# Activity Booklet

For students aged 12-13

# Be ready, be safe.

Expect THE UNEXPECTED™

Canadian Red Cross

Canadian Red Cross



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Ce programme est également publié en français.

# Be ready, be safe.

The Canadian Red Cross plays an essential role in emergencies. It provides numerous services to people affected by disasters in order to fulfill part of their essential needs such as shelter, clothing and food. It also provides personal services for moral support and first aid. During evacuations, it is often responsible for registering and informing evacuees.

To be prepared to act safely in emergencies, the Red Cross suggests you carry out the activities in this brochure with your educator. Remember that activities identified by this symbol can be completed with your family. They are combined in a special booklet intended for parents, which is available on the Red Cross Web site at: www.redcross.ca/expecttheunexpected. Come visit us with your family!

Enjoy the activities!

This activity booklet belongs to:

_____

Expect THE UNEXPECTED

Canadian Red Cross

# The seven Fundamental Principles of the Red Cross

**Objective of the activity:** This activity will help you become familiar with the seven Fundamental Principles of the Red Cross.

Humanitarian assistance must take place while respecting the persons affected by disasters and preserving their dignity. The application of the seven principles of the Red Cross achieves this objective.

**Situation 1**

**1.** You are walking down the street and while turning a corner you realize an accident has just happened. A car hit a pedestrian. Three people seem to be affected by the accident:

- An elegant young woman is in tears on the sidewalk, holding a baby who is agitated and screaming. She speaks a foreign language.
- An older man is really angry. His arm is bleeding.
- A young vagrant is lying on the ground, unconscious.

On which principle would a Red Cross first aid worker base his action to screen the needs appropriately?

**Situation 2**

**2.** In your school, the student association that fights for human rights is organizing a demonstration in the local streets to protest against the actions of the Israeli government towards Palestinians. You bring together as many youth as possible and you join the crowd bearing Red Cross flags.

Which Red Cross principle did you disregard?

# To know more about natural disasters

**Objective of the activity**
This activity will allow you to know what type of natural disasters could occur in Canada and across the world.

## General information

There are two types of disasters: natural disasters and those accidentally caused by human beings.

There are two types of natural disasters:

- Weather or climate-related disasters: storm (freezing rain, rainstorm, hurricane and tornado), heat or cold wave, drought, flood.
- Geological disasters: earthquake, landslide and tsunami.

There are many types of disasters caused by human activity as well, including:

- Biological disasters: epidemic, infestation.
- Industrial or environmental accidents: fire, explosion, transportation accident (in the air, on earth or at sea), pollution, failure of civil engineering structures, etc.
- Armed conflicts: terrorism, civil war.

## Natural disasters

According to the World Health Organization (WHO), a natural disaster is "a spontaneous phenomenon whose scope is such as to create a disastrous situation by suddenly interrupting daily activities; by rendering people helpless and causing distress, [where] the population may find itself without any food, clothing and shelter, void of any necessities, medical or nursing care, and helpless against the adverse factors and conditions of the environment."

Reference: Assan, M. (1971). ***Decontamination Guide in Case of a Natural Disaster.*** World Health Organization.

## Earthquakes

**Definition**
Earthquakes or seismic events are sudden movements of the Earth's crust. The tremors generally occur suddenly and leave very little time to react; however, major earthquakes are often preceded by weaker tremors.

**Some statistics**

In the twentieth century alone, more than one million people have died because of earthquakes. In Canada, this natural disaster is not considered a major threat, except in British Columbia.

Each year, however, more than a dozen earthquakes are felt in Canada and nearly 1,500 others of lesser intensity are recorded by the instruments of an organization called the Geological Survey of Canada.

In Canada, only one earthquake, in the Atlantic Ocean south of Newfoundland in 1929, was fatal. It caused a tsunami (an enormous tidal wave) that carried away 27 individuals. Fortunately, no other strong earthquake has struck other populated regions, which greatly accounts for the low number of victims and material damage.

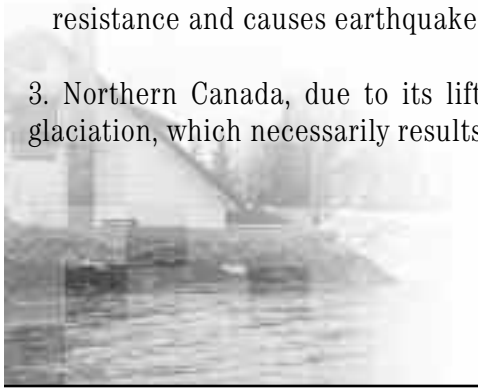
**Canada and earthquakes**

Canada is not beyond earthquakes. Three regions are especially subject to this type of natural disaster:

1. Western Canada: British Columbia and the Yukon. The structure of the Earth's crust is weaker in the Pacific Ocean.

2. Southeastern Canada: the Atlantic coast, the St. Lawrence Valley and the Ottawa Valley. In these areas, the Earth's crust may be weaker or it can move a few centimetres each year, which creates resistance and causes earthquakes.

3. Northern Canada, due to its lifting since the last glaciation, which necessarily results in earthquakes.



## Strength of earthquakes

**What is the Richter scale?**

Seismologists use the Richter scale to measure the energy produced by an earthquake.

Each earthquake has its own magnitude but the consequences vary according to the distance from the epicentre, the types of soil and the types of construction. Earthquakes registering 9.0 and above are exceptional. There roughly two of them per century. The strongest quake ever registered occurred in Chile on May 22, 1960. It reached 9.5 on the Richter scale.

### Earthquake severity

| Richter scale | Earthquake consequences |
|---|---|
| Less than 3.5 | Tremors registered but generally not felt. |
| 3.5 to 5.4 | Tremors often felt but with little damage. |
| 5.5 to 6.0 | Light damage to buildings. |
| 6.1 to 6.9 | Possibility of building destruction. |
| 7.0 to 7.9 | Major earthquake and serious damage. |
| 8.0 to 8.9 | Major earthquake and total destruction of towns. |
| 9.0 and above | Catastrophic damage. |

Reference: Emergency Preparedness Canada and *Canadian Geographic* (1996). **National Atlas of Canada: Natural Disasters.** Emergency Preparedness Canada and *Canadian Geographic*. (Theme map)

## Tornadoes

**Definition**
Tornadoes are funnel-shaped whirlwinds that point toward the ground. This type of phenomenon can uproot trees, turn cars over and tear the roofs off houses.

**Some statistics**
Three major tornadoes have occurred in Canada. A tornado in Regina in 1912 caused 28 deaths, injured 200 persons, left 2,500 individuals homeless and destroyed 500 buildings. One in Edmonton in 1987 caused 27 deaths, injured 600 individuals, left 1,700 persons homeless and caused $300 million in damages. Another at Pine Lake, Alberta, in 2000 caused 12 deaths and injured 140 persons. Four hundred individuals were displaced and 1,200 were affected by the tornado.

**Canada and tornadoes**
Tornadoes usually move toward the east or northeast. The Canadian regions that are most subject to them are the Prairies, southeastern Ontario and sometimes southern Quebec.

Tornadoes can occur at any time of the year, especially between April and September. Hot and humid summer days are most favorable to tornadoes, especially at the end of the day.

## Tornado force

**What is the Fujita scale?**
It is the scale used to measure the strength of a tornado. We use this scale that rates from F-0 to F-5 to determine the strength of the disaster. Canada has never had F-5 tornadoes.

The strength of tornadoes that have occurred in Canada is as follows:
- 45 % were F-0
- 29 % were F-1
- 21 % were F-2
- 4 % were F-3
- 1 % were F-4

| Intensity | F-0 | F-1 | F-2 | F-3 | F-4 | F-5 |
|---|---|---|---|---|---|---|
| **Wind speed** (km/h) | 64 to 116 | 117 to 180 | 181 to 253 | 254 to 331 | 332 to 418 | 419 to 512 |
| **Damage** | light | moderate | considerate | serious | catastrophic | unimaginable |

Reference: Emergency Preparedness Canada and *Canadian Geographic* (1996). **National Atlas of Canada: Natural Disasters.** Emergency Preparedness Canada and *Canadian Geographic*. (Theme map)

## Hurricanes

**Definition**
Hurricanes are huge tropical storms that can cause great damage. They are also called “tropical cyclones” or “typhoons”. Violent winds and heavy rains accompany them.

**Some statistics**
In Canada over the past 110 years, only three category 3 hurricanes touched ground. The most deadly hurricane in Canadian history occurred in September 1775. It caused 4,000 deaths on the coast of Newfoundland.

