Career Development & Occupational Studies

PART II.5

Complex D.C. Circuits 2

Adopt an HIV / AIDS Family 8

Machine Trades Unit 13

Forest Evaluation and Tree Inventory 20

NOTE: This document is a work in progress. Parts II and III, in particular, are in need of further development, and we invite the submission of additional learning experiences and local performance tasks for these sections. Inquiries regarding submission of materials should be directed to: The Career Development & Occupational Studies Resource Guide, Room 681 EBA, New York State Education Department, Albany, NY 12234 (tel. 518-474-5922).

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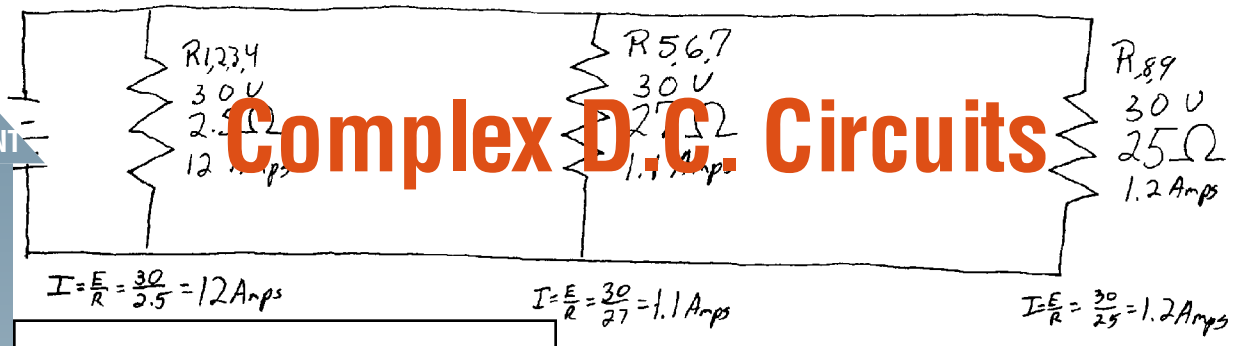
COMMENCEMENT

Standards & Performance Indicators

Complex D.C. Circuits



CDOS 3a

- ▲ engineering technology
- ▲ meet industry need

William Angeloro

BOCES Western Suffolk

Wilson Tech

885 Broadhollow Road

Farmingdale, NY 11735

(516) 752-1957

Grades 11 & 12

This lesson was presented to a class who already knew that remediation is available on request. The program that I teach employs teachers that will work with the students who need remediation on a one-to-one basis. If this lesson is used by a teacher who does not have on-sight remediation, the class must be advised of this and other arrangements made.

Paper for schematic, worksheet, and pencils (Task cannot be accomplished in ink.)

What Students Need to Know:

I. Circuit structure and configuration, properties of conductors, and power source and resistors

II. The application of Ohm's Law and Kirchhoff's Law related to voltage, current, and resistance in a complex circuit

III. Methods used to create an equivalent circuit used to solve a complex D.C. circuit.

What Students Do:

I. Use Ohm's Law and Kirchhoff's Law to determine voltage and current resistance in a complex D.C. circuit

II. Demonstrate conversion of a complex circuit to an equivalent circuit

III. After complex circuit is solved, the student will change circuit values (selected by the teacher) and recalculate the circuit for new solution. Student will report how changes affect the entire circuit.

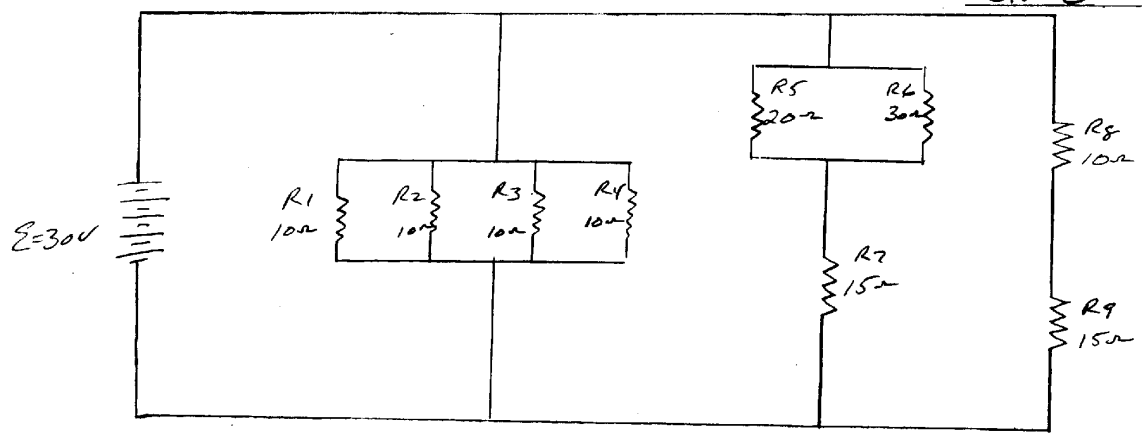
IV. Construct a schematic design using values supplied by the teacher. Construct an equivalent schematic diagram from the original with all new values or equivalent values. Atotal of two schematics and two equivalent diagrams are to be prepared along with all worksheets.

What the Teacher Does:

I. Assign the values to be used in both complex circuits (original and modified).

II. Provide remediation in an effort to bring all students up to the same level.

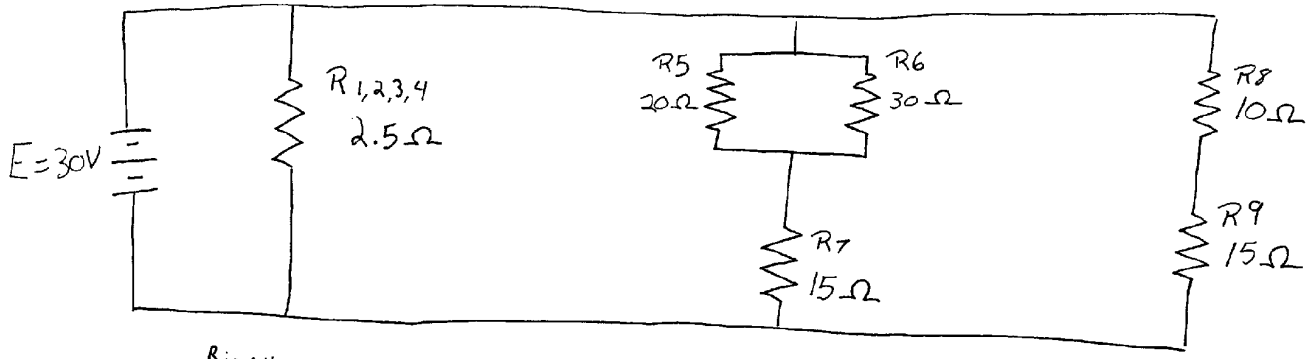
NAME _____ Circuit #1 DATE _____



Find

	Volts	Amps	Power
R1	30V	3.0A	90W
R2	30V	3.0A	90W
R3	30V	3.0A	90W
R4	30V	3.0A	90W
R5	13.5V	.68A	9.2W
R6	13.5V	.45A	6.1W
R7	16.5V	1.1A	18.2W
R8	12V	1.2A	14.4W
R9	18V	1.2A	21.6
10	R_T=2.1Ω	I_T=14.3A	P_T= 429.5

