MITA International School Syllabus 2018
三田国際学園中学校　平成 30 年度　シラバス

Grade Level / Course **学年 / コース**	S1/ Science in our daily life	**Subject Area / Class** **教科 / 科目**	Science/ 4(ICA)	**Class hours** **時間数**	2 時間 / 週

1 学期 中間試験 Term 1 Midterm

Name of Unit, Project **単元名**	Unit 1: Introducing Biology/Unit 2 Cells	**Textbooks / Materials** **使用教科書 / 教材**	Biology by Stephen Nowicki; Houghton Mifflin Harcourt Lab Handouts/Worksheets/Lab equipment
Unit Description **単元の概要**	This unit defines science, its unifying themes, and introduces biological concepts and the early history of biology. There is specific emphasis on the scientific method, and how these processes lead to discoveries. It also reviews the chemistry of living systems. Standards: HS-LS 1. A4, HS-LS1.C.2		

Class Standards　評価規準

	Recognition	Logical Thinking	Creative Thinking
楽	**A3** Able to explain phenomenon in one's own words.	**B3** Able to predict unknown results. Based on the working hypothesis, able to design an experiment.	**C3** Able to construct new concepts. Able to create an original experimental method, design and able to execute it.
好	**A2** Understand the ties of events from simple phenomenon to more complex phenomenon. Follow a known test method.	**B2** Can generalize and comprehend the connections by comparing the ties of knowledge. It is possible to consider factors that cause various phenomena.	**C2** **C2** Can predict missing variables from the contradiction of known rules.
知	**A1** Know basic terms, the names and roles of laboratory instruments and chemicals. Write and organize information.	**B1** Accurately diagram information. Compare, classify, and analyze experiment results. Find patterns in experimental results.	**C1** Able to find exceptions to rules and discuss why it is an exception. Critically evaluate the hypothesis and discover new issues.

Learning Objectives　学習内容

A3 Effectively recollect the branches of biology, Its underlying themes, and explain the chemistry necessary for life. Describe what cells are composed of and the functions different cells have.	**B3** Describe the reasoning behind the cell theory, and how cells are able to maintain their internal environment constant, despite the frequent changes that occur in the external environment.	**C3** Create discussions on the importance of biology, and how it is intricately related to our lives. Understand the structure of cells, and describe their importance to living things.
A2 Describe the science of biology, and what is the over aim of this discipline	**B2** Create clear examples of the scientific method using their own words. Can describe how an structure is related to its function.	**C2** Provide clear examples of tools in technology that is important to humanity, and describe the fundementals in the chemicals of life.
A1 Memorize essential terms in biology: Biology, Science, Scientific Method, cells, life.	**B1** Can describe what the essential molecules of life are.	**C1** Can define the relationship between the scientific method, and technology.

Others **備考**	＜評価方法＞ ＜ICT＞　Students will be given worksheets, quizzes and lab experiments to practice key concepts of the unit

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1 学期 期末試験 Term 1 Final

Name of Unit, Project **単元名**	Unit 2: Cells	**Textbooks / Materials** **使用教科書 / 教材**	- Biology by Stephen Nowicki; Houghton Mifflin Harcourt - Lab Handouts/Worksheets/Lab equipment
Unit Description **単元の概要**	Unit 2 focuses on identifying the various kinds of cells, understanding their structure and function, and describe the cell cycle with emphasis on energy transfer through cellular systems. Standards: HS-LS 1. A4/ HS-LS1.C.2/ HS-LS2.B1, HS-LS1.C.1, HS-LS1.C.4, HSLS1.B.1, HSLS1.A.2, HSLS1.A.3		

Class Standards　評価規準

楽	**A3** Able to explain phenomenon in one's own words.	**B3** Able to predict unknown results. Based on the working hypothesis, able to design an experiment.	**C3** Able to construct new concepts. Able to create an original experimental method, design and able to execute it.
好	**A2** Understand the ties of events from simple phenomenon to more complex phenomenon. Follow a known test method.	**B2** Can generalize and comprehend the connections by comparing the ties of knowledge. It is possible to consider factors that cause various phenomena.	**C2** Can predict missing variables from the contradiction of known rules.
知	**A1** Know basic terms, the names and roles of laboratory instruments and chemicals. Write and organize information.	**B1** Accurately diagram information. Compare, classify, and analyze experiment results. Find patterns in experimental results.	**C1** Able to find exceptions to rules and discuss why it is an exception. Critically evaluate the hypothesis and discover new issues.
	Recognition	**Logical Thinking**	**Creative Thinking**

