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# Electrical and Electronics 10, 20, A30, B30

## Titles and Descriptions

**Basic Electronics. 8th ed.** (Print-Non-Fiction). Grob, Bernard. Glencoe/McGraw Hill (MHR), 1997. 1010 p. ISBN 0-02-802253-X (\$133.95 hdc.).

This book is intended for beginning students who are taking their first course in the fundamentals of electricity and electronics. Following a survey chapter on electronics, the book provides complete and comprehensive coverage of the subjects related to the field. A sampling of the topics covered includes Ohm's law, series circuits, voltage dividers, conductors and insulators, batteries, alternating current, inductance and electronic circuits. Colour photographs, line drawings, self-tests, objectives and reviews all help to make the text more accessible. An index and a glossary are included.

**Suggested Use:** General; Teacher Reference

**Basic Mathematics for Electricity and Electronics. 8th ed.** (Print-Non-Fiction). Singer, Bertrand B., Forster, Harry and Schultz, Michel E. Glencoe/McGraw Hill (MHR), 2000. 897 p. ISBN 0-02-805022-3 (\$120.95 hdc.).

Although this is a fairly technical resource, teachers will be able to use this book to obtain suggestions on how best to approach the math that is associated with electricity and electronics. Some of the areas covered include simple electric circuits, formulas, Kirchhoff's Laws, Algebra of complex electric circuits, capacitance and three-phase systems. Each chapter includes self-tests, reviews and Internet activities. An index is included.

**Suggested Use:** Teacher Reference  
**Basic Skills in Electricity and Electronics Series** (Print-Non-Fiction). Please refer to

the titles: *Electricity: Principles and Applications* and *Industrial Electronics*.

**Blueprint for Life/Work Designs. Rev. ed.** (Print-Non-Fiction). Redekopp, Dave. The National Life/Work Centre (NLW), 2000. unp. No order number is required. (\$25.00 binder).

(CAN) This resource addresses the need for high quality career development programs for youth by providing specific guidelines that list competencies considered important to develop throughout one's life/work building process. The competencies cover the areas of personal management, learning and work exploration, and life/work building. Indicators that describe more specific outcomes in terms of knowledge skills and attitudes are also provided. *Blueprint* provides a theoretical framework for the work study and career modules in all practical and applied arts courses.

In addition to this package, there is *Blueprint for Life/Work Designs: The Quick Reference Guide*.

In addition to this package, there is *Blueprint for Life/Work Designs: The Quick Reference Guide*. This information is also accessible through a website at the following address: <http://www.blueprint4life.ca>.

**Suggested Use:** Career Development; Work Study; Teacher Reference  
**Other Use:** All PAA Curricula

**Career Options for Women Series** (Video). Please refer to the title: *Construction*.

**Construction** (Video). (Career Options for Women Series). Third Wave Communications Inc. (MGR), 1999. 24 min. Dup. order no. V6845. Teacher's Guide for series - Order no. G6843 (\$4.90 loose-leaf).

(CAN) This video from the *Career Options for Women Series* focuses on opportunities that are available for women in the construction industry. Viewers are informed that while construction in Canada accounts for 12% of the national economy, only 11% of construction employees are women. They

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are also introduced to three successful women who have chosen non-traditional careers in the construction industry—a welder, a carpenter and an electrician.

Supporting print is available from Media Group.

**Suggested Use:** Career Development  
**Other Use:** Construction and Carpentry; Welding

**Construction Safety Training System** (CD-ROM). Saskatchewan Construction Safety Association (SKSA), 1999. (\$FREE).

(SK) This is an excellent software package designed to encourage greater safety awareness in the construction industry. The topic, the use of interactive video and the excellent production values make this program suitable for senior high school students. Twelve areas of safety are covered - from the law at work to protective equipment, workplace hazards, machinery and Workplace Hazardous Materials Information System (WHMIS). Each section has several lessons that encourage students to learn the new concepts through the use of interactive video. Following the study component, students can check their progress and then test their learning using the same program. One hundred percent accuracy of the 12 lessons is required to obtain a one-year safety certification from the Saskatchewan Construction Safety Association. The program is very flexible and teachers can choose to use just one or more of the modules. Although the program can be used for independent study, it best serves students when implemented as a teaching tool. The video can be paused at any point for discussion and further explanation.

The program is available free to schools by contacting the Saskatchewan Construction Safety Association. This organization can also provide information regarding training options.

**Suggested Use:** Safety  
**Other Use:** Agriculture; Autobody; Construction and Carpentry; Energy and Mines; Forestry Studies; General; Horticulture; Machining; Mechanical and Automotive; Welding

**Cool Careers for Girls in Construction** (Print-Non-Fiction). Pasternak, Ceel and Thornburg, Linda. (Cool Careers for Girls Series). Impact Publications (CSK), 2000. 117 p. ISBN 1-57023-131-1 (\$21.40 pbk.).

Using a number of case studies, students are introduced to several women who have had successful careers in the construction industry. By learning about the background of these women, their personality traits and their physical and mental abilities, young women will be able to decide if this type of career is right for them.

**Suggested Use:** Career Development; Survey Course - Middle Level  
**Other Use:** Construction and Carpentry; Horticulture

**Cool Careers for Girls Series** (Print-Non-Fiction). Please refer to the title: *Cool Careers for Girls in Construction*.

**Delmar's Standard Textbook of Electricity. 2nd ed.** (Print-Non-Fiction). Herman, Stephen L. Delmar Publications (NEL), 1999. 1040 p. ISBN 0-8273-8550-1 (\$103.30 hdc.). Instructor's Guide - ISBN 0-8273-8551-X (\$25.50 pbk.).

This text offers theoretical and practical information about DC/AC circuits and machines. Herman's new edition includes increased coverage of transformers and electrical filters, as well as additional formulas and examples for determining impedance in resistive, inductive and capacitive series and parallel circuits. The extensive use of coloured illustrations and the easy-to-follow format make this a valuable resource for teachers and students. This book includes a table of contents, a glossary and an index.

**Suggested Use:** Batteries; Electrical Motor Controls; Integrated Circuits; Electric Motors; Survey Course - Secondary Level;  
**Digital Electronics: Principles and Applications. 5th ed.** (Print-Non-Fiction). Tokheim, Roger L. Glencoe/McGraw Hill (MHR), 1999. 406 p. ISBN 0-02-804161-5 (\$113.95 hdc.).

This resource is an excellent choice for the student who is career orientated in the area of digital electronics. Using an accessible format, the author has presented a very

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complete discussion of the details associated with the field. Following a general introduction to digital electronics, topics such as logic gates, IC specifications, shift registers and memories are covered. The usefulness of the book has been enhanced by the inclusion of objectives, self-tests, colour photographs, line drawings, summaries, review questions and critical thinking questions. An index and a glossary are included.

**Suggested Use:** Digital Concepts; Teacher Reference

**Don't Risk Your Life** (Video). Saskatchewan Labour (**MGR**), 2003. 15 min. Dup. order no. V2238. Teacher's Guide - Order no. G2238 (\$FREE booklet).

(SK) Effective case studies are used to reinforce the importance of safety in the workplace. The stories of several Saskatchewan young people, who have been injured or killed on the job, are an effective backdrop to the rights and responsibilities students have in the workplace. Each case study has been re-enacted and includes interviews with the students who were injured or the parents of the young workers who died.

This video was distributed to all middle and Secondary level schools in September 2003. It was also distributed to participants of the *Ready for Work* workshops. Additional copies can be obtained from Media Group.

**Suggested Use:** Safety

**Other Use:** All PAA Curricula

**Dying to Work** (Video). (W5 Series). CTV Television Network Ltd. (**MGR**), 2000. 19 min. Dup. order no. V638.

(CAN) As more and more young people start their first jobs, the rate of accidents and deaths is rapidly rising. This program features interviews with the parents of several teens who were killed or seriously injured shortly after starting their jobs. The need to ask questions related to safety before starting a job is stressed as are the rights and responsibilities of the employer and the employee. This is an effective video that reinforces a strong safety message.

**Suggested Use:** Safety

**Other Use:** All PAA Curricula

**Electric Circuits and Machines. 2nd Canadian ed.** (Print-Non-Fiction). Lister, Eugene C. and Golding, Michael R. McGraw-Hill Ryerson Limited (MHR), 1996. 570 p. ISBN 0-07-087568-5 (\$67.95 hdc.).

(CAN) This text supports the electrical portion of the *Electrical and Electronics 10, 20, A30, B30 Curriculum*. Some of the topics covered include: motors, generators, single and three-phase circuits, transformers and electrical instruments. Each chapter concludes with review questions and problems. Black-and-white photographs and numerous diagrams are used throughout this resource. A table of contents and an index are included.

**Suggested Use:** Batteries; Electric Motors; Electrical Motor Controls; Power Supplies

**Electrical Code Simplified: Residential Wiring: Saskatchewan Book 1. 6th ed.** (Print-Non-Fiction). Knight, P. S. Knight, P. S. (KTP), 2002. 147 p. ISBN 0-920312-32-2 (\$11.95 pbk.).

(SK) This valuable manual is a simplified version of the Canadian Electrical Code. Many references from the *Saskatchewan Provincial Electrical Code Rules* are presented. Each of the 33 sections deals with a specific phase of the installation. The well-labelled diagrams, charts and photographs clarify the text. This is a necessary resource for electrical construction. It includes a table of contents and an index.

**Suggested Use:** Residential Wiring; Survey Course - Middle Level; Survey Course - Secondary Level

**Electrical/Electronic Systems** (Print-Non-Fiction). Mazur, Glen A. and Proctor, Thomas E. American Technical Pubs., Inc. (NEL), 1995. 490 p. ISBN 0-8269-1772-0 (\$83.95 hdc.).

Using colourful drawings, charts and photographs, this resource presents a good general overview of the field of industrial electrical systems. Some of the areas covered include symbols and drawings, rotating outputs, motors, non-rotating outputs and interfaces. An index and a glossary are

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included.

**Suggested Use:** General; Survey Course - Secondary Level

**Electrical Motor Controls. 2nd ed.** (Print-Non-Fiction). Rockis, Gary and Mazur, Glen. American Technical Pubs., Inc. (NEL), 2001. 544 p. ISBN 0-8269-1675-9 (\$115.95 hdc.).

This American text provides comprehensive coverage of the control devices used in contemporary industrial electrical systems. A few of the topics covered include: motor starters, solenoids, control devices, motor circuits, power distribution systems and accelerating and decelerating methods. Coloured photographs, charts and diagrams are interspersed throughout the text. The text offers a table of contents, a glossary and an index.

Support material includes a CD-ROM containing quizzes, a glossary and other related material.

**Suggested Use:** Electric Motors; Electrical Motor Controls

**Electrical Power: Motors, Controls, Generators, Transformers** (Print-Non-Fiction). Kaiser, Joe. Goodheart-Willcox Publisher (NEL), 1998. 331 p. ISBN 1-56637-366-2 (\$67.95 hdc.). Laboratory Manual - ISBN 1-56637-367-0 (\$18.95 pbk.).

The emphasis of this resource is placed on the practical rather than the theoretical aspects of electrical power. Chapters cover the rules governing the behaviour of electricity and magnetism; the machines and devices that generate, transform, and use electrical power; and the control of motors. They include objectives, a summary, review questions and problems, and numerous diagrams. Included are a table of contents, a glossary and an index.

The laboratory manual consists of experiments and problems.

**Suggested Use:** Electric Motors; Electrical Motor Controls; Power Supplies

**Electrical Principles and Practices** (Print-Non-Fiction). Mazur, Glen A. and Zurlis, Peter A. American Technical Pubs., Inc.

(NEL), 1997. 460 p. ISBN 0-8269-1755-0 (\$69.75 hdc.). Instructor's Guide - ISBN 0-8269-1757-7 (\$21.50 pbk.).

This American text provides a comprehensive introduction to basic electrical theory, circuit fundamentals and practical wiring techniques. A chapter covering basic mathematical principles such as decimals, ratios, fractions and conversions is included to help students understand fundamental electrical and electronic calculations and problem solving. Black-and-white diagrams, charts and graphs help to clarify the print. This book offers a table of contents, a glossary and an index.

**Suggested Use:** Digital Concepts; Electric Motors; Power Supplies; Survey Course - Middle Level; Survey Course - Secondary Level

**Electrical Safety in the Workplace** (Video). (Safety Care Series). Safetycare Inc. (SCI), 1996. 23 min. No order number is required. (\$180.00).

The basics about how electricity behaves are covered in this video. It also examines the type of accidents that could happen if students do not have a proper understanding of how electricity works. The emphasis of the video is on how to prevent the accidents from occurring. Use of the proper safety equipment is also demonstrated.

**Suggested Use:** Safety

**Electrical Wiring: Residential. 3rd Canadian ed.** (Print-Non-Fiction). Mullin, Ray C., Miller, Gary, Stephenson, Paul. Nelson Thomson Learning (NEL), 2003. 485 p. ISBN 0-17-622369-X (\$61.50 pbk.).

(CAN) The latest edition of this classic reference is based on the 2002 *Canadian Electrical Code, Part I: The Safety Standard for Electrical Installation*. It includes all aspects of residential wiring from the design of wiring of a residence to actual installation. A few of the areas covered are calculating conductor sizes and voltage drop, sizing service, connecting electrical appliances and installing recessed fixtures. Each unit offers clearly defined objectives and questions as well as problems that deal with chapter objectives. Many diagrams and illustrations

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further emphasize unit material. This resource includes a table of contents, an index, and 10 poster-size plans for single family dwellings.

**Suggested Use:** Residential Wiring; Survey Course - Secondary Level

**Electricity and Basic Electronics** (Print-Non-Fiction). Matt, Stephen R. Goodheart-Willcox Publisher (NEL), 1998. 368 p. ISBN 1-56637-406-5 (\$72.50 hdc.). Workbook - ISBN 1-56637-407-3 (\$19.95 pbk.). Instructor's Guide - ISBN 1-56637-408-1 (\$9.95 pbk.).

This resource provides a basic introduction to electrical fundamentals, electronic principles and circuit design. Each new concept builds on the information presented in the previous chapters. In addition to the numerous black-and-white photographs and diagrams, each chapter includes learning objectives, a summary, a list of key words and terms, review questions and activities. Safe work habits are reinforced throughout the book. This resource offers a table of contents, a glossary and an index.

The workbook contains questions and activities that correspond with each chapter in the text.

The instructor's guide provides answers to the workbook questions.

**Suggested Use:** General

**Electricity and Electronics** (Print-Non-Fiction). Gerrish, Howard H., Dugger, William E. and Roberts, Richard M. Goodheart-Willcox Publisher (NEL), 1999. 479 p. ISBN 1-56637-436-7 (\$74.95 hdc.).

This resource offers practical information about the fundamentals of electricity and electronics. The six main topics covered are fundamentals of electricity and electronics, applied electricity, alternating current circuits, electronic devices and applications, basic electronic circuits, and electronic communication and data systems. Each chapter contains an overview, a summary, review questions and many appealing project ideas. Gender equitable coloured photographs, diagrams and charts are interspersed throughout the text. This book

includes a table of contents, a glossary and an index.

**Suggested Use:** General

**Electricity and Electronics Technology. 7th ed.** (Print-Non-Fiction). Buban, Peter, Schmitt, Marshall L. and Carter, Charles G., Jr. Glencoe/McGraw Hill (MHR), 1999. 658 p. ISBN 0-02-683427-8 (\$74.76 hdc.). Student Workbook - ISBN 0-02-683429-4 (\$13.95 pbk.). Teacher's Resource Guide. ISBN 0-02-683428-6 (\$64.00 pbk.).

This is a general resource that covers most topics in the electrical and electronics area. There is information provided about careers, safety and basic science in the first chapter. The bulk of the book looks at the specific topics of circuits, producing electricity, semiconductors and integrated circuits, wiring, testing, the information age, and electricity and electronics at work. Each chapter begins with objectives, contains sidebars with interesting facts and ends with a summary and review. Photographs, line drawings and tables illustrate the key concepts being discussed. As this is an American resource, a suitable Canadian resource would have to be consulted for the correct codes. An index and a glossary are included.

The teacher's guide and the student workbook contain several activities and experiments.

**Suggested Use:** General; Survey Course - Secondary Level

**Electricity: Principles and Applications. 5th ed.** (Print-Non-Fiction). Fowler, Richard J. (Basic Skills in Electricity and Electronics Series). Glencoe/McGraw Hill (MHR), 1999. 432 p. ISBN 0-02-804847-4 (\$121.95 hdc.). Instructor's Manual - ISBN 0-02-804850-4 (\$46.95 pbk.).

This resource presents a thorough look at the principles and applications of electricity. The concepts build from chapter to chapter. Self-test questions provide students with the opportunity to discover weak areas or affirm learned material. Each chapter contains objectives, many sample problems, a detailed summary, and review and critical thinking questions. The colour-coded chapters, the black-and-white photographs and many

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diagrams make this a useful resource for students. Included in this text are a table of contents, several appendices and an index.

**Suggested Use:** Cells and Small Voltage Sources; Electric Motors; Integrated Circuits; Survey Course - Middle Level; Survey Course - Secondary Level

**Electronic Communication Fundamentals Series** (Video). Bergwall Productions (MCI), 1998. 18-20 min. Order numbers follow.

Recommended titles in this series include the following:

<i>Basic Communication Systems</i>	\$99.00
(Order no. 950030)	
<i>Detection and Transmission</i>	\$99.00
(Order no. 950032)	
<i>Elements of Radio Communication</i>	\$99.00
(Order no. 950031)	
<i>FM &amp; the Superhetrodyne Receiver</i>	\$99.00
(Order no. 950033)	
Set of 4 videos	\$359.00.
(No order number is required.)	

This series of four videos takes a detailed and scientific look at how electricity has benefited communications and radio transmission. The series will be useful for the electronics portion of the curriculum if radio communication is an emphasis. The evolution of electronic communication is given in the first video along with discussion about electromagnetic radiation and the concept of Carrier. Other concepts covered include diode detectors, AM wave, antenna, waveform analysis and FM transmission.

**Suggested Use:** General

**Electronics: Principles and Applications. 5th ed.** (Print-Non-Fiction). Schuler, Charles A. (Basic Skills in Electricity and Electronics Series). Glencoe/McGraw Hill (MHR), 1999. 532 p. ISBN 0-02-804244-1 (\$121.95 hdc.). Instructor's Manual - ISBN 0-02-804256-5 (\$43.95 pbk.).

This technical resource prepares students to diagnose, repair, verify and install electronic circuits and systems. It provides a solid, practical foundation in analog electronic concepts and device theory. The 15 chapters progress from an introduction to

electronics through solid-state theory, transistors, amplifiers, oscillators, radio, integrated circuits, control devices and regulated power supplies. Each of the colour-coded chapters begins with objectives and concludes with a summary, a review and critical thinking questions. This book includes numerous diagrams, a table of contents, a glossary and an index.

**Suggested Use:** General; Teacher Reference

**Electronics Technology: Devices and Circuits** (Print-Non-Fiction). Dugger, William E. and Gerrish, Howard H. Goodheart-Willcox Publisher (NEL), 1994. 656 p. ISBN 0-87006-085-6 (\$76.95 hdc.).

This basic text provides students with information on electricity and electronics fundamentals, components, circuits and applications. Chapters 1 through 11 examine direct current and alternating current electricity. Chapters 12 through 21 present theory and applications that include diodes, transistors and various solid-state devices. This is a well-designed text with numerous diagrams and black-and-white photographs. The coloured photographs depict both male and female personnel. This resource includes a table of contents, a glossary and an index.

**Suggested Use:** General

**Employability Skills Toolkit for the Self-Managing Learner** (Print-Non-Fiction). The Conference Board of Canada (MHR), 2000. ISBN 0-07-087847-1 (\$79.95 binder).

(CAN) The five modules within this practical resource are designed to help students develop and use the skills they need to enter into and progress within the world of work. The modules include information on knowing yourself, identifying and reflecting upon personal skills as well as practising and marketing these skills. The step-by-step layout and the use of charts make this resource very user friendly.

Background information on the *Toolkit* can be obtained online at <http://www.conferenceboard.ca/nbec/toolkit.htm>.

**Suggested Use:** Career Development; Work Study

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**Other Use:** All PAA Curricula

**Suggested Use:** General; Survey Course - Secondary Level

**Essential Skills/Compétences**

**Essentielles: Skills for Life, Learning and Work** (CD-ROM). Human Resources Development Canada (NAD), 2000. No order number is required. (\$10.00).

(CAN) Developed by Human Resources Development Canada, this resource can provide some excellent answers to students who are wondering about future careers and the skills they will need. Skills such as reading, writing, numeracy, oral communication, thinking, problem solving, working with others and computer use are all connected to 170 different occupations. Students can look up a particular career/occupation and see how each of the skills fits in, or they can look up the skill and receive a list of all the occupations that would make use of that skill. For example, if problem solving is entered as a skill it will list occupations such as mechanics, cosmetologists and carpenters. The program will then give examples of the types of problem solving that takes place in each of these occupations. Students can then compare their skill levels with those that are needed on the job. Links to websites for further information are also provided.

Human Resources Development Canada's website at <http://www15.hrdc-drhc.gc.ca/english/es.asp> provides further information.

**Suggested Use:** Career Development; Work Study; Teacher Reference

**Other Use:** All PAA Curricula

**Essentials of Electronics. 2nd ed.** (Print-Non-Fiction). Petruzella, Frank D. Glencoe/McGraw Hill (MHR), 2001. 726 p. ISBN 0-07-827696-9 (\$98.90 hdc.).

This is an excellent resource that covers all aspects of the Electrical and Electronics 10, 20, A30, B30 Curriculum. The format is easy to follow with bolded headings, charts and well-labelled diagrams. Objectives are listed at the beginning of each chapter and review questions are included to help students evaluate their understanding of the content presented. Included in this comprehensive resource are a table of contents, a glossary and an index.

**The Essentials of Fire Fighting Series** (Video). Please refer to the title: *Portable Extinguishers*.

**Eye Protection: The Humorous Approach** (Video). Programme Safety (PSA), 1992. 14 min. No order number is required. (\$185.00).

While humour and eye injuries certainly do not go together, this video takes a different approach in getting across the seriousness of the issue. What may appear as obvious safety precautions are often overlooked. The video takes a detailed look at how injuries to the eye occur in several industrial situations. Techniques that are needed to avoid these accidents are discussed, as are procedures to follow if an eye accident occurs.

**Suggested Use:** Safety

**Other Use:** Autobody; Construction and Carpentry; Mechanical and Automotive; Welding

**Guide for New Workers** (Print-Non-Fiction). (Ready for Work Series). Saskatchewan Labour (SAL), 2001. 247 p. No order number is required. (\$FREE spiral-bound).

(SK) Published by Saskatchewan Labour and distributed to all high schools in 2001, this resource offers very practical information for students in practical and applied arts courses. Some of the topics covered include applying for a job, employment equity, exploring careers, interviews, pay, rights and responsibilities, safety on-the-job and unions. As part of the *Ready for Work Series*, this book focuses on helping new workers make a successful transition to work.

**Suggested Use:** Career Development; Work Study

**Other Use:** All PAA Curricula

**Guide for New Workers: Counsellor/ Classroom Edition** (Print-Non-Fiction). (Ready for Work Series). Saskatchewan Labour (SAL), 2002. 142 p. No order number is required. (\$FREE loose-leaf).

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(SK) Based upon the *Guide for New Workers* student handbook, this resource provides teachers with excellent suggestions on how to create an awareness of work realities. New sections that do not exist in the student handbook have been added. These include topics on bullying, pertinent websites, legislation and relevant services. The format allows for photocopying in whole or in part for instructional use.

**Suggested Use:** Career Development; Work Study; Teacher Reference

**Other Use:** All PAA Curricula

**High School to Apprenticeship: A Link to the Future 2003: Handbook for High School Administrators and Guidance Counsellors** (Print-Non-Fiction).

Saskatchewan Apprenticeship & Trade Certification Commission (SATC), 2003. 126 p. No order number is required. (\$FREE pbk.).

(SK) This booklet provides an overview of the apprenticeship program in Saskatchewan and the connection it has to several high school programs. It is an essential resource for teachers who may have students who are preparing for a career in a designated trade. Each of the designated trades in Saskatchewan is listed and details are given about entrance requirements and training.

This evaluation was based on the 2003 edition. Please contact Saskatchewan Apprenticeship and Trade Certification for the latest information.

**Suggested Use:** Career Development; Work Study

**Other Use:** All PAA Curricula

**House Wiring Simplified: Tells and Shows You How** (Print-Non-Fiction). Mix, Floyd M.

Goodheart-Willcox Publisher (NEL), 1999. 208 p. ISBN 1-56637-542-8 (\$40.95 hdc.).

Based on the 1999 National Electrical Code in the United States, this resource is useful for Saskatchewan schools as it teaches the fundamentals of basic, safe, house wiring procedures. As the book cautions, local codes may vary so it is always best to check the provincial regulations. Intended for high schools, there are sections dealing with

electrical terms, conduits, switches, tools, safety, wiring systems and procedures, and house wiring circuits. The illustrations are very clear; the sections are short and well organized; and there are review questions at the end of each chapter. An index and a glossary are included.

**Suggested Use:** Residential Wiring; Survey Course - Middle Level; Survey Course - Secondary Level

**Industrial Electronics** (Print-Non-Fiction). Petruzella, Frank D. (Basic Skills in Electricity and Electronics Series). Glencoe/McGraw Hill (MHR), 1996. 404 p. ISBN 0-02-801996-2 (\$129.95 hdc.).

This resource offers a comprehensive exploration of industrial electronic circuits and equipment. It includes coverage of power distribution, power electronics, motor control, PLCs and process control systems. Each chapter contains stated objectives, self-test opportunities, a summary, and review and critical thinking questions. This book contains numerous diagrams, a table of contents and an index.

**Suggested Use:** Amplifiers; Digital Concepts; Integrated Circuits; Operational Amplifiers; Power Supplies

**Introduction to Technology** (Print-Non-Fiction). Pierce, Alan J. and Karwatka, Dennis. Glencoe/McGraw Hill (MHR), 1999. 554 p. ISBN 0-02-831275-9 (\$70.90 hdc.). Student Activity Manual - ISBN 0-02-831278-3 (\$13.05 pbk.).

This resource is ideally suited to Middle Level PAA courses as it introduces the fundamentals of several subject areas within the same book. Within the first section, the concept of technology is discussed with an emphasis on its origins, careers, safety, computers and energy. In the following sections, overall technologies such as communication, production and transportation are examined. Each of these in turn looks at particular subject fields such as construction or photography. The resource is very student friendly as it uses many photographs, drawings, graphs, activities, questions and summaries. Overall, this is an excellent resource to use, provided that the information is supplemented with



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more detailed information from each of the disciplines. An index and a glossary are included.

**Suggested Use:** Survey Course - Middle Level

**Other Use:** Construction and Carpentry; Design Studies; Drafting and Computer-Aided Design; Photographics/Graphic Arts; Photographics/Photography

**Manual Handling** (Video). Safetycare Inc. (SCI), 10 min. (\$220.00).

Manual handling is the movement of items by human energy. If manual handling is not done properly, serious injury can result. This video shows the types of injuries that can occur, how to move and lift items properly and how to avoid being injured.

**Suggested Use:** Safety

**Other Use:** Autobody; Construction and Carpentry; Horticulture; Machining; Mechanical and Automotive; Upholstery; Welding

**Moving Online...More Ready for Work Resources** (CD-ROM). Saskatchewan Labour - Prevention Services Branch (SWL), 2003. No order number is required. (\$FREE).

(SK) This CD contains a wealth of resources - electronic quizzes, PowerPoint presentations, learning activities, checklists and guides - that supplement the *Ready for Work* resource binder. By using this resource, teachers can provide students with important information about health, safety and labour standards that will help them make a positive transition from school to work. The program is designed to work with Windows 95 or higher and Internet Explorer.

The CD will be part of the *Ready for Work* binder as of September 2003. Individual copies are available from Saskatchewan Labour.

**Suggested Use:** Safety; Work Study

**Other Use:** All PAA Curricula

**Personal Protective Equipment** (Video). (Safety Care Series). Safetycare Inc. (SCI), 1995. 20 min. No order number is required. (\$220.00).

This video presents a detailed look at the many different pieces of safety equipment that are needed when working in industry. The main areas of concern are the eyes, head, hands and feet. Although the video is aimed for use in factories, it does have excellent ties to classroom use.

**Suggested Use:** Safety

**Other Use:** Autobody; Construction and Carpentry; Machining; Mechanical and Automotive; Welding

**Portable Extinguishers** (Video). (The Essentials of Fire Fighting Series). Action Training Systems (ATR), 1993. 18 min. Order no. VE107 (\$140.00 U.S.).

This program presents the different types of fire extinguishers and correct use of them. It examines the rating system for extinguishers, shows the operating instructions for portable extinguishers, describes the types and use of hand-held extinguishers, and demonstrates inspection techniques.

**Suggested Use:** Safety

**Other Use:** Agriculture Studies; Autobody; Commercial Cooking; Construction and Carpentry; Cosmetology; Driver Education; Electrical and Electronics; Energy and Mines; Forestry Studies; Horticulture; Machining; Mechanical and Automotive; Theatre Arts; Upholstery; Welding

**Ready for Work** (Kit). Saskatchewan Labour, Labour Standards Branch (SAL), 1999. No order number is required. (\$FREE).

(SK) Produced by Saskatchewan Labour, this comprehensive binder of excellent resources provides background information on virtually all areas of safety. The central concept in the package is that young people need more than a job to be ready for work. They need to know their rights and responsibilities and they need to know about health and safety and fairness in the workplace. The entire *Ready for Work* program consists of up to 25 hours of interactive, in-class materials. Some of the sections include occupational health and safety, hazardous materials, recognizing hazards, labour standards for young workers, and rights and responsibilities.

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Saskatchewan Labour's websites at [www.readyforwork.sk.ca](http://www.readyforwork.sk.ca) and [www.labour.gov.sk.ca](http://www.labour.gov.sk.ca) provide more information about other support material that goes with the package, including videos and a CD-ROM.

The entire *Ready for Work* binder is available through an STF workshop. Individual components can be requested through Saskatchewan Labour.

**Suggested Use:** Safety; Work Study  
**Other Use:** All PAA Curricula

**Ready for Work Series** (Print-Non-Fiction). Please refer to the titles: *Guide for New Workers* and *Guide for New Workers: Counsellor/Classroom Edition*.

**Safety Care Series** (Video). Safetycare Inc. (SCI). No order number is required. (\$180.00)

Recommended titles in this series include the following:

<i>Eye Safety</i>	(1989, 10 min.)
<i>Foot Safety</i>	(1990, 13 min.)
<i>Hand Safety</i>	(1989, 13 min.)

These videos take a specialized look at the hazards that exist for the eye, hand and foot. In addition to discussing the hazards that can result in injuries, each of the videos also discusses the control measures necessary to reduce these injuries.

Although they have been produced for use by companies, these programs are of value in the classroom situation.

**Suggested Use:** Safety  
**Other Use:** Autobody; Commercial Cooking; Construction and Carpentry; Mechanical and Automotive; Welding

**Safety First: Electrical Safety** (Video). (Safety First Series). Cambridge Educational (MCI), 1998. 30 min. Order no. 10111 (\$119.00).

