

BIOLUMINESCENCE IN SEA CREATURES

A UNIT FOR 5th grade

UNIT PLAN

BIOLUMINESCENCE IN SEA CREATURES

Subject(s) Drawing, Biology, Installation

Grade 5th Grade

Number of Lessons 5

Time Allotment 50 mins

Central focus of the Unit/Big Ideas

The central focus of the unit is to integrate bio science into art lessons and expand students' understanding in the themes of artmaking. Students will investigate how multiple disciplines can be incorporated into art making and how the integration brings a spark of new ideas. Throughout the unit, students will balance experimentation and freedom with safety and responsibility while developing and creating art work.

Assessments

- **Pre-Assessment:** Inquiry based questions on students' prior knowledge in bioluminescence and sea creatures
- **Formative assessment:** Students will be observed throughout class discussion, Q&As, check-ins for progress and understanding, and working period.
- **Summative assessment:**
 Final artwork: how the work reflects the student's understanding of lesson objectives
 Class participation: student's respectful behavior towards the art materials, workstations, peers' artworks, time for demonstrations and group discussions

Student Support and Differentiation

Whole Class:

- Videos for visual and auditory aid
- Well designed slideshow with a clear lesson objectives and expectations
- Step by step demonstration on crosshatch shading technique
- Extra option to research or draw more than one creature

Groups of students with similar needs:

- Modified working time: both students who are advanced and with learning issues will be able to take their work home and spend extra time to practice and complete.
- Group critiq: students will work in groups and give each other notes and suggestions
- Addressing and discussing common errors as a class and groups
- Key vocabulary written down on the board

Individual students:

- The teacher will walk around and do one on one demos if necessary.
- An extra station will be available for the students who want to work together.

Students with IEP's or 504 plans:

- The students will be asked individually what they feel comfortable doing in order to complete the lesson

- Extra credit: the students will be able to earn an extra credit for presenting what and how they have researched

Lesson#1 Bioluminescence		
<p>Unit Title: Bioluminescence in Sea Creatures Lesson Plan #: Lesson 1 Grade: 5th Grade</p>	<p>Length of each period: 50 mins Number of days: 1</p>	<p>Essential Questions:</p> <ul style="list-style-type: none"> - How science and art can be integrated? - How do artists use research to enhance their art making? - What conditions, attitudes, and behaviors support creative risk taking and innovative thinking?
<p>Lesson Objectives: Students will be able to...</p> <ul style="list-style-type: none"> - Explain how science and art can be integrated to create innovative ideas - Research about different bioluminescent life forms and how the glow works - Describe their research process and how it is an essential step in art making - Summarize information and visually take notes 		
Materials –Artist/ Visual Text /Technology/ Resources:		
Laptops, letter size papers, pencils, color pencils, erasers		
Visual References/Art Historical References:		
<div style="display: flex; align-items: flex-start;">  <div style="margin-left: 20px;"> <p>Bioluminescence on Camera - National Geographic https://www.youtube.com/watch?v=9HXXQBz6Vv0</p> </div> </div>		



The brilliance of bioluminescence

- Leslie Kenna (<https://www.youtube.com/watch?v=oKjFVBVGad0>)

Academic Vocabulary:

Research, Investigate, Describe
Bioluminescence, Organism, Illumination, Light, Glow, Transparent

NYS Visual Arts Standards

Creating	Presenting	Responding	Connecting
VA:Cr1.2.5		VA:Re8.1.5 VA:Re9.1.5	VA:Cn10.1.4 VA:Cn11.1.5

Task Analysis/Procedure

A. Motivation/Spark/Launch

Watch: Bioluminescence on Camera - National Geographic

<https://www.youtube.com/watch?v=9HXXQBz6Vv0>

Inquiry based questions on students' prior knowledge in sea creatures and bio science

Key Questions

“Why do you think the sea creatures have bioluminescence?”

“Can you think of some things in nature that create this effect?”

B. Presentation of Lesson Objectives

Ted Talk educational video on “what is bioluminescence?”

<https://www.youtube.com/watch?v=oKjFVBVGad0>

Present the concept of bioluminescence and research strategies

Hand out copies of teacher's example on a deep sea creature research note

C. Modeling/Demonstration

- Assignment: Students will research a deep sea creature that has and uses bioluminescence.
- Demonstration on researching: vocabulary to use, recommended websites, how to get a high quality image, how to summarize information, visual note taking

D. Closure

“Don't forget to bring in what you have researched today next week. If you want, you can spend more time on researching and change the organism you chose today.”

