Patterson International PYP Unit Planner - Adapted from the IBO's 2018 UOI Planner (Primary)
Drafted 11/8/2023 by the Patterson International IB Committee. Updated 8/26/2024

Overview

Grade Level: 6	**Collaborative Teaching Team: Espinal**
Date: Feb 2026	**Timeline: February - March**

Transdisciplinary Theme:
Which parts of the transdisciplinary theme will the unit of inquiry focus on?

An inquiry into the interdependence of human and natural worlds through:

- rights, responsibilities, and dignity of all;
- pathways to just, peaceful, and reimagined futures;
- nature, complexity, coexistence, and wisdom

Central Idea:
Does the central idea invite inquiry and support students' conceptual understandings of the transdisciplinary theme?

A change can create many outcomes. (Balance, Interdependence, Stability) (maybe keep this so there is not overlap with HTWW)

Human and environmental interactions shape ecosystems and societies, requiring responsibility, innovation, and informed decision-making.

Lines of Inquiry:
What teacher questions and provocations will inform the lines of inquiry?
Do the lines of inquiry clarify and develop understanding of the central idea? Define the scope of the inquiry and help to focus learning and teaching?

- (Function) How systems work
- (Causation) Causes of change
- (Connection) Change causes more change

How species adapt to survive and the challenges they face in their environment.

How humans explore, protect, and sometimes threaten ecosystems.

Modern-day impacts on societies and ecosystems in the Western Hemisphere.

Decision-making and responsibility in maintaining ecological balance.

Specified Concepts: Do the specified concepts focus the direction of the inquiry and provide opportunities to make connections across, between and beyond subjects?	**Related Concepts:** Do the related concepts provide a lens for conceptual understandings within a specific subject?	**Learner Profile Attributes:** What opportunities will there be to develop, demonstrate and reinforce the learner profile?
Connection: How are things linked? (ecosystems, food chains,	Science: ecosystems, adaptation, survival, human intervention	Thinker Caring

human impact) **Causation:** Why is it like it is? (cause-effect of human activity on nature) **Responsibility:** What is our responsibility? (sustainable practices, conservation) **Perspective:** What are the points of view? (scientific, ethical, societal) **Change:** How is it transforming? (ecological, social, technological)	Technology: innovation, problem-solving, conservation tools Social Studies: human impact, environmental policy, modern-day challenges	Balance

Approaches to Learning:
What authentic opportunities are there for students to develop and demonstrate approaches to learning?

- **Thinking:** Critical thinking, cause-effect analysis, problem-solving.
- **Research:** Data collection, evaluation of sources, analysis of environmental impact.
- **Communication:** Presenting research findings, scientific explanation, visual representation.
- **Self-Management:** Organizing projects, planning experiments, meeting deadlines.
- **Social:** Collaboration in conservation planning, respectful discussion of differing perspectives.

Action:
What opportunities are there for building on prior learning to support potential student initiated action?

Advocacy- Encourage others to make choices that benefit the world

Life-style Choice- Make conscious life choices to improve Earth's well-being

Reflecting and Planning

Initial Reflections:
How can our initial reflections inform all learning and teaching in this unit of inquiry?

This is the first year the focus will be more on weather and climate rather than ecosystems. Students do not have much background knowledge about weather so there should be a lot of learning opportunities.

Prior Learning:
How are we assessing students' prior knowledge, conceptual understandings and skills? How are we using data and evidence of prior learning to inform planning? How does our planning embrace student language profiles?

Students have some prior knowledge about the water cycle and the needs of animals. Some of the tasks at the beginning are designed to elicit background knowledge of students such as drawing their understanding of the water cycle, where water comes from, how weather works, etc. These tasks allow for the student to show what they already know and allow for misconceptions or gaps in learning to show.

Connections - Transdisciplinary and Past:
Connections to past and future learning, inside and outside the programme of inquiry. What connections are there to learning within and outside the unit of inquiry? What opportunities are there for students to develop conceptual understandings to support the transfer of learning across, between and beyond subjects? How can we ensure that learning is purposeful and connects to local and global challenges and opportunities?

Prior Learning: Students have prior learning about ecosystems and the needs of animals, the basics of the water cycle, and how earth's spheres are connected. However, this unit delves more deeply into climate and weather, how they function on a global scale, and the connection between human activities and climate change.

