Lesson Title:		Observe like a scientist	
Grade:	5-6	Week: 1st	Topic: observation

**Lesson Objectives:** Students will observe and explore how light hits an object impacts the length of the object's shadow. Students will explore drawing from observation as well as creating preliminary sketches for their final piece.

**Art/Science Inclusion** (brief description of how your lesson presents an integration of art and science concepts.)

Students will have the opportunity to reflect, explore, collect and analyze data, and then discuss what they have observed. Students will use their observational science skills to look closely at the different patterns found and turn them into a new piece.

**Art Open-Ended Question** (what problem, task, or exploration will students be dealing with (should have multiple ways to complete it))

Students will explore sketching in the field and see how they can gain inspiration from the world around them for their art. How can we draw inspiration from the world around us?

**Art Education Standard** (should include at least one, see https://www.arteducators.org/learn-tools/national-visual-arts-standards)

Anchor Standard 1:Generate and conceptualize artistic ideas and work.

- Combine ideas to generate an innovative idea for art-making.

## Science Education Standard (should include at least one, see

https://www.doe.in.gov/standards/science-computer-science, NGSS also great)

- -Observe natural phenomena and conduct multiple trials of qualitative and quantitative observation.
- -Collect data and present it in a form of tables or drawing that can reveal the pattern and relationship between lengths and direction of shadows .

Timeline 10:00-10:15	Lesson Description Introduction and set up the basic rules for the classroom conduct	Modification for Inclement Weather
10:15-11:10	Children will go outside and have them experiment with their shadows and observe different patterns of shadows.  1. Before you begin, have students point toward the direction of the sun. Then identify where their	In that case, we will do the activity using plastic cups, white paper/wax paper and light source inside the classroom to observe and explore shadows and its patterns with angle and length.

- shadows are in relation to the sun. Ask, "Are your shadows short or tall?"
- 2. Have students move around and observe their shadows as you ask them the following questions:
  - What makes your shadow move?
  - What happens to your shadow when you stretch your arms up high?
  - What happens to your shadow when you crouch down low to the ground?
  - Can you make your shadow disappear completely?
- 3. Divide students into pairs and give each pair a piece of chalk. Have students stand on a hard surface, such as the blacktop or sidewalk. Prompt them to take turns using the chalk to trace around each other's shoes and shadows. Encourage them to label the outline with their name and the time of the day.
- 4. Ask students to measure and record the time, length, angle of the shadows and find the relationship between distance, size and angle in formation of shadow.
- 5. Ask them to predict what their shadows will look like when they return to the same spot later in the day or different time. Have students test their predictions a few hours later by returning to the same spot, using their shoe outline as a guide. Instruct students to take turns tracing their new shadows.
- 6. Invite students to discuss the differences in their shadows. Why

11:15-11:45  Materials List (nle	do they think the shadows moved?  7. Explain to students that their shadows look different because the Earth is rotating. The sun is now in a different position relative to where they are standing.  1. Ask students to consider what forms in nature do we commonly see in art?  2. Ask students to think about shadows, patterns, and textures that we see in nature.  3. Give students 15 minutes to sketch out different patterns they can find in nature.  4. When finished, bring students inside and ask them to look back to their sketches and think of ways they can use the patterns they collected to create a drawing.  5. Using crayons or markers, students will use reference from the observational sketches to create a nature pattern drawing.	If weather is bad, we will look up pictures of trees and nature scenes to pull patterns from.
Art materials for each student - 4 pieces of white paper - pencils, 2b, 4b, hb - erasers - pencil sharpeners - pack of crayon		Science material (each students) -Paper cups (2 different size) -White paper/ Wax Paper

pack of markers
Science materials for each student
Meter scale
Protractor
Clipboard
Pencils
Papers
Sidewalk Chalk (different colors would be good)
Light source /Flash lights
Light source /Flash lights

Week 2: Light and Shadow

Lesson Title:

Grade: 5-6 Week: 2nd Topic: Shadow and light

**Lesson Objectives:** Students will understand formation of shadow, identify transparent or opaque objects and understand the lunar/solar eclipse. Students will be able to describe and model how the relative sizes, distances, and positions of the Moon, the Sun, and Earth produce lunar and solar eclipses.

Students will explore the creating from everyday materials in connection to shadow, light, and the lunar/solar eclipse.

**Art/Science Inclusion** (brief description of how your lesson presents an integration of art and science concepts.)

Students will discuss shadow and textures of the moon or sun which will reflect in their painting of the forms, as well as they will be using these sculptures in order to understand the lunar and solar eclipse.

