

**НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ЦИВІЛЬНОГО  
ЗАХИСТУ УКРАЇНИ**

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**Англійська мова  
за професійним спрямуванням**

**Тексти і завдання до практичних занять для 2-го курсу**

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Англійська мова за професійним спрямуванням для ВЗН системи МНС.

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Навчальний посібник спрямований на підготовку студентів та курсантів другого етапу навчання до аудиторного і самостійного читання, розуміння й перекладу оригінальної науково-технічної літератури, а також розвиток навичок усного мовлення з тем, передбачених програмою.

Посібник містить фахові тексти, завдання до них, лексичні та комунікативні вправи. Тексти посібника відображають спектр тематики, що вивчається студентами та курсантами протягом навчання у пожежно-технічних ВНЗ, і містять фахову термінологію та специфічну лексику технічного напрямку.

Розрахований на студентів, курсантів та слухачів ВЗН, а також всіх, хто пов'язаний із пожежно-рятувальною справою та охороною навколишнього середовища.

# Civil Defence

## Read and learn the new words

defence захист

consequence наслідок; наслідок; результат

establish засновувати; створювати, організовувати

destruction руйнування, знищення

counterattack контратака, контрнаступ

argue сперечатися

shelter дах, притулок

broadcast (радіо)віщання

whistle свист

hurricane ураган

forerunner попередник; предтеча

disaster нещастя

guidance керівництво; водійство

earthquake землетрус

preparedness готовність, підготовленість

## Read the texts and translate them

### Text 1

Civil defence is a nonmilitary program designed to save lives and property if an enemy attacks a country. Civil defence also provides assistance in such emergencies as blizzards, earthquakes, floods, hurricanes, tornadoes, explosions, and fires, and it is intended to reduce the consequences of major terrorist incidents.

In the United States, the federal, state, and local governments share the responsibility for civil defense. Local agencies develop and carry out civil defense plans for their communities with the guidance and assistance of state and federal agencies.

The first US civil defense agency, the Council of National Defence, was created in 1916, during World War. The council directed the nation's civil defence program until 1918, the year the war ended. In 1941, the Office of Civilian Defence was established to coordinate civil defense activities during World War II. In 1945, U.S. airplanes dropped atomic bombs on the Japanese cities of Hiroshima and Nagasaki, and the war ended. American leaders

recognized the need for a continuing civil defence program after the Soviet Union tested its first atomic bomb in 1949. The Federal Civil Defence Act of 1950 established the forerunner of the present civil defence system. The system has been reorganized several times. In 1979, The Federal Emergency Management Agency (FEMA) began to administer the nation's civil defence program.

Nuclear weapons have made civil defence more difficult than ever before. A missile can carry nuclear explosives from continent to continent in about 30 minutes and cause massive destruction. Some Americans believe civil defence is unnecessary. They question whether any nation would attack the United States at the risk of being destroyed in a nuclear counterattack. Others believe the destructive power of nuclear weapons, combined with the speed at which they can be delivered, makes civil defence useless. Some experts argue that civil defence could save at least half the U.S. population if a nuclear attack occurred, but other experts strongly disagree with that view. Supporters of civil defence say the program keeps communities prepared to protect lives and property in severe storms and other disasters.

### **Civil defence in action**

The first task of a civil defence agency in an emergency is to warn the public of danger and provide instructions on how to avoid hazards. People may be able to protect themselves from an enemy attack or other disaster in one of two ways. They can (1) evacuate the area or (2) remain and take shelter. Civil defence agencies advise the public about the best action to follow in a particular situation. They also coordinate rescue efforts and other emergency services. In most disasters, however, people usually reach safety without help and take care of their own needs.

**Warning.** Most civil defence agencies in the United States warn communities of danger by means of the attack warning signal and the attention, or alert signal. Both signals last for three to five minutes.

The attack warning signal consists of a wavering sound from a siren or a series of short blasts on a factory whistle or other device. This signal means that an enemy has attacked the country and that people should act immediately to protect themselves. The attention signal is a long, steady sound from a siren, whistle, another device. It means that the community is threatened by a peacetime disaster. After either signal has sounded, radio and television stations

broadcast information about the danger and give instructions for the public to follow.

**Evacuation.** Floods and hurricanes are the most common disasters for which communities are evacuated. Unlike many natural disasters that strike suddenly, most floods and hurricanes can be predicted in time for people to safely leave the area. If time permits, individuals should board up windows and disconnect all electric appliances before leaving home. Then they should go to the location directed by the civil defence agency, using the route specified. Citizens also may be asked to evacuate an area after an industrial accident to protect them from such hazards as leaking gasoline or poisonous fumes.

No nation could evacuate its cities in time to prevent the massive loss of life from a surprise missile attack. However, most U.S. defense experts believe that a nuclear war would begin only after a period of extreme tension between enemy nations. Some of these experts predict that the people of major cities could be moved to rural "host areas" before a war started. Other experts believe that such evacuations would be rendered futile by the widespread havoc created by nuclear war.

**Shelter.** Earthquakes, tornadoes, and other emergencies that occur suddenly give people little or no time to evacuate a community. If a tornado approaches, people should immediately take shelter in a storm cellar or basement. In an earthquake, they should stand under a doorframe or crouch under a table or chair until the shaking stops. If caught outdoors during such emergencies, they should get away from such objects as telephone poles, power lines, or anything else that might fall or be blown down. If a tornado, people should lie facedown in a ditch if possible for protection against flying debris.

People must also take cover immediately in an enemy attack. After a nuclear attack, they may be required to remain in a fallout shelter for two weeks or longer. Such shelters provide protection from radioactive fallout that has been scattered into the air by a nuclear explosion. Particles of fallout can cause illness or death and may settle on an area hundreds of miles or kilometers from the explosion. As a result, their people who have been evacuated from the blast area must remain in shelters.

The basements of office buildings, factories, and schools, plus mines and, subway tunnels, could serve as public fallout

shelters in a nuclear attack. People also could use the basement of their Borne as a fallout shelter. Fallout loses much of its radioactivity after a few days. Following an attack, civil defense officials would measure the amount of radiation and announce when people could safely leave their shelters.

**Emergency services.** When a natural disaster strikes, civil defense agencies coordinate the efforts of fire fighters, police officers, and other community employees to save lives and property. These workers often with help from the National Guard, Red Cross volunteers, and others evacuate people who have been stranded in, hazardous areas. They also provide medical care for the injured and food and shelter for people who have had to leave their homes. Officials may find it necessary to close off certain areas to prevent looting of unattended buildings. If a nuclear war appeared likely, efforts would be made to stock public fallout shelters with food, water, and other supplies that were locally available. Civil defence officials would supervise survival operations in the shelters if war broke out.

Communities begin recovery activities as soon as possible after an emergency. Workers clear away garbage and other debris, and utility companies restore telephone communications and water, gas, and electrical service. Welfare organizations help victims of the tragedy who have been left homeless. Some communities have counseling programs to meet the emotional needs of individuals who suffer psychological damage as a result of a major disaster.

### **How civil defence is administered**

In the United States, the Federal Emergency Management Agency coordinates the nation's nonmilitary preparations for an enemy attack. The agency also has the chief responsibility for the federal programs that follow peacetime disasters. FEMA works with industries, national organizations, and state and local government to improve civil defence preparedness.

FEMA administers a nationwide system of public fall, out shelters and thousands of emergency operating centers. The centers are protected places where top officials can meet to direct operations in an emergency situation.

In a major peacetime disaster, such as an especially destructive flood or storm, the President may declare a region to be a disaster area. Such a declaration makes the area eligible to receive

funds and other assistance from the federal government to help deal with the disaster. FEMA coordinates this relief program.

Every state has a civil defence director and provides assistance to the civil defense agencies of its cities and counties. Most cities and counties also have a civil defense director. This official coordinates emergency preparations made by the local government and by individuals and private organizations.

In Canada, a federal agency called the National Emergency Planning Establishment, also known as Emergency Planning Canada, administers civil defence. It coordinates emergency planning by a federal agencies and departments. It also helps the cities, provinces, and territories plan for major emergencies.

In other countries Civil defence programs are conducted by the governments of many other countries, including Denmark, Norway, Russia, Sweden, Switzerland and the United Kingdom. For example, the United Kingdom Warning and Monitoring Organization are set up to warn the public of an enemy attack and measure the level of nuclear fallout.

### **What to do in a nuclear attack**

1. Take cover immediately after hearing the attack warning signal. Go to a fallout shelter if possible. If a flash from a nuclear explosion occurs before you reach a fallout shelter, take whatever cover you can find, preferably in; ditch or other low-lying area. Instant action may prevent serious burns and other injuries caused by the heat and blast waves of the explosion.

2. Do not look at the nuclear flash. It can cause temporary or permanent blindness.

3. Move to a fallout shelter after the blast. Any structure with thick walls that block radiation can serve as a fallout shelter. Possible shelters include basements of houses and other buildings, corridors in the center of large buildings, and subway tunnels.

4. Bring necessary supplies to the fallout shelter. Such necessities include water, ready-to-eat food, sanitation equipment, medicine and first-aid supplies, and a flashlight, a battery-powered radio, and spare batteries.

5. Do not leave the fallout shelter until advised by authorities. Radio broadcasts will tell you when it is safe to go outside. In most areas, people could leave the shelter for short periods after two or three days. In areas of heavy fallout, they probably could leave after a week or two to perform such tasks as

obtaining food or water.

## Text 2

**Civil defense, civil defence or civil protection** is an effort to prepare civilians for military attack. It uses the principles of emergency operations: prevention, mitigation, preparation, response, or emergency evacuation, and recovery. Programmes of this sort were initially discussed at least as early as the 1920s but only became widespread after the threat of nuclear weapons was realized.

Since the end of the Cold War, the focus of civil defense has largely shifted from military attack to emergencies and disasters in general. The new concept is described by a number of terms, each of which has its own specific shade of meaning, such as **crisis management, emergency management, emergency preparedness, contingency planning, emergency services, and civil protection**. In some countries, the all-encompassing nature of civil defense is denoted by the term "total defense". The name suggests committing all resources, hence the term total, of the nation to the defense.

Civil Defense literature such as Fallout Protection were common during the cold war era.

In most of the NATO states, such as the United States, the United Kingdom or Germany as well as the [then] Soviet Bloc, and especially in the neutral countries, such as Switzerland and in Sweden during the 1950s and 60s, many civil defense practices took place to prepare for the aftermath of a nuclear war, which seemed quite likely at that time. Such efforts were opposed by the Catholic Worker Movement and by peace activists such as Ralph DiGia , on the grounds that these programs gave the public false confidence that they could survive a nuclear war. There was never strong civil defense policy because it fundamentally violated the doctrine of "mutual assured destruction" (M.A.D.) by making provisions for survivors. Also, a fully fledged total defense would have been too expensive. Above all, compared to the power of destruction a defense would have been ineffective. In the M.A.D. doctrine, there are not supposed to be any survivors for a civil defense system to assist (thus the acronym). Governments in the West sought to implement civil defense measures against nuclear war in the face of popular apathy and scepticism.



Public Service Announcements including children's songs were created by government institutes and then distributed and released by radio stations to educate the public in case of nuclear attack.

During the Cold War, civil defense was seen largely as defending against and recovering from an attack involving nuclear weapons. After the end of the Cold War, the focus moved from defense against nuclear war to defense against a terrorist attack possibly involving chemical or biological weapons; in the context of the United States this eventually led to the replacement of the United States civil defense with the Federal Emergency Management Agency. After the September 11, 2001 attacks, in the United States the concept of civil defense has been revisited under the umbrella term of homeland security and all-hazards emergency management.

In Europe, the triangle CD logo continues to be widely used. The old US civil defense logo was used in the FEMA logo until recently and is hinted at in the United States Civil Air Patrol logo. Created in 1939 by Charles Coiner of the N. W. Ayer Advertising Agency, it was used throughout World War II and the Cold War era. In 2006, the National Emergency Management Association — a U.S. organization made up of state emergency managers — officially retired the Civil Defense triangle logo, replacing it with a stylized EM (standing for Emergency management).

The term "civil protection" is currently widely used within the European Union to refer to government-approved systems and resources tasked with protecting the civilian population, primarily in the event of natural and technological disasters. In recent years there has been emphasis on preparedness for technological disasters resulting from terrorist attack. Within EU countries the term **crisis management** emphasises the political and security dimension rather than measures to satisfy the immediate needs of the civilian population.

In Australia, civil defense is the responsibility of the volunteer-based State Emergency Service.

### **Answer the questions**

1. What is Civil defence?
2. When does it provide assistance?

3. Who shares the responsibility for Civil defence?
4. Who develops and carries out Civil defence plans?
5. What were the first US civil defence agencies?
6. When did the FEMA begin to administer the nation's civil defence program?
7. What is the first task of a civil defence agency in an emergency?
8. How can people protect themselves from an enemy attack or other disaster?
9. Who coordinates rescue efforts and emergency services in the country?
10. In what way do civil defence agencies warn communities of danger?
11. What are signals of danger?
12. What are the most common disasters for which communities are evacuated?
13. What must be done in case of leaking gasoline or poisonous fumes?
14. What should you remember if caught outdoors during natural disaster?
15. Whose efforts do civil defence agencies coordinate? Who help them?
16. Who supervises survival operations?
17. What do you know about the administration of civil defence in U.S.?
18. What should be done in a nuclear attack?
19. What organizations administer civil defence in other countries?

**Open the brackets use the verbs in the correct forms:**

1. How much of our national income to Civil Defence?
2. The government (to limit) the increase in civil defence spending to 7,5 per cent.
3. If you (to come) to someone's defence, you help them by doing something to protect them.
4. No one (to come) to her defence as the crowd (to surge) forward.
5. In September 1975, floods in north-eastern India made 233 600 people homeless.
6. Moments later, the flood (to subside) to a trickle.

7. The dam (to collapse), (to flood) an area of five thousand square miles.
8. The rice fields (to flood).
9. If a river (to flood) or if it (to flood) an area beside it, it (to overflow) usually after very heavy rain. A river that (to be in flood) (to overflow) because it (to have) more water in it than normal.
10. If people (to flood out) they (to have to) (to leave) their homes because of a flood.
11. If flooding occurs, an area of land that (to be dry) usually (to cover) with water when a river or lake overflows or after very heavy rain.
12. (There be) heavy rain in many areas resulting in widespread flooding.
13. The island (to be) in the path of the hurricanes in the Caribbean.
14. A few people (to run) about (to swing) hurricane lamps.
15. A tornado (to whir) into town.
16. Twenty men (to kill) in the explosion.
17. They (to fly) over the areas (to hit) by the nuclear explosion.
18. You (to hear) of the explosion in the chemical plant.
19. The explosion of nuclear devices in the atmosphere (to be) ruinous for our planet.
20. Explosion (to be) an act of deliberately (to cause) a bomb or similar device (to explode).
21. Over a thousand nuclear explosions (to conduct) since 1945.
22. All my attempts (to rescue) him (to be) in vain.
23. He (to rescue) from the (to sink) aircraft.
24. Rescue (to be) help which (to give) to someone or something which (to save) them from a dangerous or unpleasant situation.
25. Rescue (to be) at hand.
26. You might (to dream) of rescue, but it (to be) unlikely.
27. If you (to go) or (to come) to the rescue of someone or something you (to help) them when they (to be) in danger or difficulty.
28. It (to be) William who (to come) to the rescue of the Smiths.
29. Toby (to come) to my rescue when I (to have) the accident in the mountains.
30. The man's shouts could (not to hear) by the rescuers.

**Fill in the articles where necessary. Read the numerals and comment on their usage.**

## Development of the Helicopter

\_\_\_\_\_ earliest known mention of a rotor-powered flying machine appears in \_\_\_\_\_ Chinese text written about A.D. 320. \_\_\_\_\_ design of this machine may have been based on \_\_\_\_\_ Chinese toy called the flying top. Such toys flew by means of feather rotors. In 1483, \_\_\_\_\_ great Italian artist and scientist Leonardo da Vinci sketched a design for \_\_\_\_\_ helicopter. It had \_\_\_\_\_ large screwlike wing made of starched linen. In 1784, two Frenchmen named Launoy and Bienvenu, built \_\_\_\_\_ first model helicopter in Europe that could fly. Based on \_\_\_\_\_ Chinese flying top, it had two rotors made of feathers. Throughout \_\_\_\_\_ 1800's, inventors in Europe and \_\_\_\_\_ United States experimented with model helicopters. \_\_\_\_\_ steam engines and electric motors of that time were too weak or too heavy to power \_\_\_\_\_ full-sized helicopter.

By \_\_\_\_\_ early 1900's, small, powerful gasoline engines had been developed that made manned helicopter flight possible. \_\_\_\_\_ first manned flight took place in 1907. \_\_\_\_\_ craft was \_\_\_\_\_ four-rotor helicopter built by Louis Breguet, \_\_\_\_\_ French inventor. \_\_\_\_\_ helicopter lifted one of Breguet's assistants 2 feet (61 centimeters) into \_\_\_\_\_ air for a minute. Assistants on \_\_\_\_\_ ground steadied the helicopter during \_\_\_\_\_ flight. Later in 1907, \_\_\_\_\_ French mechanic named Paul Cornu made \_\_\_\_\_ first free flight in \_\_\_\_\_ helicopter. He flew his tandem-rotor aircraft to \_\_\_\_\_ height of about 6 feet (1.8 meters) for about 20 seconds.

**The First Practical Helicopters.** Early helicopters were difficult to control, and their flight was wobbly. In 1935, Breguet and another Frenchman, Rene Dorand, built \_\_\_\_\_ coaxial-rotor helicopter that was easier to control and flew far more steadily. In 1936, Henrich Focke, \_\_\_\_\_ German inventor, built \_\_\_\_\_ twin-rotor helicopter that was even further advanced. The following year, it reached \_\_\_\_\_ speed of 76 miles (122 kilometers) per hour and \_\_\_\_\_ altitude of about 8,000 feet (2,400 meters). It could stay aloft for 1 hour and 20 minutes.

The first flight of \_\_\_\_\_ practical single-rotor helicopter took place in \_\_\_\_\_ United States in 1939. The craft was built and flown by Igor I. Sikorsky, a Russian engineer who had moved to the United States in 1919. Both \_\_\_\_\_ British and \_\_\_\_\_

United States armed forces used \_\_\_\_\_ improved version of Sikorsky's helicopter during World War II (1939-1945).

**Further Improvements.** During \_\_\_\_\_ mid-1900's, \_\_\_\_\_ military use of helicopters began to increase greatly, which led to major improvements in their design. \_\_\_\_\_ helicopters had been used mainly for \_\_\_\_\_ patrol and \_\_\_\_\_ rescue missions in World War II. New tasks for \_\_\_\_\_ helicopter during the Korean War (1950-1953) included armed observation of enemy positions and strength and transporting troops and supplies to hard-to-reach areas. During the Vietnam War (1957-1975), thousands of armed U.S. attack helicopters flew combat missions.

The ever-expanding military use of helicopters encouraged \_\_\_\_\_ development of faster, larger, and more powerful craft. In \_\_\_\_\_ 1940's and 1950's, engineers adapted \_\_\_\_\_ jet engine for use in helicopters. Jet engines were lighter and more powerful than \_\_\_\_\_ previous engines used to turn \_\_\_\_\_ rotor shafts. They enabled helicopters to fly faster and higher and to carry heavier loads. In addition, \_\_\_\_\_ use of new construction materials made helicopters lighter, safer, and stronger. For example, longer-lasting plastic blades replaced metal or wooden rotor blades. Such improvements also made helicopters suitable for more civilian uses.

**Recent Developments** include efforts by manufacturers to simplify \_\_\_\_\_ complicated operation of helicopters and to increase their speed. One manufacturer has developed \_\_\_\_\_ single-rotor helicopter that needs no tail rotor. Instead of \_\_\_\_\_ tail rotor, \_\_\_\_\_ craft uses jets of air to counteract torque and to change direction. Attempts to increase \_\_\_\_\_ speed of helicopters have led to \_\_\_\_\_ development of experimental compound helicopters. These vehicles do not depend entirely on rotors to provide forward movement as well as lift. Instead, they also have jet or propeller systems to help push or pull them ahead. One \_\_\_\_\_ compound helicopter has reached the speed of 345 miles (555 kilometers) per hour.

**Read the following text and match the headlines given in the box to the appropriate paragraphs**



**For Military Missions**

- **For Aerial Observation**
- **For Agricultural and Forestry Operations**
- **Helicopter**
- **For Transportation and Construction Work**
- **For Rescue Missions**

\_\_\_\_\_ (to be) an aircraft that is (to lift) into the air and kept aloft by one or two powerful whirling rotors. A helicopter rotor (to resemble) a huge propeller that is parallel to the ground. However, the rotor (to be) actually a rotating wing. The name helicopter (to refer) to the rotor. It (to come) from the Greek words helix, meaning spiral, and pteron, meaning wing. Nicknames for the helicopter (to include) “chopper”, “eggbeater”, and “whirlybird”.

A helicopter can (to fly) straight up or straight down, forward, backward, or sideways. It can even (to hover) (stay in one spot in the air). Unlike most airplanes, helicopters (to need) no runway. They can (to take off) and land in very small space. In addition, helicopters can (to fly) safely at much slower speeds and lower altitudes than airplanes.

Helicopters can (to use) for many tasks because they (to be able) (to hover) in midair and (to take off) and (to land) in small areas. They (to be) particularly useful (1) for rescue missions, (2) for aerial observation, (3) for transportation and construction work, (4) for agricultural and forestry operations, and (5) for military missions.

\_\_\_\_\_ Farmers use helicopters (to spread) seeds, fertilizers, weedkillers, and insecticides over large areas. Instead of (to build) roads, some companies that (to manufacture) forest products depend on helicopters (to transport) logging crews into and out of forests and (to carry out) logs.

\_\_\_\_\_ In the armed forces, helicopters (to serve) as flying ambulances and as troop transports. Powerful military helicopters (to carry) artillery to key battle positions and (to fly) jeeps, tanks, and other equipment wherever they (to need). Helicopters (to equip) with electronic gear (to pick up) and (to disrupt) enemy communications signals. The armed forces also (to use) helicopters (to observe) the movements of enemy troops and ships. Many naval helicopters (to have) devices (to locate) and (to track) submarines. They may also (to arm) with depth charges, missiles, or torpedoes. Army attack helicopters may (to carry) bombs,

cannons, machine guns, or missiles. Their main targets are enemy tanks.

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Many early developers of helicopters (to intend) them (to use) for saving lives. Over the years, many thousands of people have been rescued by these “angels of mercy”. A helicopter can (to hover) above the scene of a disaster. A sling or harness can then (to lower) from the craft to endangered people below. They are then (to pull up) and (to flow) to safety. Helicopters (to use) (to pluck) people from burning skyscrapers, sinking ships, and rising floodwaters. They (to fly) stranded mountain climbers and injured skiers to safety. (To serve) as flying ambulances, helicopters can (to land) near automobile or airplane crashes and (to rush) the injured to hospitals. Helicopters are also (to use) (to deliver) food and medicine to areas that cannot (to reach) by other vehicles because of earthquakes, floods, or storms.

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In many cities, police use helicopters (to trail) fleeing suspects and (to direct) squad cars on the ground. Law enforcement agents in helicopters (to look) for lost people and escaped convicts. They also (to patrol) national borders on the lookout for smugglers and illegal immigrants.

Many radio and television stations (to use) helicopters (to cover) news events from the air. In large cities, helicopter pilots (to observe) the flow of traffic and (to broadcast) radio reports (to warn) drivers of traffic jams. Motion-picture companies often (to film) from helicopters (to give) audiences a bird’s-eye view of a scene. Helicopter pilots (to fly) low along pipelines, railroad tracks, and power lines (to inspect) them for damage.

Helicopters (to use) (to explore) wilderness areas, to survey land, and (to help) (to locate) oil and other resources. From helicopters, scientists (to count) wildlife populations and (to chart) the migration routes of wild animals. Some fishing fleets (to use) helicopters to spot schools of tuna.

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Helicopter transportation (to be) expensive. However, the convenience of helicopter flight (to make) “choppers” ideal transport vehicles for certain uses. The flexibility, security, and speed of helicopter travel (to make) it a major method of transportation for political leaders in many countries. Helicopter travel (to save) business executives time that they otherwise might (to waste) in (to use) slow-moving ground transportation. From heliports (airports for helicopters) atop

downtown office buildings, business executives may (to fly) directly to nearby cities for meetings.

Helicopter service (to be) essential to many offshore oil-drilling operations. Numerous offshore wells (to be) in rough ocean waters that (to make) it hazardous (to bring) in replacement crews and supplies by ship. However, helicopters can (to land) on the drilling platforms and so (to provide) much faster and safer delivery than ships.

Helicopters are often (to use) (to transport) cargo that (to be) too large or awkward for other vehicles (to haul). The cargo (to carry) in a sling hanging below the craft.

Powerful helicopters (to use) in construction work as “flying cranes”. Workers in helicopters install antennas and huge air conditioners atop tall buildings and erect preassembled electric power transmission towers. Workers also (to use) helicopters to pour concrete in hard-to-reach places and (to put) long bridge sections in position.

### **Answer the questions**

1. What aircraft can be called helicopter?
2. What kind of wings does a helicopter have?
3. What do you know about the word helicopter?
4. Are there any nicknames for the helicopter?
5. What are basic characteristics of the helicopter?
6. Why are helicopters called “angels of mercy “?
7. What can helicopters serve as?
8. What are they used for?
9. What makes use of helicopters?
10. How are helicopters used in the construction industry?
11. What are some military uses of the helicopter?
12. In what ways can a helicopter fly that an airplane cannot?
13. Why is helicopter service essential to many offshore oil-drilling operations.
14. Why is use of helicopter essential for rescue servicers?

### **Passive Voice**

1. A single rotor helicopter that needs no tail rotor (to develop) by one manufacturer. Instead of a tail rotor, jets of air (to use) by the craft (to counteract) and (to change) direction.



2. The development of faster, larger, and more powerful craft (to encourage) by the ever-expanding military use of helicopter.
3. Helicopter (to make) lighter, suffer, and stronger. Due to the use of new construction materials
4. Helicopters in combat (to use) first on a massive scale by United States armed forces during the Vietnam War (1957-1975)
5. The first practical single-color helicopter (to build) and (to fly) by Igor Sikorsky.
6. The lives of thousands of people (to save) by helicopter Rescue missions.
- &. An antisubmarine helicopter (to arm) with torpedoes. Electronic Devices (to mount) on such helicopter (to use) (to locate) and (to track) submarines.
8. A single-rotor helicopter (to have) one main rotor (to mount) above its body and although it (to call) a single-rotor helicopter, it also (to have) a second, smaller rotor (to mount) on its tail. The tail rotor (to use) to control direction.
9. Two basic types of twin-rotor helicopters (to use) widely: tandem-rotor helicopters and coaxial-rotor helicopters. The rotors (to mount) above the middle of the helicopters body.
10. Helicopters (to use) mainly for patrol and rescue missions in World War 2.

**Put the verbs in brackets into the correct forms. Read the text about the Red Cross.**

**The Red Cross.** (to be) an organization that (to give) help to people all over the world both in peacetime and war. Its flag is a red cross on a white background.

The Red Cross (to start) by Henri Dunant. He (to see) a terrible battle in Italy and (to go) among the dead and wounded soldiers after the battle (to be over). Shocked that the suffering men (not to receive) attention, Dunant got the people of the nearby villages to help him care for the wounded of both sides.

When he (to return) to his home in Switzerland, Dunant (to set about) to form an organization to care for the suffering in all wars. In 1863, at a meeting for this purpose at Geneva, Switzerland, the International Red Cross (to get) its start. Today (there be) 126 national Red Cross societies in the world, with over 200,000,000 members. The League of Red Cross Societies (to serve) as a link

between all the national organizations. This (to make) it possible for the national organizations (to co-operate) with each other and (to make) use of Red Cross societies worldwide.

The International Committee of the Red Cross (to supervise) the Geneva Conventions, by which nations (to honor) the battlefield neutrality of the Red Cross and (to agree) to humane treatment of prisoners of war and civilians. Some Muslim countries (to use) a red crescent on a white field instead of the Red Cross Iran (to use) a red lion and sun design.

**Insert articles where necessary. Explain the usage of the articles. Read the following text**

American National Red Cross.

... Red Cross in ... United States Was started in 1881, with Clara Barton as its... first president. ... Miss Barton had become known for her work among ... sick and ... wounded during ... U.S. Civil War. In 1881 also ... organization took part in its first disaster relief work, giving aid to ... homeless after ... large forest fire in Michigan.

... disaster relief work of the American National Red Cross Includes sending help of all kinds to areas struck by floods, hurricanes, fires, explosions, and other storms or accidents. ... American Red Cross provides food, shelter, and clothing for ... people of these disaster areas. Recent major disasters that brought Red Cross aid included Hurricane Agnes in 1972, in which emergency care was given to 504,042 persons in 11 eastern states; flash floods at Ruffalo Creek, West Virginia, and Rapid City, South Dakota, also in 1972; and ... 1974 tornado onslaught many Midwest communities.

... American Red Cross has helped U.S. military forces in each war since ... Spanish-American War in 1898. It has aided them in ... areas of health, welfare, and recreation.

In addition to its work in disaster and its services, ... American Red Cross works for ... general health, safety, and welfare of ... country. ... Red Cross Blood Program, for example, operates throughout ... country and has blood ready for anyone needing it. Over 4,000,000 units of blood per year are collected.

The American Red Cross provides training.

Each year. It... constantly trains new instructors to teach these courses. ... Volunteers trained by ... American Red Cross serve

regularly in ... hospitals, nursing homes, and blood centers throughout the country. Other workers, such as ... women who roll bandages and compresses for .... Hospitals, motor service drivers, ... volunteer disaster workers, and canteen workers, help others through... American Red Cross.

**Put the verbs in brackets into the correct voice and tense-forms.  
Read the text**

The American National Red Cross (to be) a semiofficial agency of the United States. The President of the United States served as honorary chairman. A board of Governors (to direct) the activities of the organization.

American Red Cross national headquarters(to be) in Washington, D.C. Area offices (to be) in Alexandria, Virginia; Atlanta, Georgia; St. Louis, Missouri; and San Francisco, California. Every community in the country (to serve) by a local Red Cross chapter. ( There be) more than 3.100 chapters.

The work of the organization, (to carry) on by a permanent staff and about 1,500,000 volunteers throughout the country. The money for Red Cross services ( to contribute) by the public.

### **Red Cross Youth**

Young people (to serve) the American Red Cross through activities of the Red Cross youth, which (to include) student-members in more than 37,000 elementary and high schools, plus students in hundreds of colleges and universities. Besides (to serve) in their home communities, Red Cross Youth members ( to send) gift boxes, correspondence albums, paintings, and other items to children in other countries. They also (to make) articles (to give) to soldiers and veterans in hospitals. Red Cross Youth members (to make part) in all Red Cross activities where young people (to need). Youth programs (to set up) tutoring partnerships with children, recruit teenagers for volunteer work in hospitals, and (to set up) volunteer projects in nursing homes.

**All the paragraphs in this text are jumbled up. Rearrange them into the correct order. Fill in the gaps in these sentences with a suitable word the first letter of which it given. Read the text**

## **Canadian Red Cross Society**

The Canadian Red Cross Youth is a .... In international relief w..... Each year it provides a ... to some 50 countries throughout the world.

The Red Cross in C... was established in 1896 as the first overseas b... of the British Red Cross Society. From this small b... developed the Canadian Red Cross Society. It was incorporated by an act of Parliament in 1909. the Society was r... by the International committee of the Red Cross as an independent national society in 1927.

Canadian Red Cross Youth has more than 400,000 m... in schools from Newfoundland to british Columbia. It's most interested in h... and c... children in Canada and in Unfortunate children overseas.

The Canadian Red Cross Society is a... in the provinces of Canada in more than 1,000 communities. The Canadian Red Cross provides disesler s... velerans' s... instruction in first a..., water s..., and home n... as well as travelling medical and dental clinics. The Red Cross also operates a nrtwork of 25 Outpost Hospitals and Nurting Stations for p... in areas that are for from other h.... A national free Blood Transfusion Service operates in all ten provinces.

# Industrial disasters

## Read the texts and translate them

### Text 1

#### Industrial disasters

**Industrial disasters** are mass disasters caused by industrial companies, either by accident, negligence or incompetence.

The **Abnormal Situation Management (ASM)** Consortium is a long-running and active Honeywell-led research and development consortium of 12 companies and universities that are concerned about the negative effects of industrial accidents. An *abnormal situation* is a disturbance or series of disturbances in a process that causes plant operations to deviate from their normal operating state. The disturbances may be minimal or catastrophic, and cause production losses or, in serious cases, endanger human life. The result of an abnormal situation can be unnecessary costly due to production losses, off-spec product, equipment damage, or worse.

#### Causes of Abnormal Situations

The Consortium's early studies of incident reporting systems across multiple sites confirmed three principal sources of abnormal situations: people or work context factors; equipment factors; and process factors.

**People and work context** factors accounts for an average 42 percent of incidents (range of 35% to 58%). The influences on this factor are the training, skill and experience levels of the operations teams and their stress levels when situations reach alarm conditions. As well, the organizational structure, communications, environment and documented procedures and practices (or lack thereof) play a role in operator response.