This connects to future learning because students will have a much better understanding of the numerous causes and impacts of climate change globally and they should be able to easily connect to the economic impacts and decisions various entities are making. The connection between economic needs and the environment is powerful. Students have learned about change and interdependence before, but this unit really focuses on the connectedness of changes and how one small change can have a much larger change in other, sometimes unexpected areas.

Learning Goals and Success Criteria:
What is it we want students to know, understand and be able to do? How are learning goals and success criteria co-constructed between teachers and students?

How and why is our weather and climate changing?

Students will understand that weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. Because these patterns are so complex, weather can be predicted only probabilistically. Students will also understand that the ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents. Greenhouse gases in the atmosphere absorb and retain the energy radiated from land and ocean surfaces, thereby regulating Earth's average surface temperature and keeping it habitable.

What are the effects of human activities on Earth's climate?

Students will understand that climate changes, which are defined as significant and persistent

changes in an area's average or extreme weather conditions, can occur if any of Earth's systems change. Positive feedback loops can amplify the impacts of these effects and trigger relatively abrupt changes in the climate system; negative feedback loops tend to maintain stable climate conditions. Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.

Standard 3: Earth and Space Science

GLE 10: Human activities have altered the biosphere, sometimes damaging it, although changes to environments can have different impacts for different living things.

EO a: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (MS-ESS3-3) *(Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage, such as the withdrawal of water from streams and aquifers or the construction of dams and levees; land usage, such as urban development, agriculture, or the removal of wetlands; and pollution, such as of the air, water, or land.)*

GLE 11: Human activities affect global warming. Decisions to reduce the impact of global warming depend on understanding climate science, engineering capabilities, and social dynamics.

EO a: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. (MS-ESS3-5) *(Clarification Statement: Examples of factors include human activities [such as fossil fuel combustion, cement production, and agricultural activity] and natural processes [such as changes in incoming solar radiation or volcanic activity]. Examples of evidence can include tables, graphs, and maps of global and regional temperatures, atmospheric levels of gases such as carbon dioxide and methane, and the rates of human activities. Emphasis is on the*

major role that human activities play in causing the rise in global temperatures.)

GLE 7: Complex interactions determine local weather patterns and influence climate, including the role of the ocean.

EO b: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. (MS-ESS2-6) *(Clarification Statement: Emphasis is on how patterns vary by latitude, altitude, and geographic land distribution. Emphasis of atmospheric circulation is on the sunlight-driven latitudinal banding, the Coriolis effect, and resulting prevailing winds; emphasis of ocean circulation is on the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis effect and the outlines of continents. Examples of models can be diagrams, maps, and globes, or digital representations.) (Boundary Statement: Does not include the dynamics of the Coriolis effect.)*

ES2—The student will recognize or recall specific vocabulary (for example, atmosphere, Earth, fresh water, **gas**, glacier, groundwater, ice, lake, **liquid water**, ocean, **percentage**, polar icecap, **precipitation**, relative, reservoir, rain, river, salt water, source, **solid**, swamp, **water**, water vapor) and perform basic processes such as:

- ❏ Rank sources of water and the types of water they contain (fresh, salt, liquid, ice) by relative size.
    - ❏ Compare the percentages of salt and freshwater on Earth.
    - ❏ Compare the percentages of water in liquid and ice form on Earth.
- ❏ Identify major sources of freshwater on Earth (such as wetlands, glaciers, lakes, rivers).
- ❏ Analyze rainfall maps to determine how usable freshwater is unequally distributed around the world.
- ❏ Graph the ranked sources of water analyzed above.

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❑ I can apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
❑ I can construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Creating Meaning: Tracking Specific Chapters, Sentences, Scenes and Sections

- Analyzing Structures in Fiction
- Analyzing Structure in NonFiction

I can analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text.

Teacher Questions:
What teacher questions and provocations will inform the lines of inquiry?

- How do humans change the planet?
- How do people model and predict the effects of human activities on Earth's climate?
- How do the properties and movements water shape Earth's surface and affect its systems?
- What regulates weather and climate?
- How can a small change cause a much larger change?
- Why is balance important? What happens when balance is lost?
- How do you know when something is balanced?

Teacher Questions:

- How do ecosystems respond to human interference?
- What adaptations help species survive in challenging environments?
- How do modern activities in the Western Hemisphere affect both nature and society?
- How can humans make ethical and sustainable choices regarding ecosystems?

Student Questions:
What student questions, prior knowledge, existing theories, experiences and interests will inform the lines of inquiry?

What are greenhouse gases? Where do they come from?
Where does methane come from?

