# Bachelor of Education (Elementary) &

# Bachelor of Education (Secondary) STEM

# Unit Plan Template

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| **Unit Title:** | Body Systems (1) | **Number of Lessons** | 10 | **Time**  **(in weeks):** | 4 weeks |
| Name: | Muyang Sun | Subject(s): | Science | Grade(s): | 5/6 |

Rationale

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| This unit is important because students have the opportunity to learn about respiratory system, nervous system, digestive system, the related organs and their functions. After learning about this unit, students will be able to understand how different body systems work in humans’ body and how to protect each body system. |

Overview:

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| This unit consists of 10 lessons. The first 3 lessons introduce students to the respiratory system. In the first lesson, students get the opportunity to feel their breath by playing some games and then learn about the basic structures in human respiratory system and their corresponding functions. Next lesson introduces students to movements and breaths. Students can explore their lung capacity in a lab activity. The third lesson teaches students how to protect the respiratory system, the negative effects of smoking and some common respiratory diseases including their causes, symptoms, effects, treatments and what people can do to prevent these diseases. Lesson four, five, six and seven focus on the nervous system. In the fourth lesson, students explore stimulus and response. They also have the chance to learn about what an instinctive response is. In lesson five, students learn how to draw the message delivery process in any given scenario and the components and functions in the nervous system. Students also get to explore the optical illusion. In the sixth lesson, the components of human brain, 4 properties of human brain, 5 functions of human brain and the division of labor in human brain are introduced. Lesson seven talks about the ways that people can protect their brain and students get to learn about artificial intelligences at the end. The eighth, ninth and tenth lessons are about the digestive system. In lesson eight and nine, students are introduced to different parts in the digestive system and their functions. This lesson also talks about how we can protect the digestive system. In the last lesson, students explore the 7 types of nutrients in food and their functions. The activity of creating healthy meals is included for students to reflect about their own diets and apply their learning. |

CORE COMPETENCIES

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| Communication | Thinking | Personal & Social |
| * Communicating * The discussion and sharing part in each lesson allows students to frequently communicate with the teacher and their peers throughout the unit by presenting their prior knowledge and new understandings that they gain from class * Discussion and sharing are incorporated in every lesson to enhance students’ communication skills and make them realize the amount of knowledge that they can learn in this learning community * Collaborating * Discussion and sharing within groups involve students working together to express each person’s ideas, support group interactions and help the group form a holistic understanding about the topic being discussed | * Critical thinking * Critical thinking is used in various parts of the unit. Students needs to think critically to understand the questions posed and come up with answers to the questions * Creative thinking * Creative thinking is weaved into this unit in many lessons. Students come up with creative ideas to participate in each discussion, use creativity to write or draw about each topic and create posters in an innovative way | * Positive personal and cultural identity * Personal choices can be made when students are deciding whether they want to express themselves in writings or drawings. This can show students’ different strengths and various abilities too * Personal awareness and responsibility * Talking and sharing is incorporated in every lesson. During this process, each student is responsible for sharing his or her own ideas but keeping quiet and listening respectfully to the speaker when it is not their own turn to talk. This ensures the collective well-being * Social responsibility * Throughout the unit, students build relationships with each other in group discussions, contribute to the discussions with different ideas, come up answers to the questions that require critical thinking skills together and value the diversity in this learning community after learning more about each other’s personal stories and cultures |

BIG IDEAS

(multiple subject areas for integrated unit)

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| Subject Name: Science |
| Grade 5: Multicellular organisms have organ systems that enable them to survive and interact within their  environment.  Grade 6: Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment. |

LEARNING STANDARDS

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| Curricular Competencies | Content |
| CC1: Demonstrate a sustained curiosity about a scientific topic or problem of personal interest  CC2: Make observations in familiar or unfamiliar contexts  CC3: Identify questions to answer or problems to solve through scientific inquiry  CC4: Make predictions about the findings of their inquiry  CC8: Observe, measure, and record data, using appropriate tools, including digital technologies  CC9: Use equipment and materials safely, identifying potential risks  CC22: Contribute to care for self, others, and community through personal or collaborative approaches  CC23: Co-operatively design projects  CC26: Communicate ideas, explanations, and processes in a variety of ways  CC27: Express and reflect on personal, shared, or others’ experiences of place | Grade 5:  C1: basic structures and functions of body systems:   * digestive * respiratory   Grade 6:  C1: the basic structures and functions of body systems:   * nervous |
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Prerequisite Concepts and Skills:

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| * Students need to have some prior knowledge about body systems * Students need to have some basic writing skills * Students need to have some basic drawing skills * Students need to have developed communication skills to discuss within their groups and share their ideas with the class * Students need to be able to think creatively and critically to answer different questions * Students need to be able to listen to the speaker or watch videos quietly, carefully and respectfully without interrupting others * Students need to have some basic research skills about using a Chromebook or an iPad * Students need to be able to make connections with the texts or other sources of information |

Teacher Preparation Required:

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| Lesson # | Teacher Preparation Required (See Unit Plan Sample) |
| Lesson 1 | * Set up the video clip of Lime Water and Carbon Dioxide: <https://www.youtube.com/watch?v=Vl9A8Iyc_LY> * Set up the video clip of Matches and Carbon Dioxide: <https://www.youtube.com/watch?v=F1IfxNMRK8k> * Set up the Slideshow * Prepare Paper * Prepare writing and drawing utensils |
| Lesson 2 | * Prepare tables * Prepare writing utensils * Prepare timer * Print lab sheets * Prepare balloons * Prepare rulers * Prepare iPads with calculators |
| Lesson 3 | * Set up the slideshow * Prepare writing and drawing utensils * Prepare Chromebooks or iPads |
| Lesson 4 | * Set up the slideshow * Set up the video of Hand Slap Game: <https://www.youtube.com/watch?v=cwX-SVwyBbI> (1’49’’) * Prepare rulers * Print charts * Prepare writing utensils * Prepare cotton balls * Print worksheets |
| Lesson 5 | * Set up the slideshow * Prepare cotton swabs * Print worksheets * Prepare writing and drawing utensils |
| Lesson 6 | * Set up the slideshow * Prepare 1.4 kg of apples in a bag * Prepare walnuts * Prepare tofu * Prepare dice * Prepare tiny red circles * Prepare origami paper * Print worksheets * Prepare writing utensils |
| Lesson 7 | * Set up the slideshow * Print worksheets * Prepare writing and drawing utensils * Set up the video of AI singing: <https://www.youtube.com/watch?v=XDNmGH-IM8o> |
| Lesson 8 | * Prepare candies * Set up the slideshow * Prepare bananas * Prepare crackers * Prepare lemon juice/clear vinegar * Prepare water * Prepare strong zip-lock bag * Prepare 1 cut-off leg of tights/stockings * Prepare 1 tray/bowl * Prepare 1 plastic cup * Print lab sheet * Prepare writing utensils |
| Lesson 9 | * Prepare Paper * Prepare writing and drawing utensils * Print lab sheets |
| Lesson 10 | * Set up the slideshow * Set up the video of Iodine test for starch: <https://www.youtube.com/watch?v=HO_q8GPl3bE> (44’’) * Prepare peanuts * Prepare white paper * Prepare writing and drawing utensils * Print worksheets |

