Public

TO: ADMINISTRATIVE AND CORPORATE SERVICES COMMITTEE
JUNE 7, 2004

FROM: DIRECTOR OF EDUCATION

SUBJECT: **GUIDELINES FOR WEATHER CONDITIONS**

Origin:

Arising out of the Administrative and Corporate Services Committee meeting of February 12, 2004. Staff was directed to report back with guidelines for weather conditions.

Executive Summary

In the interest of student health and school performance, the TCDSB is in support of students being outdoors during recesses whenever possible. However, students will remain indoors during inclement weather.

Comments:

1. "It is the duty of a Principal to give assiduous attention to the health and comfort of the pupils." Education Act 265(1)(j)

2. The TCDSB is in support of healthy physical activity for all students. Health Canada's Guide for Physical Activity: Children and Youth, recommends 90 minutes of physical activity per day. In addition, school performance, time on task, creativity and productivity improve through increased physical activity. To that end, students should be outdoors during recess periods whenever possible.

3. Students will remain indoors in the event of rain.

4. Students will remain indoors based on the possibility of severe thunderstorms or lightning in the area of the school.

5. Students will remain indoors when the temperature, or the temperature in conjunction with the wind speed, creates a wind chill factor that could possibly lead to frostbite (Appendix A).

6. In the event that the condition of the schoolyard, as a result of the weather, might pose a safety hazard, the students will remain indoors.

Conclusion:

This report is presented for the information of the Board.

B. Johnson
Superintendent of Education,
Curriculum and Accountability

J. E. Guyatt
Deputy Director, Business Services

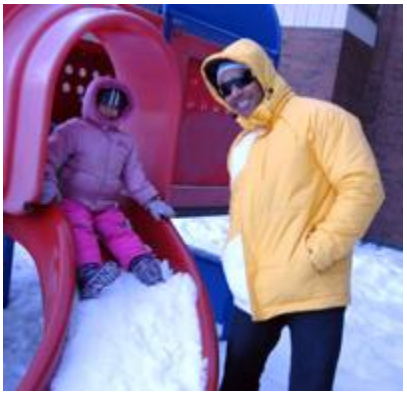
Tom Donovan
Director of Education

Wind Chill - The chilling facts

PDF; 882 KB

Canada's Wind Chill Index

Canada's wind chill index is accurate, easy to understand and reflects the needs of Canadians. It is based on research using human volunteers and advanced computer technology, combined with recent medical advances in the understanding of how the body loses heat when exposed to cold. As a result, the wind chill observations and forecasts that you hear are now much more representative of what you actually feel.

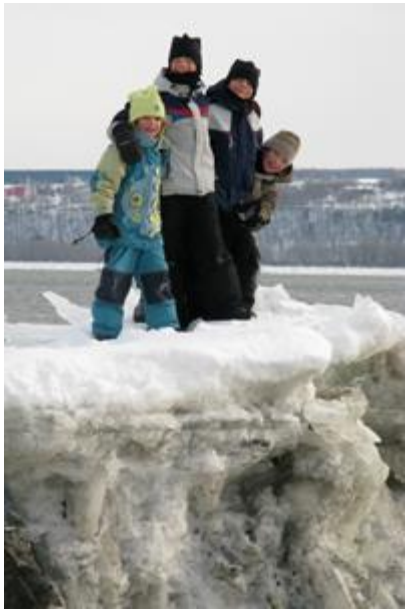


The index is expressed in temperature-like units, the format preferred by most Canadians. By equating the outdoor conditions to an equivalent temperature with no wind, the index represents the degree of "chill" that your skin senses. For example, if the wind chill is -20 while the outside temperature is only -10ºC, it means that your face will feel as cold as if it was a calm day (no wind) with a temperature of -20ºC.

The wind chill index enables Canadians to take action to avoid injuries from the cold. This includes dressing warmly to avoid frostbite and hypothermia, and making informed decisions based on accurate wind chill information, such as whether it is safe for children to play outdoors.

On cold and blustery winter days, listen for the wind chill index in your local weather forecast! Go to Canada.ca/weather.

What is Wind Chill?



Anyone who has ever waited at a bus stop or taken a walk on a blustery winter day knows that you feel colder when the wind blows. We call the cooling sensation that is caused by the combined effect of temperature and wind, the wind chill.