Student Questions:

- Why do some animals become endangered while others thrive?
- How do scientists rescue or protect species?
- What role do humans play in changing landscapes and ecosystems?
- How can we act responsibly to protect both people and nature?

Designing and Implementing

Designing engaging learning experiences:
What experiences will facilitate learning? For all learning this means: • developing questions, provocations and experiences that support knowledge and conceptual understandings • creating authentic opportunities for students to develop and demonstrate approaches to learning and attributes of the learner profile • building in flexibility to respond to students' interests, inquiries, evolving theories and actions • integrating languages to support multilingualism • identifying opportunities for independent and collaborative learning, guided and scaffolded learning, and learning extension.

Wall Stuff
Lesson Progression
Calendar

1. North Island Rescue (TWIG Science)

- **Experience:** Investigate conservation efforts to save endangered species.
- **Focus:** Ecosystem management, human responsibility, ethical decision-making.
- **Student Task:** Plan a "rescue operation" for an endangered species, including habitat protection and community awareness campaigns.
- **Teacher Support:** Ask, "How would your plan affect the ecosystem? What challenges might you face?"

2. Landscape of Fear (TWIG Science)

- **Experience:** Explore predator-prey relationships and ecosystem dynamics.
- **Focus:** Food chains, behavior adaptation, survival strategies.
- **Student Task:** Create a diagram showing the interactions between species in a given ecosystem and predict outcomes if one element is removed.
- **Teacher Support:** Encourage thinking with questions like, "What would happen if this predator disappeared? How would it affect other species?"

3. Into the Deep (HMH)

- **Experience:** Research deep-sea exploration and marine ecosystems.
- **Focus:** Oceanography, human exploration, and impact on marine life.
- **Student Task:** Produce a model or presentation of a deep-sea ecosystem, including threats like pollution or overfishing.
- **Teacher Support:** Guide discussions with, "How do humans affect life in the ocean? How can technology help reduce harm?"

4. Modern-Day Impacts in the Western Hemisphere (Social Studies Focus)

- **Experience:** Investigate current environmental and societal issues across North, Central, and South America.
- **Focus:** Climate change, deforestation, urban development, conservation policies.
- **Student Task:** Research a case study (e.g., Amazon deforestation, hurricanes in the Caribbean) and present how it affects both ecosystems and local communities.
- **Teacher Support:** Ask, "Who benefits from human activity? Who is harmed? How could these problems be solved sustainably?"

Supporting student agency:
How do we recognize and support student agency in learning and teaching? For all learning this means: • involving students as active participants in, and as co-constructors of, their learning • developing students' capacity to plan, reflect and assess, in order to self-regulate and self-adjust learning • supporting student-initiated inquiry and action.

Lifestyle choices/changes

Ongoing assessment:
What evidence will we gather about students' emerging knowledge, conceptual understandings and skills? How are we monitoring and documenting learning against learning goals and success criteria? How are we using ongoing assessment to inform planning, and the grouping and regrouping of students?

Summative Assessment

IB Summative Assessment: The Balance Between Human Activities and the Environment

Unit Title: Sustainability and Environmental Stewardship
Assessment Type: Research Project, Hands-on Activities, and Presentation

Statement of Inquiry: The balance between human activities and the environment is essential for the health of ecosystems, communities, and the future of the planet.

Assessment Ideas:

- **Formative:** Observations during simulations, ecosystem models, discussion reflections, research notes.
- **Summative:**
    - Design a conservation plan for an endangered species, explaining scientific and social reasoning.
    - Present a case study on modern environmental impacts in the Western

Hemisphere.

- Write a reflective essay on human responsibility and ethical decision-making in ecosystems.

Assessment Overview

Students will engage in hands-on environmental activities along with researching a specific environmental issue related to human activities and its impact on ecosystems and communities. They will analyze the causes, consequences, and possible solutions, making connections to sustainability and global responsibility. The final product will include a multimedia presentation (e.g., slideshow, video, infographic), a written report, and a hands-on project demonstrating practical solutions.

Assessment Criteria

Criterion A: Knowing and Understanding (8 points)

- Demonstrates knowledge and understanding of the selected environmental issue.
- Uses accurate scientific terminology and concepts.
- Provides clear explanations of causes and consequences.

Criterion B: Investigating (8 points)

- Formulates a research question that guides the investigation.
- Uses a variety of reliable sources to gather relevant information.
- Effectively organizes research findings.