This American program provides a basic introduction to electricity including what it is and how it affects us. It examines colour coding, the role of circuits and circuit

breakers, and fuses. The safety aspect is addressed with emphasis on prevention and treatment of electrical shocks.

**Suggested Use:** Safety

**Safety First Series** (Video). Please refer to the title: *Safety First: Electrical Safety*.

**Step Into the World of Workplace Learning: A Collection of Authentic Workplace Materials** (Print-Non-Fiction). Lewe, Glenda and MacLeod, Carol D. Nelson Thomson Learning (NEL), 2001. 303 p. ISBN 0-17-608571-8 (\$39.95 binder).

(CAN) As the title indicates, this package is aimed at providing the classroom teacher with actual materials used in the workplace. Samples of newsletters, contracts, tables and graphs that are used in the workplace are provided so students will be able to acquire and enhance workplace competencies. In addition to workplace competencies, students can also acquire knowledge of the occupations that use the documents, the essential skills that are needed in that job and a better idea of the norms of the world of work. The collection is not designed to be used directly by learners, but rather to help teachers develop learning activities. The occupations highlighted are real-world jobs that do not require university training.

Human Resources Development Canada's website at <http://www15.hrdc-drhc.gc.ca/english/es.asp> provides further information.

**Suggested Use:** Career Development; Work Study; Teacher Reference  
**Other Use:** All PAA Curricula

**Understanding Hazards and Risks** (Video). (Safety Care Series). Safetycare Inc. (SCI), 2001. 16 min. No order number is required. (\$220.00).

This video provides a general discussion about safety in the workplace. The philosophy and the laws behind safety are examined. In addition to safety in the workplace, the concept of safety in society as a whole is also addressed.

**Suggested Use:** Safety  
**Other Use:** All PAA Curricula

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**W5 Series** (Video). Please refer to the title:  
*Dying to Work.*

**WHMIS** (Video). Safetycare Inc. (SCI),  
2001. 16 min. No order number is required.  
(\$220.00).

This video presents an overview to  
Workplace Hazardous Materials Information  
System (WHMIS). The origins of WHMIS, the  
classes and types of controlled products and  
the symbols used to illustrate potential  
hazards are shown. Safe handling and  
storage of hazardous materials are stressed,  
as is recognizing the labels that are used.

**Suggested Use:** Safety

**Other Use:** All PAA Curricula

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## Out of Print but Still Useful Resources

Please note that the following title is currently out of print, but may be found in school libraries.

**Helping Solve the Employment Puzzle: A Toolbox for Middle & Secondary Levels** (Print-Non-Fiction). SIAST Woodland Campus, 1998.

(SK) This resource is the result of a collaborative partnership involving Saskatchewan Education, SIAST Woodland Campus and Saskatchewan Labour. The objective of the resource is to provide assistance for teachers to incorporate employability skills into their curricula. The 24 activities that are included with the resource are adaptable to either the Middle or Secondary Level curricula. Some of the topics examined through the activities include realistic job expectations, being an on-the-job coach, group decision making, conflict of interest in the workplace, telephone etiquette, fair employment and customer service. Each activity is clearly explained with objectives, resources and step-by-step directions.

Although this resource is not currently available for order, it was previously distributed to junior and senior high schools in the province.

**Suggested Use:** Survey Course - Middle Level; Survey Course - Secondary Level; Work Study

**Other Use:** All PAA Curricula

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## Short List of Recommended Titles

The titles listed below represent a starting point to support Resource-based Learning in Electrical and Electronics 10, 20, A30, B30. Before choosing to purchase any resources it is advisable to read the annotations in the bibliography and preview titles of interest to make selections that meet the needs of your particular school and community.

It is strongly recommended that teachers also access the Career and Work Exploration section of this bibliography for other recommended titles in the area of career development and work-study. This document can be viewed online at [http://www.sasked.gov.sk.ca/curr\\_inst/iru/paabibs.html](http://www.sasked.gov.sk.ca/curr_inst/iru/paabibs.html) or <http://www.sasked.gov.sk.ca/docs/paa.html>.

These and other electrical and electronics resources can be ordered by using the distributor directory found at the end of this document. Prices quoted are subject to change, but will serve as a guide to approximate cost.

**Blueprint for Life/Work Designs. Rev. ed.** (Print-Non-Fiction). Redekopp, Dave. The National Life/Work Centre (NLW), 2000. unpaginated. No order number is required. (\$25.00 binder).

**Delmar's Standard Textbook of Electricity. 2nd ed.** (Print-Non-Fiction). Herman, Stephen L. Delmar Publications (NEL), 1999. 1040 p. ISBN 0-8273-8550-1 (\$103.30 hcd.). Instructor's Guide - ISBN 0-8273-8551-X (\$25.50 pbk.).

**Electrical Code Simplified: Residential Wiring: Saskatchewan Book 1. 6th ed.** (Print-Non-Fiction). Knight, P. S. Knight, P. S. (KTP), 2002. 141 p. ISBN 0-920312-32-2 (\$11.95 pbk.).

**Electrical Power: Motors, Controls, Generators, Transformers** (Print-Non-

Fiction). Kaiser, Joe. Goodheart-Willcox Publisher (NEL), 1998. 331 p. ISBN 1-56637-366-2 (\$67.95 hcd.). Laboratory Manual - ISBN 1-56637-367-0 (\$18.95 pbk.).

**Electrical Principles and Practices** (Print-Non-Fiction). Mazur, Glen A. and Zurlis, Peter A. American Technical Pubs., Inc. (NEL), 1997. 460 p. ISBN 0-8269-1755-0 (\$69.75 hcd.). Instructor's Guide - ISBN 0-8269-1757-7 (\$21.50 pbk.).

**Electrical Wiring: Residential. 3rd Canadian ed.** (Print-Non-Fiction). Mullin, Ray C., Miller, Gary and Stephenson, Paul Nelson Thomson Learning (NEL), 2003. 485 p. ISBN 0-17-622369-X (\$61.50 pbk.).

**Electricity and Electronics Technology. 7th ed.** (Print-Non-Fiction). Buban, Peter, Schmitt, Marshall L. and Carter, Charles G., Jr. Glencoe/McGraw Hill (MHR), 1999. 658 p. ISBN 0-02-683427-8 (\$74.76 hcd.). Student Workbook - ISBN 0-02-683429-4 (\$13.95 pbk.). Teacher's Resource Guide. ISBN 0-02-683428-6 (\$64.00 pbk.).