Lesson#2 Light and Shadow

Unit Title: Bioluminescence in Sea Creatures
Lesson Plan #: Lesson 2
Grade: 5th Grade

Length of each period: 50 mins
Number of days: 2

Essential Questions:

- How does creating art generate meanings in people's daily lives?
- How do artists use observation to enhance their art making?

Lesson Objectives:

Students will be able to...

- Analyze various light artists and their use of light and shadow in their works
- Describe how using light and shadow can create depth and volume in drawing
- Understand how they perceive luminescence and how to visually show their perceptions

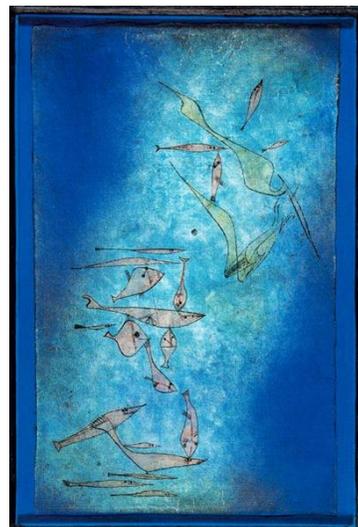
Materials –Artist/ Visual Text /Technology/ Resources:

Letter size paper, pencils, erasers, color pencils

Visual References/Art Historical References:



Fish Magic (1925) - Paul Klee



Fish Image (1925) - Paul Klee



Street Light (1909) - Giacomo Balla



Self Portrait (1921) - Käthe Kollwitz

Academic Vocabulary:

Observe, Investigate, Apply, Discuss

Contrast, Highlight and Shadow, Crosshatch, Negative Space, Depth

NYS Visual Arts Standards

Creating	Presenting	Responding	Connecting
VA:Cr1.2.5 VA:Cr2.1.5		VA:Re8.1.5 VA:Re9.1.5	VA:Cn11.1.5 VA:Cn11.2.3

Task Analysis/Procedure

Day1

A. Motivation/Spark/Launch

A group brainstorm session on things that illuminates or create light and shadow

Key Questions

“How can we draw these sea creatures and capture the luminescence?”

“What does lighting do in an artwork?”

“What do you think would change about a painting if we give it lighting and a dark black background?”

B. Presentation of Lesson Objectives

- Observation: Uses of light and shadow in paintings, patterns of lines and crosshatching
“How do these artwork remind you of the bioluminescence we studied last week?”
- Making a connection between the use of contrast in paintings and how in nature many animals also use luminosity to draw other’s eyes for their own needs

C. Modeling/Demonstration

- Visual Thinking Strategies on the artists known for their use of light
- Demonstration on breaking down the steps of shading by controlling the pressure of hands
- Draw four squares, number them 1-4, and use multiple lines to create 4 different shades

D. Closure

Clean-ups and a reminder on the research note on sea creature for next class

Day2 (Working Day)**A. Motivation/Spark/Launch**

Checking for research note from lesson #1

Review or Transition from Previous Period

Quick share on the sea creatures students researched about

Key Questions

“Why does this creature use/has luminosity?” “What did you like about this sea creature?”

“Where does this creature have its light source?” “What will you focus on when drawing this creature?”

B. Presentation of Lesson Objectives

- Teacher’s sample works
- Students will develop their sea creature drawing by using shading technique and contrast

C. Modeling/Demonstration

Quick 2nd demonstrations on drawing with shading and crosshatching techniques on whiteboard

D. Closure

Clean-ups and an announcement about the next lesson

Lesson#3 Oil Pastel Scratching

Unit Title: Bioluminescence in Sea Creatures
Lesson Plan #: Lesson 3
Grade: 5th Grade

Length of each period: 50 mins
Number of days: 2

Essential Questions:

- How does artmaking challenge our perceptions and natural ways of thinking?
- How does collaboration expand the creative process?
- How do objects and places shape lives and communities?

Lesson Objectives:

Students will be able to...