Criterion C: Communicating (8 points)

- Presents information in a well-structured and engaging manner.
- Uses appropriate formats (text, visuals, multimedia) to convey ideas.
- Cites sources properly.

Criterion D: Thinking Critically (8 points)

- Analyzes different perspectives on the issue.
- Evaluates solutions with supporting evidence.
- Makes connections to sustainability and future implications.

Assessment Instructions

1. **Choose a Topic:** Select an environmental issue related to climate change (e.g., deforestation, ocean acidification, pollution, greenhouse gas emissions, biodiversity loss, water scarcity, etc).
2. **Research:** Gather information from reliable sources such as scientific journals, government reports, and reputable news sources.
3. **Analyze:** Identify causes, consequences, and possible solutions. Consider social, economic, and environmental perspectives.

4. **Hands-on Activity:** Implement a small-scale environmental project such as a waste audit, tree planting, water filtration demonstration, composting, or community clean-up. Document the process and outcomes.
5. **Create a Presentation:** Develop a multimedia presentation to summarize your findings and document your hands-on project. Include visuals, statistics, and key arguments.
6. **Write a Report:** Submit a 750-1000 word written report that expands on your research, details the hands-on activity, and provides a well-supported argument for a proposed solution.
7. **Present to the Class:** Deliver your findings in a clear and engaging manner. Be prepared to answer questions from peers and the teacher.

Success Criteria

- The project demonstrates a deep understanding of the topic and its global significance.
- The research is well-organized, and sources are credible.
- The multimedia presentation is visually appealing and informative.
- The hands-on activity is well-documented and demonstrates real-world application.
- The written report presents a coherent and well-supported argument.
- The student engages the audience and responds thoughtfully to questions.

Reflection

After completing the assessment, students will write a reflection discussing:

- What they learned about the balance between human activities and the environment.
- Challenges they faced during their research and hands-on activity.
- How their perspective on sustainability has changed.

Other Possible Assessments:
MS-ESS2-4
- Great Lakes Snow Analysis
- Sun-Energy Moves the Water Cycle

MS-ESS2-5
- Canyon Winds
- Winds of Change

MS-ESS3-2
- Specific Pacific Predictions
- Tsunami Prediction

MS-ESS3-3
Sustainable Beef
Light of My Life
MS-ESS3-5
The Cycle of Manmade Disasters
Venus Heat Trap
MS-ESS2-6
Location, Location, Location!
Local Rain
Why So Dry ?

Resources (people, places, technologies, etc.):
How will resources add value and purpose to learning? For all learning this means: • the thoughtful use of resources, both in and beyond the learning community to enhance and extend learning. This might include time, people, places, technologies, learning spaces and physical materials

Book Two Degrees - Alan Gratz
NCAR (National Center for Atmospheric Research)
NREL (National Renewable Energy Lab)
Nature Conservancy Virtual Field Trips
CLEAN - A Collection of Climate and Energy Education Resources (900+ links)
Data Puzzle Collection
Generation Genius
Actively Learn

Student self-assessment and peer feedback:
What opportunities are there for students to receive teacher and peer feedback? How do students engage with this feedback to self-assess and self-adjust their learning?

Feedback and self-reflection after presentations

Reflecting

Teacher Reflections:
How did the strategies we used throughout the unit help to develop and evidence students' understanding of the central idea? What learning experiences best supported students' development and demonstration of the attributes of the learner profile and approaches to learning? What evidence do we have that students are developing knowledge, conceptual understandings and skills to support the transfer of learning across, between and beyond subjects? To what extent have we strengthened transdisciplinary connections through collaboration among members of the teaching team? What did we discover about the process of learning that will inform future learning and teaching?

Student Reflections:
What student-initiated inquiries arose and how did they inform the process of inquiry? What adjustments were made, and how did this enrich learning? How are students supported in having voice, choice and ownership in the unit of inquiry? (For example, through: co-constructing learning goals and success criteria, being engaged in student-initiated inquiries and action, being involved in self-assessing and self-regulating, co-designing learning spaces and so on). How have these experiences impacted on how students feel about their learning? (For example, through: developing and demonstrating attributes of learner profile and approaches to learning, developing understanding of the central idea, achieving learning goals, taking action and so on).

Assessment Reflections:
How effective was our monitoring, documenting and measuring of learning informing our understanding of student learning? What evidence did we gather about students' knowledge, conceptual understandings and skills? How will we share this learning with the learning community?

Notes: