

RENTON SCHOOL DISTRICT #403

CAREER AND LIFE SKILLS EDUCATION

POWER AND ENERGY TECHNOLOGY 1 - 2

Curriculum Guide

Approved by the Board: June 12, 2002

If you have special needs, which require this document to be provided in an alternative format, please contact the school principal (or program director) or Kay Hermann, ADA/509 Compliance Coordinator, 425-204-2421, 300 S.W. 7th St., Renton, WA 98055-2307

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A PHILOSOPHY OF EDUCATION FOR THE RENTON PUBLIC SCHOOLS

A basic function and duty of a free society is the education of its children, youth and adults.

It is the responsibility of the schools to provide each student with the opportunities necessary to develop the scholarship, skills and attitudes which will enable the student to achieve mental, physical, emotional and social maturity.

Further, each student should, as a result of the school experience, be able to make decisions and to accept responsibility for those decisions.

POLICY: 6001

ADOPTED: February 3, 1977

Renton School District No. 403

Renton, Washington

Renton School District #403 recognizes the need for every graduate to have acquired job entry skills or at least to possess a level of knowledge and skills permitting continued training after high school.

RENTON SCHOOL DISTRICT NO. 403
GENERAL INSTRUCTIONAL GOALS
Policy 6010

The Renton School District fosters an educational process that helps all students achieve at their highest potential.

The Renton School District:

LEARNING

- Offers a curriculum that prepares our students for the future.
- Emphasizes that diversity contributes positively to the individual and to the community.
- Provides learning experiences matched to the needs, interests, and abilities of our diverse student population.
- Extends learning opportunities beyond the school.

INSTRUCTION

- Offers a variety of high quality instructional resources and services to students, staff, and community.
- Supports multiple instructional strategies.
- Provides resources and opportunities for continuing professional development of our staff.
- Conducts ongoing evaluations of our instructional programs.
- Maintains safe and inviting facilities that are conducive to learning.

COMMUNITY

- Creates partnerships that involve students, parents, staff and other community members and organizations.
- Promotes effective communication.
- Values and encourages development of a spirit of community service.
- Respects the rights and responsibilities of all.

As a result of the educational process in Renton, students will understand and apply:

Language skills including reading, writing and communication, with opportunities to learn world languages.

Mathematics skills including concepts, procedures, problem solving, reasoning, and mathematical language.

Science Skills including concepts, principles, and the scientific process.

Social studies skills, concepts, and processes - emphasizing history, geography, economics, international perspectives, multiculturalism, and participatory democracy.

Arts and humanities skills, concepts, and processes to create, perform, and solve problems and respond effectively.

Health and physical education skills, concepts, and processes to promote lifelong physical, mental and social well being.

In order to strengthen the above curricular areas, Renton students will understand and apply:

Thinking skills including the ability to - gather and analyze information, think logically, critically and creatively, integrate experience and knowledge in making reasoned judgments, and solve problems.

Career and life skills necessary for successful and responsible participation in family, work and community.

Technological skills to support learning, problem solving, and communication.

Skills necessary to be a lifelong learner and a contributor to the general welfare and the quality of life for all.

EVALUATION: The Renton School District regularly reviews, evaluates and modifies these General Instructional Goals to meet the changing needs of students, staff and community.

RENTON SCHOOL DISTRICT #403

CAREER AND LIFE SKILLS EDUCATION GOALS

GOAL 1: PROVIDE HIGH QUALITY CAREER AND LIFE SKILLS EDUCATION PROGRAMS AND SERVICE

Objectives:

- A. Assure that students completing Career and Life Skills Education programs have technical and behavioral competencies and basic skills sufficient to succeed in the workplace or higher education.
- B. Establish course and/or program transferability and articulation processes among K-12, community and technical colleges, private schools, colleges and universities, industry, apprentice-related training, and military training.
- C. Establish and regularly review standards for all Career and Life Skills Education programs.
- D. Evaluate Career and Life Skills programs based on standards, objectives, placements, job performance, costs, and community/industry acceptance.
- E. Utilize global, national, state, regional, and local data and advisory committee recommendations to identify appropriate curriculum and course offerings, program standards which meet the need of families, communities, business and industry.
- F. Provide facilities, equipment and instructional programs which meet the needs of a changing workplace.
- G. Revise or discontinue these programs that no longer meet the needs of students, business, labor, industry, and/or the community.
- H. Provide qualified instructors and administrators for Career and Life Skills Education based on relevant certification standards.
- I.** Develop and utilize competency-based curricula for Career and Life Skills Education programs.

