



## Summary

### How The World Works- Physical Science

#### Subject

English, Science Lab, Visual Arts

#### Year

Second Grade

#### Start date

Week 4, January

#### Duration

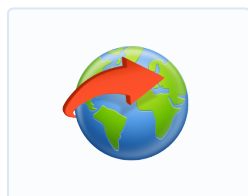
6 weeks



## Inquiry



### Transdisciplinary Theme



#### How the world works



### The Central Idea

Changes occur within the natural world.



### Lines of Inquiry

- energy Sources
- states of Matter
- properties of Matter and Changes in Objects
- effect of force in the movement of an object



### Teacher questions

- What is matter?
- What are some different states of matter?
- How do energy sources change matter into different forms?
- How does force affect the motion of an object?



## Learning Goals



### Scope & Sequence



English

[IB] Visual language - viewing and presenting

**Overall Expectations**



identify, interpret and respond to a range of visual text prompts and show an understanding that different types of visual texts serve different purposes. They use this knowledge to create their own visual texts for particular purposes.

### Conceptual Understandings

Visual texts can immediately gain our attention.

### Learning Outcomes

use a variety of implements to practise and develop handwriting and presentation skills

observe and discuss illustrations in picture books and simple reference books, commenting on the information being conveyed

through teacher modelling, become aware of terminology used to tell about visual effects, for example, features, layout, border, frame

observe visual images and begin to appreciate, and be able to express, that they have been created to achieve particular purposes.

attend to visual information showing understanding through discussion, role play, illustrations

### [IB] Written language - reading

### Conceptual Understandings

People read to learn.

The words we see and hear enable us to create pictures in our minds.

### Learning Outcomes

participate in shared reading, posing and responding to questions and joining in the refrains

participate in guided reading situations, observing and applying reading behaviours and interacting effectively with the group

listen attentively and respond actively to read- aloud situations; make predictions, anticipate possible outcomes

read and understand the meaning of self-selected and teacher-selected texts at an appropriate level

use meaning, visual, contextual and memory cues, and cross-check cues against each other, when necessary (teacher monitors miscues to identify strategies used and strategies to be developed)

instantly recognize an increasing bank of high-frequency and high-interest words, characters or symbols

have a secure knowledge of the basic conventions of the language(s) of instruction in printed text, for example, orientation, directional movement, layout, spacing, punctuation

participate in learning engagements involving reading aloud - taking roles and reading dialogue, repeating refrains from familiar stories, reciting poems.

### [CCGPS] Reading Informational

### Learning Outcomes

Key Ideas and Details



ELACC2RI1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

#### Craft and Structure

ELACC2RI4. Determine the meanings of words and phrases in a text relevant to a grade 2 topic or subject area.

ELACC2RI5. Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently

ELACC2RI6. Identify the main purpose of a text, including what the author wants to answer, explain, or describe.

#### Integration of Knowledge and Ideas

ELACC2RI7. Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.

#### Range of Reading and Level of Text Complexity

ELACC2RI10. By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 2-3 text complexity band proficiently, with scaffolding as needed at the high end of the range.

### [CCGPS] Speaking and Listening

#### Learning Outcomes

##### Comprehension and Collaboration

ELACC2SL1. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.

ELACC2SL1.a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).

##### Presentation of Knowledge and Ideas

ELACC2SL5. Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.

### [IB] Oral language - listening and speaking

#### Learning Outcomes

listen and respond in small or large groups for increasing periods of time

listen to and enjoy stories read aloud; show understanding by responding in oral, written or visual form

obtain simple information from accessible spoken texts

predict likely outcomes when listening to texts read aloud




use grammatical rules of the language(s) of instruction (learners may overgeneralize at this stage).



