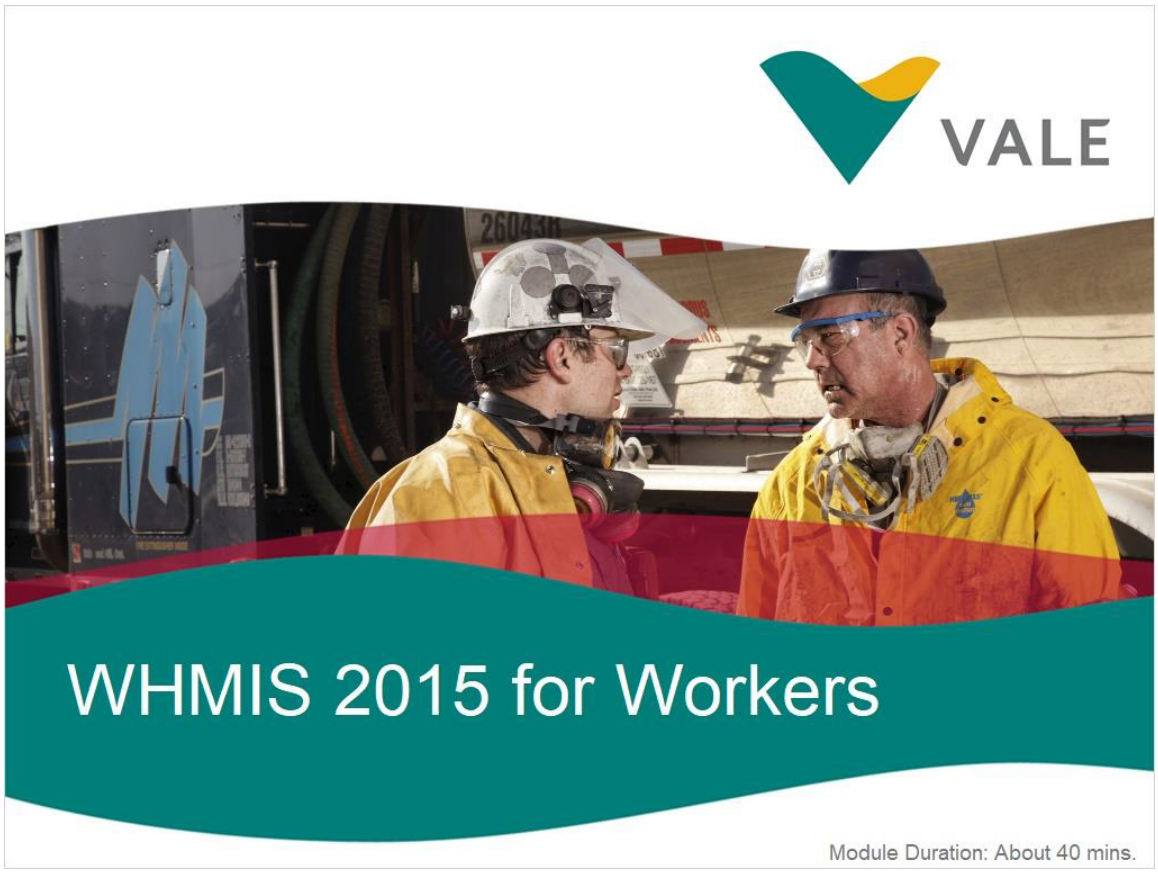
T3: WHMIS Orientation

1. WHMIS 2015 for Workers

1.1 L_D_Slide



1.2 Instructions for training recording in VES

Instructions for training recording in VES

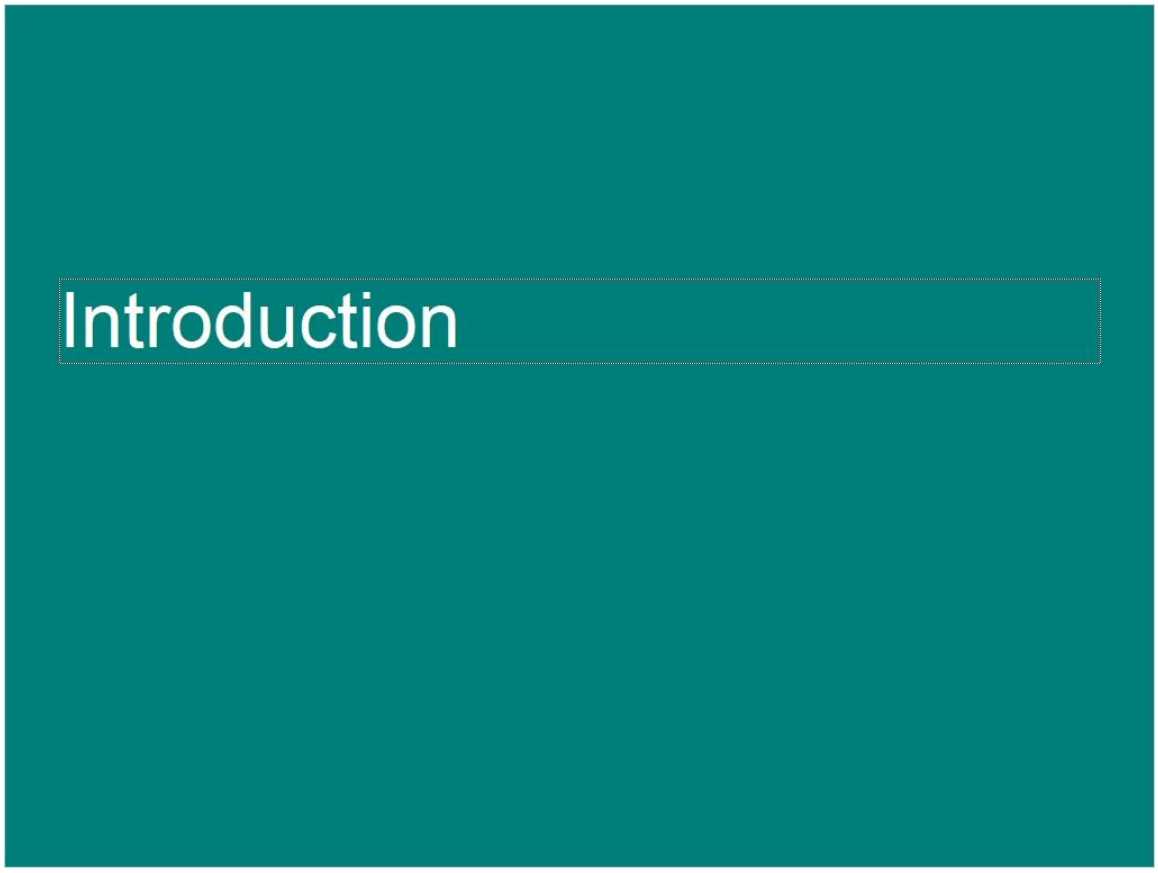
If using this module for self-directed learning, simply complete the module and follow the instructions on the conclusion slide. Your training will be automatically updated (in VES) as complete and this learning item will be removed from your Learning Assignments.

