

Arts and Science Integration

Visual Art Lessons

EARTH SCIENCE

Grade 5

2014-15

1. Independent and Dependent Variables
2. Severe Weather and Fine Art
3. Water Conservation Poster Ideas

**ITQ ARTS AND SCIENCE INTEGRATION
GRADE 5
VISUAL ART AND EARTH SCIENCE**

**Independent and Dependent Variables
Lesson # 1**

FOSS Kit Grade 5, Earth Science: Water Planet, Investigation 2

Note: This is not a controlled experiment activity. It works to illustrate a cause/effect relationship between independent and dependent variables. In a controlled experiment the results would be consistent from student to student. In art, happily, they are not!

CONTENT STANDARDS

Visual Art Grade Five

- 1.3** Use their knowledge of all the elements of art to describe similarities and differences in works of art and the environment.

Earth Science Grade Five

- I&E6d** Identify the dependent and controlled variables in an investigation.

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

- How do I describe a work of art using the vocabulary of visual art?
- What are **independent** and **dependent variables**?
- How can I recreate a masterwork of art by changing one **variable**?

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

- Describe a famous portrait using the vocabulary of visual art.
- Describe the effects of changing one variable in a work of art.
- Recreate a famous portrait illustrating the change of one variable.

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

- **Feedback for Teacher**
 - Informal observation of student artists during guided practice
 - Informal conferencing with groups and individuals
- **Feedback for Student**
 - Verbal feedback from teacher
 - Critique of completed artwork

WORDS TO KNOW

Visual Art

- **Elements of art:** sensory components used to create works of art (e.g., line, color, shape or form, texture, value, and space)
- **Sketch:** a drawing without much detail, usually completed in a short time; sometimes used as a rough draft for a late work of art.

Earth Science

- **Control:** the portion of an experiment that you are not performing experiments on; it is just there to serve as the original state that subsequent experiments are compared to.
- **Independent variable:** something that is changed on purpose
- **Dependent variable:** the result of the independent variable
- **Variable:** an element, feature, or factor that is liable to vary or change

MATERIALS

- Reproduction of the Mona Lisa (or any famous portrait, such as, *American Gothic* by Grant Wood, or *Frieda* by Diego Rivera)
- Elements of Art Handout (included at the end of this lesson), one per student
- Variables Worksheet (included at the end of this lesson)
- 9" x 12" white construction paper or copy paper, one per student
- Pencil, one per student
- Colored pencils, one 8 color set per student
- Science notebook, 1 per student

RESOURCES

- *FOSS Kit Grade 5, Earth Science: Water Planet, Investigation 2 "Swingers"*
- *Portfolios Grade 5*, Robyn Montana Turner, Barrett Kendall Publishing
 - Elements of Art: page 1
 - Portraits: pages 26, 27
- Elements of Art (included in lesson)
- Internet
 - Mona Lisa, brief background: <http://www.ibiblio.org/wm/paint/auth/vinci/joconde/>
 - Leonardo da Vinci: <http://gardenofpraise.com/art17.htm>
 - Visual art definitions: <http://www.artincanada.com/arttalk/arttermsanddefinitions.html>
 - The modern Mona Lisa (funny examples to be shown *upon completion* of the project): [http://www.mrsbrownart.com/powerpoints/Modern%20Mona%20Lisa.ppt#257,2,Modern Mona Lisa](http://www.mrsbrownart.com/powerpoints/Modern%20Mona%20Lisa.ppt#257,2,Modern%20Mona%20Lisa)
- **Instructional Media Center (IMC)**
2442 Cardinal Lane, San Diego, CA 92123
To order instructional materials on line: <http://destiny.sandi.net>

PREPARATION

- All students should understand the science vocabulary from *FOSS Kit Grade 5, Investigation 2 "Swingers"*.
- Give students the **Elements of Art** handouts to take home as homework. Affix the handout to their Science Notebook.
- Warning: do not show students the "modern Mona Lisa" examples from the website until the students have finished the lesson. Examples are not exactly indicative of dependent and independent variables; they are simply creative and a lot of fun.

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

(5 minutes)

- **Ask**:
 - *How are artists and scientists alike?*
 - *How are they different?*
- Project a reproduction of the *Mona Lisa* by Leonard da Vinci.
- Ask students to describe what they see (e.g., the woman, her clothing, location, time of day, weather, etc.)
- Have students take out the Elements of Art handouts from their Science Notebook or post the **Elements of Art** for students to see.
- Ask the students to locate and describe the **elements of art** in the portrait (e.g., line, shape/form, color, texture, space, and value).

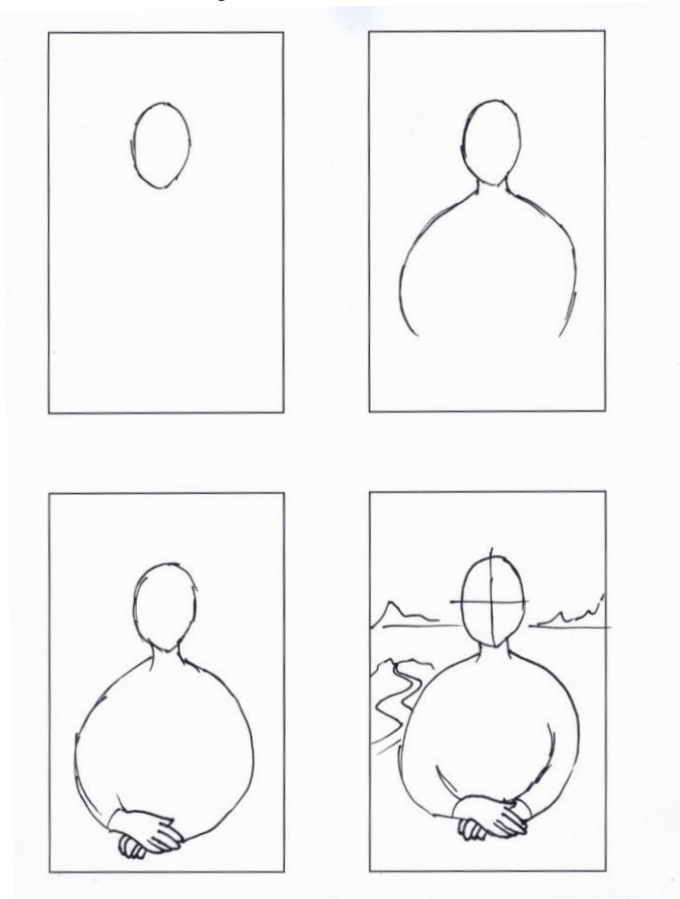
MODELING (*Presentation of new material, demonstration of the process, direct instruction*)

