Primary Years Programme

How the world works
Unit of inquiry planner

(Primary years – third grade)

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OVERVIEW

Grade/Year level:	**3rd Grade**	Collaborative teaching team:	**Julia LaVergne, Carmen Carfello, Natalie Gervais, Elisa Segura, Kayla Reardon, Shara Tsai**
Date:	**January-February**	Timeline: (continued investigation, revisiting once, or numerous times, discrete beginning and ending, investigating in parallel with others)	

Transdisciplinary theme

(Type Transdisciplinary theme here.)

How the World Works: An inquiry into the natural world and its laws; the interaction between the natural world and human societies, how humans use their understanding of scientific principles; the impact of scientific and technological advances on society and the environment.

Central idea

Our curiosity may drive us to understand Earth and its relationship to the other planets in the solar system.

Lines of inquiry

The dynamics of planets, moons, stars, and the importance of gravity, along with the movement of planets relative to the sun.
The cause and cycle of the phases of the moon.
Biographical information on important scientist and astronauts.

Key concepts

Connection, Causation, Function

Related concepts

System, Organization, Discovery

Learner profile attributes

The students grow as thinkers and inquirers. At the beginning of the unit they will ask basic questions but dig deeper to learn more about the dynamics of the universe. They will communicate through writing, discussion, and curiosity; all of which will be evident as the researched information. Students will be engaged in their projects while enjoying presenting their findings.

Approaches to learning

The student is taught and will utilize research skills, self-management skills, and public speaking skills simultaneously throughout this planner.

Action

The teacher provides the framework for the travel brochure, and the students are given total creative freedom to use the knowledge acquired from their inquiry based research. Students produce travel brochures attempting to convince humans to move to/visit their planet as wel as a model showing what their planet looks like.

Many students wanted to go further and continue their research. A few have even stated that they hope their future career is related to space.

Prompts: Overview

Transdisciplinary theme

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

Central idea

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

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?

Key concepts

Do the key 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?

Approaches to learning

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

Action

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

REFLECTING AND PLANNING

Initial reflections

Students learned the various properties of the planets as rocky and gas planets as well as the different god in which the planet was named after. They learned about the various machines-telescopes, probes that humans have created to further knowledge of the solar system. The kids used their creativity to imagine unknown planets and describe properties based on those of existing ones. This shows that students engaged in the teaching within the unit and also developed thoughts and wonderings of their own about what lays beyond our solar system.

Prior learning

We watched Brain Pop and got familiar with the planets and created a 'Space Folder' where the kids created an illustration of the planets in order. We also created models out of poster paper and labeled them and put them in order from the sun on our class bulletin board.

Connections: Transdisciplinary and past

Science: Describe and illustrate the sun as a star, Identify the planets in the solar system and their position to the sun, describe and classify planets, observe gravity, students know recognizable patterns in the natural world and among objects in the sky.
Math: Solve problems by collecting, organizing, displaying, and interpreting data such as miles form the sun and plant
ELA: Students used what they have learned about nonfiction/expositpry text to create a brochure/slide presentation using nonfiction style writing and text features to convey their newly learned information about their planet.
Social Studies: Students studied the history of space including the first trip to the moon and the famous people that helped make space exploration possible. They also pondered what historical events may take place in the future of space.

Learning goals and success criteria

Math: 3.5B, 3.6B,3.7, 3.7A,3.7C, 3.7D, 3.7E, 3.8, 3.8A
Previously learned math skills are used in this unit to help understand the distances the planets are from the sun as well as the amount of time it takes for them to revolve around the sun. We make comparisons between distances as well as temperatures.
Science: 3.2A,3.4A, 3.5A, 3.5B, 3.6C, 3.8B, 3.8C, 3.8D, 3.10A, 3.9A
This unit covers a lot of new teks centered around space including the discussion of the placement of the earth, sun, and moon, and how they connect with eachother. We also discuss important scientists who made discoveries about space as well as astronauts who have traveled to space to provide us with groundbreaking information. We also jump back to previously covered teks about adaptations and survival. Students must create adaptations for life on their planet that would allow for them to live successfully in that environment using their prior knowledge.
ELA: 3.13B, 3.13C, 3.13E, 3.13F, 3.13H, 3.1 C,
Studemts are asked to take on this research project and use nonfiction text to aid them in their research. Students must be able to work with the research questions presented and then present their information in a meaningful way.
social studies: 8.3A, 8.3B, 8.16A
Students will learn about important people who contributed to the history of space travel and research from the past and current times.

Teacher questions

What makes the Earth unique?
What sets it apart from the the other planets?
How does gravity effect the planets?
What are the names of honored space scientists?
What machines did man create to explore outer space?
How did early people regard the phenomena of Earth's changes?
What stories did they create to explain these phenomena?

Student questions

How did the planets form?
What do you call scientists who study space and make machines?
How do planets stay in orbit?
What happens if a planet spins off its orbit?
How many years does it take to make a telescope?
Will scientists prove that there was life on Mars?
What happens if objects in space collide?

Prompts: Reflecting and planning

Initial reflections

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

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?

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?

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?