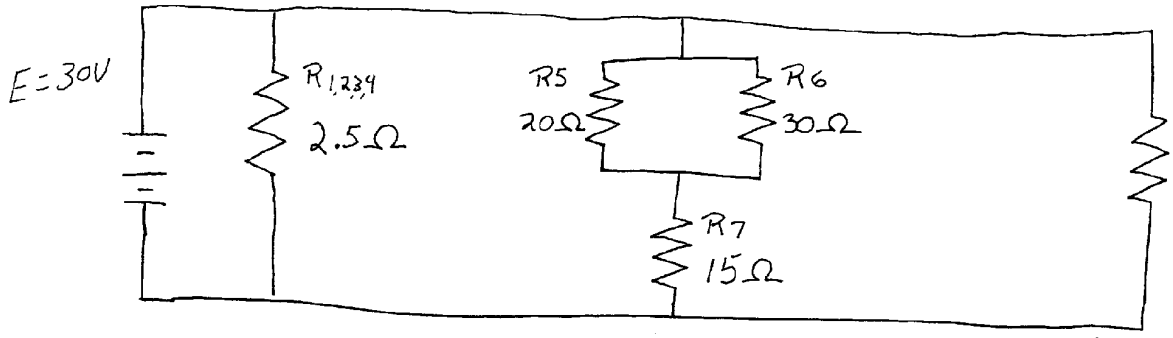
Find RT Step 1



$R_{1,2,3,4}$

$R_p = \frac{R}{N} = \frac{10}{4} = 2.5\Omega$

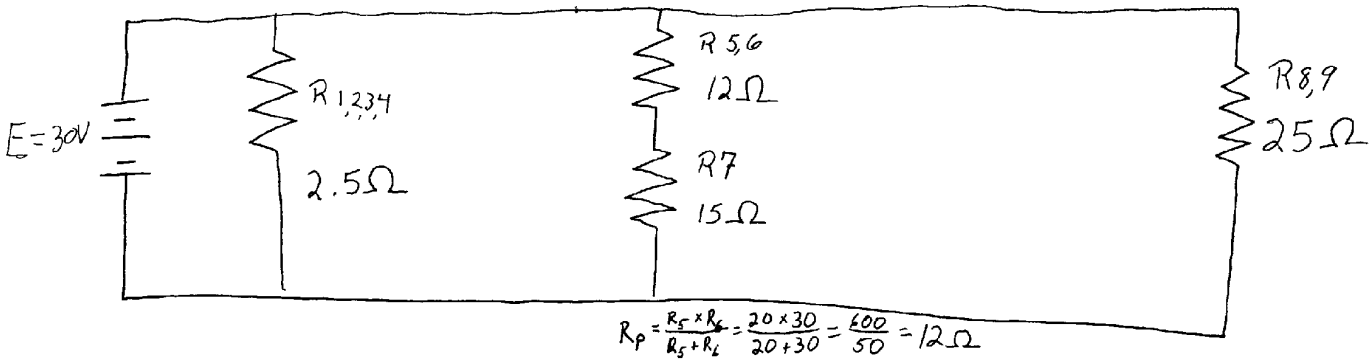
Step 2



$R_S = R_8 + R_9 = 10 + 15 = 25\Omega$

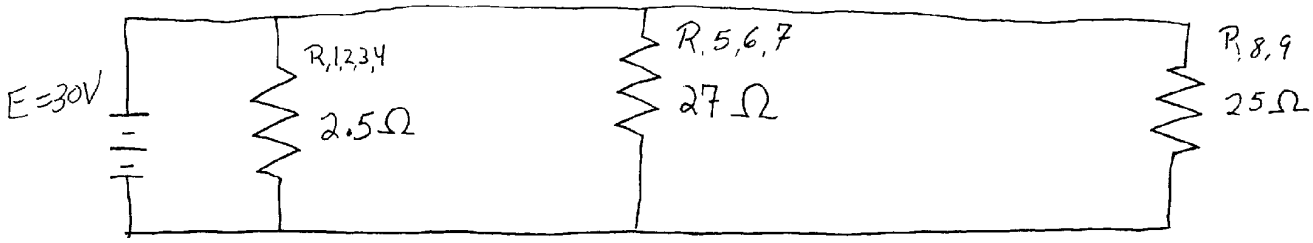
Steps 1 thru 5 Reduced circuit to basic series to find RT.

Step 3



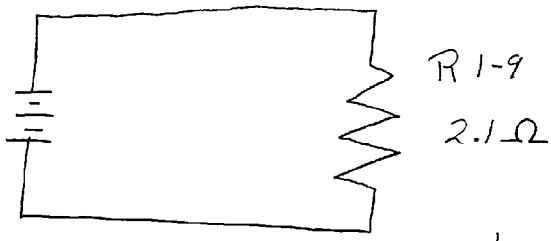
$R_p = \frac{R_5 \times R_6}{R_5 + R_6} = \frac{20 \times 30}{20 + 30} = \frac{600}{50} = 12\Omega$

Step 4



$R_5 = R_{5,6} + R_7 = 12 + 15 = 27\Omega$

Step 5



$$R_T = \frac{1}{\frac{1}{R_{1,2,3,4}} + \frac{1}{R_{5,6,7}} + \frac{1}{R_{8,9}}} = \frac{1}{\frac{1}{2.5} + \frac{1}{27} + \frac{1}{25}} = \frac{1}{.477} = 2.1\Omega$$

Find It

$$I_t = \frac{E_t}{R_t} = \frac{30V}{2.1\Omega} = 14.3 \text{ Amps}$$

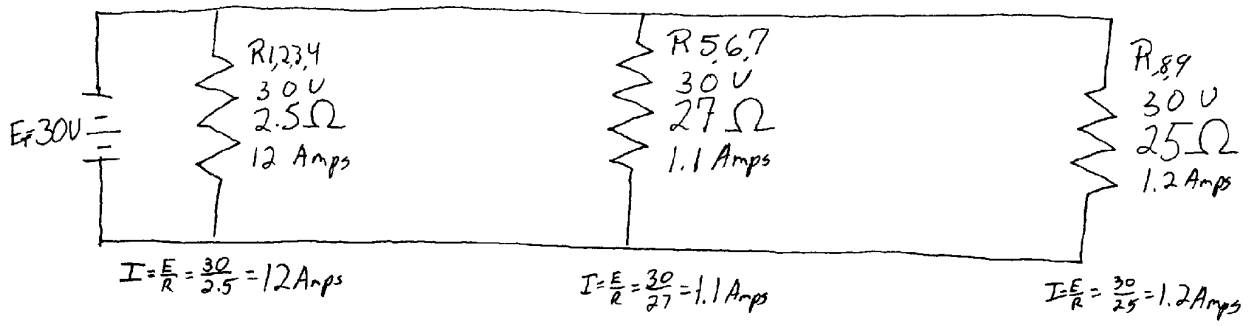
Find Pt

$$P_t = E_t \times I_t = 30 \times 14.3 = 429 \text{ w}$$

Find I

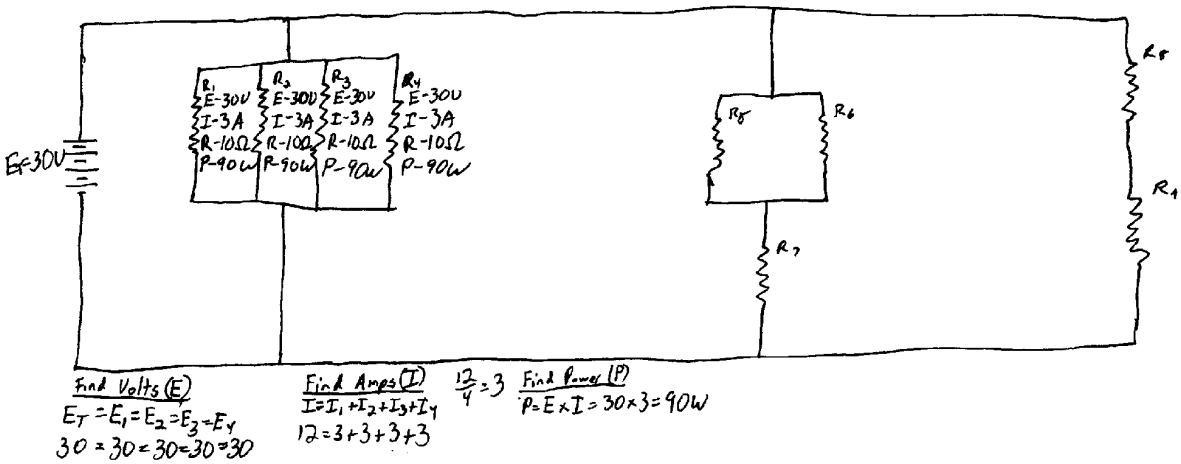
Step 1

Steps 1 thru 4 Used to find voltage drop at each resistor and current through each resistor.



Find E,I,R,P for individual resistors

Step 2

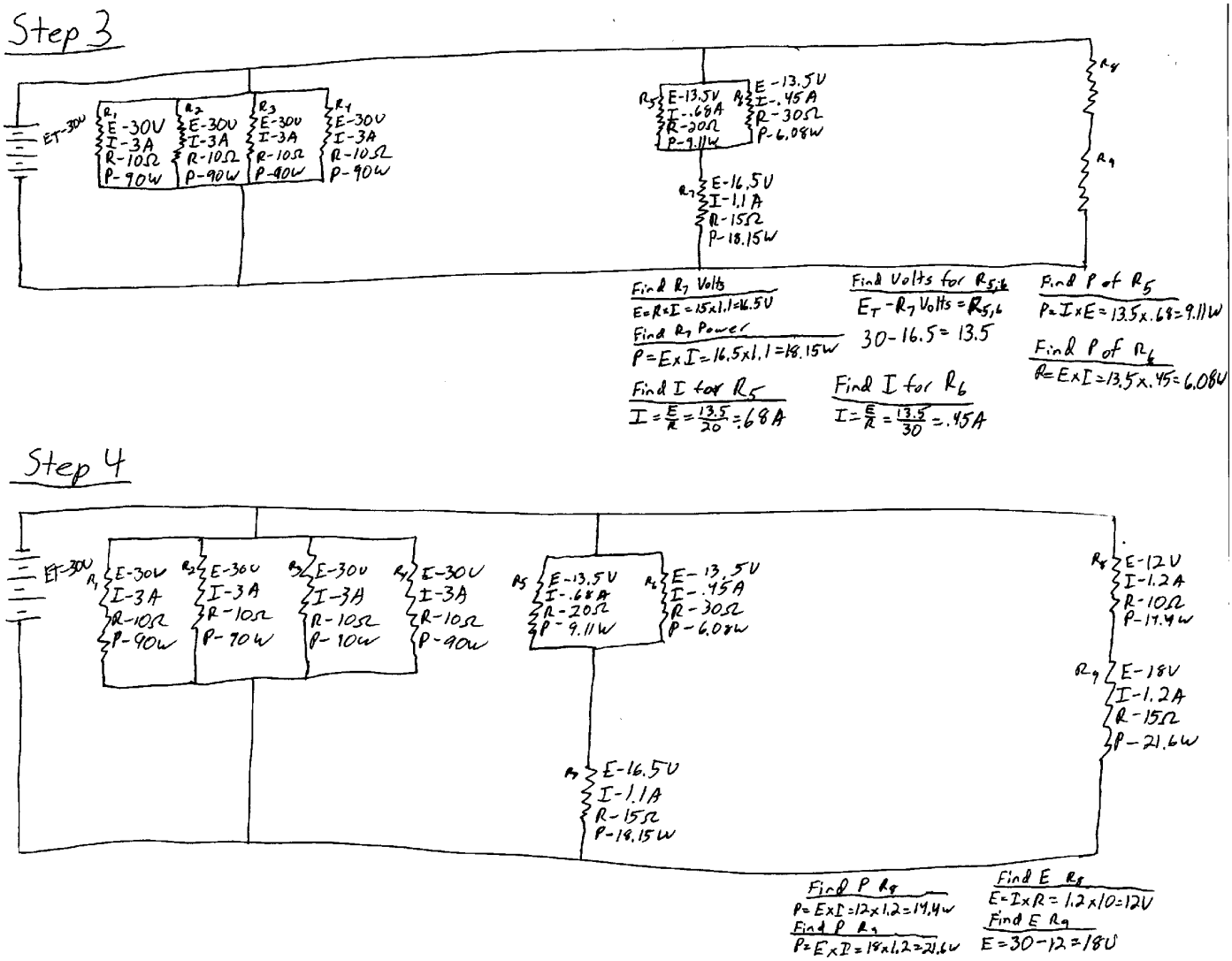


Assessment

ASSESSMENT

This lesson is not a stand-alone lesson it is the culmination of five lessons. The rubric is not necessary for the following reasons:

1. The student will present the teacher with two complete schematic diagrams along with the equivalent diagrams for each.
2. Students will present to teacher all worksheets related to solving the circuit.
3. Student will explain to the teacher methods and laws used to solve the complex circuit.
4. The assessment takes place on an individual level with each student, as he/she present their work to the teacher. Each circuit contains 10 items worth five points each. When this lesson is present, it is expected that any mistakes will be math errors and not procedure errors. The students know that each correct answer is worth five points. At the time of this lesson, the students must know the proper procedures in order to reduce the circuit to its basic form. All the work sheets performed by the students are indicated on the labeled work sheets that accompany the answer sheet. When assessed in this manner, the feedback is immediate. The teacher checks the work against the answer sheet. At this time, math, as well as procedural, errors will be pointed out and corrections made by the student on the work sheets. The students know exactly what will be graded and will strive to get the correct answers by using the already learned procedures and formulas. The answer sheet key is for the teacher's use. I indicated the point value on the bottom.
5. Each circuit will have 10 values to be calculated for a total of 20 values.



REFLECTION

The basic electrical problem-solving skills expand to A.C. circuits. It is essential that students learn complex circuits and the associated math and problem-solving skills. This exercise should be accomplished two or three times to assure understanding.

Alesson like this must be presented to a student that already has a good working knowledge of Ohm's Law and Kirchhoff's Laws. The lesson cannot be used on students who do not possess this knowledge nor a knowledge of circuit reduction procedure. These students are in a licensing course and know the relationship to the real world. They are working towards a Federal Aviation Administration Powerplant Certificate. Without this essential knowledge, the Technician cannot troubleshoot an electrical system.

This is just one lesson of many. We were originally instructed to produce a lesson that was not broad in scope, so I chose to focus on what I call a Culminating Lesson or learning experience.

This learning experience is followed by the student constructing series, parallel, and complex circuits on a circuit board. All the calculations and circuit construction are accomplished by the student. The circuit boards are powered up and the the student will use a multimeter to measure and record readings. The readings are then compared to the student's calculations.

All the students, by this time, have learned circuit calculations, how to use a meter, soldering, circuit construction, and more. This course requires 80 hours of study. Application to the outside world is an everyday event as everything they do is relate to aviation electrical work.

REFLECTION:

COMMENCEMENT

Standards & Performance Indicators

Adopt an HIV/AIDS Family

CDOS 3b

- responsibilities to customers
- communication skills
- interact sensitively
- personal/resource management

Linda Ulrich-Hagner
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Kenmore West High School
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Kenmore, NY 14223
(716) 874-8401
Hagsre@AOL.com

Grades 9-12

Students in the Child Development, Human Development and Independent Living Classes publicly demonstrated how to interact ethically, effectively and sensitively with individuals and families who were struggling to get by with a very devastating disease that impacts our communities as well as our country and world.

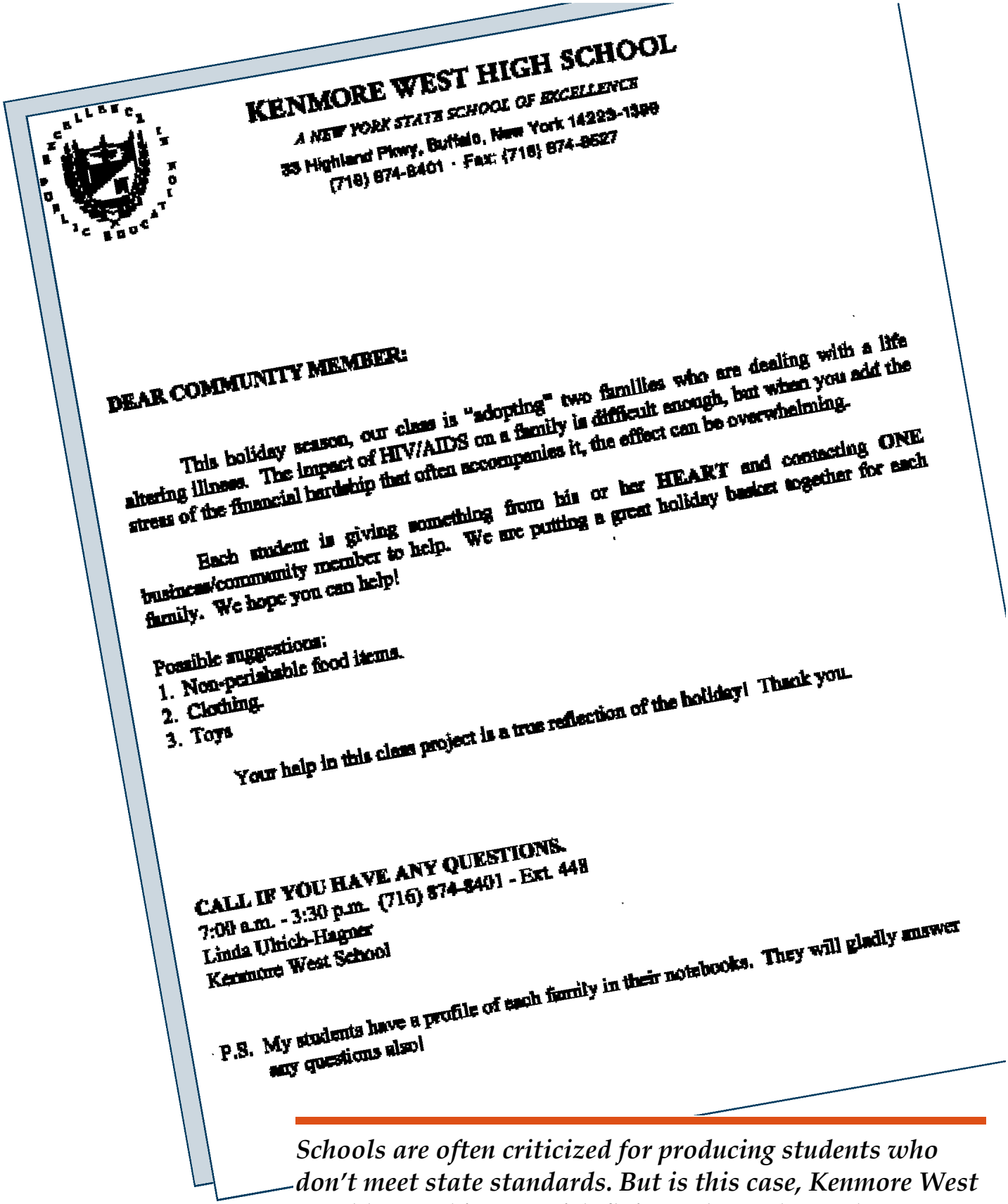
Teacher

Please Note: The ethics and confidentiality of this project provided cognitive information, behavioral skills and affective experiences for students to more effectively decide their role in the HIV/AIDS epidemic. Development of higher order turnkey skills revolving around ethical/confidentiality issues were particularly strong. The profile of the family helped personalize this project. It provided limited information regarding the disease and the families. Students understood why confidentiality and ethics were part of this project by treating the families "special needs" to privacy.

This two-week volunteer effort allows students to give their ALL, plus become active citizens in a community project. As part of a cooperative venture with AIDS Community Services, students "adopted" two families dealing with the life altering illness AIDS. Each class participated with both families. Each student brought in a gift for one particular person in either family. Boxes are ready with the name of each family member and gifts were put in the appropriate box. Afamily profile was included from the agency that provided information on the number of individuals in the family, ages, gender, hobbies, wishes, and sizes where applicable. This community service project provided real world issues with *real* people suffering from a catastrophic disease. The activity linked community-based organizations and students. Students personalized their giving, both individually and asking for community support. They referred to family members/clients as "friends. "

This project helped students understand the importance of working to solve community problems. They are part of the solution.

As caring students participating as active citizens, they will continue to show sensitivity and care in other outreach projects in their communities.



KENMORE WEST HIGH SCHOOL

A NEW YORK STATE SCHOOL OF EXCELLENCE

33 Highland Pkwy, Buffalo, New York 14223-1399

(716) 874-8401 · Fax: (716) 874-8527

DEAR COMMUNITY MEMBER:

This holiday season, our class is "adopting" two families who are dealing with a life altering illness. The impact of HIV/AIDS on a family is difficult enough, but when you add the stress of the financial hardship that often accompanies it, the effect can be overwhelming.

Each student is giving something from his or her HEART and contacting ONE business/community member to help. We are putting a great holiday basket together for each family. We hope you can help!

Possible suggestions:

1. Non-perishable food items.
2. Clothing.
3. Toys

Your help in this class project is a true reflection of the holiday! Thank you.

CALL IF YOU HAVE ANY QUESTIONS.

7:00 a.m. - 3:30 p.m. (716) 874-8401 - Ext. 448

Linda Ulrich-Hagner

Kenmore West School

P.S. My students have a profile of each family in their notebooks. They will gladly answer any questions also!

Schools are often criticized for producing students who don't meet state standards. But is this case, Kenmore West would pass this test with flying colors. The students should be proud of what they have accomplished.

Editorial, *Ken-TonBeeNewspaper*

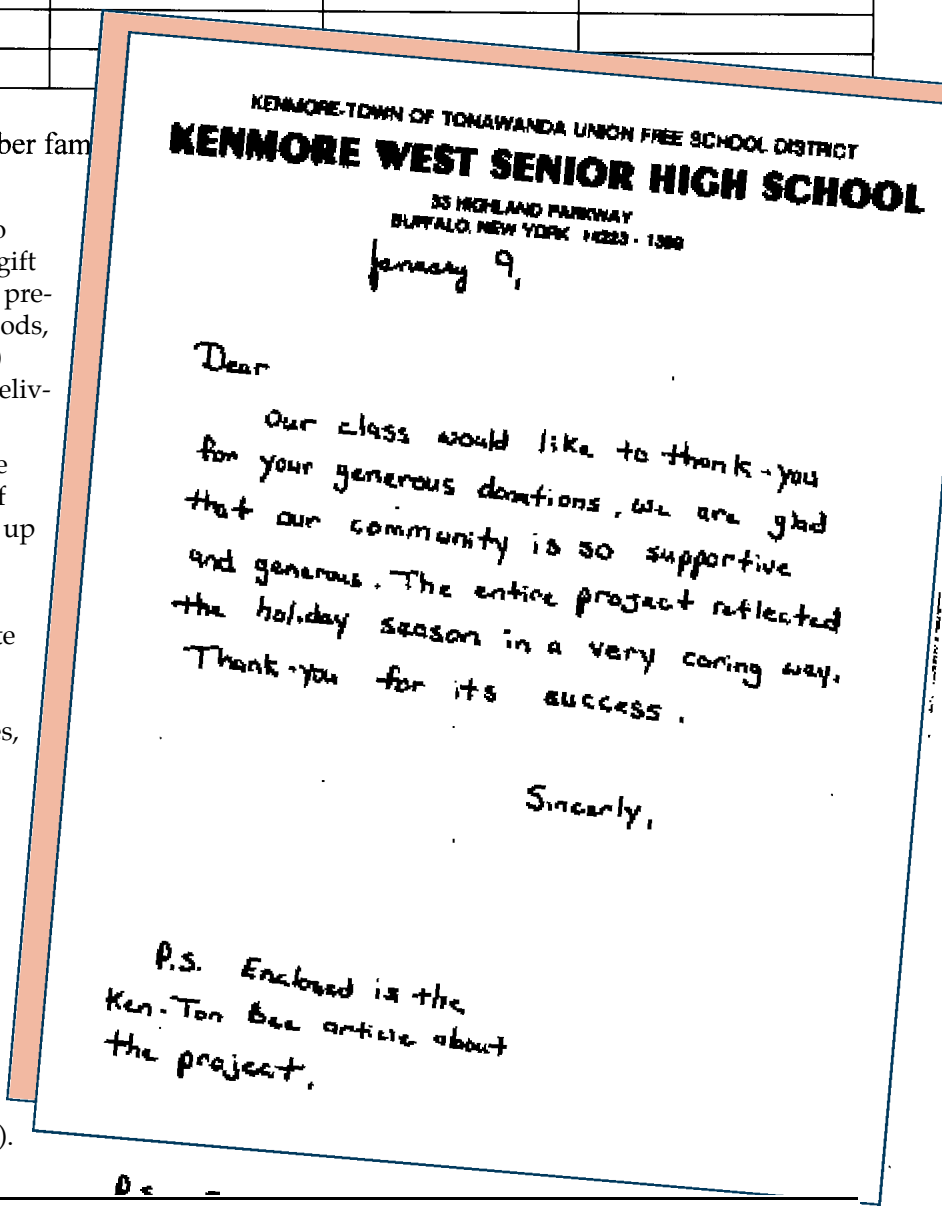
Students will:

1. "adopt" a family provided by AIDS Community Services and prepare a holiday basket,
2. study the family profile information,
3. understand the ethics and confidentiality that must be maintained in this community project,
4. treat families equally while respecting diversity,
5. help to gather gifts from their "hearts" and the community to help meet the needs/wants of the individual families. A"Gift from the Heart" is a gift that is homemade (i.e., Christmas ornament), made by the student (i.e., scrunchie for hair), by someone else, purchased (i.e., blanket for baby), or donated. Family profiles, provided by the agency, were used as guidelines and students brought appropriate gifts,
6. develop a chart with check off sections,

NAME	HEART what/who?	COMMUNITY what/who?	THANK YOU	HOW DID YOU FEEL?

What - What gift for which family?
Who - Which family member (6 member fam

7. meet deadlines (two weeks). Bundles of gift giving goods (food, presents, household goods, gift certificates, etc.) must be ready for delivery,
8. wrap gifts and write notes to members of the family. Package up (in a personalized manner) "gifts."
9. listen and participate in a presentation from the AIDS Community Services,
10. contact media for possible coverage, and
11. write thank you notes to all community members/businesses that donated gifts (i.e., supermarkets, departments stores, drug stores, discount stores, etc.).



KENMORE-TOWN OF TONAWANDA UNION FREE SCHOOL DISTRICT
KENMORE WEST SENIOR HIGH SCHOOL
35 HIGHLAND PARKWAY
BUFFALO, NEW YORK 14223 - 1399

January 9,

Dear

Our class would like to thank you for your generous donations, we are glad that our community is so supportive and generous. The entire project reflected the holiday season in a very caring way. Thank you for its success.

Sincerly,

P.S. Enclosed is the Ken-Ton Bee article about the project.

Teacher will:

1. facilitate AIDS Community Service Project with students and community-based organizations,
2. provide space for students to gather goods, wrap gifts, write notes, etc.,
3. keep up the motivation level,
4. coordinate packaging/provide letter to all community members contacted,
5. proof draft letters to community members, and
6. put together packages for media.

Gifts brought from their "Heart" and procured gifts/supplies/food/gift certificates from the community. Aletter is given to all community contacts. The students explain about the project and ask for support. The school phone number and contact with the classroom are provided, in case there are any questions.

The teacher serves as a mentor/facilitator/motivational expert. The teacher coordinates efforts, checks on progress each day, arranges for pickup of goods and speaker from Aids Community Services. He or she provides a collection corner for goods where wrapping paper, tags, and stationery are also available.

RUBRIC FOR PRODUCT/GIFT TO CHILDREN/ADULTS IN NEED

Possible Total 6 Points

CRITERIA	4	3	2	1
Product/Gifts Group Construction	Imaginative & creative, accurately constructed & packaged, completed on time	* Imaginative & creative, few errors in construction, packaged	Product completed, few errors in construction	Lacks imagination & creativity, not accurately constructed, no packaging
Letter/Note to	Writing shows creativity & in-depth understanding (does not mention diseases), few errors in mechanics, (1 or less), completed on time	Writing shows creativity, (does not mention diseases), few errors in mechanics (2 or less), 1 day late	Writing competent (does not mention diseases) several errors in mechanics (3 or less), 2 days late	Writing lacks depth, (mentions diseases frequently), errors in mechanics, turned in

*

Creative/Imaginative (see #2). Using resources, their own skills, money or family member's talents, the students chose a gift that reflected information that was sent from the agency: AIDS Community Services – Holiday Profile Information.

Assessment

ASSESSMENT

Students :

1. developed a LARGE chart on poster board which was posted for each of four classes to record all gifts for each family. Participation was enhanced by the visual "in progress" update. Feedback was done verbally at the beginning of each day. Students were asked how they were doing and what could I do to help facilitate their progress. It was just a gentle reminder that we had a deadline. The chart was posted and each student filled in what they brought to class for the families,
2. recorded profiles of the families and attained appropriate items for each family's holiday baskets,
3. held conversations with community members and wrote letters of introduction to community-based businesses,
4. presented work-in-progress report every other day in class,
5. rubric for letters to community members plus student sample final copies.
6. summarized learnings for local news coverage on WIVB TV - CBS 5:00 p.m. News
7. wrote *Ken-Ton Bee* featured article plus editorial (12/18/96).

REFLECTION:

REFLECTION

Real people (although anonymous) became members of the class and were sponsored for the holidays. This high-interest/human public service project developed a lifelong learning carry-over.

Participation was optional, but most students enthusiastically gave of themselves and sought out assistance from the community.

COMMENCEMENT

Standards & Performance Indicators

Machine Trades Unit

CDOS 2

- integration academic/occupational skills
- knowledge/skills in academic context

CDOS 3b

- meet industry needs

This unit attempts to integrate the high school courses English Language Arts, Math, and Machine Trades. It is team taught with teams of students in grades in 9-12. It fits best in the math curriculum after trigonometry has been introduced, in the English curriculum after technical report writing has been introduced, and in the safety unit after Machine Trades has been taught.

To be successful on this unit, the students must be willing to work in a shop setting as a team to solve a problem. They must agree to attend a minimum of five-half day classes that are required to complete the unit.

Jackie Spencer, Teri Rosno
Steuben/Allegany County BOCES
Coopers Education Center
1 Vocational Drive
Painted Post, New York 14870
(607) 962-3175
FAX (607) 962-1579

Grades 9-12

Dresser-Rand, a manufacturer of gas compressors in Painted Post, NY, presented a workshop for the Tech Prep teachers that would give them firsthand knowledge of the areas they would be teaching to their students. The workshop included practice in machine setup and operation.

Materials supplied to the students:

- metal piece to be machined
- drill bits
- bolts
- taps
- use of scientific calculators
- use of drill press
- use of computers
- use of CAD program
- safety glasses

Materials required by the teacher

- teacher-made worksheets
- speed and feed formulas

COOPERS EDUCATION CENTER
One Vocational Drive
Painted Post, NY 14870
Teacher: T. Rosno and J. Spencer

Course: Tech Prep

UNIT: Machine trades		LENGTH: 1 week	
Problem Solver	OUTCOMES		Effective Communicator
Goal Setter	Citizenship	Team Player	Physically/Emotionally Fit
Outcomes (Behavioral Objective) Content/Process Enablers:		How to Assess (Activities):	
Student will demonstrate the ability to: 1. Analyze assignment and produce an accurate print. 2. Plan machine settings. 3. Machine bolt holes per print specifications. 4. Relate production process.		Measure and drill required bolt holes for machine parts T-1 and T-2 used in manufacturing at Dresser Rand.	
Prerequisites:		Check for Knowledge of Prerequisites:	
Calculator skills Listening skills		Teacher observation Quick calculator activity	
Correctives (Consider Learning Styles):		Extensions/Enhancements:	
one on one instruction peer tutoring teacher designed lesson		Peer teacher/coach Offer opportunity to move to next Tech Prep unit	

The students work in teams to solve a real world problem developed by a local industry, Dresser Rand. They are given a donut shaped metal part with instructions to drill five evenly spaced bolt holes in that part. The metal piece fits with a machine at Dresser Rand and is part of a larger project there. One team is also asked to tap the holes. They are given all the small supplies that they will need along with a diagram. They have access to the drill press in the Machine Trades program. They are told that a mistake has been made in either the drawing or the parts. It is their task to find the mistake, correct it, complete the job, and write a technical report. They will know if they completed the job correctly because the two teams parts should bolt together.

The Math, English, and Machine Trades teachers team to help the students complete the project. Teaming skills, note taking, report writing and safety are all reviewed. Triangles, circles, trig functions, the coordinate system, formulas, and signed numbers are also reviewed. After this the students should have enough knowledge to solve the problem. They are then given instruction on operating the drill press, and each student gets an opportunity to drill a bolt hole. Finally the students work as a team to write the report.

Students who are not strong academically draw support from the other team members. It is stressed that every team member is important and has something essential to contribute. The unit is taught in a small classroom that adjoins the Machine Trades shop, that way the students have the opportunity to see the shop under normal working conditions. No physical modifications of the classroom were necessary.

1. Introduction

- Purpose-To develop problem solving skills in a team setting to prepare for the future and for the real world.
- Challenge- An actual Dresser-Rand situation.
- Team-Solutions- To problem solving in manufacturing.
- Academics- Importance of having good math, writing, and communication skills in all work situations.
- Print- What it is, what it means, do some codes and measurements.

2. Safety

- Glasses- special kind
- Jewelry- No rings, necklaces unless they are tucked inside clothing.
- Dress- No raggedy or loose clothing.
- Cutting tools- Safety precautions, must follow them.
- Behavior- No running around or goofing off.

3. Writing- The importance of note-taking

- Be concise.
- Be organized.
- Be thorough.
- All of details.
- Corrections.
- Sketches + graphs.
- Document questions and comments.

- At the end of project, organize notes into well-written report with cover page, prints, etc.
- Team-approach- Listening and talking.

Math-. Trig. function + Definitions

- Coordinate axis
- Practice graphing
- Practice calculating
- Scientific Calculators
- Square roots, etc.
- Actually calculate coordinates for both holes and space measurements for given situation.
- Speeds, feeds, tap drill size.
- Identify a problem- Threads on bolts and wholesize.
- Clearances
- Tolerances
- CAD

Given Schematics for T1 and T2-Dresser Rand machine parts- T1 must line up with T2.

Team: 1.
2.
3.
4.
5.

Date:

Problem: An error in the data shows that the bolt will not fit the part. Threads do not line up, and T2 will not fit the mating part T1 because of the bold hole size. The diameter is too small.

Problem-Solving Steps:

- Reviewed teaming skills.
- Reviewed mathematical and trigonometric functions.
- Calculated coordinate settings.
- Calculated feeds, speeds.

Solution:

After calculating coordinate, re-draw schematic on CAD. Then machine the parts.

Conclusion:

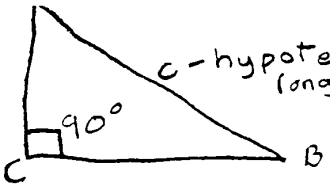
- Teaming-working together accomplishes the job more efficiently, more quickly.
- Math Skills- Math skills are necessary to keep calculate outcomes.
- Note-Taking- Note-taking is necessary to keep track of steps, results.

Summary: A trip to D-R will determine whether or not we have been successful in correcting the errors.

ASSESSMENT

Teacher observation, group discussion, and daily team analysis are used as techniques to assess student progress. Ascoring rubric is used to document student progress. On the first day, the teachers and students review the entire unit plan including rubrics. The students use the process checklist to track individual progress. The teacher scores the completed project using the learning performances and then reviews the scores with the students. At the end of each unit, the teacher also scores and reviews with the students the life-long learner outcomes. Also an authentic assessment is built into the project; if the parts do not bolt together, then there has been an error.

1. Right Triangles



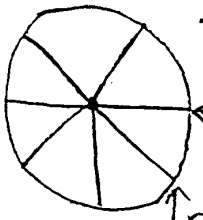
c - hypoteneuse
longest side + side opposite of the right angle.

Angles in triangle <u>always</u> add to 180°.

ex.

ex.

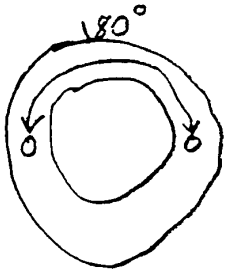
2. Circles

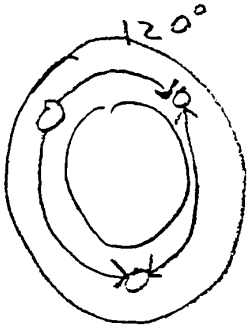


360° in a circle

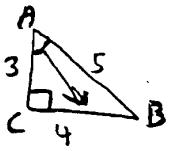
Ø (diameter)

r = radius





3. Trig Functions



cos ∡ A = $\frac{3}{5}$ = .6000

cos ∡ B = $\frac{4}{5}$ = .8000

* Sin = $\frac{\text{O opposite}}{\text{Hypotenuse}}$

Sin ∡ A = $\frac{4}{5}$ = .8000

Sin ∡ B = $\frac{3}{5}$ .6000

* cos = $\frac{\text{Adjacent}}{\text{Hypotenuse}}$

Tan ∡ A = $\frac{4}{3}$ = $1.333\overline{3}$

Tan ∡ B = $\frac{3}{4}$ = .7500

Tan = $\frac{\text{Opposite}}{\text{Adjacent}}$

Student: Sample

Unit: Machine trades

Teacher		PROCESS CHECKLIST M = Mastered I = Incomplete	Student	
M	I		M	I
		1. Analyze assignment and produce an accurate print.	✓	
		*Translate symbols	✓	
		*Calculate all dimensions	✓	
		*Compare sample part to print	✓	
		*Create new print on CAD	✓	
		2. Plan machine settings.	✓	
		*Use sin and cos to determine correct X,Y coordinates for each bolt hole	✓	
		*Use given formulas to calculate correct feeds and speeds	✓	
		*Translate chart specs for required threads per inch	✓	
		3. Machine bolt holes per print specifications.	✓	
		*Follow all safety procedures	✓	
		*Set X,Y coordinates on machine	✓	
		*Set feeds and speeds	✓	
		*Machine the part	✓	
		4. Relate production process.	✓	
		*Typed	✓	
		*Report includes: team names project dates statement of problem statement of project statement of solution conclusion focusing on personal new skills gained	✓	

REFLECTION:

REFLECTION:

REFLECTION

I think that this is a very worthwhile project. It not only integrates academic and vocational subjects, but includes business and industry partners as well. The students learn the importance of math and English in an applied setting and are given an opportunity to improve teaming skills. Emphasis was placed on the technical report to improve writing skills. The students visited the work site and were given an opportunity to work with Dresser Rand personnel.