**Canada and hurricanes**
In North America, the hurricane season extends from June to November. The Atlantic Provinces are most commonly affected by hurricanes.

Fortunately, a majority of the hurricanes that approach Canada diminish in intensity. The cold waters that surround Canada cause hurricanes to lose much of their strength.

**The strength of hurricanes**
**What is the Saffir-Simpson scale?**

It is the scale that allows public safety authorities to evaluate the possible damage a hurricane may cause. Category 1 hurricanes are not very dangerous, while category 5 hurricanes cause extreme devastation.

| Category | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| **Wind speed** (km/h) | 118 to 153 | 154 to 177 | 178 to 210 | 211 to 249 | more than 250 |
| **Description** | weak | moderate | strong | very strong | devastating |

Reference: Environment Canada, Canadian Hurricane Centre, http://www.ns.ec.gc.ca/weather/hurricane/index_e.html.

## Floods

**Definition**
Floods are the overflowing of watercourses or water stretches caused by an excessive rise in the water level. The rise varies according to the climate, precipitation, temperature, wind, sun, thickness of the snow cover, shape and composition of the water catchment basin (topography, geology, pedology, vegetation) and the action of human beings (urban development, agricultural practices, lumbering).

The rise in water level can be caused by strong precipitation in the summer that varies according to rainfall intensity, its duration and the area it covers. It is linked to storms, cyclone depression and hurricanes. The rise may also be caused by the sudden thawing of the snow cover in the spring, ice jams or ice breakups, resulting from heavy rainfalls and mild weather.

**Some statistics**
In Canada, two floods have caused major damage:

• One in the Saguenay region in 1996, where between 150 and 280 mm of rain fell within 48 hours on the Saguenay–Lac-Saint-Jean region. Over 16,000 persons were evacuated from their homes, 3,135 houses were destroyed or damaged. This disaster caused nearly $1 billion in material damage.

• One in Manitoba in the spring of 1997. This flood was caused by heavy precipitation combined with a late and sudden spring thaw. The Red River overflowed to form a lake of about 40 km by 100 km. The authorities had to evacuate 24,000 people. The damage was estimated at $750 million.

**Canada and floods**
Floods occur everywhere in Canada because the country is made up of highly branched hydrographic networks.

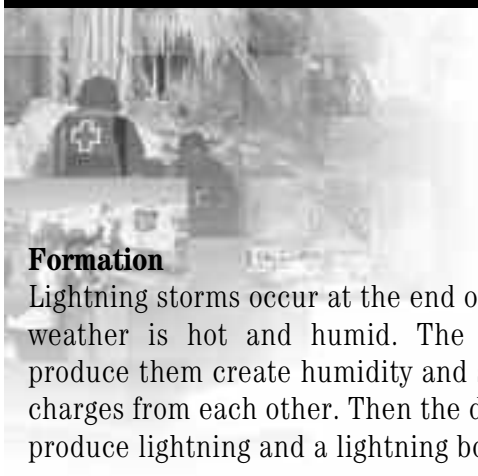
**Protection measures**
Over the years, the number of floods seems to be increasing and the damage caused by them is of high concern. This increase in damage is mainly linked to residential and industrial development in areas subject to flooding.

To reduce damage, dams have been built to control the rise in water levels, dikes have been built to reduce flood-prone areas and canals have been built to divert the flow of water. Since the beginning of the 1980s, one means of prevention has been favoured: occupation bylaws, that is, zoning the flood plains. There are two types of zoning: strong current areas and weak current areas.

The strong current area extends from the shoreline to the water rise level. This will statistically occur once every 20 years, and its annual probability is 5 %. In this area, construction should be prohibited. The weak current area extends from the upper limit of the strong current area to the limit where the water has a probability of rising once in 100 years. Statistically, this represents a probability of 1 %.

## Lightning storms

**Definition**
A lightning storm occurs when an electrical discharge (lightning bolt) is followed by a lightning flash and thunder. The lightning bolt can shatter windows, start fires, cause power failures and explosions if it is close to combustible material. It may be dangerous for people as it can cause severe burns and electrocution.



**Formation**
Lightning storms occur at the end of the day when the weather is hot and humid. The air currents that produce them create humidity and separate electrical charges from each other. Then the discharge occurs to produce lightning and a lightning bolt.

**Intensity**
Lightning bolts have a very high energy level. When they strike a tree, the electrical current reaches the water in the wood and transforms it into steam, thereby causing the tree to shatter.

The electrical discharge can reach up to 100 million volts and a temperature of 30,000 ˚C.

**Measuring the storm's distance**
Since light travels about one million times faster than sound, we see a lightning flash before we hear thunder during a lightning storm.

You may calculate how far away you are from the lightning bolt by simply counting the number of seconds between the moment you see the lightning flash and the moment you hear thunder. By dividing that number by 3, you get the distance in kilometres.

**1.** Select a natural disaster (earthquake, hurricane, tornado or flood) and then answer the following questions:

Natural disaster chosen: _____

a) Define in your own words the natural disaster you have chosen and summarize its characteristics.

b) List the places, seasons or times of the day that this type of disaster is most likely to occur.

c) Explain the possible causes of that type of disaster.

d) Describe the most important emergency caused by this type of disaster.

e) If applicable, state the units of measure or the instrument that is used to calculate the intensity of the disaster you have chosen.

**2.** Describe a lightning storm in 15 lines by using the information from the text.

# What is an earthquake?

**Objective of the activity:** This activity will help you understand an earthquake as a natural phenomenon.

The structure of the Earth can be compared to that of an egg. The egg's shell is like the Earth's lithosphere: the shell's depth relative to the whole egg is about the same as the lithosphere's depth relative to the whole Earth. The asthenosphere of the mantle corresponds to the egg's membrane. The egg's white layer corresponds to the remainder of the mantle. The yolk of the egg is similar to the Earth's core.

**Material required:**

- Eyedropper
- Small glass of water
- Knife
- Hard-boiled egg
- Small bowl for discarded egg pieces

**Instructions:**

**1.** Use a knife to cut the egg in half. Examine the layers that are revealed. What parts of the Earth's structure are represented by these layers: shell, white, yolk?

**2.** Look for a very thin layer between the shell and hardened egg white. It is called the membrane. What part of the Earth's structure might correspond to the membrane?

**3.** Lightly tap one half of the egg on the surface of your desk. The shell will break into fragments. Let these fragments represent the Earth's tectonic plates.

**4.** Lift two of the larger, connecting fragments slightly and use an eyedropper to add a drop of water beneath each one. Now replace the fragments on the egg.

**5.** Slide these two fragments or "plates" toward each other. Do the "plates" slide smoothly? If not, where do they catch?

**6.** What would happen if you pushed the two plates against each other in an opposite but parallel motion?

**7.** What if you pushed them together so they collide?

# What is a tornado?

**Objective of the activity:** This activity will help you understand a tornado as a natural phenomenon.

**Material required:**
- Two 2-litre soda bottles with caps
- Hammer and 5- or 7-cm nail
- Scissors
- Balloon
- Food colouring
- About 2 litres of water

**Instructions:**

**1.** Use the hammer and nail to punch a hole through each bottle cap.

**2.** Widen the holes to about 5 millimetres.

**3.** Cut the top off the balloon, leaving just 2 centimetres or so of the tight bottom.

**4.** Fill 2/3 of one bottle with water. Put a few drops of food colouring in the water and swirl it around so the colour mixes in. Leave the other bottle empty.

**5.** Screw the caps on each bottle.

**6.** Fit one end of the balloon over the neck of the bottle with water in it.

**7.** Flip the empty bottle over and place the caps of the bottles together.

**8.** Fit the other end of the balloon over the neck of the empty bottle.

**9.** Turn the bottles over and shake the full bottle in a circular motion.

**10.** Describe what happens:

_____

_____

_____

**11.** What part of a tornado does this demonstrate?

_____

**12.** How does it compare to a real tornado formation?

_____

_____

_____

# What is a flood?

**Objective of the activity:** This activity will help you to better understand floods, what makes them happen and what damage they can cause.

**Material required:**

- Very large pan or plastic-covered box
- Water source with hose
- Large basin or area for drainage
- Bricks or blocks
- Soil of different types and porosity
- Toy houses, buildings and cars
- 2 or 3 spray bottles

**Instructions:**

**1.** Fill the large pan with soil. Mold the soil into hills, valleys, and dry environment. Place the toy buildings and cars into the table "landscape" to create a town.

