2. What happens to the pressure in the lungs when you breathe out?	2. How does smoking cigarettes make you cough?
3. How are gases transported around the body?	3. What do cilia do in the airways?	3. Explain what happens when you breath in.
4. What are cilia?	4. How is the bronchiole different during an asthma attack compared to normal?	4. What does our breathing rate increase when we exercise?
5. What does the ribcage do?	5. What does tar in cigarettes do to the lungs?	5. Why does someone having an asthma attack find it difficult to breathe?
6. What is the trachea?	6. What happens to the diaphragm when you breathe in?	6. Explain what is meant by gas exchange.
7. Which gas moves out of the blood into the lungs?	7. Where does the carbon dioxide come from in the blood?	7. How does someone's lifestyle affect how efficient their lungs are?
8. What happens to the volume of the lungs when we breathe in?	8. What happens to our breathing when we exercise?	8. How is carbon dioxide removed from the blood?
9. What is the singular of 'bronchi'?	9. Why are alveoli important in breathing?	9. How do muscles help us to breathe?
10. What tube does air first pass through when you breathe in?	10. Why do we need oxygen?	10. How are the alveoli in the lungs and the villi in the small intestine similar?