Heed the Warnings

Name _____

Directions: Ivan just finished his first week in sixth grade, and he's excited. It's Saturday, and he has nothing to do but have fun. Oooops, at least that's what he thought. But just like any other day, he must make lots of decisions to stay safe. As Ivan goes through his day, help him make the best decisions for safety. **Follow the steps below each scenario to decide on the best solution.**

Scenario 1:
Ivan strolled down to the park. He saw two kids he knew, Jeffery and Thomas, and they were skateboarding. As Ivan approached the boys, he noticed that neither was wearing a helmet or other protective gear. The boys were riding their skateboards down a stair railing, or at least attempting to.

"Hey, that looks dangerous," said Ivan. "It's not so bad," said Thomas, as he aborted an attempt to skate the rail. "Do you board?"

"Sure," said Ivan, who was quite proud of his ability to skateboard. "But I don't have my gear."

"Here, use my board," said Jeffery.

Ivan had always been taught to wear a helmet and pads when riding a skateboard and his dad would be disappointed if he rode without them. Still, he didn't want his new friends to think he was scared. He wasn't sure what to do.

- **Step 1: Figure out the problem.**
  - What does Ivan have to decide?
  - What is the exact problem that is causing trouble?
- **Step 2: Identify solutions.**
  - What are Ivan's choices?
  - What are all the possible ways to solve the problem?
- **Step 3: Name the positive and negative consequences of each choice.**
  - What are the positive and negative consequences of each way to solve the problem?
- **Step 4: Decide what is the best choice, then act on it.**
  - Which is the best solution for Ivan?

Heed the Warnings

Scenario 2:

Ivan walked on to the nature trail in the park. There were Maria and Jasmine, the younger sisters of two of his good friends. They were looking at some red berries on a bush on the trail.

"Those berries look great!" Maria was saying.

"And I'm hungry and thirsty," said Jasmine.

"Whoa," said Ivan. "Those don't look like blueberries or blackberries. I'm not sure what they are. Maybe they're not safe."

"Sure, they are," insisted Maria.

Ivan thought, "What should I do?"

- **Step 1: Figure out the problem.**
  - What does Ivan have to decide?
  - What is the exact problem that is causing trouble?

- **Step 2: Identify solutions.**
  - What are Ivan's choices?
  - What are all the possible ways to solve the problem?

- **Step 3: Name the positive and negative consequences of each choice.**
  - What are the positive and negative consequences of each way to solve the problem?

- **Step 4: Decide what is the best choice, then act on it.**
  - Which is the best solution for Ivan?

Heed the Warnings

Scenario 3:

Ivan started walking toward home when he saw his friend York.

"Hey, I'm glad you're here, Ivan," said York. "We're getting ready to go swimming."

"Really? I thought the pool was closed for the season," said Ivan.

"That's the cool part. It is closed, but I just went by and there's still water in it, even though it looks like it's dirty. We can slip through the hole in the fence, and we'll have the entire pool to ourselves," said York.

"Look, you can't swim in a dirty pool. Besides, there's no lifeguard on duty."

"Oh, what could go wrong?" said York. "C'mon, guys. Let's go." The group of kids looked undecided; a few glanced toward Ivan.

Ivan knew it wasn't a good idea to sneak into a closed pool. Debris could be dangerous; bacteria could have grown if no one was keeping the pool cleaned; and, it's always unsafe to swim without a lifeguard or adult. What should he do?

- **Step 1: Figure out the problem.**
  - What does Ivan have to decide?
  - What is the exact problem that is causing trouble?

- **Step 2: Identify solutions.**
  - What are Ivan's choices?
  - What are all the possible ways to solve the problem?

- **Step 3: Name the positive and negative consequences of each choice.**
  - What are the positive and negative consequences of each way to solve the problem?

- **Step 4: Decide what is the best choice, then act on it.**
  - Which is the best solution for Ivan?