If you need to leave the module part way through you can always return again and resume where you left off.

If you wish to review the module again you will find it in your Learning History list.

2. Introduction

2.1 Divider



2.2 Purpose

Purpose

This WHMIS GHS *(Globally Harmonized System)* module is designed to provide a basic awareness regarding the hazardous products that you use and store in your workplace.

This information is provided by labels and safety data sheets (SDSs).

GHS is a worldwide system. Its goal is to have a common set of rules for classifying hazardous products, common rules for labels, and a standard format for SDSs that is adopted around the world.

2.3 Purpose

Purpose

Aligning WHMIS with GHS helps to:

- Enhance the protection of worker health and safety by having improved and consistent hazard information.
- Encourage safe transport, handling and use of hazardous products.
- Promote better emergency response.
- Promote regulatory efficiency and compliance.

2.4 Objectives

Objectives

In this course, you will learn how to:

- Understand labels.
- Recognize the pictograms (symbols) and understand the hazards that they represent.
- Identify the hazards represented by each hazard class.
- Find additional information about hazards and protective measures on safety data sheets (SDSs).

Important Notice

This module will help you fulfill the legislated requirements for education and training related to hazardous products. In addition, you will need instruction specific to your work-site and procedures.

The information in this module is based on the federal Hazardous Products Act and the Hazardous Products Regulations, administered by Health Canada.

2.5 WHMIS Components

WHMIS Components

WHMIS 2015 is a workplace safety and education program that helps to protect workers from hazardous materials. It is based on the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) and is designed to ensure that workers are aware of the potential hazards of the chemicals they work with and how to handle them safely.

The program includes standardized labels and safety data sheets (SDS) for hazardous materials, as well as training for workers on how to read and understand this information. The labels and SDS provide information about the hazards of the material, how to handle it safely, and what to do in case of an emergency.

To ensure their own safety, workers must be able to recognize potential hazards and understand the precautions that should be taken when working with these materials. This includes knowing how to read labels and SDS, as well as being familiar with the hazard classes and their associated symbols.

The symbols may be in the form of pictograms, which are simple, standardized images that convey information about the hazard. These symbols are designed to be easily recognizable and understood, even by people who may not speak the language of the label or SDS. Examples of these symbols include a flame for flammable materials, a skull and crossbones for toxic materials, and a corrosive symbol for materials that can cause burns.

2.6 WHMIS Components

WHMIS Components

You will likely have had WHMIS training before. With the alignment with GHS, you will notice that there are new pictograms and new requirements for labels and SDSs.

In general, pictograms (at right) are similar to WHMIS 1988 hazard symbols (at left).

Many of the symbols are almost identical.

However, there are some new symbols (the ones within the “Health hazard,” “Exploding bomb,” “Environment,” and “Exclamation mark” pictograms, highlighted by dashed lines).

And two symbols (in the “Materials causing other toxic effects” and “Dangerously reactive material” hazard symbols, highlighted by dotted lines) have been retired.

In all but one case (“Biohazardous infectious materials”), the pictogram borders are red and diamond-shaped.

Most pictograms are assigned to multiple hazard classes and categories.

WHMIS 1988 Hazard Symbols

WHMIS 2015 Pictograms

2.7 WHMIS Key Questions

WHMIS Key Questions

The Workplace Hazardous Materials Information System is in place to make sure you get the answers and information you need to Get **HomeSafe**.

