

Starry Night Energy Module

Teachers See Special Instructions Below*

Science SOL: 3.11a-d, 4.2a-d, 4.3a-f, 3.3.1, 4.4.1, 4.4.2

PWC Art Objectives: 3P.1.1, 3P.9.3, 3P.10, 3H.1.2, 5C.1.1, 4A.1.1, 4A.1.2

Vocabulary: work, force, kinetic energy, electricity, motion, vibration, potential energy, sound, conductor, circuit, flow, closed circuit, open circuit, series circuit, parallel circuit, wire, switch, bulb, crescent or new moon, night, light, resistance, reflection, voltage, amps.

Materials Provided: Blue “Starry Night” module, Small Black Case containing hand crank generator & red and black wires, diagrams for connections on the board (in teachers manual).

Objectives:

1. Distinguish the differences between serial and parallel circuitry
2. Recognize the two energy sources used to light up the module wall - solar panel and hand crank generator (mechanical).
3. Understand the difference between volts and amps
4. Recognize Vincent Van Gogh’s famous ‘Starry Night’ painting, artist’s technique and how technology has been integrated with the piece of art
5. Recognize the style of art on the bottom portion of the module wall popularized by ***Piet Mondrian*** (1872-1944) . The artwork most known by artist Piet Mondrian is dominated by the geometric shapes and interlocking planes commonly found in cubism. The art movement known as Cubism lasted from 1908-1920.

**Instructions:* This module is to be used ONLY with adult supervision! The module is safe BUT will not hold up to lots of curious little fingers!!! In order for the module to last for the entire school year, we recommend that one student at a time follow the diagrams (in Teacher’s Manual) and demonstrate to the rest of the class how the different connections work.

Prism & Light Energy Module

Science SOL: 5.4.3, 5.3a-e

PWC Art Objectives: 3P.1.1, 3P.1.3, 4P.2.2, 4P.4.1, 5P.4.1, 3P.6.1, 4P.6.1, 3P.9.3, 4P.9.1

Vocabulary: energy, light, prism, translucent, refraction, reflection, visible spectrum, transparent light

Materials Provided: Red “Prism & Light” module, prisms, color paddles, 9 extra rechargeable batteries for the light display (battery access located in back of wall), battery recharger.

Objective: To experience light reflection, refraction, the color spectrum, and how light works. Be able to recite ROY G BIV and know what it stands for. Know primary & secondary colors. Discuss Georges Seurat’s “Sunday Afternoon on the Island of La Grande Jatte” to better understand how the artist portrays light and color. (**Pointillism** is a method of painting in which small distinct points of primary colors create the impression of a wide selection of secondary and intermediate colors.)

Instructions:

1. Have students experiment with the light display in a darkened room by pressing buttons singly, 2 at a time, or all 3 together. Notice the additive light – the colors turn white in the middle.
2. Experiment with the prisms in available light. Have the students hold the prisms 1” from their eyes (similar to glasses) and look out a window at the trees, clouds, or a building. A computer monitor also shows the breakout of the spectrum.
3. Color Paddle Wheel project: Have students create a “Color Paddle Wheel”. Trace three overlapping paddle shapes on to a piece of paper. Color the paddle shapes with crayons or markers. Color the 3 paddles with the 3 primary colors. Where the paddles overlap, color in the correct secondary color mixture. (Example in teacher’s manual.)
4. Hold the paddle wheels up to light to show the primary & secondary colors. Point out that when all 3 primary colors are held up together, there is additive (clear) light.
5. The lights are powered by 9 batteries in the back of the module wall. Nine extra batteries and a battery recharger are included; you should replace all 9 of them at one time and recharge the extras for the next school. Each recharge should take approximately 20 minutes.

Energy Transfer Flashcards

Science SOL: 3.11a-d, 3.10a-d, 5.4a-c, 4.3a-f, 5.2a-c, 4.2a-d

Vocabulary: Waste, electricity, solar, fire, light, energy, sunlight, water, wind, fossil fuels, oil, natural gas, wood, gasoline

Materials provided: Twenty four laminated cards with an “energy conversion device” (examples: toaster, engine, or nuclear reactor) on one side of the card, and the types of energy which have been transferred shown on the reverse side (example: nuclear to electric).

