

The Asian International School
 Unit Backward Design
 General Science, Elementary, 2018-2019
 Unit 1A: The Simplest Living Things

Stage 1 - Desired Results

Established Goal(s):

In this unit students will learn the characteristics of bacteria and viruses and their functions. Furthermore, students will be able to understand that all microorganisms are not harmful and will also learn about infectious diseases. Students will receive an opportunity to perform experiments and note down their results.

Understandings:
Students will understand ...

- ✓ Viruses are extremely small and they aren't cells.
- ✓ Unicellular and multicellular living things are all eukaryotes.
- ✓ Bacteria are classified according to shape.
- ✓ The main characteristics of microorganisms
- ✓ The chemical composition of all living things.
- ✓ The nutrition habit of bacteria
- ✓ Protozoa and algae.

Essential Questions:

- ✓ What is the Monera Kingdom?
- ✓ What is the Protocist Kingdom?
- ✓ What are viruses and infectious diseases?
- ✓ How can we fight infectious diseases?
- ✓ Are all microorganisms harmful?
- ✓ What are algae?

Knowledge:
Students will know ...

- ✓ How to recognize the main characteristics of microorganisms and viruses.
- ✓ How to examine the structure and vital functions of bacteria.
- ✓ What infectious diseases are and how to fight them.
- ✓ What is cell, tissue, organ and organ system.
- ✓ Bacteria generally reproduce by binary fission
- ✓ How microorganisms enter body
- ✓ How does intestinal flora help human beings?
- ✓ What is a virus like?

Skills:
Student will be able to:

- ✓ Examine different groups of algae
- ✓ Discuss the method of reproduction in bacteria
- ✓ Examine different groups of bacteria, protozoa and algae.
- ✓ Illustrate the life cycle of plasmodium
- ✓ Discuss about zooplankton and phytoplankton.
- ✓ Analyze the structure of flu virus.
- ✓ Illustrate virus infection process
- ✓ Ability to visualize and diagrammatically interpret structure of viruses.
- ✓ Identify living things in the puddle water. Visualize diagrammatically represent microorganisms
- ✓ Share views and work in groups
- ✓ Perform experiments and scientifically record their findings.

Stage 2 - Assessment Evidence

Performance tasks:

Other Evidence:

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- Making Venn diagram: Compare vaccines and antibiotics.

- ✓ Two individual assessments (Mid-Term/Final) accounting for the assigned percentage of the overall course grade.
- ✓ Homework, participation, behavior, and attendance.
- ✓ Grades based on presentation of knowledge and ideas.

Stage 3 – Learning Plan

Learning Activities:

Monera Kingdom

- Draw a bacteria cell and clearly label each part.
- Compare the various types of bacteria using a chart – Parasites, Saprophytes, Symbionts.

Protoctist Kingdom

- In groups, compare protoctists and monera.
- Describe how each group of protozoa move.
- Compare algae and plants
- Using a Venn diagram, compare protozoa and algae.

Viruses

- Draw and label a virus.
- Discuss with your partner -Which vital function do viruses share with other living things.

Infectious diseases

- Choose five infectious diseases and complete the table. Information should include – Illness, microorganism, transmitted through and symptoms
- Discuss the benefits and differences between vaccines and antibiotics.

Experiment

- Put moist bread in a plastic box. Observe the changes after a few days. Record your findings and provide reasons for this change.
- **Cheek Cells VS Onion Cells**

Hands On activity:

- Make a model Cell

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 Unit 1B: Minerals

Stage 1 - Desired Results

Established Goal(s):

In this unit, students will gain an understanding of how minerals can be classified and identified by its properties. Students will investigate how to study minerals.