On a calm day, our bodies insulate us somewhat from the outside temperature by warming up a thin layer of air close to our skin, known as the boundary layer. When the wind blows, it takes this protective layer away, exposing our skin to the outside air. It takes energy for our bodies to warm up a new layer and, if each layer keeps getting blown away, our skin temperature will drop and we will feel colder.

Wind also makes you feel colder by evaporating any moisture on your skin - a process that draws more heat away from your body. Studies show that when your skin is wet, it loses heat much faster than when it is dry.

How Does Wind Chill Affect You?

Photo © istock.com, 2008.

Living in a cold country can be hazardous to your health. Each year in Canada, more than 80 people die from over-exposure to the cold, and many more suffer injuries resulting from hypothermia and frostbite. Wind chill can play a major role in such health hazards because it speeds up the rate at which your body loses heat.

How much heat you lose depends not only on the cooling effects of the cold and the wind chill, but on other factors as well. Good quality clothing with high insulating properties traps air, creating a thicker boundary layer around the body which keeps in the heat. Wet clothing and footwear lose their insulating properties, resulting in body heat loss nearly equal to that of exposed skin. Your body type also determines how quickly you lose heat: people with a tall, slim build become cold much faster than those who are shorter and heavier.

In addition, we can also gain heat by increasing our metabolism or soaking up the sun. Physical activity, such as walking or skiing, increases our metabolism - which generates more body heat. Age and physical condition also play a part. Elderly people and children have less muscle mass and, as a result, generate less body heat. Sunshine, even on a cold winter day, can also make a difference. Bright sunshine can make you feel as much as 10ºC warmer.

Over time, our bodies can also adapt to the cold. People who live in a cold climate are often able to withstand cold better than those from warmer climates.

Beating The Chill

Photo © Environment Canada, 2008.

The best way to avoid the hazards of wind chill is to check the weather forecast before going outside and to be prepared by dressing warmly. As a guideline, keep in mind that the risk of frostbite increases rapidly when wind chill values go below -27.

A simple way to avoid wind chill is to get out of the wind. Environment Canada's wind chill forecasts are based on the wind you would experience on open ground. Taking shelter from the wind can reduce or even eliminate the wind chill factor. However, you would still feel cold from the outside temperature alone.

A recent survey indicated that 82% of Canadians use wind chill information to decide how to dress before going outside in the winter. Many groups and organizations use the wind chill index to regulate their outdoor activities. Schools use wind chill information to decide whether it is safe for children to go outdoors at recess. Hockey clubs cancel outdoor practices when the wind chill is too cold. People who work outside for a living, such as construction workers and ski-lift operators, are required to take indoor breaks to warm up when the wind chill is very cold.

Seven Steps to Cold Weather Safety

1. Listen to the weather forecast

- Check the Environment Canada weather forecast before going out in the winter.
- Listen for an extreme cold warning. These warnings, based on local climate conditions, are issued when significant cold temperatures or wind chills are expected to occur.

Environment Canada's weather forecasts are available through radio and TV broadcasts, Environment Canada's Weatheradio network, and online at: www.Canada.ca/weather.

2. Plan ahead

- Develop a cold weather safety plan in advance to ensure that you address safety concerns when it is very cold or when the wind chill is significant.

(For example, schools could hold recess indoors, outside workers could schedule warm-up breaks and those involved in winter recreation could reduce the amount of time they spend outdoors.)

3. Dress warmly

- Dress in layers with a wind-resistant outer layer.
- When it is cold, wear a hat (we lose a large portion of our body heat from the head), mittens or insulated gloves and something to keep your face warm, such as a scarf, neck tube or face mask.
- Wear warm and waterproof footwear.
- When it is very cold, or when the wind chill is significant, cover as much exposed skin as possible. Your body's extremities, such as the ears, nose, fingers and toes, lose heat the fastest.

4. Seek shelter

- When the wind chill is significant, get out of the wind and limit the time you spend outside.

5. Stay dry

- Wet clothing chills the body rapidly.
- Remove outer layers of clothing or open your coat if you are sweating.

6. Keep active

- Walking or running will help warm you by generating body heat.

