Acknowledgments and Third Party Copyright

Youth Explore Trades Skills
Learning Resources Development

Open School BC, the Custom Programs work unit of the BC Ministry of Education, and the BC Industry Trades Authority are grateful to the following individuals and organizations for their contributions to the Youth Explore Trades Skills Learning Resources Development Project.

Baker

Resource Development Planning Session (May 10–12, 2017)
Martin Barnett, Vancouver Island University
Fionna Chong, Vancouver Community College
Patience Cox, Career and Skills Education Coordinator, BC Ministry of Education
Rita Gower, Vancouver Island University
Nancy Lawrence, SD 71 (Comox Valley School District)
Jessica Mann, SD 72 (Campbell River School District)
Laura Mann, SD 71 (Comox Valley School District)
Tracey Peever, Project Manager, Open School BC
Nannette Plant, Camosun College
Christina Teskey, Project Manager, Open School BC

Writing

Martin Barnett, Vancouver Island University
Nancy Lawrence, SD 71 (Comox Valley School District)
Laura Mann, SD 71 (Comox Valley School District)

Review

Fionna Chong, Vancouver Community College
Tammy Williamson, SD 72 (Campbell River School District)

Cook

Resource Development Planning Session (March 8–10, 2017)
High School Teachers
Cathy Gordon (SD 46, Sunshine Coast); Foods and Nutrition, ACE IT Professional Cook 1, Elphinstone Secondary School
Lauri Humeniuk (SD 61, Victoria); Chef Instructor, Culinary Arts Professional Cook Training Program, Spectrum Community School
Acknowledgments and Third Party Copyright

Kathryn Johnson (SD 58, Nicola-Simikameen), Merritt Secondary School, Café 10-12, Home Economics, member of the Applied Design, Skills and Technology (ADST) curriculum team

Trevor Randle (SD 42, Maple Ridge); Chef Instructor, Maple Ridge Secondary School, Vice President, BC Culinary Arts Specialists Association, Chef-BC Agriculture in the Classroom

Scott Gordon Roberts (SD 73, Kamloops/Thompson); NorKam High School, Culinary Arts, Café 11/12, Foods 10-12

Brian Smith (SD 42, Maple Ridge); Culinary Arts Teacher, Thomas Haney Secondary School, President, BC Culinary Arts Specialists Association

Donna-Lynn Thompson (SD 79, Cowichan)

Industry / Post-secondary

Patience Cox, Career and Skills Coordinator, Ministry of Education (Day 1 only)

Dennis Green, Director, Industry Training, Go2 HR (Day 1 only)

Rodger Hargreaves, South Island Partnership Transition Coordinator, Camosun College

Jason Leber, Youth Program Manager, Industry Training Authority (Day 1 only)

Nannette Plant, Manager, BC FOODSAFE Secretariat (Day 1 only)

Debbie Shore, Chef Instructor, Chair, Culinary Institute of Vancouver Island Chair - British Columbia Professional Cook Articulation Group

Steve Walker-Duncan, Department Chair, Culinary Arts, Camosun College

Facilitation

Adrian Hill, Project Manager, OSBC

Tracey Peever, Project Manager, OSBC

Writing and Reviewing

Cathy Gordon (SD 46, Sunshine Coast); Foods and Nutrition, ACE IT Professional Cook 1, Elphinstone Secondary School

Lauri Humeniuk (SD 61, Victoria); Chef Instructor, Culinary Arts Professional Cook Training Program, Spectrum Community School

Kathryn Johnson (SD 58, Nicola-Simikameen), Merritt Secondary School, Café 10-12, Home Economics, member of the Applied Design, Skills and Technology (ADST) curriculum team

Trevor Randle (SD 42, Maple Ridge); Chef Instructor, Maple Ridge Secondary School, Vice President, BC Culinary Arts Specialists Association, Chef-BC Agriculture in the Classroom
Electronics and Robotics

Resource Development Planning Session (April 25–27, 2016)
Todd Ablett, SD 45 (West Vancouver Schools)
Jason Brett, British Columbia Institute of Technology
Patience Cox, Career and Skills Education Coordinator, BC Ministry of Education
Adrian Hill, Project Manager, Open School BC
Tyler Kuhn, SD 36 (Surrey)
Jason Leber, Youth Program Manager, BC Industry Training Authority
Tracey Peever, Project Manager, Open School BC
Scott Richmond, SD 54 (Bulkley Valley)
Brian Yu, SD 39 (Vancouver)