## Key and Related Concepts



### Key Concepts

Key Concepts	Key questions and definition	Rationale	Related concepts	Subject Focus
 Form	<b>What is it like?</b> The understanding that everything has a form with recognizable features that can be observed, identified, described and categorized.		changes of state, solids, liquids, gases	Science Lab
 Causation	<b>Why is it as it is?</b> The understanding that things do not just happen; there are causal relationships at work, and that actions have consequences.			
 Change	<b>How is it transforming?</b> The understanding that change is the process of movement from one state to another. It is universal and inevitable.	Change was selected because some states of matter change from one state to another. The energy sources (heat, light) change materials through melting, freezing, etc.		Science Lab



## Developing IB Learners



### Learner Profile



Inquirers



Communicators



Risk-takers (Courageous)



## ATL Skills

### Approaches to Learning

#### Description

Transdisciplinary Skills: Observing, Planning, Time Management, Safety, Acquisition of knowledge, Analysis, Accepting Responsibility, Respecting others, Listening, Speaking, Presenting.



### Communication Skills

- Exchanging information - Listening, interpreting and speaking

#### Listening

Listen to, and follow the information and directions of others.

Listen actively to other perspectives and ideas.

Ask for clarifications.

Listen actively and respectfully while others speak.

#### Speaking

Speak and express ideas clearly and logically in small and large groups.

Give and receive meaningful feedback and feedforward.

State opinions clearly, logically and respectfully.

Discuss and negotiate ideas and knowledge with peers and teachers.

Communicate with peers, experts and members of the learning community using a variety of digital environments and media.



## Action

### Student-initiated Action

Students reported that they demonstrated the science experiments at home for their families and built highways for their toy cars at home.



## Assessment & Resources

### Ongoing Assessment

What are the possible ways of assessing student learning in the context of the lines of inquiry? What evidence will we look for?

Each student will select a science experiment in which they will model and present to the class. A rubric will be used to assess the student's learning.

There will be a grade level rotation that will consist of stations where the students will experience (1) States of matter (2) A change in force sources and (3) Properties of matter and changes in Objects. The students will be assessed on the writing piece



that will be created. The students must include unit vocabulary in their writing to show understanding.

What are the possible ways of assessing students' understanding of the central idea? What evidence, including student-initiated actions, will we look for?

Goal: Your goal is to show customers an experiment that supports your hypothesis on one form of matter or force.

Role: You are a soda fountain operator.

Audience: The audience is a group of customers, visiting your soda fountain observing your experiment.

Situation: You need to demonstrate to the customers changes in matter whether (tearing, cutting, freezing, and heating solids, liquids, and gases to change them).

Product: The soda fountain operator will be required to complete a demonstration of their science experiment for the customers. The soda fountain operator will be required to complete a graphic organizer about the scientific process followed during the science experiment.

Standard:

S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects. a. Ask questions to describe and classify different objects according to their physical properties. (Clarification statement: Examples of physical properties could include color, mass, length, texture, hardness, strength, absorbency, and flexibility.) b. Construct an explanation for how structures made from small pieces (linking cubes, building blocks) can be disassembled and then rearranged to make new and different structures. c. Provide evidence from observations to construct an explanation that some changes in matter caused by heating or cooling can be reversed and some changes are irreversible. (Clarification statement: Changes in matter could include heating or freezing of water, baking a cake, boiling an egg.)

S2P2. Obtain, evaluate, and communicate information to explain the effect of a force (a push or a pull) in the movement of an object (changes in speed and direction). a. Plan and carry out an investigation to demonstrate how pushing and pulling on an object affects the motion of the object. b. Design a device to change the speed or direction of an object. c. Record and analyze data to decide if a design solution works as intended to change the speed or direction of an object with a force (a push or a pull)

What are the possible ways of assessing students' prior knowledge and skills? What evidence will we look for?

The teacher will perform a simple science experiment in front of the class dealing with solids, liquids and gasses. (such as adding vinegar to baking soda) Next, a KWL chart about solids, liquids and gasses will be developed. Then, the teacher will show the Science Explore and Discovery Education videos on matter. Students will journal about what they observed and any questions or wondering they have. The teacher will gather books related to matter and energy and display them in a center.

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What are the possible ways of assessing students' understanding of the central idea? What evidence, including student-initiated actions, will we look for?

Goal: Your goal is to show visiting scientist an experiment that supports your hypothesis on one form of matter or force.

Role: You are a mad scientist.

Audience: The audience is a group of visiting scientist, visiting your lab observing your experiment.

