

LIGHTNING SAFETY

IDENTIFY

Lightning causes more fatalities than hail, wind, rain and tornados combined.

The most vulnerable people are workers in industries such as construction, farming, and landscaping that primarily work outdoors amongst conductors such as tools and equipment.

Environment Canada states that lightning strikes cause six to 12 fatalities and 60 to 70 serious injuries per year. Severe burns and other injuries can occur.

This toolbox talk highlights the hazards associated with electrical storms and the safe procedures to create a safe work environment outdoors.

COMMUNICATE AND CONTROL

Pay attention to the weather forecast

Weather conditions can change in an instant. Pay attention to the weather conditions and forecast, prepare for threatening weather conditions, and create a communications plan for workers on site.

Take shelter from the storm

Myth: If it's not raining or there aren't clouds overhead, you're safe from lightning.

Fact: Lightning often strikes more than four kilometres from the centre of the thunderstorm, far outside the rain or thunderstorm cloud. "Bolts from the blue" can strike 16 to 24 kilometres from the thunderstorm.

The safest place to be during a thunderstorm is in a well constructed building that is fully enclosed with a roof, walls, and flooring and contains electrical wiring, plumbing, telephone line, or antennas that can ground the lightning.

If you are nowhere near a building, take shelter in an enclosed metal car, truck, or van (NOT a tractor, golf cart, or topless or soft-top vehicle). Make sure to park your vehicle away from trees or other tall objects that could fall during a storm. When inside a vehicle during a lightning storm, roll up the windows and sit with your hands in your lap — don't touch any part of

the metal frame or any wired device in the vehicle that can conduct electricity (including the steering wheel or a plugged-in cell phone). A direct strike to your car will flow through the frame of the vehicle and usually jump over or through the tires to reach ground.

Myth: If trapped outside and lightning is about to strike, it's best to lie flat on the ground.

Fact: Lying flat increases your chance of being affected by potentially deadly ground current. If you are caught outside in a thunderstorm, keep moving toward a safe shelter.

Work safe

If a thunderstorm is in the forecast, be mindful of your work environment:

- Don't work on or near anything tall or high, including rooftops, scaffolding, utility poles, ladders, trees, and large equipment such as bulldozers, cranes, backhoes, track loaders, and tractors.
- Do not touch or handle any materials or surfaces that can conduct electricity, including metal scaffolding, metal equipment, utility lines, water pipes, and plumbing.

If lightning strikes a worker

Myth: People who have been struck by lightning are "energized."

Fact: Lightning victims are safe to touch.

If someone has been struck by lightning call 911 immediately. Lightning victims are safe to touch. If the victim is not breathing or they do not have a pulse, a trained first-aider should administer cardio-pulmonary resuscitation (CPR) until emergency services arrive.

DEMONSTRATE

Create an emergency preparedness plan for workers on site and introduce them to the safety practices on what to do and where to go during a thunderstorm.

Estimating time and distance

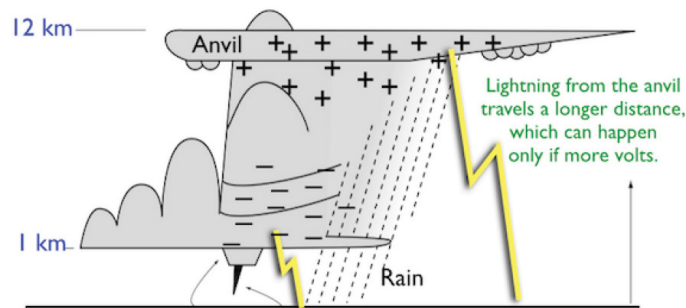
It takes approximately three seconds for the sound of a thunderclap to travel one kilometre.

If thunder is heard...	Lightning is...
3 seconds after a flash	1.0 km away
10 seconds after a flash	3.2 km away
15 seconds after a flash	5.0 km away
20 seconds after a flash	6.4 km away
25 seconds after a flash	8.2 km away
30 seconds after a flash	10 km away

30/30 rule – If the flash-to-bang is less than 30 seconds, seek shelter and wait at least 30 minutes after the last thunder is heard.

Cloud-to-Ground (CG) Lightning

To make a spark in air, you need 3 billion volts / km.



SW In Canada, over 90% of positive CG has single stroke. NE
 Negative CG can have > 10 strokes, but mode is about 2 strokes/flash. 1% of CGs are ≥ 100 kAmps.

THE QUIZ

- If a thunderstorm hits, where can you safely take shelter?
 - Fully enclosed building
 - Metal van, car, or truck
 - a and b
- Lightning can strike anywhere from four to 24 miles from the centre of a thunderstorm:
 TRUE _____ FALSE _____
- If a thunderstorm is in the forecast, do not touch or handle _____.
 - Metal scaffolding
 - Utility lines
 - Water pipes
 - All of the above
- A cell phone is not classified as a conductor of electricity:
 TRUE _____ FALSE _____
- If trapped outside during lightning, what should you do?
 - Lay down on the ground
 - Find cover under bushes or trees
 - Stay still
 - Keep moving toward safe shelter
- Anyone hit by lightning is charged electrically and should not be touched:
 TRUE _____ FALSE _____

1. c; 2. TRUE; 3. d; 4. TRUE; 5. d; 6. FALSE

ANSWERS: