



Manitoba Home
Builders' Association

FALL PROTECTION COMPANION APP

Facilitator Guide



Table of Contents

INTRODUCTION	1
Fall Protection Overview	2
Fall Protection Awareness Applications	2
Learning Outcomes	3
Fall Protection Application Usage	4
Introduction Module	5
Learning Outcome.....	5
Content of the Story Comic.....	5
Discussion Questions Following the VR Experience.....	5
Teacher Led Activities (45 Minutes).....	6
Module 1: Use of the Harness	8
Learning Outcome.....	8
Module Content.....	8
Discussion Questions Following the VR Experience.....	8
Teacher Led Activity.....	8
Module 2: Proper Training on Fall Protection	9
Learning Outcomes	9
Module Content.....	9
Discussion Questions Follow the VR Experience	9
Teacher Led Activities Online Research Activity (2 Hours)	9
Module 3: Choose the Right Equipment	12
Learning Outcomes	12
Module Content.....	12
Discussion Questions Following the VR Experience.....	12
Teacher Led Activities (Half Day)	13
Module 4: Proper Fitting of Fall Protection Equipment	14
Learning Outcomes.....	14
Module Content.....	14
Discussion Questions Following the VR Experience.....	14
Teacher Led Activities (1.5 Hours)	14
Module 5: Equipment Inspection Before Use	15
Learning Outcomes	15
Module Content.....	15
Discussion Questions Following the VR Experience.....	15

Teacher Led Activities (30 Minutes).....	15
Module 6: Proper Storage and Maintenance of Fall Protection Equipment.....	16
Learning Outcomes.....	16
Module Content.....	16
Discussion Questions Following the VR Experience.....	16
Teacher Led Activities (30 Minutes).....	16
Module 7: Rescue Plans in Accordance with Legislation.....	17
Learning Outcomes.....	17
Module Content.....	17
Discussion Questions Following the VR Experience.....	17
Teacher Led Activity (30 Minutes)	17

INTRODUCTION

The Manitoba Homebuilders Association (MHBA) proposed the digitalization of four safety courses using virtual reality technology for use in both blended and on-line delivery of training in support of the MHBA's safety training courses. The safety programs will be delivered at and in partnership with the Construction Safety Association of Manitoba (CSAM). The target group or audience includes general laborers, tradespeople, new supervisors and safety trainers working in homebuilders, commercial and the heavy construction industries and transportation. It is the intention of MHBA to share these resources with Construction Safety Association of Manitoba, Work Safely at Manitoba Heavy Construction's Association, RPM Trucking Safety Association at Manitoba Trucking Association and other safety associations who would benefit from these interactive resources.

The workplace safety and health issues to be addressed include: confined space, fall protection, scaffolding and safe use of power tools. Currently these courses are not available using this innovative and engaging approach to teaching safety. The blended/on line virtual reality format will standardize safety training, allow greater access to training in rural and remote locations, increase access for refresher training, improve retention through use of different teaching strategies, provide opportunity for repetition and reduce employees time away from work for training. Virtual reality gives safety associations the means to engage our technology savvy youth. In addition, virtual reality allows participants to experience height and confined space sensations in a safe non-threatening environment before getting into a difficult and uncomfortable situation. Recent changes to legislation will demand increased training in these areas so digitalization of the courses will ensure larger audiences receive certification. This virtual reality experience was developed by a team of experts well versed in adult learning principles and knowledge transfer planning.



According to “Manitoba’s Five-year Plan for Workplace Illness and Injury Prevention” (see the link below), government is committed “to ensuring that safety and health programs reflect workplace realities and meet the evolving needs of both workers and employers. Creating a culture of prevention means further strengthening opportunities for accessible, flexible training; focusing efforts where they’re needed most such as high-hazard industries and workplaces that employ most-at-risk workers; and improving system-wide responsiveness for all stakeholders via distinct, dedicated resources both for enforcement and prevention.”(p.5) Development of these virtual reality safety courses will address the Workplace Illness and Injury Prevention guidelines by giving youth simulated experiences of hazardous situations. When they spot the hazard in real life they will recognize and be more capable of avoiding injury.