Injury Statistics

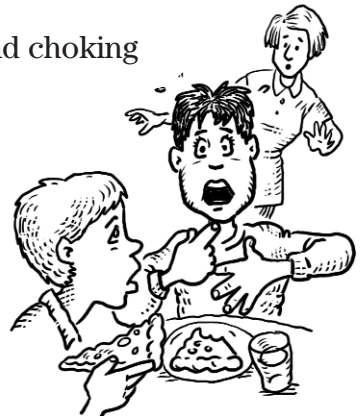
Name _____

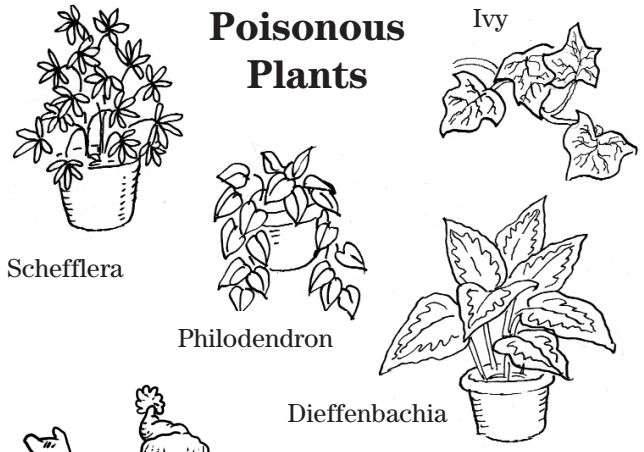
Directions: Below is a list of statistics about injuries. How does it correspond to the class statistics gathered from newspaper reports on accidents? What additions would you make?

Injury Statistics

Injuries are a major source of childhood emergency room and hospital admissions. Accident statistics from the National Safety Council, the National Center for Injury Prevention and Control, and other sources tell us that:

- Injury is the leading cause of death in children and young adults.
- Dogs bite more than 4.7 million people each year.
- In 2000, nearly 373,000 children ages 14 and under were treated in the United States for bicycle-related injuries and 173 died from this type of injury.
- In 2000, approximately 2,300 children ages 14 and under died from accidents in the home.
- Children from birth to four years old account for nearly 60 percent of deaths in residential fires.
- The types of trauma that cause death in children (in order of frequency) are:
  - Motor-vehicle accidents
  - Drowning
  - Fires/burns
  - Suffocation and choking
  - Firearms
  - Falls
  - Poisoning





American Red Cross

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Burning Facts

Name _____

The skin is the largest organ of the body. The skin and its derivatives (hair, nails, and sweat and oil glands) make up the integumentary system. One of the main functions of the skin is protection. Skin protects the body from external factors, such as germs and temperature.

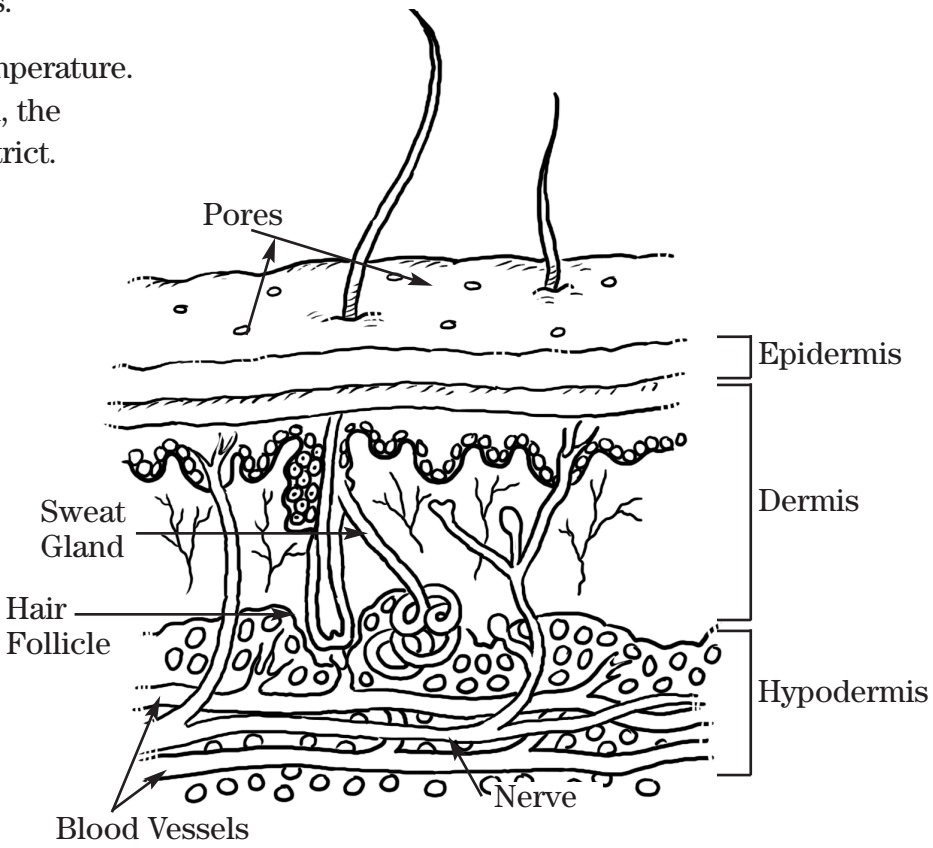
Skin contains germ-killing secretions and melanin—a pigment that provides a chemical defense against ultraviolet light, which can damage skin cells.