GOAL 2: CONTRIBUTE TO THE ECONOMIC DEVELOPMENT OF THE STATE

Objectives:

- A. Facilitate cooperation between public and private sector entities.
- B. Establish new Career and Life Skills Education programs based on existing and projected employment needs/demands and entrepreneurial opportunities.
- C. Work cooperatively with the public and private sectors, economic development organizations, labor, and educational institutions to provide creative, targeted programs that meet the needs of youth in economically depressed areas.
- D. Provide family life education programs that serve to strengthen families and contribute to the effectiveness of workers in managing their consumer and family roles and in their careers.
- E. Strengthen management skills for those seeking employment in worker owned and managed businesses.
- F. Create a stronger working partnership with Team Washington and other economic agencies and the associate development organizations.

GOAL 3: ASSURE ALL INDIVIDUALS EQUAL ACCESS TO CAREER AND LIFE SKILLS EDUCATION PROGRAMS, SERVICES, AND ACTIVITIES

Objectives:

- A. Provide Career and Life Skills programs, services, and activities that are free from racial, socio-economic, age, ethnic or sex bias, discrimination or stereotyping.
- B. Provide access to barrier-free Career and Life Skills Education programs.
- C. Actively recruit under-represented groups to all aspects of Career and Life Skills Education.
- D. Provide supportive services that promote entrance and success in Career and Life Skills programs.

GOAL 4: PROVIDE/UTILIZE AN INTEGRATED STATE PLANNING PROCESS

Objectives:

- A. Involve business, industry, agriculture, labor and other governmental and educational agencies in the planning processes at the state and local levels to ensure that establishment of delivery objectives and budget priorities.
- B. Identify instructional area/programs based on demand, placements, training needs, program costs, and follow-up.
- C. Utilize local, regional, state, national and global employment data, trends and advisory committees/organizations in identifying program offerings.

GOAL 5: PROVIDE AND MARKET CAREER AND LIFE SKILLS EDUCATION

Objectives:

- A. Increase public awareness, understanding, and acceptance of Career and Life Skills Education.
- B. Actively involve students, parents, community leaders, legislators, labor representatives, business organizations, industry, representatives, and other decision-makers from state and local arenas in Career and Life Skills Education program events and issues.

GOAL 6: PROVIDE INDIVIDUALS WITH CAREER DEVELOPMENT PROGRAMS AND EXPERIENCES

Objectives:

- A. Provide career orientation, exploration, occupational information, self-appraisal, and educational planning.
- B. Provide instruction in job search, job retention and job change skills and further education pursuits.
- C. Assure that Career and Life Skills Education programs encompass demands of today's workplace and include attitudinal, employability, leadership, basic interpersonal, and job specific skills.

GOAL 7: ASSURE A QUALITY STAFF DEVELOPMENT PROGRAM

Objectives:

- A. Provide appropriate channels for advisory committee recommendations in the program and policy-making process.
- B. Provide in-service training opportunities for local advisory committee members.
- C. Provide in-service training for administrators and Career and Life Skills Education instructors regarding the effective use of advisory committees.

RENTON SCHOOL DISTRICT NO.403
Renton, Washington

CAREER AND LIFE SKILLS EDUCATION

Renton School District #403 operates a comprehensive Career and Life Skills Education Program through its four comprehensive high schools and two alternative programs. The district also participates in two countywide Tech Prep consortia with local community and technical colleges. This partnership allows students to earn college credit while still enrolled in high school programs. Secondary and post-secondary curricula are coordinated and students master and achieve skills, concepts, and technical competencies in high school that articulate with college programs. Students earn credit towards high school graduation and college technical programs at their home high schools.

The focus has changed in recent years from an emphasis on only job preparation to one of career exploration and exposure. While skill development and employment readiness is still a primary goal, emphasis has been placed on career exploration, career pathway preparation, and post-secondary articulation.

The **Family and Consumer Science Education Program** is offered at Hazen, Lindbergh, Renton, and Black River High Schools. The program is comprised of the following: Careers in Education; Careers with Children; Child Development; Creative Foods/Nutrition; Family Health; Health Club; Independent Living; Interior Design/Living Environments; Personal Choices; Teen Parenting/GRADS; and American Sign Language. School District and community sites provide applied work-based learning opportunities for program students.

The **Business Education Program** is offered in the District's three comprehensive high schools and at the Sartori Learning Center. The program consists of technical business related classes sequentially arranged into a course of instruction leading to a Certificate of Proficiency or Mastery to facilitate job placement or post secondary articulation. These courses are as follows: Accounting 1-4, Business Communications; Business Connections 1-2; Business Connections Work Experience 1-2; Business Law; Computer Program Design 1-2; Electronic Math Applications; Introduction to Information Technology; Information Technology 1-2; Information Technology-Project Management; Information Technology-Multimedia; Principles of Business; Web Site Development 1; and Recordkeeping. The Business Connections Work-based Learning component provides actual related job experience through workstations in the community. Business programs are often arranged and blocked with language arts programs to support program integration and technology use in the writing process.

A comprehensive **Work-based Learning Program** is offered in all of the facilities in the Renton School District. This program couples on-the-job experience and related classroom training to prepare students for employment during and beyond high school. The **Marketing Education Program** which offers Introduction to Marketing, Advanced Marketing, Marketing-Entrepreneurship, Marketing Education Seminar 1-2, Exploration of Travel and Tourism and Introduction to Travel and Tourism/Hospitality, and **Diversified Occupations Programs** provide students the opportunity to combine related classroom instruction and paid work experience to earn

high school credit. These programs assist and support students as they make the transition from school to work. **Volunteer experiences, Internships, Job Shadows, and Service Learning** are also strong components of this community based applied experiences.

The community also plays a vital role in other programs offered through the Renton School District. The **Health Careers/ Sciences and Athletic Trainer/Sports Medicine Programs** are reliant on clinical training stations and coordinated work experiences for students through local convalescent centers, nursing facilities, community hospitals health clubs and sports teams. These programs are offered to all students in the Renton School District but operate only at Hazen High School.

Technology Education Programs are offered at all three comprehensive high school facilities, and the Sartori Education Center. These programs are often integrated with the Science and Math Departments to support applied learning and the development of technical skills and competencies for all students. Courses in this department are: Automotive Service Technician 1-2; Computer Aided Design and Drafting 1-6; Computer Graphics 1-8; Fundamentals of Networking Technology 1-4; Jewelry Manufacturing 1-2; Light Duty Mechanics and Related Careers 1-2; Materials Science and Technology 1-2; Construction Technology 1-2; Building Maintenance Technology 1-2; Power and Energy Technology 1-2; Principles of Technology 1-2; Principles of Technology/Robotics 3-4; and Video Production 1-2.

Integrated instruction has been the focus of the Career and Life Skills Education instructional team for the past several years and the results can be seen throughout the program in each of the secondary schools. Several programs have been launched and are operating very successfully in all of the secondary sites. While these programs qualify for vocational funding, the District has made the commitment to operate them in collaboratively with a related academic instructor. These **Applied Vocationally Approved Programs** are titled: Applied Communications; Applied Mathematics; Material Science Technology; and Principles of Technology.

Renton School District has made a commitment to provide career and life skills training and job preparation opportunities for Special Needs students in addition to mainstreaming them, when appropriate. In order to have enough students to allow several offerings, the District has entered into interdistrict cooperative agreements with surrounding districts to accept students on a space available basis. There are four such **special programs**: **Building Maintenance** operates at the Sartori Learning Center and the **Career Ladders/Community Classroom** is offered at Valley Medical Center. The **Horticulture/Landscape Design 1-2 Program** is operated at Black River High School and **Health Careers** section is located at Hazen High School.

