HANDOUT: Efficient Reading: Dislocations (3 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: People read text for different purposes. Whatever the reason for reading, being able to quickly and accurately find and understand the information you need makes reading both more pleasant and more efficient.

Refer to the excerpt from the text **How to Treat a Dislocation** to complete the tasks and locate answers to the questions.

Being able to predict content from titles and sub-titles in a document is an effective strategy to make it easier to understand the content and read faster and more efficiently.

1. **Before** reading the text, and just thinking about title, list 2 things you think will be mentioned in the text.

_____

_____

2. **Before** reading the text, look at the information below about the author. What do you think the author's purpose in writing will be? Write it in 1 sentence.

Author: Anthony Stark, Emergency Medical Responder (EMR). EMRs are specially trained to administer first aid in medical emergencies but are not trained as emergency medical technicians or paramedics.

_____

_____

3. **Next** read the text. What is the author's intent in writing? (For example, the author is writing to warn, inform, persuade…) Write your answer in 1 sentence.

_____

_____

4. What is 1 question you could ask that the text answers?

5. What is a related question that the text does NOT answer?

6. Using another source, find the answer to the question you identified in number 5. Identify your source.

7. Does the excerpt want you to read more of this text or a similar one? Why or why not?

Excerpt from *How to Treat a Dislocation*

A dislocation occurs when two bones that come together in a joint come out of their normal positions. Symptoms of a dislocation include severe pain, immobilization, and deformity of the joint area. Dislocations can occur to nearly any joint of the body, including the shoulders, elbows, knees, hips and ankles; they are also seen in the smaller joints of the fingers and toes. Dislocations are considered urgent situations that require medical care, but you can learn how to treat a dislocation until the patient can receive professional medical help.

Initial Evaluation of the Dislocation

- Cover the dislocated joint with something sterile. It is important to take steps to prevent an infection, especially if there is any broken skin around the area of the dislocation.
- Wait until professional medical personnel arrive before attempting to wash or in any way "clean" the wound (if there is a wound, or if there are any areas of broken skin). Attempting to do so without the proper sterilizing equipment or medical training increases the chance of infection rather than decreasing it.

Immobilize the joint.

- Try to use nonstick gauze if there is an open wound. Note that it is very important not to try and re-position or re-align the joint in any way. This can cause further harm, and it is best to simply immobilize it in the position it is in and to wait for a trained medical professional to definitively treat the dislocation.
- Be sure to immobilize both above and below the dislocated joint to ensure maximum stability while awaiting medical treatment.
- If it is the shoulder that is dislocated, you can use a sling (or make a sling by tying a long piece of fabric into a circle) to immobilize it. Make sure the sling holds the limb against the body. Instead of just wrapping the sling around the neck, try wrapping it around the torso before tying it at the neck.
- If it is another joint such as a knee or elbow, a splint is your best bet. Splints can be constructed of sticks or another stabilizing device and tape or fabric strips to hold the splint in place.

Ref. Stark, A. (2019). How to Treat a Dislocation. https://www.wikihow.com/Treat-a-Dislocation (CC BY-NC-SA 3.0)

HANDOUT: Efficient Reading: Building a Drone (3 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: People read text for different purposes. Whatever the reason for reading, being able to quickly and accurately find and understand the information you need makes reading both more pleasant and more efficient.

Refer to the excerpt from the text **Building a Drone** to complete the tasks and locate answers to the questions.
Being able to predict content from titles and sub-titles in a document is an effective strategy to make it easier to understand the content and read faster and more efficiently.

1. **Before** reading the text, and just thinking about title, list 2 things you think will be mentioned in the text.

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_____

2. **Before** reading the text, look at the information below about the author. What do you think the author's purpose in writing will be? Write it in 1 sentence.

> The author describes himself as "I use technology to make the world more open. Linux desktop enthusiast. Map/geospatial nerd. Raspberry Pi tinkerer. Data analysis and visualization geek. Occasional coder. Cloud nativist. Civic tech and open government booster".

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3. **Next** reading the text, what is the author's intent in writing? (For example, the author is writing to warn, inform, persuade…) Write your answer in 1 sentence.

_____

_____

4. What is 1 question you could ask that the text answers?

5. What is a related question that the text does NOT answer?

6. Using another source, find the answer to the question you identified in number 5. Identify the source.

7. Does the excerpt want you to read more of this text or a similar one? Why or why not?

Building a Drone

Over the past few years, interest in civilian, military, and commercial drones has grown rapidly, which has also driven the maker community's interest in open source drone projects.

The list of unmanned aerial devices (UAVs) that fit the moniker of drone seems to be constantly expanding. These days, the term seems to encompass everything from what is essentially a cheap, multi-bladed toy helicopter, all the way up to custom-built soaring machines with incredibly adept artificial intelligence capabilities.

Most people are looking for something in the middle. They'd like a flying vehicle that is large enough to support a decently long flight time, hold a camera or other data capture device, and perhaps be able to control some (or all) of its flight autonomously using pre-programmed coordinates or real-time data.

The premade devices in this space vary greatly in both price and build quality, and most of the ones I've seen use proprietary software and hardware. But you don't have to go this route! The drone-building community has created many software and hardware projects under open licenses that allow you to build, repair, customize, and experiment with your own drone, or to supplement the use of drones in some other way. Let's take a look at some of those projects.

Paparazzi UAV: A GPLv2 licensed project that combines both the software and hardware needed to build and fly an open source vehicle under open licenses. Source code and releases of the software components can be found on GitHub, and tutorials for adapting it to off-the-shelf or custom-built hardware can be found on the project's wiki.

ArduPilot: Claims it's "the most advanced, full-featured, and reliable open source autopilot software available." Its features include advanced data-logging, analysis, and simulation tools, and it's supported by a broad ecosystem of third-party sensors, companion computers, and communication systems.

Flone: A cool project that basically turns a smartphone into a drone. It combines a digitally fabricated airframe with software that allows an Android smartphone on the ground to control the one strapped onto the airframe via Bluetooth. It is licensed under GPLv3 and its source code resides on GitHub. English-speaking developers and drone enthusiasts should know that the project is based in Spain and most of the documentation and other materials are in Spanish.

This is definitely an incomplete list of open source drone projects; others you may want to check out include MatrixPilot and AdaPilot.

Ref: Baker, J. (February 12, 2018). 8 open source drone projects. Retrieved from: https://opensource.com/article/18/2/drone-projects

HANDOUT: Efficient Reading: Solar Power (3 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: People read text for different purposes. Whatever the reason for reading, being able to quickly and accurately find and understand the information you need makes reading both more pleasant and more efficient.

Refer to the excerpt from the text **Introduction to Solar Panels** to complete the tasks and locate answers to the questions.

Being able to predict content from titles and sub-titles in a document is an effective strategy to make it easier to understand the content and read faster and more efficiently.

1. **Before** reading the text, and just thinking about title, list 2 things you think will be mentioned in the text.

_____

_____

2. **Before** reading the text, look at the information below about the author. What do you think the author's purpose in writing will be? Write it in 1 sentence.

Author: No author is mentioned by name. The article appears in the education section of a company website. The company has been manufacturing and selling solar panels for over 20 years.

_____

_____

3. **Next** reading the text, what is the author's intent in writing? (For example, the author is writing to warn, inform, persuade…) Write your answer in 1 sentence.

_____

_____

4. What is 1 question you could ask that the text answers?

5. What is a related question that the text does NOT answer?

6. Using another source, find the answer to the question you identified in number 5. Identify the source.

7. Does the excerpt want you to read more of this text or a similar one? Why or why not?

Excerpt from Introduction to Solar Panels

The first solar panels, that resemble today's technology, appeared in the 1950s and were primarily used for space applications. Following the 1970s energy crisis, more R&D and commercial development helped to further the deployment mostly for off-grid applications. In early 2000, Germany was one of the first countries to implement what is called a "fee in tariff" (FIT). FIT is a policy mechanism designed to encourage the adoption of renewable energy sources. As of 2018, over 60 countries had adopted FIT programs including parts of Canada.

FAQ about Solar Panels

Why haven't we seen more solar technologies used in the world today?

The market has been expanding rapidly all over the world. This being said, the initial investment is still relatively expensive. The cost has significantly dropped over the last 15 years and can be, in some cases, cost effective compared to traditional distributed power such as coal, gas, nuclear and hydro especially where grid tied power systems are driven by financial incentives that makes solar panels a very lucrative investment.

What can we power with solar energy?

Solar energy can be used to power all appliances that require electricity. When the system is tied to the grid, the solar energy is exported to the grid. The meter counts the energy "in" and "out". An average Canadian home consumes between 30-50 kWh/day therefore it would take at least a 7-8 kW array to fulfill that energy requirement.

How much does it cost?

The answer is simple; the more you consume energy the more it will cost you. By managing your consumption you can greatly reduce the size of your system and thus, the cost of your system.
However, the cost of your system is dependent not only on your consumption, but also varies depending on the country and the latitude where it will be installed. For a grid tied system without batteries, cost varies around $7-10/watt and around $10-25/watt for an off-grid system with batteries.

What are some of the advantages to using solar energy?