**Electricity: Principles and Applications. 5th ed.** (Print-Non-Fiction). Fowler, Richard J. (Basic Skills in Electricity and Electronics Series). Glencoe/McGraw Hill (MHR), 1999. 432 p. ISBN 0-02-804847-4 (\$121.95 hcd.). Instructor's Manual - ISBN 0-02-804850-4 (\$46.95 pbk.).

**Employability Skills Toolkit for the Self-Managing Learner** (Print-Non-Fiction). The Conference Board of Canada (MHR), 2000. ISBN 0-07-087847-1 (\$79.95 binder).

**Essentials of Electronics. 2nd ed.** (Print-Non-Fiction). Petruzella, Frank D. Glencoe/McGraw Hill (MHR), 2001. 726 p. ISBN 0-07-827696-9 (\$98.90 hcd.).

**Guide for New Workers** (Print-Non-Fiction). (Ready for Work Series). Saskatchewan Labour (SAL), 2001. 247 p. No order number is required. (\$FREE spiral-bound).

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**Introduction to Technology** (Print-Non-Fiction). Pierce, Alan J. and Karwatka, Dennis. Glencoe/McGraw Hill (MHR), 1999. 554 p. ISBN 0-02-831275-9 (\$70.90 hdc.). Student Activity Manual - ISBN 0-02-831278-3 (\$13.05 pbk.).

**Ready for Work** (Kit). Saskatchewan Labour, Labour Standards Branch (SAL), 1999. No order number is required. (\$FREE).

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# Titles Available From Media Group Educational Video Duplication

2710 Millar Ave  
SASKATOON SK S7K 4J4  
(306) 933-4212  
Toll Free: 888-682-8808  
Fax: (306) 933-3183  
Toll-Free Fax: (877) 444-3354  
E-mail: [vidlib@mg.sk.ca](mailto:vidlib@mg.sk.ca)  
NETSITE: <http://www.sasked.gov.sk.ca/video>

Saskatchewan Learning's educational video programs are duplicated by Media Group, a full-service video production and post-production company in Saskatoon.

Many of the videos that support this curriculum can be obtained from Media Group for a nominal fee. Schools are responsible for postage, a duplication fee of \$1.00 per title, blank tapes and applicable taxes. Please consult your latest catalogue for the procedures to order these titles:

**Construction** (Video). (Career Options for Women Series). Third Wave Communications Inc. (**MGR**), 1999. 24 min. Dup. order no. V6845. Teacher's Guide for series - Order no. G6843 (\$4.90 loose-leaf).

**Don't Risk Your Life** (Video). Saskatchewan Labour (**MGR**), 2003. 15 min. Dup. order no. V2238. Teacher's Guide - Order no. G2238 (\$FREE booklet).

**Dying to Work** (Video). (W5 Series). CTV Television Network Ltd. (**MGR**), 2000. 19 min. Dup. order no. V638.

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## Examples of Appropriate Internet Sites

If teachers are unsure about the reliability of the information found at a website, they should compare the author's claims and evidence with other sources with which they are familiar. When in doubt, teachers should choose only the sites that list the authors' and/or contributors' names along with the title. If the site does not identify contributors and authors, the information found at the site might not be reliable.

The following Internet sites provide a very brief overview of what is available. It is recommended that a careful screening and evaluation of each site be undertaken prior to using it. These sites were checked for availability on August 12, 2003.

Internet sites that have been formally evaluated and linked to curriculum objectives can be viewed by selecting the **Database of Websites** found on the **Evergreen Curriculum Resources** page at

[http://www.sasked.gov.sk.ca/docs/resources\\_main.html](http://www.sasked.gov.sk.ca/docs/resources_main.html)

*Alex's Electronic Resource Library*  
<http://www.iserv.net/~alex/lib/tutorial.htm>

*Authentic Workplace Materials*  
<http://www15.hrdc-drhc.gc.ca/awm/default.asp>

*BluePrint for Life/Work Designs*  
<http://www.blueprint4life.ca>

*Canadian Electricity Association*  
<http://www.canelect.ca/>

*Canadian Standards Association*  
<http://www.csa-international.org/default.asp?language=english>

*Career Awareness*  
<http://www.hrdc.gc.ca/career>

*Circuit Cellar*  
<http://www.circuitcellar.com/>

*Essential Skills: Skills for Life Learning and Work*  
<http://www15.hrdc-drhc.gc.ca/english/es.asp>

*Human Resources Development Canada*  
<http://www.hrdc.gc.ca/common/home.shtml>

*National Life/Work Centre*  
<http://www.lifework.ca/home.htm>

*National Occupational Classification (NOC)*  
<http://www23.hrdc-drhc.gc.ca/>

*Nuts & Volts*  
<http://www.nutsvolts.com/>

*Poptronix*  
<http://www.poptronics.com/index.php>

*Printed Circuit Design*  
<http://www.pcdmag.com/>

*Ready for Work*  
<http://www.readyforwork.sk.ca>

*Robot Information Central*  
<http://www.robotics.com/robots.html>

*Robot Science & Technology*  
<http://www.robotmag.com/>

*Robotics*  
<http://www.nosc.mil/robots/index.html>

*Saskatchewan Human Rights Commission*  
<http://www.gov.sk.ca/shrc/>

*Saskatchewan Labour*  
<http://www.labour.gov.sk.ca/>

*Saskatchewan Labour - Health and Safety Video Catalogue*  
<http://www.labour.gov.sk.ca/safety/video/>

*Saskatchewan Workers' Compensation Board*  
<http://www.wcbsask.com/>

*SaskNetWork Site*  
<http://www.sasknetwork.gov.sk.ca>

*SaskWork Online Guide*  
<http://www.saskworkguide.ca/>



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# Index of Suggested Uses

Please note that the titles in this list are truncated. The complete titles appear in the citations for each resource.