- Manitoba’s Five-Year Plan for Workplace Injury and Illness Prevention online PDF link: https://www.gov.mb.ca/labour/safety/pdf/workplace_injury_illness_prevention_web.pdf

Fall Protection Overview

Fall Protection focuses on the daily needs of the employee including information about the different types of fall protection, what personal protective equipment to use, emergency procedures and how to calculate fall clearances. In Manitoba, the workplace safety requirements for fall protection are very strict. Often forgotten is the legal requirement to also ensure an employer includes an Emergency Rescue Plan in the event of a fall.

Training will include 10 virtual reality (VR) case studies as a pre-activity / assessment to the in-class discussion / practical application component. In class, students will be required to review the VR case studies and determine the best assessment for each situation. This in class training will reinforce learning on the Manitoba fall protection requirements and the steps to take in the event of a fall. Participants will receive practical application through knowledge transfer of new skills.

Sharing the VR experiences will reinforce new learning. They will come to class familiar with learning expectations of the fall protection training and will be prepared to share and ask questions. VR involves critical thinking while the classroom experience reinforces new learning as students learn from one another.

Fall Protection Awareness Applications

- iOS:
<https://itunes.apple.com/us/app/mhba-fall-protection/id1279854422>
- Android:
<https://play.google.com/store/apps/details?id=com.BSD.FallProtection>



Learning Outcomes

Upon completion of this awareness course, students will be able to:

- Explain why fall protection is important on the construction site
- Explain the use of the harness and the importance of wearing the harness properly
- Differentiate between awareness and a recognized safety course for fall protection
- Identify where to take fall protection training
- Know what type of fall protection equipment works in different situations
- Demonstrate the proper fitting or explain how to properly fit fall protection equipment
- Inspect fall protection equipment
- Identify and report defective fall protection equipment
- Explain how to properly store and maintain fall protection equipment
- Explain the procedures to follow when an incident occurs and a person falls

Workplace Safety and Health Issue to be addressed in Fall Protection.

Falls are among the most common causes of serious work-related injuries and deaths.

Who Needs Fall Protection Training?

Any individual who is required to working at a height of more than 3 metres, including but not limited to the following industries:

- Construction
- Manufacturing
- Oil and Gas
- Painters
- Commercial Window Washers
- Electrical Workers
- Forestry
- Cities and Townships

Fall Protection Application Usage

The application is intended to be used in 2 ways:

1. In Classroom Training

Deployed to students in the class room using either the student's own smart phone or supplied devices

2. Offsite Training

Using loaned devices or the student's own device.

Once launched the smart phone should be placed inside a Google Cardboard capable viewer. The application does not work without a virtual reality display.

Virtual Reality may cause dizziness for approximately 30% of students. It is advised the facilitator takes time to discuss each module to allow for a break between each VR experience. In addition, the discussion time will allow for reflection and application of new learning. Guiding questions are provided for each module.

Introduction Module

Learning Outcome

Students will be able to:

- Explain why fall protection is important on the construction site.

Content of the Story Comic

Tom (Supervisor)	<i>"Bill, once again you are not tying off."</i>	
	<i>"I've been doing this 35 years, why should I start tying off now."</i>	Bill (Worker)
Tom (Supervisor)	<i>"Is your wife willing to put you in a coffin at an early age"</i>	
	(walks away shaking his head)	Bill (Worker)
<u>2 weeks later:</u>		
The worker falls 22 ft. and lives. He had a concussion, broken clavicle and broken arm.		
	<i>"Tom, I have to tell you, these life changing moments have sure made a difference in the way I look at safety. "</i>	Bill (Worker)

Lesson:

If your harness chest strap is too high it will choke you and if it is too low it can break your ribs.

Discussion Questions Following the VR Experience

- Have you or anyone you know had an incident relating to a fall on a construction site? What happened? Did the individual learn from the experience?
- Have you ever changed a behavior after you learned something new about the dangers associated with it?
(Example: lawn mower, turn off before clearing grass, ladder precautions)
- How might this resource help workers on the construction site?

Teacher Led Activities (45 Minutes)

A. Watch the Fake Jobs Real Hidden Camera Interviews (31 seconds)

Link:

<https://www.safemanitoba.com/Topics/Pages/New-Workers.aspx>

Have you ever dismissed a near miss safety incident or a minor injury?