- The energy required to fabricate a solar module is produced and paid back within the first year of use. Solar modules are made of materials that are recyclable.
- Solar modules do not pollute or produce any noise and have a life expectancy of more than 25 years.
- It is relatively easy to predict the number of sunlight hours for any given region on the globe.
- For grid-tied installations in urban areas, solar modules produce energy during the peak demand period (9am-5pm and summer cooling) and help to offset this high energy demand.

Ref: Ramatek Energie. (n.d.). About solar PV (solar panels). https://rematek-energie.com/eng/energy-101/solar-pv.php

HANDOUT: Efficient Reading: Sports Story (3 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: People read text for different purposes. Whatever the reason for reading, being able to quickly and accurately find and understand the information you need makes reading both more pleasant and more efficient.

Refer to the article, **The death of the CWHL presents a new opportunity for women's professional hockey** to complete the tasks and locate answers to the questions.

Being able to predict content from titles and sub-titles in a document is an effective strategy to make it easier to understand the content and read faster and more efficiently.

1. **Before** reading the text, and just thinking about title, list 2 things you think will be mentioned in the text.

2. **Before** reading the text, look at the information below about the author. What do you think the author's purpose in writing will be? Write it in 1 sentence.

   The author is an Associate Professor in Sport Management and the Director of the Centre for Sport Capacity, at Brock University in St. Catherines, Ontario. She studies historical and current change management in hockey in Canada and around the world.

3. **Next** reading the text, what is the author's intent in writing? (For example, the author is writing to warn, inform, persuade…) Write your answer in 1 sentence.

4. What is 1 question you could ask that the text answers?

5. What is a related question that the text does NOT answer?

6. Using another source, find the answer to the question you identified in number 5. Identify the source.

7. Does the excerpt want you to read more of this text or a similar one? Why or whynot?

The death of the CWHL presents a new opportunity for women's professional hockey

The sudden announcement by the Canadian Women's Hockey League (CWHL) that it was ceasing operations has generated controversy and confusion. But as an academic who researches sport organizations, I have a different take — the CWHL closure opens the door for new and innovative women's professional hockey opportunities.

On the surface, this ordeal reads as a tale of two leagues – one non-profit, the CWHL, and one for-profit, the National Women's Hockey League (NWHL).

When the CWHL announced it was shutting down, the league's board of directors stated "the business model has proven to be economically unsustainable." Many fans and media took this to mean the non-profit model won't work and the only option is the NWHL's for-profit approach. But this is a shortsighted view.

Closure is a catalyst for change

The closure of the CWHL is a catalyst for other key stakeholders to enter the scene — which has happened many times in the past for men's professional hockey, where leagues have come and gone. As my early doctoral research shows, many different stakeholders — including players, hockey federations, government and industry officials — have influenced the development of hockey over time.

The Canadian Amateur Hockey Association, created in 1914, initially resisted popular pressure to allow pay-to-play leagues to emerge. But as players opted for independent leagues that paid them, the CAHA loosened its regulations and accommodated a degree of professionalism while at the same time overseeing the development of hockey in the country.

This shift opened the market to hockey boosters and entrepreneurs, some of whom owned rinks and needed to have an attractive product in order to entice customers. Money-making activity was fast and furious. Leagues came (the National Hockey League started in 1917) and went (the professional National Hockey Association lasted from 1909-18).

Rivalry between leagues

In his account of the emergence of the NHL, academic John Wong says separate camps jockeyed for position and profit as commercial hockey gained public interest. This is no different than the interplay — or as some note, the business rivalry — between the CWHL and NWHL that has unfolded since 2015, when the U.S.-based NWHL formed.

Women's hockey also attracted economic interests during the early part of the 20th century. In his review of American women's hockey in the First World War era, Andrew Holman notes that sports entrepreneurs sought new ways to sell the game, and as a result, women's hockey was positioned as a commercial venture.

The key point Holman makes about this historic time, though, is the rise and fall of the women's game, including its professional form. It is important to note the CWHL story has happened before.

In his examination of hockey capital and the sports industry, historian Andrew Ross notes the complex men's professional hockey landscape has included single-ownership leagues. He points out the NHL was once an unincorporated, non-profit organization.

Not a new model

The key lesson, then, is to recognize the CWHL model was not new and that this approach, as well as others, has existed and failed in the past. More importantly, these models, and the individuals that spearheaded them, pave the way for new and viable professional women's hockey approaches to emerge.

Which brings us to the next phase of the story. In my work on the global development of women's hockey, I note there is no one "best" model, and that each country must develop at its own pace through a method that best suits its unique hockey system. The same is true for a professional women's hockey league.

However, the CWHL's shutdown created a vacuum. Just over 48 hours after the CWHL released news of its decision to close, the NWHL's board announced an investment plan to establish two teams in Canada, and that it received a financial sponsor commitment from the NHL. And so, in a similar fashion to how the NHL and World Hockey Association, a rival men's professional hockey league that existed from 1972-79, merged, one league shuts down while the others acquire some of its franchises and moves on as the lone commercial player in the female game.

Looking back to 2015 when the NWHL was formed, it's interesting to reflect upon the CWHL's response. The CWHL commissioner at the time, Brenda Andress, commented that the NWHL model was wrong and "that for us, it's about sound operational and financial foundations first because we want to ensure the viability of the long term."

During its 12 years of operation, the CWHL took this approach and in so doing, shaped the professional women's hockey landscape. It's now time for the next stage.

Stevens, J. (April 3, 2019). The death of the CWHL presents a new opportunity for women's professional hockey. Retrieved from: https://theconversation.com/the-death-of-the-cwhl-presents-a-new-opportunity-for-womens-professional-hockey-114802?utm_source=timminstoday.com&utm_campaign=timminstoday.com&utm_medium=referral

HANDOUT: Efficient Reading: White Fang (Fiction) (3 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: People read text for different purposes. Whatever the reason for reading, being able to quickly and accurately find and understand the information you need makes reading both more pleasant and more efficient.

Refer to the excerpt from the text **White Fang** to complete the tasks and locate answers to the questions.

Being able to predict content from titles and sub-titles in a document is an effective strategy to make it easier to understand the content and read faster and more efficiently.

1. **Before** reading the text, and just thinking about title, list 2 things you think will be mentioned in the text.

2. **Before** reading the text, look at the information below about the author. What do you think the author's purpose in writing will be? Write it in 1 sentence.

   Author: Jack London was an American novelist, journalist, and social activist using his platform to inform the public about animal cruelty. A pioneer in the world of commercial magazine fiction, he was one of the first writers to become a worldwide celebrity and earn a large fortune from writing.

3. **Next** reading the text, what is the author's intent in writing? (For example, the author is writing to warn, inform, persuade…) Write your answer in 1 sentence.

4. What is 1 question you could ask that the text answers?

5. What is a related question that the text does NOT answer?

6. Using another source, find the answer to the question you identified in number 5. Identify the source.

7. Does the excerpt want you to read more of this text or a similar one? Why or why not?

Excerpt from The Call of the Wild

[Note: The story is told from the point of view of White Fang, a domesticated wolf.]

Had there been in White Fang's nature any possibility, no matter how remote, of his ever coming to fraternize with his kind, such possibility was irretrievably destroyed when he was made leader of the sled-team. For now the dogs hated him -- hated him for the extra meat bestowed upon him by Mit-sah; hated him for all the real and fancied favors he received; hated him for that he fled always at the head of the team, his waving brush of a tail and his perpetually retreating hind- quarters forever maddening their eyes.

And White Fang just as bitterly hated them back. Being sled-leader was anything but gratifying to him. To be compelled to run away before the yelling pack, every dog of which, for three years, he had thrashed and mastered, was almost more than he could endure. But endure it he must, or perish, and the life that was in him had no desire to perish. The moment Mit-sah gave his order for the start, that moment the whole team, with eager, savage cries, sprang forward at White Fang.

There was no defence for him. If he turned upon them, Mit-sah would throw the stinging lash of the whip into his face. Only remained to him to run away. He could not encounter that howling horde with his tail and hind-quarters. These were scarcely fit weapons with which to meet the many merciless fangs. So run away he did, violating his own nature and pride with every leap he made, and leaping all day long.

One cannot violate the promptings of one's nature without having that nature recoil upon itself. Such a recoil is like that of a hair, made to grow out from the body, turning unnaturally upon the direction of its growth and growing into the body -- a rankling, festering thing of hurt. And so with White Fang. Every urge of his being impelled him to spring upon the pack that cried at his heels, but it was the will of the gods that this should not be; and behind the will, to enforce it, was the whip of cariboo-gut with its biting thirty-foot lash. So White Fang could only eat his heart in bitterness and develop a hatred and malice commensurate with the ferocity and indomitability of his nature.

Ref: London, J. (2008). The Call of the Wild. https://www.gutenberg.org/files/215/215-h/215-h.htm

HANDOUT: Changes in the Electrical Code (3 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: The 24th edition of the Canadian Electrical Code (2018) contains a number of significant changes and updates to better ensure safe installation and maintenance of electrical equipment in order to prevent hazards and ensure proper maintenance and operation. It is the responsibility of apprentices and journeypersons to be certain their work is consistent with the latest version of the Code.

