Horizontal Lesson Planning

Terminal Objective (plan 1st)
Given information about electricity production, the students will identify traditional and alternative energy sources and explain their effect on the Earth system by correctly identifying the sources and listing the pros and cons of one traditional and two alternative sources on a teacher made test.

Content Standard Reference
Energy in the Earth System: 4b
Biogeochemical Cycles: 7b

Introduction (plan last)	**Body of Lesson (plan 2nd)**				
Anticipatory Set What is one of the biggest topics for environmentalists? Why is the greenhouse effect/global warming such a big issue? What causes these to happen? ↓	**Input →** **(content/strategy)** Vocabulary: energy source, natural resource, alternative, heat energy, chemical energy, mechanical energy, solar radiation, energy conversion Traditional sources Alternative sources	**Modeling →** List known energy sources, Define alternative (2 ways) Producing electricity: Hand crank generators, Steam through a funnel to turn a pinwheel Coal and fossil fuels Nuclear Hydropower Solar thermal Solar photovoltaic Wind Biomass Tidal Geothermal Natural gas	**Check for → Understanding** Non-volunteer sticks	**Guided Practice →** Build a glossary Cloze notes Diagram and label	**Closure** Rewrite the definition in your own words Quick write: electricity production through conversion of mechanical energy to electrical energy AND Conversion of chemical energy to heat energy to electrical energy
Objective **(as stated to students)** We are going to discuss electricity power production and identify alternative sources ↓					
Purpose to increase your awareness to the problems of society's increased usage of electricity and to gain an understanding that the sun is the source of the majority of energy on Earth					

Independent Practice
Write an opinion paper describing the problems of using fossil fuels to produce electricity and identify an alternative source with its pros and cons.

Brian Heese

Modesto High School

LESSON PLAN

Grade Level: 11-12

Curriculum: Advanced Physics: heat and heat transfer due to conduction

Key Concepts:

a. The difference between heat and temperature

b. The three possible ways heat (energy movement due to temperature differences) is transferred: Conduction, Convection, Radiation

c. Rate of Energy transfer due to Conduction:

$(Q/t)= kA (T_h – T_c)/L$

d. Different materials allow heat to pass through them at different rates. This idea is used in construction to minimize heat loss.

Instructional Strategies: Using demonstration materials, lecture and sample word problems, teacher will introduce and explain key concepts. Cooperative learning groups will complete similar problem solving examples. Students in lab groups will complete lab assessing heat loss rate through windows of classroom.

Objectives:

1. Students know that heat is a form of energy movement due to temperature differences.

2. Students understand that conduction is one way heat is transferred and is due to various materials with different temperatures in contact.

3. Students can identify the variables that determine rate of heat loss and their role in calculating the amount of heat loss.

4. Students can calculate the rate of heat loss through a material using the heat transfer due to conduction equation.

5. Students can identify materials that have low heat conductivity and those with a high conductivity.

Activities: Cooperative team problem solving will be used to help identify the variables involved with heat conduction and to put info together to calculate rate of heat loss due to conduction.

A lab will be completed by teams of students. “Heat Loss Through Classroom Windows”(see lab guide included) will have the students research materials and their conductivity; measure aspects of window/curtain thickness and area; and calculate the heat loss through the classroom windows during a school day in January.

Assessment: a. Study guide using student textbook involving: heat, temperature, conduction, convection, radiation, insulator, and conductor.

b. Word problems involving conduction

c. Lab Report following format given to students at the beginning of the year.

Products: See the attached Lab guide

Heat Transfer by Conduction

(Heat Loss Through Classroom Windows)

Purpose: To determine the amount of heat lost during an average January school day:

a. with curtains covering classroom windows

b. when curtains are open.

**Assume window area is all glass. Ignore the frames in-between windows.

**Assume curtains are flat and uniform.

**School day runs from 7 am to 3 pm and use the average temperature during those times of day during the month of January.

You will need to find the coefficient for Plexiglass and assume the curtains are vinyl.

The thermostat in classroom is set at 70 degrees for 1.2 m off of the floor.

Report should include:

Procedure

Data Collection

Data Analysis (show direct comparison with curtains closed and open)

Conclusion (make recommendations to help lower heat loss and save the school district some money!!!)

Steve Merenda
Enochs High School

Curriculum/Instructional Strategies: Students will be performing a lab in a science class.
Objectives: 1. Students will make and improve upon a rubber band powered car.
2. Students will observe,weigh, test, and evaluate each change made to the car to enhance speed.and list findings.
3. Students will compare and contrast their data and draw conclusions about their method for continuous improvement.