7. Be aware

- Watch for signs of frostnip, frostbite and hypothermia.
- Some people are more susceptible to the cold - particularly children, the elderly and those with circulation problems.
- The use of alcohol, tobacco and certain medications will increase your susceptibility to cold.

Cold Injuries

Exposure to the cold can be hazardous or even life-threatening. Your body's extremities, such as the ears, nose, fingers and toes, lose heat the fastest. Exposed skin may freeze, causing frostnip or frostbite. In extreme conditions or after prolonged exposure to the cold, the body core can also lose heat, resulting in hypothermia.

Hypothermia

- Being cold over a prolonged period of time can cause a drop in body temperature (below the normal 37ºC).
- Shivering, confusion and loss of muscular control (e.g., difficulty walking) can occur.
- Can progress to a life-threatening condition where shivering stops or the person loses consciousness. Cardiac arrest may occur.

What to do:

- Get medical attention immediately.
- Lay the person down and avoid rough handling, particularly if the person is unconscious.
- Get the person indoors.
- Gently remove wet clothing.
- Warm the person gradually and slowly, using available sources of heat.

Frostnip

- A mild form of frostbite, where only the skin freezes.
- Skin appears yellowish or white, but feels soft to the touch.
- Painful tingling or burning sensation.

What to do:

- Do **not** rub or massage the area.
- Warm the area gradually - use body heat (a warm hand) or warm water. Avoid direct heat which can burn the skin.
- Once the affected area is warm, do not re-expose it to the cold.

Frostbite

- A more severe condition, where both the skin and the underlying tissue (fat, muscle, bone) are frozen.
- Skin appears white and waxy and is hard to the touch.
- No sensation - the area is numb.

What to do:

- Frostbite can be serious, and can result in amputation. Get medical help!
- Do not rub or massage the area.
- Do not warm the area until you can ensure it will stay warm.
- Warm the area gradually - use body heat, or warm water (40 to 42ºC). Avoid direct heat which can burn the skin.

Try this!

Turn on a fan. Stand in front of it. You will feel colder because of the wind cooling your skin, but the temperature in the room has not changed. You cannot make the room any colder, no matter how high you turn up the fan. Similarly, no matter how strong the wind blows, the temperature of the air outside does not change. Now dab some water on your skin. Stand in front of the fan again. The wet skin will feel much colder. This demonstrates how important it is to stay dry when outdoors in cold and windy conditions.

Canada's Role in Developing the Wind Chill Index

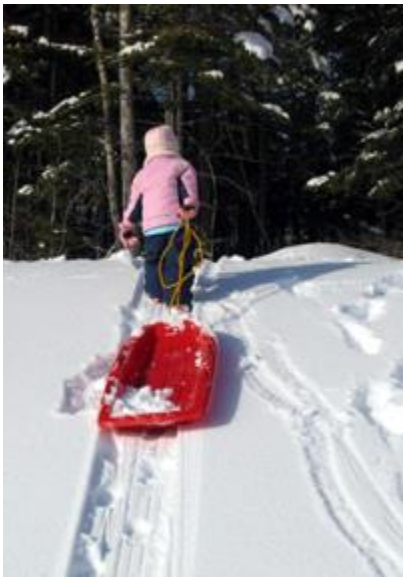


Photo: © Environment Canada, 2008.

Canada took the lead to promote an international standard for wind chill. In April 2000, Environment Canada held the first global Internet workshop on wind chill, with more than 400 participants from 35 countries. Almost all participants agreed on the need for an international standard for measuring and reporting wind chill.During 2001, a team of scientists and medical experts from Canada and the U.S. worked together to develop the current wind chill index. The research agency of the Canadian Department of National Defence, with its knowledge of how troops are affected by cold weather, contributed to the effort by conducting experiments using human volunteers.The wind chill index is based on the loss of heat from the face - the part of the body that is most exposed to severe winter weather. Volunteers were exposed to a variety of temperatures and wind speeds inside a refrigerated wind tunnel. They were dressed in winter clothing, with only their faces exposed directly to the cold. To simulate other factors affecting heat loss, they also walked on treadmills and were tested with both dry and wet faces.To ensure that the wind chill index met the needs of Canadians, Environment Canada conducted public surveys across the country. The current index is expressed in temperature-like units because it is the format that was preferred by most Canadians.However, since the wind chill index is not actually a real temperature but, rather, represents the feeling of cold on your skin, it is reported without the degree sign. For example, "Today the temperature is -10ºC and the wind chill is -20."The same index is also used in the U.S. to ensure that travellers hear consistent information in both countries (although the U.S. index is provided on a Fahrenheit scale).