Fill the spray bottles with water and spray the water onto the stream table to simulate steady rain. What happens when the water hits the ground?

**2.** After a few minutes, increase the opening on the nozzles of the spray bottles and pour a larger amount of water onto the landscape. What happens now?

**3.** Does the water infiltrate the soil? Why?

**4.** Would different soils have slowed or quickened the flooding process? Why?

**5.** What happens if any type of soil reaches its saturation point?

**6.** What happens to the streams and streambeds when the soil reaches its saturation point?

**7.** Where does the runoff go on the table?

**8.** What areas of the simulated landscape would be the flood plain? Why?

**9.** What areas accumulate runoff water?

**10.** Where would be the safest place to build? Why?

# What is lightning?

**Objective of the activity:** This activity will help you understand the phenomenon of lightning during a storm.

**Material required:**
- Foam dinner plate
- Disposable aluminum pie pan
- Masking tape
- Wool cloth
- Foam cup

**Instructions**

**1.** Tape the cup, upside down, to the inside centre of the aluminum pie pan.

**2.** Turn the foam plate upside down and rub it with a wool cloth for about a minute.

**3.** Then charge the pie pan in the following manner: Place the pie pan directly on top of the charged foam plate, with the cup sticking up like a handle.

**4.** Quickly touch the pie pan with your finger. What do you hear? What do you feel?

**5.** Remove the pie pan by holding the insulating foam cup. What do you see?

**6.** What is the charge of the foam plate once it attracts electrons from the wool?

**7.** What is the insulator in this experiment?

**8.** What happens to the charged pie pan when you touch it?

**9.** What charge does the pie pan carry?

**10.** What causes the spark of light and sound?

**11.** What are you actually feeling when the “shock” flows through your finger?

# Hurricanes, tsunamis and volcanic eruptions

**Objective of the activity:** This activity will help you understand what causes hurricanes, tsunamis and volcanic eruptions.

**Instructions**

**1.** Visit the Web site of *Sécurité publique du Québec*, Youth Section at: www.msp.gouv.qc.ca/jeunesse/index_en.html.

**2.** Read the information on hurricanes, tsunamis and volcanic eruptions. Analyze the information by answering the following questions.

a) Describe a hurricane.

b) What is the "eye of the hurricane"?

c) Where do hurricanes happen?

d) How are hurricanes named?

e) What natural phenomena can cause a tsunami?

f) What is the other name of a tsunami?

g) Describe the waves of a tsunami.

h) Where do tsunamis happen?

i) When a volcano erupts, what comes out of it?

j) What is magma?

k) What is lava?

l) What could volcanoes be compared to and where can they be found?

m) What is an active volcano?

# Natural disasters throughout the world

**Objective of the activity:** This activity will help you to be more aware of the fact that natural disasters happen all over the world.

**1.** Scan Web sites, newspapers and magazines and find reports about natural disasters around the world.

**2.** Read the article you found and analyze it by answering the following questions.

a) Which natural disaster did you learn about?

b) What region was affected by this natural disaster?

c) Briefly describe the natural disaster.

d) Specify the severity of the disaster.

e) Explain possible causes for this kind of disaster.

f) Explain the possible consequences of this disaster on human populations.

g) Name the humanitarian organizations involved in providing assistance to populations affected by the disaster.

# Climate change and natural disasters

**Objective of the activity:** This activity will help you understand the links between natural disasters and climate change.

**1.** Read the article handed out by your teacher and answer the following questions.

a) What is the temperature increase expected in the next century?

b) Why are little temperature changes (less than 1°C) still important?

c) Name some consequences of temperature increases in the future that are expected.

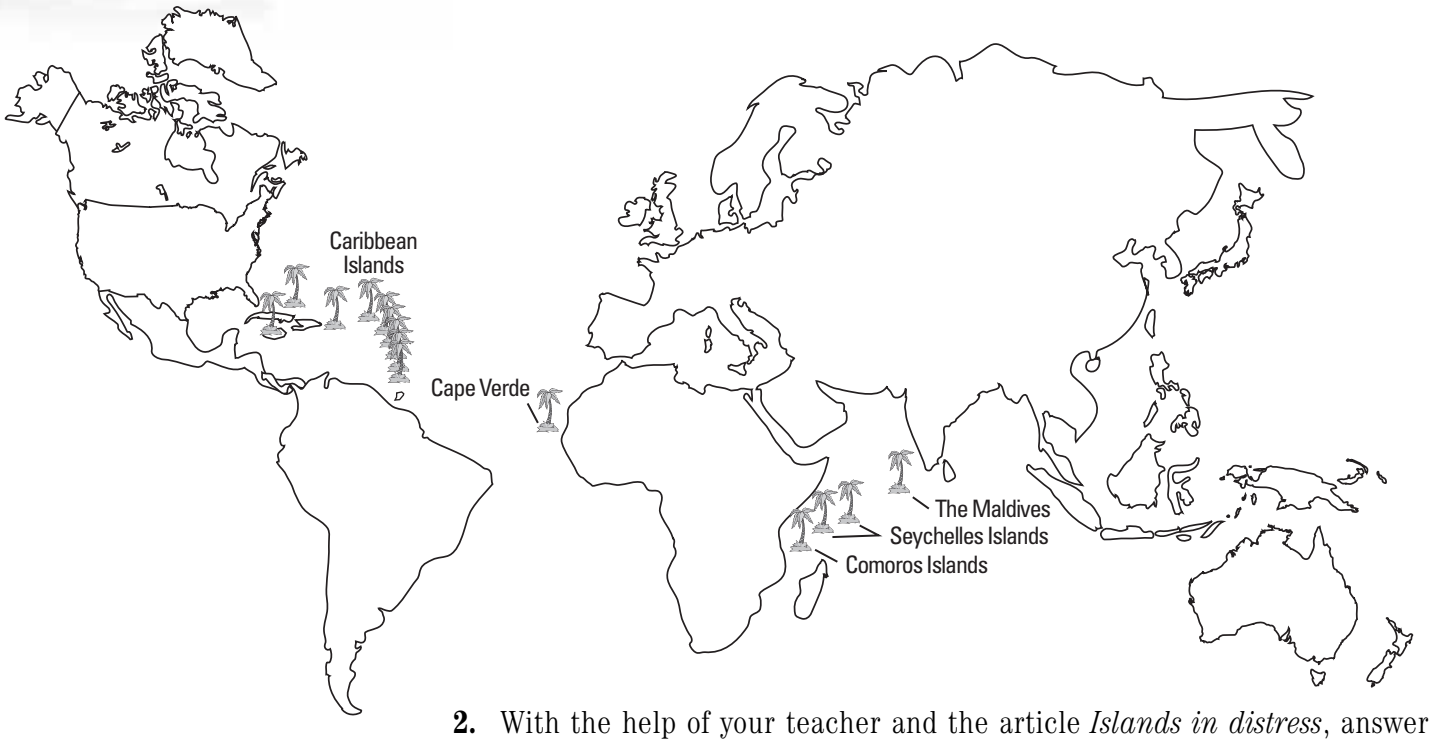
d) Who do you think will be affected by the consequences of climate change? Do you think a lot of people will be affected by these consequences?

e) Why, in your opinion, are less developed countries harder hit by climate change?

# What could happen around the world?

**Objective of the activity:** This activity will help you explain the links between natural disasters and climate change in some regions of the world.

**1.** Examine the map of the world. Locate the small island states referred to in the article *Islands in distress*.




**2.** With the help of your teacher and the article *Islands in distress*, answer the following questions:

1. To which natural phenomena are small island developing states exposed to?

_____

_____

_____

2. What problems do these states face every day, because of climate change and more frequent natural disasters?

_____

_____

_____

# What does heat mean to you?

**1.** Answer the following questions with help from your family. Be prepared to share your answers with your classmates.

a) Can you remember a time when you were very hot?

b) Where were you? Who were you with?

c) What were you doing?

d) How did you feel? How did the people with you feel? Did you or someone else get uncomfortable or sick because of the heat?

e) What did you do to cool down?

# Extreme heat events in Canada

In this activity, you will start by learning about the concept of extreme heat events. You will also explore when extreme heat events have severely affected populations. Finally, you will learn about how the weather is forecasted.

**1.** Form teams of four (4) students.

**2.** Your teacher will hand out copies of a newspaper article to you. Read the newspaper article as a team.

**3.** Get a topic assigned to your team.

**4.** Research information on the topic that has been assigned to your team. Use the information contained in the newspaper article. Search the Internet to gather more information on your subject or go to the library to read newspapers or scientific magazines.