Activities – these are explained in the lesson step by step.
Assessment – Students formal lab write up will be graded and assessed for their data gathered and the presentation of their data and quality of discussion.
Products – The product is the lab write up and functioning car

Lesson Plan – Continuous Improvement Lab

Background Information:

Continuous Improvement model in business, education is of the greatest importance for advancement. By looking at every aspect of your subject matter you can analyze in detail the parts to the whole and seek to improve each part until the overall outcome is greatly enhanced. Students will research how the Continuous Improvement model is applied to automobile development.

Materials:

Rubber band
Plastic cup
Scissors
Construction paper
4 paperclips
Graph paper
card board
bamboo skewers
tape

Procedure:

1. Have each partner draw a design for a functioning vehicle from listed material.
2. Decide which design will work the best.
3. Build that design
4. Measure speed over a 1 meter distance.
5. Decide 1 modification to enhance speed and make that modification
6. Repeat step 4 and 5 until car is at maximum speed.
7. Have final race of the all group's final design.

Data Analysis:

1. As a class – discuss how this method improved your car's speed from start to finish.

2. Draw conclusions about your data, as well as how cost effective each change was to the overall speed to the car.

3. Write a discussion paragraph about your findings and how this method can be incorporated into other aspects of life

Bob Starling
Thomas Downey High School

Lesson plan

Strategies: Electricity can be generated and measured in different ways.

Objectives:

Students will use a variety of fruits and wires to produce a flow of electrons
Students will measure the amount of current and voltage using D.C. batteries
Students will measure the voltage and current of an electrical outlet using a volt meter

Activities:

Electricity using fruits lab
Electricity Lab: Series vs. Parallel wiring
Volt meter lab

Assessment:

Students will be given a Pre-test and Post-test covering electricity basics

Products

(Not produced yet)

key; SWBAT student will be able to , SW students will

Lesson topic: Mixtures/Solutions

Standards: S8.5d Physical Change
S8.9 b,e,f Investigation

Lesson Content Objectives:
SWBAT list the factors involved in the solubility of a substance.
SWBAT describe how concentration is measured.
SWBAT calculate the concentration of a salt solution.
SWBAT graph data.

Lesson Language objectives:
SW observes, discuss & make write conclusions about solubility of substances.
SW read & discusses the laboratory procedure.
SW record data.
SW discuss & write a summary of their results.

Civility & Character Development:
Students will work as a team to complete the activity in the time allotted. Students will communicate results to the team leader (Listen). Students will treat each other with respect & support each other to complete the task (Respect). Students will discuss results summarize their information as a team (Acknowledge others).

Day 1 (based on 45 minute class periods)
Content Objective:
SWBAT list the factors involved in the solubility of a substance.

Lesson Language objectives:
SW observe, discuss & make write conclusions about solubility of substances.
SW read & discuss the laboratory procedure.

Building Background:

"Why does it dissolve?" The teacher will demonstrate the solubility of several substances including detergent, salt, sugar, chalk, pepper, cornstarch using different techniques (stir, shake,) & temperatures.

Teams will discuss & list what increases solubility of substances & report back to the class.

Lesson topic: Mixtures/Solutions

Key vocabulary:

Mixture, solution, soluble, solvent, solute, insoluble.
Students will discuss the following terms in their teams. The team leader will record the meaning of each & when was it observed in the teacher's demonstrations. When the group is called upon the team leader will chose the team member to reply.

Assessment:

The students will use the following sentence stems:
In the demonstrations that I observed _____ was a mixture.
In the demonstrations that I observed _____ was a solution.
In the demonstrations that I observed _____ was a solvent.
In the demonstrations that I observed _____ was a solute.
In the demonstrations that I observed _____ was a soluble.
In the demonstrations that I observed _____ was an insoluble.

Practice/Application:

Hand out the Frito Lay lab activity. The students will read & discuss it in their team. The students will plan tomorrow activities.

Assessment:

The team leader will report to the class a summary of the activity & how the team will complete the task. The team can also ask for clarification of the laboratory procedure during this time.

Lesson topic: Mixtures/Solutions
Day 2 & 3 (based on 45 minute class periods)

Content Objectives:
SWBAT use the factors involved in the solubility of a substance to complete the lab.

Language objectives:
SW record data.

Build Background:

Review of yesterday's key vocabulary (pull sticks)

Practice/Application:

Frito Lay Chips Lab: Students will work as a team to complete the laboratory activity in the time allowed.

Lesson topic: Mixtures/Solutions
Day 4 (possibly 5) (based on 45 minute class periods)

Content Objectives:
SWBAT describe how concentration is measured.
SWBAT calculate the concentration of a salt solution.

Language objectives:
SWBAT graph data.
SW discuss & write a summary of their results.
SW present to the class.

Build Background:

Review Key vocabulary (sticks)
Discuss the previous day's lab procedure.

Key Vocabulary:

Concentration;
Students will turn to page 263 in the textbook & read the math skills section. Students will then use the whit boards to do the practice problems on the board.

Assessment:

Teacher will check the white boards.

Practice/Application.

Students will calculate the concentration of each of the lab samples. Students will graph the results and draw a best-fit line.
Students will answer the questions at the end of the activity.
Students will summarize the lab & draw conclusions about the samples.

Assessment:

Teams will present their lab results and conclusions to the class.

LESSON PLAN

Grade: 10

Content Area: Agriculture/Life Science

Content Standard:

BLS1. The fundamental life processes of plants and animals depend on a variety of chemical reactions that occur in specialized areas of the organism's cells. As a basis for understanding this concept:

a. Students know cells are enclosed within semipermeable membranes that regulate their interaction with their surroundings.

c. Students know how prokaryotic cells, eukaryotic cells (including those from plants and animals), and viruses differ in complexity and general structure.

Materials used: Small incubator, PowerPoint for Chapter 5.2 Mitosis (see attached), http://www.sites.ext.vt.edu/virtualfarm/poultry/poultry_development.html (video of chick development), "Chick Hatching" handout (class set)

1. **Anticipatory Set**
   Focus the learner: Show students incubator- group discussion lead by teacher. What is this? What is it used for? What is inside an egg? Why and how does a single cell grow into a complex organisms like a chicken? (Informal pre-assessment)
   Stating the objective: Today we are going to be learning about the process of MITOSIS, or cell division. Its how organisms grow and replace old cells.
   Setting a purpose for learning: Mitosis is the basis for understanding how organisms grow and develop; being able to see an egg grow from a single celled organism to a fully developed chick will allow us to see this process in action, and also give us an opportunity to practice our responsibility in caring and maintaining the ideal conditions for these chicks to develop.

2. **Instruction**
   Direct teaching: PowerPoint 5.2: Mitosis. Students take notes and participate in think-pair-share and checks for understanding.
   Modeling: Teacher demonstrates how to set up incubator and shows a fertilized egg that hasn't started developing.
   Checking for understanding: What are the 4 steps that occur during mitosis? What occurs during prophase? Metaphase? Anaphase? Telophase? What are the ideal conditions for this chick to start the process of cell growth and development?

3. **Guided Practice:** Students prepare incubator and investigate fertilized egg; students create a flip book for mitosis.

4. **Closure/Evaluation/Assessment:** "Out the door" quiz- students write responses to the following questions on a half slip of paper so teacher can assess knowledge before next class period. "What are the 4 stages of mitosis?" "What is mitosis?" "How long does it take a chick to grow from a single cell to a fully developed organism?"

5. **Notes:** This will be an ongoing class project; students will assist with maintaining conditions and looking at developing eggs as the process continues. Teacher will also tie in poultry industry/hatchery experience, and discuss work ethic and responsibility while working with students on incubator.

Lesson Plan

Grade Level: 7th

Curriculum: Life Science: reproduction in seed plants.

Key Concepts:

a. What are the characteristics of seed plants and how do they reproduce?

b. What are the structures by which flowering plants generate pollen, ovules, seeds and fruit.

Instructional Strategies:

Teacher will introduce and explain key concepts using flower parts model, lecture and workbook and textbook pages. Students will work in pairs to complete flower dissection lab.

Objective:

1. Students identify the parts of a flower.

2. Students will understand the functions of the reproductive parts of a plant.

3. Students will understand the difference between sexual reproduction and asexual reproduction in plants.

Activities:

Students will draw and color flower parts and functions. Using hand lens, they will also look at various flowering plants and identify reproductive parts. A lab will be completed by pairs of students in which they dissect a flower and label the parts and functions.

Assessment

a. Study guide using student texbook
b. lab sheet with flower dissection correctly labeled and diagramed.

Products: none

Life Science

Volumetric Measurement

Context:

A. **How does this lesson fit into the unit: how is it related to yesterday's lesson and tomorrow's lesson**? This lesson will be taught in the middle of the metric system unit.
B. **Why is this lesson worth teaching**? It's important for students to learn to use the metric system because it is important at every level and area of science. The skills learned in the metric system will also help them in their mathematics courses as well.
C. **What teaching methods will you use? Why**? Notes, Lecture, Example, Pair Skills Activity.

Standards: California Standards for the Teaching Profession. a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.

