Improving Teacher Quality
Arts and Science Integration

VISUAL ART & PHYSICAL SCIENCE

GRADE 4
WINTER 2012

ITQ ARTS AND SCIENCE INTEGRATION
GRADE 4
VISUAL ART AND PHYSICAL SCIENCE

What I See, What I Think
Visual Language, Observation and Inference
Lesson 1

CONTENT STANDARDS

Visual Art

4.1 Describe how using the language of visual art helps to clarify personal responses to works of art.

Physical Science

I & E 6 Scientific progress is made by asking meaningful question and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations.

I & E 6.a Differentiate observation from inference (interpretation) and know scientists' explanations come from what they observe and partly from how they interpret their observations.

ESSENTIAL QUESTIONS *(Questions students might ask about the topic)*

- What are the elements of art?
- How can I use what I know about the elements of art to describe works of art?
- What is the difference between observation, inference and interpretation?

OBJECTIVES & STUDENT OUTCOMES *(Students will be able to…)*

- describe the line, shape/form, color, texture, space and value in a work of art.
- interpret the meaning of a work of art using the vocabulary of art.
- compare and contrast observation skills in visual art and science.
- compare and contrast inference and interpretation.
- demonstrate an understanding of the word evidence.

ASSESSMENT *(Various strategies to evaluate effectiveness of instruction and student learning)*

- **Feedback for Teacher**
  - Informal assessment of student skills and understanding through teacher observation
- **Feedback for Student**
  - Informal verbal feedback from the teacher

WORDS TO KNOW

Visual Art Vocabulary

- **credit lines:** information accompanying a work of art that typically includes title, artist name, media used, year completed, present location of the original
- **elements of art:** line, shape/form, color, texture, space and value
- **evidence:** fact or information that is considered true or valid
- **illusion of space:** a deceptive appearance or impression of the dimensions of height, depth, and width, usually associated with foreground, middle ground and background
- **observation:** the action or process of noticing facts, especially significant details in order to gain information

Physical Science Vocabulary

- **inference:** a conclusion reached on the basis of evidence and reasoning
- **interpretation:** the action of explaining the meaning of something
- **observation:** the action or process of noticing facts, especially significant details in order to gain information using the 5 senses and/or measurement

MATERIALS

- Reproduction of *The Return* by Rene Magritte
- Chart paper, white board or paper under a document camera
- Appropriate marker or pen
- Science notebooks (one per student)

RESOURCES

- *FOSS Kit, Grade 4*, "Physical Science: Magnetism and Electricity," Investigation 4: Current Attractions, Part 1, 2, and 3

- *Portfolios, Grade Four,* by Robyn Montana Turner, Barrett Kendall Publishing
  - Elements of art: page 1
  - Line and shape: pages 6 & 7
  - Space: pages 8, 10 thru13
  - Color and value: pages 24 thru 27
  - Expression: Unit 4: Art As Expression, pages 67 thru 82

- Instructional Media Center (IMC)
  - 2441 Cardinal Lane, San Diego, CA 92123

- Internet Web sites:
  - *The Return*, by Rene Magritte http://www.prints.co.nz/page/fine-art/PROD/1375
  - *The Return*, by Rene Magritte http://www.posterrevolution.com/gallery/item.cfm?ID=567889

PREPARATION *(To be completed prior to the lesson)*

- Review the Elements of Art (line, shape/form, color, texture, space and value). Use the adopted text or Power Point at: http://art.pppst.com/elements.html

WARM UP *(Engage students, access prior learning, review, hook or activity to focus the student for learning)*

(10 minutes)

- Display the reproduction of *The Return* by Rene Magritte in an area easily seen by all students, so that no title or credit lines appear.
- Instruct students to examine the work of art visually and silently for 1 minute.
- *Ask to make observations:*
  - *Let talk about* ***line****. What lines do you see?* [horizontal, vertical, diagonal, straight, curved]
  - *Lets talk about* ***shapes****. What shapes do you see?* [geometric, natural, free]
  - *Lets talk about* ***colors****. What colors do you see?* [tints, shades, neutrals]
  - *What* ***textures*** *do you see?* [smooth, rough, hard, soft, sharp]
  - *How did the artist create* ***illusion of space*** *in this work of art?* [foreground, background, middle ground]
  - *Where did the artist use* ***values*** *or lights and darks of the same color? Why?* [light/medium blue; tints and shades of brown in the nest, light/dark green]