Writing
Todd Ablett, SD 45 (West Vancouver Schools)
Jason Brett, British Columbia Institute of Technology
Tyler Kuhn, SD 36 (Surrey)
Scott Richmond SD 54 (Bulkley Valley)
Brian Yu, SD 39 (Vancouver)

Review
Jason Brett, British Columbia Institute of Technology
Scott Richmond, SD 54 (Bulkley Valley)

Metal Work

Resource Development Planning Session (Jan. 11–13, 2016)
Leanne Baugh, Project Manager, Open School BC
Heather Elliott, SD 33 (Chilliwack)
Rob Gibbs, SD 69 (Qualicum)
Adrian Hill, Project Manager, Open School BC
Kevin McIntyre, SD 22 (Vernon)
Dunia Magnusson, Project Leader, BC Industry Training Authority
Keenan Richards, SD 20 (Kootenay-Columbia)
Courtenay Rimaldi, SD 23 (Central Okanagan)
Chris Teskey, Project Manager, Open School BC
Leanne Tycho, SD 39 (Vancouver)
Richard Wimmer, SD 34 (Abbotsford)
Acknowledgments and Third Party Copyright

Writing
Heather Elliott, SD 33 (Chilliwack)
Rob Gibbs, SD 69 (Qualicum)
Kevin McIntyre, SD 22 (Vernon)
Keenan Richards, SD 20 (Kootenay-Columbia)
Courtenay Rimaldi, SD 23 (Central Okanagan)
Leanne Tycho, SD 39 (Vancouver)

Review
Heather Elliott, SD 33 (Chilliwack)
Rob Gibbs, SD 69 (Qualicum)
Kevin McIntyre, SD 22 (Vernon)
Keenan Richards, SD 20 (Kootenay-Columbia)
Courtenay Rimaldi, SD 23 (Central Okanagan)
Leanne Tycho, SD 39 (Vancouver)
Richard Wimmer, SD 34 (Abbotsford)

Design and Drafting

Steve Claassen, SD 71 (Comox Valley)
Patience Cox, Career and Skills Education Coordinator, BC Ministry of Education
Sharissa Desrochers, SD 36 (Surrey)
Heather Elliott, SD 33 (Chilliwack)
Adrian Hill, Project Manager, Open School BC
Dunia Magnusson, Project Leader, BC Industry Training Authority
Sabinah Rafiq, Manager, Youth Initiatives, BC Industry Training Authority
Monica Strimbold, SD 54 (Bulkley Valley)
Chris Teskey, Project Manager, Open School BC
Jim Watkins (SD 64, Gulf Islands)

Writing
Steve Claassen, SD 71 (Comox Valley)
Sharissa Desrochers, SD 36 (Surrey)
Heather Elliott, SD 33 (Chilliwack)
Monica Strimbold, SD 54 (Bulkley Valley)
Jim Watkins (SD 64, Gulf Islands)

Review
Monica Strimbold, SD 54 (Bulkley Valley)
Acknowledgments and Third Party Copyright

**Automotive Service Technician**

**Resource Development Planning Session (Nov. 22, 2013)**

Paul Elmont, SD 22 (Vernon)
Adrian Hill, Project Manager, Open School BC
Ken Jorgensen, SD 57 (Prince George)
Dick Brouwer, SD 63 (Saanich)

**Writing**
Paul Elmont, SD 22 (Vernon)
Ken Jorgensen, SD 57 (Prince George)

**Review**
Dick Brouwer, SD 63 (Saanich)

**Carpenter, Electrician and Plumber**

**Resource Development Planning Session (July 11–12, 2013)**

Dick Brouwer, SD 63 (Saanich)
Jeff Dickson, SD 35 (Langley)
Brad Edmondson, SD 36 (Surrey)
Adrian Hill, Project Manager, Open School BC
Mike Howard, President, BC Technology Education Association, SD 19 (Revelstoke)
Martin Lim, Vice-President, BC Technology Education Association, SD 36 (Surrey)
David Olsen, SD 69 (Qualicum)
Stu Rhodes, SD 63 (Saanich)
Chris Teskey, Project Manager, Open School BC
Cory Williams, Manager, Program Standards, BC Industry Training Authority

**Electrician**

**Writing**
Brad Edmondson, SD 36 (Surrey)

**Review**
Donald Zaklan, British Columbia Institute of Technology

**Plumber**

**Writing**
Jeff Dickson, SD 35 (Langley)

**Review**
Jeff Doolan, Kwantlen College
Carpenter

Writing
David Olsen, SD 69 (Qualicum)