Refer to the article **Changes in the 2018 Electrical Code** and your own research to complete the tasks and locate answers to the questions.

1. What do each of the following acronyms stand for?

   a) EVSE: _____

   b) GFCI: _____

   c) LED: _____

   d) TR: _____

2. What does the term "wet areas" refer to?

   _____

   _____

3. What voltage LEDs are affected by the 2018 change?

   _____

4. What new rules and subrules also refer to the provision of power related to electric vehicles?

   _____

5. When was the previous version to the 2018 Code published? Assuming the same number of years between revisions, when will the next version be published?

6. Changes to the Code typically reflect changes in consumer behaviour and expectations. Select 2 of the changes and in your own words describe why you think the changes were made.

Changes in the 2018 Electrical Code

The 2018 Canadian Electrical Code, Part I includes a number of significant updates and changes to better help electrical workers in the safe maintenance of electrical equipment and create safer electrical installations. **Here are 4 key changes.**

1. Disconnecting means for LED luminaires
2015 Code — disconnecting means required for fluorescent ballasts
2018 Code — disconnecting means required for fluorescent ballasts and LED drivers

To support safe maintenance, the Code has for several editions required disconnecting means for fluorescent luminaires utilizing double ended lamps and operating at more than 150 V. With increased use of LED lighting, the requirements have been extended to LED luminaires exceeding 150 V to ground with double ended lamps.

2. Tamper resistant (TR) receptacles
2015 Code — TR receptacles required in dwelling units and child care facilities
2018 Code — TR receptacles required in additional occupancy types

The requirement for tamper resistant receptacles in dwelling units and child care facilities is expanded to include other areas where children may be present including hotel guest rooms, preschools, and elementary education facilities.

3. Increased GFCI protection for wet areas
2015 Code — No requirement for GFCI protection for heaters or controls in bathrooms
2018 Code — GFCI protection required

Similar to GFCI requirements for receptacles in the vicinity of showers, sinks or tubs, new Section 62 Rules mandate GFCI protection for electric heating devices and heating controls in the vicinity of sinks, showers or tubs.

4. Electric vehicle energy management system
2015 Code — EV supply equipment loads added to load calculations at 100% of rating
2018 Code — demand factors recognized where energy management system used.

Electric vehicle supply equipment (EVSE) can draw a substantial load when in the charging mode. For existing buildings, the addition of EVSE can result in the total load exceeding the existing service capacity. In this case, the first option is to increase the service size. A second option is to install a system to monitor the power being drawn by EVSEs and other building loads, and control the EVSE loads such that the overall load does not exceed the limits of the existing service, feeders, and branch circuits. In combination with new Rule 8-500 and new Subrules 8-106(11) and (12) such systems are now recognized in the Code as Electric Vehicle Energy Management Systems (EVEMS). Complementary to the introduction of EVEMS, a new Table of loads and demand factors has been added specifically for EVSE.

Ref: Electrical Industry Newsweek. (June 28, 2018). 2018 Canadian Electrical Code, Part I: Top 15 Changes. https://www.electricalindustry.ca/latest-news/3739-2018-canadian-electrical-code-part-i-top-15-changes

HANDOUT: Demand for Skilled Trades (4 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: Skilled trades are a significant factor in, and contributor to, the strength of the Canadian economy. Understanding how your work contributes, and staying current on trades' trends in the news, is part of taking professional pride in your work.

Refer to the article **Skilled trade jobs go begging in Canada** to locate answers to the questions.

Being able to predict content from titles and sub-titles in a document is an effective strategy to make it easier to understand the content and read faster and more efficiently.

1. **Before** reading the article, and just from looking at the title, list 3 topics you expect to find mentioned in the article.

   _____

   _____

   _____

2. Who authored the report referred to?

   _____

3. How many employers participated in the survey? _____

4. According to the article, what is a large organization?

   _____

   _____

5. A "gap" is the distance between 2 things or sides. What are the 2 sides of the skills gap?

   _____

   _____

6. Articles often use a lot of "jargon" or words that are specific to the topic being discussed. In your own words, write a definition for each of the following jargon words used in the human resources sector:

   a. Boomerang retirees

   _____

   b. Upskilling

   _____

   c. Reskilling

   _____

   d. Learning platform

   _____

   e. Adjacent skills

   _____

   f. Skilled trade

   _____

7. Complete the following table.

%	**Of employers…**
	… are changing their existing work models
41%	
	… are investing in learning platforms
58%	
56%	

8. Identify 2 things that employers are doing to attract new employees.

_____

_____

9. The article focuses on what employers can do to fill jobs. What is an exampleof something a worker can do?

_____

_____

10. Now that you've read the article, look back at your prediction in Question 1. Did your predictions match the content of the article? What do you think would be a different good title for the article?

_____

_____

Skilled trade jobs go begging in Canada

Skilled trades are the hardest jobs to fill

A new report by ManpowerGroup finds that 41 per cent of Canadian employers say they can't find the skilled people they need to fill jobs.

"We continue to see increasing demand for skilled workers across all sectors of the Canadian economy from trades and transport to sales," said Darlene Minatel, country manager of ManpowerGroup Canada. "Today's job seekers don't always have the skills employers need. To solve our growing skills gap, we need to take a new approach.

"Employers need to buy skills in the short term, cultivate communities of talent by borrowing from external sources and help people with adjacent skills transition from one role to another. Above all, we need to build talent through upskilling and reskilling programs to develop a workforce with the skills companies and individuals need to succeed.

The ManpowerGroup 2018 Talent Shortage Survey, which was released on Monday, said skilled trades are the hardest jobs to fill in Canada, followed by sales representatives and drivers.

"At a time when organizations face a tightening labour market and the lowest unemployment in 40 years, most of the jobs where demand is growing are mid-skilled roles that require post-secondary training, yet not always a full university degree," said Manpower.

"Nearly three in four of the companies surveyed (68 per cent) are investing in learning platforms and development tools to build their talent pipeline, while 28 per cent of employers are changing their existing work models, including offering flexible work arrangements to attract and retain talent, according to the nearly 2,000 employers surveyed. More than half of companies (56 per cent) are looking at different talent pools for skills, including boomerang retirees or returning parents and part-timers."

Manpower said that globally, 45 per cent of employers say they can't find the skills they need. Large organizations (250-plus employees) are struggling the most: more than half (58 per cent) of large organizations in Canada reported talent shortages this year.

Ref: Toneguzzi, M. (August 20, 2018). Skilled trade jobs go begging in Canada. https://troymedia.com/business/skilled-trade-jobs-go-begging-canada/

HANDOUT: Finding Information in Codes: Building (4 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning, Navigating Regulations

IN THE WORKPLACE: The National Building Code applies mainly to new construction, but also to aspects of demolition, relocation, and renovation. Provinces and territories can adopt the National Code or adapt it to their own jurisdictions. It is the responsibility of workers to be certain their work is consistent with the latest version of the Code.

Refer to the excerpt of the **BC Building Code** to complete the tasks and locate answers to the questions.

1. Using the following structure, complete the table below using the information in the excerpt. Locate and use the first example that allows you to complete every line inthe structure. The first line is done for you.

3	Part
3.5	Section
3.5.2	Sub-section
3.5.2.1	Article
3.5.2.1 (2)	Sentence
3.5.2.1 (2) (a)	Clause
3.5.2.1.(2) (a) (i)	Subclause

Division	B: Acceptable Solutions
Part	
Section	
Sub-section	
Article	
Sentence	
Clause	
Subclause	

2. What are the 3 main categories of information in sub-section 3.8.2?

_____

_____

3. Angles brackets < > are used to indicate changes between the current and previous versions of the Code. How many changes are indicated in 3.8.2.1 and what do they refer to?

_____

4. What is the rule number that governs openings through firewalls?

_____

5. Under what circumstances must more than 1 universal toilet room be provided?

_____

_____

6. What size units does subsection 3.8.2 apply to?

_____

7. Where can you find more information on Group C apartment buildings?

_____

8. How many specific requirements are identified in 3.8.2.3 (1)?

_____

9. What 2 parking options are permitted? Provide the full rule number where you found the answer.

_____

_____

10. Does this excerpt from the building code apply to new construction only? Provide the full rule number where you found the answer.

_____

DIVISION B ACCEPTABLE SOLUTIONS

Part 3 — Fire Protection, Occupant Safety and Accessibility

Section 3.8. Building Requirements for Persons with Disabilities

3.8.1. GENERAL

3.8.1.1. Application

1) This Section applies to the design and construction of *buildings* and *occupancies* to make them *accessible* by *persons with disabilities*.

2) The requirements of this Section take precedence over other requirements contained in this Part and in Part 9.

3) *Access* shall be provided to *alterations*, additions and changes in *occupancy* to the extent required in Subsection 3.8.4.

3.8.1.2. Openings through Firewalls

1) Where there are openings through a *firewall*, other than those for piping, tubing, wiring and conduit, the requirements of this Section shall apply to the *floor areas* on both sides of the *firewall* as if they were in the same *building*.

3.8.2. CLASSIFICATION REQUIREMENTS

3.8.2.1. Application and Exemptions

1) Except as provided in Sentence (2), *access* shall be provided to all *storeys* of *buildings* of new construction.