<p>Understandings: <i>Students will understand ...</i></p> <ul style="list-style-type: none"> ✓ How to identify minerals and non minerals? ✓ The use of physical properties to sort, classifies, and describes minerals. ✓ Geological evidence to support the idea that the extracting minerals can damage the environment. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ✓ What Are Minerals? ✓ What Are Minerals Composed of? ✓ How are Minerals Extracted? ✓ How Are Minerals Classified? ✓ What Are The Properties Of Minerals?
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<p>Knowledge: <i>Students will know ...</i></p> <ul style="list-style-type: none"> ✓ The definition of minerals ✓ How to identify the properties of minerals ✓ How to classify minerals ✓ How to use the Moh's Scale of hardness ✓ How to use the mineral identification key to identify minerals. ✓ Importance of minerals in everyday life. 	<p>Skills: <i>Student will be able to:</i></p> <ul style="list-style-type: none"> ✓ Differentiate Silicates from Non-Silicates. ✓ Elaborate different properties of Minerals. ✓ Explain the importance of Mineral Extraction. ✓ Classify minerals by using mineral identification key. ✓ Analyzing photos of some mineral stones to identify its composition and impurities. ✓ Examine whether the chemical composition of the mineral changes? ✓ Discuss about the impurities in minerals? ✓ Discuss about mineral extraction and its consequences. ✓ Examine what metals are obtained from mineral. ✓ Visualize and diagrammatically represent data ✓ Share views and work in groups ✓ Clearly communicate and expression of ideas, both written and oral.
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Stage 2 - Assessment Evidence

<p>Performance tasks:</p> <ul style="list-style-type: none"> • Research assignment on interesting facts about minerals. 	<p>Other Evidence:</p> <ul style="list-style-type: none"> ✓ Two individual assessments (Mid-Term/Final) accounting for the assigned percentage of the overall
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<ul style="list-style-type: none">• Composition of Minerals Worksheet• Photo description of some mineral stones to identify its composition and impurities.• Create a chart about common silicates which make up many rocks.• Research Assignment: You can't scratch quartz with a nail. Can quartz scratch the nail? Why?	course grade. ✓ Homework, participation, behavior, and attendance. ✓ Grades based on presentation of knowledge and ideas.
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Stage 3 – Learning Plan

<p>Learning Activities</p> <p><u>What are minerals?</u> Looking at some photos and tabulate whether they are minerals or not by identifying the properties of minerals.</p> <p><u>What are minerals composed of?</u> Research varieties of quartz. What colors are they? (amethyst, jasper, citrine, creolite, rose quartz, rock crystal)</p> <p><u>How are minerals extracted and used?</u> Create a poster about the advantages and disadvantages of mineral extraction.</p> <p><u>How are minerals classified?</u> Summarize the information on silicates on a chart.</p> <p><u>What are the properties of minerals?</u> Using the Moh's Scale of Hardness, describe some minerals.</p> <p><u>Experiment:</u></p> <ul style="list-style-type: none">➤ Using a mineral identification key classify some minerals.➤ Rock Investigation➤ Hands on Activity: Identifying Minerals
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 Unit 2A: The Simplest Living Things

Stage 1 - Desired Results

Established Goal(s):

In this unit students will learn the characteristics of bacteria and viruses and their functions. Furthermore, students will be able to understand that all microorganisms are not harmful and will also learn about infectious diseases. Students will receive an opportunity to perform experiments and note down their results.

Understandings:
Students will understand ...

- ✓ Viruses are extremely small and they aren't cells.
- ✓ Unicellular and multicellular living things are all eukaryotes.
- ✓ Bacteria are classified according to shape.
- ✓ The main characteristics of microorganisms
- ✓ The chemical composition of all living things.
- ✓ The nutrition habit of bacteria
- ✓ Protozoa and algae.

Essential Questions:

- ✓ What is the Monera Kingdom?
- ✓ What is the Protocist Kingdom?
- ✓ What are viruses and infectious diseases?
- ✓ How can we fight infectious diseases?
- ✓ Are all microorganisms harmful?
- ✓ What are algae?

Knowledge:
Students will know ...