Identify a moment in your life that you learned an important life lesson. What was the incident that could have resulted in a serious injury? Did you take a risk that could have changed your life if an incident had occurred? Were you advised by a supervisor/adult not to do something, as Bill was in this situation?

In groups, share your life experience and the lessons you learned from it. On a flipchart, make a list of recommendations/life lessons you would make to a new construction entrant. Share the results with the large group.

B. Handout - Reading Activity:

Workers Compensation Board of Manitoba Community Initiatives Grant Program Young Worker Responses to Workplace Hazards Final Report April 17, 2008 to August 20, 2010

Link:

https://www.safemanitoba.com/Page%20Related%20Documents/resources/microsoft_word_young_workers_responses_to_workplace_hazards_draft_final_sept_3_2010.pdf

Research Recommendations:

Based on the results of this research, we propose several recommendations related to the content of young worker occupational safety campaigns, safety management, evaluation of injury prevention interventions, and young worker research in Manitoba.

Young worker safety campaigns:

- The results show that in the context of starting a new job, a time when it is important for young workers to engage in safe work practices because they are more likely to be hurt, young workers who are injured or have safety concerns prefer to take a wait-and-see or adaptive approach rather than ask questions or voice concerns. Further, we found that young workers are reluctant to raise safety concerns with supervisors, managers, and sometimes in front of their coworkers. Thus, we recommend that media and school-based campaigns that seek to raise awareness about young worker safety should be explicit about barriers to voice (e.g., fear of job loss) and propose practical ways of voicing in the face of fear (e.g., coalition building). Relatedly, voice should be portrayed both as an individual and collective act in campaigns.
- Campaigns should be broadened to target supervisors and managers and inform them about teenage workers reluctance about speaking up about safety issues. Line and upper management need to be aware of the impact of their perceived openness to hearing about safety concerns and the negative consequences of subtle forms of resistance to voice (e.g., embarrassing a young worker who raises a safety concern).
- Young worker safety awareness campaigns should also encourage speaking up about seemingly minor issues (i.e., close calls), which research shows are associated with major injuries (e.g., Alamgir, Yu, 32 Gorman, Ngan & Guzman, 2009). We found that young workers tend to take a wait-and-see approach in the face of dangerous work.
- In the scenario study, females reported higher voice, higher patience, and lower neglect than males. Although these results were not replicated in the other studies, we recommend considering targeting teenaged males about the potential benefits of voice and problems with neglecting safety.
- Campaigns should highlight the benefits of reporting injuries to employers. Accurate injury reporting can signal to employers (and the WCB) areas in which safety management could be improved. At the same time, young workers also need to be aware of reporting mechanisms.

Would you agree with Tuckers recommendations?

Module 1: Use of the Harness

Learning Outcome

Students will be able to:

- Explain the use of the harness and the importance of wearing the harness properly

Module Content

- Tie off properly
- Empty all pockets
- Anchor point needs to be able to hold 5000 lbs. or 22 kn. Temporary anchor points are used for re-roofing and on commercial sites, wire anchor points need to be grounded
- Anchor points could be I-hooks, wire rope slings, a temporary anchor point (Acti Done on: Ross to get name- like rock climbing hook)
- Anchor points and life lines are to be used by one person at a time
- Required at 3M/10 ft. or over top of dangerous ground or in the path of a wheel barrow and at lower heights.
- Lower heights are when you are exposed to any danger below. This may include water, construction debris, materials such as rebar that can be found below the worker. Then you need to be tied off.
- Do make sure your harness is fitted properly to you.
- If any component of a fall protection or fall restraint system has been engaged (has been used in a fall incident), those components must be taken out of service.

Discussion Questions Following the VR Experience

- What did you learn about the proper use of a harness?
- What will help you to remember how to use a harness properly?