The District is also a partner in the Career and Life Skills/Special Education consortium of King County School Districts. The primary purpose of this participation is to make Career and Life Skills Education more accessible to persons with disabilities, provide additional inservice opportunities to all instructors and support to Career and Life Skills instructors as they provide applied learning opportunities to special needs students.

RENTON SCHOOL DISTRICT NO. 403

CAREER AND LIFE SKILLS EDUCATION

MISSION STATEMENT

The mission of career and life skills education in the Renton School District #403 is to prepare all learners for successful roles in families, careers and communities.

THREE BELIEFS

A. Beliefs about individual needs

1. All learners have unique gifts and talents and can be successful.
2. All learners must develop self-esteem and personal confidence for productive roles in society.
3. All learners need to have and attain personal and career goals, arising from a lifespan approach to personal growth and career development.

B. Beliefs about society's expectations

1. All learners must be prepared to become ethical, responsible and contributing world citizens.
2. All learners must adapt to change and participate in lifelong learning.
3. All learners must prepare for family roles and to balance work and family responsibilities.
4. All learners must develop essential creative/critical thinking, problem solving and communication skills.
5. All learners must value and have an appreciation for diversity in their schools, communities and workplaces.
6. All learners must recognize the impact of productive work on our economy.

C. Beliefs about systems that care for and support learners

1. All learners must have equitable access to a quality education.
2. All learners deserve to participate in learning systems where programs are mutually reinforcing and interdependent and where learning is related to life applications.
3. All learners must discover that school is part of a broader set of community resources they must access for learning and for achieving success in life.
4. All school programs must be developed in cooperative with family, business, labor and community representatives.
5. All staff must be accountable to ensure that all learners have the opportunity to establish and reach their goals.

POWER AND ENERGY TECHNOLOGY 1 - 2

History

Since the early 70's, the mechanics related sequences of courses were titled Small Engine Repair, Power Mechanics, and Light Mechanics Related Technology. The content was considered part of the Industrial Arts curriculum. With the introduction and widespread use of computers and other technology in the transportation industry and the higher skill requirements of today's technicians, this introductory program was reviewed and revised to meet current industry trends and standards.

In response to the growing use and development of technologies and processes in local industries, the Technology Education Department (formally Industrial Arts) began to incorporate new technologies and related concepts into the overall curriculum. During the past few years, the program has changed its principle focus from small engine operation and repair to project development, processes, service, production simulations, and career related opportunities. This course represents the introductory section of the overall Transportation Related Program that will focus on industry standards and student articulation to a post secondary educational program.

The staff, and their respective advisory committee, began to meet and review the program curriculum guide during the 2000-01 school year. Over the past several months, they have revised and validated instructional materials and activities to support business and industry practices and standards.

This program will offer students the opportunity to develop valuable skills applicable to other academic areas, enhance future career choices, and provide a foundation for a variety of life applications.

POWER AND ENERGY TECHNOLOGY 1 - 2
Washington State Essential Academic Learning Requirements

POWER AND ENERGY TECHNOLOGY						
This Career and Life Skills class supports the Washington State Essential Academic Learning Requirements.						
COURSE OBJECTIVES:	ART	COMMUNICATIONS	MATHEMATICS	SCIENCE	WRITING	READING
Unit 1: Safety			*	*	*	*
Unit 2: Engine Construction	*	*	*	*	*	*
Unit 3: Fuel Systems	*	*	*	*	*	*
Unit 4: Carburetion	*	*	*	*	*	*
Unit 5: Ignition Systems	*	*	*	*	*	*
Unit 6: Lubrication	*	*	*	*	*	*
Unit 7: Engine Cooling	*	*	*	*	*	*
Unit 8: Measurement of Engine Performance	*	*	*		*	*
Unit 9: Mechanical Measurements - Precision			*		*	*
Unit 10: Hand Tools - Practical			*		*	*
Unit 11: Servicing/Maintenance			*		*	*
Unit 12: Welding – Oxygen/Acetylene	*		*		*	*
Unit 13: Welding – Arc/Wirefeed	*	*	*		*	*
Unit 14: Career Opportunities			*		*	*
Unit 15: Leadership			*		*	*