Skin also helps regulate body temperature. When the skin is exposed to cold, the blood vessels in the dermis constrict. This allows the blood, which is warm, to bypass the skin. The skin then becomes the temperature to which it is exposed. Body heat is conserved since the blood vessels are not diverting heat to the skin anymore.

Burn Damage

A burn involves the destruction of skin cells and, sometimes, the underlying structures of muscle and bone. A burn occurs when cells absorb more heat than they can dissipate.

Compared with people in other age groups, children and older adults have thinner skin and, therefore, sustain severe burns at lower temperatures and in less time. For example, children and older adults who are exposed for three seconds to water at 140° F (60° C) can receive a third-degree burn, which would require hospitalization and skin grafts. (In the



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Burning Facts

average home, the temperature of hot water as it comes from the tap is often 140° F. Set your water heater no higher than 120° F [49° C].) People in other age groups would have to be exposed to water at 140° F for about five seconds to sustain the same burn.

Most people think of burns in terms of degrees: first-, second-, and third-degree burns. The medical profession often categorizes burns in terms of thickness: superficial, partial thickness and full thickness.

First-degree Burns (Superficial)
First-degree burns are red and very sensitive to touch. Skin with a first-degree burn appears blanched when light pressure is applied. First-degree burns involve minimal damage to the epidermis (outer layer of skin). These burns cause pain, redness and swelling. Sunburn is a good example of a first-degree burn.

Signals of first-degree burns:
- Redness
- Pain
- Swelling

Second-degree Burns
(Partial thickness)
Second-degree burns affect both the epidermis and the dermis (underlying layer of skin). They often affect sweat glands and hair follicles. If a deep second-degree burn is not treated properly, swelling and decreased blood flow in the tissue can result in the burn becoming a third-degree burn.

Signals of second-degree burns:
- Redness
- Pain
- Swelling
- Blisters

Third-degree Burns
(Full thickness)
Third-degree burns affect the epidermis, dermis and hypodermis, the loose connective tissue below the skin (see diagram on page 1). Third-degree burns may appear dark or charred or pearly and translucent, with coagulated (clotted or thickened) vessels visible just below the skin surface. These burn areas may be numb if nerves are destroyed, although the person may complain of pain, usually because of second-degree burns. Healing of third-degree burns is very slow because of the destruction of skin tissue and structures. Third-degree burns usually result in extensive scarring.

Burning Facts

The hypodermis is not part of the skin, and lies below the dermis. Its purpose is to attach the skin to underlying bone and muscle as well as to supply the skin with blood vessels and nerves. It is made up of loose connective tissue and elastin.

Signals of third-degree burns:
- Redness
- Numbness
- Swelling
- Blisters
- Charred, peeling skin
- Shock (pale, cool, moist skin; weakness; bluish lips and fingernails; troubled breathing)

Types of Burns

Thermal burns are caused by exposure to heat that damages the skin. These burns are caused by flames, hot liquids, steam or hot objects.

Chemical burns are caused by exposure of the skin to a chemical substance—strong acids, alkalies or other corrosive materials, such as drain cleaner, ammonia, bleach and nail polish remover. Chemical burns are the result of the conversion of chemical energy to thermal energy. Reactions to chemicals can be localized or systemic (whole body). If localized, the skin can be red or blistered or a rash may appear. The process continues as long as the chemical remains in contact with the skin.

Electrical burns, injury to the skin or internal organs, are caused by exposure to electric current. When the current enters the body, it is converted to heat. Electrical burns may look minor, but there may be extensive internal damage because the heat follows the flow of the current through the body, usually along blood vessels and nerves.

Radiation burns are caused by localized exposure to high radiation doses. The most easily recognized radiation burn is sunburn.

Mechanical burns are caused by friction against the skin from an outside irritant, such as rope, carpet or clothing, or from contact, such as during sports activities. Friction produces heat that may cause redness, peeling or blistering.

Burn Hazards

Name _____

Directions: In **Column 1**, without checking, list burn hazards you think could be found in your home. Next, search your home for burn hazards, and list in **Column 2** the hazards you actually find. Finally, conduct research in local libraries and on the Internet, and interview local experts on burn hazards to discover actions you can take to burn-proof your home (**Column 3**).