Teacher Led Activity

- A. Invite a construction worker to the class to demonstrate the use of the harness on a construction site. (Contact the Manitoba Construction Sector Council for a speaker if required at info@mbcsc.com)**

Ask the construction worker to:

- Demonstrate the proper use of the harness
- Explain the different types of harness
- Demonstrate how to care for the PPE
- Speak on the personal experience with fall protection, why wear it?
- Give advice to the new entrants

Module 2: Proper Training on Fall Protection

Learning Outcomes

Students will be able to:

- Differentiate between awareness and a recognized safety course for fall protection
- Identify where to take fall protection training

Module Content

- Do need to take an in-depth course. Needs to include: Theory, practical and test.
- On lines courses are considered awareness and is not enough. A practical component is necessary.
- Buyer beware!! Make sure you are taking competent safety training.
- If something happens on the job, you could be taken to court and you will have to prove the training was sufficient and the person doing the training was competent.
- Who is qualified? Where can you take it? Ask your local safety associations
- Retraining after 3 years is recommended

Discussion Questions Follow the VR Experience

- What does a competent safety training course include for fall protection?
- Where can you take fall protection training?

Teacher Led Activities Online Research Activity (2 Hours)

- A. Ask students to locate the Construction Safety Association of Manitoba (CSAM) website. Locate the training course for working from heights. Open the document, Working at Heights Training Program Standards.**

Link:

<http://www.constructionsafety.ca/wp-content/uploads/2017/05/Working-at-Heights-Training-Program-Standard-best-practice.pdf>

Locate the following information in this document:

1. Who approved this training as a standard of best practice in Manitoba?

“SAFE Work Manitoba has approved this training standard as “best practice” for Working at Heights training in the province of Manitoba.” P.4

2. There are two modules in this training program including the Working at Heights Basic Theory Module and the Working at Heights Practical Module. What do these two modules include?

“3.1. Working at Heights Basic Theory Module the Working at Heights Basic Theory module covers the following content:

- a) Rights and responsibilities related to working at heights under the rights and responsibilities for workers and employees;
- b) General hazard recognition for working at heights;
- c) Hierarchy of controls;
- d) Safety procedures for warning methods and physical barriers;
- e) Safety procedures for ladders and similar equipment; and
- f) An introduction to personal fall protection equipment.

3.2. Working at Heights Practical Module the Working at Heights Practical module covers the following content:

- a) Barriers and safety nets;
- b) Personal fall protection equipment;
- c) Anchor points;
- d) Work positioning systems, work access and platforms; and
- e) Rescue planning.” p.6

3. From your research on the CSAM website, what do you think is the difference between an awareness course and a required training program for working at heights?

A required course provides greater detail and is recognized by Workplace Safety and Health as sufficient training for new entrants. Awareness training provides the basics and does not provide sufficient detail to work at heights. Awareness training is to make new entrants aware of the working at heights training courses.

B. Ask Students to locate the Safe Work Manitoba website.

Link:

<https://www.safemanitoba.com/Pages/default.aspx>

1. What is the purpose of Safe Work Manitoba?

Answer: To find safety information, take the guess work out of it, read and share safety information quickly

2. Who is this website designed for?

Answer: Go to the tab....I am...

Worker, manager/supervisor, employer, safety and health professional, safety and health committee or representative

3. Go to the tab “Safety Topics” and to the link “New/Young workers” Locate the document:

Handout: Questions to Ask Employers when starting a new job. List the questions a new entrant should ask an employer.

Link:

https://www.safemanitoba.com/Page%20Related%20Documents/resources/2783_wcb_safe_questions_to_ask_an_employer_when_starting_a_new_job_web.pdf

Module 3: Choose the Right Equipment

Learning Outcomes

Students will be able to:

- Know what type of fall protection equipment works in different situations

Module Content

- What's the difference between fall protection and fall arrest? Fall protection is a preventative measure, an example is a guard rail system and fall arrest is when you have fallen and the system stops you from hitting the ground or landing on something.
- Know what works in each situation based on where you are working and what you are doing. For example, you will want a shock absorption lanyard when it is necessary but it is not always suitable. It depends on the situation.
- Fall Clearance is a mathematical formula that will allow the user to determine whether or not, if they should fall, they will still come in contact with the ground based on the equipment they are using. For example, they may need to go to a shorter lanyard.

Photos:

- a) Rope grabs
- b) Shock absorber,
- c) Retractable strap: - crinkled- Crinkled straps- these straps can stretch over time. Without daily inspection, these straps stretch from 4 to 6 ft.
- d) Retractable strap: packed types: The Pack is safer because it doesn't stretch like the crinkled pack. As soon as it has been deployed it is out of service.
- e) Grommet style- the grommet has pre-drilled holes that can be adjusted to your size but if you are in between the holes they can't be fitted.
- f) Roofers harness/safety kit comes with harness, lanyard, rope in a 5- gallon bucket- low end but meets standards
- g) **Y-lanyard** is a strap used in commercial or industrial jobs to tie off.
- h) **Sling:** (AKA: Dog leash) When you are working in commercial, you can run the sling over a beam and connect to the harness. These are not assigned to a single person. The slings need to be inspected at the beginning of each shift. Any component that does not pass inspection must be removed from service immediately.