**5.** Organize the information that you have found into a presentation. Use Word or PowerPoint if possible. If not, you can use cardboard or flip chart papers to make your presentation colourful.

**6.** Share the responsibilities of developing the presentation and present your findings as a group.

**Research topics:**

- Extreme heat events:
  - What are they?
  - How do they impact the lives of Canadians?
  - How do heat alerts work?
  - Why are we getting more extreme heat events?

- History of extreme heat events
  - Trace the history of extreme heat events in Canada and discuss one of these events of your choice (in Canada, the United States, or Europe).

- Weather forecast
  - How is weather forecasted?
  - How is it used for extreme weather emergency preparedness?

# What is heat and how does the body regulate?

**1.** Read the following text with your teammates.

**2.** Discuss the content by answering the questions.

**3.** Use the information handed out by your teacher (Annex 4).

**4.** Write the answers **using your own words** on a flipchart paper. **Don't copy the text provided below when answering the questions**.

**5.** Find **other examples** to illustrate the content than those provided in the text.

**6.** Use the Internet if it is available.

**7.** Be prepared to present your answers to your classmates.

**Definition of heat**

Heat and temperature are often used synonymously; however heat is more than just temperature. Heat is a composite of four factors:

- **Ambient temperature**: the measurement of how cold or hot it is outside, as measured by a mercury or ethanol thermometer and reported in degrees Celsius.

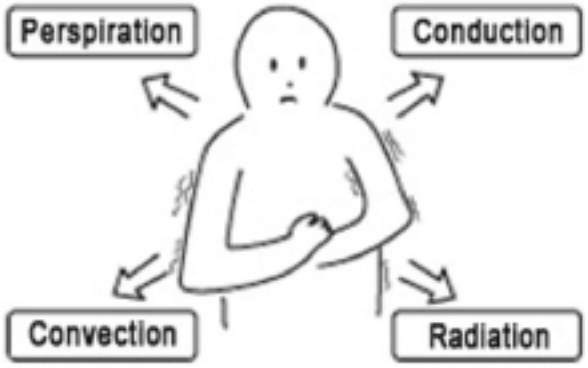
- **Radiant heat**: heat emanating from the sun's direct infrared heat rays. These rays can also be reflected from different types of surfaces on the ground.

- **Humidity**: the amount of moisture in the air.

- **Wind**: the speed at which the air moves.

The combination of these four factors is the most accurate way to assess the environmental parameters of heat that contribute to heat stress.

The following picture represents the four thermoregulation mechanisms. Complete the picture by adding one example of each mechanism in the appropriate space.




# Questions

**Group 1**

**1.** What is heat?

**2.** How do you define humidity?

**3.** What is your body temperature?

**4.** How does your body regulate its temperature when it is very hot outside?

**Group 2**

**1.** How does the human body maintain normal body temperature?

**2.** Name the four mechanisms upon which your body depends to regulate itself. Explain one of the four mechanisms.

**3.** True or false: Convection and conduction is the same thing. Explain the difference.

**4.** True or false: When it is windy, sweat evaporates faster. Explain the statement.

**Group 3**

**1.** What is conduction?

**2.** True or false: Heat and temperature is the same thing. If false, explain what heat is and what temperature is.

**3.** How does the human body gain and lose heat?

**4.** True or false: Low humidity and high heat is a greater strain on the body than high humidity and heat. Explain the statement.

# Heat-related illnesses

**1.** Read the following three (3) scenarios.

**2.** Answer the questions.

**3.** Your teacher will provide you with some information (Annex 5) that will help you complete the activity.

**4.** Work as a team and write your answers in the space provided below.

**5.** Be prepared to share your answers with your classmates.

**Scenario 1: A game of soccer**

Gregory plays soccer every Saturday afternoon with his friends. Today, Gregory and his friend Manuel, who are both 10 years old, are playing in the town's annual weekend youth soccer tournament, which is held in July and is typically the hottest time of the year. The weather forecast for the weekend is going to be hot and humid. On the first day of the tournament, the outdoor temperature is 30°C. The humidity level is very high and there is no wind. All of a sudden, during a game, Manuel falls on the ground and starts to cry. He says that he has pain in his left leg. Gregory notices that Manuel has not been drinking water during the game.

a) Could Manuel have a heat-related illness? Which illness is most likely?

_____

_____

b) How do you know?

_____

_____

c) What should Gregory do to help him?

_____

_____

d) What could Manuel have done to better prepare himself?

_____

_____

**Scenario 2: A hike in the mountain**

It is the middle of August. After a midday rain shower, Lucy and her older Aunt Mildred decide to go for a hike in the afternoon. The weather is very hot and humid from the rain and cloud cover. The two walk for about three (3) hours. When Aunt Mildred arrives home, she tells Lucy that she feels light-headed, hot and sick to her stomach. When Lucy asks if Aunt Mildred feels okay, she appears to be uncomfortable and cranky.

a) Could Aunt Mildred have a heat-related illness? Which is most likely?

_____

_____

b) How do you know?

_____

_____

c) What should Lucy do to help her aunt?

_____

_____

d) What could Aunt Mildred have done to better prepare herself?

_____

_____

**Scenario 3: An afternoon at the beach**

It is the August long weekend and Tanya and Joe decide to go to the beach on the Saturday afternoon. The sky is blue, the sun is shining and the weather forecast calls for a high of 34°C. The level of humidity is high in the city. When they arrive at the beach, Tanya and Joe realize that it still feels humid and they have forgotten their beach umbrella at home. They don't really mind since there is a light, warm wind and they enjoy laying in the sun. As the afternoon goes on, Joe feels tired, weak and dizzy. Joe typically doesn't drink water so he has not been drinking much at the beach. He also hasn't been swimming yet. Later in the afternoon, he starts having cramps in his stomach and feels like vomiting, but he is unable to walk to the washroom. He is sweating a lot and says that he is very tired and hot. When Tanya asks him what is wrong, he is very confused and cannot answer simple questions. Then Joe loses consciousness.

a) Could Joe have a heat-related illness? Which is likely?

b) How do you know?

c) What should Tanya do to help him?

d) What should have Joe and Tanya done to be better prepared?

**Question**

What is the first thing you should do when you are with someone who has heat stroke?

# Heat-vulnerable groups

In this activity, you will learn about groups vulnerable to heat, their challenges and steps to help them adopt preventive measures for extreme heat events. You will learn the content by doing research on the topic.

**1.** Form teams of four students.

**2.** Choose a topic from the list below.
- Older adult (grandparents or an older neighbour)
- Infants and young children (little brother, sister or cousin)
- People with chronic illness or physically impaired (someone who has been sick for a long time, or someone in a wheelchair or who has a cane)
- People of lower socio-economic status (low income, homeless)
- Newcomers to Canada and tourists
- People who work in hot environments (farmers, construction workers, miners)
- The physically active (marathon runners, recreational athletes)

**3.** Research information on the topic that you choose. Search for:
- the challenges that the vulnerable group you chose face during extreme heat events;
- the solutions that could be put in place to help the vulnerable group take preventive measures.

**4.** Search the Internet to gather information on your subject. You can start with the following Web sites and use others as well.
- http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/heat-chaleur-eng.php
- http://www.bt.cdc.gov/disasters/extremeheat/
- www.redcross.ca

**5.** Organize the information that you have found into a presentation. Use Word or PowerPoint if possible. You can use cardboard or flip chart papers to make your presentation colourful if you do not have access to PowerPoint.

**6.** Share the responsibilities of developing the presentation amongst the team members and present your findings as a group.

# Being prepared for the heat

**1.** You are part of a team of heat expert consultants. With the help of your teammates, you will put together a list of recommendations that will help your client take advantage of the day and be safe in hot weather.

**2.** Create a name for your consulting firm. You can also draw a logo or find a slogan. Make it fun!

**3.** Your teacher will provide you with a scenario to work on. There are four different scenarios.

**4.** To complete the activity, refer to Annex 7, which your teacher will give you. There, you will find some ideas to help you prepare your recommendations.

**5.** Be creative and colourful in your answers. You can write, draw and do crafts. You can use the computer to prepare your presentation, if available.

**6.** Once completed, you will have to present your recommendations to your classmates by acting out the scenario.

**Context:**

You are part of a large consulting firm that provides advice to people about vacations to tropical places and during hot weather. Your expertise is in how extreme heat affects the body and your team specializes in physical activities during hot weather. Extreme heat events are happening more and more frequently. Through the effects of climate change, you know that most cities across the world will see an increase in the number of hot days. Congrats! You are in the right business! As you pat yourself on the back for having started your business, a client walks into your office.