**Equipment** factors account for an average 36 percent of incidents (range 30% to 45%). This category includes degradation and failures in the process equipment, such as pumps, compressors and furnaces, and failures in the control equipment, such as sensors, valves and controllers.

**Process** factors account for an average 22 percent of incidents (range 3% to 35%). Impacts include process complexity, types of materials and manufacturing (batch vs. continuous) and state of operation—steady state vs. startups, shutdowns and transitions.

- Grover Shoe Factory disaster was a boiler explosion, building collapse and fire that killed 58 people and injured 150 in Brockton, Massachusetts on March 20, 1905.
- Courrières mine disaster in Courrières, France, on March 10, 1906. 1,099 workers died, including children, in the worst mine accident ever in Europe.
- Triangle Shirtwaist Factory fire in New York City on March 25, 1911. This was a major industrial disaster in the U.S., causing the death of more than one hundred garment workers who either died in the fire or jumped to their deaths. The fire led to legislation requiring improved factory safety standards and helped spur the growth of the International Ladies' Garment Workers' Union, which fought for better working conditions for sweatshop workers in that industry.
- The Boston Molasses Disaster occurred on January 15, 1919. A large molasses tank burst and a wave of molasses rushed through the streets at an estimated 35 mph (56 km/h), killing 21 and injuring 150. The event has entered local folklore, and residents claim that on hot summer days the area still smells of molasses.
- Port Chicago Disaster. On 17 July [[1944, an explosion that killed 320 people occurred at the Port Chicago Naval Magazine in Port Chicago, California.
- Ludwigshafen, Germany, 1948: The explosion of a tank wagon within the BASF-site, loaded with chemicals, causes 207 fatalities.
- Seveso disaster. This was an industrial accident that occurred in Seveso, Italy, on July 10, 1976, in a small chemical manufacturing plant of ICMESA. Due to the release of dioxins into the atmosphere and throughout a large section of the Lombard Plain, 3,000 pets and farm animals died and, later, 70,000 animals were slaughtered to prevent dioxins from entering the food chain. In addition, 193 people in the affected areas suffered from chloracne and other symptoms. The disaster led to the Seveso Directive, which was issued by the European Community and imposed much harsher industrial regulations.
- Bhopal disaster in India (1984). This was one of the worst industrial disasters on record. A faulty tank containing poisonous methyl isocyanate leaked at a Union Carbide plant and left nearly 3,000 people dead initially, and at least 15,000 from related

illnesses.<sup>[1]</sup> The disaster caused the region's human and animal populations severe health problems to the present.

- Kader Toy Factory fire. On May 10, 1993, a fire started in a poorly built factory in Thailand. Exit doors were locked and the stairwell soon collapsed. 188 workers were killed, mostly young women.
- Enschede fireworks disaster on May 13, 2000. A fire and explosion at a fireworks depot in Enschede, Netherlands leaves 22 people dead and 947 injured. About 1,500 homes are damaged or destroyed. The damage is estimated to be over US\$ 300 million in insured losses.
- Texas City Refinery explosion. On March 23, 2005, an explosion occurred at a petroleum refinery in Texas City, Texas, that belonged to BP. It is the third largest refinery in the United States and one of the largest in the world, processing 433,000 barrels of crude oil per day and accounting for 3% of that nation's gasoline supply. Over 100 were injured, and 15 were confirmed dead, including employees of the Fluor Corporation as well as BP. BP has since accepted that its employees contributed to the accident. Several level indicators failed, leading to overfilling of a knock out drum, and light hydrocarbons concentrated at ground level throughout the area. A nearby running diesel truck set off the explosion.
- Hertfordshire Oil Storage Terminal fire, on December 11, 2005 a series of explosions at the Buncefield oil storage depot described as the largest peacetime explosion in Europe, devastated the terminal and many surrounding properties. Fortunately there were no fatalities, however, as the explosions occurred early on a Sunday the neighbouring industrial estate, which was severely damaged, it is likely that there would have been extensive casualties/fatalities if the explosions had occurred during a working day. Total damages have been forecast as £750 million.
- Qinghe Special Steel Corporation disaster, on April 18, 2007, a ladle holding molten steel separated from the overhead iron rail, fell, tipped, and killed 32 workers, injuring another 6.
- The 2008 Georgia sugar refinery explosion occurred on February 7, 2008 in Port Wentworth, Georgia, United States. Thirteen people were killed and 42 injured when a dust explosion occurred at a sugar refinery owned by Imperial Sugar.

Other disasters can be considered industrial disasters, because their causes are rooted in the products or processes of industry. For example, the Great Chicago Fire of 1871 was severe due to the heavy concentration of lumber industry, wood houses, fuel and other chemicals in a small area.

## **Text 2**

### **Chernobyl Nuclear Accident**

#### **Date and Time of the Chernobyl Nuclear Accident:**

The Chernobyl nuclear accident occurred on Saturday, April 26, 1986, at 1:23:58 a.m. local time.

#### **Location of the Chernobyl Nuclear Power Station:**

The V.I. Lenin Memorial Chernobyl Nuclear Power Station was located in Ukraine, near the town of Pripyat, which had been built to house power station employees and their families. The power station was in a wooded, marshy area near the Ukraine-Belarus border, approximately 18 kilometers northwest of the city of Chernobyl and 100 km north of Kiev, the capital of Ukraine.

#### **Background on the Chernobyl Nuclear Accident:**

The Chernobyl Nuclear Power Station included four nuclear reactors, each capable of producing one gigawatt of electric power. At the time of the accident, the four reactors produced about 10 percent of the electricity used in Ukraine.

Construction of the Chernobyl power station began in the 1970s. The first of the four reactors was commissioned in 1977, and Reactor No. 4 began producing power in 1983. When the accident occurred in 1986, two other nuclear reactors were under construction.

#### **The Chernobyl Nuclear Accident:**

On April 26, 1986, the operating crew planned to test whether the Reactor No. 4 turbines could produce enough energy to keep the coolant pumps running until the emergency diesel generator was activated in case of an external power loss. During the test, power surged unexpectedly, causing an explosion and driving temperatures in the reactor to more than 2,000 degrees Celsius—melting the fuel rods, igniting the reactor's graphite covering, and releasing a cloud of radiation into the atmosphere.



### **Causes of the Chernobyl Nuclear Accident:**

The precise causes of the accident are still uncertain, but it is generally believed that the series of incidents that led to the explosion, fire and nuclear meltdown at Chernobyl was caused by a combination of reactor design flaws and operator error.

### **Loss of Life from the Chernobyl Nuclear Accident:**

By mid-2005, fewer than 60 deaths could be linked directly to Chernobyl—mostly workers who were exposed to massive radiation during the accident or children who developed thyroid cancer.

Estimates of the eventual death toll from Chernobyl vary widely. A 2005 report by the Chernobyl Forum—eight U.N. organizations—estimated the accident eventually would cause about 4,000 deaths. Greenpeace places the figure at 93,000 deaths, based on information from the Belarus National Academy of Sciences.

### **Physical Health Effects Linked to the Chernobyl Nuclear Accident:**

The Belarus National Academy of Sciences estimates 270,000 people in the region around the accident site will develop cancer as a result of Chernobyl radiation and that 93,000 of those cases are likely to be fatal.

Another report by the Center for Independent Environmental Assessment of the Russian Academy of Sciences found a dramatic increase in mortality since 1990—60,000 deaths in Russia and an estimated 140,000 deaths in Ukraine and Belarus—probably due to Chernobyl radiation.

### **Psychological Effects of the Chernobyl Nuclear Accident:**

The biggest challenge facing communities still coping with the fallout of Chernobyl is the psychological damage to 5 million people in Belarus, Ukraine and Russia.

"The psychological impact is now considered to be Chernobyl's biggest health consequence," said Louisa Vinton, of the UNDP. "People have been led to think of themselves as victims over the years, and are therefore more apt to take a passive approach toward their future rather than developing a system of self-sufficiency."

### **Countries and Communities Affected by the Chernobyl Nuclear Accident:**

Seventy percent of the radioactive fallout from Chernobyl landed in Belarus, affecting more than 3,600 towns and villages, and

2.5 million people. The radiation contaminated soil, which in turn contaminates crops that people rely on for food. Many regions in Russia, Belarus and Ukraine are likely to be contaminated for decades.

Radioactive fallout carried by the wind was later found in sheep in the UK, on clothing worn by people throughout Europe, and in rain in the United States.

### **Chernobyl Status and Outlook :**

The Chernobyl accident cost the former Soviet Union hundreds of billions of dollars, and some observers believe it may have hastened the collapse of the Soviet government.

After the accident, Soviet authorities resettled more than 350,000 people outside the worst areas, including all 50,000 people from nearby Pripyat, but millions of people continue to live in contaminated areas.

After the breakup of the Soviet Union, many projects intended to improve life in the region were abandoned, and young people began to move away to pursue careers and build new lives in other places.

"In many villages, up to 60 percent of the population is made up of pensioners," said Vasily Nesterenko, director of the Belrad Radiation Safety and Protection Institute in Minsk. "In most of these villages, the number of people able to work is two or three times lower than normal."

After the accident, Reactor No. 4 was sealed, but the Ukrainian government allowed the other three reactors to keep operating because the country needed the power they provided. Reactor No. 2 was shut down after a fire damaged it in 1991, and Reactor No. 1 was decommissioned in 1996. In November 2000, the Ukrainian president shut down Reactor No. 3 in an official ceremony that finally closed the Chernobyl facility.

But Reactor No. 4, which was damaged in the 1986 explosion and fire, is still full of radioactive material encased inside a concrete barrier, called a sarcophagus, that is aging badly and needs to be replaced. Water leaking into the reactor carries radioactive material throughout the facility and threatens to seep into the groundwater. The sarcophagus was designed to last about 30 years, and current designs would create a new shelter with a lifetime of 100 years. But radioactivity in the damaged reactor would need to be contained for

100,000 years to ensure safety. That is a challenge not only for today, but for many generations to come.

### **Text 3**

#### **Weather Considerations**

The driver of an emergency vehicle must be constantly alert during inclement weather- rainstorms and fog decrease visibility and allowances in speed and following distances should be made. During the first twenty minutes of a rainstorm the pavement can be extremely hazardous since the accumulation of grease and oils on the pavement makes an extremely slippery emulsion. Vehicles tend to hydroplane, or skim along on the surface of water, above certain speeds on wet pavement. Experienced drivers slow down to meet the conditions of the road and their own capabilities.

Icy or snowy roads present special hazards which must *be* taken into consideration. The driver should get the feel of the roads by trying out the brakes occasionally while driving slowly and away from traffic. This will acquaint him with the slipperiness of the road. Speed should be decreased to road and weather conditions so that stops and maneuvering can be handled safely. Keep the windshields clear and be certain headlights, windshield wiper blades and defrosters are in perfect condition. The use of chains on snow and ice will decrease stopping distances and increase starting and hill-climbing traction. Pump the brakes to slow down or stop. Jamming the brakes can lock the wheels and throw the vehicle into a dangerous skid. Follow other vehicles at a safe distance so there is room to stop. It takes three to twelve times the distance to stop on snow and ice as (in dry concrete. When traveling over bridges, beware of ice even when the rest of the roadway is ice-free. Water on a bridge will freeze long before water on roadways.

