Dominican International School

SUBJECT: Science 3

GRADE LEVEL: 8 **SCHOOL YEAR: 2022-23**

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COURSE DESCRIPTION:

The focus of the Grade 8 Science is an integrated science course that explores the scientific method through the study and experimentation of topics in Physical Science, Life Science and Earth & Space Science. Students will investigate and draw conclusions from learning activities that are designed to foster critical thinking and inquiry.

The teaching session consists of 5 periods (45 minutes) per week, running from August 2019 till May 2020. The nature of the subject relates to explanation, comprehension, comparison, analysis and application of the learned knowledge.

Science projects will be carried out for the science fair, where pupils create their own experiments/investigations, and present their science inquiry via both poster and oral presentation. Scientific thinking will be introduced and step-wise guidance will offer to help pupils understand the nature of science.

COURSE OBJECTIVES:

The science curriculum adapts the Next Generation Science Standards (NGSS). In Grade 8 students continue working towards the achievement of the Middle School NGSS Standards. The standards for each sub- topic are described in narrative form below:

Middle School Physical Sciences

Students in middle school continue to develop understanding of four core ideas in the physical science. The middle school performance expectations in the Physical Sciences build on the K-5 ideas and capabilities to allow learners to explain phenomena central to the physical sciences but also to the life sciences and earth and space science. The performance expectations in physical science blend the core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge to explain real world phenomena in the physical, biological, and earth and space sciences. In the physical sciences, performance expectations at the middle school level focus on students developing understanding of several scientific practices. These include developing and using models, planning and conducting investigations, analyzing and interpreting data, using mathematical and computational thinking, and constructing explanations; and to use these practices to demonstrate understanding of the core ideas. Students are also expected to demonstrate understanding of several of engineering practices including design and evaluation.

Middle School Life Sciences

Students in middle school develop understanding of key concepts to help them make sense of the life science. These ideas build upon students' science understanding from earlier grades and from the disciplinary core ideas, science and engineering practices, and crosscutting concepts of other experiences with physical and earth sciences.

There are five life science topics in middle school:
1) Structure, Function, and Information Processing,
2) Growth, Development, and Reproduction of Organisms,
3) Matter and Energy in Organisms and Ecosystems,
4) Interdependent Relationships in Ecosystems, and
5) Natural Selection and Adaptations.

The performance expectations in middle school blend core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge across the science disciplines. While the performance expectations in middle school life science couple particular practices with specific disciplinary core ideas, instructional decisions should include use of many science and engineering practices integrated in the performance expectations. The concepts and practices in the performance expectations are based on the grade-band endpoints described in A Framework for K-12 Science Education (NRC, 2012).

Middle School Earth and Space Sciences (ESS)

Students in middle school develop understanding of a wide range of topics in Earth and space science that build upon science concepts from elementary school through more advanced content, practice, and crosscutting themes. There are six ESS standard topics in middle school: Space Systems, History of Earth, Earth's Interior Systems, Earth's Surface Systems, Weather and Climate, and Human Impacts. The content of the performance expectations are based on current community-based geoscience literacy efforts such as the Earth Science Literacy Principles (Wysession et al., 2012), and is presented with a greater emphasis on an Earth Systems Science approach. The performance expectations strongly reflect the many societally relevant aspects of ESS (resources, hazards, environmental impacts) as well as related connections to engineering and technology.

ASSESSMENT:

Assessment is an essential component of the learning process. It is also the key to unlock what students have actually learned. Classroom formative assessment will be given to students throughout the year to collect feedback on how well they are learning. Students also will be assigned online classroom homework. Section or chapter tests will be given to students to evaluate their knowledge and ability to apply science concepts, and to cultivate critical thinking. Summative exams conducted quarterly aim to assess students' learning and to structure their academic efforts.

Assessment strategies include

Deportment	(10%)
Homework and classwork	(30%)
Chapter tests & Quizzes	(30%)
Quarter exam	(30%)
TOTAL	**100%**

All formative assessments, including reports, essays, presentations or projects would be accompanied with written or oral feedbacks. Multiple assessments address different learning styles and the results are aligned to NGSS to evaluate student progress, wherever applicable. All the students' attainment and achievement records would be carefully recorded and data entered in the school gradebook system for tracking and evaluation.