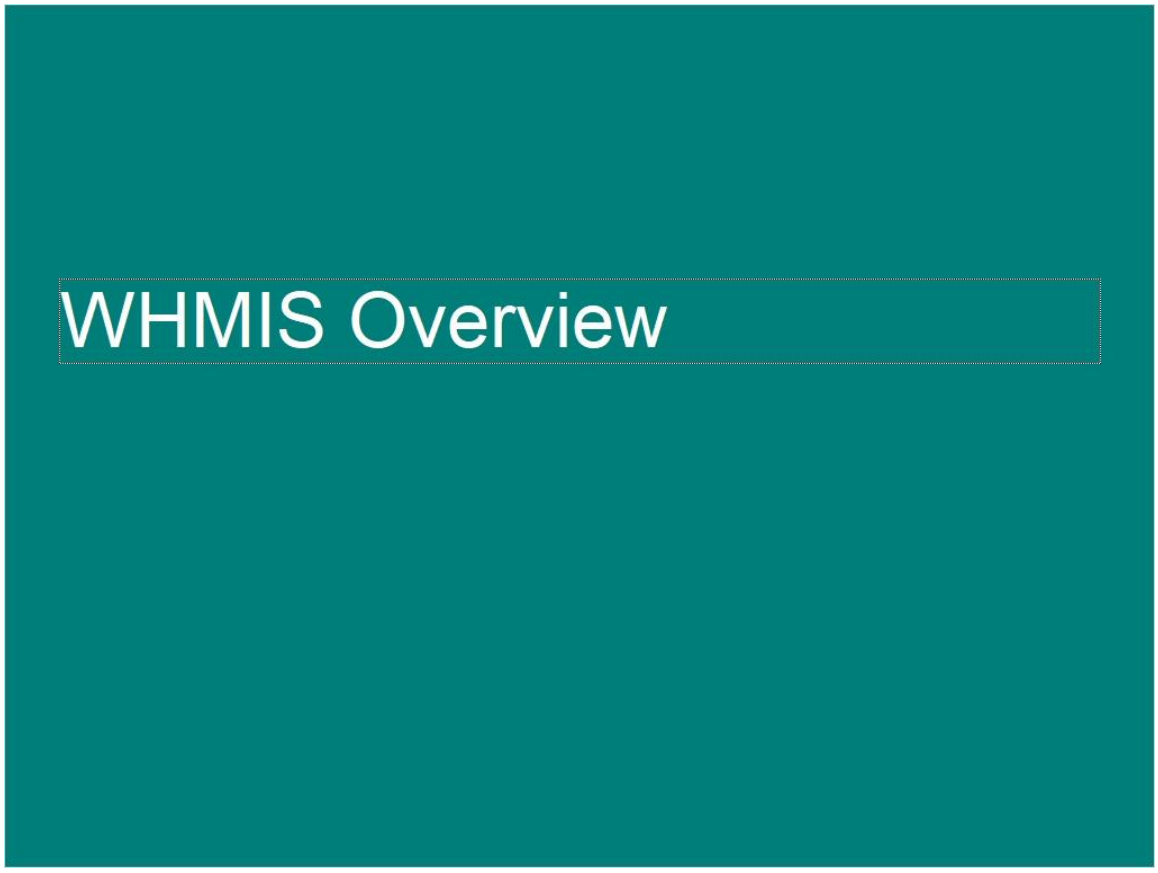
Remember, to ask yourself these key questions *before* working with *any* hazardous materials;

- What is the Hazard?
- How do I protect myself?
- What should I do if there is an accident?
- How do I get more information?

WHMIS 2015 will provide you with the answers to these questions.

3. WHMIS Overview

3.1 Divider



3.2 Legal Requirements

WHMIS Overview

Legal Requirements

In February 2015, Canada amended the Hazardous Products Act and published the Hazardous Products Regulations in order to incorporate the GHS into WHMIS. The new WHMIS is identified as WHMIS 2015.

To allow time for suppliers, employers and workers to adjust, implementation will take place over a multi-year transition period, where both the original WHMIS (WHMIS 1988) and WHMIS 2015 may be used in the workplace. Suppliers can currently use either WHMIS 2015 labels and SDSs for hazardous products, or they may use WHMIS 1988 labels and MSDSs.

Employers are required to educate and train workers about WHMIS 2015, and the new labels and SDSs as they will appear soon in their workplaces. Consult your local jurisdiction for WHMIS requirements and implementation dates.

3.3 What Does WHMIS Do?

WHMIS Overview

What Does WHMIS Do?

WHMIS legislation provides standards for classifying hazardous products into hazard ***classes*** and ***categories***.

Under WHMIS legislation suppliers are required to attach labels to hazardous products that meet one or more of the classification criteria according to the Hazardous Products Act and regulations.

Suppliers are also required to ensure that Safety Data Sheets (SDS's) for these hazardous products are provided to their customers.

3.4 Hazard Classification

WHMIS Overview

Hazard Classification

Hazardous products are assigned to hazard classes based on their properties such as, *Flammable gases* or *Skin corrosion/irritation.*

The hazard class and category provide information which describes:

- The *Type* of hazard
- The *Degree* of the hazard, and
- *Preventative Measures* to follow

3.5 Hazard Classification

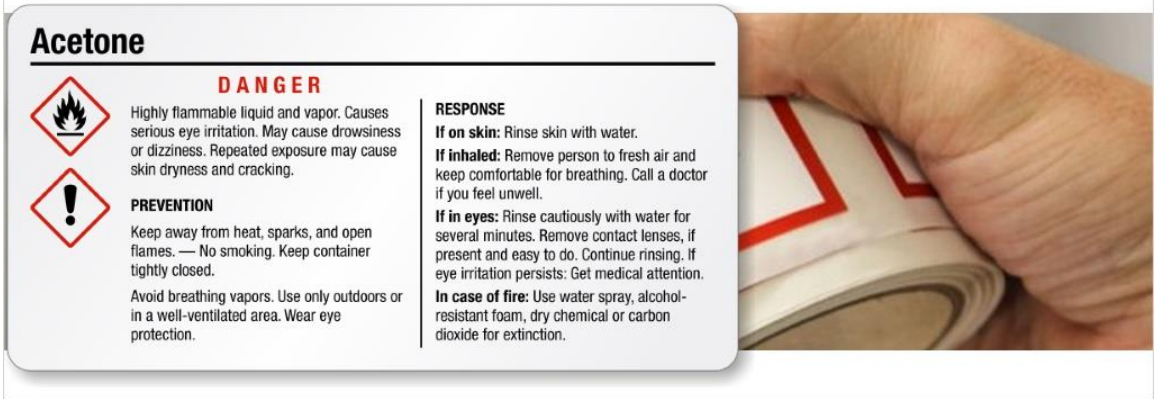
WHMIS Overview

Hazard Classification

Preventative Measures provide guidance about the precautions necessary to safely handle the product, as well as information about how to store and how to clean up or deal with a spill or leak.

It is important to note that some products can present more than one hazard, and therefore belong to more than one hazard class.

For example, acetone falls into multiple hazard classes, including Flammable liquids - Category 2, Eye irritation - Category 2A, and Specific target organ toxicity - Single exposure - Category 3. Another example is benzene.



3.6 Exemptions

WHMIS Overview

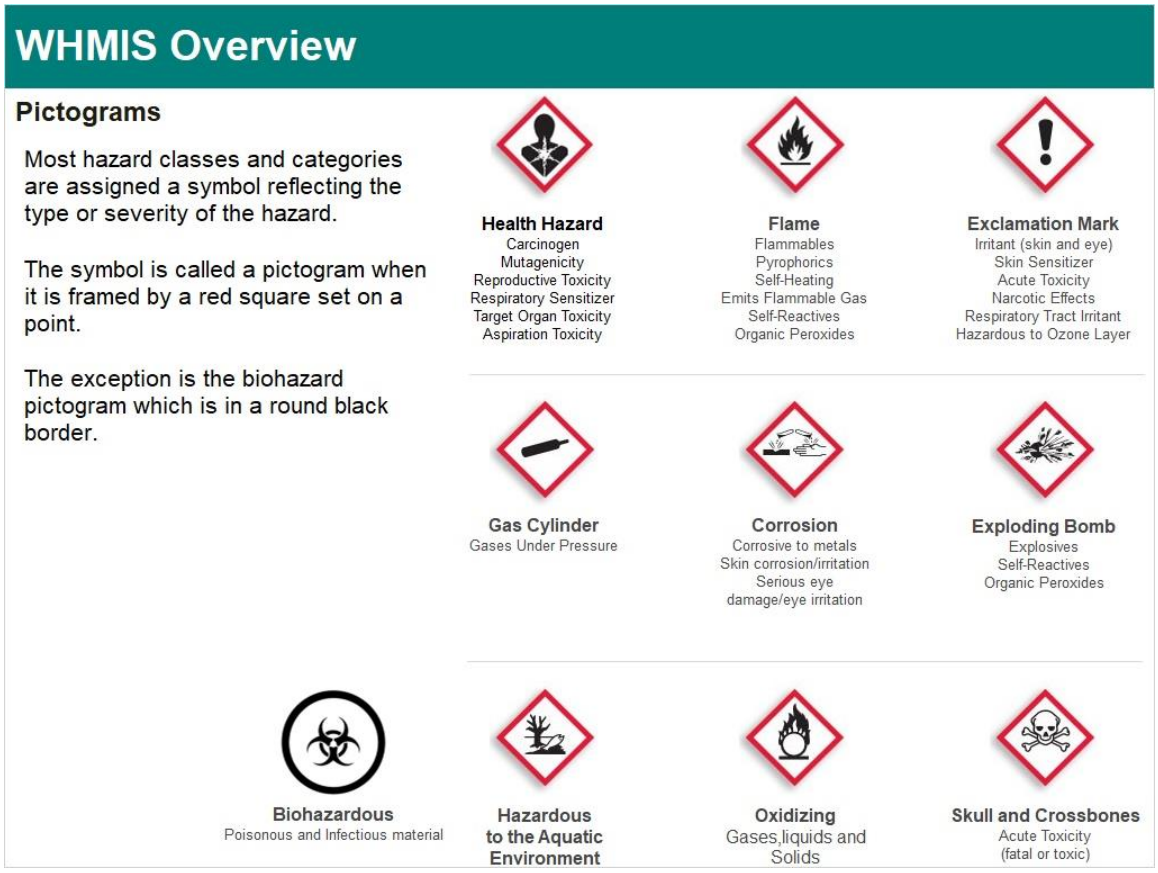
Exemptions

Like previous WHMIS legislation, the update excludes some types of products from labelling and SDS requirements because these products are regulated by other laws.

Products which are outside of the WHMIS legislation include:

- Explosives *(as identified in the Explosives Act)*
- Hazardous Waste
- Pest control products *(as defined in the Pest Control Products Act)*
- Radioactive Materials
  (as explained in the Atomic Energy Control Act)
- Wood or Wood Products
- Hazardous Materials in Transit
  (as indicated in the Transportation of Dangerous Goods Act and Regulations)
- Tobacco or Tobacco Products
- Manufactured Articles, as well as
- Food, Drugs, Cosmetics or Devices
  (as outlined in the Food and Drugs Act), and also
- Consumer Products

3.7 Pictograms



3.8 Knowledge Check

(Matching Drop-down, 10 points, unlimited attempts permitted)

Knowledge Check

Using the drop-down lists, select the appropriate pictogram for the hazard description.

Gas under pressure

Fire Hazard

Health Hazard

Short exposure can cause death

Correct	Choice
Gas under pressure	Gas under pressure
Fire Hazard	Fire Hazard
Health Hazard	Health Hazard
Short exposure can cause death	Short exposure can cause death

Feedback when correct:

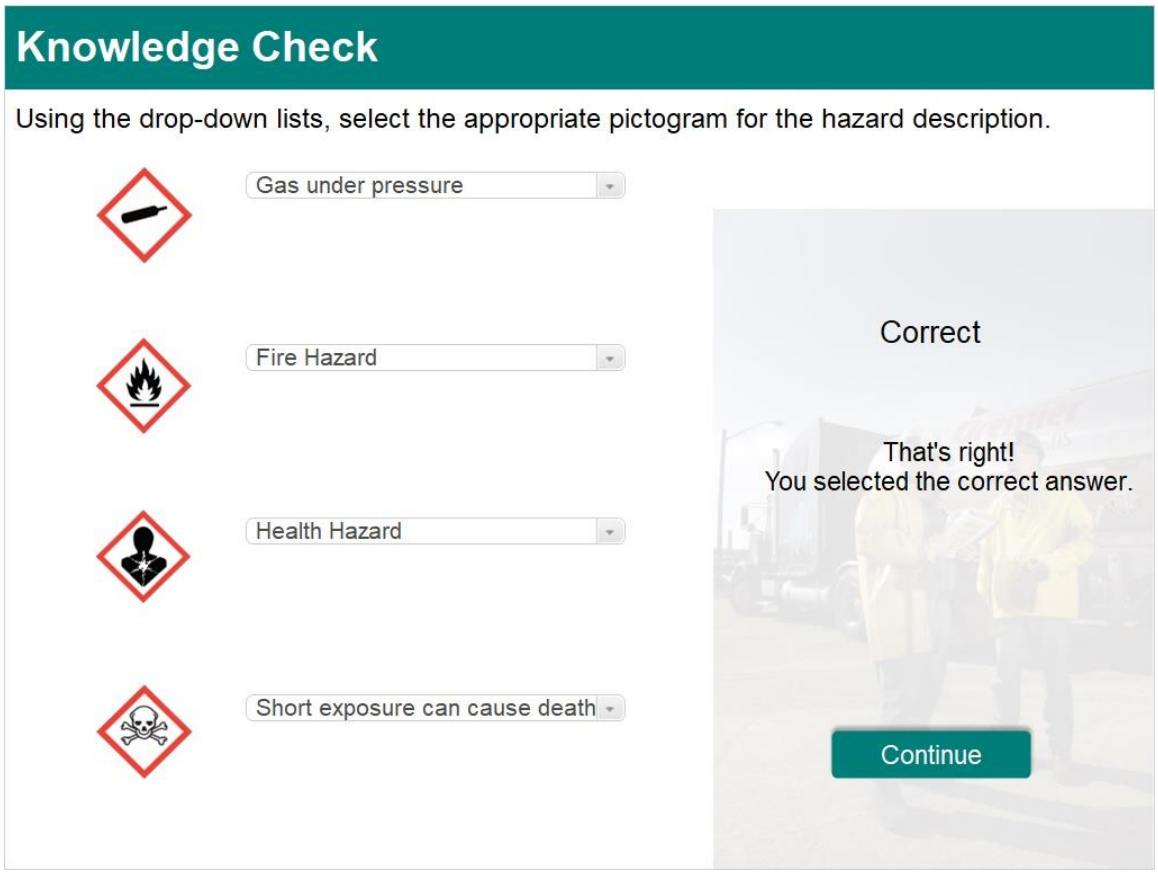
That's right!

You selected the correct answer.

Feedback when incorrect:

You did not select the correct answer.

Correct (Slide Layer)