(15 minutes)

- Distribute a 9" x 12" piece of white construction paper and a pencil to each student.
- Demonstrate how (using the example images below to guide you) and instruct students to sketch the

basic shapes and lines in the *Mona Lisa* as true to the original as they can, using graphite pencil only.

- Turn the paper to portrait orientation.
- Trace your finger around the shape of Mona's face several times on the projected image.
- Determine that the shape is a "rectangular oval".
- Measure the size of the face using your hands and then show the students how many heads would fit in the length of the frame. (3 heads)
- Show the children that the oval of Mona's face is in the upper 1/3 of the work of art.
- Sketch very lightly, a "rectangular oval" in the upper 1/3 of your demonstration drawing.
- Notice that Mona's shoulders are about in the middle of the work of art.
- Place dots on the demonstration drawing where her left and right shoulders will be.
- Trace the line of Mona's neck and left shoulder on the projected image.
- Sketch very lightly, the line representing Mona's neck and shoulder. Stop at the left dot.
- Trace Mona's hands with your finger on the projected image.
- Notice that the hands are toward the bottom and slightly to the left of center in the portrait.
- Sketch very lightly, the hands on the demonstration drawing. Very signature of the Mona Lisa is her right hand resting over her left. Only four fingers of her left hand are coming out from under the right hand.
- Do not sketch the whole image.
- Ask students to recall what **variables** are and the difference between **independent** and **dependent variables**.
- Explain that the students are going to change one and only one **variable** in their reproduction of the portrait.
- Explain to students that Leonardo da Vinci's original Mona Lisa is the portrait that would be called the **control**. In science it is important to make careful observations of the original condition(s) of the painting in order to know what has changed.



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

(20 minutes)

- Ask:
 - What would the portrait look like if the weather were changed?
 - What would Mona Lisa look like on a windy day? [hair is blowing, trees swaying, holding a hat on her head, surprised expression, etc.]
- Have students discuss what Mona Lisa would look like in various situations:
 - "What would Mona Lisa look like in a rainstorm, or on a hot, muggy day?"
 - "What would she be wearing?"
 - "What would the background look like?"
 - "What other details would help show the effects of the new **independent variable**?"
- Have students select one variable from the *Independent Variables* list on the worksheet and write it in the oval (example: blizzard). Have students complete the worksheet by writing dependent variables in the rectangle boxes (example: Mona is wearing a scarf).
- Instruct students to draw Mona Lisa the way she would look if that single **independent variable** was changed using pencil and colored pencils.
- Circulate throughout the room encouraging students as they work.

Example:

Independent Variable:
Blizzard

Dependent Variables:

- Mona wears winter jacket, scarf, hat and gloves
- There is snow on the mountains in the background
- The river is frozen
- Icicles are forming
- There are snowflakes and snow all around her and building up on her
- Mona's cheeks are pink
- Her hair is blowing in the wind



DEBRIEF & REFLECT (Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet outcomes?)

(10 minutes)

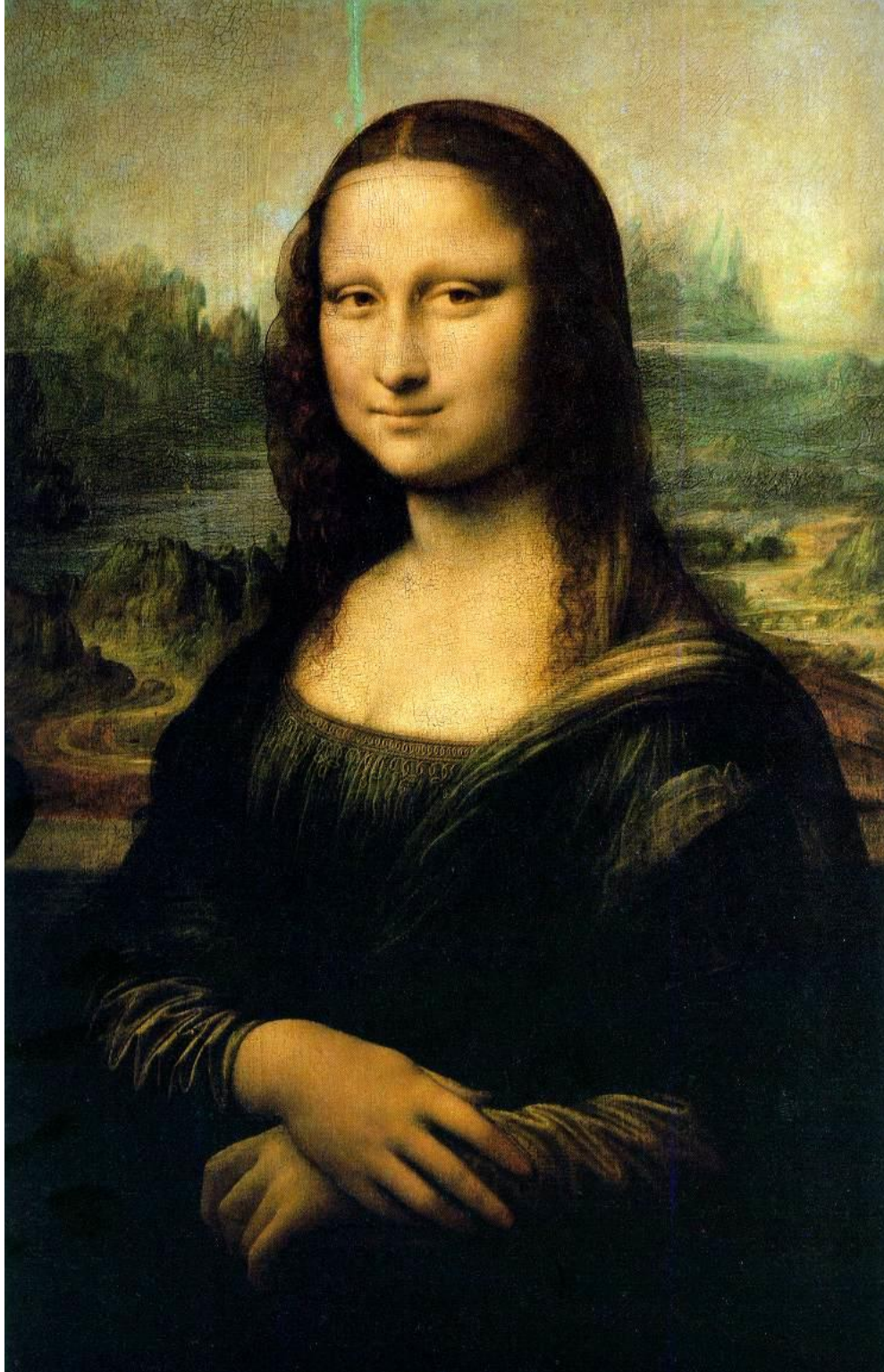
- Allow all students to stand around the perimeter of the classroom and hold their "Experimental Mona Lisa" for all to see.
- Allow each student to tell about their independent variable while showing their work.
- Science Notebook Prompt: Use the vocabulary of visual art and earth science to answer this question: *How did changing one variable affect the portrait of the Mona Lisa?*