- Utilize scratching techniques to draw a bioluminescence creature
- Experiment how scratching technique creates various textures and patterns
- Understand how to create highlight and shadow in scratch art
- Collaborate with peers efficiently to present the final artwork

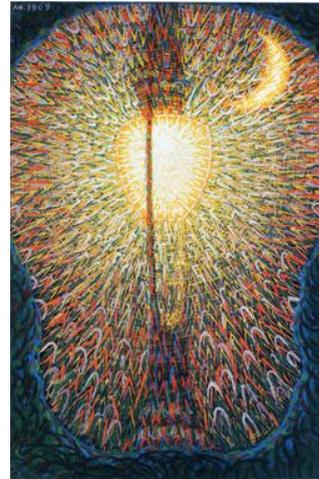
Materials –Artist/ Visual Text /Technology/ Resources:

Oil pastels, scratching tools, drawing paper, set spray, Containers (to hold pastels and tools), glow sticks, wires

Visual References/Art Historical References:



A Saber-toothed Viper Fish in Pursuit of Ocean Sunfish (1934) - Else Bostelmann



Street Light (1909) - Giacomo Balla



Photo Respiration City Scape #272 Koto-ku
Aoimi (1996) - Tokihiro Sato



HEDERA (2018) - Grimanesa Amorós

Academic Vocabulary:

Experiment, Collaborate
Scratching, Texture, Pattern, Contrast, Highlight and Shadow, Installation

NYS Visual Arts Standards

Creating	Presenting	Responding	Connecting
VA:Cr1.2.5 VA:Cr2.1.5	VA:Pr5.1.5 VA:Pr6.1.2	VA:Re8.1.5 VA:Re9.1.5	VA:Cn11.1.5 VA:Cn11.2.3

Task Analysis/Procedure

Day1

A. Motivation/Spark/Launch

A warm up hand out on analyzing and simplifying the shapes of the sea organism the students researched about.

Review or Transition from Previous Period

“Can someone recall what the contrast is?”

“Can someone demonstrate how to create shadow in drawing?”

B. Presentation of Lesson Objectives

Asking inquiry based questions on the artists known for their use of light

Key Questions

“What is scratching in art?” What kind of tools can we use for scratching?”

“How will we create the glow effect?”

“How will you depict the luminosity with this method?”

C. Modeling/Demonstration

- Demonstration on using pastels, scratching techniques(crosshatch, squiggles, etc), and reminder on light and dark and how bioluminescence research ties into lesson project

“In scratching, you need to ‘draw’ to create highlights and do not touch the area you want to keep it dark.”

- “First, you can either randomly or selectively color the surface of your paper with any color but black. Only when a full color layer is on paper, you will completely cover the colors with a thick black layer. From there, you can start scraping to draw out the sea creature activating its bioluminescent.”

D. Closure

Cleaning up: using cleaning spray to wipe up the tables and oil pastels back into the container

Day2 (Class Presentation & Group Installation Project)

A. Motivation/Spark/Launch

A creative discussion on how we would use luminosity in our lives if we had the ability

Key Questions

“What is the biggest take away from a bioluminescence lesson and oil pastel scratching?”

Review or Transition from Previous Period

- Class share on the final pieces: talking about the organisms they researched about with some fun facts, how it uses its luminosity, and their scratching process and some difficulties they had
- “I would like to see many of you all using academic languages and art vocabulary in your presentation.”

B. Presentation of Lesson Objectives

A wrap up activity for the unit: creating a group installation by using glow sticks.

A reminder to respect the materials, peers, and spaces we have in the classroom.”

C. Modeling/Demonstration

Demonstration on how glow sticks work, how to connect them, how to safely install the glow sticks in the classroom.

D. Closure

Taking pictures & breaking down the installation collaboratively as a class.

“Can I have a volunteer to collect all the used glow sticks and wires?”

Teacher Samples (Lesson #3)
Oil pastel scratchings & Glow stick installations



Group Installation Activity



Rubric

	Advanced 4	Developing 3-2	Inadequate 1
Understanding of the lesson objectives	Final work reflects a student's understanding in scratching technique, and was able to experiment further than the tools provided during the lessons.	Students partially used the tools provided in the lessons, and did not show the understanding of the lesson objectives.	Students were unable to show any understanding of the lesson objectives.
Class participation & Efforts	Students were actively attentive, participated during class discussion, group critique, and demonstration, final artwork shows evidence of efforts and shows details.	Students were attentive throughout the unit, final artwork was partially completed.	Students did not participate in class and did not complete the work on time.
Evidence of content research	Students showed evidence in their research on a deep sea animal with bioluminescence, explained further on how the glow works.	The research note is partially completed, showed a little evidence of research.	Student did not complete the research note.
Final presentation	Students presented the project with a clear voice, talked about their process by using academic languages, actively participated in the group installation.	Student presented the project, had trouble explaining their process, was not collaborative during the group installation.	Student did not present the project, did not participate to the group installation.