#### **Environmental Considerations**

City driving poses special problems of which the apparatus driver should be cognizant. Headways crowded with hundreds of vehicles make trying to arrive at a location quickly a frustrating experience. Near shopping areas or business districts drivers must be alert to pedestrians. Be extremely cautious when turning at

intersections, since pedestrians may step from the curb to cross the intersection. In apartment or residential areas, the number of cars can often far exceed the number of parking spaces or garages. This condition results in cars parking in streets or in other than designated parking spaces in lots. Fire apparatus may have trouble maneuvering in these areas, and such conditions should be noted during preplanning if at all possible. Since playing children are constantly moving in and around parked cars, be especially alert in such areas during daylight hours.

Rural driving, like city driving, requires special precautions but for different reasons. Speed must be reduced during dry summer months on dirt roads since dust gathers on these roads and may obstruct vision. This is especially true when traveling behind another vehicle. Country blacktop roads can be treacherous since loose gravel may be on the surface. This occurs primarily at curves, and traveling at higher speeds may cause an unexpected slide. Rural bridges present a problem to the driver in that the vehicle may exceed the weight limit for the bridge. Slow down and check the posted weight the bridge can withstand. Such contingencies should be preplanned whenever possible. Freeways, turnpikes and other controlled access-type roads can present unique problems when getting onto them. Exit ramp may have very limited visibility to service; roads and emergency vehicles may find themselves locked into a continuous "parking lot." Remain calm because oftentimes progress can be made on shoulder strips or median separations. Never enter on exit ramps the wrong direction unless the entire road system has been secured by law enforcement officers.

Pre-fire planning for these emergencies is extremely important and can save valuable response time as well as alleviating frustrating situations.

### **The Ecological Problems**

1. The global ecological problem is how to preserve our environment from pollution.

2. The pollution of the water is evident.

- Water animals and fish die, water become unfit to drink.
- Water flora disappears or starts to modificate.

3. Air pollution is evident too.

- The climate changes in some parts of the planet.

- We can see smog near plants, factories and at the centers of cities.

4. An there is invisible pollution.

5. This is radiation, the most dangerous kind of pollution.

6. It occurs around nuclear power station and cemeteries of radioactive waste.

7. But accident in such places is a tragedy.

8. We are all witnesses of the Chernobyl accident.

9. The radioactive cloud from the nuclear power station polluted the territory of Ukraine, Russia, Byelorys, Poland and some other European countries.

10. People had to leave their houses in the towns and the villages around the station.

11. Nobody lives there now.

12. The scientists obtained mutation in the nature of Chernobyl zone.

13. The consequences of Chernobyl events are irrevocable.

14. Our duty is protection the world from such accidents.

**Read the text given below match the words in the left column with their synonyms or explanations in the right column:**

vaporize	radioisotopes
radioactive	to give off
material	break down
fission	explosion
decay	return to the earth
release	splitting
blast	to turn into gas
settle over	fallout
the earth	emit

**Read the following text about fallout and match the headlines given in the box to the appropriate paragraph**

**Fallout** is radioactive material that settles over the earth's

surface following a nuclear explosion in the atmosphere. It consists of atoms known as *radioactive isotopes* or *radioisotopes*. These isotopes form from the *fission* (splitting) of uranium or plutonium in a nuclear weapon. Radioisotopes also form when radiation that results from the explosion causes other atoms nearby to become radioactive.

After the explosion, the radioisotopes in the air, on the ground, and in the bodies of human beings and other organisms *decay* (break down) into more stable isotopes. They do so by emitting radiation in the form of alpha particles, beta particles, and gamma rays. Exposure to large amounts of radiation can result in immediate sickness and even death. Exposure to radiation over longer periods can cause cancer and damage genes.

The testing of nuclear weapons in the atmosphere once produced large amounts of fallout. Today, fallout has been almost eliminated by underground testing. However, a serious accident in a nuclear reactor can release the same radioisotopes that occur in fallout. In 1986, an explosion and fire at the Chernobyl nuclear power plant in Ukraine released radioisotopes that scattered across the Western Hemisphere.

**How fallout is produced.** All nuclear explosions produce a giant fireball of intensely hot gases. Everything inside the fireball or in contact with it is *vaporized* (turned into a gas). When an explosion occurs close to the earth's surface, the fireball vaporizes soil, vegetation, and buildings. It then begins to rise, carrying the vaporized material with it. As the fireball rises, a low-pressure area forms beneath it. Air rushes in to fill this partial vacuum carrying along with it dust, dirt, and other small particles. Much of this debris may be lifted up through the atmosphere along with the fireball.

As the vaporized materials rise and cool, some of them condense into solid particles. Atoms of the various radioactive elements produced by the explosion cling to these particles. These radioisotopes eventually return to the earth as fallout. Fallout particles range in size from fine invisible dust to ash of snowflake size.

**The fallout hazard.** Fallout can be dangerous to plants, animals, and people because of the radioactive elements it contains. These elements include about 200 isotopes of more than 30 chemical elements produced by a nuclear explosion.

The radioisotopes in fallout give off radiation for varying periods of time. Most fallout radioactivity dies off in a matter of hours or days. As a result, the radioactivity at the end of two weeks is only one-thousandth as strong as the radioactivity one hour after the nuclear explosion. But even at the end of two weeks, local fallout can be so intense that it remains a serious hazard. A few of the fallout elements continue to give off radiation over a long period. For example, the radioisotope strontium 90 loses half its radioactive strength every 28 years, and the radioisotope cesium 137 loses half its strength every 30 years. The possibility of nuclear war has caused people to think about the danger of local fallout. This type of fallout involves a twofold problem. First, there is the danger of radiation that is emitted by the radioactive debris on the ground. People can best protect themselves from this radiation by taking refuge in underground fallout shelters. For example, 3 feet (91 centimeters) of earth overhead will reduce the radiation's intensity to one-thousandth of its original intensity.

Second, there is the danger that certain fallout elements may enter the human body through breathing and eating. For example, milk is a route by which the radioisotopes iodine 131 and strontium 90 enter the body. First, fallout descends on grass. Next, cows eat the grass. Some of the radioisotopes are then transferred to the cows' milk. Anyone who drinks the contaminated milk takes in iodine 131, which collects in the thyroid, and strontium 90, which is absorbed by the bones.

Foods are contaminated by the direct deposit of fallout on plants and by the slow uptake of radioisotopes in soil by the plants' roots. The behavior of radioisotopes in the environment depends partly on the chemical properties of the element. For example, bones in the body can absorb strontium-90 because strontium and calcium have certain similar chemical properties.

**History.** From the mid-1940's to the early 1960's, the United States, the Soviet Union, and a few other nations exploded many experimental nuclear weapons. As a result, distant fallout increased to alarming levels. In 1963, more than 100 nations, including the United States and the Soviet Union, signed a treaty that banned the testing of nuclear weapons everywhere but underground. Fallout then decreased greatly. China and France did not sign the treaty. They later stopped testing nuclear weapons

aboveground.

**Fallout shelter** is a building or an underground area that protects people from nuclear fallout. A nuclear explosion scatters bits of radioactive material into the air. Within a few hours, the fallout particles settle over hundreds of square miles or square kilometers. Fallout gives off radiation that can cause burns, illness, or even death.

People can protect themselves from fallout by taking shelter in a building made of such heavy materials as brick, concrete, or stone. Any such building blocks most of the radiation and can serve as a fallout shelter. Underground areas, including mines and tunnels, also provide protection from fallout.

The United States government has designated many buildings and underground areas as public fallout shelters. Many public shelters have been set up in the basements of apartment and office buildings, factories, schools, and other large structures, or in windowless central areas aboveground. Other public fallout shelters are in subway-train tunnels or other underground areas. In the United States, public fallout shelters are marked by a black-and-yellow sign.

The U.S. public fallout shelter program began in 1961. This program is now the responsibility of the Federal Emergency Management Agency (FEMA), an independent agency established in 1979. Public fallout shelters have also been established by the governments of many other countries, including Denmark, Finland, Sweden, and Switzerland.

A family may build its own fallout shelter in a basement or outside the home. Underground shelters provide the most protection from radiation. Plans for home fallout shelters may be obtained from the Federal Emergency Management Agency, Washington, DC 20472.

**Check your knowledge of the active vocabulary. Match the following English words and expressions to their Ukrainian equivalents**

occur  
debris  
fission  
precipitation

розкладатися  
виставляти, піддавати дії  
траплятися, відбуватися  
зола, попіл



expose	осколки, уламки
shelter	осадження, осад
fallout	розкидати, посипати, розсіювати
decay	підняття, тех. вертикальний канал
eliminate	випадання радіоактивних осадків
uptake	притулок, дах, покрив, прикриття
ash	усувати, виключати, знищувати, ліквідувати
scatter	розщеплення, розділення, ділення атомного ядра

**Match the words in the left column with their explanations in the right column**

hearing	Is a state of physical, mental, and social well-being.
respiration	Surroundings, specially the material and spiritual influences which affect the growth, development and existence of a living being.
noise pollution	The act of apprehending or the ability to apprehend sounds aurally.
contaminate	To make unhealthy impure.
pollute	Any of various processes by which an organism takes in air or dissolved gases, uses one or more of them in energy-producing chemical changes, and expels both the gaseous by-products of the changes and the unused part of the air or gas.
health	Expenditure of goods, materials etc. without proportionate result; deterioration or decay by use, misuse or lack of use; useless or damaged material produced during or left over from a manufacturing process;
waste	To infect with contagious disease; to pollute.
	Excessive noise in the environment, typically from planes, autos, industry.

### **Answer the questions**

1. What is radioactive material?
2. When do radioisotopes form?
3. In what form do radioisotopes emit radiation?

4. Exposure to radiation can cause cancer, can't it?
5. What has underground testing done to fallout?
6. What scattered across the Western Hemisphere in 1986?
7. What do all nuclear explosions produce?
8. What can the fireball vaporize?
9. What forms under the fireball when it rises?
10. What may be lifted up through the atmosphere along with the fireball?
11. What happens to the vaporized materials?
12. How is fallout described?
13. What can be considered local fallout?
14. What are hot spot?
15. What does distant fallout consist of?
16. Where do winds generally blow in an eastward direction?
17. What may carry fallout to the earth?
18. Why is fallout hazardous?
19. In what way can people protect themselves from radiation?
20. Why did distant fallout increase to alarming levels in early 1960's? Was it eliminated?
21. What materials should be used for construction of fallout shelter?
22. What other buildings can provide protection from fallout?
23. What can be obtained from the Federal Emergency Management agency in Washington?

**Match the rowels in the left column with their explanation in the right column**

Explosion	Is a ball of fire, e.g. one at the centre of a nuclear explosion?
Eliminate	An intensely burning fire or an active burning
Fission	A violent expansion, usually accompanied by noise, caused by a sudden release of energy from a very rapid chemical or nuclear reaction.
Fallout	The remnants of something broken to pieces
Precipitation	Means to remove something completely, especially when it something that you do not want or need.
Decay	Is the splitting of the nucleus of an atom to produce a large amount of energy or cause a large

	explosion?
Blaze	The often radioactive particles stirred up by or resulting from a nuclear explosion and descending through the atmosphere
Defies	Is a process in a chemical reaction which causes solid particles to become separation from a liquid?
Fireball	To decrease gradually in quantity, activity, or force.

