

Science YEAR 0 (Grade 5)							
Unit Title	Key Concept	Related Concept(s)	Global Context and Exploration	Statement of Inquiry	MYP Objectives	ATL Skills	Content
<b>Variables</b>	Change	Consequences	<p>Scientific and Technical Innovation</p> <p>Exploration: systems, models, methods, products, processes and solutions.</p>	Variables <u>can</u> change results.	Objective B Objective C	<p>Collaboration skills: Working effectively with others</p> <p>Critical thinking skills: Analyzing and evaluating issues and ideas</p>	Students will investigate how variables will impact results by conducting experiments with pendulums and by creating a model of a lifeboat.
<b>Environments</b>	Relationships	Balance	<p>Globalization and Sustainability:</p> <p>Interconnectedness of human made systems and communities and what impact our decision making has on the environment.</p>	Interdependence promotes balance within an ecosystem.	Objective A Objective D	<p>Communication skills: Exchanging thoughts, messages and information effectively through interaction</p> <p>Information literacy skills: Finding, interpreting, judging and creating information</p>	Students will learn how organisms have adaptive characteristics that would help it survive a disruptive event. they will explore how a non-native species can disrupt the biodiversity of an ecosystem
<b>Levers and Pulleys</b>	Systems	Consequences	<p>Scientific and Technical Innovation</p> <p>The students will explore the natural world and its laws.</p>	Simple machine systems change the way work is done.	Objective A	Communication: Reading, writing and using language to gather and communicate information	Students will explore how simple machine systems provide an advantage by either making work easier, changing the direction of the

							force or reducing the distance necessary to do the work.
Physical Science YEAR 1 (Grade 6)							
Unit Title	Key Concept	Related Concept(s)	Global Context and Exploration	Statement of Inquiry	MYP Objectives	ATL Skills	Content
<b>Measurement and Graphing</b>	Systems	Function Form	Scientific and Technical Innovation  Systems, Processes and Solutions	Systems of measurement and graphing allow information to be accurately identified, described, and communicated.	Objective A	Communication: Reading, writing and using language to gather and communicate information  Collaboration: Working effectively with others  Affective skills: Managing state of mind  Information literacy skills: Finding, interpreting, judging and creating information  Transfer skills; Utilizing skills and knowledge in multiple contexts	Students will engage with a variety of measurement tools and processes.
<b>Measurement of Flight (ID)</b>	Relationships System	Measurement Form	Scientific and Technical Innovation  Systems, methods, processes	Systems of measurement and graphing allow information to be accurately identified, described, and	ID Objectives: A, B, C, D	Critical thinking: Analyzing and evaluating issues and ideas  Transfer skills: Utilizing skills and	Students will collect data on flight and convert to metric measurements and interpret results.

				communicated.		knowledge in multiple contexts	
<b>Forces</b>	Relationships	Balance	Scientific and Technical Innovation  Consequences	Relationships between forces have both effects and consequences.	Objective A	<p>Communication: Reading, writing and using language to gather and communicate information</p> <p>Collaboration: Working effectively with others</p> <p>Information literacy skills: Finding, interpreting, judging and creating information</p> <p>Critical thinking: Analyzing and evaluating issues and ideas</p> <p>Transfer skills: Utilizing skills and knowledge in multiple contexts</p>	Students will explore forces and perform a skit that demonstrates a variety of forces.
<b>Invention</b>	Change	Transformation	Scientific and Technical Innovation  Ingenuity and progress	The processes of inventing and innovating changes lives.	Objective D	<p>Communication: Exchanging thoughts, messages and information effectively through interaction</p> <p>Organization:</p>	Students will study the process of invention and create their own unique invention. This unit will culminate with the inventor's