**Client no. 1: The football coach**

Mr. Brown is the head coach for the regional Pee-Wee football team. His team members are 13 years old. This summer has been warmer than normal and July has been no exception. The temperature has been very hot and humid for the last four days and Environment Canada has forecasted more sunny, hot and humid days for the weeks to come.

Last week, during a practice, two players suffered from heat-related illnesses. Louis had heat cramps and Joe vomited on two occasions during the last practice.

Mr. Brown is very concerned about his players' safety. There are 5 practices planned in the next 10 days and last two hours each. Practices typically begin at 1 p.m., which means the team is on the field during the hottest part of the day. Mr. Brown cannot cancel the practices since the team is registered for a tournament on July 31st.

Mr. Brown is asking you to provide him with tips to keep his players cool while practising and a structured plan to help him ensure his team's safety during the coming hot days.

**Customer no. 2: The tennis player**

Lucy Mayor is a professional tennis player. It is the beginning of August and Lucy is preparing to compete in a tournament being held in Florida this coming September. Lucy was injured in April and cannot afford to miss any training during the summer if she wants to be ready for the competition. Lucy's coach is from Cuba and he spends the summer months there with his family. Lucy has decided to join her coach in Cuba to train. However, the temperature in Cuba typically reaches the mid-30°C with a high humidex value. Lucy is sensitive to extreme heat and, last season, she suffered from heat cramps and heat rashes. Lucy is discouraged and worried that the heat might prevent her from being able to maximize her training efforts, but she will have to acclimatize if she wants to play well at the tournament.

Lucy will be in Cuba from August 1 to August 28. She practises twice a day, five days a week. Each practice lasts two hours. The long-range forecast for the month of August in Cuba is 35°C with high levels of humidity. There is always a chance of thundershowers in the late afternoon.

Lucy wants to know how to prepare herself to face the weather in Cuba and how to get the best out of her practices without compromising her health.

**Customer no. 3: A young mother going to the beach**

Linda Smith is a mother of four children aged 2, 4, 6 and 9 years old. She is planning her summer vacation in Ocean City, South Carolina, for the month of July. July in South Carolina can be very hot and humid. Among the various activities, Linda plans to spend two weeks of the vacation at the beach with her children. She has rented a house on the boardwalk without any air conditioning. There is no basement. Although the weather can be unpredictable at times in Ocean City, Linda wants to be prepared in case of extreme heat events. She needs your expertise to help her plan outdoor activities for her children in hot weather.

Linda also mentions a few important facts about her family. Her six-year-old son, Jay, is allergic to pollen and her elderly mother will be joining the family on vacation for a week. Linda's mother is 72 years old and has chronic asthma.

Mrs. Smith would like a complete list of things to consider when at the beach during very hot weather.

**Customer no. 4: A teacher preparing for back-to-school**

Mr. Duval is a grade six teacher. He is preparing his classroom for the students' return in September. There will be 28 students in his class this year. Mr. Duval is concerned with the unseasonably high temperatures that they have been experiencing in late August-early September for the past two years. Last year, one of his students suffered heat exhaustion during math class. Mr. Duval wants to prevent this situation from happening again by preparing a small heat kit that will enable him to make his students as comfortable as possible.

The school is located in a small rural town and does not have air conditioning. Behind the school is a large field that is full of trees and close by is a lake that most of the local residents use for recreational swimming. The library and the gym are located at the other end of the school, where trees offer shade to these areas.

Mr. Duval hopes to receive your recommendations shortly as he would like to present them to the school principal.

# Other kinds of disasters in Canada

**Objective of the activity:** This activity will help you identify natural disasters that have happened in Canada, which were caused by human activity.

**1.** Scan newspapers, magazines or Web sites and find reports about natural disasters that have happened in Canada and were caused by human activity.

**2.** Read the article you find and analyze it by answering the following questions:

a) Which disaster did you learn about?

b) What region was affected by this disaster?

c) Briefly describe the disaster.

d) Specify the severity of the disaster.

e) Explain possible causes of this kind of disaster.

f) Explain the direct and indirect consequences of this disaster on human populations.

g) Who helped the people affected by disaster? And how?

# To be ready for an emergency

**Objective of the activity:** This activity will help you become familiar with the preparedness activities that will help you to act effectively in an emergency situation.

A natural disaster often occurs unexpectedly. To react properly, it is essential that some of your personal belongings be ready.

**1.** An emergency kit is a bag or backpack that you can prepare ahead of time. In the list of the following objects, check off those that should be part of your emergency kit.

**Personal care**

- ☐ Shampoo
- ☐ Facecloth and towel
- ☐ Hair brush
- ☐ Hair dye
- ☐ Makeup
- ☐ Deodorant
- ☐ Medication
- ☐ Toothbrush
- ☐ Toothpaste
- ☐ Body soap
- ☐ Hand and body cream
- ☐ Hairspray
- ☐ Perfume
- ☐ Personal hygiene items

**Clothing**

- ☐ Socks(cotton, wool)
- ☐ Sneakers/runners
- ☐ Pants
- ☐ Shoes
- ☐ Sweaters (wool, heavy cotton)
- ☐ Jackets (raincoat, coat)
- ☐ Gloves, mittens
- ☐ Jewelry
- ☐ Hat
- ☐ Underwear

**Food**

- ☐ Canned food (vegetables, fruit, stews, beans, etc.)
- ☐ Bread
- ☐ Soft drinks
- ☐ Dry fruits and vegetables
- ☐ Bottled water
- ☐ Condiments (ketchup, mayonnaise, etc.)
- ☐ Cake
- ☐ Jam, honey, peanut butter, etc.
- ☐ Milk products (cheese, milk, etc.)
- ☐ Pudding
- ☐ Crackers and melba toast
- ☐ Cereal
- ☐ Seasoning (salt, pepper, spices, etc.)
- ☐ Meat and fish
- ☐ Fruit juice
- ☐ Pasta
- ☐ Hot drinks (coffee, tea, etc.)
- ☐ Chips
- ☐ Nutrition bars

**Miscellaneous**

- ☐ Keys (house, car)
- ☐ Flashlight and spare batteries
- ☐ Glasses
- ☐ Dishes
- ☐ Music CDs
- ☐ Money
- ☐ Camp stove with fuel
- ☐ Whistle
- ☐ Portable radio
- ☐ Manual can opener
- ☐ Books
- ☐ Red Cross first aid kit
- ☐ Backpack
- ☐ Important documents (identification and personal documents, copy of insurance policy)
- ☐ Games
- ☐ Heavy blanket

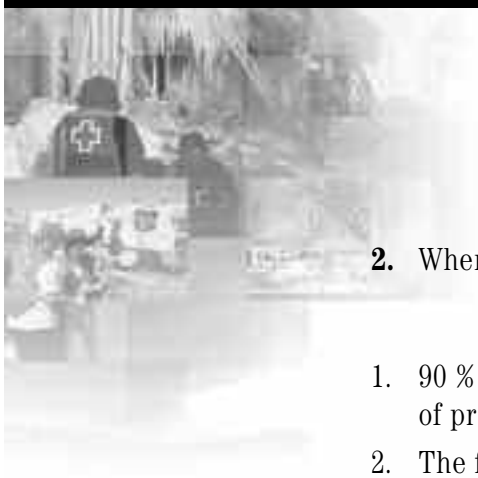
**N. B. These lists are not exhaustive.**

**A Red Cross first aid kit allows you to provide first aid in emergencies. It contains at least the following objects:**

- Sterile gauze of various sizes
- Adhesive tape
- Gauze roll
- Triangular bandage
- Adhesive bandages of various sizes
- Pressure bandages
- Scissors
- Disposable non-latex gloves
- Antiseptic wipes
- Protective barrier device for rescue breathing
- Emergency blanket

**You could add the following objects:**

- Red Cross first aid manual
- Emergency telephone numbers
- Soap
- Paper and pencil
- Coins
- Ice pack
- Flashlight with spare batteries stored separately
- Tweezers
- Thermometer
- Pocket resuscitation mask



**2.** When answering the following questions, evaluate your aptitude to help.

| | TRUE | FALSE |
|---|---|---|
| 1. 90 % of accidents can be avoided with a minimum of prevention. | ☐ | ☐ |
| 2. The first step to follow on the site of an accident is to ensure my own safety. | ☐ | ☐ |
| 3. If I am witness to an accident, it is my duty to stop and help. | ☐ | ☐ |
| 4. To ease the pain, I can apply butter or petroleum jelly to a burn. | ☐ | ☐ |
| 5. In case of poisoning, I must ask the victim to drink milk. | ☐ | ☐ |
| 6. To stop a nose bleed, I must tilt the head back. | ☐ | ☐ |
| 7. In case of a fracture, I must reposition the limb in its natural position. | ☐ | ☐ |
| 8. I must remove shards of glass lodged in a wound. | ☐ | ☐ |
| 9. It is important to find cotton swabs, peroxide and Mercurochrome in a first aid kit. | ☐ | ☐ |
| 10. The majority of deaths after a heart attack occur in the two hours following the appearance of the first symptoms. | ☐ | ☐ |
| 11. I must burst a blister to ease the pain. | ☐ | ☐ |
| 12. One would have to place a hard object in the mouth of a victim of epilepsy to prevent him or her from swallowing his or her tongue. | ☐ | ☐ |

1) You obtained nine to twelve correct answers. Great! Any injured person would be in good hands with you. But for added safety, why not take a first aid course?