Lesson Objectives: 1. Students will demonstrate their knowledge of the metric system by making correct conversions in a variety of volumetric measurements. 2. Students will demonstrate their knowledge of lab skills by correctly measuring volumes using pipets and graduated cylinders.

Materials: PowerPoint, Beakers, Pipets, Graduated Cylinders.

Lesson Outline:

Anticipatory Set: Students will complete a warm-up that refreshes them on the metric system we have been studying in days previous. The warm-up will include simple conversions within the metric system.

Objective: Read the objective.

Teach: I will use slides 7 through 10 of the attached PowerPoint to teach the students, as they take notes, about volume measurements. I will include the attached pictures of my internship experience as examples of why learning the metric system will serve them well in the future. I will also explain all of the other positions that I learned about the need to use the metric system other than lab personnel.

Guided Practice: I will demonstrate for them how to use a graduated cylinder and how to read the volume using the meniscus. I will then show them how to use a pipet and how to convert units of volume within the metric system.

Directions: I will explain the directions of the activity and how they are trying to finish all conversions and measurements correctly to obtain a desired, and secret, end volume. (Volume sheet not attached because it will be different for each class and changed often)

Activity: During the activity the students, working in pairs, will be given instructions on volumes of liquid to take from one container to another. The instructions need to be converted to the units on the equipment they are using. They will have to make correct conversions, follow directions, and make correct measurements. They will demonstrate their knowledge of the metric system and volumetric measurements by ending up with the desired volume in the final container.

Independent Practice: The independent practice is part of the activity. They will be given different sets of instructions that lead to different end volumes so that students who need assistance can have more than one try. (Also working in pairs should cut down on students making large mistakes)

Closure: I always try to remind them how easy and useful the metric system is and how good they are at it. This is a learning activity, which is also meant to build confidence in their abilities within a new system.

Assessment: Students will be rewarded with a small number of points for ending with the correct volume in each of the trials. After finishing the metric system unit we will have a quiz on conversions which will include the volume conversions.

Marilyn Toscano
Beyer High School
San Joaquin Valley Air Pollution Control Board
SPIE Educator Internship Lesson Plan

Ozone: Invisible Killer

This lesson is designed for the high school science student in a Chemistry class as an extension to a unit on Gases. It could also be incorporated in an Earth Science class as part of a Meteorology unit.

I. Objectives

a) Students will know what ozone is, how it is formed, and why it presents a health risk (**Post-Test**).
b) Students will collect and analyze local ozone data for daily and seasonal changes (**Modesto Ozone Data Collection and Analysis** Activity).
c) Students will identify ways they can reduce ozone emissions (**Keeping my Air Cleaner** Activity).

II. Strategies/Methods

a) Teacher-led general discussion about local air quality conditions, and impact of air pollution on health.
b) Self-assessment. Students take **Ozone Pre-Test** individually to assess what they already know about ozone.
c) Reading for information. Students gather information about ozone from internet website "Air Quality Guide for Ozone" http://www.airnow.gov/index.cfm?action=pubs.aqiguideozone
d) Data collection and analysis. Students record and analyze scientific data from internet website "Healthy Air Living" http://www.healthyairliving.com/ and complete **Modesto Ozone Data Collection and Analysis** Activity.
e) Group discussion/brainstorming (**Keeping the Air Cleaner** Activity)
f) Self-assessment. Students take **Ozone Post-Test** individually to assess what they now know about ozone.

III. **Activities/Materials/Assessment** – see a, b, d below

a) **Ozone Pre-test**

b) **Modesto Ozone Data Collection and Analysis** (RAAN)

c) Keeping the Air Cleaner - divide students into small groups and have them brainstorm 10 things they or their family can do to reduce ozone levels. Share lists with the class and make a list of all practical ideas.

d) Ozone Post-Test (students retake Pre-Test)

Ozone Pre-Test/Post-Test

Answer the following, true (T) or false (F):

1. Ozone looks like black smoke coming from car exhausts. T F
2. Ozone gas is always bad for us, no matter where it's found. T F
3. Naturally occurring ozone high in the stratosphere shields us from the sun's ultraviolet rays. T F
4. When found at ground level, ozone is harmful to our health. T F
5. Ozone levels are higher on cold days versus warm days. T F
6. Ozone levels are higher in urban areas versus rural areas. T F
7. Persons living in rural areas do not have to be concerned with ozone pollution. T F
8. Driving a car, painting your house and mowing your lawn can all contribute to increased ozone levels. T F
9. When putting gasoline in your car, it is a good idea to continue to pump gas even after the pump shuts off the first time (topping off). T F
10. An increase in ozone levels leads to an increase in asthma attacks. T F