MODELING *(Presentation of new material, demonstration of the process, direct instruction)*

(15 minutes)

- *Ask:*
  - *Now that you have examined/described/observed what we see in the painting, what do you think the artist was trying to tell us? What is the meaning of the work? Why did the artist create this work of art?*
- On chart paper, a white board or under a document camera, create a two-column list.
- On the top of the left column write the word "**Observations**".
- On the top of the right column write the word " **Inferences**".
- Discuss the use of these two words in science experimentation referring to *FOSS Kit Grade 4*, "Physical Science: Magnetism and Electricity," Investigation 4: Current Attractions, Parts 1, 2

and 3.

- Say:
  - *Observations are things we notice when we look carefully at something.*
  - *Let's add the word **evidence** next to the word **observation** because **evidence** are the things we consider true or real. **Observations** in science and in art can be considered **evidence**.*
  - ***Inferences** are conclusions that we reach based on evidence and reasoning.*
- Ask student to remember what facts they observed about *The Return* by Rene Magritte and list them on the chart, white board or under the document camera.

GUIDED PRACTICE *(Application of knowledge, problem solving, corrective feedback)*
(15 minutes)

- Divide the class into groups of three students.
- Distribute one sheet of paper and a pen or marker to each group of students.
- Instruct each group of students to choose a scribe or secretary from the group to record their ideas.
- Explain that when we analyze works of art we use the term **interpretation**. Define **interpretation** as *the action of explaining the meaning of something (data, work of art, presentation, literature, etc.).*
- Direct each group of students to list at least 4 **inferences** or **interpretations** they develop from looking at *The Return* by Rene Magritte.
- Add the word **interpretations** to the right column of the chart, white board or list under the document camera.
- When the students have completed their task, invite the groups to share their ideas. Add these to the classroom list under **interpretations** and **inferences**.

DEBRIEF AND EVALUATE *(Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet expected outcomes?)*
(10 minutes)

- *Ask: What other information might we need to better understand this work of art?* [title, historic context, artist]
- Introduce the term **credit lines** and reveal the artist's name, title of the work, media used, year completed, and present location.
- *Ask: How does this work of art make you feel? Why?* [accept various responses]
- Prompt for reflection writing in Science notebook: *Why is **observation** important in science? In art?*

EXTENSION *(Expectations created by the teacher that encourages students to participate in further research, make connections and apply understanding and skills previously learned to personal experiences.)*

- Try this same lesson using **representational**, **abstract** or **non-representational/non-objective** works of art.
- Continue to categorize **observations** and **inferences** throughout the curriculum and in daily classroom experiences. (e.g., fact vs. hearsay; what a classmate actually said vs. what was heard, what the parent meant and what the student wanted to hear)

Group Names:

1._____

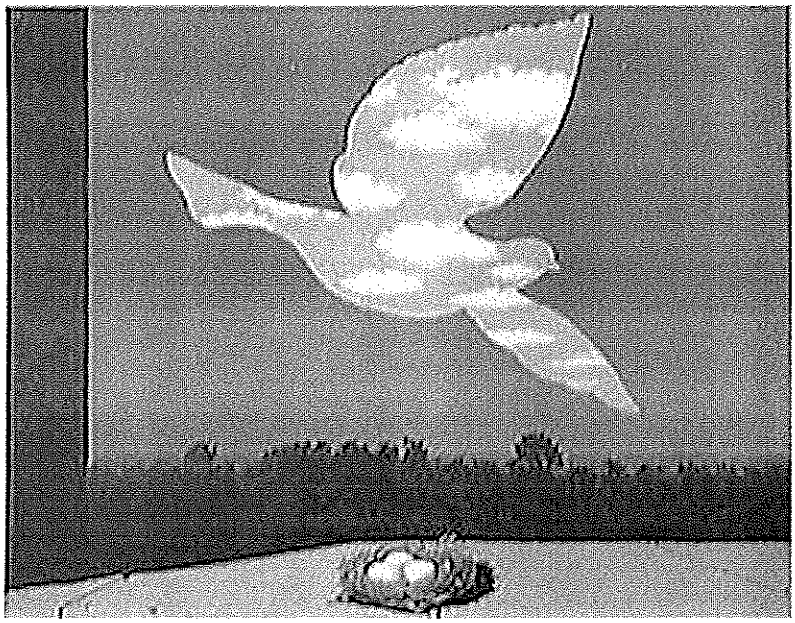
2._____

3._____

4._____

Observation/Inference
Group Worksheet

OBSERVATION #1	INFERENCE #1
OBSERVATION #2	INFERENCE #2
OBSERVATION #3	INFERENCE #3
OBSERVATION #4	INFERENCE #4

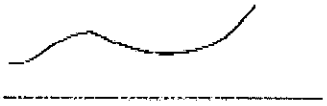


The Return by Rene Magritte

Elements of Visual Art

#1. LINE: a point moving through space

Two types of line: **CURVED** (suggests movement)
STRAIGHT (suggests rigidity)

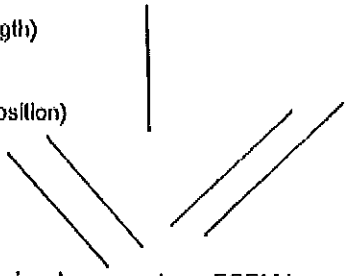


Three general DIRECTIONS a line can travel:

HORIZONTAL (suggests stability and rest)

VERTICAL (suggests strength)

DIAGONAL (suggests opposition)



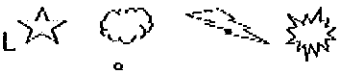
Line creates edges and suggests space

#2. SHAPE/FORM: SHAPE is a 2-dimansional area or plane; FORM is a 3-dimensional volume or space

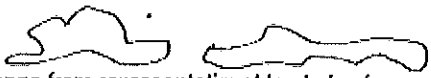
Three types of shapes/forms:

GEOMETRIC

NATURAL



FREE

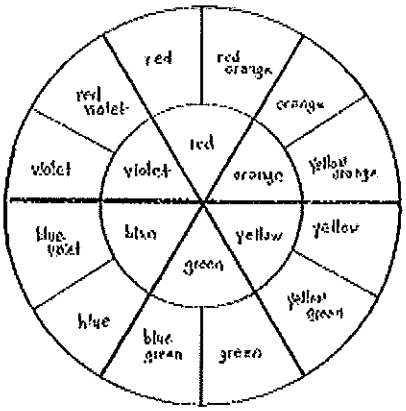


Shapes/forms can range from representational to abstract

#3. COLOR: the visual sensation dependent on the reflection or absorption of light hitting a given surface

Hue: refers to the name of a given color (red, orange, yellow, etc.)

Color Wheel



PRIMARY Colors: red, blue and yellow

SECONDARY Colors: color created by mixing two primary colors together (orange, green and violet or purple)

TERTIARY or Intermediate Colors: colors produced by adding a primary to the neighboring secondary or two part of one primary and one part of another. (red-orange, blue-green, etc.)

NEUTRAL Colors: black, white, gray, and variations of brown, earth colors

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WARM Colors: Colors suggesting warmth: red, orange and yellow
COOL Colors: Colors suggesting coolness: blue, green and purple

COMPLEMENTARY Colors: Colors opposite each other on the color wheel: Red/green; blue/orange; yellow/violet

TINTS: Colors create by adding white to a color or hue
SHADES: Colors created by adding black to a color or hue

#4. **TEXTURE** : surface quality of materials

ACTUAL: Tactile texture

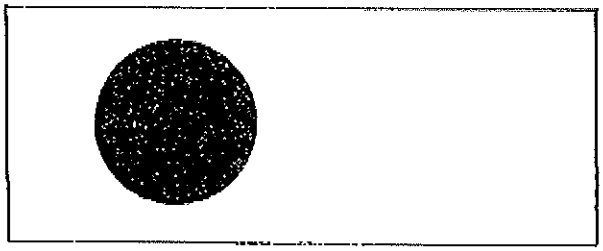
IMPLIED: Visual texture

Texture can be unique to the medium (clay, paint, pencil, etc.)

Texture can be suggested through shading, pattern and relationship

#5. **SPACE:** the emptiness or area between, around, above, below or contained within objects.

POSTITIVE Space: The area occupied by objects



NEGATIVE Space: The area unoccupied by objects

#6. **VALUE:** the lightness or darkness of a hue or neutral color

A VALUE SCALE shows the ranges of values from light to dark or black to white.

Value Scale

ITQ ARTS AND SCIENCE INTEGRATION
GRADE 4
VISUAL ART AND PHYSICAL SCIENCE

Plugged into Prints
Circuit Design and Creating a Print Plate
Lesson 2

CONTENT STANDARDS

Visual Art

5.3 Construct diagrams, maps, graphs, timelines, and illustrations to communicate ideas or tell a story about a historical event.

Physical Science

PS1.a how to design and build simple series and parallel circuits by using components such as wires, batteries and bulbs.

ESSENTIAL QUESTIONS *(Questions students might ask about the topic)*

- How can I use symbols to create a design?
- How do I transfer or copy a drawn design onto another surface?
- What is a print plate and how do I make one?
- How did making a print help me to understand how to draw circuits?

OBJECTIVES & STUDENT OUTCOMES *(Student will be able to…..)*

- draw a design demonstrating a series or parallel circuit using symbols.
- transfer an original design onto a print plate.
- create a print plate.

ASSESSMENT *(Various strategies to evaluate effectiveness of instruction and student learning)*

- **Feedback for Teacher**
  - Informal assessment of student skill by observation
  - Formal assessment: Completed print plate reflects assignment criteria
- **Feedback for Student**
  - Informal verbal feedback from teacher
  - Directions and suggestions from conferences throughout the work process

WORDS TO KNOW

Visual Art Vocabulary

- **print plate:** A piece of flat material with a design on the surface used in printmaking.
- **symbols:** A thing that represents or stands for something else.

Physical Science Vocabulary

- **circuit:** A pathway for the flow of electricity.
- **parallel circuit:** A circuit that splits into two or more pathways before coming together at the battery.
- **positive terminal:** The part of a battery that protrudes from one end and is associated with positive charges
- **schematic diagram:** A way to represent a circuit on a piece of paper.
- **series circuit:** A circuit with only one pathway for current flow.

MATERIALS

- Chart or poster with circuit symbols from *FOSS Kit Grade 4*, "Physical Science: Magnetism and Electricity," Investigation 2: Making Connections
- 8 1/2" x 11" sheet of copy paper, one per student
- 4.5" x 6" sheet of styrofoam, one per student

- Pencil with eraser, one per student
- A label, one per student
- Science notebooks (one per student)

RESOURCES

- *FOSS Kit Grade 4*, Physical Science: Magnetism and Electricity, Investigation 2 and 3
- *Portfolios Grade Four*, by Robyn Montana Turner, Barrett Kendall Publishing
  - Printmaking: pages 34, 35, 40, 135

- Websites:
  - Foam print plates: http://www.kinderart.com/printmaking/styro.shtml
  - http://www.suite101.com/content/block-printing-with-styrofoam-a42026
  - http://www.make-stuff.com/projects/styro_printing.html
  - How Electric Circuits work: http://science.howstuffworks.com/electricity3.htm
  - http://www.teachersdomain.org/resource/phy03.sci.phys.mfe.lp_electric/

- Instructional Media Center (IMC)
  - 2441 Cardinal Lane, San Diego, CA 92123

PREPARATION *(To be completed prior to the lesson)*

- *FOSS Kit Grade 4*, Physical Science: Magnetism and Electricity, Investigation 2

WARM UP *(Engage students, access prior learning, review, hook or activity to focus the student for learning)*

(10 minutes)

- Display the five **symbols** from the *FOSS Kit, Grade 4, Physical Science:* "Magnetism and Electricity" page 99 on a large poster, or on separate smaller posters similar to large flashcards, or on a white board or under a document camera.
- Look at each individual **symbol** and ask students to identify its meaning.
- When the class has revealed the correct meaning, write the name next to the **symbol**.
- Place the two drawings of a **circuit** from *FOSS Kit, Grade 4*, "Physical Science: Magnetism and Electricity" page 99 on a large poster, white board or under a document camera
- Compare and contrast the two drawings.
- *Ask:*
  - *What is the same about these two drawings?* [use of line, **symbols**, illustrates a **circuit**]
  - *What is different about these drawings?* [illustration vs. **schematic symbols**; curved vs. angular]
  - *Why do you think these **symbols** have been developed?* [effective communication regardless of language]
- Explain to students that they are going to create their own **schematic** drawing of a **series circuit** and a **schematic diagram** of a **parallel circuit** using these **symbols**.