2) You obtained five to eight correct answers. You demonstrate a good aptitude to help. But enrolling in a first aid course could be beneficial.

3) You obtained one to four correct answers. Emergency 911! You should enrol in a first aid course immediately.

**Do you have a first aid kit at home? Would you know how to use the material it contains? To get a Red Cross first aid kit or to register for a first aid course, contact your local Red Cross branch.**

**3.** In case of an emergency, it may be necessary to call for help. Fill out the telephone list by finding the emergency telephone numbers. Post this reminder near your telephone at home.

a) Emergency 9-1-1 or _____

b) Fire station _____

c) Police station _____

d) Ambulance _____

e) Mother at work _____

f) Father at work _____

g) Another adult (relative, neighbour) _____

_____

_____

_____

_____

h) Local community health centre _____

i) Family doctor _____

**4.** Now that you know the telephone numbers to call for help in case of emergencies, write down the essential information you should give the switchboard operator. Check your answers with your teacher.

_____

_____

_____

_____

_____

# Risk analysis

**Objective of the activity:** This activity will enable you to identify potential hazards in your bedroom.

**Your bedroom is a place where you spend a lot of time. To make it as safe as possible, use the following list to identify potential hazards and then make whatever changes are called for.**

**In my room:**

a) No heavy objects are suspended on the wall over my bed. ☐

b) Curtains and drapery don't touch the heaters. ☐

c) No object is in contact with the heating elements. ☐

d) Rugs are taped down in order to prevent slips and falls. ☐

e) I always put my shoes in the closet to be sure that they don't block the door if I have to get out quickly. ☐

f) There are no objects near the door that could block the exit in an emergency. ☐

g) I know under which furniture I can find shelter in case of an earthquake or a tornado. ☐

h) I have identified walls without objects against which I can lean in case of an earthquake or a tornado. ☐

i) The furniture is placed in such a way that it can't slide and block the door. ☐

j) All cupboard doors are securely latched. ☐

k) My computer is securely fastened to the workstation. ☐

l) Shelves, wardrobes and other wall units are bolted to the floor. ☐

m) My aquarium is protected from falling over or sliding. ☐

n) All overhead lamps are securely attached to the ceiling. ☐

o) Books and objects are placed in bookcases in such a way that they can't fall from the shelves. ☐

p) All wall decorations are securely fastened to the wall. ☐

# Your school evacuation plan

**Objective of the activity:** This activity will enable you to become more familiar with your school evacuation plan.

**1.** Give the reasons why you should quickly exit the classroom or the school.

_____

_____

_____

**2.** By referring to your school plan, answer the following questions:

a) How many emergency exits are there and where are they located?

_____

_____

b) Where are the fire extinguishers and other emergency material located?

_____

_____

c) What is the quickest route you should take to evacuate the school starting from your:

- Classroom: _____
- Cafeteria: _____
- Gymnasium: _____
- Library: _____

# The behaviours and attitudes to adopt in emergencies

**Objective of the activity:** This activity will allow you to identify the behaviours and attitudes to adopt in emergencies.

One dictionary definition of a natural disaster is: "Sudden event that causes a disruption that could lead to destruction and deaths: it is a great mishap, a disaster." People must be prepared to face a disaster because it is a sudden unexpected event. **How? By knowing what to do!**

**Part one**

**1.** Read the following case studies. Fill out the chart on the following page to identify the attitudes and behaviours to adopt in case of an emergency.

a) It's September, the Smith family is getting ready for dinner. Suddenly, an earthquake tremor is felt. The dinnerware on the table is shaking and a few plates fall on the floor. Mary starts to yell: "It's shaking everywhere, everything is falling down," and she starts running around the table. Mark hides under the table. Mary runs out of the house.

b) During summer holidays in Western Canada, the Williams family is traveling on the highway. Everyone is astounded when they notice on the horizon a whirlwind of dust and earth rising in the sky. It is moving very quickly in their direction. They decide to stop the car on the highway shoulder, lock the doors and hang on to the seats while waiting for the air current to go by.

c) On a lovely summer afternoon, the sky gets clouded over and thunder is heard far away. The Jones family goes inside the house to seek shelter from the rain. The kids decide to turn on the computer and to use the Internet while the parents close the windows and the doors and disconnect the electrical appliances.

d) The spring is very warm. The snow is thawing quickly and ice jams are forming on the river. The water level is rising and the land next to the river is flooded. The residents are moving their belongings to the upper floor of their house and are staying there until things return to normal.

| Natural disaster | What to do | What not to do |
|---|---|---|
| a) | | |
| b) | | |
| c) | | |
| d) | | |

In these situations, which one presents only the proper things to do in case of a natural disaster:

_____

Remember that it is always better to stay _____ and to avoid using the _____ .

**Part two**

**2.** To know what you should do after a disaster, determine which of the following statements are true or false. Circle one of the two letters.

1. After a flood, turn on the heating system immediately. **T** **F**
2. Listen to the radio station. **T** **F**
3. Keep the food in your refrigerator and freezer so it does not go to waste. **T** **F**
4. Use the telephone to let someone know your condition. **T** **F**
5. Turn the lights on immediately. **T** **F**
6. Check for possible fire hazards. **T** **F**
7. Help injured people even if you're injured yourself. **T** **F**
8. After an earthquake, return immediately into your house. **T** **F**
9. Take the elevator. **T** **F**
10. Remain where you are and protect yourself during aftershocks. **T** **F**
11. After an earthquake, use water from the water heater or the toilet bowl if necessary. **T** **F**
12. After a flood, drink tap water. **T** **F**
13. After a flood, wash and then sterilize dishes. **T** **F**
14. Stay close to power lines. **T** **F**
15. When you evacuate, leave a note of your destination point on the table. **T** **F**
16. Take your time to evacuate the house. **T** **F**
17. Lock the doors of your home before leaving. **T** **F**
18. Use the routes designated by the authorities and avoid shortcuts. **T** **F**

# Myth or fact?

**Objective of the activity:** This activity will help you distinguish between myths and facts related to a few natural disasters.

**1.** Read each of the following statements. Connect each myth in the left column to the corresponding reality in the right hand column.

## MYTH

- ☐ a) If I'm in a car during a storm, I'm safe.
- ☐ b) When lightning strikes people, it always kills.
- ☐ c) People struck by lightning carry an electrical charge. Helping them can put you at risk.
- ☐ d) If I'm in a shelter during an electrical storm, I'm protected from lightning.
- ☐ e) Lightning only strikes during strong downpours.
- ☐ f) During a storm, it is safe to use the phone or take a bath.
- ☐ g) Carrying an umbrella does not increase my risk of being struck by lightning.
- ☐ h) If a tornado strikes, open all windows so that the building you're in doesn't explode.
- ☐ i) A car is a safe place to be during a tornado.
- ☐ j) Tornadoes occur only in springtime.
- ☐ k) Tornadoes never strike down in cities.
- ☐ l) It is safe to step out of the house in the "eye" of a hurricane.

## FACT

1. The "eye" of a hurricane is a moment of calm between two more intense moments. It is important to remain in shelter during this calm moment.

2. Although tornadoes primarily occur in wide open spaces, they can also hit cities.

3. Opening windows during a tornado lets strong winds enter the house and can increase the risk of damage.

4. A tornado can overturn cars and other objects in its path. If you are in a car during a tornado, get out and find shelter in a ditch or ravine, protecting your head with your arms.