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

- Visual art: After discussing how students could improve the quality of their drawings, students can spend more time editing their works of art to a level of exhibition quality.
- After reading a story, students can change just one variable in the story and create a new ending. (e.g., "What if the character didn't win?" "What would happen if the story took place in a different

location?")

- Display the works of art with written explanation by each artist describing their independent variable.



Portrait of Mona Lisa (1479-1528), also known as *La Gioconda*, the wife of Francesco del Giocondo; 1503-06 (150 Kb); Oil on wood, 77 x 53 cm (30 x 20 7/8 in); Musee du Louvre, Paris

NAME: _____ DATE: _____

Controlled experiment: an experiment in which one, and only one, variable is changed in order to find out how it affects the outcome of the experiment; all other variables are kept the same, or controlled

Independent variable: something that is changed on purpose

Dependent variable: the result of the independent variable

1. Choose one **independent variable** from this list that you will apply to the Mona Lisa portrait. Write it in the *oval* on your chart:

hurricane

blizzard

tornado

flood

rainstorm

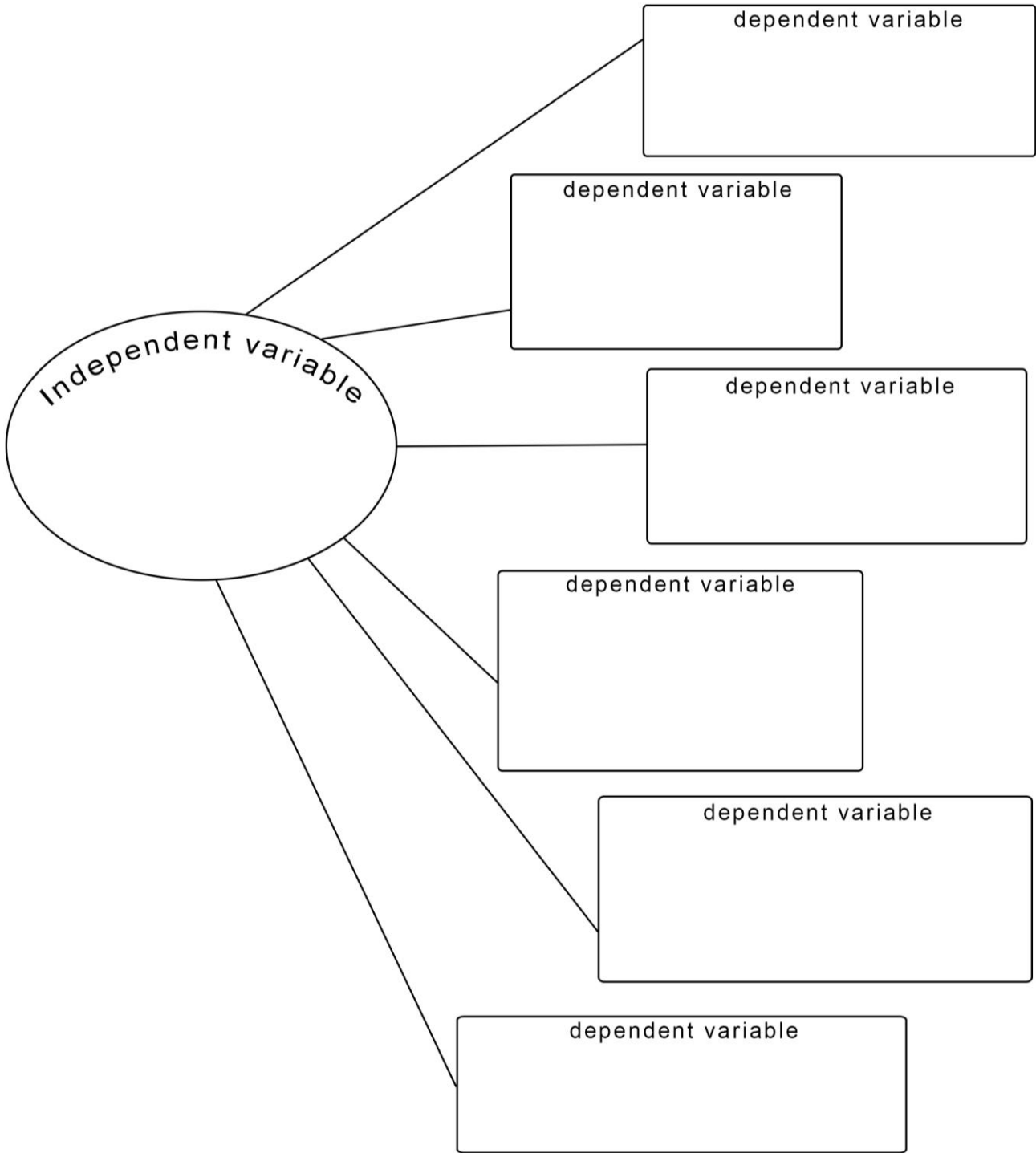
hail shower

heat wave

sandstorm

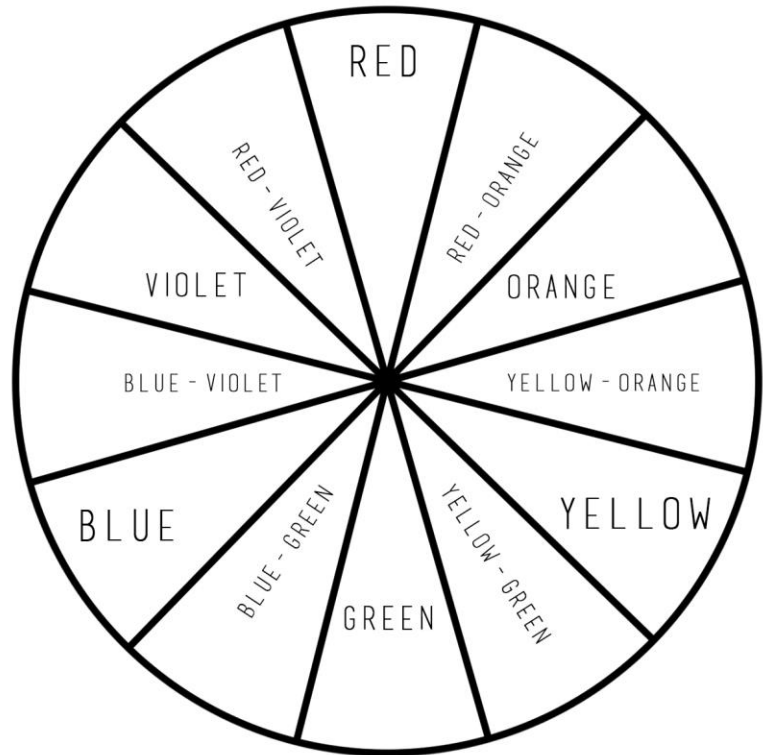
lightning and thunder

2. In the *rectangles*, write the **dependent variables** that will change in the Mona Lisa portrait as a result of your **independent variable**.



#3. Color

The Color Wheel



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.)

PRIMARY Colors: RED, BLUE, YELLOW

SECONDARY Colors: ORANGE, GREEN and VIOLET

secondary colors are created by mixing two of the **primary colors** together.