						<p>Managing time and tasks effectively</p> <p>Affective skills: Managing state of mind</p> <p>Reflection skills: (Re-)considering the process of learning; choosing and using ATL skills</p> <p>Critical thinking: Analyzing and evaluating issues and ideas</p> <p>Creative thinking Generating novel ideas and considering new perspectives</p>	fair.
<b>Motion</b>	Change	Movement	<p>Orientation in Space and Time</p> <p>Duration and frequency</p>	Motion is affected by the balance of forces.	Objective B	<p>Communication: Reading, writing and using language to gather and communicate information</p> <p>Critical thinking: Analyzing and evaluating issues and ideas</p> <p>Transfer skills: Utilizing skills and knowledge in multiple contexts</p>	Students will investigate how motion works and apply this knowledge to other situations. They think critically to figure out how forces affect motion. They communicate with group members and must be open minded as they work with their peers. Throughout the unit, students

							reflect on activities in their interactive science notebook
<b>The Science of Musical Sound (ID)</b>	Aesthetics Relationships	Energy Patterns	Orientation in Space and Time  Scale, duration, frequency, and variability	Relationships create patterns of energy that include duration and frequency.	Objective A  ID Objectives: A, B, C, D	Information literacy skills: Finding, interpreting, judging and creating information	Students will create an infographic about research exploring overtone, resonance, acoustics, and intonation
<b>Light, Color, Sound</b>	Relationships	Energy Form	Orientation in Space and Time  Duration and frequency	Waves of energy impact the way we see and hear.	Objective C	Communication: Reading, writing and using language to gather and communicate information  Collaboration: Working effectively with others  Information literacy: Finding, interpreting, judging and creating information  Creative thinking Generating novel ideas and considering new perspectives	Students will explore the MN state standards relating to properties of waves, sound, light and color.
<b>Solar Energy</b>	Relationships	Energy	Globalization and Sustainability  Human impact on the environment, Consumption,	Energy, in various forms, affects how we experience our world.	Objective A Objective B Objective C	Communication: Reading, writing and using language to gather and communicate	After participating in a lab on solar energy, students will apply the concepts learned by designing a solar house.

			conservation, natural resources			information  Collaboration: Working effectively with others  Organization: Managing time and tasks effective  Transfer skills: Utilizing skills and knowledge in multiple contexts	
<b>Chemistry</b>	Change	Transformation Interaction	Scientific and Technical Innovation  Processes, Interaction, Causality	Changes in matter influences how we experience our world	Objective A Objective C	Communication: Reading, writing and using language to gather and communicate information  Collaboration: Working effectively with others  Critical thinking: Analyzing and evaluating issues and ideas	Students will explore processes that we see in our everyday lives like melting, condensing, and evaporating.  In the Mystery Mixture Lab, students are asked to identify how materials interact and change.
<b>Life Science YEAR 2 (Grade 7)</b>							
<b>Unit Title</b>	<b>Key Concept</b>	<b>Related Concept(s)</b>	<b>Global Context and Exploration</b>	<b>Statement of Inquiry</b>	<b>MYP Objectives</b>	<b>ATL Skills</b>	<b>Content</b>
<b>Scientific Inquiry</b>	Change	Models Evidence	Scientific and Technical Innovation  Models and systems	Scientific questions are answered using systems and models supported with evidence.	Objective B Objective C	Organization skills Managing time and tasks effectively	Students will design a method to test a question including: design a procedure, identify all variables, write a hypothesis, and

							designate a method for data collection. Students will conduct their experiment, collect data and analyze data which will be turned into a lab report.
<b>Cells</b>	Systems	Functions Models	Scientific and Technical Innovation  Systems Models	Functions of systems can be understood at a deeper level using scientific models.	Objective A	Transfer skills:  Utilizing skills and knowledge in multiple contexts	Students will examine the basic structure and function of the cell as the building block of the human body.
<b>Heredity</b>	Systems	Function Transformation Patterns	Scientific and Technical Innovation  Adaptation	Genetics are controlled by patterns in heredity	Objective A	Communication:  Reading, writing and using language to gather and communicate information	Students will study how genes carry hereditary material and that characteristics can sometimes be influenced by the environment.
<b>Ecology</b>	Relationships	Models Balance	Globalization and Sustainability  Interconnections	Ecological balances are interdependent on both biotic and abiotic factors	Objective C	Collaboration skills:  Working effectively with others	Natural systems include a variety of organisms that interact with one another in several ways.  The flow of energy and the recycling of matter are essential to a stable ecosystem.
<b>Human Interaction with Living Things</b>	Systems	Functions	Globalization and Sustainability	Interactions between elements of a	Objective B	Creative thinking skills:	Students will study human interactions with