Discussion Questions Following the VR Experience

- Explain the difference between fall protection and fall arrest
- What does the roofer's safety kit come with?
- Why is the retractable strap packed type safer?

Teacher Led Activities (Half Day)

A. We think of fall protection training being necessary for roofers working from heights. What other types of falls could happen on a construction site?

- Falls from a height of more than 3 metres (approx. 10 feet); (ladders, scaffolding, mounting or dismounting heavy equipment)
- Falls into operating machinery; (warehouse, maintenance shop)
- Falls into water or another liquid; (a bridge, waterway)
- Falls into or onto a hazardous substance or object; (working below ground)
- Falls through an opening in a work surface. (plywood covering holes on a construction site that are not properly marked)

B. Distribute copies of the Safe Work Manitoba, Fall Protection Brochure.

Link:

https://www.safemanitoba.com/Page%20Related%20Documents/resources/4149_swm_fall_protection_brochure2_0.pdf

Divide students into groups to develop a teaching resource that would make new entrants more aware of fall protection safety. Use the information on the brochure. The brochure includes:

- Fall protection systems
- Quick tips for Fall protection
- Requirements of Workplace Safety and Health

This is a creative exercise to teach awareness of fall protection. Students will develop:

- A musical rap
- A play
- Demonstration
- A powtoon video
- A power point

Student will work on this project a half day to complete this work in class and will complete the activity for homework.

C. Handout: Order and distribute the Young Works Kit from Safe Work Manitoba that provides valuable resources to keep new entrants safe.

Link:

<https://www.safemanitoba.com/Resources/Pages/Make-the-SAFE-Work-Commitment-to-Your-Young-Workers---Kit.aspx>

Module 4: Proper Fitting of Fall Protection Equipment

Learning Outcomes

Students will be able to:

- Demonstrate the proper fitting or explain how to properly fit fall protection equipment

Module Content

- Harnesses are often not fitted properly.
- Video: Students demonstrate Proper and improper fitting examples-do them side by side; nipple height, D-ring centre of shoulder blades if d- ring high hit in head, d-ring low flip out of harness
- Video: 2 finger rule (use Matt's video from PPE)
- Potential injuries from improper fitting: examples: concussion, choking, dislocate spinal cord, sustain lacerations on back of head, MSI's, bite your tongue, cut chin/throat and neck, crack or chip teeth, break ribs, puncture lungs, internal injuries and bleeding, damage reproductive organs, cut tendons, sever arteries, dislocate hip, fracture or dislocate pelvis, car keys/pencil in pocket can be embedded in skin

Discussion Questions Following the VR Experience

- If the d ring is too high what can happen to the person wearing it?
- If the d ring is too low what can happen to the person wearing it?
- What is the 2-finger rule?
- What are potential injuries caused from improper fitting of fall protection equipment?

Teacher Led Activities (1.5 Hours)

- A. Ask students to create a safety poster to encourage safe work practices. Think of a snappy saying that may catch the attention of new entrants. '

This may or may not relate directly to fall protection.

Module 5: Equipment Inspection Before Use

Learning Outcomes

Students will be able to:

- Inspect fall protection equipment
- Identify and report defective fall protection equipment

Module Content

- Inspection checklist on a harness
- If there is paint, stucco or writing on the harness remove it from service
- Wash harness with mild unscented dish soap; can put in washer but it may ruin the machine; don't put in the dryer, hang to dry; heat gun will melt it
- Report any defected fall protection equipment to the superintendent and remove the equipment from service
- Video #3 Students show inspection of equipment
- Do inspect your fall protection/fall arrest at the start of every shift.

Discussion Questions Following the VR Experience

- What kinds of defects are you looking for on fall protection equipment?
- What do you need to do if you locate a defect on the fall protection equipment?