TERTIARY or Intermediate Colors: colors produced by adding a **primary** to an adjacent **secondary** on the colorwheel 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.

WARM Colors: are energetic and suggest warmth
examples: RED, ORANGE & YELLOW.

COOL Colors: are calming and give a soothing impression
examples: BLUE, GREEN & VIOLET

COMPLEMENTARY Colors: colors opposite of each other on the color wheel:
red & green; blue & orange; yellow & violet

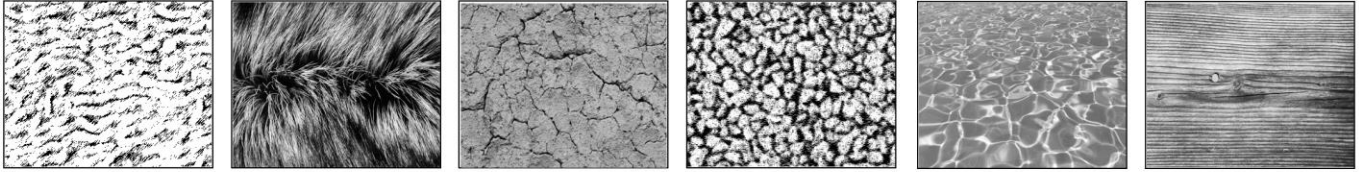
TINTS: can be created by adding white to a color or **hue**.
blue + white = **tint** of blue

SHADES: can be created by adding black to a color or hue
red + black = **shade** of red

#6. Texture

ACTUAL texture: Tactile texture (the actual surface you can feel with your fingers)

IMPLIED texture: Visual texture (for example in a drawing or painting of a cat where the fur is drawn to look like real fur)



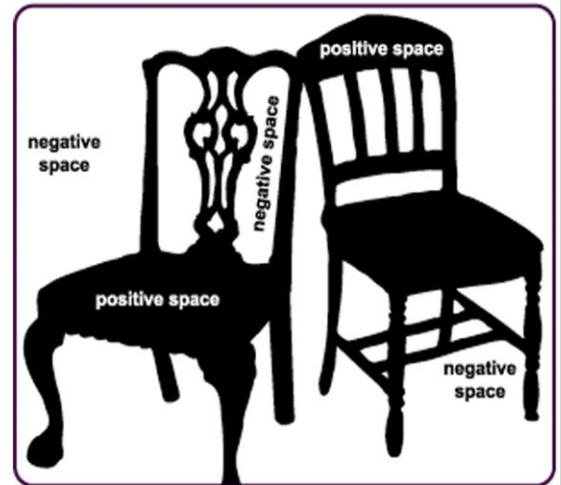
- * Texture can be unique to the medium (clay, paint, pencil, etc.)
- * Texture can be suggested through shading, pattern and relationship

#5. Space

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

POSTITIVE Space: The area occupied by objects

NEGATIVE Space: The area surrounding, between and around the objects (unoccupied by objects)



#6. Value

VALUE: refers to the lightness or darkness of a hue or neutral color

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

Value Scale



**GRADE 5
VISUAL ART AND EARTH SCIENCE**

**Severe Weather in Fine Art
Lesson #2**

FOSS Kit Grade 5, Water Planet: Investigation 5, Part 2

CONTENT STANDARDS

Visual Art Grade Five

- 1.3** Use their knowledge of all the elements of art to describe similarities and differences in works of art and in the environment.
- 4.1** Construct and describe plausible interpretations of what they perceive in works of art.