- ✓ How to recognize the main characteristics of microorganisms and viruses.
- ✓ How to examine the structure and vital functions of bacteria.
- ✓ What infectious diseases are and how to fight them.
- ✓ What is cell, tissue, organ and organ system.
- ✓ Bacteria generally reproduce by binary fission
- ✓ How microorganisms enter body
- ✓ How does intestinal flora help human beings?
- ✓ What is a virus like?

Skills:
Student will be able to

- ✓ *Examine different groups of algae*
- ✓ Discuss the method of reproduction in bacteria
- ✓ Examine different groups of bacteria, protozoa and algae.
- ✓ Illustrate the life cycle of plasmodium
- ✓ Discuss about zooplankton and phytoplankton.
- ✓ Analyze the structure of flu virus.
- ✓ Illustrate virus infection process
- ✓ Ability to visualize and diagrammatically interpret structure of viruses.
- ✓ Identify living things in the puddle water.
- ✓ Visualize diagrammatically represent microorganisms
- ✓ Share views and work in groups
- ✓ Perform experiments and scientifically record their findings.

Stage 2 - Assessment Evidence

Performance tasks:

Other Evidence:

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- Making Venn diagram: Compare vaccines and antibiotics.

- ✓ Two individual assessments (Mid-Term/Final) accounting for the assigned percentage of the overall course grade.
- ✓ Homework, participation, behavior, and attendance.
- ✓ Grades based on presentation of knowledge and ideas.

Stage 3 – Learning Plan

Learning Activities

Monera Kingdom

- Draw a bacteria cell and clearly label each part.
- Compare the various types of bacteria using a chart – Parasites, Saprophytes, Symbionts.

Protoctist Kingdom

- In groups, compare protoctists and monera.
- Describe how each group of protozoa move.
- Compare algae and plants
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Viruses

- Draw and label a virus.
- Discuss with your partner -Which vital function do viruses share with other living things.

Infectious diseases

- Choose five infectious diseases and complete the table. Information should include – Illness, microorganism, transmitted through and symptoms
- Discuss the benefits and differences between vaccines and antibiotics.

Experiment

- Put moist bread in a plastic box. Observe the changes after a few days. Record your findings and provide reasons for this change.

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 Unit 2B: Rocks

Stage 1 - Desired Results

Established Goal(s):

In this unit students will get an insight of rocks, their types, uses and formation. The knowledge will be further enhanced by understanding the formation of fossil fuel and the rock cycle. Students will use data about a rock's physical characteristics make and support an inference about the rock's history and connection to rock cycle.

Understandings:
Students will understand ...

- ✓ The relationship between minerals and rocks;
- ✓ The common types of rocks;
- ✓ The classification and significance of rocks;
- ✓ The difference between rock salt and sea salt;
- ✓ How pressure affects the formation of rocks;
- ✓ Clay and Granite are rocks inspite of the fact that clay is soft and fragile while granite is hard.

Essential Questions:

- ✓ How are rocks used?
- ✓ What are rocks?
- ✓ What are sedimentary rocks?
- ✓ How are sedimentary rocks formed?
- ✓ How are igneous rocks formed?
- ✓ How are metamorphic rocks formed?
- ✓ What is the water cycle?

Knowledge:
Students will know ...

- ✓ The uses of rocks as construction materials, decoration, containers, fuels and chemical industries;
- ✓ How are rocks classified;
- ✓ The classification and formation of sedimentary rocks;
- ✓ The formation of igneous and metamorphic rocks;
- ✓ How to label the stages of the rock cycle.

Skills:
Student will be able to...

- ✓ Differentiate igneous, sedimentary and metamorphic rocks.
- ✓ Investigating weathering and sedimentation.
- ✓ Able to explain the formation of three types of rocks.
- ✓ Explore some use of rocks;
- ✓ Understand the relationship between minerals and rocks;
- ✓ Recognise common types of rock
- ✓ Analyse how rocks are formed
- ✓ *Classify rocks by their properties;
- ✓ *Discover the processes involved in the rock cycle.

Stage 2 - Assessment Evidence

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Performance tasks: <ul style="list-style-type: none">• Research Assignment: Where can you find examples of rock erosion in your country? Choose an example and say what natural phenomena caused the erosion. How many active volcanoes are there on Earth?• <u>Homework:</u> Label the diagram to show the stages of erosion or weathering	Other Evidence: <ul style="list-style-type: none">✓ Two individual assessments (Mid-Term/Final) accounting for the assigned percentage of the overall course grade.✓ Homework, participation, behavior, and attendance.✓ Grades based on presentation of knowledge and ideas.
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Stage 3 – Learning Plan

Learning Activities: <p><u>How are rocks are used?</u></p> <ul style="list-style-type: none">• Make a list of the uses of rocks.• Oil has more uses than most other rocks. Investigate “products made from oil” on the internet. <p>● Experiment:</p> <ul style="list-style-type: none">➤ Weathering and Sedimentation: Chemical Weathering➤ Volcano Science Experiment: <i>Foaming volcano</i> <p>◆ Hands on Activity:</p> <ul style="list-style-type: none">➤ Compaction and sedimentation➤ Making Rock cycle

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 Unit 3: Invertebrates

Stage 1 - Desired Results

Established Goal(s):

In this unit students will learn to identify different invertebrates and recall the importance of different cell structures. Furthermore, students will be able to understand and recall the various differences between the living things classified into the five kingdoms. Also, through various class discussions and group work, the students will understand the difference between bilateral and radial symmetry.

Understandings:

Students will understand ...

- ✓ The simplest invertebrates are classified into two groups.
- ✓ The vital functions of invertebrates.
- ✓ Worms, mollusks, arthropods have bilateral symmetry while echinoderms have radial and bilateral symmetry.
- ✓ Platyhelminthes and annelids are hermaphrodites while nematodes are heterosexuals.

Essential Questions:

- ✓ What makes up the Animal Kingdom?
- ✓ How certain worms differ?
- ✓ What are Molluscs, Arthropods and Echinoderms?
- ✓ What are living things made up of?
- ✓ What is the difference between radial and bilateral symmetry?

Knowledge:

Students will know ...

- ✓ How to recognize the main characteristics of invertebrates and successfully classify them into groups.
- ✓ How to differentiate between bilateral and radial symmetry.
- ✓ How to diagrammatically represent invertebrates and describe their life functions.
- ✓ The differences between cnidaria and porifera.
- ✓ About the different groups of worms, molluscs and arthropods and their characteristics.

Skills:

Student will be able to:

- ✓ Interpret and recognize the main characteristics of invertebrates.
- ✓ Classification of invertebrates into groups.
- ✓ Describe the invertebrate life functions.
- ✓ Compare and Contrast two or three different invertebrates in a Venn diagram.
- ✓ Discuss about the larger segments called clitellum of earth worm.
- ✓ Make a poster of Garden snail and label it.
- ✓ Diagrammatical representation of metamorphosis of a monarch butterfly
- ✓ Examine the habitat of worms
- ✓ Visualize and diagrammatically represent invertebrates.
- ✓ Share views and work in groups
- ✓ Clearly communicate and expression of ideas, both written and oral.

Interpret and understand class room discussions and teachings and apply it outside the school learning

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environment.

Stage 2 - Assessment Evidence

Performance tasks:

- Homework: Complete the charts made in class and also include a diagram of the examples mentioned. This will be used to assist the student for various pop quizzes.
- Enhance Vocabulary Words Related to the topic.

Other Evidence:

- ✓ Two individual assessments (Mid-Term/Final) accounting for the assigned percentage of the overall course grade.
- ✓ Homework, participation, behavior, and attendance.
- ✓ Grades based on presentation of knowledge and ideas.

Stage 3 – Learning Plan

Learning Activities

What makes up the animal Kingdom?

- What part of a sponge body does the name *Porifera* refer to?
- Copy and label the drawing of the sponge. Use arrows to label the flow of water. Show the entry and exit points.
- Discuss the differences between cnidaria and Porifera.

How do these worms differ?

- Create a chart depicting the main characteristics, habitat and an example of Nematodes, Platyhelminthes and Annelids.

What are Molluscs, Arthropods and Echinoderms?

- Create a similar table for Molluscs, Arthropods and Echinoderms, as mentioned above.
- Discuss the difference between radial and bilateral symmetry.

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 Unit 4: Vertebrates

Stage 1 - Desired Results

<p>Established Goal(s):</p> <p>In this unit students will learn to identify different vertebrates and recall the importance of different cell structures. Furthermore, students will be able to understand and recall the various differences between the vertebrates and invertebrates and make scientific drawings on this topic.</p>	
<p>Understandings: <i>Students will understand ...</i></p> <ul style="list-style-type: none"> ✓ How to compare vertebrates and invertebrates. ✓ The characteristics of vertebrates. ✓ The difference between exoskeleton and endoskeleton. ✓ The bird's body is aerodynamic. ✓ The vital function of vertebrates. ✓ That poikilotherms refers to cold blooded animals 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ✓ What characteristics do vertebrates have? ✓ What characteristics do Mammals, Birds, Reptiles and Amphibians have? ✓ What differences to the aforementioned animals have regarding nutrition, respiration and reproduction?
<p>Knowledge: <i>Students will know ...</i></p> <ul style="list-style-type: none"> ✓ How to identify the main characteristics of vertebrates and successfully classify them into groups. ✓ How to differentiate between vertebrates and invertebrates. ✓ How to diagrammatically represent vertebrates and describe their life functions. ✓ How many groups are there for mammals, birds and reptiles? 	<p>Skills: <i>Student will be able to:</i></p> <ul style="list-style-type: none"> ✓ Learn the basic characteristics of animals. ✓ Compare vertebrates and invertebrates. ✓ Evaluate a graphic organizer for studying vertebrates and invertebrates. ✓ Differentiate between oviparous, viviparous and ovoviviparous. ✓ Visualize and diagrammatically represent vertebrates. ✓ Share views and work in groups. ✓ Clearly communicate and expression of ideas, both written and oral. ✓ Make scientific drawings on this subject. ✓ Recall previous information and incorporate them into present work.

Stage 2 - Assessment Evidence

<p>Performance tasks:</p> <ul style="list-style-type: none"> • <u>Homework:</u> Create a chart showing the similarities and differences between 	<p>Other Evidence:</p> <ul style="list-style-type: none"> ✓ Two individual assessments (Mid-Term/Final) accounting for the assigned percentage of the overall course grade.
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vertebrates and invertebrates. Mention the results (advantages/disadvantages) of these differences. Use the charts made in class on vertebrates and invertebrates. (www.hmns.org/wpcontent/uploads/2015/06/WOW_Vertebrates_Middle_School.pdf)

- **Project:**
Create a large chart showing the physical characteristics, nutrition, respiration and reproduction of some vertebrates.
Vertebrate and Invertebrate Animal Flip Book.

- ✓ Homework, participation, behavior, and attendance.
- ✓ Grades based on presentation of knowledge and ideas.

Stage 3 – Learning Plan

Learning Activities

- ✓ Create a large chart showing the physical characteristics, nutrition, respiration and reproduction of each of the aforementioned vertebrates.

- ✓ Activity1: The Name Game

The Name Game is a fun way to introduce students to the concept of classification. Students will discover that every human has his/her own unique set of characteristics, or properties. This concept can then be carried over into the study of animals, where every species of animals has its own unique set of properties. By observing the properties of various animal species and through the process of elimination, students will be able to identify specific classifications of animals.

- ✓ Activity 2: Classifying animal card
- ✓ Activity 3: Study the scales on a fish. Make a scientific drawing of their shape and position.
- ✓ Activity 4: Show the life cycle of a frog with drawings.
- ✓ Activity 5: Compare tadpoles and frogs in a chart.
- ✓ Activity 6: Associate each beak with how the bird feeds.
- ✓ Activity 7: Show the bilateral symmetry of two animals with lines.

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 Unit 5: The Earth Atmosphere

Stage 1 - Desired Results

Established Goal(s):

Students will investigate how atmosphere interacts with the Earth system. They will demonstrate an understanding of the relationship between Earth’s atmospheric properties and processes, its weather and climate, and describe how matter in the atmosphere cycles through other Earth systems. Moreover, students will explain the role of differential heating or convection in ocean currents, winds, weather and weather patterns, atmosphere, or climate.

Understandings:
Students will understand ...

- ✓ The Earth’s atmospheric properties
- ✓ Weather conditions such as humidity, clouds, precipitation, temperature and wind.
- ✓ Low Pressure Area and High Pressure Area
- ✓ Characteristics of weather pattern in an area and factors affecting it.
- ✓ The meteorological role of each instrument and what it measures.
- ✓ The atmospheric pollution caused by human activities.
- ✓ The effect of carbon dioxide in the atmosphere.
- ✓

Essential Questions:

- ✓ What do we know about the atmosphere?
- ✓ What makes up the weather?
- ✓ What factors affect climate?
- ✓ What is meteorology?
- ✓ How do humans impact on the atmosphere?
- ✓ What is greenhouse effect?

Knowledge:
Students will know ...

- ✓ The composition and origin of the Earth’s atmosphere;
- ✓ The effects of living things on atmosphere and climate;
- ✓ The formation of wind, clouds and precipitation.
- ✓ How to predict the weather;
- ✓ How to use meteorological instrument;
- ✓ The greenhouse effect.

Skills:
Student will be able to:

- ✓ Examine the origin and composition of the atmosphere;
- ✓ Describe the state of atmospheric conditions;
- ✓ Discover how living things affect the composition of the atmosphere;
- ✓ Analyze how wind, clouds and precipitation are formed;
- ✓ Study the effects of living things on atmosphere and climate.

Stage 2 - Assessment Evidence

Performance tasks:

- Research Assignment:

Other Evidence:

- ✓ Two individual assessments (Mid-Term/Final)

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<p>Tabulate a one week weather forecasting in the city where the students lived.</p> <ul style="list-style-type: none">• Exercises and Videos on: Layers of the atmosphere Components of Air Weather and Isobar Contour Maps• Project: Illustrate Weather Maps Green House Model	<p>accounting for the assigned percentage of the overall course grade.</p> <ul style="list-style-type: none">✓ Homework, participation, behavior, and attendance.✓ Grades based on presentation of knowledge and ideas.
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Stage 3 – Learning Plan

Learning Activities

What do we know about the atmosphere?

- Create a poster showing the importance of oxygen in the atmosphere suitable for life.

What makes up the weather?

- Interpreting weather maps by identifying isobars.

What factors affect climate?

- Look at the factors that affect climate. Can you define how these affect the climate in your part of the country.

What is meteorology?

- Which instruments are needed to collect the information about wind speed and rain.

How do humans impact on the atmosphere?

- Represent in tabular form how human activities that pollute the atmosphere.

Investigate:

Ozone is very scarce, but very important. Explain why is it important. Tell how can it be beneficial or harmful.

◆ Experiment:

➤ **Balloon Magic with baking soda and vinegar**

◆ Hands On activity:

➤ Making of anemometer, to measure the wind speed

➤ Does air have weigh?

A. Air pressure with tissue paper

B. Air pressure with glass and cardboard

C. Air pressure with balloon and bottle

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 Unit 6: Hydrosphere

Stage 1 - Desired Results

Established Goal(s):

Students will understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans. They will also describe how matter in the atmosphere cycles through other Earth systems. Then, explain the water cycle in terms of its reservoirs, the movement between reservoirs, and the energy to move water.

Understandings:
Students will understand ...

- ✓ The processes involved in the water cycle such as evaporation, transpiration, condensation, precipitation, runoff and infiltration.
- ✓ The significant uses of water in agriculture and other industries.
- ✓ The importance of Earth’s resources
- ✓ The importance of cohesion and adhesion properties for living beings.

Essential Questions:

- ✓ Where is there water on Earth?
- ✓ What are the properties of water?
- ✓ What are the properties of sea water?
- ✓ Where is freshwater found?
- ✓ What is the water cycle?
- ✓ What is water used for?
- ✓ What pollutes water?

Knowledge:
Students will know ...

Skills:
Student will be able to:

Stage 2 - Assessment Evidence

Performance tasks:

- ✓ Draw and label the processes involved in a water cycle;
- ✓ Represent the pie chart information about fresh water distribution in bar graph format;
- ✓ Homework:
- ✓ Draw a frozen lake showing living things that exist under the ice.
- ✓ Research Assignment:
 Why do you think sea water in warm areas contains more salt than sea water in cold areas.

Other Evidence:

- ✓ Two individual assessments (Mid-Term/Final) accounting for the assigned percentage of the overall course grade.
- ✓ Homework, participation, behavior, and attendance.
- ✓ Grades based on presentation of knowledge and ideas.

Stage 3 – Learning Plan

Learning Activities

Where is there water on Earth?

- Represent the pie chart information in two bar graphs.

What are the properties of sea water?

- Look up the following terms: solvent, evaporation, cohesion, anomalous dilation and adhesion

Where is fresh water found?

- Create a power point presentation about bodies of fresh water you can find in Vietnam.

What is water used for?

- Make a water poster which will show how to prevent water pollution.
- Create a slogan that may raise awareness on the prevention of water pollution.

Experiment:

- Studying the effects of temperature on condensation.

➤ The Effect of Temperature in Condensation

Hands on activity:

➤ Making Mini water cycle

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 Unit 7: Force

Stage 1 - Desired Results	
<p>Established Goal(s):</p> <p>Students will have an overview about the basic concepts of force and its effects on different materials and on objects on the move. They will also understand about the concepts of Newton’s Law of motion and its application.</p>	
<p>Understandings: <i>Students will understand ...</i></p> <ul style="list-style-type: none"> ✓ The different application of force in real life; ✓ Newton’s Law of motion; ✓ The relationship of force and motion; ✓ Different types of forces. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ✓ Define force. ✓ What is the difference between constant force and force at a distance? ✓ What is tension and compression and what are the effects? ✓ How force change the speed and direction of the moving object?
<p>Knowledge: <i>Students will know ...</i></p> <ul style="list-style-type: none"> ✓ How to define force; ✓ The effects of forces on materials and in moving objects; ✓ What is pressure and how do we use it; ✓ The types of force; ✓ Forces will change the speed of objects; ✓ Forces will change the direction of moving objects. 	<p>Skills: <i>Student will be able to:</i></p> <ul style="list-style-type: none"> ✓ Distinguish between the types of forces. ✓ Ability to visualize and diagrammatically interpret the effect of tension and compression. ✓ Analyze the effect of force in speed and direction. ✓ Visualize and diagrammatically represent vertebrates. ✓ Share views and work in groups ✓ Clearly communicate and expression of ideas, both written and oral. ✓ Make scientific drawings on this subject ✓ Recall previous information and incorporate them into present work.
Stage 2 - Assessment Evidence	
<p>Performance tasks:</p> <ul style="list-style-type: none"> ✓ Project: Force and motion (www.all-science-fair-projects.com) ✓ Video: (www.phet.colorado.edu) ✓ Discuss with a partner how bounciness of a golf ball affect the distance it will travel. ✓ Explain Newton’s third law of motion using a 	<p>Other Evidence:</p> <ul style="list-style-type: none"> ✓ Two individual assessments (Mid-Term/Final) accounting for the assigned percentage of the overall course grade. ✓ Homework, participation, behavior, and attendance. ✓ Grades based on presentation of knowledge and ideas.