MODELING *(Presentation of new material, demonstration of the process, direct instruction)*

(20 minutes)

- Distribute 8.5" x 11" copy paper and a pencil with an eraser to each student.
- Demonstrate how and instruct students to fold the copy paper in half, short sides together.
- Demonstrate how and instruct students to draw a line on the fold and turn the paper to a landscape orientation.
- Explain that the students are going to design a **series circuit** on the left hand side of the paper.
- Place the words "**series circuit**" in an area easily seen by all students.
- Demonstrate how and instruct students to draw the **symbol** of a cell about 1 inch in size somewhere on the left side of the paper.
- Encourage students to be creative and place their cell **symbol** in a place different than the teacher's example.
- Demonstrate how and instruct students to draw two light bulb symbols somewhere on the left side of the paper.

- Demonstrate how and instruct students to complete the schematic by drawing the wire connections to create a **series circuit**.
- Demonstrate how and instruct students to draw a battery complete with a **positive terminal** somewhere on the right side of the paper.
- Place the words "**positive terminal**" in an area easily seen by all students.
- Demonstrate how and instruct students to draw two light bulb **symbols** somewhere on the right side of the paper.
  - *Ask: How many different ways could we draw lines to represent wire that would illustrate a **parallel circuit**?* [see suggestions in *FOSS Kit Grade Four*: "Physical Science: Magnetism and Electricity" Teachers Guide, page 141 and 142]
- Place the words "**parallel circuit**" in an area easily seen by all students.
- Have individual students offer ideas and ask the class to trace those ideas on their paper using their fingers, not a pencil.
- When several ideas have been suggested, direct students to choose their favorite **parallel circuit** design and draw it between the battery **symbol** and the light bulb **symbols**.
- Do a quick check of student work individually insuring correct illustration of **parallel circuit** design.

GUIDED PRACTICE *(Application of knowledge, problem solving, corrective feedback)*
(15 minutes)

- Distribute a 5" x 8" styrofoam sheet to each student.
- Choose either the **series circuit** or **parallel circuit schematic** as the favorite design.
- Demonstrate how and instruct students to repeat the favorite drawing on the Styrofoam sheet using pencil.
- Explain that the lines should press into the surface of the foam, but not so deeply to cause a hole.
- Distribute one label to each student.
- Instruct students to write their name on the label, tear off the attached paper and stick the label to the un-incised side of the **print plate**.

DEBRIEF AND EVALUATE *(Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet expected outcomes?)*
(5 minutes)

- *Ask:*
  - *Why would is be useful to create schematic drawings of circuits?*
  - *Who would use them? How?*
  - *What do you think we might use the styrofoam sheet for when we come together next week?*
  - *Our styrofoam sheets are now called a "**print plates**." When we come together for our next lesson, how do you think we might use them to make something?* [for printing repeated designs]
- Collect **print plates** and store for use in the next art/science lesson.
- Add **schematic** drawings to the student's science notebook or sketchbook/journal.
- Writing prompt for reflection writing in the science notebook: "Where do children use schematics or illustrations? Why?"

EXTENSION *(Expectations created by the teacher that encourages students to participate in further research, make connections and apply understanding and skills previously learned to personal experiences.)*

- Check out functional visual art made with electrical wiring and used as lighting at the Museum of Contemporary Art Downtown San Diego. http://www.mcasd.org/collection/
- Scroll to *Light and Space* by Robert Irwin
- Check out Robert de Salvo's web site: http://www.romandesalvo.com/main.html Turn off pop up blocker and look at the permanent installation he created for the stairwells in the Museum of Contemporary Art San Diego downtown.
- Discuss function of circuits and the creation of visual art. How do they interact in these works of art?