			Human interactions with the environment	system can alter its function or behavior.		Generating novel ideas and considering new perspective	living systems and how human activity can change living organisms and ecosystems.
<b>Infectious Disease</b>	Relationships	Interaction Environment	Identities and Relationships  Health and well-being	Interactions between human organisms in the environment can impact health.	Objective D	Collaboration skills: Working effectively with others  Information literacy skills: Finding, interpreting, judging and creating information	Students will research how human beings are constantly interacting with other organisms that cause disease.
<b>Evolution</b>	Change	Transformation	Orientation is Space and Time  Evolution, constraints and adaptation	Adaptations over time result in transformations within living organisms.	Objective D	Information literacy skills:  Finding, interpreting, judging and creating information	Student will study the factors that influence changes in organisms over time and why organisms with certain traits in particular environments are more likely than others to survive.

**Earth Science YEAR 3 (Grade 8)**

<b>Unit Title</b>	<b>Key Concept</b>	<b>Related Concept(s)</b>	<b>Global Context and Exploration</b>	<b>Statement of Inquiry</b>	<b>MYP Objectives</b>	<b>ATL Skills</b>	<b>Content</b>
<b>The Scientific Method</b>	Systems	Evidence	Scientific and Technical Innovation  ingenuity and progress	The scientific method is a universal, organized system for investigating and analyzing the world around us resulting in innovation and progress.	Objective B Objective C	Collaboration skills: Working effectively with others  Media literacy skills: Interacting with media to use and create ideas and	Students will investigate and analyze their own ideas and be given unfamiliar situations based on observations of the real world through the framework of the scientific method

						<p>information</p> <p>Critical thinking skills: Analyzing and evaluating issues and ideas</p> <p>Creative thinking skills: Generating novel ideas and considering new perspectives</p>	and share this new knowledge with others.
<b>Weather</b>	Systems	Patterns Movement	<p>Orientation in Space and Time</p> <p>Natural and human landscapes and resources</p>	Patterns of atmospheric and water cycle movement influence global climate and local weather affecting natural and human landscapes and resources.	<p>Objective C</p> <p>Objective D</p>	<p>Reflection skills: (Re-)considering the process of learning; choosing and using ATL skills</p> <p>Information literacy skills: Finding, interpreting, judging and creating information</p> <p>Critical thinking skills: Analyzing and evaluating issues and ideas</p> <p>Transfer skills: Utilizing skills and knowledge in multiple contexts</p>	Students will analyze patterns of atmospheric conditions and how they influence local weather.
<b>Rocks and Minerals</b>	Change	Movement Conditions	<p>Orientation in Space and Time</p> <p>Natural and human</p>	The movement and conditions of minerals and rocks causes change to Earth's	Objective A	<p>Collaboration skills Working effectively with others</p>	Students will explore the movement and properties of minerals and

			landscapes and resources	natural and human landscapes and resources.		Critical thinking skills Analyzing and evaluating issues and ideas	rocks and how they change the Earth's natural landscapes and resources.
<b>Earthquakes and Plate Tectonics</b>	Relationships	Energy Movement	Orientation in space and time  natural and human landscapes and resources	Energy within the Earth causes movement of the Earth's plates which cause catastrophic events that affect natural and human landscapes and resources.	Objective A Objective B	Communication skills: Exchanging thoughts, messages and information effectively through interaction  Collaboration skills: Working effectively with others  Reflection skills: (Re-)considering the process of learning; choosing and using ATL skill  Critical thinking skills: Analyzing and evaluating issues and ideas	Students will complete a lab assessment that will focus on the impact of earthquakes on human built structures. They will also complete a written test that addresses energy in the Earth's, plate movement, effects of this movement, and the impact on humans.
<b>Space</b>	Systems	Movement Patterns	Orientation in Space and Time  natural and human landscapes and resources	The Earth is a part of a system that includes the sun, planets, moons, and smaller objects and the movement, patterns, and forces between these objects affects natural	Objective D	Communication skills: Exchanging thoughts, messages and information effectively through interaction  Collaboration skills: Working	Students will complete a group project that demonstrates the systems and forces of space and the resources and infrastructures needed to colonize another planet.

				and human landscapes and resources.		effectively with others  Reflection skills: (Re-)considering the process of learning; choosing and using ATL skills  Information literacy skills: Finding, interpreting, judging and creating information  Creative thinking skills: Generating novel ideas and considering new perspectives  Transfer skills: Utilizing skills and knowledge in multiple contexts	
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**Physics YEAR 4 (Grade 9)**

Unit Title	Key Concept	Related Concept(s)	Global Context and Exploration	Statement of Inquiry	MYP Objectives	ATL Skills	Content
Driving The Roads	Relationships	Interactions; Motion - Velocity, Acceleration	Identities and relationships  Moral reasoning and ethical judgments	The choices we make have consequences beyond ourselves in the moment	Objective D	Communications skills - exchanging thoughts, messages and information effectively through interaction  Collaboration	Newton's Laws and $F = ma$  Students will understand how distractions affect reaction time and distance and how distracted driving has consequences for themselves and

						skills - working effectively with others.	others.
Physics in Action	Change	Energy, Interactions, Models	Scientific and technical innovation  Explore natural world and its laws, models	Modeling the natural world helps us explain changes in it	A and D	Communication Skills  Information Literacy skills  Critical thinking skills	Students will understand how to apply models of Newton's Laws and friction.
Safety	Systems	Energy, Function, Patterns	Scientific and technical innovation  The impact of scientific and technological advances	Safety systems and their functions can affect the energy of collisions	A, B, and C	Collaboration skills  Affective skills  Information literacy skills	The Egg Drop Safety System allows students to show they understand conservation of momentum, impulse, and the energy of collisions.
Let us entertain you	Creativity	Form, Representation	Personal and cultural expression  Creation, expression of ideas, social constructions of reality	Appreciation of the arts can be enhanced by an understanding of the physics principles behind the art	D	Creative thinking skills  Transfer skills	The Story Soundtrack allows students to show they understand the physics principles behind sound and the connection to artistic representations and forms.
Electricity for everyone	time , place and space	Environment, Development, Transformations	Globalization and sustainability  Interconnectedness of human-made systems and communities; conservation, consumption	Human-made systems can transform communities and impact the environment.	B and C	Reading, writing and using language to gather and communicate information  Reflection Skills  Critical Thinking Skills	The Homes for Everyone project allows students to demonstrate how human-made systems can transform communities and impact the environment.

**Chemistry YEAR 5 (Grade 10)**

Unit Title	Key Concept	Related Concept(s)	Global Context and Exploration	Statement of Inquiry	MYP Objectives	ATL Skills	Content
The Chemistry Classroom	Relationships	Interaction Patterns	Identities and relationships  Interactions between chemistry concepts and our everyday lives	It is important to understand how our surroundings affect us.	B and C	Communications skills	<ol style="list-style-type: none"><li>1. Recognize and apply appropriate lab behavior, attire, and procedures.</li><li>2. Understand how to use said safety devices in the case of an accident.</li><li>3. Identify the names and uses of basic lab equipment.</li><li>4. Perform basic laboratory techniques. This includes being able to accurately measure substances using the balance, graduated cylinder, ruler, and thermometer. Also include being able to light a Bunsen Burner.</li><li>5. Convert and go between units in the metric system.</li><li>6. Make direct measurements in order to calculate indirect measurements</li><li>7. Observations</li></ol>

							<p>and inferences are key methods in science.</p> <p>8. Law of Conservation of Mass, Law of Definite Proportions, and the Atomic Theory.</p> <p>9. Laws and theories are not separate, but work together.</p> <p>10. Laws describe a pattern and theories explain.</p> <p>11. Both laws and theories are subject to change, subject to scale, subject to time, subject to relativity, and subject to new interpretations.</p>
Matter	Systems	Evidence  Form  Function	<p>Scientific and technical innovation</p> <p>The interaction between people and the natural world</p>	Observing the form and function of matter helps us to understand the relationship between humans and the world we live in.	A	<p>Communication skills</p> <p>Collaboration skills</p> <p>Organization skills</p>	By investigating physical and chemical properties of matter students can understand classification systems, and similarities and differences in elements and make connections between properties of