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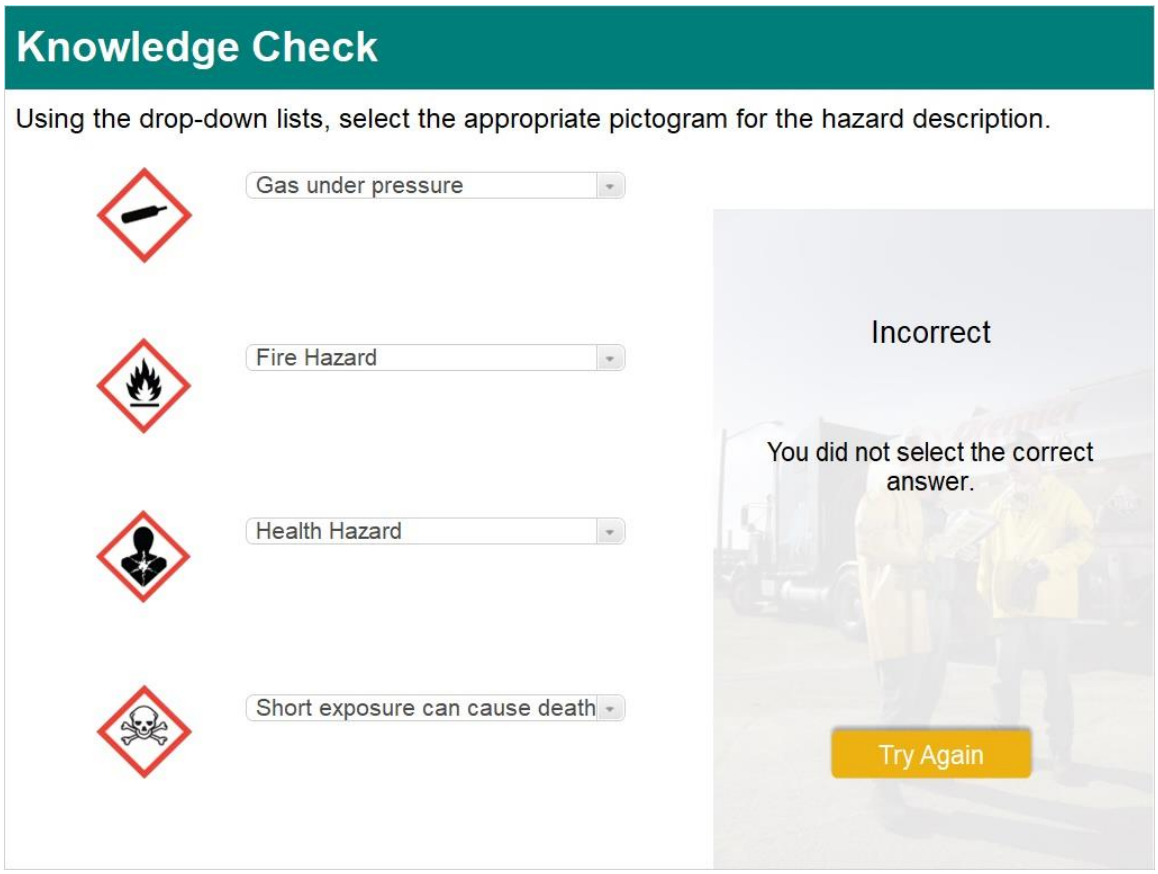

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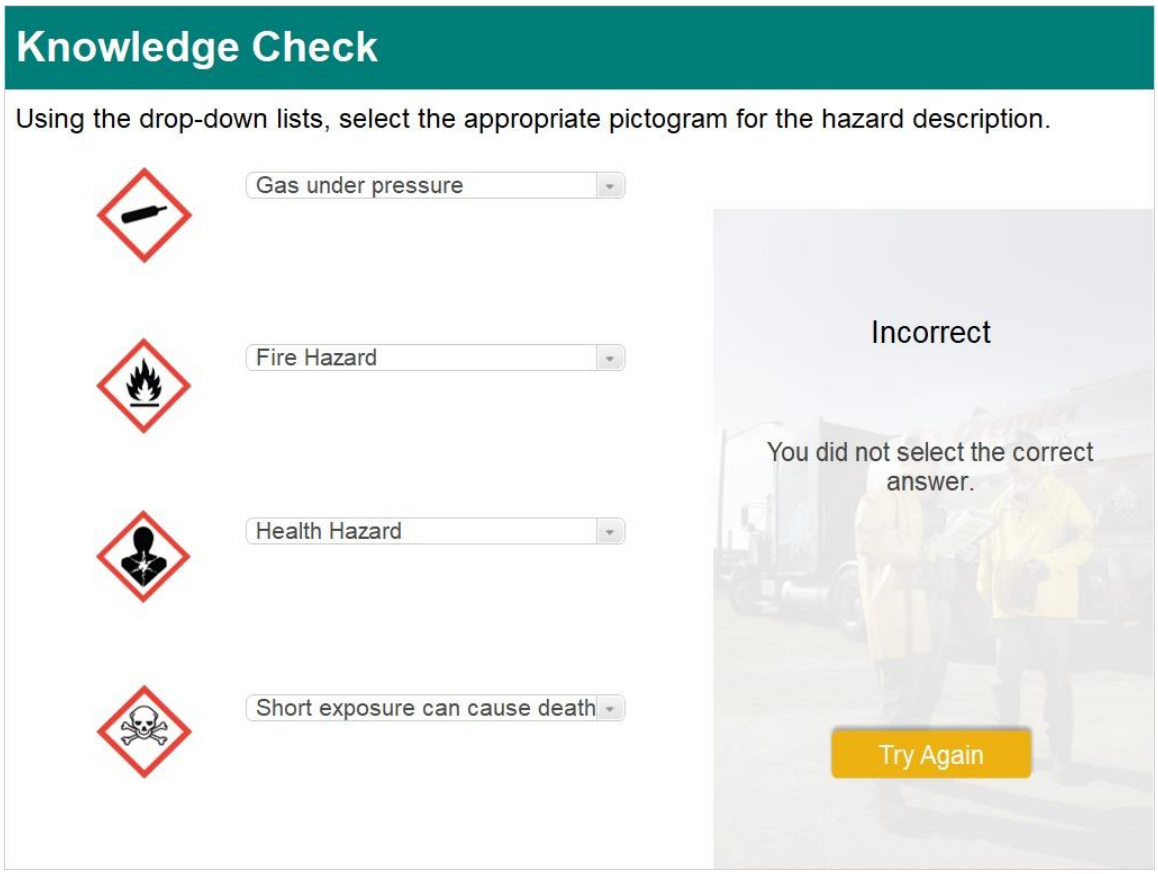

3.9 Knowledge Check

(Matching Drop-down, 10 points, unlimited attempts permitted)

Knowledge Check

Using the drop-down lists, select the appropriate pictogram for the hazard description.

Corrosive

Biohazardous

Highly self-reactive

Skin or eye irritant

Correct	Choice
Corrosive	Corrosive
Biohazardous	Biohazardous
Highly self-reactive	Highly self-reactive
Skin or eye irritant	Skin or eye irritant

Feedback when correct:

That's right!