ITQ ARTS AND SCIENCE INTEGRATION
GRADE 4
VISUAL ART AND PHYSICAL SCIENCE

Artists are Scientists too!
Printmaking and Multiple Trials
Lesson 3

CONTENT STANDARDS

Visual Art

2.8 Use complementary colors in an original composition to show contrast and emphasis.

Physical Science

I&E 6 Scientific progress is made by asking meaningful questions and conducting careful investigations.

I&E 6d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.

I&E 6f. Follow a set of written instructions for a scientific investigation.

ESSENTIAL QUESTIONS *(Questions students might ask about the topic)*

- What are complementary colors and how can I use them to create contrast?
- How do scientists test their predictions and draw conclusions?
- How does the printmaking process compare to what a scientist does when doing an experiment?

OBJECTIVES & STUDENT OUTCOMES *Students will be able to…..)*

- demonstrate an understanding of the three basic pairs of complementary colors.
- follow procedural steps to complete three prints.
- observe another student following procedural steps and make notes about the observation.
- explore the similarities between multiple trials and printmaking.

ASSESSMENT *(Various strategies to evaluate effectiveness of instruction and student learning)*

- **Feedback for Teacher**
  - "Multiple Prints Class at a Glance" sheet
  - "Printmaking Observation" form
- **Feedback for Student**
  - "Printmaking Observation" form created by student partner

WORDS TO KNOW

Visual Art Vocabulary

- **brayer:** A small hand roller typically used to spread ink thinly and evenly.
- **color wheel:** A circle with different colored sectors used to show the relationship between colors.
- **complementary colors:** Colors opposite one another on the color wheel (e.g., red/green; blue/orange; violet/yellow).
- **ink:** A colored fluid used for writing, drawing, printing, or duplicating.
- **ink plate:** A flat surface used to distribute ink evenly onto a brayer.
- **multiple trials**: Conducting an experiment again, following the same procedure as the first time.
- **primary colors:** Red, blue and yellow. All other colors on the color wheel can be created from the primary colors.
- **printmaking:** The transfer of an inked image from one surface (from plate or block) to another.
- **print plate:** A piece of flat material with a design on or in the surface used in printmaking.
- **secondary colors**: Colors that are equal mixtures of two primary colors, orange, green and violet or purple.
- **tertiary colors**: An uneven mixture of two primary colors or the combination of one primary and the secondary color next to it on the color wheel (e.g., red-orange, yellow-orange, blue-green). Also known as intermediate colors.

Physical Science Vocabulary

- **multiple trials**: repetitions of an experiment
- **observation**: notice or perceive something significant and in detail via the 5 senses and/or measurement
- **procedure**: an established or specific way of doing something

MATERIALS

- Expanded Color wheel, including tertiary colors
- "Printmaking Procedure" sheet or poster
- "Printmaking Observation" form, one per student
- Foam sheets with parallel or series circuit design inscribed into the surface, one per student
- Red, blue and yellow block printing ink
- Brayers, 15 per class
- Three 6" x 19" sheets of orange, green or violet construction paper, per students
- Sheet newspaper, one per student
- Paper towel, one per student
- Science notebooks (one per student)

RESOURCES

- *FOSS Kit Grade 4*, "Physical Science: Magnetism and Electricity," Investigation 2 and 3
- *Portfolios Grade Four*, by Robyn Montana Turner, Barrett Kendall Publishing
  - Printmaking: pages 34, 35, 40, 135

- *Websites*
  - Foam print plates: http://www.kinderart.com/printmaking/styro.shtml
  - http://www.suite101.com/content/block-printing-with-styrofoam-a42026
  - http://www.make-stuff.com/projects/styro_printing.html