POWER & ENERGY TECHNOLOGY 1 - 2
Program Goals

Renton School District students enrolled in Power and Energy Program Technology will:

- Develop an awareness of safety procedures in the use of hand tools and in the lab setting
- Develop skills in using hand tools and shop equipment
- Develop a procedure for storing and handling hazardous materials
- Develop a basic knowledge of the theory, practical repair, and usage of internal combustion engines
- Explore career opportunities in related occupational areas
- Be better equipped to predict the future applications of the internal combustion engine
- Develop abilities to service and repair equipment
- Develop a note taking strategy for application in a lab-based environment

POWER & ENERGY TECHNOLOGY 1 - 2

Scope & Sequence

Unit 1: Safety

- A. General –including Safety Letter
- B. Small Engine related
 - 1. Air quality
 - 2. Acoustics (noise)
 - 3. Burns
- C. Hazardous Material
 - 1. M.S.D.S.
 - 2. Handling, Storage & Disposal
- D. First Aid
- E. Shop Equipment
 - 1. Grinding & Drilling
 - 2. Shearing & Bending
 - 3. Valve reconditioning equipment
 - 4. Cylinder reconditioning equipment
- F. Fire Prevention
- G. OSHA Rules/WISHA Regulations
 - 1. Rules
 - 2. Recommendations

Unit 2: Engine Construction

- A. 4 cycle
 - 1. Internal Combustion
 - 2. External Combustion
 - 3. Sterling Operation
- B. 2 cycle operation
 - 1. Internal
 - 2. External
 - 3. Diesel
- C. Engine Construction Materials
 - 1. Aluminum
 - Sleeved Block – Dry
 - Standard Block – Wet
 - Cast in Block
- D. Valve Systems
 - 2. In head
 - 3. Over head

Unit 3: Fuel Systems

- A. Gasoline
 - 1. Octane
 - 2. Additives
- B. LP Gas/Natural Gas
 - 1. Octane
 - 2. Combustion of LP Gas
- C. Kerosene and Diesel Fuels
 - 1. Advantages/Disadvantages
- D. Two Cycle Mixtures
 - 2. Types of Oils
 - 3. Ratios for operation
- E. Fuel Tanks
 - 1. Vented
 - 2. Remote/Internal
- F. Fuel Filters
 - 1. Paper
 - 2. Sediment Bowls
- G. Pumps
 - 1. Mechanical
 - 2. Electric
 - 3. Gravity Operation
 - 4. Primers
 - 5. Pressurized Fuel systems

Unit 4: Carburetion

- A. Air fuel Mixture
 - 1. Calculations
 - 2. Ratios
- B. Pressure Difference
 - 1. Vacuum (less than atmospheric)
 - 2. Atmospheric pressure
 - 3. Venturi Effect
- C. Types of Carburetors
 - 1. Natural/side Draft
 - 2. Updraft
 - 3. Downdraft
- D. Float types
 - 1. Ventilation
 - 2. Choke System
 - 3. Throttle
 - 4. Load Adjustment
 - 5. Acceleration
 - 6. Economizer Circuit
 - 7. Idle Circuit
- E. Diaphragm Type

1. Operation
- F. Governors
2. Air Valve (pneumatic)
 3. Centrifugal
 4. Vacuum
 5. Adjustments
- G. Air filters
1. Paper
 2. Oil Bath
 3. Foam

Unit 5: Ignition Systems

- A. Magneto
1. Point type
 - a. Dwell Angle
 - b. Advance System
 - c. Stop Switches
 2. Solid State
 - a. Transistor controlled
 3. Comparison
- B. Distributors
1. Point type
 2. Solid State
 3. Battery Ignition Systems
 - a. Auto Transformer Coils
- C. Ignition Coils
1. Compact type
 2. Solid State
 3. Schematics
- D. Spark Plugs
1. Heat Range
 2. Electrode types
 3. Spark Plug Reaches
 4. Sealing Methods
 - a. O-Ring
 - b. Tapered Seat
 - c. Tightening Valves
 5. Resistor/Non-resistor
 - a. Applications
 - i. RF Interference
- E. Batteries
1. Lead Acid
 - a. Construction
 - b. Cell Voltage
 - c. Charge/Discharge

- i. Hydrogen Gases
- d. Disposals

Unit 6: Lubrication

- A. Friction
- B. Pressure
- C. Oils
 - 1. Hydrodynamic
 - 2. Boundary
 - 3. Rust Corrosion
 - 4. Detergent/Non-Detergent
 - a. Applications
 - 5. Viscosity
 - a. Grades
 - b. Applications
 - c. API Classifications
 - d. SAE Classifications
- D. 2 Cycle Engine Lubrication
 - 1. Additives
 - a. Fuel Mixtures
- E. 4 cycle Lubrication
 - 1. Splash
 - 2. Injection Pump
 - 3. Positive Displacement Pumps
 - 4. Full Pressure Pumps
 - a. ByPass System
- F. Oil filters
 - 1. Shunt Filter
 - 2. Full Flow
 - 3. Spin-On
 - 4. Canister

Unit 7: Engine Cooling

- A. Air Cooling
 - 1. Fin Shrouds
 - 2. Fan
 - 3. Coolant fins
- B. Exhaust Cooling
- C. Water Cooling
 - 1. Water Jackets
 - 2. Coolants
 - a. Ethylene Glycol
 - b. Sennia
 - c. Handling/Disposal
 - 3. Water Pumps

- a. Sliding Valve
- b. Rotor Valve
- c. Plunger Pump
- d. Vari-Volume
- e. Pressure/Vacuum
- 4. Thermostat
 - a. Heat Range
 - b. Applications
 - c. Emissions
- 5. Radiators
 - a. Aluminum Core
 - b. Copper Core
 - c. Plastic Core
 - d. Repair
- 6. Oil Cooling
 - a. Related to Engine
 - b. Maintenance of Oil

Unit 8: Measurement of Engine Performance

- A. Bore & Stroke
- B. Engine Displacement
 - 1. Formulas
 - 2. Computation
- C. Compression Ratio
 - 1. Formula
 - 2. Computations
 - 3. Practical Application
- D. Force
 - 1. On Piston
 - 2. Head Gasket
 - 3. Closure of Valves
- E. Work
 - 1. Formulas
 - 2. Computations
- F. Power
 - 1. Formula
 - 2. Computations
- G. Energy
 - 1. Definition
- H. Horsepower
 - 1. Formulas
 - 2. Computations
 - 3. Calculations
 - 4. Brake Horsepower
 - a. Pony Brake

- b. Indicated Horsepower
- 5. Dynamometer
- 6. Frictional
 - a. Rated Horsepower
 - i. Calculations
 - ii. Formulas
 - b. Corrected Horsepower
 - i. Graphing

I. Torque

- 1. Definition
 - a. Formula
 - b. Calculations

J. Volumetric Efficiency

- 1. Definition
- 2. Graphing
- 3. Practical Efficiency
- 4. Mechanical Efficiency
 - a. Relevance to Applications

Unit 9: Mechanical Measurements - Precision

A. Micrometer, Reading of

- 1. Clamp
 - a. Inside
 - b. Outside
- 2. Depth
- 3. Standard/SI.

B. Vernier Caliper, Reading of

- 1. Standard/S.I.

C. Scaling

- 1. Standard/S.I.