Earth Science Grade Five

- ES4c** Students know the causes and effects of different types of severe weather.

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

- Can I interpret what I see in the environment to understand weather?
- How do I paint a landscape depicting severe weather?
- What causes severe weather?

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

- use the vocabulary of art to describe works of art and the environment.
- practice interpreting and predicting weather based on visual cues from the environment.
- draw and paint a severe weather landscape.
- describe the three necessary conditions for severe weather.

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

- **Feedback for Teacher**
 - Informal observation
 - Finished works of art depicting severe weather
 - Comments made by each student during reflection about weather variables
- **Feedback for Student**
 - Comments from the teacher during discussion, instruction and individual conferencing

WORDS TO KNOW

Visual Art

- **Color:** The visual sensation dependent on the reflection or absorption of light from a given surface. The three characteristics of color are hue, value and intensity.
- **Elements of Art:** Line, Shape/Form, Color, Texture, Space and Value.
- **Form:** A three-dimensional volume or the illusion of three dimensions (related to shape, which if two-dimensional); the particular characteristics of the visual elements of a work of art (as distinguished from its subject matter or content).
- **Line:** A point moving in space. Line can vary in width, length, curvature, color or direction.
- **Shape:** A two-dimensional area or plane that may be open or closed, free-form or geometric. It can be found in nature or is made by humans.
- **Space:** The emptiness or area between, around, above, or contained within objects.
- **Texture:** the surface quality of materials, either actual (tactile) or implied (visual).
- **Value:** Lightness or darkness of a hue or neutral color. A value scale shows the range of values from black to white.

Earth Science

- **Heat:** Temperature, especially weather conditions.

- **Hurricane:** A severe tropical storm or moving wind system that rotates around an eye, or center of low atmospheric pressure.
- **Moisture:** Water or other liquid diffused in a small quantity as vapor, within a solid, or condensed on a surface.
- **Movement:** An act of changing physical location or position or of having this changed.
- **Severe Weather:** Out-of-the-ordinary and extreme weather conditions.
- **Tornado:** a rapidly rotating column of air that extends from a thunderstorm to the ground. Wind speeds can reach more than 400 kilometers per hour (250 mph) in a tornado.
- **Weather:** The condition of the atmosphere around us. Heat, moisture, and movement are the three important variables that describe weather.
- **Weather variables:** Data that meteorologists measure. These include temperature, wind speed and direction, air pressure, cloud cover and precipitation.

MATERIALS

- Elements of Art handout from Lesson #1 in the student Science Notebook
- Work of art depicting severe weather: tornado
- Work of art depicting severe weather: hurricane
- 9" x 12" white construction paper, one per student
- pencil and eraser, one per student
- watercolor pencil set of 8 colors, one packet per student
- water containers
- watercolor paint brush, one per student
- Science notebook, 1 per student

RESOURCES

- *FOSS Kit Grade 5, The Water Planet*, Investigation 5 "Weather", Part 2 "Severe Weather"
- Portfolios, Grade: Five, Robyn Montana Turner, Barret Kendall Publishing
- "Views of the Environment" pages 6, 7, 8, 9, 11
- "Works of Art with sky" pages 37, 38, 46, 54, 56, 8388, 89, 90, 91, 92, 94, 98, 99, 100, 104, 112, 113
- Internet Websites:
- Paintings of Tornadoes
 - *Relocation* by David Jay Spyker, 2004: <http://www.Davidjayspyker.com>
 - *The Haven (In Memory of Martin Maddox, 1954-1997)* by David Spyker, 1998: <http://www.davidjayspyker.com>
- Paintings of Hurricanes
- *Hurricane, Bahamas* by Winslow Homer, 1898-99: <http://www.the-athenaeum.org>
- *Hurricane Before Saint Malo* by Eugene Isabey, 1860: <http://www.bbc.co.uk/arts/yourpaintings/paintings/hurricane-before-saint-malo-france-68869>
- Paintings of Thunderstorms
 - *Tiger in a Tropical Storm (Surprised!)* by Henri Rousseau, 1891: <http://www.henrirousseau.org/Tiger-In-A-Tropical-Storm---Surprised.html>
 - *View of Toledo* by El Greco, 1600: http://en.wikipedia.org/wiki/View_of_Toledo
 - *Great Bridge, Sudden Shower at Atake* by Utagawa Hiroshige, 1857: http://www.brooklynmuseum.org/opencollection/objects/121666/Sudden_Shower_Over_Shin-Ohashi_Bridge_and_Atake_Ohashi_Atake_no_Yudachi_No._58_from_One_Hundred_Famous_Views_of_Edo
 - What Causes Severe Weather? Power Point: <http://www.slideshare.net/allsaintsscience/5th-grade-ch-8-lesson-3-what-causes-severe-weather>
- Severe Weather Power Point: http://www.slideshare.net/Teach5ch/storms-andie?src=related_normal&rel=3043163 Instructional Media Center (IMC)
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PREPARATION

- This lesson should be presented in conjunction with the *FOSS Kit Grade 5, the Water Planet Investigation 5 “Weather”, Part 2 “Severe Weather”*
- Review how tornadoes and hurricanes form. (see Power Points found in Resource Section of this lesson)
- Review the Elements of Art (line, shape/form, color, texture, space and value).
- Post the Elements of Art in an area easily visible by all students
- Collect photos of severe weather, specifically tornadoes and hurricanes from magazines, newspapers and websites. Make them available for students to access for this lesson.