Answers

1. F – ozone is a colorless gas.
2. F – ozone is only bad for us when it's formed on the ground. See #3.
3. T
4. T – leads to lung and respiratory disease, can cause premature death
5. F – sunlight is necessary for formation of ozone, so higher on sunny day
6. T – more vehicles, industry, etc. to release emissions in urban areas
7. F – winds can carry ozone from urban areas to rural areas

8. T – all these activities can lead to emissions of VOCs (volatile organic compounds) and NOx (nitrogen oxides) that combine in sunlight to form ozone
9. F - increases emissions, see #8
10. T

Modesto Ozone Data Collection and Analysis (RAAN)

Directions:

a) Go to website: http://www.healthyairliving.com/. Click on sidebar link: **RAAN** (Real-time Air Advisory Network).

b) Under Stanislaus County, click on **Modesto**.

c) Complete the following:

I. Current Ozone Conditions

1. Today's date and current time _____
2. Current season (winter, spring, summer, fall) _____
3. Current ozone (O3) levels _____ppb
4. Current ROAR level: 1 2 3 4 5 Current Health Precautions:

   _____
5. ROAR Forecast for Day: 1 2 3 4 5
6. Look at wind direction map. What direction are winds currently blowing in San Joaquin Valley? _____

II. Daily Ozone Levels

1. On calendar, select yesterday's date to analyze 24 hours of data.
2. Yesterday's low Ozone level/time _____ppb _____
3. Yesterday's high Ozone level/time _____ppb _____
4. Describe the trends for the day. Ozone levels rose from _____ to _____ and fell from _____ to _____. The reason for this trend is that ozone formation requires the presence of _____.

III. Seasonal Ozone Levels - use the calendar to select 1/15, 4/15, 7/15, 10/15 from the previous year.

1. Complete the data table.

	Winter 1/15/____	Spring 4/15/____	Summer 7/15/____	Fall 10/15/___
Low Ozone Level (ppb)				
High Ozone Level (ppb)				

2. The season with the lowest ozone level is _____ and the season with the highest ozone level is _____. The reason for this trend is because ozone formation requires _____.

IV. Conclusion

Daily ozone levels are the highest during the _____ and seasonal ozone levels are the highest in _____ making _____, _____ days the worst in terms of air quality.

SPIE Lesson Plan for Dave Menshew, Enochs High School

Curricular Area: Science

Subtopic: Biology

Standards addressed: Biology Physiology 9. As a result of the coordinated structures and functions of organ systems, the internal environment of the human body remains relatively stable (homeostatic) despite changes in the outside environment. As a basis for understanding this concept:

a. Students know how the complementary activity of major body systems provides cells with oxygen and nutrients and removes toxic waste products such as carbon dioxide.

Learning Objective: Students will be able to explain the complementary activity of two major body systems with examples of what happens when that activity is disrupted.

Into: Students will view a brief segment of the TV show CSI to engage the learners, followed by released photos of actual wounds suffered by victims of crimes (edited for age and grade appropriateness). Class will discuss the concept of homeostasis as it relates to maintaining life.

Through: Students will make a list of needs of a body to live. Emphasis will be made on guiding them to respiratory and circulatory systems. Inflow and outgo will charted, drawings will be made of both systems, and additional emphasis will be made on the complementary activity of each system. Students will learn all parts, performance, and pathways of each. Hands on lab activity will focus on teaching above.

Beyond: Students will deliver all lab write-ups. 75% will take and successfully score 75% or better on a teacher created measure (quiz) of concept knowledge. (Later, students will take a district benchmark on physiology covering additional concepts.

Educator Internship Program
Stanislaus Partners in Education – SPIE

Lesson Plan
Curriculum/Instructional Strategies:
This lesson will focus on a career in veterinary medicine. The day preceding this particular lesson, the students will watch a 15 minute video on "Career in Veterinary Medicine", so they have some prior knowledge.

Objectives:
- list educational requirements for veterinarian & veterinary assistant
- list temperature, heart rate, & breathing rate for horses
- count &/or record your respiration, temperature, & heart rate

Activities: this lesson will be conducted using stations
- list educational requirements & duties for a veterinarian
- list temperature, heart rate, & respiration for horses, draw tools used
- take your temperature using a forehead thermometer
- listen, count, & write your respiration
- count & write your heart rate
- (there will be information & directions @ each table/station)
- (students will predict their own heart rate & breathing rate)

Assessment:
- students will complete a packet based on the 5 activities for this lesson
- students will design & illustrate a small poster writing/typing information from stations

Product:
- worksheet
-

Career in Veterinary Medicine
(Stations)

