



ALTERNATIVE ENERGY

Name: _____ Rotation #: _____ Hour Code: _____ Date: _____

Name: _____

LESSON 1

As you do the Exercise "CALCULATING POTENTIAL ENERGY", also put your answers in the spaces below:

1. _____ foot pounds 2. _____ foot pounds 3. _____ foot pounds

LIST ARGUMENTS FOR OR AGAINST NUCLEAR POWER.

1. _____
2. _____
3. _____

LESSON 2- ELECTROSCOPE ACTIVITY

Define Static Electricity - _____

Circle which items the balloon was attracted to? the Wall the Pith Balls the Metal leaves

Describe why the balloon should have been attracted to the three objects?

LESSON 3 - LIGHT INTENSITY EXPERIMENT

Show the worksheet to the instructor.

Completed Worksheet: _____

LESSON 4

"LESSON 4 SOLAR CELL ACTIVITY DATA SHEET"

Completed Worksheet: _____

"LESSON 4: ACTIVE SOLAR SYSTEM DATA WORKSHEET"

Completed Worksheet: _____

Explain the Active Solar System Experiment to the instructor.

Instructor's Initials: _____

Environmental Impacts Response – on a separate sheet of paper, write a response to this question.

- How do the environmental impacts you just learned about effect your community?

LESSON 5: WIND ENERGY

Instructor's Initials: _____

LESSON 6- On a separate sheet of paper, write a paragraph: Which alternative energy resource would be best for the Saline area? Why?

Instructor's Initials: _____

LESSON 7 - On a separate sheet of paper, write a paragraph: What is Biomass and why is it an important Alternative Energy? How can it be used to produce Energy?

Instructor's Initials: _____

Career Research

What career do your interests place you into the "Bio-Related" field?

ALTERNATIVE ENERGY “NOTES”

Take notes while at this module!

Equipment- Ask instructor for specific equipment / materials needed in each lesson.

LESSON 1

Exercise: CALCULATING POTENTIAL ENERGY - Put your answers on the worksheet.

LESSON 2

ELECTROSCOPE ACTIVITY-get the materials from the instructor. Do the activity and complete the questions on the packet. The balloon does not always stick to the Wall.

LESSON 3- *You will not cook today. **Skip this part of the lesson.***

The METER may not stop on one number; just write the average of the numbers that are flashing.

"LESSON 3: ACTIVITY DATA SHEET". Have the instructor check the worksheet. You will turn this in at the end of the module.

LESSON 4-

“LESSON 4 SOLAR CELL ACTIVITY DATA SHEET”- Skip the part of the experiment in Lesson 4 that is the same as Lesson 3.. Then do the part on the Solar cell and the DC Motor.

Plug the solar cell into the motor ports (holes). The DC Motor is to the left of the Multi-meter. IT WON’T WORK (none) in the first 6 positions. You may have to give spin the fan to get it to start spinning.

“ACTIVE SOLAR SYSTEM DATA SHEET”-**Do not adjust the flow meter so the ball floats to the top.** The air is already out of the system.

Fill out: "LESSON 4: ACTIVE SOLAR SYSTEM DATA WORKSHEET". Show the worksheets to the instructor and explain what you did. Get instructors initials.

LESSON 5- WIND ENERGY

Ask the instructor for the “Wind Energy” equipment setup

The METER may not stop on one number; just write the average of the numbers that are flashing. Fill out the “WIND ENERGY ACTIVITY DATA SHEET” including the two “Other” angles you need to set the blades to on the wind turbine to. Set them to 45 and 75 degrees. These are half way (one click) between the other numbers on the dial. Turn in the worksheets with your grade sheet when done.

LESSON 6- HYDROELECTRIC ENERGY

On a separate sheet of paper, explain which Alternative Energy would be the best to use to create electrical power for “OUR” school / community. Take into consideration the three items discussed in this lesson.