You selected the correct answer.

Feedback when incorrect:

You did not select the correct answer.

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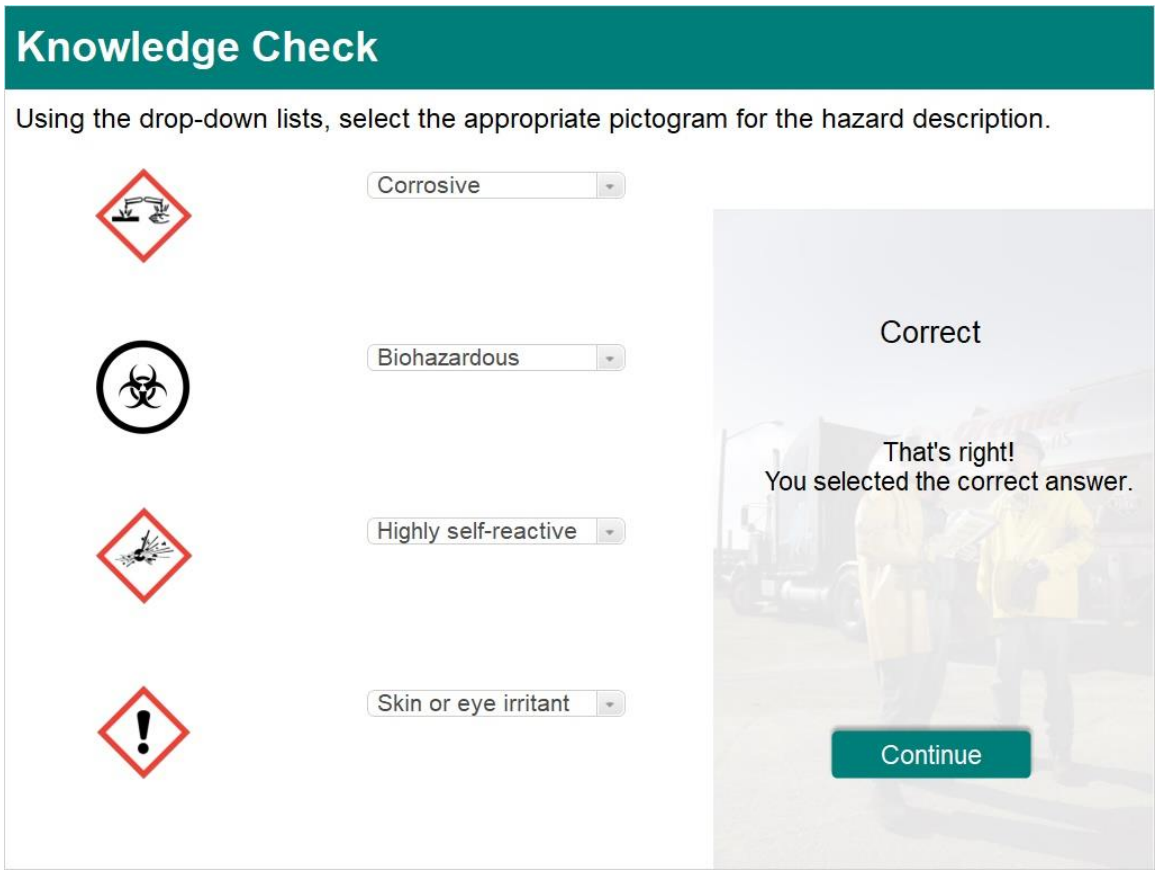
Correct (Slide Layer)



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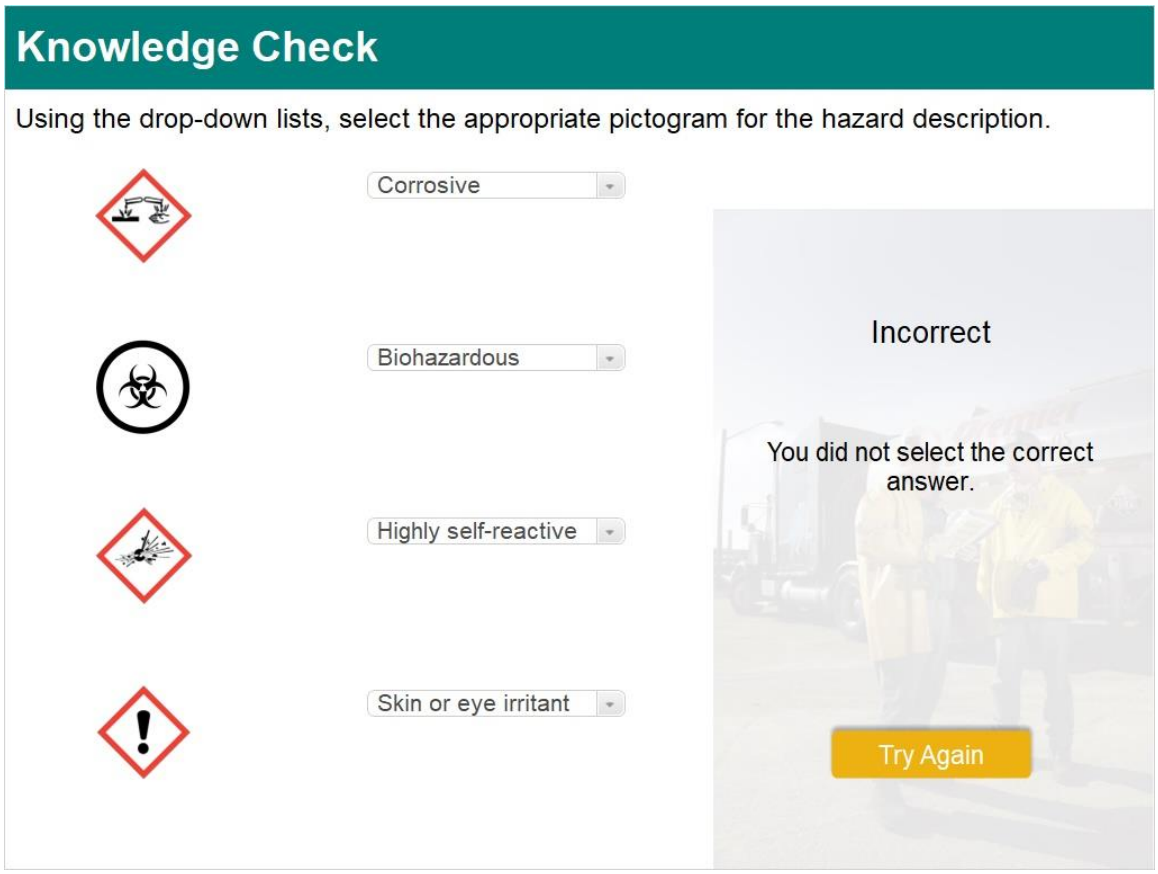

