

KINDERGARTEN INTERDISCIPLINARY UNIT (K1)

Unit 1: Exploring My World

*Note: all inquiry centers can be adapted for whole group

Concept: Observation

Essential Questions: How do my observations affect how I make sense of the world?

Deepening Questions:

Enduring Understandings:

Identifying the rule of a pattern brings predictability and allows one to make generalizations.

We learn best about our world when we use our five senses at the same time.

Patterns exist in all different places.

Observations can be organized

Unit Overview

The systematic way we make and organize our observations help to better understand the world. During the first section of the unit, students will learn about the five senses and how they can be used to explore the world around them. Through various experiments, students will investigate how their senses impact their perception. They will use graph, diagrams, maps, etc. to record their observations. This is a formal access point where students will learn about the process of scientific inquiry.

Next, students will specifically focus on the sense of sight. Through the study of art and literature, students will recognize how color can communicate feelings and emotions. They will learn how the world is composed of many patterns. They will begin by looking at patterns in stories and poetry as well as investigate the patterns in words. They will then learn about the patterns in math focusing on counting and simple operations. By taking a look at a famous painting and series of photographs, students will also see patterns in art and in nature. The overall theme of this section is that patterns can help people make sense of the world and can be used to make predictions.

Academic Vocabulary:

Pattern
Color
Observation
Compare
Contrast
Chart

Prediction
Repeating
Explore
Translate
Senses
Perception

Rhyming
Symbol
Record
Description

UNIT HOOK: Studying Colors and Patterns

Comparing two pieces of artwork:

Squares in *Color of Squares*, Wassily Kandinsky and *Day and Night*, M.C. Escher

Looking at the two pieces of art, students can add questions/comments using a Wow/Wonder Chart Prompt students to give Wows and Wonders that include ideas such as same/different, pattern/repetition, and colors (light/dark, mood).

Students can complete a short reflection journal entry picking their favorite from the two pieces of art explaining their choice.

SECTION 1: EXPLORING WITH MY SENSES

Deepening Questions: What are my five senses and in what way are they used to make observations?

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Whole Group: Identifying the Five Senses

My Five Senses by Aliko (HMH Unit 2: Lesson 6)

After reading aloud the book, as a class, the students will create a web that pairs up the sense and the observation (seeing=red fire truck, taste=ice cream). Students should also be prompted to note what body part they use for each sense. Continue the discussion by asking the following and similar questions:

- Why is it important to use all five sense?
- Can you use more than one sense at a time? Give an example and refer back to the web to see if there is anything that might fit multiple senses.
- What would happen if you lost one of your senses?

Inquiry Centers: (STEM project: My Five Senses)

The following link gives a detailed sample lesson plan for this STEM project. Activities can be adapted to meet the learning objectives of this unit.

<http://www.k12.wa.us/EarlyLearning/pubdocs/Unit1UsingOurSensestoObserve.pdf>

Center 1: Sorting the Senses (Technology)

Choose From One:

- Kidspiration (or similar technology)-students will choose pictures of items to place with their corresponding sense
- Printable Worksheet (sort pictures)

http://www.lakeshorelearning.com/media/images/free_resources/teachers_corner/printables/5SensesSortingGame.pdf?utm_medium=pin&utm_source=pinterest

- Online video and game:

<http://www.turtlediary.com/preschool-games/science-games/the-five-senses.html>

Center 2: Make a Graph

Given a large set of items (preselected by the teacher), students will sort the items by the sense then create a pictograph to show their sorting results. (Note: Students may begin to make the observation that some items can be sorted into multiple columns. Ask students what primary sense they used to explore the item. For instance, if given a lemon, students can see and feel it but the primary sense that dominates is taste. They can have an opportunity to explore cross category sorting after completing their first pictograph.)

Additional exploration:

Students can begin to sort items by the number of senses they can use to explore each item. First students should determine the number of senses that are used to explore an item, for example watermelon would be graphed as four senses (sight, taste, touch, and smell) while a rock might be graphed as two (sight and touch). Remind students to be flexible in their thinking. Can rocks be explored with hearing since there is a sound when they collide?

Center 3: Conducting Observation

Students will be exposed to using scientific tools to begin the process of scientific inquiry (making observations and recording their findings.) Give students a tub of materials and instruments to explore with (measuring tape, magnifying, scale, thermometer, etc.) Allow students time to just explore with the tools then ask them to complete a few observation pages (students record, write or draw a picture, the item they are exploring, the tools they are using to explore the item and their observations.) As an extension, create a class anchor chart that displays the tools and how they are used to make observations.