PRIMARY TEXTBOOK & OTHER RESOURCES

Michelle Anderson, Julie Berwals, et al. *Integrated iScience Course 3.* Columbus, Ohio. Glencoe/ McGraw Hill, Copyright 2017.

Google Classroom offers the web-based platform for effective instructional communications and formative feedbacks. It is accessible not only for pupils, but also for parents and the school. Video clips, interactive

learning programs, and web-based learning tools, such as iScience, are also used to facilitate and stimulate learning.

ADDITIONAL INFORMATION– Please see Google Classroom for more information.

Class code: **Saint Catherine of Siena** _____
Saint Agnes of Montepulciano _____

References:

National Research Council. (2012) *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.* Committee on a Conceptual Framework for New K-12 Science Education Standards. Board on Science Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Wysession, M. E. *et al.* (2012) Developing and applying a set of earth science literacy principles. *J. Geosci. Educ.*, 60(2), pp. 95–99.

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)	
Week / Date	Topic / Projects / Assessments
Week 1 **Aug 10th to 12th** **3 Days of Class** *10~ First Day / Orientation Day*	**Wednesday** – Orientation in the morning. M/H School regular class after lunch **Thursday or Friday –** Diagnostic Assessment **Pre-requisite skills Review** **Diagnostic test and Review**
Week 2 **Aug 15th to 19th** *Opening Mass*	Scientific Problem Solving **Lesson 1** Measurement and Scientific Tools
Week 3 **Aug 22nd to 26th**	**Scientific Problem Solving** Lesson 2 Measurement and Scientific Tools
Week 4 **Aug 29th to Sep 2nd**	**Ch1: Laws of motion** Lesson 1 Gravity and Friction
Week 5 **Sep 5th to 9th** **4 Days of Class** *8~ Mass &Birthday Mother Mary* *9th – Moon Festival*	**Ch1: Laws of motion** Lesson 2 Newton's first law
Week 6 **Sep 12th to 16th** FYI – Pre-Exam Days	**Ch1: Laws of motion** Lesson 3 Newton's second law Lesson Lesson 4 Newton's Third Law
Week 7 **Sep 19th to 23rd**	**Ch3: Energy, Work, and Simple Machines** Lesson 1: Types of Energy Lesson 2 Energy Transformations and work
Week 8 **Sep 26th to 30th** **2 Days of Class** *28-30 ~Teacher's Conference*	**Ch4: Sound and Light** Lesson 1 Sound
Week 9 **Oct 3rd to 7th** **3 Days of Class** *6-7 ~Q1 Exams*	Cumulative Review – Exam preparation

2nd QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)	
Week / Date	Topic / Projects / Assessments
Week 1 (10) **Oct 10th to 14th** **4 Days of Class** *10 – Double 10 Holiday*	**Review Quarter Exam** **Ch5: Thermal Energy** Lesson1 Thermal Energy, Temperature, and Heat
Week 2 (11) **Oct 17th to 21st**	**Ch5: Thermal Energy** Lesson1 Thermal Energy, Temperature, and Heat
Week 3 (12) **Oct 24th to 28th** *25-27 – Book Fair* *28- Masquerade Night* *TBA-Holy Rosary Mass*	**Ch5: Thermal Energy** Lesson 2 Thermal Energy Transfers Lesson 3 Using Thermal Energy

Week 4 (13) **Oct 31st to Nov 4th** *1-All Saint's Day Mass*	**Ch6: States of Matter** Lesson 1 Solids, liquids and gases
Week 5 (14) **Nov 7th to 11th**	**Ch6: States of Matter** Lesson 2 Changes in State
Week 6 (15) **Nov 14th to 18th**	**Ch8: Elements and chemical bonds** Lesson 1 Electrons and Energy levels Lesson 2 Compounds, chemical formulas, and covalent bonds
Week 7 (16) **Nov 21st to 25th** *25 - YSC Contest* *25-Gr.12 Q2 Exam*	**Ch8: Elements and chemical bonds** Lesson 3 Ionic and metallic bonds
Week 8 (17) **Nov 28th to Dec 2nd** FYI – Pre-Exam Days *28-Gr.12 Q2 Exam*	**Ch9: Chemical Reactions and Equations** Lesson 1 Understanding Chemical Reactions
Week 9 (18) **Dec 5th to 9th** 8 - Foundation Day Celebrations	**Ch9: Chemical Reactions and Equations** Lesson 2 Types of Chemical Reactions
Week 10 (19) **Dec 12th to 16th** **3 Days of Class** *15-16 ~Q2 Exams*	**Ch9: Chemical Reactions and Equations** Lesson 3 Energy Changes and chemical reactions
Dec 19th to Jan 2nd	**Christmas Break**