Learning Objectives　学習内容

A3 Explained in detail the mechanisms involved in cellular respiration and photosynthesis that enable cells to reproduce and thrive.	**B3** Think critically on the molecular mechanisms involved in CR/PS/cell cycle, and identify the consequences when there are mistakes within the processes	**C3** Effectively explain what are the processes of cell energy and photosynthesis/cell cycle,and describe why it is essential to understand in modern society.
A2 Identify the essential mechanisms needed for cells survival.	**B2** Deduce what are the necessary materials needed for cellular processes to be executed.	**C2** Think critically about mishaps in cell cycle and identify what are some methods, on how these mishaps can be avoided.
A1 Describe the general concepts involving cells and how they obtain energy, and reproduce	**B1** List the similarities and differences between plant and animal cells	**C1** Observe onion cells and deduce which cells are undergoing cell division.

Others **備考**	＜評価方法＞ ＜ICT＞　Students will be given worksheets, quizzes and lab experiments to practice key concepts of the unit

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2 学期 中間試験 Term 2 Midterm

Name of Unit, Project **単元名**	Unit 3: Genetics	**Textbooks / Materials** **使用教科書 / 教材**	- Biology by Stephen Nowicki; Houghton Mifflin Harcourt - Lab Handouts/Worksheets/Lab equipment
Unit Description **単元の概要**	Unit 3 has emphasis on defining principles of genetic inheritance from parent to offspring, genetic makeup of an individual, and how the genetic code translates DNA information into proteins. Specific emphasis is given on how biotechnology can change an organism's DNA. Standards: HSLS3.A1, HSLS1.A.2, HSLS3.B.1, HSLS.B.2		

Class Standards　評価規準

	Recognition	**Logical Thinking**	**Creative Thinking**
楽	**A3** Able to explain phenomenon in one's own words.	**B3** Able to predict unknown results. Based on the working hypothesis, able to design an experiment.	**C3** Able to construct new concepts. Able to create an original experimental method, design and able to execute it.
好	**A2** Understand the ties of events from simple phenomenon to more complex phenomenon. Follow a known test method.	**B2** Can generalize and comprehend the connections by comparing the ties of knowledge. It is possible to consider factors that cause various phenomena.	**C2** Can predict missing variables from the contradiction of known rules.
知	**A1** Know basic terms, the names and roles of laboratory instruments and chemicals. Write and organize information.	**B1** Accurately diagram information. Compare, classify, and analyze experiment results. Find patterns in experimental results.	**C1** Able to find exceptions to rules and discuss why it is an exception. Critically evaluate the hypothesis and discover new issues.

Learning Objectives　学習内容

A3 Able for formulate an example, and explain effectively Mendelian Genetics, its variance, and state the reason for differences in traits within a family.	**B3** Can effectively conclude why experiments can obtained unknown results. Can troubleshoot the experiment to obtain results which give plausible genetic results.	**C3** Can select the necessary variables to lead a specific trait within a genetic variation problem.
A2 Understand how traits are past down from parents to offspring, and how that lead to characteristic variance.	**B2** Can depict the processes of inheritance patterns, and identify genetic factor which influences variation.	**B3** Solve problems related to human genetics and predict the missing/defective genes which lead to disorders/illnesses/mutations.
A1 Know the basic terms in genetics, Meiosis, transcription and translation, process of inheritance	**B1** Can recreate the process of meiosis and explain via diagrams. Can execute an experiment regarding classical genetics, and understand results.	**C1** Identify the variety of exceptions to mendelian genetics and explain why they happen in real life. Create questions/hypothesis that may solve current problems in genetics.

Others **備考**	＜評価方法＞ ＜ICT＞　Students will be given worksheets, quizzes and lab experiments to practice key concepts of the unit

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2 学期 期末試験 Term 2 Final

Name of Unit, Project **単元名**	Unit 3: Genetics/ Unit 4 Evolution	**Textbooks / Materials** **使用教科書 / 教材**	- Biology by Stephen Nowicki; Houghton Mifflin Harcourt - Lab Handouts/Worksheets/Lab equipment
Unit Description **単元の概要**	Unit 3 has emphasis on defining principles of genetic inheritance from parent to offspring, genetic makeup of an individual, and how the genetic code translates DNA information into proteins. Specific emphasis is given on how biotechnology can change an organism's DNA. Unit 4 Discusses the basic principles of evolution and natural selection, how populations evolve, and the history of life on Earth. Standards: HSLS3.A1, HSLS1.A.2, HSLS3.B.1, HSLS.B.2, HSLS4.B.1, HSLS4.B.2, HSLS4.C.1, HSLS4.C.2, HSLS4.A.1		