Center 4: Mapping My Classroom (My Map Book by Sara Fanelli)

Read aloud the story My Map Book. Ask students to “draw” a map of the classroom. Pair up students and ask them to lead each other through using their classroom map. Then students can try to lead their partner around the classroom without using one of their sense (without sight, without sound, etc.)

Assessment: Digital Portfolio

Students will create a digital portfolio (photos taken on ipad or imported into file) or video (using videolicious app) that summarizes their learning about the five senses and scientific inquiry. Use a rubric to score each portfolio with special consideration to assessing students’ understanding of how the five senses are used to make observations as well as on the oral presentation given in the portfolio. See the examples of making a video portfolio using the videolicious app:
<http://ksespreksprouts.blogspot.com/2014/03/five-senses-2-week-stem-unit.html>

SECTION 2: COLOR MY WORLD

Whole Group 1: Informational Text *All the Colors of the Rainbow*

As the class reads an informational or literary book, introduce the idea of author and illustrator. Describe their roles in the creation of a text. Do a “text walk” by carefully showing the front cover, back cover, and title page of the book. As you read an informational text such as *All the Colors of the Rainbow*, pause to ask the children questions. Encourage them to ask questions about the text and unfamiliar words.

Prepare a basket of colored objects. Invite students to come to the basket and choose something to tell the class about. This is the rule: Each student must describe the object using at least two “describing words” (i.e., adjectives). Example: a bright red apple, a small green block. Extend this activity by introducing opposites of one of the adjectives. “You showed me a small block. Now find a large block.” You could have another vocabulary activity with the same collection by sorting the same objects into color categories such as “red” and “green” or by asking the students to think of rhyming words that describe.

Whole Group 2: Comparing/Contrasting Artwork

Show students the Whistler and the Rivera. Ask them to discuss how Whistler used a mostly black and white palette, while Rivera used a wide range of colors. Then ask them to choose to draw their favorite of the two works, either in black and white or using a wide range of colors. (

Display the works by Matisse and Picasso. Ask the students what color dominates each work. Ask the students why they think Picasso chose blue and Matisse chose red. Ask how the paintings are the same (e.g., both figures are preparing food and neither is looking at us) and how they are different (e.g. we can see outside in the Matisse, whereas Picasso's is a close-up), preparing the way for literature conversations in comparing and contrasting texts. As a class create a Venn diagram comparing and contrasting the Matisse and Picasso using the students observations (remind students to consider their Five Senses when exploring the paintings.)

Inquiry Centers:

Center 1: Sorting by Attribute

Given a collection of items, students will first explore separating them into piles. Then, with prompting, students will be given a workmat where they can separate the items by different attributes primarily focusing on color. Students will complete a bar graph showing how many items of each color they have in each pile and then answer questions about their graph (e.g. what did you have the most of? What other things can we make a graph about?)

Center 2: Symbols of the United States

Read aloud one of the books on symbols of the United States:

O, Say Can You See? America's Symbols, Landmarks, And Important Words

F is for Flag

The Pledge of Allegiance (Scholastic)

Show the American flag. Record student observations (colors, pattern, etc.) Say the pledge of allegiance.

Record student observations (attention on hand on heart, sound and rhythm of pledge) Continue to do the same for other U.S. symbols (White House, American Bald Eagle, National Anthem, Statue of Liberty)

Complete a bubble to map noting the symbols and some of the observations.

Students will then create a "symbol" (or particularly a flag) of their own that represents the class. Ask them to choose the colors carefully to represent something about the class. Students can pair up and explain their symbols to a classmate.

Center 3: Exploring Colors of the Rainbow with our Senses (perception)

Read the book *Lemons are Not Red* by Laura Vaccaro Seeger. Students can begin to understand that by changing the way we normally use our senses (changing the color), things can be observed differently. Students will use a color paddle tool to make observations and draw conclusions by looking at a white item on top of an orange bottle (see link).

<http://preschoolstem.wordpress.com/2012/03/15/colored-vision/>

If color paddles are not available, teachers can make a window using tissue paper and a cardboard tube cut down. (Wrap the tissue paper around the end of the tube using a rubber band.) Students can make observations about what they see when looking through the different colors by drawing.

Taste Perception

<http://www.education.com/science-fair/article/can-eyes-fool-taste-buds/>

After sampling apple juice mixed with different color food coloring, students will make observations about the way each cup tastes. Students may note that there are 3 different kinds of juices simply because the color has changed.

Mixed Media (Reading a Magazine)

Using texts from *Ask Magazine: Can You Trust Your Senses*. Students will explore how to gather information from a magazine. (Activities can be taken from Stephanie Harvey's Comprehension Toolkit, particularly those listed in the nonfiction feature (lesson 2).)

As a whole group, ask students to identify certain features of nonfiction (labels, captions, photographs, illustrations, diagrams, maps). Create an anchor chart showing a visual of each feature and then its purpose. Give students a variety of texts (magazines, internet articles, informational texts.) Ask them to identify the features and then create a tally graph of their findings. As an easier alternative, students can capture images of the features and then print them out as a way to show a pictograph.

<http://www.scholastic.com/teachers/lesson-plan/finding-nonfiction-features>

<https://cobblestonepub.com/product/can-you-trust-your-senses/>

Center 4: Colorful Language

Read aloud *The Black Book of Colors* by Menena Cottin. Students can start to understand how words (descriptive language) are important to how we see and understand the world. Give students a teacher-created book similar to the style of *The Black Book of Colors*. For instance, one page would read "I see a shiny bright red fire truck with its siren blaring." Students may begin to notice that as more details (descriptive words) are used, they are better able to create an image.

Additional Exploration:

The Black Book of Colors would provide a glue project students might enjoy. Students can draw a simple pencil image on a piece of black paper. They will then use elmer's glue to trace the outline. When the images are dry, students can try guess what the image is in a dark classroom. They can dictate sentences for each picture. Links below show examples of this type of project.

<http://www.wiseowlfactory.com/BookaDay/archives/4674>

<http://msnovak.blogspot.com/2012/01/black-book-of-colors-3rd-grade.html>

SECTION 3: PLAYING WITH PATTERNS

Note: Patterns in the Common Core

Although patterns are not a strand identified in the common core math standards, we can find patterns embedded different strands. For example, in kindergarten when we count to 100 by ones and tens, we using a plus one or plus 10 growing pattern. When we teach our first graders about the commutative property and how knowing $2 + 3 = 5$ means they also know $3 + 2 = 5$, we are asking them to recognize patterns. When we teach our second grades about odd and even numbers we are looking at an AB pattern. And, when we show students how to use repeated addition to determine how many objects are in a rectangular array, we are asking them to count by twos, threes, fives, etc. Teaching a simple pattern creation, extension and translation is crucial because many of the standards will require this skill to fully develop more sophisticated math concepts (e.g. multiplication as repeated addition.)

Whole Group:

The Napping House by Audrey Wood

After reading the story, students will retell the story using pictures from the story (see the link below.) Students will notice the pattern of the story is that one character is added each time. Encourage students towards the end to make predictions about who else might be joining in the nap on the bed.

<http://earlymath.erikson.edu/who-is-napping-primary-math-games-and-activities/> (video link for activity)

http://www.theeducationcenter.com/print/editorial_content/44046 (blackline master of characters)

Reading Nursery Rhymes

As students read a nursery rhyme (or poem) from a chart or interactive whiteboard in the front of the class, choose a student to come up and follow the words from left to right with a pointer. Instruct the students that if there is a word they do not understand in this rhyme, they should raise a hand to ask about it.

Inquiry Centers:

Center 1: Poetry Patterns

As students read a rhyme, ask them to focus on listening for rhyming words and hearing the rhythm of the lines. By teaching the children to follow along with you on wall charts or an interactive whiteboard, they are able to enjoy rich vocabulary in context and become familiar with sight words and word families. Adding the simple melodies to the nursery rhymes will enhance the students' perception of rhythm. By using musical recordings of the nursery rhymes, students can move to the rhythm of the rhymes in song and recite the words with ease.

Students will then work as a group with one of the poems. They will highlight words that rhyme, switching to a new highlighter color for every new rhyming set. Ask students to then assign letters to the colored rhyming words. See the following link:

<http://www.poetry4kids.com/blog/lessons/rhyme-schemes-poetry-lesson-plan/>

Continue to do the same activity on another poem (with a different rhyming pattern) and have students compare the letter patterns of both poems.