LESSON 7- BIOMASS AND GEOTHERMAL ENERGY

LESSON 3- LIGHT INTENSITY EXPERIMENT

Note: you will use these answers in the first part of the next lesson. You do not need to do the experiment all over again in Lesson 4. Use the space to the right of the table to convert the Light intensity into LUX

Location of Light Adapter/ Meter	Room Light Intensity (mV)	Room Light Intensity Converted to LUX
Sun Lamp OFF		
1. Hold Light Adapter in Your Hand and Point it Straight UP		
2. Hold the Light Adapter in your hand and Point it DOWN		
3. Put Light Adapter in front and to the left of the "Collector" on the Trainer		
4. Put the Light Adapter in the center of the "Collector"		
Sun Lamp ON		
1. Hold Light Adapter in your hand and Point it Straight UP		
2. Hold Light Adapter in Your hand and Point it DOWN		
3. Put Light Adapter in front and to the Left of the "Collector". Set the meter to 50,000. For this one and the next one.		
4. Put the Light Adapter in the center of the "Collector".		

LESSON 4- ACTIVITY DATA SHEET

In lesson 4 you need to do the Solar Panel (ask instructor for equipment) and the DC Motor experiment on the Trainer. Please follow the “sticky notes” in the lesson to understand the changes made to this experiment.

Location of Light Adapter/ Meter	Solar Panel (Solar Cell) measured in Volts	DC Motor on the Trainer record the speed of the motor (none, slow, medium, or fast)
Sun Lamp OFF		
1. Hold Light Adapter in Your Hand and Point it Straight UP		
2. Hold the Light Adapter in your hand and Point it DOWN		
3. Put Light Adapter in front and to the left of the “Collector” on the Trainer		
4. Put the Light Adapter in the center of the “Collector”		
Sun Lamp ON		
1. Hold Light Adapter in your hand and Point it Straight UP		
2. Hold Light Adapter in Your hand and Point it DOWN		
3. Put Light Adapter in front and to the Left of the “Collector”. Set the meter to 50,000. For this one and the next one.		
4. Put the Light Adapter in the center of the “Collector”.		

LESSON 4- ACTIVE SOLAR SYSTEM DATA SHEET-

Using the Water Tank, Water Pump, Collector and Heater Coil.

Do not adjust the flow meter! It should be set at 400. You might pull it out and get water all over. It's a big mess YOU will have to clean up. Please don't touch.

You need to take readings for at least **12 minutes** taking readings every two minutes. If you run out of time before you finish, you need to start over again tomorrow. Take your initial readings, then each time you take a reading you will press the red button on the trainer and **take all four readings at one time for: Collector in, Collector out, Heater Out, and Water Tank.** This activity does not take 48 minutes!

(Make sure you understand this before starting the activity. Ask instructor if unclear of these procedures.)

Selection	Temperature Readings						
	TIMED INTERVALS (MINUTES)						
	Initial Reading	2	4	6	8	10	12
COLLECTOR IN							
COLLECTOR OUT/ HEATER IN							
HEATER OUT							
WATER TANK							

Write a paragraph that describes what was happening in the **entire water "System"** you were using for this experiment.

LESSON 5 WIND ENERGY ACTIVITY DATA SHEET

In the first column set the box fan to the low speed, and then use the anemometer to measure the wind speed. Do the same for medium and high speed on the fan.

Next, set the wind turbine on the table about 1 & ½ feet in front of the box fan. Use a ruler if needed.

Measure the voltage at all three-wind speeds (low, medium and high).

Also set the angle of the blades on the wind turbine to 15 and 75 degrees. Put these angles in the “**OTHER**” columns, #1 &2. **Find the angle where you get the most voltage or power and write the angle on the blank space, _____.**

Fan Speed	Wind Speed	Wind Turbine Output				Other	Other #2
		0	30	60	90		
LOW (1)							
MEDIUM (2)							
HIGH (3)							