Date _____

LIFE LONG LEARNING PERFORMANCES	N	A	J	T
Problem Solver: Collects and presents all information necessary to make a decision.	1	2	3	4
Locates appropriate available tools, materials, and equipment necessary to complete task.	1	2	3	4
Communication Skills: Engages in professional vs. personal conversation in work area and with customers.	1	2	3	4
Consistently participates in class discussions and activities.	1	2	3	4
Records legible, accurate orders.	1	2	3	4
Verbal communication is clear and precise.	1	2	3	4
Goal Setting: Consistently meets deadlines.	1	2	3	4
Self assesses and meets short term goals.	1	2	3	4
Strives to do quality work.	1	2	3	4
Strives to maintain professional appearance.	1	2	3	4
Citizenship: Consistently adheres to OSHA regulations.	1	2	3	4
Consistently adheres to state safety regulations.	1	2	3	4
Teamwork: Contributes positively as a team member.	1	2	3	4
Displays a positive attitude toward classwork, peers and teacher.	1	2	3	4
Physical and Emotional Well-being: Accepts responsibility for own actions.	1	2	3	4
Regularity and punctuality.	1	2	3	4

91%

1	2	3	4
Novice	Apprentice	Journeyman	Peer Teacher/Coach
Incomplete	Competent	Highly Competent	Excellence
(55-65%)	(75 - 85%)	(86 - 95%)	(96 - 100%)

40 18/58 3.625

N) 1 - **Novice** - Incomplete: Someone who is trying a new skill and beginning to understand how to do it.

A) 2 - **Apprentice** - Competent: Someone who can do important parts of the process; whose approximations are close; who recognizes some mistakes.

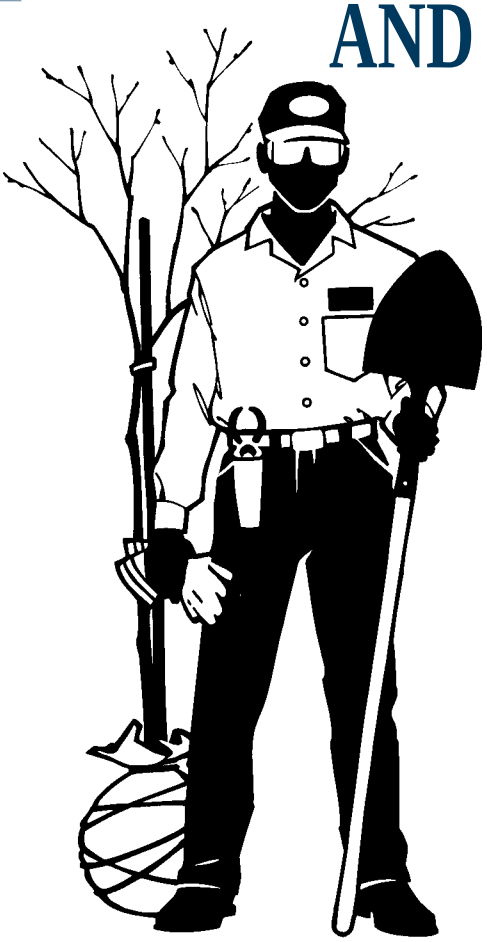
J) 3 - **Journeyman** - Highly Competent: Someone who understands how and why the process works; who can do it easily with few mistakes; who can quickly recognize and correct mistakes.

T) 4 - **Peer Teacher/Coach** - Excellence: Someone who can communicate the concept well; who can demonstrate the process clearly; who can help novices understand their mistakes.

COMMENCEMENT

Standards & Performance Indicators

Forest Evaluation and Tree Inventory



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Grades 11& 12

This project can be done at area parks, state land, or other places where permission for access is granted.

The learning experience provides an actual hands-on experience where students will plan the management practices and actually determine what effects these practices will have. Each group of students is responsible for recording the data needed to complete the *Forest Evaluation Sheet, Regeneration Survey*, and *Merchantable Tree Inventory* using appropriate management practices and tools. They would also have to determine the value of the harvestable lumber.

The students will need to be able to identify trees. Tree identification will be taught before the project begins. Students also must be familiar with figuring board feet, tree diameter, and tree height with a Biltmore Stick. In addition to identifying the types of trees, they will need to identify soil types.

CDOS 3b

- natural/ag sciences
- quantitative/qualitative information

Supplies

- Biltmore Stick
- tree identification book
- 110 foot steel tape
- poster board
- overheads

This lesson ties in with the Environmental Science class. This is part of a unit on *Forest and Wildlife Management.*

Regeneration Survey

1/2500-hectare (1/1000-acre) plot. Tally all trees including sprouts by species and size class within this plot.

Species	***Size Class***				
	Less than .3 tall	*.3 - 1 m tall*	*>1 m and ≤2.5 cm in diameter*	*2.5 - 8.0 cm in diameter*	*9 - 15 cm DBH*
		16 - 30 cm DBH	*31 - 45 cm DBH*	*46 - 60 cm DBH*	*61 + cm DBH*

Merchantable Tree Inventory

2/25-hectare (1/5-acre) plot. Measure all trees 15 cm (5.9 in) or greater in DBH.

Species	*Diameter*	*Height*	*Form*	*Damage*	*Animal Signs*	*Miscellaneous*

Forest Evaluation Inventory Sheet

A. Technical Data

Plot #_____ Date measured_____ Field crew _____

Property owner_____ Location_____

B. Environmental Factors

General topography: Flat_____ Hilly_____ (Steep_____ Rolling_____ Gradual_____)

Topographic site: Ridge top_____ Mid-slope_____ Valley bottom_____ Riverbank_____

Other_____

Slope_____ Aspect _____

C. Vegetation

Forest Type: Hardwood_____ Origin of Stand: Seeds or root sprouts_____

Conifer _____ Planted_____

Mixed _____ Stump sprouts_____

Vegetation other than trees: Brief description of shrubs, forbs, leafy, and other vegetation present. Give some idea of abundance. _____

_____

_____

D. Forest Floor and Soil

Litter: Absent (mineral soil)_____

If present, Depth_____ Composition _____

Soil: Developed from underlying rock_____ Transported _____

Description: _____

_____

	Depth	*Color*	*Texture*
A Horizon	_____	_____	_____
B Horizon	_____	_____	_____
C Horizon	_____	_____	_____

Description of soil drainage and where most of the roots are located.

_____

_____

_____

Evidence of pit-mound topography:_____

Water: Description of open bodies of water — color, depth, width. Note animal life associated with it.

_____

_____

_____

E. Animal Activity

Wildlife: Note scats, evidence of feeding (browsing of limbs, pile of seed shells, etc.), actual sightings, nests, songs, snags with woodpecker holes, bones, etc._____

_____

_____

_____

Human: Note trails, stone walls, fences, buildings, stumps, trees painted or flagged. _____

_____

_____

_____

F. Damage

Description of damage due to fire, weather, insects, fungi (rots), animals, humans. Include the extent and relative abundance in the stand._____