Cross-Curricular Connections:

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| This unit is primarily about science. However, it connects with Arts Education, English Language Arts, Mathematics and Physical and Health Education in some ways. For example, students have the opportunity to draw a picture or design a poster. This is where Visual Arts elements can be seen. When students are reading informational texts about the body systems, English Language Arts elements appear. This unit relates to Mathematics when students are recording their data from their lab experiments. Also, students get to exercise at the beginning of one lesson as a hook activity. This connects with Physical and Health Education. |

Aboriginal Connections/ First Peoples Principles of Learning:

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| * First Peoples Principles of Learning * Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors: In this unit, students are able to explore how to protect their various body systems and this helps with their own health and well-being * Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place): Experiential and hands-on learning is incorporated throughout the unit. Students have the opportunity to participate in various games or activities, create their own poster and story of food travelling in their digestive system. Choice and flexibility in activities are provided in the unit so that different aspects of the whole self can be attended to * Learning involves patience and time: This unit spans over 10 days and it really takes time to see learning happen. During the daily learning, students need to keep patient so that there is a chance for them to explore further and gain new understandings about the topic of this unit * Learning is embedded in memory, history, and story: Students have the opportunity to create a story of their favorite food’s journey in their body * Circle of Courage: * The “belonging” quadrant in the Circle of Courage can be seen in various parts of this unit. Students are able to communicate with each other, discuss about their thoughts and share their ideas in every lesson. This can make students feel that they are all included in this learning community. Therefore, they can feel the sense of belonging easily. |

Universal Design for Learning (UDL)

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| 1. MULTIPLE MEANS OF REPRESENTATION – I provide for multiple means of representation in this unit in the following ways:  * Teacher shows students the videos * Teacher displays pictures to students as parts of the teacher’s examples about the various topics in the unit * Teacher talks in each lesson to offer students an opportunity to learn by listening * Teacher displays slideshows for students to see * Teacher incorporates lab experiments into the unit  1. MULTIPLE MEANS OF ACTION AND EXPRESSION – I provide multiple means of action and expression in this unit in the following ways:  * Students can speak out their ideas individually * Students can share their thoughts within their groups * Students can share their ideas with the entire class * Students can participate in various lab activities * Students can choose whether they want to write or draw for multiple activities in the unit * Students can create an individual poster * Students can create a story about their favorite food’s journey in their digestive system * Students can write or draw a comic strip about what artificial intelligence can do in the future  1. MULTIPLE MEANS OF ENGAGEMENT – I provide multiple means of engagement in this unit in the following ways:   **Auditory:**   * Teacher poses questions by talking for students to think about * Teacher talks to introduce the topic for each lesson * Students have the opportunity to discuss and share their ideas throughout the unit * Students have the opportunity to listen to various videos * Students have the opportunity to listen to the presentations from the teacher and sharing from their peers   **Visual:**   * Students are able to watch the video clips in various lessons * Students are able to read the requirements on the slideshow for various tasks and activities * Students can see pictures from the teacher’s examples about certain topics being discussed in the unit * Students can participate in various lab activities   **Kinesthetic:**   * Students are able to choose whether they want to use hokey chairs * Students can choose to write or draw about their understanding of various topics in the unit * Students have the opportunity to do a little research by using a Chromebook or an iPad * Students have the opportunity to record their research findings on a piece of paper * Students have the opportunity to fill out various worksheets * Students have the opportunity to participate in various labs * Students have the opportunity to record their lab data on their chart or table |

Differentiated Instruction (DI):

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| * Teacher will instruct at the front of the classroom and use the projector to show the words and pictures to fulfill the needs of the students who are having difficulties in seeing and hearing * Students who are having difficulties in seeing and hearing will be placed in a position that is close to teacher * For energetic students who have a hard time concentrating on their tasks, teacher will offer them the opportunity to move around frequently (e.g., assign them the task of handing out materials) * Students who are having mental disabilities can choose not to participate in a specific activity if they are not feeling comfortable * Teacher will pay more attention to the students who are having learning difficulties and offer support when they need it * Advanced students who finish tasks early will be asked to read story books from the classroom library or add drawings to their finished work |

Overview of Lessons:

Lesson 1

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| Name &Time (Minutes Allotted): | Introduction to Respiratory System  67 min |
| Learning Standards: Curricular Competencies | Grade 5: CC1, CC2, CC22, CC26, CC27  Grade 6: CC1, CC2, CC22, CC26, CC27 |
| Learning Standards: Content | Grade 5: C1 |
| Instructional Objectives | * SWBAT understand that humans take in oxygen by inhaling and get rid out of carbon dioxide by exhaling * SWBAT know that lungs are the places that conduct gas exchange (from oxygen to carbon dioxide and vice versa) * SWBAT understand the basic structures and functions of respiratory system * SWBAT describe the pathways that oxygen enters the body * SWBAT describe the pathways that carbon dioxide leaves the body |
| Assessment: | What: Point and Talk  How: Teacher Observation and Notes (teacher will observe students when they are doing the point and talk activity and make notes of their understanding)  What: Draw and Label  How: Complete/Incomplete (teacher will mark students’ labelled drawing as complete or incomplete based on the accuracy) |
| Teaching Strategies: | Feel the breath, games, discussion and sharing, video clips, discussion and sharing, teacher’s instructions, point and talk, draw and label |
| Materials: | * Picture of a girl holding breath underwater * Video clip of Lime Water and Carbon Dioxide: <https://www.youtube.com/watch?v=Vl9A8Iyc_LY> * Video clip of Matches and Carbon Dioxide: <https://www.youtube.com/watch?v=F1IfxNMRK8k> * Slideshow * Paper * Pencils * Erasers * Pencil crayons * Makers |
| Lesson Activities: | |
| Introduction/Hook: | **Feel the Breath (5 min)**   * Ask students to put their index finger below their nose * Ask students to inhale and exhale deeply to feel their breath * Have students share their findings or feelings * Ask students to put their hands under their ribs * Ak students to inhale and exhale deeply to feel their breath * Have students share their findings or feelings   **Games (5 min)**   * Have everyone stand up, inhale deeply and hold their breath * Make it clear to students that it is not a competition and when they feel uncomfortable, they can just sit down and resume their breath * Once most people sit down, ask students how they feel * Have everyone close their mouth and hold their nose using their hands for a few seconds * Ask students how they feel   **Discussion and Sharing (5 min)**   * Show students a picture of a girl holding breath underwater * Ask students “Who knows how to swim?” and “How did you feel when you hold your breath underwater?” * Call upon volunteers to answer * Explain to students that “After holding your breath for a while underwater, you need to lift your head above the water to breathe. Otherwise, you will drown. Therefore, we cannot hold our breath for a very long time” * Ask students “Why we need to breathe?” * Call upon volunteers to answer * Explain to students that we need to breathe because we need oxygen to live and there is oxygen in the air around us. Also, we need to get rid of carbon dioxide by exhaling |
| Body: | **Video Clips (7 min)**   * Make it clear to students that by breathing, we take oxygen in by inhaling and get rid out carbon dioxide by exhaling * Explain to students that three are two scientific facts:  1. Carbon dioxide can cause clear lime water to turn milky 2. Carbon dioxide can make matches go out  * Show students 2 video clips:  1. Lime Water and Carbon Dioxide (1’10’’): <https://www.youtube.com/watch?v=Vl9A8Iyc_LY> 2. Matches and Carbon Dioxide (3’16’’): <https://www.youtube.com/watch?v=F1IfxNMRK8k>  * Explain to students that matches can be lighted up in the air because there is oxygen in the air and oxygen can help with combustion which is a chemical reaction that produces heat and light. Therefore, we take in oxygen when we inhale * Explain to students that the lime water video and the matches video show us that there is carbon dioxide in the gas we exhale   **Discussion and Sharing (5 min)**   * Ask students “We take in oxygen when we inhale and get rid of carbon dioxide when we exhale. These are two different types of gases. Where does the change take place in our body?”, “What are the pathways that oxygen goes into our body?” and “What are the pathways that carbon dioxide leaves our body?” * Call upon volunteers to share their ideas and guesses * Make it clear to students that in order to know the answers, we need to learn about the respiratory system and the related organs first   **Teacher’s Instructions (20 min)**   * Project a diagram of the respiratory system on the smartboard for students to see * Go over each organ and their functions in this system (nose, mouth, pharynx, larynx, trachea, bronchi, bronchioles, lungs, alveoli and diaphragm) using a slideshow * Explain to students that oxygen enters from our nose and passes through pharynx, larynx, trachea, bronchi and lungs in turn * Explain to students that carbon dioxide leaves our body in a reverse order: leaves from our lungs and passes through bronchi, trachea, larynx, pharynx and nose in turn * Explain to students that lungs are the places that conduct gas exchange (from oxygen to carbon dioxide and vice versa) |
| Closure: | **Point and Talk (10 min)**   * Call upon volunteers to go to the smartboard one at a time * Have each volunteer point to the diagram and talk through the pathways that oxygen enters our body and the pathways that carbon dioxide leaves our body   **Draw and Label (10 min)**   * Tell students to draw a diagram of the respiratory system on their own * Have students label each organ on their diagram |