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

(10 minutes)

- Display two works of art, one depicting a tornado and one depicting a hurricane in an area easily seen by all students. (See suggested works of art in the “Resources” section of this lesson.)
- Say:
 - *Silently examine these two works of art for one minute. While you are looking, think about how you might describe what you see.*
- Ask:
 - *What is the same about these two paintings?* [line, shape, color, texture, space, severe weather, landscape, sky, etc.]
 - *What is different about these two paintings?* [one is about severe weather on land, the other about severe weather near or over water]
 - *What kind of **severe weather** do you think is depicted in the first painting? Why?*
- Say:
 - *We know that there are three important weather variables: **moisture, heat and movement.***
- Ask:
 - *How does the artist show **moisture**?* [lines of rain]
 - *How does the artists show **heat**?* [palm trees grow in tropical climates]
 - *How does the artist show **movement**?* [indication of wind: blowing flags]
 - *What kind of **severe weather** is depicted in the second painting? Why do you say that?*
 - *Why would artists create paintings of **severe weather** like **hurricanes** and **tornadoes**?*

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

(15 minutes)

- Allow students to locate their copy of the **Elements of Art** handout in their science notebook to use as a reference for the rest of the discussion.
- Say:
 - *Now that we have looked at these two painting scientifically, lets look at them using the **Elements of Art.***
 - *The first **Element of Art** is **line.***
 - *Who can point out straight and curved **lines** in these works of art?*
 - *Which directions are the **lines** traveling?* [horizontal, vertical and diagonal]
 - *What **shapes** do we see?* [geometric, natural and free]
 - *Where did the artists use primary **colors** in these paintings?* [red, yellow, blue]
 - *Where did the artists use secondary **colors**?* [green, orange and violet or purple]
 - *Usually there are lots of neutral **colors** in landscapes. Where do we see neutral **colors**?* [black, white, brown]
 - *There are lots of tints and shades in these paintings too. Tints are **colors** that have white added to it, like light blue. Where do you see tints?*
 - *Shades are **colors** that have black added to it like navy. Where do you see shades?*
 - *How does the artist make the painting look like it has **textures**?*
- Distribute one 9” x 12” white construction paper and a pencil with an eraser to each student.
- Demonstrate how and instruct students to sketch a work of art depicting one type of **severe weather**

working from one chosen image.

- Identify the largest shape in the image.
- Determine how big it is and where it is placed within the frame.
- Sketch the shape in about the same place and the same size as in the original image on the demonstration drawing.
- Choose the next important shape in the work of art.
- Determine its shape size and placement within the frame.
- Sketch this shape in about the same place and the same size as in the original image on the demonstration drawing.
- Continue this process until the scene is mapped out.
- Students may use one of the paintings or a magazine, newspaper or website photograph as inspiration.

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

(20 minutes)

- Remind students to begin by sketching important **lines** and **shapes** using pencil and using the entire **space** on the paper.
- Next the students should draw in details, also using pencil.
- Distribute colored pencil sets to students when significant details have been added to the **severe weather** work of art.
- Circulate throughout the classroom as students are working encouraging them and conferencing with individuals as needed.

DEBRIEF & REFLECT *(Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet outcomes?)*

(5 minutes)

- Instruct students to group in pairs and examine one another's artwork for the clues showing **moisture**, **heat** and **movement**.
- Ask them to identify their favorite thing about their partners' artwork using the Elements of Art vocabulary.
- Allow students to attach the **Severe Weather** work of art to their Science notebook.
- Science Notebook Prompt: Describe how you represented **moisture**, **heat and movement** in your work of art.

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

- Ask students to locate additional photographs and illustrations of current severe weather from anywhere in the world. Place these on a bulletin board or area of the classroom to share.
- Use watercolor paints to add additional color to the works of art.



Hurricane, Bahamas 1898 by Winslow Homer (watercolor)
<http://www.the-athenaeum.org>



Tornado by John Brosio
http://www.johnbrosio.com/tornadoes_one.html



Hiroshige, Sudden shower over Shin-Ōhashi Bridge and Atake

http://www.brooklynmuseum.org/opencollection/objects/121666/Sudden_Shower_Over_Shin-Ohashi_Bridge_and_Atake_Ohashi_Atake_no_Yudachi_No._58_from_One_Hundred_Famous_Views_of_Edo

**ITQ ARTS AND SCIENCE INTEGRATION
GRADE 5
VISUAL ART AND EARTH SCIENCE**

**Water Conservation Poster Ideas
Lesson # 3**

FOSS Kit Grade 5, Earth Science: Water Planet, Investigation 5, Part 4

CONTENT STANDARDS

Visual Art Grade Five

- 2.7** Communicate values, opinions, or personal insights through an original work of art.

Earth Science Grade Five

ES3d Students know that the amount of fresh water located in rivers, lakes, underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing use of water.

ES3e Students know the origin of the water used by their local communities.

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

- Where does the water I use come from?
- What can I do to conserve water in my community?
- How do I create a poster that communicates my ideas effectively to others?

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

- Explain the importance and source of fresh water for San Diego.
- Develop ideas on how to conserve the use of fresh water.
- Design and create effective poster ideas communicating water conservation.

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

- **Feedback for Teacher**
 - Informal observation
 - Thumbnail sketches of water conservation posters
- **Feedback for Student**
 - Comments from the teacher during discussion, instruction and individual conferencing

WORDS TO KNOW

Visual Art

- **Focal Point:** The center of interest or activity
- **Image:** A visible representation, a visible impression
- **Poster:** A large printed picture, notice, or advertisement displayed in a public place
- **Thumbnail Sketch:** A concise, miniature version of a larger, completed work of art

Earth Science

- **Conserve:** To use carefully and protect.
- **Fresh Water:** Water without salt that is found in lakes, rivers, groundwater, soil and the atmosphere.
- **Ice cap:** A glacier forming on an extensive area of relatively level land and flowing outward from its center.
- **River:** A large natural stream of water emptying into an ocean, lake or other body of water.
- **Salt Water:** Ocean water.