Center 2: Number Patterns (counting)

Read *Pattern Fish* by Trudy Harris. Let students have sentence strip to make their own pattern. (This may take additional class time as a separate activity and then place all the patterns out at the center for students to observe.) Students will then explore patterns as a way of counting. The following link explains how to connect between numbers and counting.

<http://www.kindergartenkindergarten.com/patterns/> See the section called "Can you make a number pattern?" Concentrate on how an ABBABB pattern really is like $1 + 2$ and counting is just repeatedly adding one thing.

Then students will investigate counting different ways (by 2s and 10s). Students will Building unifix cube tower (students will notice that each tower is exactly one cube taller than the other; this lead to the concept that counting by ones is a pattern of adding one to the previous number. Then give the group this number sequence: 2, 4, 6, 8, 10 and ask them to build the towers accordingly (with assistance). Ask them to notice if there is any pattern to how "tall" the towers are (e.g. they are two cubes taller each time.) This activity can also be extended to have students begin to understand the concept of counting by 10's to 100. Read aloud the book *The Father Who Had 10 Children* by Benedicte Guettier.

Center 3: Movement pattern

Students will play the game "Copycat": One student will start a pattern (one clap, three stomps, two jumps-repeat.) The other student will count the movements and orally explain the pattern. Then he/she will copy the same pattern. Both students will then translate the pattern to numbers and record the pattern (1-3-2-1-3-2). Students can take turns making up movement patterns and the other student copying it. Both students will then translate the pattern into a number pattern.

Assessment: Students will have developed a pattern book and added one page from each center. They will collect samples of a pattern they created, a pattern they have found around the classroom/school,

a pattern in a story (translate), number pattern and a movement pattern. The last page of the book can be a reflection of what they student has learned about patterns (e.g. "Patterns help me to know what comes next.")

Week 4: Bringing it all Together

In this section, students will use all they have learned and learned how to do from this unit (using their senses, sorting and classifying, patterns in stories, rhyming words) and identify how making these types of observations is critical in making a prediction.

Whole Group:

Activity 1: Patterns/Color in Reading

Read aloud the classic tale *Brown Bear, Brown Bear* by Eric Carle. Read aloud all the way through once. During the second reading students should start to notice the pattern of the text and how that can help them decode the text on the additional page. During an additional reading students can start to notice the rhythm (pattern) in the text itself. Students can try to order sentence strips to retell the story. Ask what would happen if the pattern was not continued.

Activity 2: Patterns in Art-Kreate like Kadinsky

Students will create their own pattern picture modeled after Kadinsky. Show students the artwork and ask them to observe. They should be comfortable discussing ideas such as repeating, colors, etc. Kadinsky's concentric circles are in a pattern but not one that is easily recognizable. Ask students to find images or things that show pattern other than in a linear fashion.

Students will then be given a sheet of large white paper folded into at least 8 boxes. They can begin by sketching concentric circles in each box (big, medium, small.) Using colored pencils, students can color the circles. Although their creations may be a bit more prescribed (by following patterns), a conversation can be had about why patterns are so pleasing in art. Students can also experiment with color and see if it changes the "mood" of their artwork.

The following link describes (in more sophisticated language) how artists use patterns and rhythm in fine art: <http://www.sophia.org/tutorials/design-in-art-repetition-pattern-and-rhythm>

Activity 3: Patterns in Nature

As a whole group read aloud the book *Lots and Lots of Zebra Stripes* by Stephen R. Swinburne. Take a nature walk (or just a tour around the school) and have students snap photos of any pattern. A possible extension would be to sort the images students captured into nature/not nature (a preclusion to living vs. non-living.) Brainstorm all of the patterns students found adding to the list already made from images in the book.

Students will work on combining Activity 2 and 3 to create original artwork. Using digital images captured, students can create their own artwork in an organized collage (similar to Kadinsky). Students will use at least 8-10 images of a pattern they will use to place in a matrix (4 by 4). Challenge students to capture repeating patterns in concentric designs (not just a linear pattern!) Here is a link that shows some examples: <http://weepeople.com/drawer/concentriccirclepage.htm>

Activity 4: Anchor Chart

Ask students in what ways they have used prediction in this unit. Create an anchor chart for students to refer to when making any prediction.

Pattern for Problem Solving (Extension)

<http://www.mathsisfun.com/algebra/patterns.html>