Lesson 2

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| Name &Time (Minutes Allotted): | Movements and Breaths  76 min |
| Learning Standards: Curricular Competencies | Grade 5: CC1, CC2, CC3, CC4, CC7, CC8, CC26, CC27  Grade 6: CC1, CC2, CC3, CC4, CC7, CC8, CC26, CC27 |
| Learning Standards: Content | Grade 5: C1 |
| Instructional Objectives | * SWBAT understand that the number of their breaths within 1 minute are different when they are in different states (quiet state, moving state and resting state) * SWBAT understand that under the same state, boys and girls have different numbers of breaths within 1 minute * SWBAT understand that under the same state, children and adults have different numbers of breaths within 1 minute * SWBAT compare the amount of air taken in during various breathing exercises in their lab process |
| Assessment: | What: Discussion and Sharing  How: Teacher Observation and Notes (teacher will observe students when they are participating in the discussion and sharing activity and make notes of their understanding)  What: Exploring Lung Capacity Lab  How: Complete/Incomplete (teacher will mark students’ lab sheets as complete or incomplete) |
| Teaching Strategies: | Pose questions, experiment time, discussion and sharing, teacher’s summary, exploring lung capacity lab, calculate your lung capacity, answer related questions |
| Materials: | * Tables * Pencils * Erasers * Timer * Lab sheets * Balloons * Rulers * Calculators on iPads |
| Lesson Activities: | |
| Introduction/Hook: | **Pose Questions (1 min)**   * Ask students “Who loves doing physical exercises?” and “How do you think your breaths change before and after exercises?” * Call upon volunteers to answer   **Experiment Time (10 min)**   * Make it clear to students that we are going to do a little experiment about the relationship between movements and breathing * Give each student a table to record their data * Lead students to go to the gym * Tell students that they need to measure how many times they breathe within 1 minute when they are in the quiet state, after jogging in the classroom and after resting for 3 minutes from jogging * Explain to students that 1 inhalation and 1 exhalation together will be counted as 1 breath for this activity * Make it clear to students that once they are done, they need to repeat the whole process 2 more times and record their data clearly on their table   **Discussion and Sharing (13 min)**   * Have students use a large piece of grid chart paper to make a graph of the class results * Make it clear to students that they need to put their sticker at the right place * Ask students to study their data and share their findings * Call upon volunteers to share * Ask students to compare girl’s data with boy’s data and share their findings * Call upon volunteers to share * Ask students to compare their data with the teacher’s data and share their findings * Call upon volunteers to share   **Teacher’s Summary (7 min)**   * Tell students that the number of their breaths within 1 minute are different when they are in different states (quiet state, moving state and resting state), their breaths become quicker after moving, become slower when they rest from moving and return to the frequency of their quiet state gradually * Tell students that under the same state, boys and girls have different numbers of breaths within 1 minute. Under the quiet state, boys breathe slightly slower than girls * Tell students that under the same state, children and adults have different numbers of breaths within 1 minute. Under the quiet state, adults breathe slight slower than children |
| Body: | **Exploring Lung Capacity Lab (20 min)**   * Tell students that they are going to participate in an activity called “Don’t Hold Your Breath!” * Give each student two lab sheets * Make the objective clear to students:To compare the amount of air taken in during various breathing exercises * Provide students with some background information about lung capacity:Lung Capacity is the amount of air contained within the lungs during various breathing activities. It can be measured in several ways:  1. TOTAL LUNG CAPACITY: the amount of air in the lungs after a very deep inhalation. Includes vital and residual capacities 2. RESIDUAL LUNG CAPACITY: any air left in the lungs after a deep exhalation. Even after you breathe out everything in your lungs, there is still some air in there 3. VITAL LUNG CAPACITY: the amount of air you can forcibly exhale in a single breath. Measured as a deep inhalation then blowing it all out until you can blow no more 4. TIDAL LUNG CAPACITY: the amount of air you breathe normally. NOT a deep breath – this is normal breathing such as if you were reading a book or washing the dishes  * Make it clear to students that they need to:  1. Stretch out your balloon by pulling it several times 2. Measure your **Tidal Capacity (Normal Breath)** \*\*In order to do this, take a normal breath in. Place the balloon to your lips and exhale a normal breath into the balloon. DO NOT force the air into the balloon\*\* 3. Pinch the open end of the balloon and place the balloon on the table. Holding the balloon, measure the diameter of the balloon with the ruler 4. Record your information in the chart on the lab sheet. Release the air and complete steps 1-3 four more times 5. Measure your **Vital Capacity (BIG breath)** \*\*In order to do this, take a DEEP breath in. Place the balloon to your lips and exhale as much breath as you can into the balloon. Force as much air as you can into the balloon\*\* 6. Repeat steps 3-4 from above |
| Closure: | **Calculate Your Lung Capacity (8 min)**   * Have students calculate their different lung capacities using the formula: Total Lung Volume = (balloon diameter) ^3x 3.14/6   **Graphing the Class Results (10 min)**   * Have students use a large piece of grid chart paper to graph the class results * Make it clear to students that they need to put their sticker at the right place   **Answer Related Questions (7 min)**   * Have students answer the questions on the lab sheet (e.g., What is meant by the term “lung capacity”? How did your tidal and vital lung capacity differ? Explain why might you see that difference? How might an athlete’s vital lung capacity compare to a non-athlete?) |