Class Standards　評価規準

	Recognition	Logical Thinking	Creative Thinking
楽	**A3** Able to explain phenomenon in one's own words.	**B3** Able to predict unknown results. Based on the working hypothesis, able to design an experiment.	**C3** Able to construct new concepts. Able to create an original experimental method, design and able to execute it.
好	**A2** Understand the ties of events from simple phenomenon to more complex phenomenon. Follow a known test method.	**B2** Can generalize and comprehend the connections by comparing the ties of knowledge. It is possible to consider factors that cause various phenomena.	**C2** Can predict missing variables from the contradiction of known rules.
知	**A1** Know basic terms, the names and roles of laboratory instruments and chemicals. Write and organize information.	**B1** Accurately diagram information. Compare, classify, and analyze experiment results. Find patterns in experimental results.	**C1** Able to find exceptions to rules and discuss why it is an exception. Critically evaluate the hypothesis and discover new issues.

Learning Objectives　学習内容

A3 Describe using own examples the process of the evolution and what is its relationship with genetics.	**B3** Can adequately explain the concept of evolution and deduce what can happen in the future to populations if certain trends continue within a given time and place.	**C3** Can identify how advances in biotechnology is increasing our understanding of evolutionary theory and genetics, as well as provide own opinion on these topics.
A2 Explain the steps in DNA replication and gene expression, as well as identify the factors that influence process of evolution	**B2** Identify some crucially important factors that promote mutations on genes.	**C2** Create a personal experiment by understanding the various techniques used for gene manipulation, to solve a question on genetic engineering.
A1 Identify the key concepts of transcription and translation as well as evolution	**B1** Can describe the process of DNA replication, evolution, and how new species can arise.	**C1** Understand what are the limitations and advantages to molecular techniques and choose one to devise an experiment.

Others **備考**	＜評価方法＞ ＜ICT＞　Students will be given worksheets, quizzes and lab experiments to practice key concepts of the unit

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3 学期 学年末試験 Term 3 Final

Name of Unit, Project **単元名**	Unit 4 Evolution	**Textbooks / Materials** **使用教科書 / 教材**	- Biology by Stephen Nowicki; Houghton Mifflin Harcourt - Lab Handouts/Worksheets/Lab equipment
Unit Description **単元の概要**	Unit 4 Discusses the basic principles of evolution and natural selection, how populations evolve, and the history of life on Earth. Standards: HSLS4.B.1, HSLS4.B.2, HSLS4.C.1, HSLS4.C.2, HSLS4.A.1, HSLS3.B.2,HSLS3.B.2, HSLS4.B.1, HSLS4.B.2,HSLS4.C.3, HSLS4.C.4,HSLS4.C4,HSLS4.C.5		

Class Standards　評価規準

	Recognition	**Logical Thinking**	**Creative Thinking**
楽	**A3** Able to explain phenomenon in one's own words.	**B3** Able to predict unknown results. Based on the working hypothesis, able to design an experiment.	**C3** Able to construct new concepts. Able to create an original experimental method, design and able to execute it.
好	**A2** Understand the ties of events from simple phenomenon to more complex phenomenon. Follow a known test method.	**B2** Can generalize and comprehend the connections by comparing the ties of knowledge. It is possible to consider factors that cause various phenomena.	**C2** Can predict missing variables from the contradiction of known rules.
知	**A1** Know basic terms, the names and roles of laboratory instruments and chemicals. Write and organize information.	**B1** Accurately diagram information. Compare, classify, and analyze experiment results. Find patterns in experimental results.	**C1** Able to find exceptions to rules and discuss why it is an exception. Critically evaluate the hypothesis and discover new issues.

Learning Objectives　学習内容

A3 Can deduce what are the fundamental principles of evolution, and describe in own words how natural selection, HW equation equilibrium, and speciation occur.	**B3** Can accurately describe how organisms are related, and explain why there is so much diversity in life. Can state possible hypothesis on the origin of life.	**C3** Can develop an experiment using bacteria and evaluate a number of antibiotics which are resistant /successful in their uses.
A2 Explain how these concepts tie in together and can explain in general terms evolutionary theory.	**B2** C Identify patterns in evolution and provide specific examples of this process happening today.	**C2** Can creatively describe the relationship of geologic time scale with changes organisms had over time. Can effectively create an experiment using radioactive decay to see how old material is
A1 Identify the key concepts on Darwinian evolution, natural selection, and the history of life.	**B1** Develop a diagram depicting how organisms are related to each other, and how much they have changed over time.	**C1** Identify the basic issues society has regarding evolution, and find ways to explain evolution and fundamental scales.

Others **備考**	＜評価方法＞ ＜ICT＞　Students will be given worksheets, quizzes and lab experiments to practice key concepts of the unit