_____

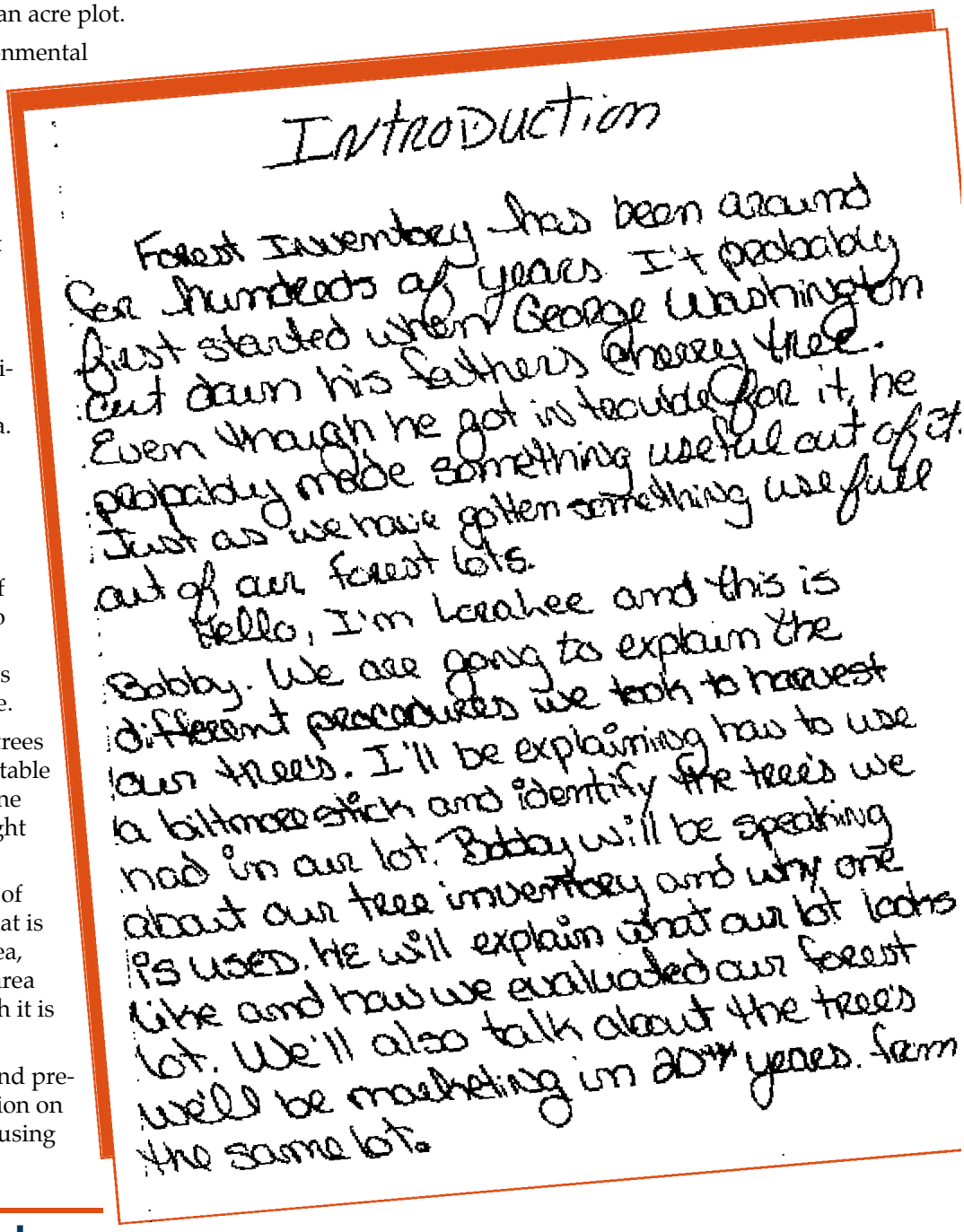
_____

_____

_____

What The Students Do:

- Measure out a 1/10 of an acre plot.
- Begin filling out environmental factors from inventory sheets.
- Fill out vegetation area of inventory sheet.
- Explain what the forest floor is like. (Ex. soil, drainage access, open water.)
- Describe the type of animal and human evidence that is in the area.
- Explain the damage to the forest due to fire, weather, insects, and fungi.
- Explain what species of trees they would like to regenerate in this area, and describe the species and the size of each one.
- Determine the type of trees to be used for merchantable trees, and also determine their diameter and height using a Biltmore Stick.
- Determine the amount of board feet of lumber that is generated from that area, and find out from the area lumberyards how much it is worth.
- Compile information and prepare a group presentation on individual forest plots using all data collected.



INTRODUCTION

Forest Inventory has been around for hundreds of years. I't probably first started when George Washington cut down his fathers cherry tree. Even though he got in trouble for it, he probably made something useful out of it. Just as we have gotten something usefull out of our forest lots.

Hello, I'm Larahee and this is Bobby. We are going to explain the different procedures we took to harvest our tree's. I'll be explaining how to use a biltmore stick and identify the tree's we had in our lot. Bobby will be speaking about our tree inventory and why one is used. He will explain what our lot looks like and how we evaluated our forest lot. We'll also talk about the tree's we'll be marketing in 20** years from the same lot.

What The Teacher Does:

- Discuss the expectations for the projects.
- Discuss the inventory and proper information needed in each area.
- Facilitate the project and answer any questions the students may have.
- Compile information into a 10- to 15-minute presentation.
- Evaluate presentation and information recorded in the *Forest Evaluation Inventory Sheet*.

Now Bobby is going to explain to you Forest Evaluation, the Inventory and what it is.

How many weeks for the trees to come down.
→ work an 8 hr day
→ 16 trees a day
→ 5 days a week that means
→ 80 trees a week it'll take
→ 9 weeks to cut down 1400 trees

Skidder-
→ you gave us a price of $50 an hour
→ that'll be $400 per day because of the 8 hr work day
→ use it twice for 5 days which will be
→ 10 days total
→ the skidder to rent will be $4,000

Chainsaws
→ $25 per hour → 5 days a week
→ $125 per day → $625 per week
for → 9 weeks total equals $5625
→ times 3 for 3 saws
= → $16,875 for 9 weeks.

ASSESSMENT

A *Forest Evaluation and Tree Inventory Student Rubric* form was developed, using a high school English oral presentation rubric as a guide.

Forestry Evaluation and Tree Inventory Student Rubric

	Distinguished	Supported
Presentation:		
1. Content/Development	1 2 3 4 5	
2. Organization	1 2 3 4 5	
Style:		
1. Text	1 2 3 4 5	
2. Diction	1 2 3 4 5	
Delivery:		
1. Question Response	1 2 3 4 5	
2. Fluency / Mechanics	1 2 3 4 5	
3. Language / Articulation	1 2 3 4 5	
Hands-on Mechanics:		
1. Teamwork-Even Distribution of work	1 2 3 4 5	
2. Correct use of Biltmore stick	1 2 3 4 5	
3. Measurement with Biltmore stick	1 2 3 4 5	
4. Identification of tree species	1 2 3 4 5	
5. Computation of accurate timber prices	1 2 3 4 5	
6. Computation of overall costs	1 2 3 4 5	

Scoring

65-59	A
58-52	B
51-45	C
44-0	F

*Adopted from the Tri-Valley Central School Oral Presentation Rubric

TRI-VALLEY CENTRAL SCHOOL
HIGH SCHOOL
ORAL PRESENTATION RUBRIC

	DISTINGUISHED	PROFICIENT	COMPETENT	SUPPORTED
Style (cont.) diction	Vivid and imaginative language (e.g. similes, metaphors) is used throughout the speech to effectively enhance the speaker's meaning and purpose. Active voice and strong verbs are used to create energy, rhythm, and power of expression. Word choice is always appropriate for meaning and audience, and reveals an understanding of connotation.	Vivid and imaginative language is used at times within the speech to enhance the speaker's meaning and purpose. Active voice and strong verbs are used. Word choice is appropriate for meaning and audience.	A limited, but clearly evident, attempt has been made to use imaginative and/or vivid language within the speech. The passive voice and weak verbs are used regularly when active voice and strong verbs would be preferable. The speech has a few instances in which word choice is inappropriate for the meaning and audience, yet does not detract from the overall effectiveness of the presentation.	No imaginative or vivid language is apparent within the speech. The talk relies almost entirely on passive voice and weak verbs. Word choice is often inappropriate for meaning and audience.

REFLECTION:

REFLECTION

This exercise gives students a chance to do hands-on problem-solving. The students were able to demonstrate the ability to ID trees, evaluate forests and ecosystems, and problem-solve to show how to successfully manage a forest plot.

This activity involves an integrated approach to learning and involves standards in English language arts as well as math, science, and technology. Improvements to the strategy can be made by involving teachers in these areas.

Even though the career major has been identified, improving the activity could be done by directly connecting it to careers in forestry, science, or others.