MATERIALS

- 8 ½" x 11" copy paper, one per student
- Pencil and eraser, one per student
- Set of 8 basic colored pencils, one per student
- Science notebook, one per student
- Poster board or 9 x 12" or larger construction paper for final finished poster

RESOURCES

- FOSS Kit Grade 5, "Water Planet", Investigation 5 "Weather", Part 4, "Local Water"
- Portfolios, Grade 5, Robyn Montana Turner, Barrett Kendall Publishing
 1. Examples of magazine covers (pages 32 and 33)
 2. "Today's Designs" (pages 76 and 77)
- Internet sites:
 - ★ Water Conservation Poster Contest & examples:
<http://www.sandiego.gov/water/conservation/contests/poster/index.shtml>
 - City of San Diego Water Department:
<http://www.sandiego.gov/water/conservation/kids/>
 - School Zone: <http://20gallonchallenge.com/schoolzone.html>
 - Water for Kids (Environmental Protection Agency) www.epa.gov/ow/kids.html
 - EcoKids - Includes water conservation tips you can follow in each room of your house to save water www.ecokids.ca/pub/eco_info/topics/water/water/index.cfm
 - Where Does MY Water Come From?
www.watereducation.org/watersources/region.asp?rid=10
 - U.S. Department of the Interior Bureau of Reclamation
www.usbr.gov/mp/watershare/resources/waterlearn.html
 - Surfrider Foundation: www.surfrider.org
- **Instructional Media Center (IMC)**
2442 Cardinal Lane, San Diego, CA 92123
To order instructional materials on line: <http://destiny.sandi.net>

PREPARATION

- This lesson will be most effective when given after or in conjunction with FOSS Kit Grade 5, "Water Planet", Investigation 5 "Weather"; Part 4 "Local Water".

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

(5 minutes)

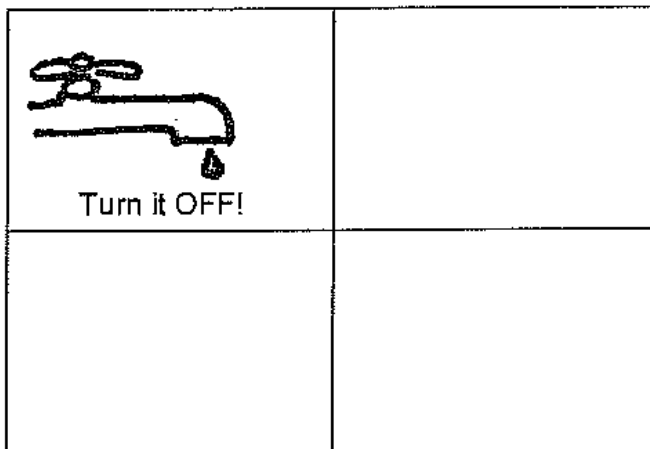
- Display an advertisement in an area easily seen by all students.
Suggestions: Global Warming PSA (*Image 3.1*)
<http://thefinishedbox.com/inspiration/print/best-advertisement-posters/>
- *Discussion questions:*
 - *What is the first thing you notice when you look at this poster?*
 - *What is this poster trying to tell the viewer?*
 - *Is this a realistic image? Glaciers and a city scene inside of this glass container?*
 - *What is the glass container? [hourglass]*
 - An hourglass is an old fashioned way to tell time. It was filled with sand and it would take one hour for the sand to trickle down from the top to the bottom once it was flipped over.
 - *Why did this artist choose to put this scene inside an hourglass?*
 - *How does the artist want us to feel when we think about this poster? Why do you think that? What clues do you see that make you say that?*

- Say:
 - Artists, graphic designers and advertisers use lines, shapes, colors and images to get your attention.
 - The place where your eyes are drawn to is called the **focal point**.
 - Notice that the **poster** designer used very few words and that the words are powerful.
 - Who would like to come forward and read the words?
 - The artist combined a powerful **image** and only a few words to catch your attention and make you think.

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

- Explain that during this lesson students will be *designing* a very important poster. The poster will encourage water conservation.
- Say:
 - Creating an effective **poster** is not the same as creating a drawing or writing a message.
 - Here are some steps that will help us create successful **posters**.
 1. Step one is **RESEARCH** your subject or theme.
 2. Step two is to **PLAN** your **poster**. That means you should make several small sketches illustrating different ideas, different words and different images. Artists call small sketches “**thumbnail sketches**”.
 3. Step three is to **EDIT** your ideas. You look at your **thumbnail sketches** and decide which one is your favorite. Take that sketch and re-sketch it until you have the placement of the image and the words just the way you want it.
 4. Step four is to **CREATE** your poster. You create the final poster in the correct size using **poster** paper or **poster** board and appropriate medium like markers or **poster** paints.
- Display the “Water Conservation Data” sheet provided in this lesson in an area easily seen by all students, e.g., under a document camera.
- Say:
 - Remember how I said we were going to be designing an important **poster** during this lesson?
 - This is step one in creating a poster, **RESEARCH**.
 - Read and examine these two graphs independently then you will talk with your partner about what you learn.
- After an appropriate amount of time, have students talk to their partner about their responses to the following questions:
 - From the top graph, what percentage of the earth’s water is **salt water**? [97%]
 - What percentage of the earth’s water is **fresh water**? [3%]
 - What percentage is frozen in **ice caps**? [2 %]
 - What percentage of the world’s water is drinkable? [1%]
- Have students list the ways in which they use water everyday in their science notebooks.
- Gather and record a variety of responses from students on a separate piece of paper under a document camera or on a large chart paper.
- Say:
 - Let’s take a look at the graph on the bottom of Water Conservation Data sheet.
 - How is most of the available drinking water in San Diego used? [55% for watering lawns and landscaping]
 - What do I mean when I say available water? [clean, fresh water]
 - What percentage of available water in the City of San Diego is used to flush toilets? [20% flushed down toilets]
 - What percentage of available water is used to do laundry and dishes? [7 % is used to do laundry and dishes]
 - What does it means when it says 2% is lost to undetectable leaks? [this refers to water lost from leaks in the water delivery system, usually underground and not detected until