							elements and how they are part of their everyday lives in the natural and human-made environment.
The Periodic Table	Relationships	Evidence Patterns	Scientific and technical innovation  Systems and models	Relationships become evident through patterns by building systems and models	D	Communication skills	<p>1. The trend in chemistry after Dalton was the discovery of new elements.</p> <p>2. Before Mendeleev, elements were organized by their atomic mass and properties.</p> <p>3. Comparing a group of objects by mass leads to the concept of relative mass</p> <p>4. Mendeleev used properties to organize elements and predict undiscovered elements based on his Periodic Law.</p> <p>5. The periodic table contains periods and families which are groups that contain similar chemical and physical properties.</p> <p>6. Using relative mass numbers of</p>

							objects/atoms are obtained. The gram relative mass of any element equals the same number of atoms; Avogadro's number $6.02 \times 10^{23}$ is the number of atoms in one mole of atoms. In chemistry the counting unit, the mole, is used to count atoms.
The Atom	Change	Evidence Interaction Models	Scientific and technical innovation  Models, solutions, discoveries	Changes in models are revealed through discoveries that lead to solutions	C	Critical thinking skills	<p>1. The discovery of subatomic particles resulted in modifications in the Periodic Law and Atomic Theory.</p> <p>2. Atomic structure explains the periodicity of the periodic table.</p> <p>3. Atomic number describes the number of protons and atomic mass describes the number of protons and neutrons.</p> <p>4. The mass of an atom is determined by the nucleus. The volume of an atom is defined by the electron cloud</p>

							<p>or the atom's electrons (moving around; therefore, the atom is mostly empty space).</p> <p>5. Isotopes represent the same element, but with different numbers of neutrons.</p> <p>6. Theory of the atom and history of the development of the theory.</p> <p>7. Changes in the nucleus of the atom results in nuclear reactions (nuclear chemistry).</p> <p>8. There is relationship between an element's location on the periodic table and the electron structure of the atoms of those elements (orbital and energy levels).</p> <p>9. Electrons can be in ground and excited states. When electrons move between these states there is a release (photon) or</p>
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							absorption of light.
Nomenclature & Bonding	Systems	Patterns Function Form	Scientific and technical innovation  Systems	Nomenclature systems interact through patterns developed by IUPAC, revealing form and function through determining formulas and correct names of ionic and molecular compounds, which will help the learner understand chemical equations.	A	Reading, writing and using language to gather and communicate information	<p>1. Covalent bonds are formed when two atoms share a pair of electrons.(sharing bonding)</p> <p>2. The shape of molecules (molecular geometry) depends on the number of bonds and the number of unshared pairs of electrons (VSPER theory).</p> <p>3. The IUPAC naming rules associated with covalent bonds (molecules).</p> <p>4. Covalent bonds are between a nonmetal and a nonmetal. Ionic bonds are between a metal and nonmetal.</p> <p>5. The IUPAC naming rules associated with ionic bonds (compounds).</p> <p>6. Ionic bonds are formed when ions of opposite charges are attracted to each other. In ionic bonds there is a</p>

							transfer of electrons.(greedy bonding)
Acids, Bases & Solutions	Systems	Function Interaction	Globalization and sustainability  Conservation, natural resources and public goods	Reactions within systems can impact natural resources	B, C	Reading, writing and using language to gather and communicate information  Collaboration skills Reflection skills Critical thinking skills	<p>1. Acids are sour, corrosive and typically found in citrus fruits (pH less than 7).</p> <p>2. Bases are bitter, caustic and typically found in cleaning products (pH greater than 7).</p> <p>3. Acid-base reactions involve a double replacement reaction. The products are always water and a salt.</p> <p>4. A solution is a homogeneous mixture of a solute dissolved in a solvent.</p> <p>5. Polar substances dissolve in polar substances and nonpolar substances dissolve in nonpolar substances. "Like dissolves like."</p> <p>6. Physical properties can be</p>

							<p>used to separate the substances within a mixture.</p> <p>7. Units of concentration express the ratio of solute to solution (molarity) or solute to solvent (molality).</p> <p>8. Molarity is moles of solute to liters of solution.</p> <p>9. Water is the universal solvent.</p> <p>10. Concentrations of solutions are saturated, supersaturated, or diluted.</p> <p>11. Solubility curves demonstrate the relationship between solubility and temperature for specific substances.</p> <p>12. Pressure and temperature are factors that affect the solubility of gases.</p> <p>13. Colligative properties (i.e. freezing point depression, boiling point, vapor pressure)</p>
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							involve the number of solute particles in solution.  14. Some reactions are reversible and do not go to completion, but oscillate back and forth between reactants and products.
Reactions & Stoichiometry	Relationships	Models Interactions Patterns Form Function	Scientific and technical innovation  Systems, models, methods, product	Relationships are revealed through patterns and models, identifying interactions in matter.  Systems interact through patterns, revealing form and function.	A	Thinking: Critical Thinking	1. Definition of a chemical reaction (chemical change is a rearrangement of atoms) 2. Types of chemical reactions (decomposition, synthesis, single replacement, double replacement, combustion, acid/base) 3. The symbols used in a chemical reaction. 4. The application of the Law of Conservation of Mass and Law of Definite Proportion. 5. Reactions happen at different rates.
Chemistry of Life	Connections	Energy Interaction	Scientific and technical	The structure of life is based on	A	Thinking: Creative Thinking	1. Understand that the structure

			innovation: systems, models, ingenuity	similar fundamental chemical building blocks and energy flow.			of the major macromolecules determines their function. 2. Carbohydrates are simple sugars in the form of monosaccharide s, two bonded together to form disaccharides, or multiple bonded together to form polysaccharides. Shorter chains tend to glucose, fructose, and sucrose while longer chains form starches and cellulose. 3. Lipids contain long chains of fatty acids and because of the types of bonds, are able to store more energy. 4. Proteins have a complex folded structure and serve many functions in the body (keratin, myosin, actin, casein, and albumin). Enzymes represent a particular type of protein that acts as a biological catalyst in matters of metabolism. 5. Carbohydrates provide 4 Calories
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							<p>per 1 gram. Fats provide 9 Calories per 1 gram. Protein provides 4 Calories per one gram.</p> <p>6. Energy is calculated using joules. Chemical energy as it relates to food uses Calories (1 Calories = 1000 calories). Energy in food can be calculated using the equation, <math>q=mCT</math> through methods of calorimetry.</p>
<b>Thermochemistry</b>	Change	Balance Energy	Globalization and sustainability - human impact	The transfer of thermal energy affects balances in environment.	A, D	<p>Self-Management: Reflection Research: Information Literacy Thinking: Transfer</p>	<ol style="list-style-type: none"> <li>1. The difference between heat and temperature.</li> <li>2. Phases of matter (solid, liquid, gas).</li> <li>3. Phase changes (condensation, vaporization, freezing, melting, sublimation, and deposition).</li> <li>4. Substances have different specific heat capacities.</li> <li>5. The law of conservation of thermal energy states that energy cannot be created or destroyed, but rather changes form. Matter moves in a cycle while ENERGY</li> </ol>

							<p>FLAWS.</p> <p>6. The equation, <math>Q = mc\Delta T</math>, and the relationships of the variables involved describes the amount of energy a substance contains. This equation often involves calorimetry and a calorimeter.</p>
Gas Laws	Systems	Conditions Evidence Interaction	Scientific and technical innovation -  models, modernization	Investigations provide evidence of conditions that affect the behavior and interaction of gases.	A	Thinking: Critical Thinking Skills	<p>1. Properties of gases include: nonmetal, compressible, no definite volume and no definite shape, greater volume than liquids, occupy large volumes, can be liquefied under pressure, diffusion, and effusion.</p> <p>2. The atmosphere is made up of many different types of gases (nitrogen, methane, carbon dioxide, water vapor, oxygen, argon, sulfur dioxide, ozone, and nitrogen dioxide).</p> <p>3. The variables of pressure, temperature, volume, and number of moles are related in a</p>

							<p>series of gas equations (Charles' Law, Boyle's Law, Gay-Lussac's Law, Avogadro's Law, and Dalton's Law of Diffusion).</p> <p>4. Gases are involved in chemical reactions as either reactants or products.</p> <p>5. The kinetic molecular theory of gases describes the behavior and motion of ideal gas particles (constantly moving, random motion, move in straight line until comes into contact with another particle or sides of container, collisions against side of container create pressure, elastic collisions, energy conserved in collisions).</p> <p>6. Atmospheric pressure changes with different environmental factors and has different effects on reactions.</p>
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