Review
Jerry Schouten, SD 36 (Surrey)

2013 Curriculum Advisory Committee
Brian Campbell, District Principal, Careers and International Education, SD 60 (Peace River North)
Larry Espe, Superintendent of Trades and Student Transitions, BC Ministry of Education
Colleen Hannah, Aboriginal Agreements Coordinator, BC Ministry of Education
Rodger Hargreaves, Career Programs, SD 62 (Sooke)
Mike Howard, President, BC Technology Education Association, SD 19 (Revelstoke)
Erin Johnston, Manager, Labour Supply Initiatives, BC Industry Training Authority
Eleanor Liddy, Director, Open School BC
Eric MacNeil, President, BC Culinary Arts Specialist Association
Jim Pelton, former Director, Training Delivery, BC Industry Training Authority
Glenn Rowan, Education Officer, Graduation, Dual Credit, Industry Training, BC Ministry of Education
Tim Winkelmans, Lead, Graduation Standards, Educational Technologies, Learning Alternatives, BC Ministry of Education

2013 Resource Development Planning Session (July 10, Victoria BC)
Dick Brouwer, SD 63 (Saanich)
Jeff Dickson, SD 35 (Langley)
Brad Edmondson, SD 36 (Surrey)
Adrian Hill, Project Manager, Open School BC
Mike Howard, President, BC Technology Education Association, SD 19 (Revelstoke)
Tom Hoyme, SD 42 (Maple Ridge-Pitt Meadows)
Eleanor Liddy, Director, Open School BC
Erin Johnston, Manager, Labour Supply Initiatives, BC Industry Training Authority
Ken Jorgensen, SD 57 (Prince George)
Karen Larsen, Career Programs Coordinator, SD 39 (Vancouver)
Martin Lim, Vice-President, BC Technology Education Association, SD 36 (Surrey)
David Olsen, SD 69 (Qualicum)
Stu Rhodes, SD 63 (Saanich)
Acknowledgments and Third Party Copyright

Glenn Rowan, Education Officer, Graduation, Dual Credit, Industry Training, BC Ministry of Education
Rhonda Stangeland, SD 38 (Richmond)
Chris Teskey, Project Manager, Open School BC
Cory Williams, Manager, Program Standards, BC Industry Training Authority

Open School BC Production Team
Copyright: Shannon Sangster
Editing: Keith Learmonth
Graphics: Max Licht (http://www.maxlicht.com)
Graphics Coordination: Christine Ramkeesoon
Photography: Dennis Evans
Project Managers: Adrian Hill, Tracey Peever, Chris Teskey
Project Supervision: Monique Brewer (Director), Jennifer Riddel (Manager, Instructional Services)
Production Technicians: Beverly Hooks, Brian Glover
Website Construction and Design: Christine Ramkeesoon

Third Party Copyright
Every effort has been made to contact copyright holders for third party works included in the Youth Explore Trades Skills learning resources. If you have any questions or concerns, please contact openschoolinfo@gov.bc.ca

Carpenter
Build a Wall Mockup
Figure 3—Typical compound mitre saw used to cut plates and studs to length. Used by permission, courtesy of Makita.

Build a Full Height Wall
Figure 2—Typical layout of stud location onto top and bottom plates. Used by permission. Copyright © 2006 The Family Handyman magazine. All Rights Reserved.

Figure 4—Typical positioning and nailing of plates and studs. Used by permission. Copyright © 2006 The Family Handyman magazine. All Rights Reserved.

Electrician
Introduction to Electrical Theory
Ohm’s Law Problems, question #3. The image and accompanying caption on page five are from the publication Working Safely Around Electricity and cannot be reproduced without written permission from WorkSafeBC. For more free information on this and other safety topics, go to www.worksafebc.com.
Acknowledgments and Third Party Copyright

Fishing a Receptacle into a Wall Section
Figure 7—Loomex 2 ¼” rework device box. Use by permission, courtesy of Thomas & Betts Corporation.

Figure 10—2 ½” deep Loomex device box. Used by permission, courtesy of Thomas & Betts Corporation.

Figure 11—Rework device box supports: used by permission, courtesy of Hubbell.

Plumber
Drafting
Figure 22—Lamp constructed from piping and bottles: used by permission, courtesy of La Rosca Lights LLC. https://s-media-cache-ak0.pinimg.com/564x/e0/62/e9/e062e910e6a990b3b721d23729865ea5.jpg

Cast Iron
Figure 7—The Ridgid Press Snap soil cutter is a user-friendly method of cutting cast iron pipe. Used by permission, courtesy of Ridgid.

Crimping
Figure 4—Go/no go gauge. Used by permission, courtesy of Nibco.

Fixtures Installation
Figure 2—Closet bolts will be used to tighten the bowl to the floor flange. Used by permission, courtesy of Oatey SCS.

Figure 5—A union type p-trap has a threaded connection that allows quick removal for cleaning or inspection. It also allows the teacher to reuse this p-trap. Used by permission, courtesy of Nibco.

Figure 6—A compression-style CR 19 will fit over copper pipe. The chrome nut is then tightened to compress a brass ring providing a watertight seal. Used by permission, courtesy of iBuild.

Figure 7—Closet flanges may have plastic plugs in the drain. A Slotted screwdriver and a hammer can quickly remove it. Used by permission, courtesy of Nibco.

Figure 9—Faucets are normally connected to the basin by means of a threaded nut. Braided water supply lines run from the brass connections to the CR 19 stops. Used by permission, courtesy of DIY Project-aholic.

Solvent Welding
Figure 2—Ridgid FC-200 capable of cutting ABC pipe up to 2” Used by permission, courtesy of Home Depot.

The following images are all used by permission, courtesy of Nibco:

Figure 3—ABS 45°, The hub by hub 45° (left), hub by spigot 45° (right)
Figure 4—ABS 90° elbow
Figure 5—ABS tee
Figure 6—ABS Wye
Figure 7—ABS double wye
Figure 8—ABS line cleanout
Figure 9—ABS p trap
Figure 11—ABS water closet floor flange.
Figure 12—ABS bushing

**Design and Drafting**

**Drafting Dictionary (PPT)**
Staedler Drafting Dots—image courtesy of DickBlick.com and/or Blick Art Materials ph. #800-828-4548.

**Metal Work**

**Introduction to Welding**
Welding Beads courtesy of Malcolm from “migwelding: the DIY guide.” [http://www.mig-welding.co.uk](http://www.mig-welding.co.uk)

**Tools and Equipment**
The following images are copyright BC Industry Training Authority and licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 licence (CC By-NC-SA 4.0) [http://creativecommons.org/licenses/by-nc-sa/4.0/]
angle grinder, bench grinder, drill press, hand drill, horizontal bandsaw, allen wrench, centre punch, combination square, dividers, file, file card, hacksaw, hammer, micrometer, pliers, screwdriver, scriber, tap and die, tin snips, vernier calipers, wrenches

The following images are licensed from Thinkstock
dremel (rotary tool), forge, foundry, milling machine, sandblaster, soldering pencil, hole saw, jeweller’s saw, letter stamps, number stamps, punch, rivets and rivet gun, ruler, side cutter, socket set, step drill, twist drill

The following images are from Wikipedia.org
Abrasive saw – Public Domain
Arc welder – Bruno Bouygues / CC By-SA 3.0
Chisel, English wheel, reamers (2), and lathe – Glenn McKechnie / CC By-SA 3.0
Emory cloth – Tenbergen / CC By-SA 3.0
Impact driver – bushytails / CC By-SA 3.0 migrated
Spot welder – copyrighted free use

The following images are from Flickr.com
Striker – Phil Gradwell / CC By 2.0

**Electronics and Robotics**

**Rolling Platform Driver Challenge**
Figure 1—Three simple VEX-based "rolling chasis" using "skid" steering. Image courtesy of Jason Brett, BCIT, used with permission.
Robot Mask Challenge
The following images were used with permission and courtesy of Jason Brett, BCIT:

Figure 2—Various kinds of multi-conductor stranded wire
Figure 3—Two styles of control board - front
Figure 4—Two styles of control board - back
Figure 5—Control board with custom-built switches
Figure 6—Perfboard - front
Figure 7—Perfboard - back
Figure 8—Wood LED mount - front
Figure 9—Wood LED mount - back
Figure 10—Wood board in cardboard mask
Figure 11—Perfboard in cardstock mask
Figure 12—The BCIT TTED Class of 2012 shows off their robot masks
Figure 13—The BCIT TTED Class of 2013 shows off their robot masks
Figure 14—A robot mask created from a cardboard box

Robot Arm Challenge
Figure 1—Syringes. Image courtesy of Jason Brett, BCIT, used with permission.

Multi-bot Challenge
Figure 2—Clear the field arena. Image courtesy of Brian Yu, Vancouver School Board, used with permission. Additional robotics resources from Brian Yu can be found here:

www.vsbrobotics.wordpress.com