1. Burn Hazards I Think Are in My Home	2. Burn Hazards I Found in My Home	3. What I Can Do to Avoid Burns

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Transporting O_2 Through the Body

Name _____

Directions:

1. Read the information about aerobic cellular respiration.

Aerobic Cellular Respiration

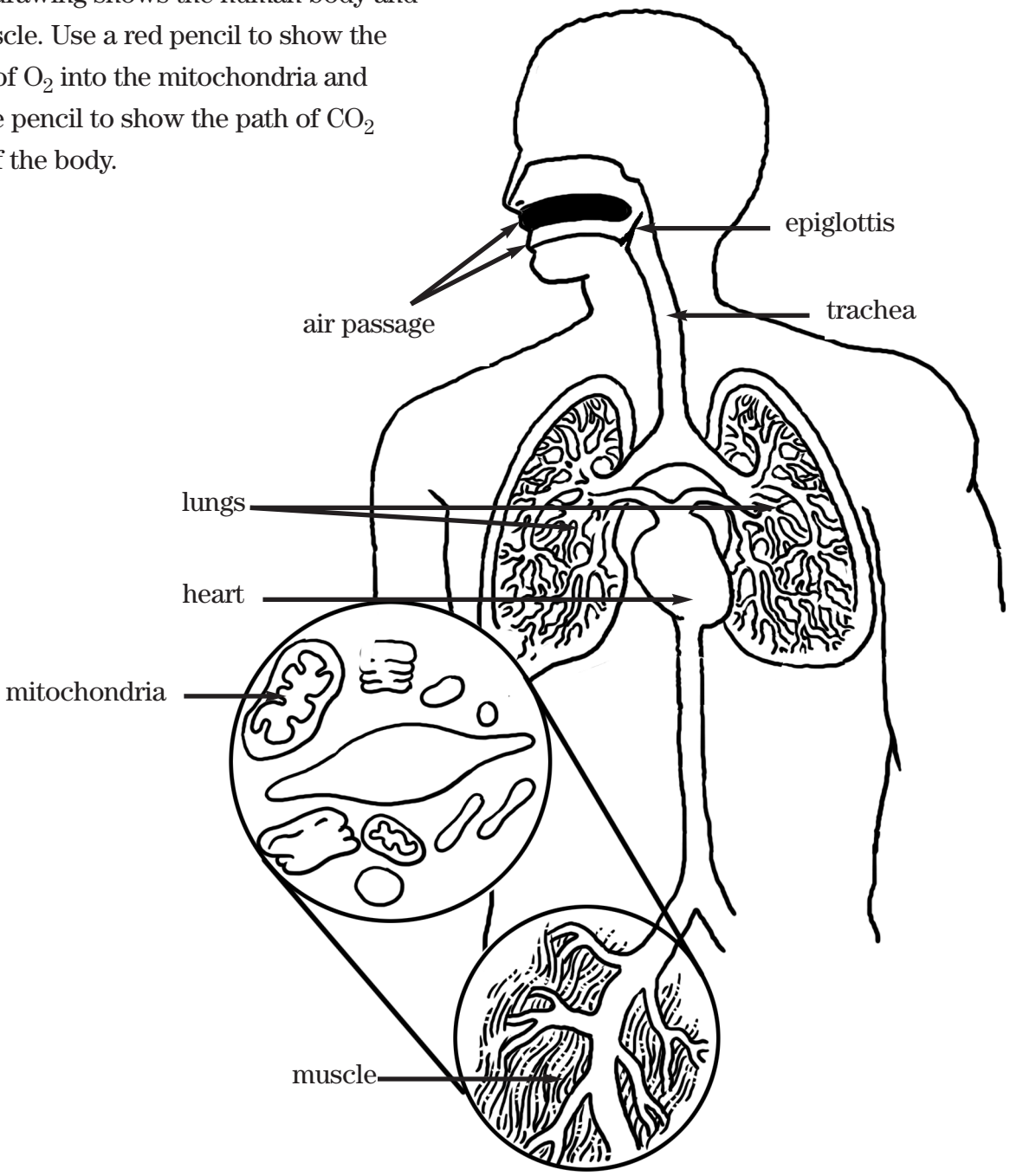
Combustion reactions also take place in cells. Sugar (carbohydrate) is burned in a controlled oxidation called **aerobic cellular respiration**. This reaction releases energy. Cells use this energy to grow, move and make substances that the body needs. For aerobic cellular respiration to continue to provide energy for cells, they must have molecular oxygen (O_2) and dispose of carbon dioxide (CO_2).

Aerobic cellular respiration takes place in special organelles in the cell. These organelles are called "mitochondria." Mitochondria provide energy for the cell to do work. Often, they are called the power-house of the cell. Cells that use a lot of energy, such as muscle cells, have lots of mitochondria.

All organisms must exchange gases with their environment. In mammals, such as humans, different organ systems work together to carry O_2 to cells. The O_2 is used in aerobic cellular respiration. The exchange of gases requires the coordination of the respiratory and circulatory systems. The respiratory system carries the O_2 from the atmosphere to the lungs. The circulatory system carries the O_2 from the lungs to the cells where it is needed. The circulatory system also carries CO_2 to the lungs, where the respiratory system removes it from the body.

Transporting O_2 Through the Body

2. This drawing shows the human body and a muscle. Use a red pencil to show the path of O_2 into the mitochondria and a blue pencil to show the path of CO_2 out of the body.



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Prevent Breathing Emergencies

Name _____

Directions: Cite some risky behavior you think could result in breathing emergencies. Use what you know along with media references to complete the chart below, detailing what risks are most prevalent in each age group. Be thorough, because you will use this information to make your community and family aware of the risks of breathing emergencies.

Age Group	Risky Behavior	How to Prevent Breathing Emergencies
0–3		
4–6		
7–9		
10–14		
15 and older		

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The Physics of Falling

Name _____

Directions: Falls are a part of many sports, and in most instances, participants are trained to anticipate and control falls. Below you will find controlled falls described using physics concepts. All falling objects, including humans, must follow the laws of physics as they fall. Understanding these laws can make falls less injurious. Read the following paragraphs carefully to help learn the physics of falling.

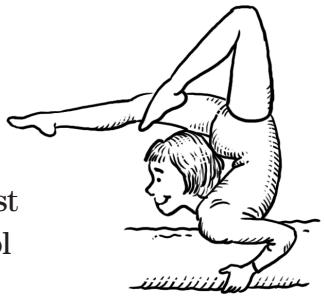
All objects with **mass** have **inertia**, or resistance to change in motion. It takes a force, or a push or pull, to overcome **inertia** and to get a stationary object in motion or to stop a moving object. The faster an object is moving, the more momentum it has and the harder it is to stop the object. For example, a gymnast running across the floor has **momentum** and **inertia**. It will take a **force** to stop the gymnast before he or she reaches the edge of the mat. The friction of the gymnast's feet provides this force against the mat. If the mat is slick, then the **force of friction** may not be enough to stop the gymnast who could go sliding off the mat and have a dangerous fall.

An object is **balanced** whose **center of mass** (the point in the body where all the mass is considered to be concentrated) is directly over a support. Often, athletes spread their legs and arms if they feel themselves losing **balance**. An object supported on a single point, such as one leg, is more unstable than an object with two or more bases of support. The wider the base of support, the better **balanced** the object. When gymnasts dismount an apparatus, they like to "stick" the landing—that is, land with both feet close together and their arms straight in the air. Often their **momentum** and **inertia** push them **off balance**, and they must open their legs, take a step, and spread out their arms. This provides a more stable base to support their **center of mass,** and while not scoring many points with the judges, it can prevent a serious fall.

The Physics of Falling

Athletes sometimes twist their bodies as they fall through the air. They can control the speed at which they **rotate**. The **force** causing this rotation is called **torque**. Just as objects with mass have **inertia**, twisting objects have **rotational inertia**, or resistance to change in rotation. If the same **torque** works on a rotating body, the body can be made to spin faster or slower by changing the **rotational inertia**. If athletes want to **rotate** faster, they tuck in their arms and legs to decrease their **rotational inertia** and spin faster. If athletes want to slow the rotation, they spread their arms and legs wide to increase the **rotational inertia**.

Watch gymnasts on the balance beam as they use their arms and legs to change rotational inertia and lessen the chances for a fall. Gymnasts who have lost their balance and are falling out of control quickly position their arms and legs to decrease their acceleration toward the ground and lessen the **impact** of the fall.