## Amplifiers

Industrial Electronics

## Batteries

Delmar's Standard Textbook of  
Electric Circuits and Machines

## Career Development

Blueprint for Life/Work Designs  
Construction  
Cool Careers for Girls in Construction  
Employability Skills Toolkit for the Self  
Essential Skills/Compétences Essentielles  
Guide for New Workers  
Guide for New Workers: Counsellor  
High School to Apprenticeship: A Link to  
Step Into the World of Workplace Learning: A

## Cells and Small Voltage Sources

Electricity: Principles and Applications

## Digital Concepts

Digital Electronics: Principles and  
Electrical Principles and Practices  
Industrial Electronics

## Electric Motors

Delmar's Standard Textbook of  
Electric Circuits and Machines  
Electrical Motor Controls  
Electrical Power: Motors, Controls  
Electrical Principles and Practices  
Electricity: Principles and Applications

## Electrical Motor Controls

Delmar's Standard Textbook of

Electric Circuits and Machines  
Electrical Motor Controls  
Electrical Power: Motors, Controls

## General

Basic Electronics  
Electrical/Electronic Systems  
Electricity and Basic Electronics  
Electricity and Electronics  
Electricity and Electronics Technology  
Electronic Communication Fundamentals  
Electronics: Principles and Applications  
Electronics Technology: Devices and Circuits  
Essentials of Electronics

## Integrated Circuits

Delmar's Standard Textbook of  
Electricity: Principles and Applications  
Industrial Electronics

## Operational Amplifiers

Industrial Electronics

## Power Supplies

Electric Circuits and Machines  
Electrical Power: Motors, Controls  
Electrical Principles and Practices  
Industrial Electronics

## Residential Wiring

Electrical Code Simplified: Residential  
Electrical Wiring: Residential  
House Wiring Simplified: Tells and Shows

## Safety

Construction Safety Training System  
Don't Risk Your Life  
Dying to Work  
Electrical Safety in the Workplace  
Eye Protection: The Humorous Approach  
Manual Handling  
Moving Online...More *Ready for Work*  
Personal Protective Equipment  
Portable Extinguishers  
Ready for Work

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Safety Care Series  
Safety First: Electrical Safety  
Understanding Hazards and Risks  
WHMIS

### **Survey Course - Middle Level**

Cool Careers for Girls in Construction  
Electrical Code Simplified: Residential  
Electrical Principles and Practices  
Electricity: Principles and Applications  
Helping Solve the **(Out of Print Section)**  
House Wiring Simplified: Tells and Shows  
Introduction to Technology

### **Survey Course - Secondary Level**

Delmar's Standard Textbook of  
Electrical Code Simplified: Residential  
Electrical/Electronic Systems  
Electrical Principles and Practices  
Electrical Wiring: Residential  
Electricity and Electronics Technology  
Electricity: Principles and Applications  
Essentials of Electronics  
Helping Solve the **(Out of Print Section)**  
House Wiring Simplified: Tells and Shows

### **Teacher Reference**

Basic Electronics  
Basic Mathematics for Electricity and  
Blueprint for Life/Work Designs  
Digital Electronics: Principles and  
Electronics: Principles and Applications  
Essential Skills/Compétences Essentielles  
Guide for New Workers: Counsellor  
Step Into the World of Workplace Learning: A

### **Work Study**

Blueprint for Life/Work Designs  
Employability Skills Toolkit for the Self  
Essential Skills/Compétences Essentielles  
Guide for New Workers  
Guide for New Workers: Counsellor  
Helping Solve the **(Out of Print Section)**  
High School to Apprenticeship: A Link to  
Moving Online...More *Ready for Work*  
Ready for Work  
Step Into the World of Workplace Learning: A

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## Media Index

Please note that the titles in this list are truncated. The complete titles appear in the citations for each resource.

### CD-ROM

Construction Safety Training System  
Essential Skills/Compétences Essentielles  
Moving Online...More *Ready for Work*

### Kit

Ready for Work

### Print-Non-Fiction

Basic Electronics  
Basic Mathematics for Electricity and  
Blueprint for Life/Work Designs  
Cool Careers for Girls in Construction  
Delmar's Standard Textbook of  
Digital Electronics: Principles and  
Electric Circuits and Machines  
Electrical Code Simplified: Residential  
Electrical/Electronic Systems  
Electrical Motor Controls  
Electrical Power: Motors, Controls  
Electrical Principles and Practices  
Electrical Wiring: Residential  
Electricity and Basic Electronics  
Electricity and Electronics  
Electricity and Electronics Technology  
Electricity: Principles and Applications  
Electronics: Principles and Applications  
Electronics Technology: Devices and Circuits  
Employability Skills Toolkit for the Self  
Essentials of Electronics  
Guide for New Workers  
Guide for New Workers: Counsellor  
Helping Solve the **(Out of Print Section)**  
High School to Apprenticeship: A Link to  
House Wiring Simplified: Tells and Shows  
Industrial Electronics  
Introduction to Technology  
Step Into the World of Workplace Learning: A

### Video

Construction

Don't Risk Your Life  
Dying to Work  
Electrical Safety in the Workplace  
Electronic Communication Fundamentals  
Eye Protection: The Humorous Approach  
Manual Handling  
Personal Protective Equipment  
Portable Extinguishers  
Safety Care Series  
Safety First: Electrical Safety  
Understanding Hazards and Risks  
WHMIS



NR30. - RAIL MOUNTED POWER NETWORK METER. • Measurement of 54 power network parameters and current and voltage harmonics up to 51st, in 1-phase 2-wire or 3-phase 3 or 4-wire balanced and unbalanced systems. • Backlit LCD screen fully configurable by a user (22 views, 3 parameters in each). • For direct (up to 63A) and indirect measurement (x/1A or x/5A). • indications considering values of programmed ratios. • Memory of minimum and maximum values. • 2 configurable alarm outputs. • IV switchgear IV switchgear. NR30. Modbus RS-485. RTU. Modbus TCP/IP Ethernet. NR30. server www/ftp. scaDa. Electrical and Electronics Engineering. 10K likes. Education Website. Kirchhoff's current law is a fundamental principle of Electrical Engineering which states that total current flow towards a node equals total flowing away. Kirchhoff's current law is a fundamental principle of Electrical Engineering which states that total current flow towards a node equals total flowing away. Electrical and Electronics Engineering. 6 February at 20:27 •. Switchgear. +7. Electrical and Electronics Engineering. 31 January •. Resistor color coding chart. Electrical and Electronics Engineering. 10 November 2019 •. Substitution theorem: <http://bit.ly/2p5nYQZ>. > 10. < 1.5. < 0.2. ~ 30 ~1 ~ 200. ~ 1.2. -40 +90. Purchase orders are subject to the General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry recommended by the ZVEI (German Electrical and Electronic Manufacturers' Association), unless otherwise agreed. Ab e / ab pm. Issue 03, 21.05.2002.