- Instructional Media Center (IMC)
  - 2441 Cardinal Lane, San Diego, CA 92123

PREPARATION *(To be completed prior to the lesson)*

- Display a **color wheel** that includes **primary, secondary** and **tertiary** or **intermediate** colors in an area easily seen by all students.
- You may use the Color Wheel Power Point found at: www.rcs.k12.va.us/csjh/pppintro.htm
- Distribute an uncolored Expanded Color Wheel to each student.
- *Ask:*
- *What are the three **primary colors**?* [red, yellow and blue]
- Demonstrate how and instruct students to color in the three primary colors using colored pencils or crayons. [red, blue, yellow]
- *Ask:*
  - *What are the **secondary colors**?* [green, orange, violet or purple]
  - *How are **secondary colors** made*? [even mixing of two primary colors]
- Demonstrate how and instruct students to color in the three secondary colors using colored pencils or crayons. [green, orange, violet]
- Point out the **intermediate or tertiary colors** on the **color wheel**. Explain that these colors are created by uneven mixing of two **primary colors** or adding one **primary** with the **secondary color** next to it on the **color wheel** [e.g., red-orange; blue-green]
- Notice how the **tertiary or intermediate** colors all begin with the **primary** color first.
- *Ask:*
  - *What color is exactly opposite of red on the **color wheel**?* [green]
- Red and green are considered **complementary colors** because they are opposite each other on the **color wheel**.
- *Ask:*
  - *What other pairs of **complementary colors** can we find?* [many options when using this type of color wheel]
- Explain that the students will be using **complementary colors** to complete the printmaking lesson began

last week.
- Set up a printmaking display area by placing a **brayer, ink plate, print plate,** 3 sheets of 9" x 12" green construction paper, red, yellow and blue block printing **ink**, a paper towel and a sheet of newspaper or newsprint in an area easily seen by all students. This area will be used during the modeling portion of this lesson.
- Visual Art and Physical Science Lesson #2, "Plugged Into Prints: Circuit Design and Creating a Print Plate"

WARM UP *(Engage students, access prior learning, review, hook or activity to focus the student for learning)*
(5 minutes)
- Post the Expanded Color Wheel.
- *Ask:*
  - *What are **complementary** colors?* [color across from each other on the color wheel]
  - *Name the **complementary** color for red.* [green]
  - *Name the **complementary** color for Blue.* [orange]
  - *Name **the complementary** color for yellow.* [violet or purple]
- Explain that students will be using **complementary** colors for this **printmaking** lesson.

MODELING *(Presentation of new material, demonstration of the process, direct instruction)*
(15 minutes)
- Display a "**Printmaking Procedure**" poster in the classroom or put the "**Printmaking Procedure**" sheet under a document camera.
- Allow each student to choose three 6" x 9" construction papers, all the same **secondary** color.
- Instruct students to write their name on the back of each paper using pencil.
- Divide the class into partners, with each partnership having the same color construction papers.
- Distribute one sheet of newspaper and place it on the student work area (desk or table).
- Place the student **print plates** on the newspaper.
- Instruct student partners to choose the block printing ink that is the **complementary** color to the chosen construction papers and take it to their work area.
- Distribute a "**Printmaking Observation**" form to each student.
- Ask partners to choose which student will print first and which student will record.
- Place a "**Printmaking Observation**" form in an area easily seen by all students (under the document camera).
- Choose a student to record class ideas onto this example "**Printmaking Observation**" form while the class uses their "**Printmaking Observation**" form for reference.
- Focus the attention of the students on the **printmaking** display area.
- Instruct students to read Step 1 as a class read aloud.
- Demonstrate Step 1, place 1 level teaspoon on block printing ink onto the ink plate, for the whole class to see.
- *Ask:*
  - *Did we follow Step 1 as it is written?*
- If so, then ask the student recorder to put a check next to the procedure in the "yes" box. If not, place a check in the "no" box.
- Demonstrate Step 2, roll brayer in the ink until the brayer is evenly covered.
- *Ask:*
  - *Did we follow Step 2 as written?*
- If so, then ask the student recorder to put a check next to the procedure in the "yes" box. If not, place a check in the "no" box.
- Continue in this manner going over steps 3 through 7 until the class has seen one print and recording complete.
- *Ask:*
  - *Before we begin to make our prints and record what we see lets think about science for a moment. Who can tell the class what it means when we say "**multiple trials**"?* [exact repetition of an experiment]
  - *Why are **multiple trials** important in science experimentation?* [build strong evidence, data]

- *How does multiple trials compare to printmaking?*

GUIDED PRACTICE *(Application of knowledge, problem solving, corrective feedback)*
(25 minutes)

- Ask students to finish this statement in their science notebooks: "If I make 3 prints using the identical procedure for each print, I think_____."
- Place one teaspoon (1 tsp.) of the appropriate color block printing **ink** on an **ink plate** (foam plate) for each pair of students.
- Instruct students to write their own name on the first line of the "**Printmaking** Observation" form and write their partner's name on the "Printing Partner" line.
- Instruct students to complete the printmaking process with the first Print Partner in about 10 minutes.
- Instruct partners to switch roles and complete the process again.
- Remind students that the printmaking process should be repeated exactly, just like multiple trials in a science experiment.
- Place all printed material in areas where extended drying can take place.
- Direct students through appropriate clean up procedures.