Stations

1) college education requirement & courses for veterinarian

_____

_____

2) list temperature, heart rate, & respiration for horses, along w/ tools used

temp: _____ HR: _____ resp: _____

temperature	Heart rate	Respiration rate

3) take your temperature & those @ your group by using a forehead thermometer: _____, _____, _____, _____

4) listen to & count yours respiration & those @ your group: (count for 30 secs, x 2)

prediction - _____ actual - _____

5) count your heartbeats & those in your group: (count for 30 secs, x 2)

_____, _____, _____, _____

Career in Veterinary Medicine

(Career poster)

Students will lay out information gathered from the stations lesson and design a 9”x12” poster stating the information. They will also measure & draw a 1 centimeter border around the poster border.

SPIE Executive summary

1. People and location
Intern: Derek Madden
School: Modesto Junior College
Intern site: Memorial Medical Center
Intern site supervisor: Carla Mensonides, RN

4. Lesson plan

- The lesson plan that I produced is really interesting to me because I have never attempted something like this. I have produced a laboratory activity where students study parts of the brain (not so interesting). The cool activity is that students will do an initial assessment on each other in a simulation of an emergency situation.

-Objectives. Students will be able to:

a. conduct an emergency initial assessment on a patient

b. conduct blood pressure measurement at two locations on their patient

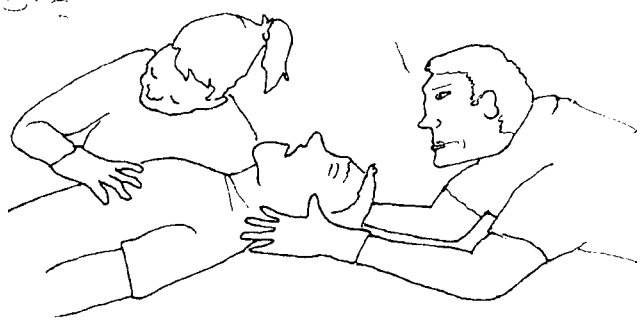
c. perform an assessment in a partnership situation

- Activities will provide a supervised situation that prepares students for dealing with an emergency trauma victim; a situation that can happen in any place and time in their lives.
- Assessments will involve both a student generated lab report, and the initial emergency assessment activity will also be graded according to a rubric that matches the items on the lab activity that is attached to this form.
- Product for this phase of the internship is a two page document that is included (the document is title Nervous system 3).

Derek Hulden [illegible]

19. Nervous system 3

Initial assessment of trauma victim



Trauma may cause a spinal cord injury. Hold the patient's head in line with the spine (head facing forward and not tilted in any direction), spreading fingers around the sides of the head to hold it steady.

A. Respiratory rate

Adequate breaths/minute:
Adults = 12-20
Child = 15-30
Infant = 25-50

I made this lab as a result of the memorial site. My drawings are not good.

B. Breathing

Rhythm: Regular = each breath lasts for about the same length of time
Quality: normal, shallow, labored, or noisy

Wheezes or stridor

High-pitched sounds caused by a narrowed air passage. May indicate asthma, infection or partial obstruction of airway.

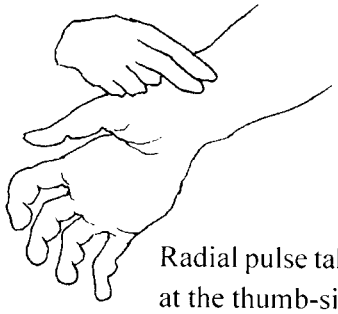
Crackles
Fine crackling or bubbling sounds hear upon inspiration, often caused by fluid in the lungs.

Rhonchi
Low-pitched sounds that resemble snoring or rattling may indicate pneumonia or materials aspirated into the lungs.

For today's lab use stethoscope just below the clavicle bones

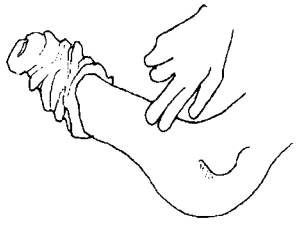
C. Circulation

Adequate pulse
Rate/minute:
Adults = 60-100, Adolescent = 70-110, Infant = 80-140
Bradycardia = slower than adequate
Tachycardia = faster than adequate



Radial pulse taken at the thumb-side of the wrist.

Pulse quality
Regular = intervals between heart beats are constant
Irregular = invervals between beats are not constant.
Thready = weak pulse
Cardiac arrest = no pulse



Dorsalis pedis pulse taken at the top of the foot (roll down sock part way).

Skin temperature (use back of hand)
Categories: Cool, Cold, Warm, Moist, Dry, Hot

Capillary refill (patients under 6)
Pess on nail bed and count how long it takes for color to return.

AP ENVIRONMENTAL SCIENCE
WATER QUALITY LESSON PLAN

Objectives

- Students will demonstrate an understanding of the process of wastewater treatment
- Students will demonstrate accurate measuring skills
- Students will complete a full analysis of the data generated during this lesson.

Time To Complete

- 2 classroom periods plus one after school field trip to the water treatment facility.

Equipment

- BOD_5 test kit
- Dissolved Oxygen/Temperature gauge
- Nephelometer

Lesson Specific Vocabulary

Influent	Sludge	Saprophytes
Effluent	Percolation	Skatole (C_9H_9N)
BOD	Composting	Indole (C_8H_7N)
DO	Biosolids	Hydrogen Sulfide (H_2S)
Activated Sludge	Aerator	Primary Treatment
Sequential Batch Reactor	Aerobic	Secondary Treatment
Potable Water	Anaerobic	Hydraulic Loading
Population Equivalent	Oxidation	Organic Loading
Receiving Water	Reduction	Turbidity
Digester/Clarifier	Electrical Conductivity	Headworks

Lab Procedure

- Students will sample water from 6 sites at the Hughson Wastewater Treatment Facility: Headworks, CML 1, PSL 1, Percolation Pond, Tuolumne River (upstream from plant), Tuolumne River (downstream from plant)
- Students will test the water at each site for the following variables: BOD, DO, and Turbidity.
- Students will chart the results of all 18 measurements
- Students will plot the three measured variables for each location on a graph to compare all 18 measurements

Assessments

1. Quiz on the understanding of lesson vocabulary.
2. Water treatment and delivery concepts tested during unit on Natural Resources
3. Lab output (charts, graphs, summaries) graded according to normal grading procedures.

Mini Ag Plant Science Propagation Project

Curriculum Strategies/Project Description:

The mini project focuses on the propagation or the re-growing of a plant, important to our valley or local farming economy. Students will use various reading skills, speaking, listening and writing skills. Students may research any specific kind of locally grown produce, flower, or agriculturally beneficial crop such as:
corn, rice, olives, walnuts, almonds, hollyhocks, sunflowers, peach, apples, tomatoes, tomatillos, sweet peas, green beans, pinto beans, cantaloupe, watermelon, coriander/cilantro, oregano, bell pepper, jalapeño pepper, zucchini, alfalfa, hay, black-eyed peas, lemons, oranges, apricots, cucumbers, oats, roses, strawberries, oak trees, ash trees, pine trees, lamb's ear, succulents, or goose neck squash or pumpkins.

Objectives:

1. Students will research and identify the scientific name for their chosen plant variety
2. Students will analyze and explain at least four steps in the propagation of their chosen plant
3. Students will synthesize detailed description of the propagation process in a paragraph of at least 8 sentences
4. Students will create a picture representation of the propagation steps of their selected plant variety with a minimum of four colored pictures to be drawn and colored by hand. Students will also include a picture serving as a close up depiction of the fruit with seed and or part that facilitates the propagation process.
5. Students will synthesize the information from objectives 1-4 into a 3 minute oral presentation.

Activities/Teacher Ideas:

1. Objective 1
   Students will get one day in the library or computer lab to research their chosen plant's scientific (Latin) name and the propagation steps. A partial list of plants has been provided, but the teacher should provide additional plants, so every student has a different one. It is advisable that students print the necessary informational pages, so as to ensure that students that need additional reading or processing time may have it accessible to them.

2. Objective 2 &3
   Once students have copies of their article/information pages, they should use the data to identify, in their own words, the process the plant goes through to be reproduced in four stages. They should also synthesize the process in their own words, into an 8 sentence paragraph. Teachers please note: Many plants (such as peach, apricot, lemon and orange trees) can be reproduced by other than seeds. Grafting is one way farmers use to reproduce certain trees. The Gum Plant (an ornamental plant grown in California) can be reproduced by using just its leaves. Articles about such propagation techniques will not only enhance the lesson for your students, but provide additional informational material necessary under the new Core Standards.

3. Objective 4

For the pictures of propagation, students should clearly identify four stages (ex. seed, seedling/sprout, young plant, mature plant). Flowers or trees should also include four or more stages. Students must also include a picture with the seed in fruit or plant part that facilitates the propagations process (ex. acorn, seed pod, bulb, etc.)

4. Objective 5

Students may share their information in various ways. They may share in small groups, to whole class, or as part of teams. The teacher may best decide the most beneficial audience format for his/her students.