3rd QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)

Week / Date	Topic / Projects / Assessments
Week 1 (20) **Jan 5 to 6th** **2 Days of Class**	Review Quarter Exam **Ch13: Minerals and Rocks** Lesson 1 Minerals
Week 2 (21) **Jan 9th to 13th**	**Ch13: Minerals and Rocks** Lesson 2 Rocks
Week 3 (22) **Jan 16th to 20th**	**Ch13: Minerals and Rocks** Lesson 3 The Rock Cycle
Jan 23rd to 27th	**Chinese New Year**
Week 4 (23) **Jan 30th to Feb 3rd**	**Ch16: Clues to the Earth's Past** Lesson 2 / 3 – Relative Age Dating / Absolute Age Dating
Week 5 (24) **Feb 6th to 10th**	**Ch17: Geological Time** Lesson 1 - Geologic history and the Evolution of Life
Week 6 (25) **Feb 13th to 17th**	**Ch18: Interactions in Ecosystems** Lesson 1 – Ecosystems Lesson 2 – Energy and Matter

Week 7 (26) **Feb 20th to 24th** *20-24 ~IOWA* *22 ~ Ash Wednesday Mass* *21-23 ~ Pre-Exam Days*	**Ch18: Interactions in Ecosystems** Lesson 3 – Humans and Ecosystems **IOWA TESTS**
Week 8 (27) **Feb 27th to March3rd** **3 Days of Class** 27-28 ~ 228 Memorial Day Holiday	**Ch20: Environmental Impacts** Lesson 1 – People and the Environment
Week 9 (28) **March 6th to 10th** **4 Days of Class** *11 – Q3 Exams*	**Ch20: Environmental Impacts** Lesson 1 – People and the Environment

4th QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)

Week / Date	Topic / Projects / Assessments
Week 1 (29) **March 13th to 17th** **4 Days of Class** *13 – Q3 Exams* *14~ Q4 Begins*	**Review Quarter Exam** **Ch22: Heredity and How Traits change** Lesson 1 – How are traits inherited?
Week 2 (30) **March 20th to 24th** *20 ~ Fire Drill*	**Ch22: Heredity and How Traits change** Lesson 2 – Genetics after Mendel
Week 3 (31) **March 27th to 31st**	**Ch22: Heredity and How Traits change** Lesson 3 – Adaptation and Evolution
Apr 3rd to 14th	**Easter Break**
Week 4 (33) **Apr 17th to 21st**	**Ch22: Heredity and How Traits change** Lesson 3 – Adaptation and Evolution
Week 5 (34) **Apr 24th to 28th** 24-28 ~ AP Mock Exams	**G8 Quarter Exams**
Week 6 (35) **May 1st to 5th** *2-4~ Pre-Exam* *1-5~ Final Exams (K, 5, 8, 12 only)* *1-5 ~ AP Exams*	**Graduation**
Week 7 (36) **May 8th to 12th** *8-12~ Final Exams(K, 5, 8, 12 only)* *1-5 ~ AP Exams*	**Graduation**
Week 8 (37) **May 15th to 19th** **3 Days of Class** *18-19~ Q4 Exams*	TBA
Week 9 (38) **May 22nd to 26th** **4 Days of Class** *22~ Record Day* *23-26 ~ Student Clearance*	TBA

Week 10 (39) **May 29th to June 2nd** **4 Days of Class** *1 ~ Students Last Day* *2~ Teachers/Staff Meeting*	TBA