2) This Subsection does not apply to

a) the *storey* next above or below the *accessible storey* in a *building* not more than two *storeys* in *building height* provided the *storeys* next above or below the *accessible storey*

i) is less than 600 m^2 in *floor area*,

ii) does not contain *facilities* integral to the principle function of the *accessible storey*, and

iii) does not contain an assembly major occupancy with an area more than 100 m^2, (See Appendix A.)

b) the *storey* next above or below the *accessible storey* in a *suite* of not more than two *storeys*, where the *accessible storeys* is the first *storey* or basement, provided the *storey* next above or below the *accessible storey*

i) is less than 600 m^2 in area,

ii) does not contain *facilities* integral to the principle function of the *accessible storey*, and

iii) does not contain an assembly *major occupancy* with an *area* more than 100 m^2,

c) Group C *dwelling units*, row houses, boarding houses and lodging houses,

d) Group C apartment *buildings* and condominiums except to the extent described in Article 3.8.2.27.,

e) Group E shops and stores with a total retail floor space of less than 50 m^2 (See Appendix A), and

f) Group F Division 1 *occupancies*.

3.8.2.2. Design Requirements

1) To meet the requirements of Articles 3.8.2.3. to 3.8.2.39., the design requirements of Subsection 3.8.3. shall form an integral part of this Subsection.

3.8.2.3. Specific Requirements

1) Except where stated otherwise *buildings* and *occupancies* to which this Subsection applies shall, in addition to the requirements listed for specific *occupancies*, have

a) *access* from the street to at least one main entrance conforming to Article 3.8.3.5.,

b) where off-street parking is provided for *persons with disabilities*, *access* from the parking area to an entrance conforming to Article 3.8.3.5. that serves the parking area unless the entrance in Clause (a) is located so as to conveniently serve both the parking area and the *street*,

c) access to all areas where work functions can reasonably be expected to be performed by *persons with disabilities*,

d) accessible washrooms conforming to Sentence (2), and

e) on each floor area to which *access* is required, egress conforming to Article 3.8.3.19.

2) In *buildings* and occupancies where water closets are required,

a) at least one universal toilet room that conforms to Sentence 3.7.2.10.(9) shall be provided, and

b) where the *occupant load* of the *building* or *occupancy* exceeds 150, other public washrooms in floor areas required to be *accessible* shall conform to Sentences 3.7.2.10.(2) to (8).

Ref: BC Building Code. (2012). Section 3.8. building requirements for persons with disabilities. In Part 3 — fire protection, occupant safety and accessibility. http://free.bcpublications.ca/civix/document/id/public/bcbc2006/building_b_p3_3.8

HANDOUT: Finding Information in the Code: Electrical (4 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning, Navigating Regulations

IN THE WORKPLACE: The purpose of the Canadian Electrical Code is to ensure safe installation and maintenance of electrical equipment in order to prevent hazards and ensure proper maintenance and operation. It is the responsibility of apprentices and journeypersons to be certain their work is consistent with the latest version of the Code.

Refer to **Section 86: 2018 Electrical Code** to complete the tasks and locate answers to the questions.

1. What are the 4 main categories of information in Section 86?

   _____

   _____

2. What are the rule and/or subrule numbers of information that is new in this version of the Code?

   _____

3. Complete the rule number for control and protection: 8 - 0 0
4. Complete the rule number for voltages: 8_ - _____ _
5. Complete the rule number for connected loads: 6 - 0 _
6. What information must be included on warning signs?

   _____

   _____

7. What vehicle types are not covered by Section 86?

   _____

   _____

8. What is the maximum voltage for vehicles covered under Section 86?

_____

9. Where can you find more information on branch circuits?

_____

10. What 3 conditions must be met for the vehicle supply equipment to beconsidered disconnected?

_____

_____

11. What are 3 sources of electrical current to vehicle motors?

_____

_____

_____

12. Where can you find more information on the max connected load?

_____

13. What provision must be made for a charging receptacle installed outside?

_____

_____

14. When is it permissible to supply equipment from a branch circuit that issupplying another load as well? Provide the full rule number where you found theanswer.

_____

_____

_____

Section 86 — Electric vehicle charging systems

Scope

86-000 Scope

This Section applies to the installation of

a) the insulated conductors and cables and the equipment external to an electric vehicle that connect it to source of electric current by conductive or inductive means; and

b) equipment and devices related to electric vehicle charging.

2) This Section supplements or amends the general requirements of this Code.

General

86-100 Special terminology (see Appendix B)

In this Section, the following definitions shall apply:

Electric vehicle — an automotive-type vehicle for use on public roads that

a) includes automobiles, buses, trucks, vans, low-speed vehicles, motorcycles, and similar vehicles powered by one or more electric motors that draw current from a fuel cell, photovoltaic array, rechargeable energy storage system (such as a battery or capacitor), or other source of electric current;

b) includes plug-in hybrid electric vehicles (PHEVs); and

c) excludes off-road electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, and mobility scooters for persons with disabilities.

Electric vehicle connector — a device that, when electrically coupled to a mating device on the electric vehicle, establishes means for power transfer and information exchange between an electric vehicle and electric vehicle supply equipment.

Δ Electric vehicle supply equipment (EVSE) — a complete assembly consisting of cables, connectors, devices, apparatus, and fittings installed for the purpose of power transfer and information exchange between the branch circuit and the electric vehicle.

Plug-in hybrid electric vehicle (PHEV) — a type of electric vehicle having an additional energy source for motive power.

86-102 Voltages

The nominal ac system voltages used to supply equipment covered in this Section shall not exceed 750 V.

86-104 Permanently connected and cord-connected equipment

Rules 86-300 to 86-404 apply to installation of permanently connected and cord-connected electric vehicle supply equipment.

Equipment

86-200 Warning sign

Permanent, legible signs shall be installed at the point of connection of the electric vehicle supply equipment to the branch circuit wiring, warning against operation of the equipment without sufficient ventilation as recommended by the manufacturer's installation instructions.

Control and protection

86-300 Branch circuits (see Appendix B)

1) Electric vehicle supply equipment shall be supplied by a separate branch circuit that supplies no other loads except ventilation equipment intended for use with the electric vehicle supply equipment.
Δ 2) Notwithstanding Subrule 1), electric vehicle supply equipment shall be permitted to be supplied from a branch circuit supplying another load(s), provided that an electric vehicle energy management system is installed in accordance with Subrule 8-106 11) or 12).
3) For the purposes of Subrule 2), the calculated demand shall be determined in accordance with Section 8.

86-302 Connected load

The total connected load of a branch circuit supplying electric vehicle supply equipment and the ventilation equipment permitted by Rule 86-300 shall be considered continuous for the purposes of Rule 8-104.

86-304 Disconnecting means

A separate disconnecting means shall be provided for each installation of electric vehicle supply equipment rated at 60 A or more, or more than 150 volts-to-ground.
2) The disconnecting means required in Subrule 1) shall be
- a) on the supply side of the point of connection of the electric vehicle supply equipment;
- b) located within sight of and accessible to the electric vehicle supply equipment; and
- c) capable of being locked in the open position.

86-306 Receptacles for electric vehicle supply equipment (see Appendix B)
1) Each receptacle for the purpose of electric vehicle charging shall be labelled in a conspicuous, legible, and permanent manner, identifying it as an electric vehicle supply equipment receptacle and shall be
- a) a single receptacle of CSA configuration 5-20R supplied from a 125 V branch circuit rated not less than 20 A; or
- b) of the appropriate CSA configuration in accordance with Diagram 1 or 2 when supplied from a branch circuit rated at more than 125 V or more than 20 A.

2) When the receptacle referred to in Subrule 1) a) is installed outdoors and within 2.5 m of finished grade, it shall be protected with a ground fault circuit interrupter of the Class A type.

HANDOUT: Finding Information in Codes: Plumbing (4 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning, Navigating Regulations

IN THE WORKPLACE: The National Plumbing Code of Canada sets out technical provisions for the design and installation of new plumbing systems and also applies to the extension, alteration, and repair of existing plumbing systems. Provinces and territories can adopt the National Code or adapt it to their own jurisdictions. It is the responsibility of workers to be certain their work is consistent with the latest version of the Code.

Refer to the excerpt of the **BC Plumbing Code** to complete the tasks and locate answers to the questions.

1. Using the following structure, complete the table below using the information in the excerpt. Locate and use the first example that allows you to complete every line inthe structure. The first line is done for you.

3	Part
3.5	Section
3.5.2	Sub-section
3.5.2.1	Article
3.5.2.1 (2)	Sentence
3.5.2.1 (2) (a)	Clause
3.5.2.1.(2) (a) (i)	Subclause

Division	B: Acceptable Solutions
Part	
Section	
Sub-section	
Article	
Sentence	
Clause	
Subclause	

2. What are the 3 main categories of information in section 2.5?

_____

_____

3. Angles brackets < > are used to indicate changes between the current and previous versions of the Code. How many changes are indicated in 2.5.2 and what do they refer to?

_____

4. What is the full rule number that governs outlet pipes of less than 2 inches?

_____

5. Under what circumstances does a trap not need to be protected by a vent pipe?

_____

_____

6. What size offset is permitted for pipes larger than 2 inches?

_____

7. Where can you find more information on additional protections for drainage systems?

_____

8. How many clauses are identified in 2.5.2.1?

_____

9. What is the maximum number of fixtures that can be connected to a combined relief and circuit vent? Provide the full rule number where you found the answer.

_____

10. What 3 rules refer to emergency floor drains?

_____

_____

DIVISION B
ACCEPTABLE SOLUTIONS

Part 2 — Plumbing Systems

Section 2.5 Venting Systems

2.5.1. VENTING FOR TRAPS

2.5.1.1. Venting for Traps

1) Except as provided in Sentences (3) and (4), every *trap* shall be protected by a *vent pipe*.

2) *Drainage systems* may require additional protection as provided in Subsection 2.5.4.

3) A *trap* that serves a floor drain need not be protected where

a) the *size* of the *trap* is not less than 3 inches,

b) the length of the *fixture drain* is not less than 450 mm, and

c) the fall on the *fixture drain* does not exceed its *size*.

4) A *trap* need not be protected by a *vent pipe*

a) where it serves

i) a *subsoil drainage pipe*, or

ii) a *storm drainage system*, or

b) where it forms part of an indirect *drainage system*. (See also Clause 2.4.2.3.(2)(b).)

2.5.2. WET VENTING

2.5.2.1. Wet Venting

1) A *soil-or-waste pipe* may serve as a *wet vent* provided that

a) the hydraulic load is in accordance with Table 2.5.8.1.,

b) the number of wet-vented water closets does not exceed 2,

c) where 2 water closets are installed, they are connected at the same level by means of a double sanitary T fitting if the *vent pipe* is vertical and by means of a double Y fitting if the *vent pipe* is horizontal,

d) the water closets are installed downstream of all other *fixtures*,

e) *trap arms* and *fixture drains* connected to the *wet vent* do not exceed 2 inches in *size*, except for connections from *emergency floor drains* in accordance with Sentence 2.5.1.1.(3),

f) the total hydraulic load on the *wet vent* does not exceed the limits stated in Table 2.5.8.1. when separately vented *branches* or *fixture drains* in the same *storey*, having a total hydraulic load not greater than 2 *fixture units*, are connected to the *wet vent* or a wet-vented water closet *trap arm*,

g) the hydraulic load of separately vented *fixtures* that drain into the *wet vent* are not included when sizing the *continuous vent* that serves the *wet vent*,

h) where a *wet vent* extends through more than one *storey*, the total discharge from any one *storey* above the first *storey* does not exceed 4 *fixture units*,

i) there is not more than one *nominally horizontal offset* in the *wet vent*, and

i)the *offset* does not exceed 1.2 m for pipes 2 inches or less in *size*, or ii)the

offset does not exceed 2.5 m for pipes larger than 2 inches in *size*,

j) the wet-vented portion is not reduced in *size* except for the portion that is upstream of *emergency floor drains* in accordance with Sentence 2.5.1.1.(3), and

k) the length of the *wet vent* is not limited.

2.5.3. CIRCUIT VENTING

2.5.3.1. Circuit Venting

1) A section of horizontal *branch* may be circuit-vented provided

a) a *circuit vent* is connected to it,

b) all *fixtures* served by the *circuit vent* are located in the same *storey*, and

c) no *soil-or-waste stack* is connected to it upstream of a circuit-vented *fixture*.

2) *Fixtures* with *fixture outlet pipes* less than 2 inches in *size* shall be separately vented or separately circuit-vented.

3) Except as provided in Sentences (4) and (5), a *relief vent* shall be connected to the *branch* that forms part of a circuit-vented system, downstream of the connection of the most downstream circuit-vented *fixture*.

4) A symmetrically connected *relief vent* may serve as a combined *relief vent* for a maximum of 2 *branches* that are circuit-vented, provided there are not more than 8 circuit-vented *fixtures* connected between the combined *relief vent* and each *circuit vent*.

Ref: BC Publications. (2012). Section 2.5. Venting Systems. In Part 2 Venting Systems. http://free.bcpublications.ca/civix/document/id/public/vpbl2014/ep001002.5

HANDOUT: Occupational Health and Safety Regulations (3 pages)
Skill Builders: Key Words & Phrases, Navigating Regulations

IN THE WORKPLACE: Being able to navigate *Occupational Health and Safety Regulations* protects workers from risks to their health and safety, and also helps them identify their own responsibilities related to workplace safety.

1. What is the title of section 2.3?

_____

2. In your own words, what is section 2.3 about?

_____

_____

3. Who is this regulation written for?

_____

_____

4. As a result of section 2.3 (1), what is the appearance of most public swinging doors?

_____

_____

5. If a gate or door opens into a hallway, what document would tell you how wide the hallway needs to be?

_____

_____

6. Underline 3 terms that you think should be defined in the *Interpretations* section at the beginning of Part II. Google the definition for each and write them below.

7. How is section 2.12 formatted to make it easier to read?

8. How far apart do supporting posts need to be spaced?

9. How tall should the guardrail be?

10. Label the picture consistent with parts a), b) and c) of 2.12 (1).

Excerpts from the *Canada Occupational Health and Safety Regulations*

Doors

2.3 (1) Every double-action swinging door that is located in an exit, entrance or passageway used for two-way pedestrian traffic or traffic involving wheelchairs or other similar devices shall be designed and fitted in a manner that will allow persons who are approaching from one side of the door to be aware of persons who are on the other side of it.

(2) The area of every passageway into which a door or gate extends when open, other than the door of a closet or other small unoccupied storage room, shall be marked, in consultation with the work place committee or the health and safety representative in a manner that clearly indicates the area of hazard created by the opening of the door or gate.

(3) Where a door or gate that is to remain open extends into a passageway for a distance that will reduce the effective width of the passageway to a width less than that required by the National Building Code,

Portes

2.3 (1) Toute porte va-et-vient située à une sortie, à une entrée ou à un passage servant à la circulation dans les deux sens des piétons ou des personnes utilisant un fauteuil roulant ou autre appareil du même genre doit être conçue et installée de manière à permettre aux personnes qui s'en approchent de se rendre compte de la présence de celles se trouvant de l'autre côté.

(2) L'aire de tout passage sur laquelle empiète une porte ouverte autre que la porte d'un placard ou d'une petite pièce inoccupée servant à l'entreposage doit, en consultation avec le comité local ou le représentant, être marquée de façon à indiquer clairement la zone de risque ainsi créée.

(3) Lorsqu'une porte devant demeurer ouverte rend la largeur utilisable d'un passage inférieure à la largeur exigée par le Code canadien du bâtiment, l'une des mesures suivantes doit être prise :

Guardrails

2.12 (1) Every guardrail shall be highly visible and consist of

(a) a horizontal top rail not less than 900 mm but not more than 1 100 mm above the base of the guardrail;

(b) a horizontal intermediate rail spaced midway between the top rail and the base; and

(c) supporting posts spaced not more than 3 m apart at their centres.

(2) Every guardrail shall be designed to withstand a static load of 890 N applied in any direction at any point on the top rail.

SOR/94-263, s. 8(F); SOR/2000-374, s. 2.

Garde-fous

2.12 (1) Tout garde-fou doit être très visible et être constitué :

a) d'une traverse horizontale supérieure située à au moins 900 mm mais à au plus 1 100 mm au-dessus de la base;

b) d'une traverse horizontale intermédiaire située à égale distance de la traverse supérieure et de la base;

c) de poteaux de soutènement séparés par une distance d'au plus 3 m d'un point milieu à l'autre.

(2) Tout garde-fou doit être conçu pour supporter une charge statique de 890 N appliquée en quelque sens que ce soit sur tout point de la traverse supérieure.

DORS/94-263, art. 8(F); DORS/2000-374, art. 2.

Government of Canada. (June 25, 2019). Canada occupational health and safety regulations. https://laws-lois.justice.gc.ca/PDF/SOR-86-304.pdf

HANDOUT: Heat Stress Safety Bulletin (3 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: It is the shared responsibility of workers and employers to ensure that workplaces are free from accidents, injuries, illnesses or fatalities. Being aware of specific health risks associated with working out of doors during warm days, helps catch potential issues before they arise.

Read **The Hazards of Heat Stress** safety bulletin to locate answers to the questions.

1. In your own words, what causes heat stress?

   _____

   _____

2. What types of heat-related illness do not usually require medical attention?

   _____

   _____

3. In what cases can heat stress cause death?

   _____

   _____

4. Complete the following:

   Heat_____happens when the body loses too much water. Heat_____may appear on the body. Heat_____are felt in the body. One sign of heat _____ is nausea. The most serious heat-related_____is heat _____.

5. Changes in heart rate can indicate heat stress. What could the following indicate?

   a) Fast heart rate _____

   b) Slow heart rate _____

6. Whose responsibility are each of the following? Put an X in the column.

Prevention Tip	Workers	Managers
1. Wear light fitting clothing		
2. Schedule hot jobs in morning		
3. Avoid coffee		
4. Monitor personal health		
5. Provide breaks		
6. Drink water		

7. Taylor has been working outside all summer. Last night, several of the crew went out for beers after work. This morning Taylor has had a couple of iced-coffee to stay cool and alert but now suddenly feels cramping in both legs.

   a) What do you think the problem is?

