

# FORM TWO

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## 3rd Term SCIENCE EXAM

FORM 2A

澳門慈幼中學 INSTITUTO SALESIANO

姓名：\_\_\_\_\_ 班級：\_\_\_\_\_ 學號：\_\_\_\_\_

20 **15** ~ 20 **16**

澳門慈幼中學

第 **3** 段考/Term Exam

INSTITUTO SALESIANO MACAU

成績/Marks: \_\_\_\_\_

姓名/Name: \_\_\_\_\_

班級/Class: **F2ABCDE**

學號/No: \_\_\_\_\_

日期/Date: **2016-06-17**科目/Subject: **Science**時限/Time: **50 Min**老師/Teacher: **Ms. Ng. Mr. Yip. Mr. Ao**

座標紙/Graph Paper( ) 原稿紙/ manuscript paper ( ) 單行紙/Ans\_sheet ( ) 則紙/Drawing Paper( ) 計算機/Calculator ( ) 聖經/Bible( ) 原卷作答( ) 其他 \_\_\_\_\_

## A. Vocabulary

Chapter 29		Acids and corrosion	
1. Calcium carbonate	碳酸鈣	2. Corrode	腐蝕
3. Marble	大理石	4. Limestone	石灰石
5. Acid rain	酸雨		

Chapter 30		Uses of acids, alkalis and neutralisation	
1. Food preservative	食品防腐劑	2. Micro-organism	微生物
3. Pickle	醃製	4. Enzyme	酶
5. Neutralise	中和	6. Neutralisation	中和作用
7. Word equation	文字方程式	8. Chemical symbol	化學符號
9. Antacid	制酸劑	10. Electroplating	電鍍
11. Dyeing	漂染	12. Slaked lime	熟石灰

Chapter 31		Senses and sight	
1. Stimulus	刺激	2. Sense organ	感覺器官
3. Receptor	感受器	4. Nerve	神經
5. Sense	感覺	6. Eyelid	眼瞼
7. Eyelash	眼睫毛	8. Eyebrow	眼眉
9. Orbit	眼窩	10. Optic nerve	視神經
11. Cornea	角膜	12. Iris	虹膜
13. Lens	晶狀體	14. Retina	視網膜
15. Sclera	鞏膜	16. Pupil	瞳孔
17. Jelly-like fluid	玻璃狀液	18. Blind spot	盲點
19. Light-sensitive cell	感光細胞	20. Convex lens	凸透鏡
21. Elastic	彈性的	22. Cone cell	視錐細胞
23. Rod cell	視桿細胞	24. Colour vision	色覺
25. Limitation	限制	26. Short sight	近視
27. Long sight	遠視	28. Cataract	白內障

29. Astigmatism	散光	30. Colour blindness	色盲
31. Concave lens	凹透鏡	32. Convex lens	凸透鏡

Chapter 32		Hearing	
1. Vibration	振動	2. Medium	介質
3. Stethoscope	聽診器	4. Outer ear	外耳
5. Middle ear	中耳	6. Inner ear	內耳
7. Eardrum	耳膜	8. Ear canal	聽道
9. Ear bone	聽骨	10. Auditory nerve	聽神經
11. Pinna	耳殼	12. Cochlea	耳蝸
13. Frequency	頻率	14. Hertz	赫茲
15. Audible frequency range	聽頻範圍	16. Ultrasound	超聲波
17. Noise	噪音	18. Decibel meter	分貝計
19. Decibel	分貝	20. Noise pollution	噪音污染

Chapter 33		Senses of touch, smell and taste	
1. Smell receptor	嗅覺感受器	2. Taste bud	味蕾
3. Taste receptor	味覺感受器	4. Saliva	唾液

Chapter 34		The brain and our senses	
1. Response	反應	2. Cerebrum	大腦
3. Medulla	延髓	4. Cerebellum	小腦
5. Reaction time	反應時間	6. Illusion	錯覺
7. Drug	藥物	8. Alcohol	酒精
9. Abuse	濫用	10. Solvent	溶劑
11. Breath test	呼氣測試	12. Breathalyser	酒精測試機
13. Addictive	上癮的	14. Addiction	上癮
15. Dichromate solution	重鉻酸鹽溶液	16. Drug abuse	濫用藥物
17. Drug addict	癮君子	18. Overdose	用藥過量
19. Thinner	天拿水	20. Irritate	刺激

## B. Questions

### 1. Describe how Sulphur dioxide and nitrogen oxides are produced respectively.

Ans: The burning of fossil fuels causes Sulphur to react with oxygen, forming Sulphur dioxide. The high temperature inside the vehicle engines causes nitrogen and oxygen in the air to react, producing nitrogen oxides.