**Open the brackets. Use the correct form of the verb**

Part 1

Environmental Health Hazards (to cause) by modern technology can (to produce) serious problems. Air pollution can (worsen) the condition of people who (to suffer) such respiratory diseases as asthma and bronchitis. It may even (to help)(to cause) some disease,(to include) cancer and emphysema. In some areas, insecticides and industrial waster (to contaminate) food and water supplies. Excessive noise can also (to threaten) people's health. Noise from airplanes, construction projects and industrial plants can (to cause) hearing loss as well as emotional damage.

PART 2

Occupational Health Hazards (to threaten) the health of many workers. In some cases, substances (to involve) in a person's job may (to cause) long-term damage that (to appear) only after many years. For example, many coal miners (to develop) a lung disease called pneumoconiosis, or "black lung", from (to inhale) coal dust. Dust also (to cause) lung diseases among workers in the asbestos and cotton industries. Some industrial chemicals, (to include) arsenic and vinyl chloride, (to cause) cancer. People who (to work) with X-rays and other forms of radiation also (to face) a health hazard unless proper precautions (to use).

**Match the words in the left column with their explanations in the right column**

flotsam	is a very bad accident such as an earthquake or an air crash, especially one in which a lot of people are killed.
explosion	a machine which is used to force a liquid or gas to flow in strong, regular movement in a

	particular direction.
heat lighting	Is a narrow bridge high in the air between two parts of a tall building on the outside of a large structure.
pump	Is a heavy iron bar which is used as a lever or for forcing things open.
catwalk	Is a person whose job is to put out fires, also rescue people or animals who are trapped in cars, trees, railings, etc.
crowbar	Are tools that you can use for putting coal or wood in a fire, or for cleaning the fireplace.
fireman	Intense direct light often accompanied by heat.
fire-irons	Reaction or by the release of highly compressed fluids. Is a violent expansion, usually usually accompanied by noise, caused by a sudden release of energy from a very rapid chemical or nuclear.
blaze	Lighting without thunder, in fitful play usually near horizon on hot evenings.
disaster	Floating wreckage, floating object on a body of water.

### **Fill in the gap with articles where necessary**

Health is... state of physical, mental, and social well – being it involves more than just ... absence of disease. ... truly healthy person not only feels good physically but also has .. realistic outlook on... life and gets along well with other ... people. Good health enables ... people to enjoy ... life and have ... opportunity to achieve ... goals they have set for themselves.

To achieve and maintain ... good health, ... people must have ... basic knowledge about ... human body and how it function. Only with such ... knowledge can they determine what will or what will not help or hurt their health. This fore, learning about ... health should be ... fundamental part of every person's education. ... current knowledge about ... health, together with ... good living habits, can help almost everyone maintain ... good health and improve ... quality of life. ... society as ... whole benefits from ...

government and voluntary agencies strive to present and improve ... health of all ... people.

...World Health organization (WHO), ... agency of ... United Nations, works to promote ... better health throughout ... world.

All party of ... body must work together property to maiain physical health. ... person who is in god ... physical condition has ... strength and ... energy to enjoy... active life and voithstanel ... stresses of ... daily life. ... various practices that help maintain ... health are called hygiene ... proper nutrition, exercise, rest and sleep, cleanliest, and medical and dental care are all ... essential party of ... hygiene.

**Match the words in the left column with their explanations in the right column**

hearing	Is a state of physical, mental, and social well-being.
respiration	Surroundings, specially the material and spiritual influences which affect the growth, development and existence of a living being.
noise pollution	The act of apprehending or the ability to apprehend sounds aurally.
contaminate	To make unhealthy impure.
pollute	Any of various processes by which an organism takes in air or dissolved gases, uses one or more of them in energy-producing chemical changes, and expels both the gaseous by-products of the changes and the unused part of the air or gas.
health	Expenditure of goods, materials etc. without proportionate result; deterioration or decay by use, misure or lack of use; useless or damaged material produced during or left over from a manufacturing process;
waste	To infect with contagious disease; to pollute.
	Excessive noise in the environment, typically from planes, autos, industry.

**Open the brackets. Use the correct form of verb and read about fallout**

Fallout (to refer) to radioactive particles that (to fall) from the atmosphere flailing an atomic or hydrogen bomb explosion. Radiation from fallout can (to cause) burns, illness and death.

When an atomic bomb or a hydrogen bomb (to explode), particles of radioactive substances (to form). These substances (to rise) far above the earth. Later, the particles (to fall) to earth as fine dust, or in rain or snow. Winds may (to carry) them to distant places. The amount and path of radioactive fallout (to depend) on the type of weapon exploded, the weather, and how the weapon (to explode).

Close-in fallout (to occur) within the first 10 to 20 hours after the explosion. Intermediate fallout (to take) place during the first few weeks after the explosion. Delayed, or distant, fall-out is the slow dropping of radioactive particles from the air over a period of years. Distant fallout may (to cover) the entire earth. Some of the particles (to release) by atomic weapons (to lose) their radioactivity before they (to reach) the earth. But others, such as some isotopes of strontium and cesium, (to remain) radioactive. The main kinds of radiation from fallout that may (to affect) man are beta particles (fast moving electrons), and gamma rays (similar to x rays). There are kinds of radiation also exist naturally.

**Match the words in the left column with their explanation in the right column:**

Explosion	Is a ball of fire, e.g. one at the center of a nuclear explosion?
Eliminate	An intensely burning fire or an active burning
Fission	A violent expansion usually accompanied by noise, caused by a sudden release of energy from a very rapid chemical or nuclear reaction.
Fallout	The remnants of something broken to pieces
Precipitation	Means to remove something completely, especially when it something that you do not want or need.
Decay	Is the splitting of the nucleus of an atom to produce a large amount of energy or cause a large explosion?
Blaze	The often radioactive particles stirred up by or resulting from a nuclear explosion and descending through the atmosphere
Defies	Is a process in a chemical reaction which causes solid particles to become separation from a liquid?

Fireball	To decrease gradually in quantity, activity, or force.
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# Natural Hazards

## Read the texts and translate them

**Natural Hazards**, dangers arising from natural circumstances that threaten the wellbeing of humans and/or the environment. These are normally taken as hazards arising from geological or climatic phenomena and thus exclude medical hazards resulting from pathogens. It is important to distinguish hazard from risk, with which it is often confused, the latter being the probability of the hazard occurring. The most familiar and publicized hazards are those which take place spasmodically, often of catastrophic dimensions. In addition, however, there are hazards of a continuous nature which are less obvious, such as natural radioactivity or naturally occurring toxic metals in the environment. There are numerous man-made hazards, both continuous and spasmodic, which can be comparable in impact to the more severe natural hazards, for example the Chernobyl accident. Furthermore, some natural hazards can be exacerbated by human activity, such as flooding resulting from the destruction of forests. Central to the study of hazards, therefore, are the fundamental issues underpinning environmental science, namely how to identify what is natural, what is man-made, and what is a combination of the two. Important factors used in characterizing hazards are: the area of damage, intensity of impact, duration of impact, rate of onset, and predictability. An important concept in terms of predictability is the return period, which represents the average period of time for an event of a given magnitude to recur. Public perception of the seriousness of a hazard is influenced by many factors, but in general a hazard is more acceptable if a relatively small amount of damage takes place frequently compared with a large degree of damage occurring infrequently.

Natural hazards mainly occur in their most severe form in developing countries, which partly reflects climatic conditions of the tropics, partly the location of geological hazards, and partly poorer infrastructure in terms of human and environmental protection. The most spectacular natural hazards are earthquakes and the eruption of volcanoes, both of which follow crustal plate boundaries and are consequently characteristic of certain areas, in particular the Pacific Rim. The relative size of an earthquake is



measured on the Richter scale, which has a practical limitation of 9 points. In California it has been estimated that an earthquake with a force greater than Richter scale 8 will occur once every 100 years, such as destroyed much of San Francisco in 1906. The most severe earthquake in recent years killed 750,000 people in Tangshan, China in 1976. Volcanic eruptions can have massive effects on a global as well as local scale. For example, the explosion of Krakatau in 1883 discharged ash up to 80 km (50 mi) high which encircled the Earth within two weeks, leading to a fall in solar radiation at ground level and spectacular sunsets for several years. Volcanoes vary greatly in their frequency of eruption, with 20 per cent erupting less than once every 100 years and 2 per cent less than once every 10,000 years. Damage to the environment by volcanoes arises not only from lava and mudflows, but also from deposition of ash and the release of toxic gases. Another major hazard produced by earthquakes and volcanic eruptions are tsunamis, enormous waves which reach maximum height near the shore where they can cause massive damage and loss of life. Climatic hazards include storms of various types, damage to coastlines by ice or wave action, droughts, floods, snow, hail, lightning, and natural fires. Tropical hurricanes are the worst and most widespread natural hazard, causing damage not only directly by wind action but also by flooding. The most serious incident in recent years resulted in 500,000 deaths in Bangladesh in 1970, while flooding of the Yangzi River in China following typhoons killed 40-50 million people in the mid-19th century. Tornadoes are rapidly rotating circular storms, particularly prevalent in the United States, which cause substantial damage by lifting large objects into the air and moving them some distance. Floods and droughts are often closely linked in both space and time, with many parts of the tropics having alternating wet and dry seasons. Human interference has increased the severity of flooding in some areas, due to changes in land use such as urbanization and deforestation. Increased incidence of drought has caused major civilizations to collapse in the past and currently much of Africa is becoming drier, particularly on the fringes of the Sahara, where the problem is exacerbated by poor farming practices and over-exploitation of fuel wood. While most serious fires are man-made, natural fires caused by lightning, such as forest fires, can cause widespread devastation. However, these can play a vital role in the ecology of dry areas, releasing nutrients from vegetation back into the soil.

Continuously occurring or chronic natural hazards are often unrecognized as such and difficult to identify, but may adversely affect large numbers of people. In many cases they are comparable in their potential for damage to pollution, which is a man-made phenomenon. One such hazard, which has only recently been recognized as widespread, is radon, a radioactive gas associated with certain rock type which seeps up through the Earth's surface into buildings. Currently it is estimated that in the United Kingdom 2,500 people per year die from radon-induced lung cancer. Another example is fluorine, which causes severe bone deformation (fluorosis) in people in India and China, arising from drinking water and food contamination from coal combustion respectively. Sometimes such hazards result from an environmental deficiency of an essential element; there is evidence that consumption of crops grown on soils low in selenium results in geochemical diseases of humans, in particular of the heart. Crops and livestock are also adversely affected by both deficiencies and excesses of natural geologically occurring elements, such as copper and zinc.

Many natural hazards, such as earthquakes, are unavoidable, but measures can be taken to minimize their impact. Thus buildings can be constructed to withstand earthquakes; flood impacts can be reduced by engineering solutions, involving water storage and embankments, and warnings and advice given to the public in advance of major storms. It is now recognized that many hazards are fairly predictable, often occurring on a cyclic basis associated with phenomena such as sun spots and the lunar orbit.