**Art Open-Ended Question** (what problem, task, or exploration will students be dealing with (should have multiple ways to complete it))

Students will be presented with some everyday materials and be asked to use them in a creative way to create a sculpture of the moon or sun

### Art Education Standard (should include at least one, see

https://www.arteducators.org/learn-tools/national-visual-arts-standards)

Creating- Anchor Standard 2: Organize and develop artistic ideas and work. Enduring Understanding: Artists and designers experiment with forms, structures, materials, concepts, media, and art-making approaches

 Demonstrate openness in trying new ideas, materials, methods, and approaches in making works of art and design.

### Science Education Standard (should include at least one, see

https://www.doe.in.gov/standards/science-computer-science, NGSS also great)

The orbits of Earth around the sun and of the moon around Earth cause observable patterns. These include day and night; daily and seasonal changes in the length and direction of

shadows; phases of the moon; and different positions of the sun, moon at different times of the day, month, and year.

Timeline	Lesson Description	Modification for Inclement
10:00-10:15	1. 1Students will be divided into two	Weather
	groups and will ask them to group	
	the things based on criteria how	
	much ligh pass through the objects.	
	2. Students will discuss the Opaque,	
	Transparent and Translucent	
	objects and categorize the	
	material.	
	3. Students will be introduced with	
	the solar system and the rotation	
	of Sun,Earth and Moon.	
10:10-10:55	Introduction to artists who sculpt with	
	everyday materials	
	1. Students will be told that building	
	off of last week, we will be	
	discussion the lunar and solar	
	eclipse and that to do so we will	
	be creating our own moons or	
	suns	
	2. Students will be given tin foil,	
	tape and paper and will be	
	instructed to create a from for	
	their moon/sun	
	3. Students will be asked to consider	
	the textures that might include in	
	their sculpture to represent the	
	moon/sun	
	4. Tempera paint will be provided	
	for students to paint their	
	moon/sun and try to mimic the	
	textures, light, and shadows of	
	them	
40 55 44 40	4. After building the model of Earth,	
10:55-11:10	Sun and moon from the Art, the	
	student will explore solar eclipse	
	and lunar eclipse by using torch	
	light, tennis ball and ping pong	
	ball.	
	5. The students will explain the	
11:10-11:30	solar/lunar eclipse by explaining	
11.10-11.30	through their model.	
Materials List (pla	ease be detailed; include exact quantities)	Modification for Inclement
Art materials for	·	Weather
1111 materials 101	cach student	TTCGGICI

- 4 sheets of white paper
- roll of tape
- roll of tin foil
- tempera paint
  - white, black, red, orange, yellow
- paint brush, 1 thicker width and 1 thinner
- paper plate for palette
- plastic cup for water
- string & 1 pair scissors for the room

#### **Science Material:**

Transparent item:Plastic wrap , plastic lead, laminating material (2 sets)

Translucent: Bubble wrap, Tissue paper, waxed paper,

white paper (2sets)

Opaque material: Tin foil, cardboard, Styrofoam, Felt (2)

sets, not for each students)

Tennis ball (each student)
Ping Pong Ball (each student)

Torch light or Flashlight (each student)

# Week 3: Exploring Color in Nature

Lesson Title: The colors of the sky

Grade: 5/6

Week: 3

Instructors: Conghui & Kodey

Topic: Color in Nature

**Lesson Objectives:** Students will learn why the sky changes in color in the context of sunrise, sunsets, and weather changes. And how artists use these knowledge to find right places to take photos in right time.

**Art/Science Inclusion** (brief description of how your lesson presents an integration of art and science concepts.) Students will be asked to consider what their favorite weather pattern is and how it looks in the sky. They will consider sunrise, sunset, night time, storms, or cloudy days. This will lead into the science as they will then be asked to consider why the colors in the sky change and will be explained this. Students will then be introduced to the concept of atmosphere and the particles in the atmosphere.

**Art Open-Ended Question** (what problem, task, or exploration will students be dealing with (should have multiple ways to complete it))

What is your favorite kind of sky? What colors does it have? What weather is happening?

# Art Education Standard (should include at least one, see

https://www.arteducators.org/learn-tools/national-visual-arts-standards)

Creating- Organize and develop artistic ideas and work

People create and interact with objects, places, and design that define, shape, enhance, and empower their lives. Identify, describe, and visually document places and/or objects of personal significance.

# Science Education Standard (should include at least one, see

https://www.doe.in.gov/standards/science-computer-science, NGSS also great)

Develop a model using an example to describe the influence of the atmosphere on landforms and ecosystems through weather and climate.

Timeline	Lesson Description	Modification for Inclement
10:00- 10:10	Students will be asked to consider what their favorite weather pattern is and how it looks in the sky. They will consider sunrise, sunset, night time, storms, or cloudy days.	Weather
10:10- 10:40	<ol> <li>Students will be given watercolor and watercolor paper</li> <li>Students will recreate their favorite type of sky with watercolors</li> <li>Students will be asked why they think the colors in their sky are the way they are. (Consider the season weather and time of day)</li> </ol>	
10:40-10:50	Group discussion of why the color of sky changes.  1. Based on students' watercolors, list all of the different colors students have come up with.  2. Conclude the changes of the color of sky: Red sunrise and sunset. Blue sky, and ask why the color of sky changes at different times of a day.  3. Finish this part with the question: Is the position of the sun affecting the color of the sky?	
10:50-11:20	Sky color experiment:  1. Briefly introduce that we will do an experiment to simulate the process of sunlight going through the atmosphere.	

11:10-11:30	<ol> <li>Lead students to think about the color of sunlight and what makes up the atmosphere. Then introduce the materials.</li> <li>Set up the equipment. Turn off the light in the classroom and let students observe in a turn and describe how the phenomenon relates to their watercolors.</li> <li>Discuss what happened in the sky when extreme weather happened.</li> <li>Introduce some artists (Jim Reed) that are interested in taking pictures of colorful skies or extreme weathers and show some of their works.</li> <li>Discuss how they find right places and times</li> </ol>	
	based on the science behind weather and climate to take these photos.	
Materials List (ple	ease be detailed; include exact quantities)	Modification for Inclement
Art Materials for 6	each student:	Weather
- watercolor set		
<ul> <li>large thick brush and small detail brush</li> </ul>		
- cups for water		
- watercolor paper		
	ided glass container or cup	
<ul><li>Milk (no less than the volume of the container)</li><li>Flash light</li></ul>		

# Week 4: Building with Mother Nature

Lesson Title: Buil	lding in nature	Grade: 5/6	
Week: 4	Topic: Building in Natu	re	
Lesson Objective	s: Students will identify local birds	and various types of their nests. They will learn	
the purpose of bird nests and discuss how, where and when to build nests. Students will apply this			
knowledge to create their own nest using natural materials.			
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**Art/Science Inclusion** (brief description of how your lesson presents an integration of art and science concepts.) Students will learn how birds create and build with natural materials and will then be able to apply and understand this knowledge by creating their own bird's nest.

**Art Open-Ended Question** (what problem, task, or exploration will students be dealing with (should have multiple ways to complete it)

Students will be exploring natural materials and ways they can create art from and with nature. Are birds architects?

**Art Education Standard** (should include at least one, see

https://www.arteducators.org/learn-tools/national-visual-arts-standards)

**Creating**- Anchor Standard 1: Generate and conceptualize artistic ideas and work Combine concepts collaboratively to generate innovative ideas for creating art.

### Science Education Standard (should include at least one, see

https://www.doe.in.gov/standards/science-computer-science, NGSS also great)

Obtain and combine information about ways individual communities use science ideas to protect the earth resources and environments.

A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.

Timeline	Lesson Description	Modification for Inclement Weather
10:00-10:10	<ul> <li>Students will be asked to consider what kind of birds they know or have seen in Indiana.</li> <li>Students will describe when and where do they see them.</li> <li>Follow up questions could include how often do they see this kind of bird.</li> <li>Students will be led to discuss other characteristics of the birds like color and size.</li> </ul>	Weather
10:10-10:25	The discussion will be ended by a PPT of a list of common backyard birds in Indiana.	
10:25-10:40	After going through all the birds, students will be asked to recall if they have seen some of the birds' nests, and discuss:  • What is the purpose of bird nests?  • Where do birds build their nests, and why?  • What is the structure of bird nests?  • What materials do birds use to build nests?	
10:40-10:50		

10:50-11:00 11:00-11:30	Students will have a brief introduction to land artist and consider how they are similar to birds building in nature  The class will go outside and collect natural materials  After materials are collected students will work collaboratively to create their own bird's nest.	Students will be presented with small teacher made sample of a bird's nest using natural materials (I will bring these in) The class will be asked to think of different natural materials that could be used to make a nest. Students will create their own nest by drawing this on paper with colored pencils
Materials List (please be detailed; include exact quantities) Art materials - students will collect materials from outside		Modification for Inclement Weather art materials for each student - colored pencils - white drawing paper