D. Thickness Gauges

- 1. Slide
- 2. Go-No-Go

E. Thread Pitching

Unit 10: Hand Tools – Practical

A. Screwdriver

- 1. Standard
- 2. Phillips
- 3. Prince Reed

B. Torc

- 1. Sockets
- 2. Bits

C. Pliers

- 1. Slip Joint

2. Parallel Saw
3. Water Pump
4. Battery
5. Needle Nose
6. Side Cutters
7. Wire Strippers
8. Tin-Metal Shears

D. Hammers

1. Dead blow
 - a. Ball Peen
 - b. Standard
 - c. Carpenter
2. Malls
 - a. Handheld
 - b. Swing
3. Rubber Mallets

E. Sockets

1. Polished
 - a. Application
 - i. Short
 - ii. Deep
 - iii. Specialized
2. Impact
 - a. Application
 - i. Short
 - ii. Deep
 - iii. Specialized

F. Socket Drivers

1. Adapters
2. Ratchets

G. Wrenches

1. Applications
 - a. Open/Box/Tubing

H. Chisels/Punches/Pullers

I. Power Tools

1. Pneumatic
2. Electronic
3. Diagnostic

Unit 11. Servicing/Maintenance

A. Service Engine Block

1. Hone
2. Bore
3. Measurements & Tolerances

B. Service Head

1. Grind Valves
 2. Faces & Seats
 3. Measurements
 4. Assembly
- C. Crankshaft
1. Polish
 2. Measurements
 3. Applications
- D. Pistons
1. Ring Applications
 2. Measurement
 3. Functions
 4. Types
 5. Installations
- E. Oil/Cooling System
1. Application
 2. Assembly
- F. Ignition System
1. Measurements
 2. Clearances
 3. Timing Valve/Ignitions
 4. Troubleshooting
- G. Fuel System
1. Overhaul
 2. Troubleshoot
 3. Assembly
 4. Governor Adjustments
- H. Starting/Charging
1. Applications
 2. Troubleshooting

Unit 12: Welding - Oxygen/Acetylene

- A. Safety
1. Personal
 2. Shop
- B. Torch Operation
1. Cutting
 2. Welding
 - a. Bar Stock
 - b. Flat Plate
- C. Project
1. Design
 - a. Integration with art
 2. Competition

Unit 13: Welding – Arc/Wirefeed

- A. Safety
 - 1. Personal
 - 2. Shop
- B. Equipment Operation
 - 1. Maintenance
 - 2. Cutting
 - 3. Welding
 - a. Bar Stock
 - b. Flat Plate
- C. Project

Unit 14: Career Opportunities

- A. Employment Options
 - 1. Advantages/Disadvantages
 - 2. Business Management
- B. Employee
 - 1. Resume Writing
 - 2. Interviewing
 - 3. Employment Success

Unit 15: Leadership

- A. Team Selection
 - 1. Task Division
- B. Presentation
 - 1. Class
 - 2. Team
 - a. Absent members
 - b. New members
- C. Final Document Presentation
 - 1. Leader

POWER & ENERGY TECHNOLOGY 1 - 2
Instructional Materials

Texts/Workbooks:

Small Gas Engines, Goodheart-Wilcox Co.

Small Gas Engines, Alfred C. Roth

Workbook for Small Gas Engines, Alfred C. Roth

Small Engine Lab Manual, A. A. Stacey, Shoreline Publications

Small Engine Lab Manual for Briggs & Stratton, A. A. Stacey, Shoreline Publications

Small Engine Lab Manual for Tecumseh, A. A. Stacey, Shoreline Publications

Briggs & Stratton Repair Instructions

OxyAcetylene-How to Weld/Cut, Clauston

TransEd Case Studies 200 (electronic), Metro Transit, Seattle, WA

POWER & ENERGY TECHNOLOGY 1 - 2

Evaluation/Assessment

The following evaluation and assessments will be used in the Power and Energy course:

- Graded Assignments
 1. In Class-Written
 2. In Lab-Written Reports
 3. Homework-Written
 4. Notebook Completion

- Lab Work
 1. Projects Completion
 2. Quality of Work
 3. Adherence to workplace standards

- Testing
 1. Written Class -Testing
 2. Verbal Lab-Testing
 3. Presentation of Projects
 4. Culminating Project