**Match the words in the left column with their explanations in the right column:**

- rescue	is an action that is taken to protect someone or something against attack; the system and organization of country's armies and weapons.
- explosion	it when a large amount of water covers an area of a land or a place which is usually dry, for example when a river overflows or a pipe bursts.
- tornado	is an extremely violent wind as storm, especially one in the western Atlantic
- hurricane	
- flood	
- earthquake	

- defence	is a shaking o the ground caused by movement of the earth' crust.
	is a sudden, violent loud burst of energy for example one caused by a bomb. It often results in damage or injury.
	is taking action to help someone or something get away from a dangerous or harmful situation.

## Read and discuss the text

### What is a disaster?

#### Are disasters caused by people or by nature?

A disaster takes place when the following three conditions occur at the same time: When people live in hazardous places like, for example, close to an active volcano, on unstable slopes where landslides are likely to happen, or close to rivers which could flood. When a hazardous phenomenon occurs, be it natural or human-made.

When the phenomenon also causes a lot of damage, especially where no preventive measures have been taken. Natural phenomena can sometimes strike very hard and cause disasters if preventive measures have not been taken or if some human activities have harmed the natural environment or upset the balance of the ecosystem. For instance, too much water that the soil is unable to absorb can cause floods, while too little water in some regions can lead to drought. But people can make the situation worse, for example when trees are chopped down and no new ones are planted. This makes the soil very dry and dusty, which can lead to erosion. When the rains come, there are not enough roots and vegetation to bind the soil together, and a landslide can occur. Most wildfires are caused directly or indirectly by people. Farmers, for example, sometimes burn their fields to get rid of weeds before planting, and the fire can get out of control. Sometimes people are careless with cigarettes or forget to put out bonfires when they go camping. A little spark is sometimes all it takes to start a fire. If we destroy parts of nature such as coral reefs, forests, or fragile mountain plants, we are destroying the natural barriers that protect us from tsunamis, drought, landslides, floods and other hazards.

**Match the words in the left column with their explanations in the right column:**

Blizzard	is the possibility that someone may be harmed or killed.
Survival	something or perhaps someone means to damage them or make them less effective or successful than they were.
Emergency	is a very bad snow storm with strong winds.
Warning	is done to spoil or harm something physically, so that it does not work properly or does not look as good as it did before.
Danger	is the state of continuing to live in spite of nearly dying or being destroyed or having to deal with very difficult circumstances.
Storm	is very bad weather in which there is heavy rain, strong wind, and often thunder and lightning.
to harm	is an unexpected and difficult or dangerous situation, especially an accident, which arises suddenly and which requires quick action to deal with.
Damage	is something which is said or written to tell people of possible danger or problems.

**Read and translate the text**

### **What are natural hazards?**

Natural hazards are dangers arising from geological or weather-related occurrences, like earthquakes, volcanoes, floods, hurricanes, and tornadoes. Notice that the occurrences themselves are not called "hazards", but the dangers arising from the occurrences -- specifically, the dangers to humans and their property. Some natural hazards can be increased by human activities, such as flooding resulting from the destruction of forests. Others cannot be prevented, like sudden tornadoes or earthquakes, but much can be done to **mitigate** (reduce or control) the cost to lives and property.



Lava flow consuming house as it moves into Kalapana Gardens on May 3, 1990. Highway 130 was crossed by a flow during May and most of the homes and remaining buildings in Kalapana Gardens were destroyed by the end of May. Photograph Credit: D. Weisel, Hawaii Volcano Observatory, U.S. Geological Survey.

Climatic hazards include violent storms (like tornadoes and hurricanes), damage to coastlines by wave action (a form of erosion), droughts, floods, snow, hail, lightning, and natural fires. Tropical hurricanes are the worst and most widespread natural hazard, causing damage not only directly by wind action but also by flooding. The most serious incident in recent years resulted in 500,000 deaths in Bangladesh in 1970, while flooding of the Yangtze River in China following typhoons killed 40-50 million people in the mid-19th century. Tornadoes also cause substantial damage. Floods and droughts are often closely linked in both space and time, with many parts of the tropics having alternating wet and dry seasons.

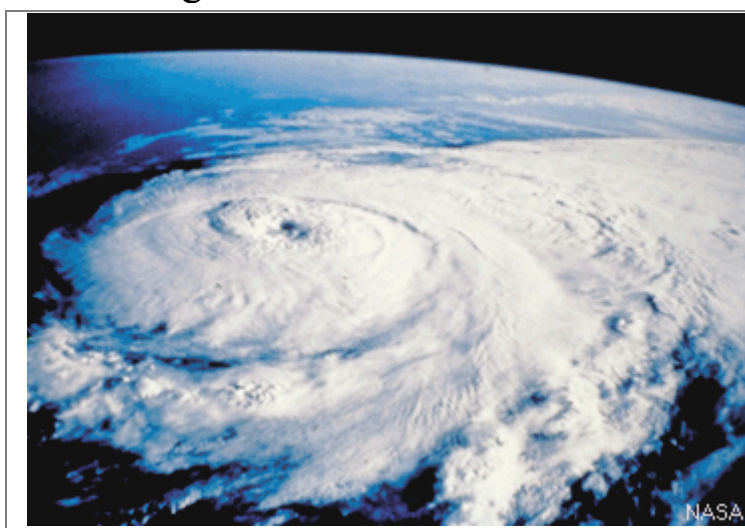
Human interference has increased the severity of flooding in some areas, due to changes in land use such as **urbanization** (the spread of cities) and **deforestation** (the removal of natural woodlands for timber, construction, farmland, and so on). Poor farming practices combined with increased incidence of drought has resulted in much of Africa becoming drier, particularly on the fringes of the Sahara.

Natural hazards have always been around. In fact, what often makes these occurrences into "hazards" is human proximity to them. People live on the Great Plains in America knowing full well the area's nickname is Tornado Alley. Millions live on vulnerable coastlines, where anything from long-term coastal erosion to tsunamis to tropical hurricanes can eliminate their homes without mercy. Hundreds of thousands build homes perched atop high cliffs, near major rivers, or with their foundations buried only in shifting sand.

(Primary source of information: Microsoft Encarta Encyclopedia 2000)

On August 17, 1992, tropical storm Andrew developed over the Atlantic Ocean - - the first tropical storm of the season. For the next few days, the storm strengthened as it headed west-northwest. By August 22, it had reached hurricane strength. At approximately 5:00 in the morning on August 24, Hurricane Andrew slammed into southern Florida with sustained winds of 145 mph and gusts up to 175 mph. Over 60 people were killed. Damages exceeded \$25 billion.

The basic hazards of a hurricane are storm surge, high winds, heavy rains, and tornadoes. A storm surge, a large dome of water 50 to 100 miles wide, is the greatest potential threat to life and property associated with hurricanes. However, more people die from flooding inland than along the coast from any storm surge. Hurricanes can drop over an inch of rain per hour, which can be devastating.



Considering the immense power of Hurricane Andrew, it is a wonder that even more people did not lose their lives. However, modern weather forecasting techniques have made it possible to track these massive storms well in

advance of landfall. Satellites are a major tool used in monitoring and forecasting hurricanes. The scientific understanding of the atmosphere and the ability to forecast large- and small-scale events



have increased dramatically over the past 20 years. This all results in increased warning times for people at risk of a hurricane.

As the National Weather Service tracks a storm, it issues watches and warnings according to the storm's strength and position. As a storm nears land, evacuations may be advised and even enforced.

However, because populations in high risk areas (in the United States, this includes coastal areas all along the eastern seaboard and along the Gulf of Mexico) have increased so much, the damage these storms inflict can be catastrophic. Look at the charts below which represent cost in lives and cost in property damage from hurricanes in the 20th century:

### How do people perceive natural hazards?



Rapid earth flow, Cincinnati, Ohio.

**Risk** is defined as the possibility of loss or injury; or someone or something that creates or suggests a hazard. **Public perception** of risk, how people think about or understand the seriousness of a hazard is influenced by many factors, but in general a hazard is more acceptable if a relatively small amount of damage takes place frequently, compared with a large degree of damage occurring infrequently. In other words, a seemingly minor thing happening a lot, like lightning, is better to live with and more acceptable than a major thing that happens only once in a while, like a monster tornado. But what about more subtle things, like **erosion**? This is when the earth slowly but steadily is whittled away by forces like wind and water. Because it often happens over a long period of time, people will minimize their perception of risk - they don't take risky things, like natural hazards, as seriously as they should. They adopt the attitude, "It won't happen to me." Therefore people will build homes in areas which have been already identified as hazardous.

### What is risk, what is mitigation, and what does it all have to do with natural hazards?

**Risk** is defined as the possibility of loss or injury; or someone or something that creates or suggests a hazard. To

**mitigate** is to cause to become less harsh or hostile, or to make less severe or painful (**mitigation**, then, is the act of doing this). The two terms are closely related. How a person perceives his or her risk is crucial to how well that same person will be able to mitigate any disaster that could occur with a natural hazard. Say, for instance, my grandfather refuses to believe that his beachfront property is at any risk. "Oh, don't be silly," he would say. "Nothing's ever happened to me and nothing ever will. Hurricanes only come once or twice in a hundred years, and I'll be long gone before I ever see one." Do you think my grandfather will be prepared if indeed a hurricane hits his home? Probably not! Therefore his ability to mitigate the natural hazard, to lessen its impact upon him and his property, will be very little.

### **Discuss the texts**

- Name some natural hazards. How are these things "hazardous?"
- What are some ways humans can increase the damage caused by natural hazards?
- What are the natural hazards of a hurricane?
- How many thousands of deaths occurred from hurricanes in 1900? In 1920? In 1980?
- How many billions of dollars damage resulted from hurricanes in those same years?
- What conclusions can you draw from these two charts?
- What do you think could be done to reduce life and property losses in the future?
- Generally speaking, what areas seem to have the most vulnerability to landslides? Why do you think this is so? (Hint: think of the possible causes of landslides, especially erosion.)
- Does vulnerability to landslides seem to have much impact on where people choose to live? Why or why not?
- What factors are increasing the risk of natural hazards? Is this the "fault" of nature? How about people? Or is anyone really to blame?
- What is risk and mitigation? Why is mitigation important?

### **Read and translate**

**What is a hazard?**



A hazard is a phenomenon or a process, either natural or human made, that can endanger a group of people, their belongings and their environment, if they do not take precautions.

There are different types of hazards. Some are natural while others are caused by human beings, such as so-called industrial or technological hazards (explosions, fires, toxic chemical spillages). Wars and terrorism are also hazards caused by human beings.

Among various natural hazards, we can identify:

**Earthquakes, earth tremors:** Violent shaking or jolt of the earth's surface due to movements originating from deep underground, which can cause a lot of damage.

**Volcanic eruptions:** Explosions or emissions of lava, ashes and toxic gases from deep inside the earth, expelled through volcanoes.

**Landslides, mudslides:** Soil, rocks and debris that move suddenly or slowly down a slope. They mainly happen during the rainy season or during times of seismic activity.

**Tsunamis:** Gigantic wave or series of waves that smash into the shore, caused by an earthquake, volcanic eruptions or landslides under the sea.

**Hurricanes:** Strong winds that start over the sea, rotating in big whirling circles, and bringing rain with them. They are also known as tropical cyclones.

**Plagues:** A widespread catastrophe that afflicts a whole town or a community caused, for instance, by huge numbers of insects or animals that destroy crops.