Situation: You need to demonstrate to the visiting scientists changes in matter whether (tearing, cutting, freezing, and heating solids, liquids, and gases to change them). The scientists may choose to demonstrate an example about changes in direction and speed on objects. (motion, pushes, pulls, friction).

Product: The mad scientist will be required to complete a demonstration of their science experiment for the group of scientist. The scientist will be required to complete a graphic organizer about the scientific process followed during the science experiment.

Standard:

S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects. a. Ask questions to describe and classify different objects according to their physical properties. (Clarification statement: Examples of physical properties could include color, mass, length, texture, hardness, strength, absorbency, and flexibility.) b. Construct an explanation for how structures made from small pieces (linking cubes, building blocks) can be disassembled and then rearranged to make new and different structures. c. Provide evidence from observations to construct an explanation that some changes in matter caused by heating or cooling can be reversed and some changes are irreversible. (Clarification statement: Changes in matter could include heating or freezing of water, baking a cake, boiling an egg.)

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## Learning Experiences



### Designing engaging Learning Experiences

Enrichment/ Gifted activities:



G2\_How\_the\_World\_Works.docx Feb 14, 2022

1. Students will sort materials into the three states of matter according to their characteristics. Students will share their observations on a chart or in a journal.
2. Students will participate in experiments and activities observing and creating changes in matter. (rotations)
3. Students will describe an object, using descriptive terms. They will include its shape, color, and texture.

### Music

Key Concepts: Form, Connection, Causation

Activities:

- Sort and classify small percussion instruments
- Play the same song on different percussion instruments to determine desired instrument timbre or quality
- Practice a quilt activity with students so they can describe a song using descriptive terms.

### Science Class Instruction:

Key Concepts: causation, form, change

- Students will investigate physical science through studying the forms and properties of matter and relating to how scientists draw conclusions based on these properties. STEMSCOPES: Engage and Explore activities
- Sort and classify various objects and forms of matter and justify their groupings. I used to think, but now I think..
- Students will communicate testable questions about matter
- Use Claim Evidence Question thinking routine to justify if various physical and chemical changes of substances were reversible or irreversible: making ice-cream, boiling egg, egg in vinegar, boiling water, melting ice, Oobleck
- Students will measure and collect data to compare and contrast physical properties of matter

### Visual Art Class Instruction:

Key Concepts: Form, causation, change

Learner Profiles: Inquirer, communicators, risk-takers

Central Idea: Change occurs within the natural world

- Students will explore how colors affect both mood, and temperature of a work of art
- Students will study the lines and perspective within various forms of architectures





-Student will explore and try to incorporate multiple elements of design within a single work of art

-Students will observe and using shading techniques using colors other than black and white. Students will use color theory to support these techniques

**Gifted Teacher** will lead the following activity:

How The World Works **SECOND GRADE** IB SRSES gjh

Goal	Discovery Identify Describe Quantify Co-Relate Apply
Role	Dark Matter
Audience	Chauvet-Pont-d'Arc - <a href="#">Gorges de l'Ardèche</a> , France Cave <i>Mexico's Cave of Crystals</i> - Chihuahuan Desert
Situation	1.An underappreciated not so distant Relative - relativity the dependence of various physical phenomena on relative motion of the observer and the observed objects, especially regarding the nature and behavior of light, space, time, and gravity – Seeks Same
Product	Earth Point Perspective – 3D Phi Expressionists – Ordinates, Platonic Solids, Polyhedral Nets & Forms Etc. with Descriptors

Provocations

Teacher does a demonstration for students. Teacher and student discuss the solids, liquids, and gas observed. (make slime of volcano from baking soda and vinegar)

## Reflections

### General Reflections

Looking Back



**Susanne Hendrickson** Apr 19, 2022 at 3:33 PM



Students created a Root Beer Float Booklet that recorded their observations, questions, and comparison after completing a science experiment <https://docs.google.com/presen...>

### Looking Forward



**Susanne Hendrickson** Apr 19, 2022 at 3:34 PM

more hands on activities.

### Additional Subject Specific Reflections



**Susanne Hendrickson** Apr 19, 2022 at 3:35 PM

This unit needs to incorporate more hands-on science experiments in order for students to access higher order thinking skills.