- Teacher Observation
 1. Classroom Conduct
 2. Lab Conduct
 3. Adherence to Safety Policies
 4. Teamwork
 5. Social Expectation

- Student Evaluation
 1. Subject Matter
 2. Relativity of Subject
 3. Lab Self evaluation
 4. Class Evaluation
 5. Practical Application

POWER AND ENERGY TECHNOLOGY 1 - 2
Leadership and Vocational Plan

LEADERSHIP AREAS	STUDENTS WILL:	VOCATIONAL ASPECTS	INTEGRATED INTO CURRICULUM
<p>Area 1: Introduction to Leadership Students will develop an understanding and demonstrate a knowledge for the purpose of Student Leadership in Vocational Education.</p>	<ul style="list-style-type: none"> *Discuss the purpose of developing personal and group leadership skills. *Determine the skills that will help me function in family, community and work setting. 	<ul style="list-style-type: none"> *To build teamwork and have assigned areas of responsibility for shop use 	<ul style="list-style-type: none"> *Team selected during Unit 1
<p>Area 2: Personal Qualities Students will demonstrate personal qualities necessary to function in a family, community and work setting.</p>	<ul style="list-style-type: none"> *Determine the importance of values and goals. *Identify short and long term goals. *Write down necessary steps to carry out goal. *Describe how personal values are reflected in work ethics. 	<ul style="list-style-type: none"> *Team Building *Shop cleaning responsibility 	<ul style="list-style-type: none"> *Team selection – Unit 1
<p>Area 3: Interpersonal Skills Students will become aware of and demonstrate interpersonal skills needed to function in a global society.</p>	<ul style="list-style-type: none"> *Demonstrate how to work cooperatively with others. *Provide for positive role models in actions, behaviors and attitudes in stressful situations. *Identify and write down goals for self. *Determine whether goals are conceivable, achievable, and can be measured. *Write down necessary steps to carry out each goal. Evaluate each step. *Manage and resolve positive stress and adversity in the work setting. 	<ul style="list-style-type: none"> *Team working for completion dates *Keep notebook record 	<ul style="list-style-type: none"> *All Units

<p>Area 4: Communication Skills Students will be able to communicate effectively in the community and work situations.</p>	<ul style="list-style-type: none"> *Students will actively “listen” and carry out signed and oral instructions. *Will prepare formal and informal written materials. 	<ul style="list-style-type: none"> *Introduction to related fields *Maintenance for printed materials 	<ul style="list-style-type: none"> *Preparation of notebook *Building user directions
<p>Area 5: Community Students will develop an understanding and demonstrate a knowledge of how to work effectively in the community.</p>	<ul style="list-style-type: none"> *Recognize the values of the work professional field. 	<ul style="list-style-type: none"> *Securing of additional components (donations) *Handling of parts ordering 	<ul style="list-style-type: none"> *After Unit 3
<p>Area 6: Personal and Tech Resources Students will be able to utilize personal and technological resources to make decisions for the family, community and workplace.</p>	<ul style="list-style-type: none"> *Research and identify the use of technological tools. 	<ul style="list-style-type: none"> *Networking technology *Use of electronic search equipment for engine upgrades 	<ul style="list-style-type: none"> *Completed for each unit in hard form in notebook
<p>Area 7: Group Dynamics Students will demonstrate organizational skills in large and small group situations.</p>	<ul style="list-style-type: none"> *Understand team skills. *Develop group facilitation skills. *Conduct an effective small group meeting. 	<ul style="list-style-type: none"> *Work as group for team success 	<ul style="list-style-type: none"> *Every class session
<p>Area 8: Employability Skills Students will understand and demonstrate effective employability skills.</p>	<ul style="list-style-type: none"> *Identify behaviors to establish successful working relationships. *Identify means of dealing with conflict resolution in the workplace. *Identify and demonstrate proper work ethic. 	<ul style="list-style-type: none"> *Team building as small groups *Written reports for large group (class) *Presentation of team reports 	<ul style="list-style-type: none"> *End of each unit after Unit 2