Assessments:

If the mini project is in collaboration with a larger biology or ag science chapter and/or lesson, a pre-test may include a review of vocabulary words and/ or concepts covered previously in science.

If the mini project is being used as a "stand alone" informational lesson prior to or at the conclusion of a literary piece, a pre-test may include the following question:

1. What are four stages plants go through in propagation?

Post-Assessments include the written and oral pieces of the mini-project

Products:

The pictures of the four propagation stages and written paragraph constitute the products of this mini project.

Lesson Plan Photosynthesis and Incorporating Internship Material

Standard- Cell biology 1f- students know usable energy is captured from sunlight by chloroplast and is stored through the synthesis of sugar from carbon dioxide

Content Objective - Students will be able to accurately describe the how photosynthesis works and provide three examples from local grape growing methods.

Learning Objective- students will write notes from power point, discuss with partners, listen to lesson, draw photosynthesis picture

Pre lesson- describe in own words the process of energy production in plants

Lesson- introductory discussion about internship and mechanisms to increase sugar yield in grapes, tie into lesson short discussion

-power point 9.2, and cloze notes (see attachments). Stop to allow for student discussion every five minutes. Add slides from internship.

-student re-write the lesson in their own words and exchange with a partner.

-random calling on students to answer lesson questions.

Colored pencils – draw photosynthesis process.

Post lesson-video on grape production (seven minutes) write three observations as ticket out the door

Lesson Plan

Grade Level: Freshmen
Subject: Earth Science
Duration: 5 days
Prior Knowledge: carbon cycle, energy budget, conversions

Earth Science Standard(s):
4a. Students know the relative amount of incoming solar energy compared with Earth's internal energy and the energy used by society.
7b. Students know the global carbon cycle: the different physical and chemical forms of carbon in atmosphere, oceans, biomass, fossil fuels, and the movement of carbon among these reservoirs.
7c. Students know the movement of matter among reservoirs is driven by Earth's internal and external sources of energy.
IE.1m. Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of animals by somatic cell nuclear transfer, choice decisions in California.

Objective(s):
1. Students will know the difference between nonrenewable and renewable energy resources when asked to identify different types of energy.
2. Students are able to create a path of energy using a circuit board and mechanical generator and measure energy using a watt meter.
3. Students will work together to balance net energy using concepts of Energy budget.
4. Students will find ways to conserve energy by testing variables and using a watt meter.

Materials
1. Circuit board
2. Wires
3. Wire cutters
4. Safety goggles
5. Average Energy Use Worksheet
6. Data table (created from template)
7. Watt Meter
8. Various light bulbs
9. Mechanical generator
10. Calculators

Activities
1. **Anticipatory Set**
   a. In groups, students will make a list of all the types of energy sources they know.
   b. As a class, we will make a master list of energy sources that we will later categorize.
2. **Providing Information/Instruction**
   a. Provide examples of renewable and nonrenewable resources as well as an explanation of the two.
   b. Use think-pair-share and random selection, students will categorize the list of energy sources as either renewable or nonrenewable. (Guided Practice "a" to follow)
   c. Provide insight on the utilities business from experience using photos and video collected. (Guided Practice "b-g")
3. **Guided Practice**
   a. Students will work in pairs as they move through stations. Stations will have various products (coal, water, fan) that represent energy. Students will then label the products as renewable or nonrenewable.

b. Students will work in lab groups to connect a light socket, and switch to a mechanical generator (hand crank or bike).
c. Using a watt meter, students will measure the amount of energy they generate from the generator.
d. In groups, students will make a list of household items they have in their house. Using this information, students will use average watt use to measure the total number of watts it will take to power their group's house. There should be several "homes" in the class (each group).
e. Students will then have to calculate the number of watts their "plant" needs to generate to support the classroom load. Students will use their knowledge of the balance of generation to load.
f. Students will calculate a monthly energy bill for each simulated household from current cost of kilowatt hours and usage.
g. Students will test various light bulbs using the circuit they previously created to find ways to save their household energy. Students will find other ways to save energy through research (adding solar, energy efficient appliances, etc.)

4. Closure

a. Students will share their thoughts on the utilities business as we simulated it in class.
b. Students will debate the benefits of energy conservation.
c. Students will debate the pros and cons of various energy sources.

5. Independent Practice

a. Students will take home a watts meter and test energy usage of a variety of common household items.
b. Students will calculate the cost to run each household product based on average usage.
c. Students will make a list of ways to reduce their energy consumption and provide savings based on conservation.

6. Assessments

a. Checking for understanding using random selection, asking questions during activity.
b. Students will turn in a written laboratory report including a written analysis from the lab.
c. Students will turn in a post-lab as explained under independent practice.