5. Although tornadoes mainly occur between March and August, they can develop at any time during the year.

6. Lightning can strike even if there is no rain.

7. If a person is struck by lightning, give first aid as soon as possible. The person does not carry an electrical charge and can be handled safely.

8. During a storm, you should not use the phone or take a bath. Both conduct electricity and can cause electrocution.

9. Lightning can injure or kill people from electrocution or by causing serious burns.

10. During a storm, a closed building provides shelter from lightning.

11. Avoid using an umbrella during a storm, as it may conduct electricity.

12. A car can provide safe shelter during an electrical storm, so long as the windows are shut and you don't touch any metal.

# My commitment in case of an emergency

**Objective of the activity:** This activity will enable you to determine which responsibilities you could take on before, during and after an emergency that happens at home.

**Part one**

**1.** Write the responsibilities that you could assume in case of an emergency in the following table.

| Responsibilities (obligations, duties, commitment) |
| --- |
| |

**Part two**

## My commitment in case of an emergency.

I, _____,

agree to assume the following responsibilities in case of emergency:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Signed on _____ in _____

Date Location

By _____ and _____

Parent Student

# A well-orchestrated response

**Objective of the activity:** This activity will help you learn about the planning and decision-making processes that occur before, during and after a hurricane.

**1.** Read the different roles above and discuss with your educator and other students.
**2.** Choose the role you would like to play.
**3.** Research and take notes on the responsibilities of your role within an emergency hurricane situation.

## Members of the emergency management team

### Mayor

You represent the city and as such, you must inform citizens about the decisions that were made and the organization of emergency services. You work closely with the city emergency manager.

### City emergency manager

You are responsible for managing emergency interventions and for coordinating emergency services provided to the people. You support the mayor in his decision-making.

### City public information officer

You are the spokesperson for the city. You answer requests for interviews from media and reporters. You also organize press conferences and the publication of official documents for the city (news bulletins, news releases, etc.). You make sure that the mayor is always well informed.

### Public works officer

You are responsible for maintaining water, sewer, streets and parks as well as the maintenance of buildings owned by the city.

### Fire chief

You are responsible for fighting fires and for rescuing people who are stuck in buildings or elsewhere.

### Police captain

You are responsible for the evacuation of people who are at risk and for preventing burglary and looting. You put in place security perimeters to prohibit access to dangerous buildings and you ensure that cars move through safe streets.

**Building inspector**
You are responsible for ensuring that public buildings, residences and offices are safe before evacuees can get back to their regular activities.

**Electric/gas company officer**
You are responsible for making sure your company fixes the power lines and broken gas main. Your company is responsible for turning the gas back on in residential neighbourhoods.

**Red Cross representative**
The city assigns you the task of opening an emergency shelter for people who are evacuated and who have nowhere else to go. Your volunteer emergency response team provides food and shelter services for the victims. You are located in a large room of the neighbourhood community centre. Your team will also organize a service aiming to reunite family members who were separated because of the disaster.

**Humane Society representative**
You are responsible for helping people find temporary refuge for their pets as they are not admitted in the emergency shelter set up by the Red Cross. You must also recuperate stray animals that lost their way home.

**Environment Canada representative**
You are responsible for providing the most recent and accurate weather forecasts to citizens, the media and municipal authorities.

**Citizens' representative**
You represent the opinions, interests and needs of your community's citizens who were affected by the disaster.

**Reporter**
You report the most up-to-date information on the storm and you are responsible for informing the public about what should be done before, during and after the hurricane. You must also inform the victims about services that were put in place to help them.

## Questions for the meeting of the emergency management team

1. Your team must organize an emergency response operation because of the coming hurricane. Where do you start?

2. What is each person's role before, during and after the hurricane?

3. Will each person be able to do his or her job despite damages?

4. Is it more important that residents are able to get back to their homes as soon as possible or that residents have a safe place to stay?

5. Whom do you assist first: The elderly? Injured people? People staying in the emergency shelter? Abandoned animals?

6. Was the community properly prepared for a hurricane?

7. Did the community know what to do when the watch was issued and then when the warning was issued?

8. When is it safe to allow citizens to return to their homes and begin the cleanup process?

9. What can the community do in the future to be better prepared for a hurricane?

# For more information on natural disasters

### Lightning storms and lightning bolts
Lightning storms are characterized by a lightning bolt followed by a lightning flash and thunder. Lightning bolts can break windows, set off a fire, cause a power failure and explosions when there is combustible material. They are dangerous and can cause serious burns or electrocute people.

### Heavy rains (or torrential rains)
Clouds are a collection of very small water droplets. Carried by the wind, they stick together and form larger droplets. When their size is greater than 0.1 mm, they fall as rain. Heavy rains last for a long period of time, accumulate and fall at a rate of about 7.6 mm per hour. If they are heavy enough, they can cause localized or generalized floods.

### Earthquakes
Earthquakes or seismic activity are sudden movements of the Earth's crust. The tremors usually occur suddenly and leave very little time to react. It is impossible to prevent or forecast earthquakes. A tremor that registers less than 3.5 on the Richter scale usually goes unnoticed. Tremors that have a magnitude of 5.5 to 6 can cause moderate damage to neighbouring buildings. When the earth shakes at a magnitude of 7 or more, it is considered a major earthquake that can cause large-scale damage.

### Floods
In Canada, floods are natural disasters that cause the most material damage. Floods are the overflow of rivers and lakes caused by an excessive rise of the water level. This rise can be caused by heavy precipitation, sudden thawing of snow, ice jams or ice breakups.

### Freezing rain
Freezing rain is caused by raindrops freezing upon impact on earth or on an object. It then forms a layer of ice. The thickness of the ice depends on the amount of time the freezing rain lasts and on its intensity. When ice accumulates on electrical wires it can result in severe damage and large-scale power failures. In addition to damaging trees and houses, freezing rain also makes it dangerous to travel.

### Hail
Hail is precipitation consisting of ice particles that are formed during a storm and can impact the ground at speeds of 130 km/hour. Hailstones can sometimes measure more than 10 centimetres, that is, the size of a grapefruit. Hail can cause severe damage to crops, houses and vehicles. It can also wound people and animals.

### Tornadoes
Tornadoes are whirlwinds shaped like a funnel that points towards the ground. They can destroy everything in their path. This type of phenomenon can uproot trees, turn cars over and tear the roofs off houses.

### Forest fires
Most fires that destroy our forests are caused by human negligence, for example, campfires that are not properly put out, or a cigarette tossed by a hiker. However, fires that occur naturally, such as those caused by lightning bolts, are more devastating and burn over larger areas. Forest fires progress very rapidly, especially when it is windy and the weather is dry. In Canada, there are about 9,000 forest fires every year.

### Landslides
Landslides are movements of clay type soil saturated with water. These ground movements occur very rapidly and leave the population very little time to react. Risks associated with landslides come from the impact of rapidly moving debris or from the ground caving in.

### Volcanic eruptions
Volcanoes can be understood as the Earth's chimneys that allow for magma to be released. You might easily believe that there are no volcanoes in Canada but, in fact, there are many dormant volcanoes in Western Canada. Therefore, the possibility of a volcanic eruption still exists.

### Tsunamis
Tsunamis or tidal waves are huge ocean waves caused by an undersea disturbance such as underwater volcanoes, earthquakes and landslides. These waves can reach up to 30 metres high and cause major damage to houses and structures along the coastline.

### Hurricanes
Hurricanes are huge tropical storms that can cause great damage. They are also called "tropical cyclones" or "typhoons". They originate in the ocean, usually near the equator. Violent winds and heavy rains accompany them.

### Extreme heat or cold waves
Climate change causes extreme meteorological phenomena such as extreme heat and cold waves. These events flow from the development of a mass of hot or cold air that provokes a sharp increase or decrease in temperatures. Heat or cold waves can be devastating for people's health, especially those who are vulnerable such as young children or older individuals.

# A few words about hazardous materials releases

Hazardous materials releases are incidents that involve an accidental spill or leak of hazardous chemical products that are dangerous to humans and the environment.

These hazardous products can contaminate the soil or water or be spread in the air. If they become airborne, they may or may not be visible as a toxic cloud. Sometimes you may be able to smell or taste the hazardous product. Inhaling toxic fumes or drinking contaminated water can be hazardous to your health. The risk depends on the toxicity of the substance in question, its concentration and how long you're exposed to it.