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balloon powered rocket car.
(www.pinterest.com)

Stage 3 – Learning Plan

Learning Activities

What is force?

- Discuss about constant force and force at a distance. Students will be asked to give examples for each type.
- Illustrate forces acting on pieces of metal and concrete on a bridge.
 - a. Tension causes stretching
 - b. Compression makes the material shorter
 - c. Bending is caused by forces acting in opposite directions.

What are the effects of forces?

- Discuss the landing and taking off of a plane.
- Demonstration
What will happen to the ball as we roll it on the floor and reaches to the wall?

➤ Experiment

- Newton's Third Law of Motion
<https://www.pinterest.com/explore/newtons-laws/?lp=true>

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 Unit 8: Slowing Things Down

Stage 1 - Desired Results

Established Goal(s):

Students will understand the importance of friction and air resistance in real life and the effect of lubricants on rough surfaces. They will know also about that air resistance can be reduced by using shapes which let the air 'slip' past more easily. Furthermore, they will understand the application of Newton's first law using friction and air resistance.

Understandings:
Students will understand ...

- ✓ The importance of friction in everyday life;
- ✓ The uses of lubricants;
- ✓ The different applications of friction in daily life;
- ✓ The correlation of air resistance and the shape of an object.
- ✓ The application of Newton's First Law of motion.

Essential Questions:

- ✓ What is friction?
- ✓ What is Newton's first law of motion?
- ✓ What is the effect of lubricant on motion of the object?
- ✓ What is streamlining?

Knowledge:
Students will know ...

- ✓ How to define friction and air resistance;
- ✓ The significance of Newton's First law of motion;
- ✓ The effects of streamlining on the speed of moving objects;
- ✓ The effects of lubricants on moving objects.
- ✓ The concepts of acceleration and deceleration.

Skills:
Student will be able to:

- ✓ Ability to define friction.
- ✓ Correlate friction and air resistance to first law of motion.
- ✓ Discuss the real life application of friction and air resistance.
- ✓ Analyze the effect of air resistance by using different model of shapes.
- ✓ Share views and work in groups
- ✓ Clearly communicate and expression of ideas, both written and oral.
- ✓ Make scientific drawings on this subject
- ✓ Recall previous information and incorporate them into present work.

Stage 2 - Assessment Evidence

Performance tasks:

- Research Assignment about the application of Newton's First Law of Motion.
- Videos on:

Other Evidence:

- ✓ Two individual assessments (Mid-Term/Final) accounting for the assigned percentage of the overall course grade.

The Asian International School
Unit Backward Design
General Science, Elementary, 2018-2019

<p>Bicycle Brakes, using Friction Smooth and Rough Surfaces, using friction</p> <ul style="list-style-type: none">• What is the effect of air resistance on different model of shapes.	<ul style="list-style-type: none">✓ Homework, participation, behavior, and attendance.✓ Grades based on presentation of knowledge and ideas.
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Stage 3 – Learning Plan

<p>Learning Activities</p> <p><u>What is friction?</u></p> <ul style="list-style-type: none">• Discussion on the nature of surfaces and effects of lubricants.• Application of friction in real life <p><u>What is air resistance?</u></p> <ul style="list-style-type: none">• What is the effect of air resistance on different model of shapes?• Application of Newton’s First Law of motion. <p>Experiment:</p> <ul style="list-style-type: none">➤ Floating Paper Air resistance➤ Sticky Rice Friction (www.sublimescience.com)➤ Sink or float