- the leak effects ground stability or becomes visible.]
- *What does it mean to **conserve** water?* [to use carefully and protect]
 - *Why is it important to **conserve** water?* Because we have a limited supply]
 - Go to <http://www.watereducation.org/watersources/subpage.asp?rid=10&page=18> and display the page for the class to see.
 - Investigate this site to discover where the usable water in San Diego comes from. [#1. Colorado **River**, #2. State Water Project from **rivers** and dams throughout California, and #3. Local **streams** and reservoirs]
 - Look at the list of how students use water everyday with the class again.
 - List ways in which students can **conserve** water on another sheet of paper under a document camera or on a chart paper.
 - Distribute an 8 ½ x 11 piece of copy paper and a pencil to each student.
 - Demonstrate how and instruct students to fold the paper in half with the “short sides” together. Repeat that process and unfold the paper revealing 4 rectangular sections.
 - Draw lines on the folds using pencil.
 - Students may choose portrait or landscape orientation.
 - Demonstrate how to transform a water conservation idea into a sketch in one of the rectangular sections.
 - Say:
 - I am going to choose an idea from the list of ways to **conserve** water.
 - I think I will use turning off the water while brushing your teeth.
 - What kind of image could I draw? [someone brushing their teeth, close up of a toothbrush, watering running from a faucet]
 - Sketch the chosen **image** in one of the rectangular section.
 - Write “Turn it OFF!” using a combination of lower case and upper case letters.
 - I am using only 3 words. Notice how I made the words large and I placed them under the **image** so the image and the words are easily seen.
 - Who can guess why I made the word “OFF” all in capital letters? [it is the most important word on the sketch, to get the viewer’s attention]



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

- Say:
 - Now it is your turn to create at least 4 **thumbnail sketches** about water conservation.
 - Use the ideas we listed or think of another water saving idea that we missed.
 - Create “mini posters” or **thumbnail sketches** illustrating your ideas.
 - Use an **image** that will get the viewer’s attention and powerful **focal point**.
 - Use 4 words or less.

- Make the words easily readable or legible and make sure you spell correctly.
- If you come up with more than 4 ideas, turn the paper over and use the back.
- Make sure you put your name in one of the rectangles on the back of the paper.
- Move throughout the classroom as students are working to observe their working process.
- Conference with students as needed.

DEBRIEF & REFLECT (*Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet outcomes?*)

(5 minutes)

- Ask students to examine their **thumbnail sketches** carefully.
- Allow students a short time to share their designs and ideas with a partner and possibly edit or revise their favorite design based on the discussion.
- Instruct students to choose the one **thumbnail sketch** that they believe communicates their water conservation idea most effectively and place a small star in the upper left hand corner of that design.
- Instruct students to attach their **thumbnail sketch** to their science notebook.
- Science Notebook Prompt: Explain why you chose the **thumbnail sketch** and how it tells about water conservation.

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

- Transfer thumbnail sketch ideas to 12" x 18" (or larger) white construction paper or poster board. Use markers, colored pencils, and/or poster paints to create final versions of the water conservation posters.
- Place the water conservation posters around the school site or in the community.
- Ask for community feedback to measure the effect of the student posters.



Image 3.1

Save Water ... Save Life



www.mowe.gov.sa

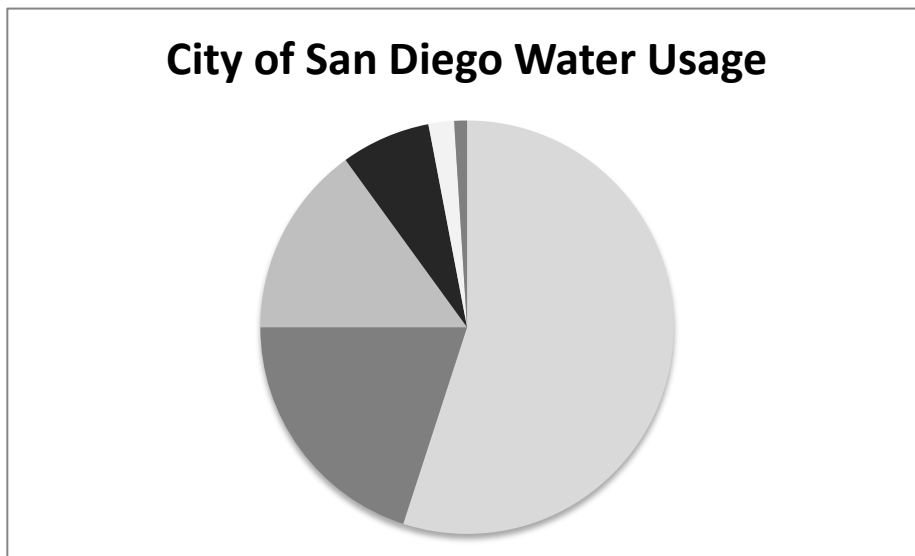
Image 3.2

Image 3.3

Water Conservation Data



97% of the world's water is salty and undrinkable
2% of the available drinking water is frozen in ice caps and glaciers
1% of the world's water is available to drink



55% used to water lawns
20% flushed down toilets
15 % used in showers and baths
7% to do laundry and dishes
2% is lost through undetected leaks
1% is available to drink

The average person uses **88 gallons** of water a day!

List many ways to **YOU** use water everyday...