In case of a hazardous materials release, the authorities may ask that you remain inside your home and use "Shelter-in-Place" techniques:

- Go inside your home and remain there;
- Close all windows and doors;
- Turn off all ventilation systems;
- Listen to the radio or watch television to be aware of the authorities' instructions.

## Other sources of information

To complement the information or for more in-depth facts, here is a list of resources to refer to:

- www.redcross.ca
- www.redcross.ca/facingfear
- www.redcross.ca/bugout
- www.climatecentre.org
- www.ifrc.org/what/disasters
- www.iclr.org/index.htm
- www.ecoaction.gc.ca
- www.publicsafety.gc.ca/res/em/nh/index-eng.aspx
- www.nrcan.gc.ca/studelev/index-eng.php
- http://earthquakescanada.nrcan.gc.ca/index-eng.php
- http://ec.gc.ca/default.asp?lang=En&n=8B2F9F48-1
- www.msp.gouv.qc.ca/jeunesse/index_en.html
- www.sopfeu.qc.ca/en/zone_interactive/jeunesse.php
- http://feu.scf.rncan.gc.ca
- http://climatechangenorth.ca/section-BG/B2_Intermediate_Outline.html
- www.fema.gov/kids/index.htm (English only)
- http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/heat-chaleur-eng.php
- http://www.hc-sc.gc.ca/ewh-semt/climat/adapt/heat-chaleur-eng.php

# Prepare for emergencies with your family

Since Nature's sudden mood swings can strike us at any moment without warning, here are some ideas that can help you and your family prepare to react better and to limit the damage. For more help, you can visit the Canadian Red Cross Web site in the section for the *Expect the Unexpected* program, where you will find an activity booklet that can be completed with your family. You can look at the document in the section intended for parents at: www.redcross.ca/expecttheunexpected.

- Discuss the risk of disasters that could occur in your area.

- Learn about attitudes to adopt in case of an emergency.

- Prepare your home for disasters.

- Prepare a survival kit, a first aid kit and a car emergency kit with your family.

- Make sure you have enough food and water to last you and your family at least 72 hours in case of an emergency.

- Make an action plan with your parents and the rest of your family:
  - Make a list of all emergency and telephone numbers, and keep it close at hand;
  - Plan on two meeting places ahead of time in case an evacuation is necessary (one that is close by your house in case of a sudden emergency like a fire; another one outside your neighbourhood in case you cannot return home right away);
  - Make sure each family member knows the phone number of someone who lives out of town in case you get separated;
  - Arrange for other places where you and your family could stay temporarily (with other family or friends for example);
  - Practice your evacuation plan at home and techniques to remain sheltered in your home in case there are hazardous materials released.

- Learn to recognize emergency exits and smoke detectors at home, in school and public places.

- Never use the elevator in case of an emergency.

- Take a Red Cross first aid course.

# After the disaster

**Even after the disaster, there is still an emergency. You must:**

- Give first aid to injured people;
- Be sure to have your survival kit with you;
- Listen to the local radio station in case you are asked to evacuate.

**If asked to evacuate, we're ready!**

If asked to evacuate, you must not insist on staying in the house, but should instead leave immediately while taking care to:

- Bring along an emergency kit and a first aid kit;
- Wear proper clothing;
- Make sure my pets are safe;
- Leave a note on the table indicating the time I left the house and my destination;
- Lock all the doors while leaving.

**Cooperate**

- Listen carefully to the instructions given by the authorities and rescuers;
- Always follow the route which has been laid out for you;
- Go to the meeting place designated by the authorities;
- Observe what is around you and notify the authorities and people about anything that may seem abnormal or dangerous.

**Returning home**

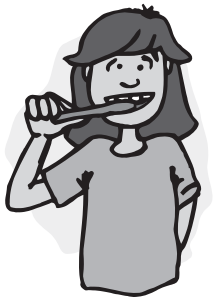
When you return home, you must:

- Check the condition of the house to evaluate the damage;
- Use a flashlight to inspect the site: it may be hazardous to turn on the lights;
- Check the condition of your electrical appliances;
- Get in touch with specialists for any electrical, heating or gas problems;
- Drink bottled water until the authorities confirm that the tap water is safe to drink;
- Check the food in your refrigerator and freezer, throw away any doubtful perishable food;
- Use the phone only for emergencies: the work teams may still need the telephone circuits for a while.

# Climate change: What can you do?

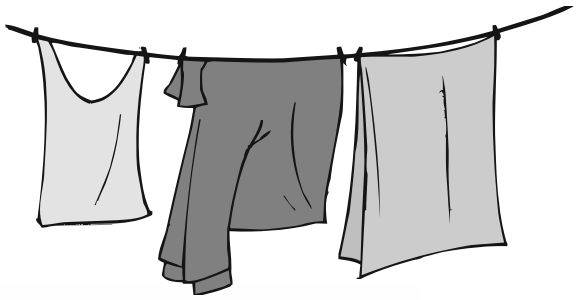
### 1. A cool suggestion!
Lower the temperature of thermostats overnight and when your family leaves for work or school. An easy way to save on heating energy!

### 2. You can do it!
Do not let water run while you are brushing your teeth or when you are washing the dishes.



### 3. You can do it now!
Take a shower instead of a bath and install a low flow showerhead with your parents.

### 4. Friendly winds!
As frequently as possible, use the clothesline or a drying rack instead of the dryer. Clothes last longer too!



### 5. Turn off to better turn on!
Turn off lights and household appliances when they are not in use.

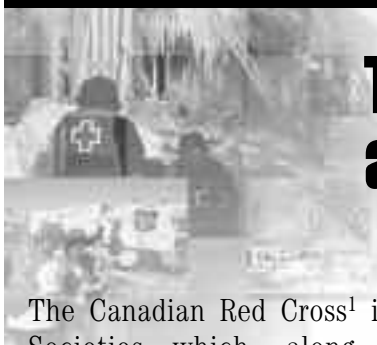
### 6. A brilliant idea!
With your family, use energy-efficient light bulbs and install timers to control exterior lighting.

### 7. Air can dry!
The dishwasher wastes a lot of energy. Leave dishes to dry on the countertop.

### 8. Moving along… without polluting!
When possible, use your bicycle or your in-line skates instead of asking your parents to use the car.

### 9. Don't idle around!
Ask your parents not to leave the car motor running needlessly.

### 10. The art of recycling and composting!
Recycle and learn how to prepare compost with your family. The less garbage that goes into the landfill, the less energy used!



# The Red Cross: anywhere, anytime

The Canadian Red Cross[1] is one of the 187 national Societies which, along with the International Committee of the Red Cross (ICRC) and the International Federation of Red Cross/Red Crescent Societies (the Federation), form the International Red Cross and Red Crescent Movement. Its mission is to improve the lives of vulnerable people by mobilizing the power of humanity in Canada and around the world.

The Canadian Red Cross Society is a volunteer organization that provides the public with humanitarian services and emergency relief:

• In the area of prevention against disasters or conflicts or when they occur in Canada and around the world.

• Through community outreach in the fields of health and social services.

Humanitarian and relief services are provided according to the Fundamental Principles[2] of the International Red Cross and Red Crescent Movement. Canadian Red Cross programs are made possible by virtue of thousands of volunteers acting on its behalf and by Canadians' generous financial assistance.

**The Fundamental Principles of the Red Cross**

**Humanity**
Work to prevent and alleviate human suffering. Promote friendship and lasting peace amongst all peoples.

**Impartiality**
Provide help based on the level of suffering and show no preference as to nationality, race, religious beliefs or social conditions.

**Neutrality**
In order to continue to enjoy the confidence of all, take no sides in hostilities nor engage at any time in controversies.

**Independence**
Act freely, in accordance with the seven principles.

**Voluntary Service**
To invest one's time and energy to help others, not prompted in any manner by desire for gain.

**Unity**
Unite all efforts of a country under one Red Cross, open to all.

**Universality**
Be mindful of human suffering all over the world.

[1] In compliance with the law, use of the emblem and name of the Red Cross in Canada is reserved exclusively for the Canadian Red Cross Society and the health care services of the armed forces (Law on the Geneva Conventions. L.R.C., 1985. Chap. G-3).

[2] This text is adapted from fundamental principles proclaimed by the Red Cross XX International Conference in Vienna in 1965. Please note that the original text has been revised and included in the Statutes of the International Federation of Red Cross and Red Crescent Societies, adopted by the Red Cross XXV International Conference in Geneva in 1986.

Canadian Red Cross

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