   _____

   _____

   b) What are 2 things that can be done to treat the problem?

   _____

   _____

   c) What are 2 things that Taylor could have done to prevent the problem?

   _____

   _____

THE HAZARDS OF HEAT STRESS

Heat and humidity are a normal part of Ontario summers, but how your body reacts to the heat depends on how hard you are working, how much water you have been drinking, how fit you are, and whether you have become acclimatized to the higher temperatures.

Heat stress can occur wherever physical work is being done in a hot, humid environment. The body tries to cool itself by increasing the heart rate to move blood—and heat—to the skin and by sweating to help cool the blood and body. But when too much water is lost through sweating, dehydration occurs. This can lead to heat-related illnesses.

Illness	Symptoms	Treatment	Severity
Heat Rash	• Red blotches and extreme itchiness in areas persistently damp with sweat • Prickling sensation on the skin where sweating occurs	• Rest in a cool place. • Take a shower or rinse skin with cool water. • Change into dry clothes.	If treated, symptoms usually disappear after a few days.
Heat Cramps	• Painful cramps or spasms in the arms, legs, back, or stomach that occur suddenly at work or later at home • Hard, painful lumps in the muscles as a result of the cramps	• Rest in a cool place. • Remove or loosen clothing. • Drink cool water or a sports drink containing electrolytes. • Stretch and massage muscles. • If the cramps are severe or don't go away, seek medical aid.	If not treated promptly, heat cramps can lead to more serious heat-related illnesses.
Fainting	• Sudden fainting after at least two hours of work • Cool, moist skin • Weak pulse	• **GET MEDICAL ATTENTION.** • Assess the need for CPR. • Rest in a cool place. • Remove or loosen clothing. • If conscious, make the person lie down. • If conscious, give the person sips of cool water.	If not treated promptly, fainting can lead to more serious heat-related illnesses. Fainting may also be due to other illnesses.
Heat Exhaustion	• Weakness • Headache • Breathlessness • Nausea or vomiting • Feeling faint	• **GET MEDICAL ATTENTION.** • Rest in a cool place. • Remove or loosen clothing. • Lie down with feet raised. • Drink cool water or a sports drink containing electrolytes. • Do not leave affected person alone. • Take a cool shower or rinse skin with cool water.	If not treated promptly, heat exhaustion can lead to heat stroke, which can be fatal.
Heat Stroke	• Irrational behaviour • Confusion • Loss of consciousness (fainting) • Convulsions • Hot, dry skin (not sweating) • Rapid heartbeat • Rapid and shallow breathing	• **GET MEDICAL ATTENTION. Call 911 or get the person to hospital immediately.** • Move the person out of the sun and into a cool place. • Cool the person's body by covering with damp sheets, spraying with cool water, or using a fan. • If conscious, give the person sips of cool water.	Can be fatal if medical assistance is not obtained immediately.

Source: ontario.ca/heatstress (reviewed December 2015)

Symptoms of heat stress should never be ignored. They are your body's way of telling you that something needs to be done to balance your body's heating and cooling system. For more information on heat stress and helpful resources on how to prevent it, visit the **Heat Stress** topic page on ihsa.ca.

Prevention tips for workers

- **Be aware of the symptoms.** Watch out for symptoms of heat stress in yourself and your co-workers.
- **Drink water.** You need to drink one cup of cool water every 20 minutes, even if you're not thirsty.
- **Avoid alcohol and caffeinated drinks.** Alcohol and caffeinated beverages such as tea, coffee, and cola are diuretics and will dehydrate your body. These drinks should also be avoided the night before work as well.
- **Wear light, loose-fitting clothing.** Wear clothes that allow sweat to evaporate. Light-coloured garments absorb less heat from the sun.
- **Know your personal risk factors.** Any of the following conditions could increase your risk for heat-related illness: excessive weight, poor physical condition, previous heat-related illnesses, older age, heart disease, high blood pressure, recent illnesses, and certain medications.

Prevention tips for managers/supervisors

- **Training.** Make heat stress your next safety talk and remind workers about it periodically throughout the summer. Visit ihsa.ca for free safety talks on heat stress and sun protection.
- **Breaks.** Give workers frequent breaks in cool areas.
- **Scheduling.** Schedule hotter jobs during cooler parts of the day.
- **Assistance.** Minimize strenuous tasks by pairing up workers or providing material handling equipment such as carts, dollies, pallet jacks, or manual forklifts.

IHSA.ca Work Safe for Life

IHSA013 Rev. 2016

Ref: ISHA (2016). Heat Stress Safety Poster. [Poster]. https://www.ihsa.ca/pdfs/topics/Heat_Stress_Poster.pdf

HANDOUT: Lockout Procedure (4 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: Following detailed step by step instructions to safely install, operate and shutdown machinery is part of most tradesperson's work. Errors in sequencing steps or skipping them altogether can result in accidents and lost time.

Read **SAMPLE 1** and **SAMPLE 3: Lockout Procedures** to locate answers to the questions. Write the answers in the space provided.

1. Who is the intended audience for SAMPLE 1?

   _____

2. Who is the intended audience for SAMPLE 3?

   _____

3. Where in the workplace would you expect to find each document? In what way(s) does that influence how the document is written?

   _____

   _____

   _____

4. SAMPLE 1 has 7 sub-headings. Divide them into the following 3 sections. Write the step numbers in the spaces:

   a. General Information: _____

   b. Procedure: _____

   c. Additional Information: _____

5. SAMPLE 3 has 2 main sections. What sub-heading would you assign to each section?

_____

_____

6. Sometimes steps in instructions have sub-steps or multiple parts.

   a. What are the 2 sub-steps in SAMPLE 1 sequence step 6?

   _____

   _____

   b. What are the 2 sub-steps in SAMPLE 3 step 3?

   _____

   _____

7. What is being locked-out in each document?

_____

8. Why is some of the information in Sample 3 written in capital letters?

_____

9. Which document do you think is easier to read? What could you do to make the less-readable document easier to understand?

_____

_____

_____

_____

TOOL B

SAMPLE 1 - GENERAL LOCKOUT/TAGOUT PROCEDURE

Purpose

This procedure establishes the minimum requirements for lockout of energy sources that could cause injury to personnel. All employees shall comply with the procedure.

Responsibility

The responsibility for seeing that this procedure is followed is binding upon all employees. All employees shall be instructed in the safety significance of the lockout procedure by (designated individual). Each new or transferred affected employee shall be instructed by (designated individuals) in the purpose and use of the lockout procedure.

Preparation for Lockout

Employees authorized to perform lockout shall be certain as to which switch, valve, or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, or others) may be involved. Any questionable identification of sources shall be cleared by the employees with their supervisors. Before lockout commences, job authorization should be obtained.

Sequence of Lockout Procedure

1. Notify all affected employees that a lockout is required and the reason therefor.
2. If the equipment is operating, shut it down by the normal stopping procedure (such as: depress stop button, open toggle switch).
3. Operate the switch, valve, or other energy isolating devices so that the energy source(s) (electrical, mechanical, hydraulic, other) is disconnected or isolated from the equipment.
4. Lockout energy isolating devices with an assigned individual lock.
5. Stored energy, such as that in capacitors, springs, elevated machine members, rotating fly wheels, hydraulic systems, and air, gas, steam or water pressure, must also be dissipated or restained by methods such as grounding, repositioning, blocking, bleeding down.
6. After ensuring that no personnel are exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate. CAUTION: Return operating controls to neutral position after the test.
7. The equipment is now locked out.

Restoring Equipment to Service

1. When the job is complete and equipment is ready for testing or normal service, check the equipment area to see that no one is exposed.
2. When equipment is clear, remove all locks. The energy isolating devices may be operated to restore energy to equipment.

Procedure Involving More Than One Person

In the preceding steps, if more than one individual is required to lock out equipment, each shall place his/her own personal lock on the energy isolating device(s). One designated individual of a work crew or a supervisor, with the knowledge of the crew, may lock out equipment for the whole crew. In such cases, it may be the responsibility of the individual to carry out all steps of the lockout procedure and inform the crew when it is safe to work on the equipment. Additionally, the designated individual shall not remove a crew lock until it has been verified that all individuals are clear.

Rules for Using Lockout Procedure

All equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy isolating device bearing a lock.

