Integrated Science - Lesson Plan

<table>
<tr><td colspan="2">Supervisor: Dr LAM Bick Har</td></tr>
<tr><td>School: Creative Secondary School</td><td>Level of Students: Band 1</td></tr>
<tr><td>Topic: Unit 10 – Sensing the Environment
- Identify the main parts of an eye
- State the functions of the main parts of an eye
- Give examples of defects or diseases of the eye (e.g. colour blindness, astigmatism, cataract)
- Describe the ways of protecting our eyes</td><td rowspan="6">Learning Objectives/ Intended Learning Outcome:
After the lesson, students should be able to…

Cognitive

1. Identify the structure and function of human eyes. (sclera, cornea, pupil, iris, lens, macula, retina, optic disk, optic nerve)

2. Distinguish the symptoms of four common eye diseases. (Glaucoma, Floaters, Macular Degeneration & Cataract)

3. Compare the causes and treatments of the four eye diseases. (Glaucoma, Floaters, Macular Degeneration & Cataract)

Skills

1. Label the name of different eye structures with reference to the eye model

2. Predict the eye diseases based on the given symptoms through experiential learning

Attitude

1. Appreciate the wonderful functions of our eyes

2. Develop an awareness in protecting our eyes in daily life</td></tr>
<tr><td>Book: Aristo S.2 Integrated Science Book 2</td></tr>
<tr><td>Date & Time: 25-11-2020 (Wed) 10:30 – 11:40</td></tr>
<tr><td>Duration of the lesson: 70 mins</td></tr>
<tr><td>Venue: Room 202</td></tr>
<tr><td>Class (No. of students): S.2M students (20)</td></tr>
<tr><td>Characteristic of class:
1. EMI class (Some students are not very well in English, sometimes need to use Cantonese for explanation.)
2. There are learning diversity among students
3. Students like having interactive approach during the lesson</td></tr>
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Prior Knowledge: Form 2: Unit 10 – Sensing the Environment - Recognize the need of sensitivity for living things to respond to the environment - Correlate our sensing organs to the corresponding types of stimuli and the senses produced	

Stage	Time (minutes)	Teacher Activities	Student Activities	Materials	Object check
Before the start of the lesson		Teacher needs to remind students to finish the pre-test first before the start of the lesson	Students finish the pre-test by using the QR code provided	Pre-test on S.2 Science Unit 10 Session 1	

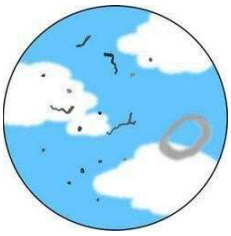
Introduction (Use of KWL chart & warm-up activities) Purpose: Let students recall their prior knowledge learnt in last lesson and raise students' curio sity on the upcoming topic, our eye.	10	Teacher introduces the topic of sensing the environment and asks students which sense is most important to them. A warm-up activity of ruler dropping test is introduced. <u>Ruler Dropping Test</u> Teacher asks students to pair up with the neighboring student. A 45cm-ruler is given to each group, student A drops the ruler while student B catches the dropping ruler and vice versa. Each student has three trials. After this multi-sensory activity, the teacher needs to discuss with students why there are differences among the reading? Teacher directly points out the necessity of our 5 senses in short reaction time or quick response to stimulus. Teacher emphasizes to the students that each individual should have a different reaction time, we do not need to compare with each other as we have different strengths and abilities among individuals. Then, teacher delivers a KWL chart worksheet for students. Students have 30 seconds to fill in the K part of the chart. Teacher guides students on how to write the K part of the chart according to their experience in the ruler dropping activity and what they have learnt in previous lesson. After students have written the chart, teacher summarises that senses not only appear in our	Students pair up with the neighboring students (2 students in a group) One student drops the ruler while another student catches the ruler. Each student has 3 trials. Students answer the questions asked by the teacher Students listen to the teaching from teacher and mark down the notes in the handouts Students should fill in the KWL chart of part K.	PowerPoint p. 1-15 A 45cm-ruler Handout x 10 KWL chart on Handout p. 1	A1 A1 A1

		human, most animals have sensing organs for different purposes, such as detection of prey, danger, temperature change, etc. <u>Recap on Previous Topic</u> In our human, we have 5 major sensing organs which are eyes, ears, nose, tongue and skin and we will focus on the eyes today <u>Dominant Eye Test:</u> Before talking about the eye structure, share one fun fact with students - In fact, for our eyes, there is one dominant eye which is highly responsible for image formation. - Teacher demonstrates a method on how to find out our dominant eye. <u>Distribution of small assignment</u> - Students are asked to form 4 groups (5 people in one group), with mixed abilities and work together in solving this problem-based learning. Students are assigned the roles of leader, note-taker and presenter among members. - Each group of students need to investigate another method to determine their dominant eye. - The method and corresponding procedure are requested to type out as PowerPoint and present it next week. - A first draft need to be handed in before next Monday (30/11/2020)	Students think about which eyes are their dominant eye Students look at the demonstration on finding our dominant eye Students mark down the assignment details and deadline on their handbook		

Development (1) (Illustration of eye structure using eye model) Purpose: Let students to visualize the eye structure through the use of app and model in pointing out the importance of various parts of the eye.	15	Teacher plays a song about eye structures to students, asking students to find the structures of eyes from the song. Teacher tries to use multi-sensory skills to help students have a better learning on eye's structures. Video link: https://www.youtube.com/watch?v=gCaVPMjh2ys Each group is distributed a set of incompleted eye structure models. Students have 7 minutes for discussion, relocating and naming different eye's parts into a completed eye model. (Sclera, cornea, pupil, iris, lens, macula, retina, optic disk, optic nerve) Teacher uses the eye's model as a teaching facilitator to teach students different eyes' structures and locations. Each group is disturbed an iPad and uses it to investigate the eye structures by using the app "Eye Anatomy Pro".	Students need to watch the video carefully, and find the answer in the eye song. Students have 7-mins discussion time with groupmates to think about the eye structures and rebuild the model. Students should pay attention to the teacher.	PowerPoint p.16-20 Eye models x 4 iPads x 4	A1 C1, S1 C1
Break (Self – Investigation & Consolidation) Purpose: Let students consolidate the knowledge being taught in the lesson.	5	Students are allowed to get some refreshment and read the description of different parts of eye structures in the app. Students can feel free to ask teacher questions. Teacher can answer student misconceptions and provide some support to the students.	Students can ask teacher when they have some misconception.		

		(Teacher should be aware in learning diversity among students)			
Development (2) (Direct Teaching on the Causes of Eye diseases) Purpose: Let students to understand different causes of eyes' disases	10	Activity: Direct teaching Investigation on the causes (Glaucoma, Floaters, Macular Degeneration & Cataract). Teacher shows a mind-map on the PowerPoint and asks students to organize their ideas of causes and treatment. Teach students the possible causes of the above mentioned four eyes' diseases	Students listen carefully, markdown notes on the handout and answer questions	PowerPoint p.21-25 Handout p. 2-3 Mind-map	C3

Development (3) ("Enter the special world") Purpose: To let students experience different eyes' diseases. Throughout the experiential learning, students can learn the critical features of the eyes' diseases.	15	Activity: "Enter the special worlds" - Matching game Teacher allows students to experience some common eye disorders and diseases (Glaucoma, Floaters, Macular Degeneration & Cataract) . Teacher conducts a game. Each group receives the symptom sheets of 4 eye diseases and one random special-made glasses  Students need to match the special-made glass with its corresponding symptom. Before the discussion, the teacher explains the worksheet to students. 1. Classify the eye disorders of the glasses? Please explain why. 2. What are the symptoms of this disorder? Teacher walks around in the classroom to observe and assist each group during the discussion. Teacher guides students to classify the symptoms of the disease. 	Group discussion: Each group should classify the related eye disorders of the corresponding using special-made glasses according to the worksheet provided (symptoms of those four diseases). Students need to present their findings to other groups. When students have the correct answer, they may get the marks. Students try other eye disorders glasses of other groups Students discuss which glass can match to the corresponding symptoms. Each group presents the matching answer from their discussion.	PowerPoint p.26-30 Four types of glasses (Glaucoma, Floaters, Macular Degeneration & Cataract) Handout p. 2-3 Each group one Discussion worksheet	C2, S2

		 Floaters  Macular Degeneration After the discussion, the teacher invites all groups to present their points and gives other groups to observe other eye disorders glasses. Teacher summarizes the concepts and organizes students' ideas based on their discussion. The summary includes the type of eye diseases (Glaucoma, Floaters, Macular Degeneration & Cataract) and the symptoms of each disease.			
Development (4) (Extension discussion on Eye diseases) Purpose: Let students to understand possible treatments on eyes' diseases	10	Activity: Direct teaching Treatments of different eye diseases (Glaucoma, Floaters, Macular Degeneration & Cataract). Teach students the possible treatments of the above mentioned four eyes' diseases.	Students listen carefully, markdown notes on the handout and answer questions.	PowerPoint p.31-35	C3
Closure (KWL chart & Post – Test) Purpose: Summarize the knowledge learnt in this lesson.	5	Teach students the ways to protect our eyes to increase ss awareness on eye protection in daily life. Ask students to fill in the L part of the KWL chart to summarize what they have learnt in this lesson.	Students need to think about common methods that can be used to protect our eyes. Students should fill in	PowerPoint p.36-39 KWL chart on Handout p. 1	A2

		Students need to finish the post-test after the lesson.	the KWL chart of part K and L.		
After the lesson		Teacher remind students to finish the post-test after the lesson	Students finish the post-test after class	Post-test on S.2 Science Unit 10	

Follow-up work/ assignment:

- Post-Test on S.2 Science Unit 10
- A first draft on the method of finding our dominant eye
- Finish this lecture's handout

Materials and reference:

- A 45cm-ruler Handout x 10
- Eye model x 4
- Whiteboard and white board pen
- Laser Pointer
- Ipad with "Eye Anatomy Pro" App
- Four types of special-made glasses (Glaucoma, Floaters, Macular Degeneration & Cataract)
- Handout → Appendix 2
- Group discussion - Matching information table → Appendix 3
- Discussion worksheet for Activity: "Enter the special worlds" (A2 size) → Appendix 4
- PowerPoint - Unit 10 Sensing on Environment → Appendix 5
- Pre-test and Post-test → Appendix 6
- Sitting arrangement → Appendix 7