Objective: To help students understand the energy devices shown on the cards and the energy transformations that they perform.

Instructions: The cards are a tool to get students thinking about energy transformation. Place cards picture side down in the center of the table. Have the students draw from the stack of cards and discuss the type of energy that goes into the device, what action is produced, and what kind of energy is lost, if any. The cards can be placed in a chain where natural flows of energy occur with the devices. (For example: microphone card joins to the ear card)

Please return materials to the appropriate container when activity is completed.

Thank you!

3 Energetic Giants Puzzle

Science SOL: 4.3a-f

PWC Art Objectives: 3P.16.1

Vocabulary: electromagnetic, electricity, current, energy, hypothesis, light, nonrenewable, work, conductor, circuit, flow, bulb

Materials Provided: Puzzle Pieces and Puzzle Board

Objective: To remember the names of Benjamin Franklin, Michael Faraday, and Thomas Edison, and their major contributions to energy advancement.

Instructions: Set up a puzzle station where students can put together the puzzle.

Please return all puzzle pieces to the bucket!

Solutions & Density

Science SOL: 3.1a-k

PWC Art Objectives: 3P.1.1, 3P.1.2, 3P.2.2, 3P.4.1, 3P.6.1, 3P.7.1, 3P.9.1, 3P.10.1, 4P.1.3, 4P.2.2, 4P.3.1, 4P.4.1, 4P.6.1, 4P.7.1, 4P.9.1, 4P.10.1, 5P.1.4, 5P.1.5, 5p.4.1, 5P.7.1, 5P.9.1,

Vocabulary: Solute, solvent, solution, mixtures, similar, liquid, length

Materials Provided: Containers of red & green paint powder, container of stamps, black magic markers, white card stock, and foam plates to be used as ‘palettes’ squeegee bottle, tsp. measuring set, plastic tablecloth to protect the desks.

Objective: To better understand solutions and mixtures, by creating a piece of art using the Piet Mondrian poster and the geometric style he popularized on the module walls as inspiration. Define and deepen understanding of solutions & density by experimenting with different strengths of paint and how it affects the work of art.

Instructions: Working in groups of 6-8 students in a workstation. Mix the red paint on one plate and the green paint on another. Follow instructions on the paint containers for suggested paint solution. Have the students begin designing their project by drawing several sections on a piece of cardstock very lightly in pencil with a ruler. Use the stamps provided to fill in some of the blocks, or the entire paper. Be creative with this project! The students can use very dense paint in some squares, less dense in other squares, or a combination. After the paint is completely dry – the students should use the black markers to outline the squares/rectangles, again using a ruler. Stamping blocks should be rinsed out in clear water before repacking.

Thank you!

Categorizing Energy Types – Renewable & Nonrenewable

Science SOL: 3.a-d, 4.2 a-d,

Vocabulary: Classification, renewable, nonrenewable, solar, light, energy, sunlight, water, wind, fossil fuels, coal, oil, natural gas, gasoline, electricity, force, work, motion, speed

Materials Provided: Worksheet template and answer key provided in Teacher's Manual.

Objective: To categorize the many kinds of energy into renewable or nonrenewable energy using the pictures on the green module panel.

Instructions: Have students identify the types of energy represented by the pictures on the flat panel of the green module wall. They should list the types of energy on the worksheet in the appropriate category – renewable or nonrenewable.

“From Trash to Art” Recycle Project

Project Parameters:

1. There are famous artists who have used recycled materials to produce artwork - Robert Rauschenberg is one, Louise Nevelson is another.
2. The theme for this project is “From Trash to Art”.
3. Each school may choose which ONE recycled material they would like to use to create a piece of art. Examples to choose from: paper towel tubes, soda can pop tops, plastic water bottles, rinsed milk cartons, magazines, newspaper, or choose your own! The entire piece of artwork should be out of one material.
4. Artwork may be 3-dimensional but should not exceed 4’x4’x4’ in size.
5. The PWCS’s Communication Dept. will photograph the completed artwork in the spring. The photos will be posted on the School Fusion site, and the Center for the Arts’ website.

Fulfills PWC Art SOL’s: 3P.4.1, 3P.12.1, 4P.4.1, 4P.12.1, 5P.4.1,

5P.12.1, P.15.1