### 2. State the effects of acid rain on the environment.

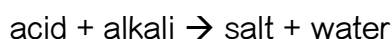
Ans : (1) Corroding metal objects and building materials.

(2) Killing organisms living in water.

(3) Damaging plants.

### 3. What is neutralization and its word equation?

Ans: Acids and alkalis react with each other when they are mixed together. This reaction is called neutralization. It can be represented by the following word equation:



### 4. State the uses of neutralization.

Ans: (1) Neutralization of stomach acid.

(2) Treatment of industrial waste containing acids and alkalis.

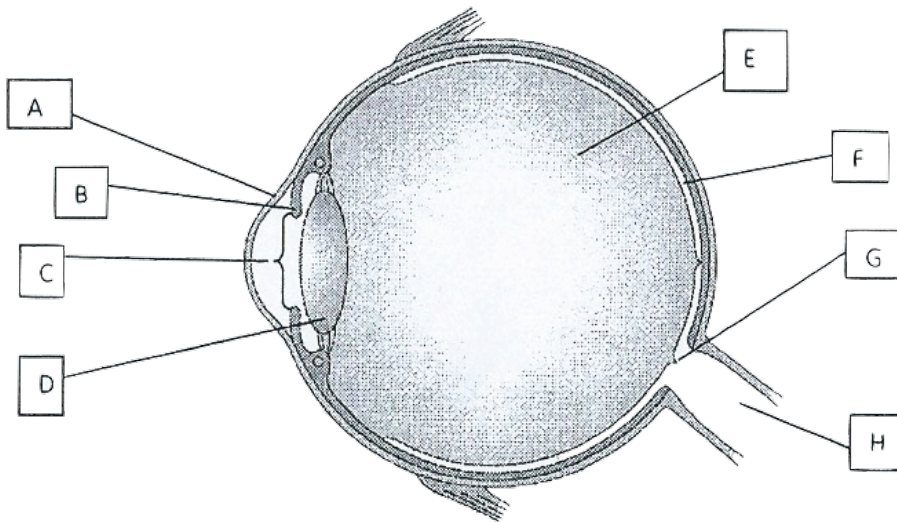
(3) Treatment of insect stings.

(4) Regulation of pH values of soil.

### 5. Sketch a table to summarize the stimuli detected by our sense organs and the corresponding senses produced.

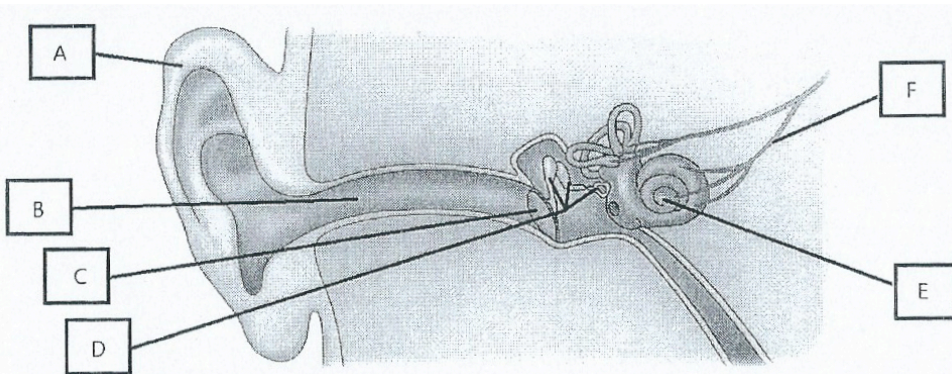
Sense organ	Stimuli detected	Sense
Eye	Light	Sight
Ear	Sound	Hearing
Nose	Smells	Smell
Tongue	Flavours	Taste
Skin	Touch, temperature, pressure and pain	Touch

6. Write down the structure and its function for the different parts of the eye.



A. Cornea	Helps focus light
B. Iris	Controls the size of the pupil
C. Pupil	Allows light to enter the eye
D. Lens	Helps focus light
E. Jelly-like fluid	<ul style="list-style-type: none"> <li>● Maintains the shape of the eyeball</li> <li>● Helps focus the light</li> </ul>
F. Retina	Contains light-sensitive cells
G. Blind spot	<ul style="list-style-type: none"> <li>● Where the optic nerve leaves the eyeball</li> <li>● Contains no light-sensitive cells</li> </ul>
H. Optic nerve	Transmits messages to the brain

7. Write down the name and its function for each of the different parts of the ear.



A. Pinna	Collects sound waves.
B. Ear canal	Transmits sound waves.
C. Eardrum	Changes sound waves into vibrations.
D. Ear bones	Magnify and transmit the vibrations.

E. Cochlea	Changes vibrations into messages.
F. Auditory nerve	Sends messages to the brain.

### 8. What is noise? How does noise affect us?

Ans: Noise is any sound that is unwanted, disturbing, or so loud that it can cause damage to our ears. Noise can damage our ears and cause hearing loss. Long-term exposure to noise may also cause mental stress.

### 9. What is the use of skin? What kinds of stimuli can skin detect?

Ans: Skin is the protective covering of our body. In the skin, there are different kinds of receptors that can detect touch, heat, cold, pressure and pain.

### 10. What are the functions of cerebrum, cerebellum and medulla?

Cerebrum	<ul style="list-style-type: none"> <li>● Interprets the messages from sense organs.</li> <li>● Sends messages to the muscles to make responses.</li> <li>● Responsible for intelligence, memory and thinking.</li> </ul>
Cerebellum	<ul style="list-style-type: none"> <li>● Coordinates muscles to produce body movements.</li> <li>● Maintains the balance of the body.</li> </ul>
Medulla	<ul style="list-style-type: none"> <li>● Controls heartbeat, breathing and blood pressure.</li> </ul>

### C. Fill in the blanks — Textbook

1. Acids react with some metals. During the reaction, hydrogen is produced.
2. Building materials such as marble and limestone contain calcium carbonate, which reacts with acids. Carbon dioxide is formed during the reaction.
3. Burning fossil fuels produces sulphur dioxide and nitrogen oxides. These acidic gases react with water and oxygen in the atmosphere to form acids.
4. We should help reduce the emission of sulphur dioxide and nitrogen oxides in order to control acid rain.
5. Hydrochloric acid + sodium hydroxide → sodium chloride (table salt) + water
6. When an acid neutralises an alkali (or vice versa), salt and water are formed, and heat is given out.

7. To dilute a concentrated acid or alkali, always add acid or alkali slowly into a large amount of water and stir the solution continuously during dilution.
8. To ability to detect and respond to stimuli is important for the survival of living things.
9. Humans detect stimuli with five sense organ: the eyes, ears, nose, tongue and skin.
10. The iris controls the size of the pupil, which in turn controls the amount of light entering the eye.
11. When we look at an object, the light from the object enters the eye. The cornea, the lens and the jelly-like fluid help focusing the light into the retina. Light-sensitive cells on the retina are stimulated and send messages to the brain through the optic nerve. The brain the interprets the messages to produce sight.
12. When we look at near object, the focusing muscles contract and the lens becomes thicker.
13. When we look at distant object, the focusing muscles relax and the lens becomes thinner.
14. There are limitations of our eyes. We cannot see objects that are too small, too close or too far away.
15. People with short sight cannot see distant objects clearly because the images of the distant objects are formed in front of the retina. Short sight can be corrected by wearing glasses with concave lens.
16. People with long sight cannot see near objects clearly because the images of the near objects would be formed behind the retina of the retina. Long sight can be corrected by wearing glasses with convex lens.
17. Sound is produced by vibrations of objects.
18. Sound must travel through a medium. The medium can be a gas, a liquid or a solid.
19. Frequency is the number of vibration per second. The unit of frequency is hertz (Hz).
20. There are limitations to our ears. We can hear sound only within a certain range of frequencies.
21. Different animals have different audible frequency ranges.
22. The loudness of a sound is indicated by its sound level. Sound level is measured in decibel (dB). It can be measured by using a decibel meter.
23. Long-term exposure to noise may cause mental stress and hearing loss.
24. The touch receptors of the skin are not evenly distributed. Different parts of the skin have different sensitivities to touch.
25. Our skin is not always reliable in detecting hot and cold.
26. The flavour of food is detected by both our senses of smell and taste.
27. The brain receives messages from the sense organs. After interpreting the messages, it sends messages to the muscles to make responses.
28. The brain is made up of three main parts: the cerebrum, the cerebellum and the medulla.

29. Reaction time is the time between detecting a stimulus and making a response. It varies from person to person.
30. Reaction time can be improved by training.
31. When the brain interprets messages incorrectly, illusions may result.
32. Drinking alcohol, abusing drugs and sniffing solvents can affect our senses. They cause harm to our body and may even lead to death.

D. Fill in the blanks - Workbook

1. The sense organs produce messages and the messages are sent to the brain through nerves. The messages are interpreted in the brain to produce the sensations we experience. The brain then sends messages to muscles to make a response.
2. Sometimes the brain interprets the messages received wrongly. This may result in an illusion.
3. Acid can be used as food preservatives to prevent food from spoiling.
4. Vinegar can be used to preserve cucumbers and scallions. We say that these foods are pickled with vinegar.
5. The browning of fruits is speeded up by the enzymes inside the fruits. We can slow down the browning process by putting the fruits in environments with suitable pH value.
6. Most Household cleansing agents contain acids or alkalis which can remove stains and greases respectively.
7. Human have five sense organs. They are the eyes, nose, tongue and skin.
8. When the receptor of our sense organs detect a stimulus, they send messages to the brain through nerves and a sense is produced.
9. The sclera is a tough structure for protecting the eyeball/
10. The jelly-like fluid inside the eyeball maintains the shape of the eyeball and also helps focus light.
11. When the light-sensitive cells on the retina are stimulated by light, they produce messages which are then sent to the brain through the optic nerve.
12. There are two kinds of light-sensitive cells on the retina. Cone cells are responsible for colour vision and rod cells are responsible for black and white vision.



E. Tests for substances:

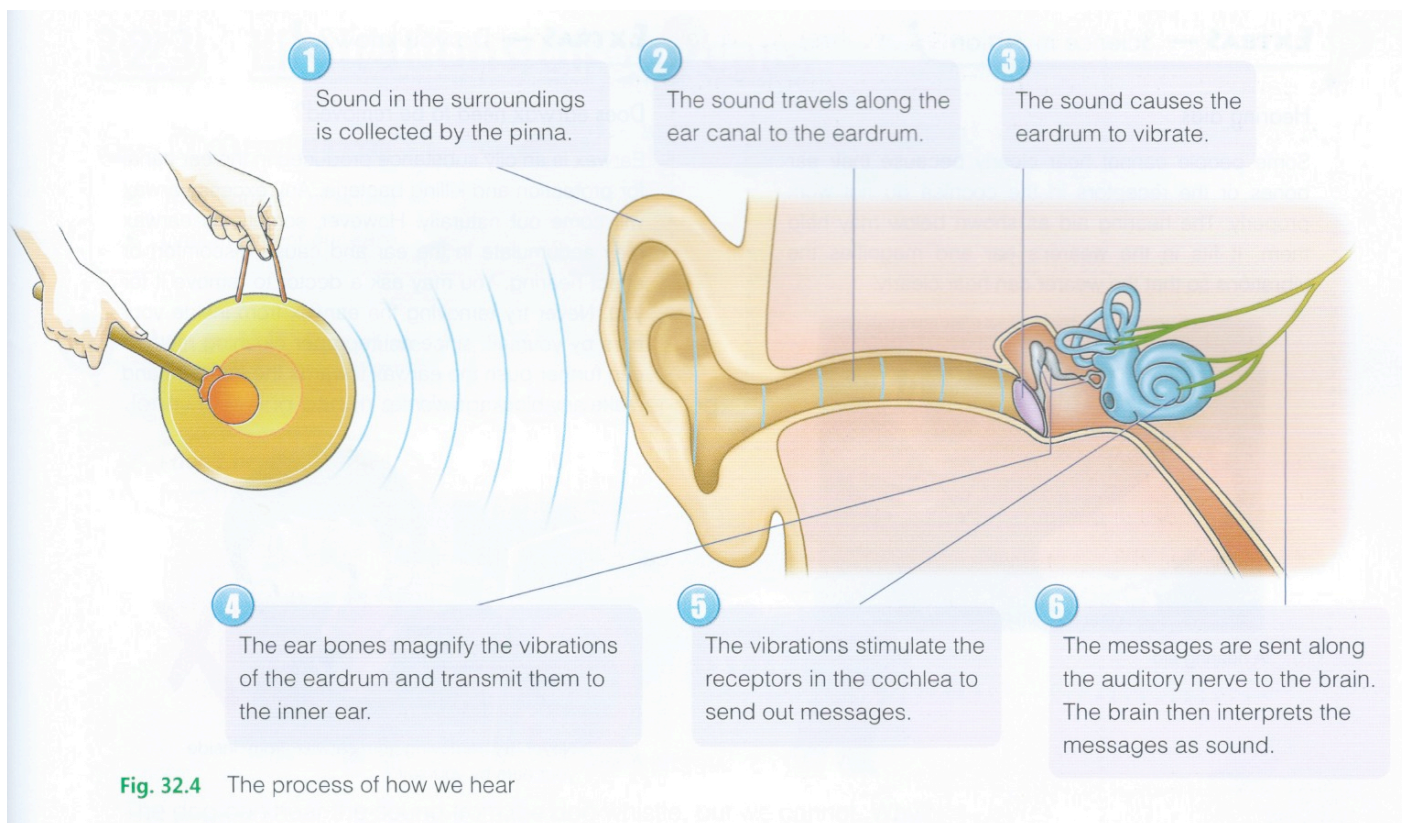
Substance	Testing material	Result of the light
Oxygen	Glowing splint	It relights
Carbon dioxide	Limewater	It relights
Hydrogen	Limewater	It turns from colourless to milky
Water vapour	Dry cobalt chloride paper	It changes from blue to pink
Starch	Iodine solution	It changes from brown to deep blue
Acid	Blue litmus paper	It turns from blue to red
Alkali	Red litmus paper	It turns from red to blue

F. Word equations

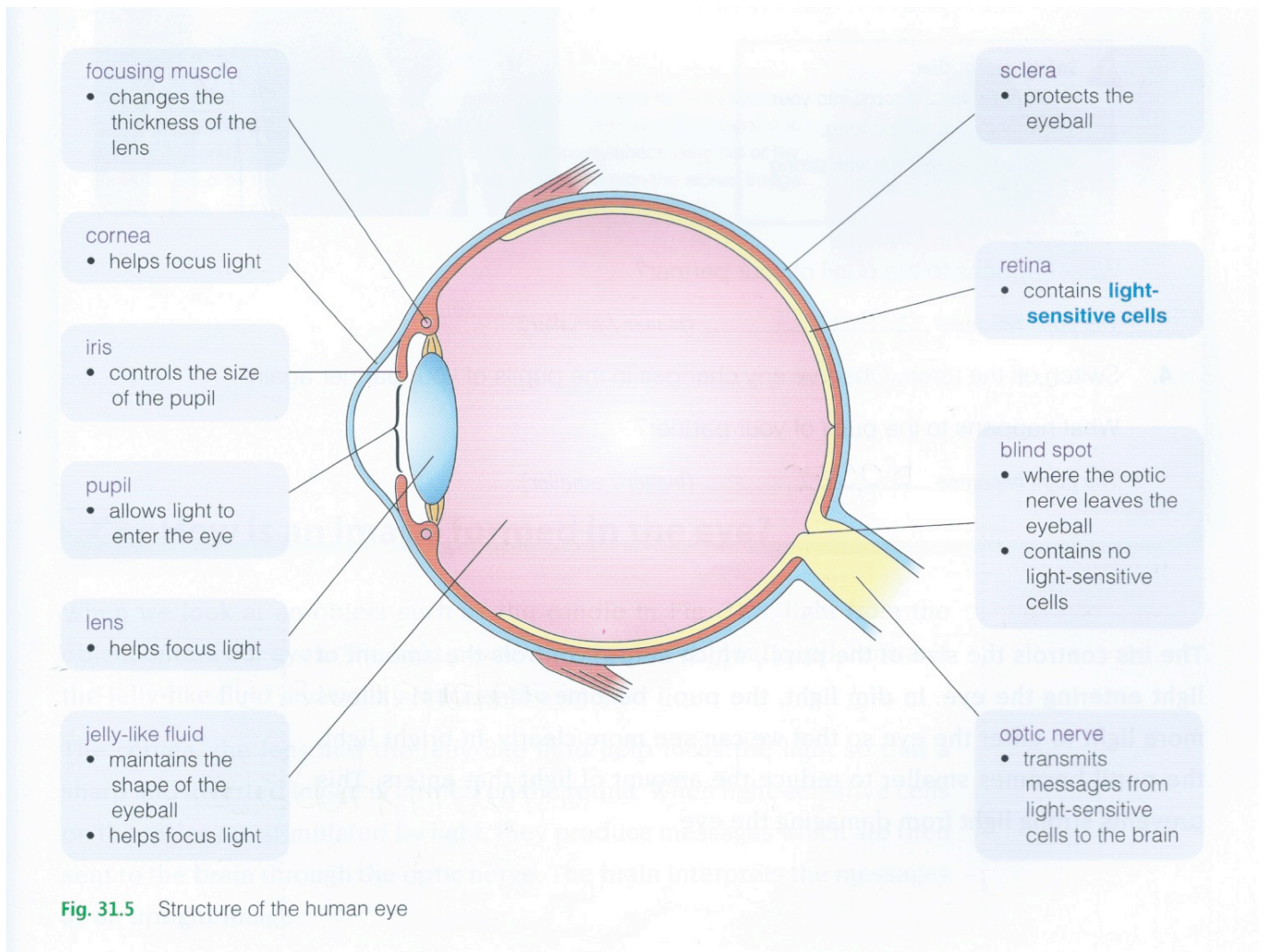
Burning	Fuel + oxygen $\rightarrow$ Water + carbon dioxide + heat and light
Respiration	Food + oxygen $\rightarrow$ Carbon dioxide + water
Photosynthesis	Carbon dioxide + water $\rightarrow$ food (starch) + oxygen
Neutralization	Acid + alkali $\rightarrow$ salt + water

G. Structure and function of sense organs

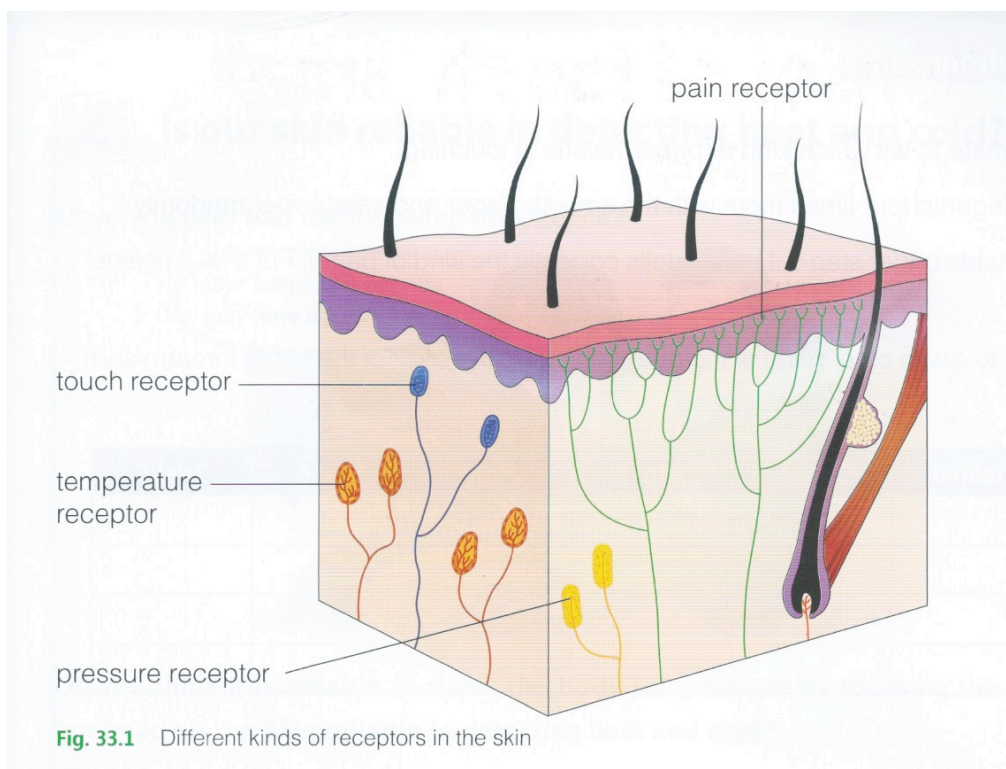
1. Ear:



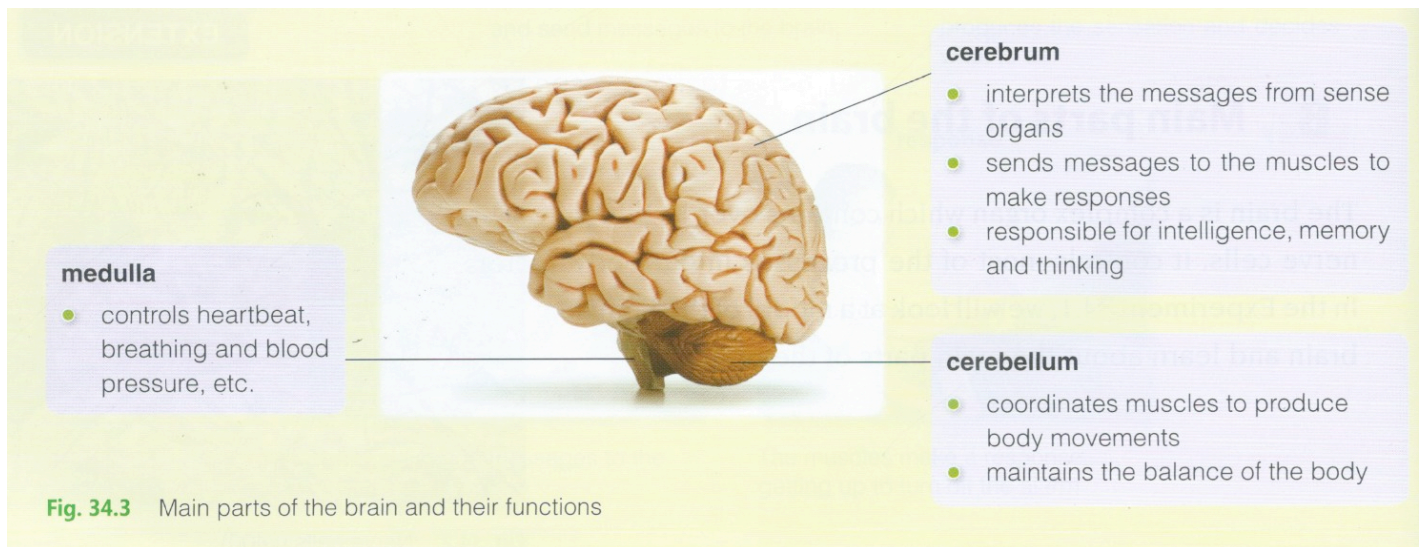
## 2. Eye:



## 3. Skin:



#### 4. Brain:



#### H. Summary: - Chapter 20, 21, 22

1. Air is a mixture of gases, including nitrogen, oxygen, carbon dioxide, noble gases, water vapour and small amounts of other gases.
2. Oxygen can cause a burning splint to burn more brightly and relight a glowing splint.  
Carbon dioxide turns red hydrogencarbonate indicator yellow and turns lime water from colourless to milky.  
Water turns dry cobalt chloride paper from blue to pink.
3. Breathed air contains less oxygen but more carbon dioxide and water vapour than unbreathed air does. In addition, the temperature of breathed air is higher than that of unbreathed air.
4. When a fuel is burned, the chemical energy stored in the fuel is changed to heat energy and light energy. Water and carbon dioxide are produced.
5. For a fire to occur, a fuel, oxygen and a high temperature are required. These three conditions make up the fire triangle.
6. To put out a fire, we can
  1. remove the fuel;
  2. cut off the oxygen supply;
  3. lower the temperature.
7. Uncontrolled fire is dangerous. We must take safety precautions to prevent fire accidents. If a fire breaks out, keep calm, act quickly and protect ourselves from smoke.
8. We obtain energy from the food we eat. The chemical energy stored in food is changed to useful forms of energy through a process called respiration.
9. Different types of food contain different amounts of energy.
10. Green plants make their own food by a process called photosynthesis. During this process, light

energy is changed to chemical energy in the food produced.

11. Starch and oxygen are produced during photosynthesis.
12. Carbon dioxide, light, chlorophyll and water are necessary for photosynthesis to take place.
13. Food chains show the feeding relationships among living things.  
In a food chain, green plants are producers whereas animals are consumers.
14. Animals take in oxygen and give out carbon dioxide.
15. Photosynthesis of green plants and respiration of living things help keep a balance of carbon dioxide and oxygen in nature.
16. Some air pollutants can irritate the eyes and the throat. Some can cause dizziness and headaches. Prolonged breathing in the air pollutants can also cause respiratory diseases.
17. The AQHI provides information about the air quality. The higher the index, the poorer is the air quality.
18. Smoking and passive smoking will increase the risk of getting respiratory diseases, lung cancer and heart diseases.

I. True or False — Chapter 20, 21, 22

1. Hydrogencarbonate indicator turns yellow when the concentration of carbon dioxide in it is greater than 0.03%. ## T ##
2. The three conditions making up the fire triangle include oxygen, fuel and high temperature. ## T ##
3. We can remove the starch in the leaves of a plant by destarching. This can be done by keeping the plant in the dark for at least 24 hours. ## T ##
4. Butter has higher energy content than cabbage. ## T ##
5. The products of photosynthesis include oxygen and starch. ## T ##
6. Food containing much fat has very high energy content. ## T ##
7. Both Sulphur dioxide and nitrogen oxides can cause irritation to the respiratory system and the eyes. ## T ##
8. Carbon monoxide can lower the amount of oxygen carried by blood. ## T ##
9. Both soda lime and hydrogencarbonate indicator can be used to test for carbon dioxide. ## F ##
10. The only function of a desiccator is for storage of dry cobalt chloride paper. ## F ##
11. Breathed air contains less nitrogen than unbreathed air. ## F ##
12. As oxygen is produced during photosynthesis, green plants do not take in oxygen from the atmosphere for respiration. ## F ##
13. During photosynthesis, chlorophyll combines sunlight and starch. ## F ##
14. Green plants can make their food from carbon dioxide only. ## F ##

15. The air quality monitoring stations measure the Air Pollution Index is set up by the Hong Kong Observatory. ## F ##
16. Tar causes smokers become addicted to cigarette smoking. ##F##
17. All green plants can make food by themselves. ## T ##
18. Gaseous exchange occurs in the air sacs. ## T ##
19. Respiration only takes place when a green plant is not undergoing photosynthesis. ## F ##
20. Humans are producers in the food chain because they can make different kinds of food. ## F ##
21. Heat energy is the only product of burning. ## F ##

致 有幸成為 2015~2016 年度 F2A 的學生：

溫習紙的作用是為了協助你們能夠方便、快捷地溫習，將溫習內容集合在一份文件中，雖然有點兒浪費地球資源，但出發點還是為了你們的學業成績。

是次 Science 溫習紙，是本學年最後一份我們能為各位提供的溫習紙，我們在此向大家衷心感謝，感謝你們在這學年接納我們所為你們提供的溫習紙。這一年裡，我們收到很多的意見，你們的意見令我們的質素逐步提升，由學期初錯漏百出的一份溫習紙，到現在很少錯誤的，也是全靠你們向我們提出錯的地方，感謝你們！

到了 F2 最後一段的考試，能為你們提供的溫習紙亦到此為止，希望明年有幸再為你們提供溫習紙。

祝你們考試成功，加油努力，爭取好成績，希望明年能再遇到你們！

衷心感謝你們，祝你們好運 ☺

陳文諾 (JASON CHAN) & 楊曉泓 (CALVIN IEONG) 上

2016 年 6 月 13 日

# 加油！F3 見