DEBRIEF AND EVALUATE *(Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet expected outcomes?)*
(5 minutes)

- *Ask:*
  - *Why did some prints turn out differently than others?* [procedure was different; pressure on the brayer, evenness of ink on the brayer, how wet or dry the ink was, etc.]
  - *What could we do to make sure procedures were exactly the same for each print?* [measure ink, pressure, time; follow detailed notes each time, print by machine]
  - *How is this printmaking procedure like multiple trials in science?* [systematic, repeated processes, reporting for data collection]
- Teacher wills score each student's prints on the "Multiple Prints Class at a Glance" sheet
- Use results of the "**Printmaking** Observation" form to assess the students' ability to follow written procedure with accuracy.
- Writing prompt for science notebook: How does the printmaking process compare to what a scientist does when doing an experiment?

EXTENSION *(Expectations created by the teacher that encourages students to participate in further research, make connections and apply understanding and skills previously learned to personal experiences.)*

- Allow students to examine their own three prints, their prediction and the checklist created by their partner. Ask students to identify the reasons (variables) their three prints did not turn out exactly alike. Write this reflection in the science notebook.
- Encourage students to notice where repetitive action creates like products or data in their daily lives and give them opportunities to share these observations. [e.g., hamburgers at a fast food restaurant, computer games, sports activities]

Printmaking Procedure

Printing Partner will:

1) Place one level teaspoon of ink onto the ink plate.
2) Roll brayer in the ink until the brayer is evenly covered.
3) Roll ink evenly onto the print plate (foam sheet) using the inked brayer.
4) Place one construction paper on top of the inked surface. Your name should be facing you.
5) Roll a clean, dry brayer over the paper evenly using medium pressure.
6) Gently remove the construction paper from the print plate.
7) In the lower right hand corner of the print write 1/3, meaning first print out of three.
8) Place the wet print away from the work area in a safe place to dry.
9) Repeat steps 1 through 7 two more times, writing 2/3 and 3/3 in the right hand corners.

Recording Partner will:

10) Observe the printing partner as they go through each step of the "Printmaking Procedure."
11) Make a check in the "yes" or "no" area on the "Printmaking Observation" form each time the print partner completes the step.
12) Describe any action that was different on the line next to each step.

Change partners. The new Printer will complete steps 1 through 10 and the new observer will complete steps 11 through 13.

13) Follow clean up procedures as a class.

Observer:_____

Date:_____

Printing Partner:_____

Printmaking Observation
Visual Art/Physical Science
Grade 4, Lesson 3

Procedural Step	Print 1		Print 2		Print 3	
1. Place one level teaspoon of ink onto the ink plate.	YES	NO	YES	NO	YES	NO
2. Roll brayer in the ink until the brayer is evenly covered.	YES	NO	YES	NO	YES	NO
3. Roll block printing ink evenly on to the print plate (foam sheet) using the inked brayer.	YES	NO	YES	NO	YES	NO
4. Place one construction paper on top of the inked surface. Your name should be facing you	YES	NO	YES	NO	YES	NO
5. Roll a clean, dry brayer over the paper evenly using medium pressure	YES	NO	YES	NO	YES	NO
6. Gently remove the construction paper from the print plate	YES	NO	YES	NO	YES	NO
7. In the lower right hand corner of the print write 1/3, meaning *first* print out of three. Write 2/3 on the second and 3/3 on the third print.	YES	NO	YES	NO	YES	NO
8. Place the wet print away from the work area in a safe place to dry.	YES	NO	YES	NO	YES	NO

Printmaking Class at a Glance
Visual Art/Physical Science
Grade 4, Lesson 3

	Student completed 3 prints		Ink and construction papers are complementary color combinations.		Student completed observation form appropriately	
Student Name	Yes	No	Yes	No	Yes	No

Name:_____ Date:_____

Visual Art Grade 4: Expanded Color Wheel Worksheet