Teacher questions

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

Student questions

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

DESIGNING AND IMPLEMENTING

Unit of inquiry and/or subject specific inquiry (inside/outside programme of inquiry)

Transdisciplinary theme/Central idea:	**How the World Works**		
Collaborative teaching team:	**Julia LaVergne, Carmen Carfello, Natalie Gervais, Elisa Segura, Kayla Reardon, Shara Tsai**	Grade/Year level: 3	Date: 1/7/2021-2/15/2021

Designing engaging learning experiences

Students are introduced to our space unit for two weeks before the start of their project. We dive into many different space topics including the difference between inner and outer planets, the asteroid belt, the Milky Way, and the difference between rotating and revolving. This introduction to the unit sparks student interest and creates excitement to begin research on the planet of their choice the following week. Once started, Students will develop research skills. During independent reading and shared reading, students and the teacher will read a variety of library books related to the solar system. Children will research specific characteristics of their chosen planet while creating a report to share.
Students will exhibit self-management skills. They will have time to put these skills into practice while working in collaborative groups and comparing and contrasting selected planets. The focus in theses groups will be comparing the distance, time length of a day on each planet, the number of rings, the surface properties and atmosphere on each planet. Students will create a poster listing the advantages of living on Earth, describing the resources available, and the seasons. Childern will independently chose a planet and create an informative presentation including the above information along with five facts that they found interesting. Students can include fantasy activities to "advertise" the planet in their Planet Visitor's Guide.

Supporting student agency

Students are provided with basic information about each planet in the solar system, then they choose their planet to research, how they want to gather their research(books/websites), as well as how they want to display and present their findings.

Students have the choice of which planet they want to dive deeper into. They also have the choice to venture outside of the most commonly kown planets and research dwarf planets. Students are provided with materials to create a model of their planet based off of their research and findings. They also have choice in how they present their research to the class.

Students are provided with a research report form to guide their research as well as a project rubric to help guide their work and serve as a presentation check list.

Teacher and student questions

How did the planets form?
What do you call scientists who study space?
How do planets stay in orbit?
What happens if a planet spins off its orbit?
How many years does it take to make a telescope?
Will scientists prove that there was life on Mars?
If Earth moves close to the sun, will it burn up? How are craters formed?

Ongoing assessment

Parent interviews: Students developed questions about the planet of their choice to ask their parents and community to add on to their research. They used the feedback when creating their summative assessment and also shared what they learned with the class.

Student-Led conferences: Students meet one-on-one with their parents and share what they have learned and to present the informaton they have gathered thoughout the learning experiences.

Ongoing discussions reflecting back on prior UOI take place organically in class: This unit ties in with our unit on sharing the planet. In our previous unit we discussed animal adaptation and what helps life to be successful here on Earth. During this unit, students were also tasked with creating life on their planet. Each planet is different and students were to develop 3 adaptations to help life succede on their planet. Example: internal heating system that kicks in when the internal body temperature of their life form drops too low for survival.

Making flexible use of resources

Students conducted research through the use of shared books checked out from our school and public library as well as our district digital library, MyOn.
Students were also provided with a selection of websites for research including the following:

- National Geographic
- Solarsystem.nasa.gove\kids
- Ducksters
- Planets for kids

Student self-assessment and peer feedback

Students are able to self assess while they work on completing their project by using both the research report for and the project rubric. The research report form guides them through their research by providing basic research questions for the student to answer. Students are encouraged to find additional infpormation to share about their planet, but are given a guideline to start. Students use the project rubric to make sure they have completed the project yet are also encouraged to extend their thinking and make the presentation their own.

Ongoing reflections for all teachers

Teachers reflect over this unit during our weekly PLC meetings. We discuss student progress as well as student questions to guide our planning and instruction for the next week. We also reflect on our planners during IB meetings.

Additional subject specific reflections

Donate more time to unit so children can do more of the work during class time as opposed to just using the Satellite lab and use newspapers and scientific jornals to show children the advances in space information.

Prompts: 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.

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.

Questions

Teacher questions
What additional teacher questions and provocations are emerging from students' evolving theories?

Student questions
What student questions are emerging from students' evolving theories?

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?

Making flexible use of resources

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.

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?

Ongoing reflections

For all teachers

- How are we responding to students' emerging questions, theories, inquiries and interests throughout the inquiry?
- How are we supporting opportunities for student-initiated action throughout the inquiry?
- How can we ensure that learning is purposeful and authentic and/or connects to real-life challenges and opportunities?
- How are we nurturing positive relationships between home, family and school as a basis for learning, health and well-being?

Additional subject-specific reflections

Inside or outside the programme of inquiry

- What opportunities are there for students to make connections to the central idea and lines of inquiry or the programme of inquiry?
- What opportunities are there for students to develop knowledge, conceptual understandings and skills to support the transfer of learning across, between and beyond subjects?

REFLECTING

Transdisciplinary theme/Central idea:	**How the World Works**		
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Teacher reflections

The books from the public library were very helpful, it helped speed up the process, because the majority of the research was able to be located in the books as opposed to everyone having to use the internet. The 'Space Folders' kept all the information organized together in one folder. We referred to the TEKS, and found that it completely mastered the science TEKS, and everything else they learned was just a bonus. The guided creative freedom presented an opportunity for multiple entry points. We've talked about being more specific about how to paraphrase and put it into their own words and respect intellectual property. The kids take non-fiction information and are able to creatively combine it with a fictional product.

Student reflections

Kids realized how fun it is to display their learning using art. The voice, choice, and ownership allowed each kid to take their brochure, adaptations, and planet model to their own independent highest level.

Assessment reflections

Examples from other classes allowed students to build off each other's interpretations for the summative assessment. The students used the data collected from their research to create what a person on their planet would look like, dress like, and pack to travel to their planet.

Prompts: 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

-Google slides is a great alternative to the paper brochure when virtual assignments are necessary.