Lesson 3

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| Name &Time (Minutes Allotted): | How to Protect Our Respiratory System  60 min |
| Learning Standards: Curricular Competencies | Grade 5: CC1, CC22, CC24, CC26, CC27  Grade 6: CC1, CC22, CC24, CC26, CC27 |
| Learning Standards: Content | Grade 5: C1 |
| Instructional Objectives | * SWBAT list ways that they can do to protect their respiratory system * SWBAT understand the negative effects that smoking has on humans’ lungs and overall health * SWBAT understand the symptoms of certain respiratory diseases and how to prevent these diseases from happening |
| Assessment: | What: Discussion and Sharing  How: Teacher Observation and Notes (teacher will observe students when they are participating in the discussion and sharing activity and make notes of their understanding)  What: Individual Poster  How: Complete/Incomplete (teacher will mark students’ individual poster as complete or incomplete) |
| Teaching Strategies: | Pose questions, discussion and sharing, lungs of non-smokers and smokers, poster time, jigsaw activity, sharing with the class |
| Materials: | * Projector * Smartboard * Slideshow * Paper * Pencils * Erasers * Pencil crayons * Markers * iPads/Chromebooks |
| Lesson Activities: | |
| Introduction/Hook: | **Pose Questions (1 min)**   * Ask students “What can we do to protect our respiratory system?” * Call upon volunteers to answer   **Discussion and Sharing (5 min)**   * Project some pictures about the ways that we can protect our respiratory system onto the smartboard for students to see (e.g., wearing a mask when the air quality is bad, refusing to smoke and staying away from second-hand smoking, open windows frequently for ventilation, gargle with salt water frequently, actively participate in various physical exercises) * Have students discuss about the pictures and share any ideas or thought they may have |
| Body: | **Lungs of Non-Smokers and Smokers (7 min)**   * Show students the pictures of the lungs of non-smokers and smokers * Ask students “What differences can you see from the two pictures?” and “Why do you think there are differences between the lungs of non-smokers and smokers?” * Make it clear to students that smoking can cause lung disease by damaging humans’ airways and the small air sacs (alveoli) found in lungs. Lung diseases caused by smoking include COPD, which includes emphysema and chronic bronchitis. Cigarette smoking causes most cases of lung cancer. If you have asthma, tobacco smoke can trigger an attack or make an attack worse. Smokers have more risks of getting respiratory diseases than non-smokers.   **Class Discussion (10 min)**   * Have students discuss their own experience or their family member’s experience of having a cold/fever/running nose or keeping cough and sneeze * Lead students to talk about what the symptoms were like, how they felt at that time, the possible causes for the illness, how they treated with it and what they can do in the future to prevent the illness from happening again   **Brief Introduction to COVID (10 min)**   * Make it clear to students that COVID is a respiratory disease * Briefly talk about the COVID including the causes, the symptoms, the negative effects, how to treat it and what we should do to prevent it   **Poster Time (20 min)**   * Have student create an individual poster based on one of the following topics:  1. Ways that we can protect our respiratory system 2. Effects that smoking have on humans’ lungs 3. Respiratory diseases (the causes of these diseases, the symptoms of these diseases, the negative effects of these diseases, how to treat the diseases and what we should do to prevent these diseases)  * Make it clear to students that they need to do a little research about their chosen topic and design a poster about it |
| Closure: | **Jigsaw Activity (5 min)**   * Once students finish their poster, have them share their poster and learnings with each other   **Sharing with the Class (2 min)**   * Call upon volunteers to share their poster with the whole class |

Lesson 4

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| Name &Time (Minutes Allotted): | Stimulus and Response  60 min |
| Learning Standards: Curricular Competencies | Grade 5: CC1, CC2, CC3, CC4, CC7, CC9, CC22, CC26, CC27  Grade 6: CC1, CC2, CC3, CC4, CC7, CC9, CC22, CC26, CC27 |
| Learning Standards: Content | Grade 6: C1 |
| Instructional Objectives | * SWBAT identify the stimulus and the response in any given situation * SWBAT understand the reaction time varies from one person to another * SWBAT understand what an instinctive response is |
| Assessment: | What: Class Discussion  How: Teacher Observation and Notes (teacher will observe when students are participating in the class discussions and make notes of their understanding)  What: Games  How: Teacher Observation and Notes (teacher will observe when students are participating in the various games and make notes of their understanding)  What: Worksheet  How: Marking (teacher will mark students’ worksheet to see how many questions they got correct) |
| Teaching Strategies: | Observation activity, hand slap game, catch me if you can, reaction time, how will you react?, instinctive response, practice time |
| Materials: | * Projector * Smartboard * Slideshow * A video of Hand Slap Game: <https://www.youtube.com/watch?v=cwX-SVwyBbI> (1’49’’) * Rulers * Charts * Pencils * Erasers * Cotton balls * Worksheet |
| Lesson Activities: | |
| Introduction/Hook: | **Observation Activity (7 min)**   * Project 4 pictures (a boy waking up in the morning with the alarm clock ringing, a boy going to bathroom in a rush because of a stomachache, a group of kids crossing the road when the green light is on, a group of kids celebrating after hearing the good news) onto the smartboard for students to observe * Tell students that human bodies can detect the changes in our environment and receive signals from our surroundings. We call the changes and signals that we detect “stimulus” and we call the activities or changes that are caused by the stimulus “response” * Give students an example by explaining the first picture: “This is a scenario when the boy is woken up by the alarm clock. The alarm clock is ringing. We can say the sound of the alarm clock is the stimulus and the action of getting up is the response” * Ask students whether they have any questions or confusions * Answer questions and clarify confusions * Ask students “Can you identify the stimulus and the response for the rest of the 3 pictures?” * Call upon volunteers to answer |
| Body: | **Hand Slap Game (5 min)**   * Show students a video of Hand Slap Game: <https://www.youtube.com/watch?v=cwX-SVwyBbI> (1’49’’) * Have student partner up and play the game * After the game, ask students “What is the stimulus and what is the response in this game?” * Call upon volunteers to answer   **Catch Me if You Can (25 min)**   * Inform students that they are going to play another game called “Catch Me if You Can” * Give each student a chart to record their data later * Make the objective of the game clear: To determine your reaction time by measuring how long you take to catch a falling ruler during times of concentration and distraction * Have students each make a hypothesis about whether they think their reaction time will be faster under normal or distracted conditions * Make the steps of the game clear to students:  1. Have your partner hold the ruler with the 0 cm mark level with your thumb and forefinger. Do not touch the ruler. Focus on catching the ruler as soon as your partner releases it 2. When your partner releases the ruler, attempt to catch it as quickly as possible 3. Observe and record the measurement where your thumb and forefinger have caught the ruler in the chart provided 4. Use the conversion chart to change centimeters to seconds and record this data in your table 5. Complete four trials 6. Once complete with normal conditions, have your partner distract you by asking you multiplication problems as you try to catch the ruler 7. Complete four trials under distracted conditions following steps 2-4  * Have students compare their data with each other * Call upon volunteers to share their findings   **Reaction Time (1 min)**   * Tell students that humans’ reaction time varies from one to another * Make it clear to students that athletes usually react quicker than ordinary people (e.g., reacting in a gun in a starting line of 100-meter sprint) |
| Closure: | **How will You React? (7 min)**   * Project 3 pictures (hearing a fire alarm, step on a nail, touch a cactus) onto the smartboard for students to see * Ask students what will be their reactions if they are in those 3 scenarios * Have students identify the stimulus and the response in the 3 pictures * Have students discuss in their group of 3 first * Call upon volunteers to answer   **Instinctive Response (10 min)**   * Have student partner up to participate in the game of throwing cotton balls * Make the rules of the game clear to students:  1. Two partners will stand 0.5 m away from each other 2. Partner A will throw a cotton ball towards Partner B’s face without giving a hint ahead of time 3. Observe whether Partner B blinks 4. Repeat the same process 9 more times 5. Record down how many times Partner B blinks 6. Switch roles and play the game  * After playing the game, ask students “Is it hard to not to blink?” * Call upon volunteers to share * Explain to students that under that kind of situation, blinking is called an instinctive response. This happens when human bodies respond very quickly without being controlled by the brain. It is an instinct for self-protection   **Practice Time (5 min)**   * Give each student a worksheet with 6 stimulus and 6 responses mixed up * Have student match the stimulus with the corresponding response |

Lesson 5

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| Name &Time (Minutes Allotted): | From Stimulus to Response  60 min |
| Learning Standards: Curricular Competencies | Grade 5: CC1, CC2, CC9, CC22, CC26, CC27  Grade 6: CC1, CC2, CC9, CC22, CC26, CC27 |
| Learning Standards: Content | Grade 6: C1 |
| Instructional Objectives | * SWBAT draw the message delivery processes for any given picture * SWBAT understand the components of the nervous system and their functions * SWBAT understand that the skin sensitivity varies in different parts of the human body * SWBAT understand that different body parts have different reaction time to stimulus * SWBAT understand that there exist optical illusions * SWBAT know how to protect our spinal cord |
| Assessment: | What: Drawing Activity  How: Complete/Incomplete (teacher will mark students’ drawing of the message delivery process as complete or incomplete based on the accuracy)  What: In-Class Activities  How: Teacher Observation and Notes (teacher will observe students when they are participating in various activities in this lesson and make notes of their understanding about each topic being discussed)  What: Class Discussion  How: Teacher Observation and Notes (teacher will observe students when they are participating in the class discussion and make notes of their understanding) |
| Teaching Strategies: | Teacher’s example, components of the nervous system, it is your turn to draw, test the skin sensitivity in different parts of the human body, test the reaction time for different body parts, optical illusions, protecting our spinal cord |
| Materials: | * Projector * Smartboard * Whiteboard * Markers * Slideshow * Cotton swabs * Erasers * Worksheets * Pencils * Pencil crayons |
| Lesson Activities: | |
| Introduction/Hook: | **Teacher’s Example (5 min)**   * Project a picture of a boy trying to touch a cactus onto the smartboard for students to see * Review with students what is the stimulus and what is the response in that picture * Demonstrate how to draw the message delivery process when the boy touches the cactus (use a red line to show the pathway that the message enters the brain and use a blue line to show the pathway that the message leaves the brain) * Ask students whether they have any questions or confusions * Answer questions and clarify confusions   **Components of the Nervous System (5 min)**   * Project a diagram of the nervous system onto the smartboard for students to see * Explain to students that our nervous system consists of brain, spinal cord and surrounding nerves * Tell students that the brain and the spinal cord act like the control center of our body. The brain is responsible for storing and processing information and the spinal cord is responsible for giving simple commands and sending the information from the senses to the brain and then sending the instructions from the brain to the surrounding nerves. The surrounding nerves are responsible for collecting sensory signals and sending instructions from the brain to the muscles to respond |
| Body: | **It is Your Turn to Draw (10 min)**   * Give each student a worksheet with 2 pictures (one is a girl sending a message and the other one is a goalie preventing the soccer from entering their net) * Ask students to draw the message delivery process for the 2 pictures given * Make it clear to students that they can use a color to draw the pathway that the message enters the brain and use another color to show the pathway that the message leaves the brain * Have students share their drawings within their group of 3 first * Then, call upon volunteers to share their drawings with the whole class and explain their reasons * Go over the correct answers with the whole class * Ask students if they have any questions or confusions * Answer questions and clarify confusions   **Test the Skin Sensitivity in Different Parts of the Human Body (10 min)**   * Have students close their eyes and gently touch the tips of two cotton swabs to different parts of their body (fingertip, the back of their hand, elbow skin and knee skin) to see where they can feel two tips and where they can feel only one tip * Make it clear that the high-sensitive skin parts can sense two tips * Call upon volunteers to share their results with the whole class * Make it clear to students that the skin on our fingertips is the most sensitive, then the back of our hands, then the elbow skin and our knee skin is the least sensitive * Explain to students that the skin on our fingertips can sense two tips of the cotton swabs and the rest three skin parts can only sense one tip of the cotton swab |
| Closure: | **Test the Reaction Time for Different Body Parts (5 min)**   * Have students partner up * Have Partner A drop an eraser from a height of 0.5 m above Partner B’s hands and have Partner B use hands to avoid the eraser falling * Have Partner A drop the eraser from the same height above Partner B’s feet and have Partner B use feet to avoid the eraser falling * Have students pay attention to the reaction time of their hands and feet * Ask students “Which body parts react faster? Your hands or your feet?” * Call upon volunteers to answer * Explain to students that our hands react faster than our feet because there is a shorter distance from our hands to our brain whereas there is a longer distance from our feet to our brain   **Optical Illusions (20 min)**   * Show students two lines with the same length that can cause an optical illusion * Ask students “Are the two lines having the same length?” * Call upon volunteers to answer * Show students a slideshow to explain optical illusion including physiological illusion, literal illusion and cognitive illusion * Give each student a worksheet with 4 more pictures that can cause optical illusions * Ask students to write down what they see in each picture and what type of optical illusion happens in each picture   **Protecting Our Spinal Cord (5 min)**   * Discuss the vulnerability of our spinal cord and how we can protect it by telling students “Our spinal cord is very vulnerable. Once it is damaged, the body can become numb to severe paralysis. Therefore, we should pay attention to our own safety when we play sports. For example, do not do backbends without protection and do enough preparatory activities before exercises.” |

Lesson 6

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| Name &Time (Minutes Allotted): | Our Brain  60 min |
| Learning Standards: Curricular Competencies | Grade 5: CC2, C22, CC26, CC27  Grade 6: CC2, C22, CC26, CC27 |
| Learning Standards: Content | Grade 6: C1 |
| Instructional Objectives | * SWBAT know that humans’ brain is made up of cerebrum, cerebellum and brain stem * SWBAT understand the four properties of humans’ brain * SWBAT understand the five functions of humans’ brain * SWBAT understand the division of labor in humans’ brain |
| Assessment: | What: Class Discussion  How: Teacher Observation and Notes (teacher will observe students when they are participating in the class discussion and make notes of their understanding)  What: In-Class Activities  How: Teacher Observation and Notes (teacher will observe students when they are participating in the various in-class activities and make notes of their understanding about each topic being discussed)  What: Worksheet  How: Marking (teacher will mark students’ worksheet to see how many questions they got correct) |
| Teaching Strategies: | Introduction to our brain, experience the weight of adults’ brain, experience the size and shape of our brain, experience the surface of our brain, experience the hardness of our brain, experience the function of memorizing, experience the function of identifying, experience the function of controlling, experience the function of reasoning, experience the function of creating, division of labor in our brain, practice time |
| Materials: | * Projector * Smartboard * Slideshow * 1.4 kg of apples in a bag * Walnuts * Tofu * Dice * Tiny red circles * Origami paper * Worksheet * Pencils * Erasers |
| Lesson Activities: | |
| Introduction/Hook: | **Introduction to Our Brain (1 min)**   * Tell students that our brain is encased in a hard skull and it consists of cerebrum, cerebellum and brain stem * Show students a diagram of the human brain   **Experience the Weight of Adults’ Brain (1.5 min)**   * Take out the pre-prepared bag of 1.4 kg of apples * Tell students that adults’ brain have a similar weight as these apples and cerebrum takes 80% of the weight of the whole brain * Have students take the bag of 1.4 kg of apples and feel the weight of adults’ brain   **Experience the Size and Shape of Our Brain (1 min)**   * Demonstrate to students: clench two hands together in a fist * Tell students that humans’ brain have a similar size and shape to this stimulation * Have students clench their hands together in a fist and experience the size and shape of the human brain   **Experience the Surface of Our Brain (1.5 min)**   * Give each student a walnut * Tell students that the surface of our brain is very similar to the walnut * Explain to students why our brain is so wrinkled: Our brain is an organ that stores all of our memories throughout our life and controls everything we do. When we are born, our brain is only half the size it is when we are an adult. As it grows, it fills up our skull and runs out of growing room, creating the characteristic wrinkles we see as it folds in on itself. The purpose is to give us more surface area to think   **Experience the Hardness of Our Brain (1.5 min)**   * Have students touch the tofu that is pre-prepared * Tell students that our brain has a similar hardness to the tofu * Make it clear that our brain is not white but has a color of light pink |
| Body: | **Experience the Function of Memorizing (5 min)**   * Project 15 objects onto the smartboard for students to memorize * Tell students that they have 10 seconds to memorize as many objects as they can * After 10 seconds, call upon volunteers to list the objects that they remember * Make it clear to students that this activity shows us that our brain has the function of memorizing   **Experience the Function of Identifying (2 min)**   * Project 4 pictures with different emotions (happy, angry, terrified, sad) onto the smartboard for students to see * Ask students to identify what emotion each picture conveys * Make it clear to students that this activity shows us that our brain has the function of identifying   **Experience the Function of Controlling (5 min)**   * Give each group (3 students) a die and a tiny red circle * Tell students to put the tiny red circle somewhere on their desk and use their fingertip to push the die once so that it lands on the tiny red circle as much as possible * Make it clear to students that this activity shows us that our brain has the function of controlling   **Experience the Function of Reasoning (10 min)**   * Project the first 3 pictures of shapes with a pattern * Ask students to figure out the 4th picture * Make it clear to students that this activity shows us that our brain has the function of reasoning   **Experience the Function of Creating (20 min)**   * Give each student a piece of origami paper * Ask students to create anything they want * Make it to students that this activity shows us that our brain has the function of creating |
| Closure: | **Division of Labor in Our Brain (10 min)**   * Explain to students that our brain is made of two symmetrical parts, the right and left hemispheres. Although they are equal in size, they carry out two very different jobs. The right side of the brain controls the left side of the body. The left hemisphere controls the right side of the body. The left brain focuses more on mathematics, linguistics, writing and etc. whereas right brain focuses more on music, drawing, emotions and etc. Each hemisphere is connected to the other which allows the two sides to communicate with one another. Scientists have also found that when the brain is working, not all parts are involved in the same thing but different parts of the brain do different jobs * Project a diagram of the division of labor in the left hemisphere of the human brain for students to see   **Practice Time (1.5 min)**   * Give each student a worksheet with the activities that they did in this lesson on the top row and the functions of our brain on the bottom row (with a random order) * Have student match the activities with the corresponding functions of the brain |

Lesson 7

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| Name &Time (Minutes Allotted): | The Development and Utilization of the Brain  64 min |
| Learning Standards: Curricular Competencies | Grade 5: CC1, CC2, CC22, CC26, CC27  Grade 6: CC1, CC2, CC22, CC26, CC27 |
| Learning Standards: Content | Grade 6: C1 |
| Instructional Objectives | * SWBAT understand the parts of the brain and their functions * SWBAT understand sensory and motor nerves * SWBAT know how to protect our brain * SWBAT understand what an AI is and what they can do |
| Assessment: | What: Worksheets  How: Marking (teacher will mark students’ worksheets to see how many questions they got correct)  What: Creation  How: Complete/Incomplete (teacher will mark students’ writing and drawing about AI as complete or incomplete) |
| Teaching Strategies: | Review, teacher’s instructions, label the diagram, matching activity, short answers, sensory nerves and motor nerves, overview of the nervous system, how to protect our brain?, introduction to artificial intelligence, creation activity |
| Materials: | * Projector * Smartboard * Slideshow * Worksheets * Pencils * Erasers * A video of AI singing: <https://www.youtube.com/watch?v=XDNmGH-IM8o> * Pencil crayons * Markers |
| Lesson Activities: | |
| Introduction/Hook: | **Review (5 min)**   * Give each student 3 handouts/worksheets with information and questions * Lead students to review:  1. What is the nervous system? 2. How does the nervous system work?   **Teacher’s Instructions (10 min)**   * Explain to students the different parts of humans’ brain (cerebrum, cerebellum, brain stem, pituitary gland, hypothalamus) and the function of each part * Ask students to read their first handout to follow along   **Label the Diagram (2 min)**   * Have students label the diagram of humans’ brain using the words from the word bank on their second worksheet * Go over the correct answers with the whole class   **Matching Activity (2 min)**   * Have students match each part of the brain with their corresponding function on their second worksheet * Go over the correct answers with the whole class   **Short Answers (2 min)**   * Have students respond to the 2 short answer questions on their second worksheet (What happens to your nervous system when you put your hand too close to a fire? What could happen if your nervous system wasn’t working properly?) * Go over some reasonable answers with the whole class   **Sensory Nerves and Motor Nerves (5 min)**   * Introduce the sensory nerves and motor nerves to students * Ask students to read their third handout to follow along * Have students label the nerve type based on the 4 descriptions on their third worksheet |
| Body: | **Overview of the Nervous System (15 min)**   * Display a slideshow to briefly talk about the central nervous system, periphery nervous system, how vision/hearing/smell and taste/touch work and lobes of the brain   **How to Protect Our Brain? (10 min)**   * Tell students: Studies have found that the brain is the body’s most energy-consuming organ. It takes only 2.5% of body weight but uses 20% of the body’s energy and 25% of its oxygen. Different parts of the brain are responsible for different functions. If one area is activated for a long time, it will cause fatigue which may lead to neurasthenia and memory loss. Sleeping is important for resting the brain and children around the age of 10 need about 10 hours of sleep a day. Keeping a happy mood is also good for the health of the brain and it can improve learning and working efficiency * Project 3 scenarios onto the smartboard for students to see (opening windows for ventilation, wearing a helmet when riding a bike, skipping breakfast) * Ask students “Which are correct ways to protect our brain and which are not?” * Have students discuss * Give each student a worksheet with 6 scenarios (taking turns doing homework in different subjects, starting homework right after dinner, reading while eating, staying up late before a test, sleeping with the quilt over the head, wearing a helmet while riding a motorcycle) * Have students identify which ways are correct in terms of protecting our brain and which are not * Have students label each scenario with a check mark or an x |
| Closure: | **Introduction to Artificial Intelligence (3 min)**   * Explain to students: Artificial Intelligence (AI) is a new technology that stimulates, extends and expands the function of human brain. The developed AIs are different from simple robots that complete repeated tasks. After being implanted with learning programs, AIs can stimulate human thinking and have certain abilities to discover and solve problems * Tell students that AIs can sing, play chess, cook, clean the house, play sports, drive, go shopping and accompany humans * Show students a video of AI singing: <https://www.youtube.com/watch?v=XDNmGH-IM8o> (40’’ to 1’4’’)   **Creation Activity (10 min)**   * Ask students “What else do you think AI can do in the future?” * Have students either write a simple story or draw a comic strip about the posed question |

Lesson 8

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| Name &Time (Minutes Allotted): | Introduction to Digestive System (1)  60 min |
| Learning Standards: Curricular Competencies | Grade 5: CC1, CC2, CC9, CC22, CC23, CC26, CC27  Grade 6: CC1, CC2, CC9, CC22, CC23, CC26, CC27 |
| Learning Standards: Content | Grade 5: C1 |
| Instructional Objectives | * SWBAT know the pathways that food travels through in humans’ body * SWBAT know each part of the human’s digestive system * SWBAT understand the process of digestion and what happens in each organ of the digestive system |
| Assessment: | What: Point and Talk  How: Teacher Observation and Notes (teacher will observe students when they are participating in the point and talk activity and make notes of their understanding)  What: Label the Diagram  How: Teacher Observation and Notes (teacher will observe students when they are labelling their diagram and make notes of their understanding)  What: Digestive System Lab Experiment  How: Complete/Incomplete (teacher will mark students’ lab and lab sheet as complete or incomplete) |
| Teaching Strategies: | Pose questions, showing the diagram, point and talk, teacher’s instructions, label the diagram, digestive system lab experiment |
| Materials: | * Projector * Smartboard * Candies * Slideshow * Digestive system diagram without labels * Bananas * Crackers * Lemon juice/clear vinegar * Water * Strong zip-lock bag * 1 cut-off leg of tights/stockings * 1 tray/bowl * 1 plastic cup * Lab sheet * Pencils * Erasers |
| Lesson Activities: | |
| Introduction/Hook: | **Pose Questions (1 min)**   * Give each student a small bag of candy and have them eat it * Ask students “Where did the candies go?”, “How did the candies travel in our body?” and “What changes might happen to the candies?” * Call upon volunteers to answer   **Showing the Diagram (2 min)**   * Project the diagram of the digestive system onto the smartboard for students to see * Go over the pathways that food travels in humans’ body (food enters our mouth and moves to pharynx, esophagus, stomach, small intestine, large intestine, rectum in turn and leaves our body through anus)   **Point and Talk (2 min)**   * Call upon volunteers to come up to the smartboard * Have them point to the diagram and talk through the pathways that food travels in humans’ body |
| Body: | **Teacher’s Instructions (20 min)**   * Show students a slideshow to explain different organs found in humans’ body and their functions (i.e.., mouth, esophagus, stomach, small intestine, large intestine, rectum and anus) * Show students accessory organs that food does not pass through and their functions (i.e., tongue, teeth, salivary glands, liver, gallbladder and pancreas)   **Label the Diagram (5 min)**   * Give each student a diagram about the digestive system without labels * Have student label each part of the digestive system |
| Closure: | **Digestive System Lab Experiment (30 min)**   * Tell students that they are going to watch a simulation experiment of humans’ digestive system done by the teacher first * Inform students that they can do the simulation experiment themselves within their group of 3 after watching the teacher’s demonstration * The materials include:  1. Food to be digested (1 banana, 3 crackers) 2. Lemon juice or clear vinegar 3. Water 4. Strong zip-lock bag 5. 1 cut-off leg of tights/stockings (i.e., small intestine) 6. 1 tray or bowl to catch the mess 7. 1 plastic cup to catch the food that passes through (large intestine)  * The procedures are like this:  1. Place a banana and 3 crackers inside the Ziplock bag (eating the food) 2. Slowly add a little bit of water (saliva) 3. Let all the air out of the bag and shut it 4. Smash the ingredients with your hands until there are no more clumps (chew) 5. Squeeze the chewed-up food into one end of the bag and add a small amount of acid to it (the food has moved from the mouth to the stomach) 6. Continue mashing the food in the stomach with the acid breaking it down more 7. Now the food from the stomach will need to travel into the small intestine. Tilt the bag up slightly so the food is on one side of the bag. Cut a small hole in the other corner of the bag (the corner you are not tipping) 8. Squeeze the chewed food into the cut-off tights while holding everything over the bowl/tray 9. Squeeze the food through the tights (small intestine) 10. When the food is through the tights, cut a small hole in the end of the tights to let the waste move to the cup (large intestine) 11. Optional – cut a small hole in the bottom of the cup to represent getting rid of the waste in a trip to the toilet  * Talk through the process and explain what happens to each step while doing the experiment * Once the experiment is done, ask students whether they have questions or confusions * Answer questions and clarify confusions * Have students start the experiment * Once students are done with the experiment, have them fill out the lab sheet |