SAMPLE 3 - EQUIPMENT LOCKOUT/TAGOUT PROCEDURE

Equipment Number	Equipment Type	MCC *	Row	Bucket	Department
0594 - 01	*Motor*	*019*	*B*	*03*	*Board Plant*

Equipment Name: *Cutoff Knife Drive*

MCC Location: *Old Boiler Room*

Potential Hazards:	☑ Electrical	☐ Pneumatic	☐ Mechanical	☑ Multiple Lockouts
	☐ Hydraulic	☐ Chemical	☐ Combustables	☐ Confined Space
Methods of Neutralizing Energy:	☐ Relieve Pressure	☐ Block/Bleed	☑ Lockout/Tagout	
	☐ Disconnect Lines	☐ Set Fire Watch	☐ Confined Space Permit	
Permits Required:	☐ Safe Work	☐ Hot Work	☐ Line Blanking	☐ Confined Space

Lockout Procedure:

1. Notify Production Supervisor and ALL affected personnel.
2. After completing Step 1, if running, shut down the equipment as trained. If you are not sure how, SEE YOUR SUPERVISOR.
3. "Lock" and "Tag" the equipment out at the "Knife Drives Cabinet", located across from the knife on the north wall, following the lockout procedure. CAUTION! THE COMPLETE LIVE ROLL SECTION MUST ALSO BE LOCKED OUT. REFER TO THE SPECIFIC LOCKOUT PROCEDURES FOR THAT EQUIPMENT. Test the equipment at the Knife control panel.
4. After ALL the previous steps have been completed, begin your work assignment.
5. After the completion of the work assignment, assure that the work area is clean.
6. Notify the Production Supervisor and/or ALL affected personnel that the equipment is operational and that removal of lock ous will occur.
7. Remove ALL locks and tags following the lockout procedure.
8. When production is ready, verify that the equipment is operating correctly.
9. When Production is ready, verify that equipment is operating correctly.
10. Close out any applicable permit/s and return them to your supervisor.

* MCC means Motor Control Center

Review Date:
Revision Date:

Ref: Government of California. (n.d.). Sample 1 general lockout/tagout procedure. (pp. 1-2). https://www.dir.ca.gov/dosh/etools/08-003/P08-00301B.pdf

HANDOUT: Navigating Codes (3 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning, Navigating Regulations

IN THE WORKPLACE: The object of the Electrical Code is to establish safety standards for the installation and maintenance of electrical equipment in order to prevent fire and shock hazards, as well as ensure proper maintenance and operation. It is the responsibility of apprentices and journeypersons to be certain their work is consistent with the latest version of the Code.

Refer to the article **Tips for Navigating the Electrical Code** to complete the tasks and locate answers to the questions.

1. In what Part of the Code will you find information on the following?

   a) Transmission circuit safety _____

   b) Standards that cover all electrical installations _____

   c) Residential inspections _____

   d) Objective-based standards _____

2. Why are there no sections 11 or 13 in the Code Book?

   _____

   _____

3. How are changes from the previous versions of the Code indicated?

   _____

4. Complete the following table.

00-000	_____
_____	Subrule
_____	Item
(i)	Item
(A)	_____

5. Use the excerpt from the Code to answer the following.

a) In what section is this rule? _____

b) How many subrules are there? _____

c) Which subrule contains items? _____

d) Where can you find more information? _____

e) Which subrule overrides subrule 1)? _____

f) Which subrule is a change from the previous version? _____

12-510 Running of cable between boxes and fittings (see Appendices B and G)

Δ 1) Where the cable is run between boxes and fittings, it shall be supported by straps, Type 2S or 21S cable ties, or other devices located

a) within 300 mm of every box or fitting; and

b) at intervals of not more than 1.5 m throughout the run.

2) Cables run through holes in joists or studs shall be considered to be supported.

3) Notwithstanding Subrules 1) and 2), where the cable is run as concealed wiring such that it is impracticable to support it, and where metal sheeting or cladding, metal joists, metal top or bottom plates, or metal studs are not used, the cable shall be permitted to be fished and need not be supported between boxes and fittings.

Tips for Navigating the Electrical Code

Navigating the Code Book can be an intimidating exercise. These 4 tips can make it easier.

1. Understanding the Parts

The Canadian Electrical Code is published in several parts: Part I is the safety standard for electrical installations. Part II is a collection of individual standards for the evaluation of electrical equipment or installations. Part III is the safety standard for power distribution and transmission circuits. Part IV is a set of objective-based standards that may be used in certain industrial or institutional installations. Part VI establishes standards for the inspection of electrical installation in residential buildings.

2. Code Format

The Code Book is divided into numbered sections, each section covering a main component of electrical work. The general sections of the code book are 0, 2, 4, 6, 8, 10, 12, 14, 16 and 26. All other sections supplement or amend the general section. Rules found in the supplementary section overrule general section rules.

Even numbers have been used to identify sections and rules throughout the code with one exception being 38 which has odd numbered rules within it. The format was used to allow room for further expansion of new rules, as odd numbers.

3. Subdivision of Rules

The first two digits of the rule number represent the section number. Rules are divided as follows:

00-000	Rule
(1)	Subrule
(a)	Item
(i)	Item
(A)	Item

4. Changes to Rules

When a change in a rule has occurred from the previous version of the code book to the exisiting version identified by the delta symbol in the margin "**Δ**". Remember, delta **Δ** means change.

Adapted from https://www.electricalexamprepcanada.com/3-tips-on-using-the-canadian-electrical- code-book/ and https://en.wikipedia.org/wiki/Canadian_Electrical_Code

HANDOUT: Project Schedule Emails (3 pages)
Skill Builder: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: Email is used across the trades to discuss project details, apply for jobs, communicate project status, and even order parts. Being able to scan email quickly and accurately to locate key specifics is an increasingly important part of the job.

Refer to the **Project Schedule Emails** between Sam, the company owner, and Alex and Jane, project managers, to complete the tasks and locate the answers to the questions.

1. Using both emails, complete the calendar on the next page showing all of the tasks mentioned and which project each is associated with.

2. What and when are the tasks that Sam has to complete?

   _____

   _____

   _____

3. Sam needs to schedule a trip to Moose Jaw before the end of the month. The trip needs to be 3 consecutive days and the team there doesn't work weekends. When is the first available day that the trip can start?

   _____

May

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Project Schedule Emails

Email 1:

From: Alex Water
<alex@samsco.com> Sent:
Thursday, May 6
Subject: Green Street update

Hi Sam,
Architect meeting confirmed for this Monday to review. I can handle it but you need to be in our office the next day to sign agreement. Building permit still on track for end of next week. Crew scheduled to take space the following Wed. Will be good if you were here for usual talk.

Alex

Email 2:

From: Jane Partner
<jane@samsco.com> Sent:
Thursday, May 6
Subject: Uptown Tower update

S:
Work crew orientation was yesterday and full on excavation starts today. Lumber scheduled for Monday 17 but I think it's too soon. Going to push it out 2 weeks. I called Tues and cancelled but they're going to want you to call to confirm that's the 2nd delay. They need the call 7 days minimum before the original delivery.
And, owner of office next door likes our work and wonders if you can stop in and see them when you're on site next Thurs? That's it.
J

HANDOUT: Safety Bulletin: HEO (3 pages)
Skill Builders: Key Words & Phrases

IN THE WORKPLACE: It is the shared responsibility of workers and employers to ensure that workplaces are free from accidents, injuries, illnesses or fatalities. Being aware of specific health risks common in specific occupations, helps catch potential issues before they arise.

Read the **For Workers** page of the safety bulletin written for Heavy Equipment Operators to complete the tasks and locate answers to the questions.

1. Complete the table to connect each possible hazard to a unique action that will minimize the risk and protect your health.

Possible Hazard	Minimize the Risk by…
1. When asbestos is present…	
2. When working with solvents…	
3. Before eating or drinking…	
4. When you see a hazard…	
5. When you don't know how to complete a task…	
6. Consult MSDS to learn about…	

2. Write an example for each type of hazard listed below.

   a) Injection hazards

   _____

   b) Biological hazards

   _____

   c) Exhaust fumes

   _____

3. What are 3 hazards for HEOs specific to working outside?

_____

_____

4. What 4 groups of people share responsibility for preventing accidents and illnesses?

_____

_____

_____

_____

5. What is one thing the worker can do away from the workplace to reduce the spread of illness?

_____

6. Identify 2 types of personal protection equipment (PPE) and when you should use each one.

_____

_____

FOR WORKERS

IHSA.ca
Work Safe for Life

Tasks and possible hazards

All tasks

- **Hazardous materials from industrial worksites** (pulp and paper, refineries, chemical plants, glass plants, factories, cement plants, foundries/smelters, power plants, nuclear plants)
- **Awkward postures and vibration** when mounting or dismounting equipment, **vibration and hazardous noise** while using heavy equipment
- **Asbestos** (could be part of the equipment—in old brake pads—or in building materials)
- **Dust and insulation fibres** on construction sites
- **Bearing greases, lubricants, cleaning solutions, machine and cutting fluids**
- **Solvents, adhesives, and epoxies**
- **Biological hazards** in soil, industrial plants or on equipment
- **West Nile Virus** from mosquito bites
- **Ultraviolet light** from the sun
- **Exhaust fumes** from gas- or diesel-powered equipment
- **Injection hazards** from compressed air or hydraulic hose failure
- **Radio frequency (RF) energy** from base station antennas such as cell towers
- **Hazardous noise** from surrounding construction activities.

Other hoisting devices

- **Extreme temperatures** in cold or hot environments
- **Dust** on construction sites.