In many events, gymnasts are off the ground. If they lose their **balance** in these positions, the falls can be much more serious. **Gravity** will **accelerate** the gymnasts toward the ground, and they will land with a greater **velocity**. If the gymnasts land on a very hard surface, such as a wood or concrete floor, serious injury is likely to occur, such as **fractured** bones. Mats are used to try to avoid such injuries. Mats are less **dense** than other flooring materials, and they **compress** to absorb the **weight** of gymnasts. As the mat **compresses,** the gymnast slows to a stop, thus decreasing the **force** of the **impact**.

Playground Safety Checklist

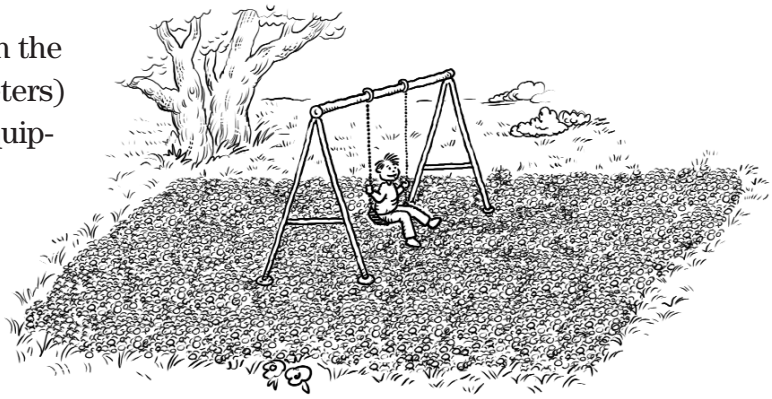
Name _____

Directions: Slips, trips and falls account for most playground injuries. Most falls are to the ground below the equipment, but some falls are from one piece of equipment to another. Use this checklist and a ruler, meter stick, or tape measure to help you evaluate the safety of the playground and its equipment.

YES NO

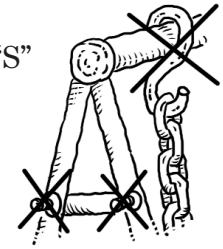
❑ ❑ 1. Do surfaces around playground equipment have shock-absorbing material (wood chips, mulch, sand or pea gravel) at least 12 inches (30 centimeters) deep or safety-tested rubber or rubber-like mats?

❑ ❑ 2. Is the protective material on the surface at least 6 feet (2 meters) in all directions from the equipment? For swings, does the surfacing extend, back and front, twice the height of the suspending bar?



❑ ❑ 3. Are play structures that are more than 30 inches (76 centimeters) high spaced at least 9 feet (3 meters) apart?

❑ ❑ 4. Is potentially dangerous hardware (for example, open "S" hooks or protruding bolt ends) installed safely?



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Playground Safety Checklist

YES NO

❑ ❑ 5. Is equipment free of sharp points or edges?

❑ ❑ 6. Are spaces between such things as guardrails or ladder rungs less than 3.5 inches (9 centimeters) or more than 9 inches (23 centimeters)?

❑ ❑ 7. Are tripping hazards, such as exposed rocks, tree stumps and concrete footings, removed or safely buried?

❑ ❑ 8. Do all ramps and platforms have guardrails?

❑ ❑ 9. Are the equipment and the surfacing material in good condition?

❑ ❑ 10. Are the rules of the playground posted where everyone can read them?

❑ ❑ 11. Is an adult supervising the children to make sure they are safe?

When you have completed your evaluation, assign 1 point for each "Yes." Add up the points and bring the checklist back to class to compare with your classmates' checklists.

Number of points _____

Source: U.S. Consumer Product Safety Commission, "Public Playground Safety Checklist," Doc. No. 327. Accessed April 6, 2004, at *http://www.cpsc.gov/cpscpub/pubs/327.html*.

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Commonplace Poisons

Name _____

Directions: Find the most common poisons in your medicine cabinet. Then, use reference materials and other sources to complete the research guide. Be thorough. You will use this information to design new and better product warning labels. "Cough suppressant" is filled in for you.

Research Guide					
Consumer product	**Potential poison**	**Dangerous dose**	**How taken into the body**	**Symptoms of overdose**	**Action** (Call Poison Control Center (PCC) and follow instructions; call physician; call 9-1-1 or your local emergency number.)
Cough Suppressant	Dextromethorphan (DXM)	More than 30 ml	Orally	Nausea, vomiting, diarrhea	Call PCC or physician

If the person is unconscious, having trouble breathing, or not breathing, call 9-1-1 or your local emergency number.

Poison Control Center: 1-800-222-1222

Be prepared: Take a CPR or first aid course from your Red Cross chapter. To find your local chapter, go to *www.redcross.org* and enter your zip code.

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