Teacher Led Activities (30 Minutes)

A. Write a letter to your future child to tell them why working safely is important.

Explain what they can do to make sure they return home safely each day from the construction site.

Module 6: Proper Storage and Maintenance of Fall Protection Equipment

Learning Outcomes

Students will be able to:

- Explain how to properly store and maintain fall protection equipment

Module Content

- Do not store in a job box full of tools/equipment/materials
- Do not store in the back of a vehicle
- Do not store around chemicals
- Store all fall protection gear on its own in a gym bag or crate/box
- Best case scenario- hang it on a hook by the d-ring

Discussion Questions Following the VR Experience

- Where should fall protection equipment not be stored?
- Where should the equipment be stored?
- Where do you think is the best place to store the fall protection equipment?

Teacher Led Activities (30 Minutes)

A. What could cause defects to fall protection equipment?

- Improper storage (throwing the equipment in with tools)
- Stains on the straps (paint, glue, mud)
- General wear (catching the equipment on sharp corners etc.)

Make a safety sign to inform employees on how to safely store their PPE.

B. Handout: Fall Protection Tip Card:

Link:

https://www.safemanitoba.com/Page%20Related%20Documents/resources/2726_wcb_safe_fall_protection_tip_card_web.pdf

Module 7: Rescue Plans in Accordance with Legislation

Learning Outcomes

Students will be able to:

- Explain the procedures to follow when an incident occurs and a person falls

Module Content

- Suspension Trauma- A person who falls needs to be rescued within 5 minutes or they will lose consciousness; suspension trauma safety straps attached to the harness releases pressure on the legs until rescue arrives
- Dial 911
- Rescue plans are legislated but if you dial 911 there are only 2 firehalls in the city that have the proper equipment to perform a high angle rescue so they may not get to you. It may take 15 minutes to get there and then the emergency crew has to do a hazard assessment. So, its best if the worksite has a rescue plan in place. It could be something as simple as setting up a ladder or use the safety straps to take the pressure off the arteries.
- If someone falls don't ever grab the person and pull them back up. It will cause more damage. They could have a back or neck injury. It could be as simple as putting up a ladder to take the pressure off the fallen person's legs
- Do not cut the person down and lay them horizontally. This is the worst thing to do as it causes stress to the heart and could cause clots in the body.
- Anyone who has experienced a fall should go immediately to the hospital to be checked out. They may or may not need to attend trauma therapy for PTSD.

Discussion Questions Following the VR Experience

- Names some of the things that you do not do when a person falls.
- Walk me through the steps you would follow from the time you see a person fall.

Teacher Led Activity (30 Minutes)

- A. The student has been hired as a roofer who is required to complete a hazard assessment checklist. The student will identify all the possible hazards that may be faced on the work site.

Students will check off the hazard and describe how the hazard could be controlled on the Hazard Assessment Checklist.

INSPECTION / HAZARD ASSESSMENT CHECKLIST					
Location: _____		Date: _____			
Completed by: _____					
Trade	✓	Trade	✓	Trade	✓
Excavation & Trenching		Foundation, damp proofing & weeping tile		Framing	
Electrical		Insulation		Drywall & Taping	
Finishing flooring		Flooring		Exterior finishes	
Siding		Plumbing & Heating		Cabinets	
Roofing		Soffits, Fascia & Eaves		Painting	
Hazard Rating:		A – Extreme Hazard / B – Moderate Risk / C – Low Risk / D – OK / E – N/A			
Item #	Identified Hazard	HR	Control	Action By	Completed
1	Housekeeping				
2	Access / Egress				
3	Material Storage				
4	WHMIS (chemical/biohazards)				
5	Lighting				
6	Flammables				
7	Electrical Hazards				
8	Confined Space Entry				
9	Ladders				
10	Work at Heights				
11	Scaffolds				
12	Hoisting of Materials				
13	Other Contractors				
<i>Hazard assessments are to be conducted prior to conducting work in a new area or in an unfamiliar way to identify the potential hazards in which employees may be exposed</i>					
Employer		Safety Coordinator		Worker Representative	

Discuss the findings with the large group.

B. The Safe Work tip sheet is an additional resource – handout:

Link:

https://www.safemanitoba.com/Page%20Related%20Documents/resources/2635_wcb_safe_q2_spot_the_hazard_construction_tip_sheet.pdf