How to protect your health

- Ask your supervisor or employer for safe work **instructions** and training.
- Consult industrial clients on site-specific health and safety **procedures.**
- Ask about any hazardous materials or unknown chemicals when **entering** an industrial site for work.
- Ensure proper **ventilation**.
- Wear a proper **respirator** when
  - you suspect asbestos may be a hazard
  - working in dusty atmospheres
  - welding
  - using solvents, adhesives, or other hazardous substances
  - using metalworking fluids (cutting oils).
- Wear gloves, coveralls or welding jackets, or use barrier creams to protect the **skin**.
- Consult material safety data sheets (**MSDSs**) for information about hazardous chemicals used at work, and obey workplace health and safety rules.
- **Never eat, drink, smoke, or chew gum** in areas contaminated with asbestos, lead, or toxic chemicals.
- Wash or wipe **hands** clean before eating, drinking, and smoking, and always clean up and change out of contaminated **clothing** before going home at the end of the shift.
- Wash work clothes **separately** from casual and other family members' clothes.
- **Report** hazards to your employer.

Workers who are without symptoms and who have been exposed to asbestos may participate in a research study at Princess Margaret Hospital by volunteering to be screened for mesothelioma/asbestos.
Phone: 416-340-5686 Fax: 416-340-4964

For more information about health and safety in your job, contact your union or

Infrastructure Health & Safety Association: 1-800-263-5024, www.ihsa.ca
Ontario Ministry of Labour: 1-877-202-0008, www.labour.gov.on.ca
Workplace Safety and Insurance Board: 1-800-387-5540, www.wsib.on.ca

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Labour Management Network

Ref: IHSA. (2014). Occupational Health Risks: Operating Engineers Heavy Equipment Operators. [Poster]. https://www.ihsa.ca/PDFs/Products/Id/W114.pdf

HANDOUT: Starting Your Own Business (4 pages)
Skill Builders: Key Words & Phrases, Skimming, Scanning

IN THE WORKPLACE: For many apprentices, one of the appeals of having a trade is the possibility of someday starting your own business. Being your own boss comes with a lot of freedom but also a great deal of responsibility

Refer to the article **5 Must-Dos For Running Your Own Business** to complete the tasks and locate answers to the questions. Being able to predict content from titles and sub-titles in a document is an effective strategy to make it easier to understand the content and read faster and more efficiently.

1. **Before** reading the article, and just looking at the title, list 4 things you think are most important for starting your own business.

_____

_____

_____

_____

2. **Before** reading the article, review the list of sub-titles below and write one thing you would expect to find included in each section. **Then** read the article and check your predictions to see if they are the same as the information included in the article.

a) Converting Leads to Sales

_____

b) Fire Yourself

_____

c) Calculating Overhead

_____

d) Don't Get Complacent

_____

3. Locate each of the following in the article and write another word (or phrase) that means the same thing.

    a. Overhead _____

    b. Lead _____

    c. Break even _____

    d. Grasp _____

    e. Asset _____

4. What 4 factors need to be included when calculating overhead?

    _____

5. What are 3 examples of administrative components?

    _____

6. What are 4 examples of ways to thank customers for their business?

    _____

    _____

7. Draw a diagram to show the relationships between reputation, good work, and trust.

5 Must-Dos For Running Your Own Business

As a tradesperson, some of the main factors necessary for running a successful business are the same for just about any other type of company: Provide a service your customers cannot do without, and do it so well that yours will be the first name they think of when they have a construction, plumbing, electrical or general repair issue. However, you obviously have a lot of competition out there, so how do you separate yourself? These are just a few of the ways you can build a sustainable business.

Converting Leads to Sales

Most new companies have a goal of breaking even within a year or two, but there is nothing wrong with turning a profit sooner. There are a few strategies that can help you get to that point. For example, provide rewards for customer referrals, or offer discounts to return customers. Offer follow-up services to make sure your customers are still happy with your work. Consider establishing a frequent buyer program to reward loyal customers and keep them coming back.

If you do not have a website, it is time to embrace the Internet and all that it can provide. A well-built site can drive a steady stream of customers to your business. There are several tools – many of them free – that can help you establish an effective online presence that will take very little day-to-day effort on your part. Social media is the word of mouth of the 21st Century.

Fire Yourself

As great a tradesperson as you may be, there is only one of you. If your goal is to build the most successful business you can, that will mean taking on far more jobs than you could ever complete on your own. You will very likely need to fire yourself as a worker and hire yourself as a business manager. You will need a solid grasp of the administrative components of your company, such as personnel, marketing and finances. There is no way you will be able to focus on those areas if you are still making service calls every day.

Calculating Overhead

One of the main stumbling blocks to building a successful business is not having a clear understanding of your costs. If you do not have the most accurate picture possible of the expenses associated with providing your services, you will have an extremely difficult time correctly setting up your pricing structure. You need to take a close look at all of your costs, including labour, equipment (don't forget to take factors such as depreciation of vehicles into consideration), marketing and materials. You also need to have an idea of how many jobs you need to earn in order to start making a profit.

Don't Get Complacent

It is natural for some people to get to a certain level in their business and then lose the drive that got them to that level in the first place. If you want to build the most successful business you can, complacency can never be allowed. Your reputation is your most important asset; you would be shocked at how quickly your business could fail if you allow a lackadaisical attitude to set in and your work begins to suffer as a result. In order to increase profitability, you need to continually improve wherever you can. The stronger your reputation, the more trust you build among your customers. The more trust you build, the more work will come your way. As long as you remain passionate about what you do every day, your chances of success are very good.

Ref: Mascari, T. (September 21, 2015). 5 must-do's for running a successful plumbing business. (Blog post). https://porch.com/pro/blog/2015/09/5-must-dos-for-running-a-successful-plumbing-business/

HANDOUT: Step by Step Instructions: Millwright (3 pages)
Skill Builders: Scanning, Percentages, Decimals & Fractions

IN THE WORKPLACE: Following detailed step by step instructions to build structures or install and operate machinery is part of most tradesperson's work. Errors in sequencing steps or skipping them altogether can result in significant losses to the company in lost time and wasted materials.

Read **Step by Step Instructions** to locate answers to the questions. Write the answers in the space provided.

1. What is the process being described?

   _____

2. Divide the steps of the process into the following 3 phases. Write the step numbers in the spaces:

   a. Safety: _____

   b. Preparation: _____

   c. Procedure: _____

3. Sometimes steps in instructions have sub-steps or multiple parts.

   a. Which steps have sub-steps that must be performed to successfully complete the procedure? List them.

   _____

   _____

   b. How many sub-steps are in Step 10? List them.

   _____

   _____

4. Which steps are performed before the wheel touches the part?

_____

5. Which steps must be completed before setting the grinding depth?

_____

6. What parts are magnetic?

_____

7. Why is some information in steps 1,9, and 14 written in brackets? How is it different from the rest of the instructions?

_____

_____

8. Write the following decimals as percentages and as fractions:

   a. 0.0005 _____

   b. 0.001 _____

   c. 0.0002 _____

9. The measurements given are very precise. Calculate the difference in size between 0.0005" and 0.0001" and show your answer as a fraction.

STEP BY STEP INSTRUCTIONS
GRINDING PROCEDURE FOR METAL STOCK

1. Ensure the proper wheel for the stock is being used (there are different grinding wheels for aluminum, stainless steel, and titanium), the wheel is not defective and is properly dressed for the grinding application.
2. Clean the bed before placing the workpiece onto it. This will prevent interference with the magnetic chuck.
3. Place magnetic parallels around the workpiece to ensure the workpiece does not shift during grinding. Turn the magnetic chuck on to secure the pieces onto the bed.
4. Adjust the bed and saddle position to center the stock below the wheel.
5. Lower the wheel an inch above the workpiece.
6. Take a piece of paper and place it between the wheel and the stock. Move the paper back and forth while simultaneously lowering the wheel until the paper is no longer able to move to zero the z-axis. Zero the z-axis of the workpiece by setting the dial on downfeed handwheel to 0 inches.
7. Lock the table Longitudinal stroke setting block so that there is about an inch of overtravel at each end of the table stroke.
8. Adjust the table position so the wheel sits about an inch to the right of the workpiece.
9. Lower the wheel to the desired depth of grinding (preferably 0.0005”- 0.0001” per pass). There should be a maximum downfeed of 0.001 inch per pass.
10. Ensure the wheel is not in contact with the workpiece before turning the main power on. Press the green button to turn the spindle on and turn the coolant switch on.
11. Grind the stock by making passes left to right along the x-axis.
12. Once the first strip of the workpiece has been sufficiently ground, turn the y-axis handwheel half a turn clockwise.
13. Grind another strip of the workpiece from left to right along the x-axis.
14. Repeat until the workpiece is fully ground, then repeat all the previous steps for the other side (take a piece of paper and place it between the magnetic chuck and stock to protect the finish).
15. When finished, elevate the wheel then clean the machine and the surrounding area.

Ref: Virasak, L. (2019). Chapter 5 Surface Grinding. In Manufacturing processes 4-5. (pp. 133-143). Retrieved from: https://openoregon.pressbooks.pub/manufacturingprocesses45/chapter/chapter-5-surface-grinder/. This work has been adapted. Manufacturing Processes 4-5 by LamNgeun Virasak is licensed under a Creative Commons Attribution 4.0 International License, except where otherwise noted.