**Droughts:** A period of time (months or years) during which a part of the land suffers from lack of rain, causing severe damage to the soil, crops, animals, and even people, sometimes causing death.

**Floods:** The building up of large quantities of water, generally caused by heavy rains which the soil is unable to absorb.

**Wildfires:** Destructive fires in forests and other areas covered by vegetation. These fires can get out of control and easily spread over vast areas of land.

**Tornadoes:** Very violent gusts of whirling, funnel-shaped winds which spin along over the ground.

**Fill in the blank with the correct words. Use these words:**

*die*      *fire*

*electricity explode shortest water  
tree tallest thundertelephone*

1. About 100 people each year from lightning and the fires it causes.
2. Don't use a \_\_\_\_\_ unless there is an emergency.
3. \_\_\_\_\_ and lightning occur together.
4. Lightning can make a tree \_\_\_\_\_ by heating the sap in the tree
5. Lightning hits the \_\_\_\_\_ objects.
6. Lightning takes the \_\_\_\_\_ path.
7. When lightning forms, clouds become charged with \_\_\_\_\_
8. If you are outside when there is lightning, don't go under a \_\_\_\_\_.
9. \_\_\_\_\_ When lightning strikes, it can start a \_\_\_\_\_ that kills people and animals.
10. If you are in \_\_\_\_\_ get out. Stay away from the beach.

**Circle T (true) or F (false) for each sentence below**

- T F 1. When there is lightning, crouch under a tree.
- T F 2. When there is lightning, stay away from anything made of metal.
- T F 3. Stay by the window and watch for streaks of lightning.
- T F 4. In a storm, you usually see the lightning before you hear the thunder.
- T F 5. When the sky lights up, but you can't see the streaks of lightning, it means the storm is over.
- T F 6. When there is lightning, go to the highest spot on a hill and get out your umbrella for protection from the storm.
- T F 7. Every day someone is struck by lightning.
- T F 8. Lightning never strikes twice in the same place.
- T F 9. If there is lightning, call all your friends to make sure they are safe.
- T F 10. Lightning storms may occur in the winter but are most common in spring and summer.

**Fill in the blank with the correct words. Use these words:**

*winter antenna snowdrift carbon monoxide  
watch mittens warning layers  
kitty litter wind chill*

1. \_\_\_\_\_ A winter storm means there is a chance of heavy snow or blizzards.
2. \_\_\_\_\_ A winter storm means severe winter weather is coming.
3. \_\_\_\_\_ If a winter storm is expected you should have sand or \_\_\_\_\_, in your trunk in case your car gets stuck.
4. \_\_ If a winter storm is expected, you should put a bright colored cloth on the \_\_\_\_\_ so someone can find you.
5. \_\_\_\_\_ If you keep your car engine running to keep warm, you could die from \_\_\_\_\_ poisoning unless your windows are open to get fresh air.
6. \_\_\_\_\_ If you go outside in severe weather, you will be warmer if you wear \_\_\_\_\_ of wool clothing are warmer than gloves.
7. \_\_\_\_\_ Snow storms and blizzards usually occur in \_\_\_\_\_.
8. \_\_\_\_\_ The temperature your body feels when the actual temperature and wind are combined is called \_\_\_\_\_.
9. If you are driving during a blizzard, your car could be stalled in a huge \_\_\_\_\_.

**Circle T (true) or F (false) for each sentence below.**

- T F 1. During a winter storm you can be stuck in a snowdrift.
- T F 2. If your car is stuck in the snow, roll up all the windows and keep the engine running until you run out of gas.
- T F 3. If you are trapped in a car, move your hands and feet as much as possible to keep warm.
- T F 4. An umbrella should be a part of your winter storm safety kit.
- T F 5. Snow storms can occur anytime of the year.
- T F 6. If your car is stuck in the snow, leave your ceiling light on at night so you can be seen.
- T F 7. Booster cables and a snow brush should be part of your winter storm car safety kit.
- T F 8. Wind chill is the combined effect of temperature and wind felt by your body.

- T F 9. Wear gloves. They are warmer than mittens.  
T F 10. If your car is stuck in a snowdrift, stand on the roof wearing brightly colored mittens and wave your arms.

**Circle T (true) or F (false) for each sentence below**

- T F 1. A tornado looks like a funnel with the fat part at the top.  
T F 2. You will always notice a funnel before a tornado strikes.  
T F 3. A tornado destroys everything in its path.  
T F 4. A tornado may hit your home and leave your neighbor's home alone.  
T F 5. A tornado can throw cars and trucks into the air.  
T F 6. There will seldom be lightning during a tornado.  
T F 7. Go into a large room such as the school cafeteria if there is a tornado warning.  
T F 8. The sky may be blue at the time you hear a tornado watch.  
T F 9. When a tornado is coming, get out of a car and go inside a house.  
T F 10. When you hear a tornado warning, get in the car and drive as fast as you can in the opposite direction.

**Fill in the blank with the correct word. Use these words:**

<i>funnel</i>	<i>radio</i>	<i>ditch</i>	<i>train</i>
<i>windows</i>	<i>bathroom</i>	<i>watch</i>	<i>sky</i>
<i>warning</i>	<i>hail</i>	<i>mobile home</i>	<i>tornado</i>
<i>black clouds</i>	<i>basement</i>	<i>top</i>	

1. A \_\_\_\_\_ can flatten homes and buildings.
2. A tornado looks like a \_\_\_\_\_ with the fat part at the \_\_\_\_\_.
3. Before a tornado, you will probably see \_\_\_\_\_.
4. A tornado \_\_\_\_\_ is issued by the National Weather Service when a tornado \_\_\_\_\_
5. \_\_\_\_\_ may develop later.
6. A tornado \_\_\_\_\_ is issued by the National Weather Service when a tornado has \_\_\_\_\_
7. \_\_\_\_\_ actually been seen.
8. A tornado can sound like the roar of a \_\_\_\_\_.

9. If you are outside when you see a tornado, go to a low spot or a
10. The best place to be if there is a tornado is in a \_\_\_\_\_.
11. There may be thunder, lighting, rain or \_\_\_\_\_ along with the tornado.
12. If you don't have a basement, the next best place to be is in a \_\_\_\_\_ or other small room in the center of the house.
13. Stay away from \_\_\_\_\_ during a tornado.
14. If you live in a \_\_\_\_\_, get out. It can be shattered by a tornado.
15. When you hear a Tornado Watch, keep your eyes on the \_\_\_\_\_.
16. You can hear a Tornado Watch by listening to NOAA Weather \_\_\_\_\_.

**Fill in the blank with the correct word. Use these words:**

*streams*

*ground*

*flash flood*

*roads*

*bridges*

*car*

1. A flash flood can wash out \_\_\_\_\_ and bridges.
2. A \_\_\_\_\_ may come to you as a high wave of water.
3. If it is raining hard, water cannot sink into the \_\_\_\_\_.
4. Flash floods most often occur in mountain \_\_\_\_\_.
5. If you are driving in deep water, get out of your \_\_\_\_\_
6. \_\_\_\_\_ and climb to higher ground.
7. If you are driving in heavy rain, watch for flooding at \_\_\_\_\_ and low points in the road.

**Circle T (true) or F (false) for each sentence below**

T F 1. When you hear a flash flood warning it means there will be a flood within 24 hours.

T F 2. Flash floods usually occur along beaches.

T F 3. If you are camping and a flash flood occurs, run to higher ground.

T F 4. Along with flash floods, there is often heavy lightning.

T F 5. Drive as fast as possible through a flooded road to avoid being washed downstream.

T F 6. Never try to outrun a flash flood.

T F 7. If you are camping and you hear a flash flood warning, pack up your tent and bring all your camping gear so it will not be damaged by the flood.

T F 8. A flash flood can wash out roads and bridges and uproot trees.

T F 9. The National Weather Service will always warn you if a flash flood is expected.

T F 10. Whenever it rains heavily, there may be flash floods

**Circle T (true; or F (false; for each sentence below**

T F 1. High wind is called a storm surge.

T F 2. NOAA Weather Radio stations warn people about hurricanes.

T F 3. Hurricanes usually appear suddenly and surprise everyone.

T F 4. When a hurricane is expected to reach land in 2 days forecasters issue a Hurricane Warning.

T F 5. Hurricane Hunter airplanes fly into a storm to get information about the hurricane.

T F 6. Hurricane winds can reach 350 mph.

T F 7. Hurricanes cause rain, high tides and flooding.

T F 8. During a hurricane, stay under a tree.

T F 9. Put duct tape on your windows if a hurricane is coming.

T F 10. It is a good idea to have a flash light, radio and extra batteries if a hurricane is expected.

**Fill in the blank with the correct words. Use these words:**

*watch*                      *eye*              *radio*              *flooding*  
*hurricanes*              *moving*              *warning*              *air*  
*inland*                      *high tides*              *oceans*

The \_\_\_\_\_ that surrounds our planet weighs five quadrillion tons.

Air is \_\_\_\_\_ all the time. It swirls, blows, sinks and rises  
Air moves over warm \_\_\_\_\_ and picks up lots of moisture.

In summer and early fall, \_\_\_\_\_ form when air masses pick up lots

1. of moisture.

Hurricanes cause \_\_\_\_\_ and \_\_\_\_\_ .

A hurricane \_\_\_\_\_ tells people a hurricane may reach land within 2 days.

A hurricane \_\_\_\_\_ means a hurricane is expected within 24 hours and winds could reach up to 74 mph.

NOAA Weather \_\_\_\_\_ warns people about hurricanes.

If you live near the ocean, go \_\_\_\_\_ where it is safe.

The center of a hurricane is called the \_\_\_\_\_ .

**Fill in each space with one of the answer below**

*Electricity, eye, floods, forecasts, funnel, hail, hurricane, lightning, radio, shortest, snowstorms, summer, surge, thunder, tornado, warning, weather, or wind chill.*

During a severe storm watch or listen to your local \_\_\_\_\_, it can help save lives.

Before the storm comes get a flashlight and \_\_\_\_\_ with batteries in case you lose electricity.

The calm section of a hurricane is called the \_\_\_\_\_ .

It packs a lot of energy enough to blow down a whole town.

They occur in winter and sometimes in early spring or late fall.

\_\_\_\_\_ kills more people than hurricanes and tornadoes.

Water 25 feet above normal high tide in a hurricane is called a storm \_\_\_\_\_.

Lightning takes the \_\_\_\_\_ path.

If you hear a tornado \_\_\_\_\_ act immediately.

A \_\_\_\_\_ is a big doughnut of winds with a calm section in the middle.

Stay away from sinks and tubs and anything else wet that could conduct \_\_\_\_\_.

\_\_\_\_\_ is a measure of how cold the air feels when combined with air temperature to make your body feel even cooler than the actual temperature.

Lightning storms may occur in the winter but are most common in the spring and \_\_\_\_\_.

Flash \_\_\_\_\_ can occur even though it's not raining where you are.

\_\_\_\_\_ and lightning occur together.

More than 700 NOAA \_\_\_\_\_ Radio stations broadcast hurricane watches and warnings.

Thunderstorms can be accompanied by damaging ; as large as golf balls or baseballs.

A tornado looks like a \_\_\_\_\_ with the fat part at the top.