Lesson 9

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| Name &Time (Minutes Allotted): | Introduction to Digestive System (2)  60 min |
| Learning Standards: Curricular Competencies | Grade 5: CC1, CC2, CC22, CC23, CC26, CC27  Grade 6: CC1, CC2, CC22, CC23, CC26, CC27 |
| Learning Standards: Content | Grade 5: C1 |
| Instructional Objectives | * SWBAT know the functions of organs in humans’ digestive system * SWBAT know the neighbor organs of any given organ in humans’ digestive system * SWBAT know the ways that we can protect our organs in humans’ digestive system * SWBAT describe food’s journey in humans’ digestive system |
| Assessment: | What: Trek the Tract Lab  How: Checklist (teacher will give students a check mark besides their name if they demonstrate their understanding about the questions on the lab sheet)  What: Class Discussion  How: Teacher Observation and Notes (teacher will observe students when they are participating in the class discussion and make notes of their understanding)  What: Digestion Story  How: Complete/Incomplete (teacher will mark students’ digestion story as complete or incomplete) |
| Teaching Strategies: | Review, trek the tract lab, how to protect our organs in the digestive system?, Digestion Story: An Epic Tale of Food’s Digestive Journey |
| Materials: | * Projector * Smartboard * Pencils * Erasers * Pencil crayons * Markers * Paper * Lab sheet |
| Lesson Activities: | |
| Introduction/Hook: | **Review (15 min)**   * Lead students to review the following:  1. The pathways that food travels in humans’ body (food enters our mouth and moves to pharynx, esophagus, stomach, small intestine, large intestine, rectum in turn and leaves our body through anus) 2. Different organs found in humans’ body and their functions (i.e.., mouth, esophagus, stomach, small intestine, large intestine, rectum and anus) 3. Accessory organs that food does not pass through and their functions (i.e., tongue, teeth, salivary glands, liver, gallbladder and pancreas) |
| Body: | **Trek the Tract Lab (20 min)**   * Have students work in their group of 3 * Assign each group an organ found in humans’ digestive system * Make it clear to students that everyone should write down the name of their assigned organ and draw a picture of it on their own piece of paper * Inform students that they need to work as a group to answer the questions on their lab sheet (e.g., What is the function of this organ? What happens to food within this organ? Are there any other organs that interact with your organ? If so, which ones? What are the organs that come before or after your organ? What accessory organs relate to your organ?) * Once students are done with their lab, call upon volunteers to share their answers * Choose one organ as an example and go over the answers to the questions on the lab sheet   **How to Protect Our Organs in the Digestive System? (5 min)**   * Have students discuss how we can protect our organs in digestive system and the consequences that will happen if our organs do not work * Some possible answers can be:  1. Brush our teeth properly so that we can have good teeth to chew food 2. Do not eat too much so that our small intestine can digest and absorb food properly |
| Closure: | **Digestion Story: An Epic Tale of Food’s Digestive Journey (20 min)**   * Inform students that they are going to create a story about the food’s journey in their digestive system by either writing a story or drawing a comic strip * Project the requirements on the smartboard for students to see: You’ve just taken a bite of your favorite food. Where does it go? What does it see? How does it change? Your meal has a story to tell about its journey through the digestive tract and the interactions it has with the accessory organs of the digestive system. Your job is to express and illustrate this journey! * Ask students whether they have any questions or confusions * Answer questions and clarify confusions * Have students start creating their story |

Lesson 10

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| Name &Time (Minutes Allotted): | Food and Nutrition  60 min |
| Learning Standards: Curricular Competencies | Grade 5: CC1, CC2, CC22, CC26, CC27  Grade 6: CC1, CC2, CC22, CC26, CC27 |
| Learning Standards: Content | Grade 5: C1 |
| Instructional Objectives | * SWBAT know the 7 types of nutrients and their functions * SWBAT know what types of food contain the 7 types of nutrients respectively * SWBAT assess their meals according to the food pyramid for kids and design their own healthy meals |
| Assessment: | What: Class Discussion  How: Teacher Observation and Notes (teacher will observe students when they are participating in the class discussion and make notes of their understanding)  What: Worksheet  How: Marking (teacher will mark students’ worksheet to see how many questions they got correct)  What: Design Healthy Meals  How: Complete/Incomplete (teacher will mark students’ meals design as complete or incomplete) |
| Teaching Strategies: | Dividing into categories, 7 types of nutrients, teacher’s instructions, detecting nutrients in food, is your diet reasonable?, design your own healthy meals, practice time |
| Materials: | * Projector * Smartboard * Slideshow * A video of Iodine test for starch: <https://www.youtube.com/watch?v=HO_q8GPl3bE> (44’’) * Peanuts * White paper * Pencils * Erasers * Pencil Crayons * Markers * Worksheet |
| Lesson Activities: | |
| Introduction/Hook: | **Dividing Into Categories (7 min)**   * Project a picture of a variety of food onto the smartboard for students to see * Ask students to divide the food into categories within their group of 3 * Make it clear to students that there is no right or wrong answer for this activity as long as they can explain their reasons * Have one student in each group share their categories and explain their reasons   **7 Types of Nutrients (1 min)**   * Explain to students that nutrients are substances that human bodies can absorb and utilize from the food that we eat. There are 7 types of nutrients that human bodies need: carbohydrates, proteins, fats, vitamins, minerals, dietary fiber and water   **Teacher’s Instructions (6 min)**   * Explain to students that food that contains starch (e.g., rice, noodles, bread) includes lots of carbohydrates. These types of food provide us with energy and support our movements * Explain to students that oily food contains lots of fats. They can provide us with energy and keep our body temperature. However, we should not eat too much oily food * Explain to students that fish, meat, eggs, milk and soy beans contain lots of protein which is the necessary nutrient that help us grow * Explain to students that vegetables and fruits contain lots of vitamins and minerals. They help us stay in good health * Explain to students that water is the most important nutrient for human bodies. It helps us absorb nutrients and get rid of wastes * Explain to students that whole grain, vegetables and soy beans contain lots of dietary fiber. They can help us get rid of wastes |
| Body: | **Detecting Nutrients in Food (13 min)**   * Tell students that Iodine is a detector of starch in food. When we drop some Iodine onto the food that contains starch, the food will turn blue * Have students watch a video of Iodine test for starch: <https://www.youtube.com/watch?v=HO_q8GPl3bE> (44’’) * Ask students “What conclusions can we make by watching the video?” * Call upon volunteers to answer * Lead students to smash peanuts on the surface of a white paper and tell them if they see transparent oil on that paper, then we can say that peanuts contain oil   **Is Your Diet Reasonable? (10 min)**   * Project the food pyramid for kids onto the smartboard for students to see * Make it clear to students that the food pyramid for kids indicates how much food in each category they should eat every day * Ask students to list what they ate for breakfast, lunch and dinner yesterday on a piece of paper * Have students compare the food they ate with the requirements on the food pyramid to see whether their meals were reasonable * Call upon volunteers to share * Explain to students that there is no one food that contains all the nutrients we need so we should eat a variety of food to stay healthy |
| Closure: | **Design Your Own Healthy Meals (15 min)**   * Have students design their own breakfast, lunch and dinner in a healthy way * Make it clear to students that they should refer to the food pyramid for kids when they are designing their meals * Once students are done, have them discuss and share their meals within their group of 3 first * Then, call upon volunteers to share their meals with the whole class and explain their reasons for that   **Practice Time (8 min)**   * Give each student a worksheet with 10 types of food (bread, pasta, cabbage, carrot, beans, chicken, watermelon, sweet potato, cake and pork) and 5 types of nutrients (carbohydrates, protein, fats, vitamins and dietary fiber) * Have students match the food with their corresponding nutrient |

Resources:

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| * BC – Grade 5 & 6 Science Units (<https://www.teacherspayteachers.com/Product/BC-Grade-5-6-Science-Units-FULL-YEAR-BUNDLE-5612700?st=66d6a8dc1664063989fd6f134614b260>) * Human Body Systems (<https://www.teacherspayteachers.com/Product/Human-Body-Systems-PowerPoint-Handouts-Bundle-Paper-Digital-488351>) |

Extensions to Unit:

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| After this unit, I can continue to teach the body systems including related organs and their corresponding functions. Some possible topics can be:   * Circulatory system * Execratory system * Hormonal system * Musculo-skeletal system (might just briefly touch on this to review) |

Reflections and Revisions

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| This unit has not been taught yet. |