Where is the coldest wind chill in Canada?

Wind chills below -70 have been recorded in northern communities in Canada. On January 13, 1975, at Kugaaruk, Nunavut, the air temperature was -51ºC and the winds were 56 km/h, producing a bone-chilling wind chill of -78.

Wind Chill Hazards

Wind Chill Hazards and What To Do

Wind Chill	Exposure Risk	Health Concerns	What to Do
0 to -9	**Low Risk**	• Slight increase in discomfort	• Dress warmly • Stay dry
-10 to -27	**Moderate Risk**	• Uncomfortable • Risk of hypothermia and frostbite if outside for long periods without adequate protection.	• Dress in layers of warm clothing, with an outer layer that is wind-resistant. • Wear a hat, mittens or insulated gloves, a scarf and insulated, waterproof footwear. • Stay dry. • Keep active
-28 to -39	**High Risk**: exposed skin can freeze in 10 to 30 minutes	• High risk of frostnip or frostbite: Check face and extremities for numbness or whiteness. • High risk of hypothermia if outside for long periods without adequate clothing or shelter from wind and cold.	• Dress in layers of warm clothing, with an outer layer that is wind-resistant • Cover exposed skin • Wear a hat, mittens or insulated gloves, a scarf, neck tube or face mask and insulated, waterproof footwear • Stay dry • Keep active
-40 to -47	**Very High risk**: exposed skin can freeze in 5 to 10 minutes[Footnote 1]	• Very high risk of frostbite: Check face and extremities for numbness or whiteness. • Very high risk of hypothermia if outside for long periods without adequate clothing or shelter from wind and cold.	• Dress in layers of warm clothing, with an outer layer that is wind-resistant. • Cover all exposed skin. • Wear a hat, mittens or insulated gloves, a scarf, neck tube or face mask and insulated, waterproof footwear.

Wind Chill Hazards and What To Do

Wind Chill	Exposure Risk	Health Concerns	What to Do
			• Stay dry • Keep active.
-48 to -54	**Severe risk**: exposed skin can freeze in 2 to 5 minutes[Footnote 1]	• Severe risk of frostbite: Check face and extremities frequently for numbness or whiteness. • Severe risk of hypothermia if outside for long periods without adequate clothing or shelter from wind and cold.	• Be careful. Dress very warmly in layers of clothing, with an outer layer that is wind-resistant. • **Cover all exposed skin** • Wear a hat, mittens or insulated gloves, a scarf, neck tube or face mask and insulated, waterproof footwear. • **Be ready to cut short or cancel outdoor activities**. • Stay dry. • Keep active.
-55 and colder	**Extreme risk**: exposed skin can freeze in less than 2 minutes[Footnote 1]	• **DANGER!** Outdoor conditions are **hazardous.**	• **Stay indoors**.

Footnotes

Footnote 1

In sustained winds over 50 km/h, frostbite can occur faster than indicated.

Return to footnote 1

How to Estimate Wind Chill Values

1. Estimate the wind speed outside by observing the movement of trees and flags, using the guide provided in the table below.
2. Once you have estimated the wind speed and you know the temperature outside, you can estimate the wind chill by referring to the numerical chart below.

Wind Chill Index

Wind speed (km/h)	Estimating wind speed - what to look for	Temperature (°C)												
		0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50		
10	Wind felt on face - wind vane begins to move	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63		
20	Small flags extended	-5	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68		
30	Wind raises loose paper, large flags flap and small tree branches move	-6	-13	-20	-26	-33	-39	-45	-52	-59	-65	-72		
40	Small trees begin to sway and large flags extend and flap strongly	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74		
50	Large branches of trees move, telephone wires whistle and it is hard to use an umbrella	-8	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76		
60	Trees bend and walking against the wind is hard	-9	-16	-23	-30	-36	-43	-50	-57	-64	-71	-78		

Weather forecasts: Canada.ca/weather

Date Modified: 2015-09-11