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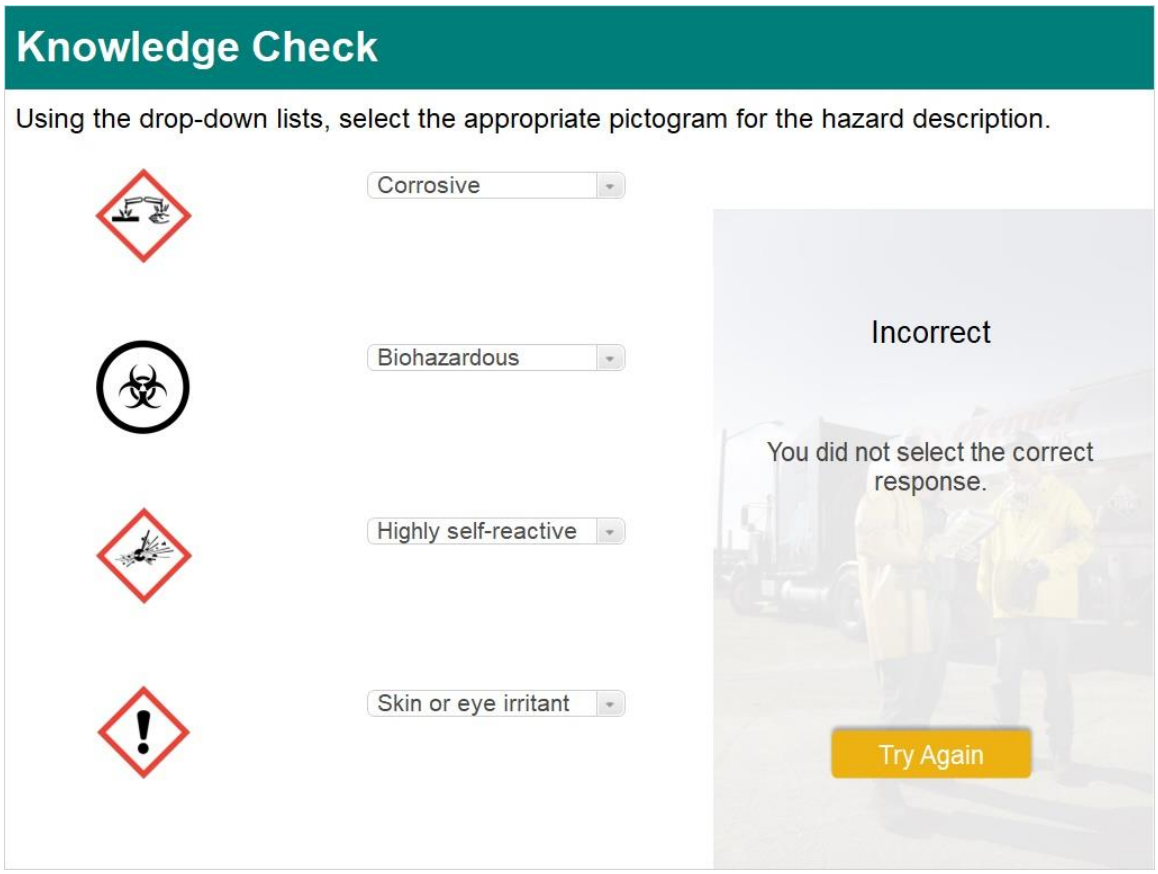


4. Groups and Classes Overview

4.1 Divider

4.2 Groups and Classes Overview

Groups and Classes Overview

What is a Hazard Group?

WHMIS 2015 defines two major groups of hazards which are:

- physical hazards and,
- health hazards.

Each hazard group includes hazard classes that have specific hazardous properties.

The pictograms are used to help identify the many classes of specific hazards.

4.3 Groups and Classes Overview

Groups and Classes Overview

Physical Hazards

Physical hazard classes defined by WHMIS include:

- Flammable gases
- Flammable aerosols
- Gases under pressure
- Oxidizing gases
- Flammable liquids
- Flammable solids
- Pyrophoric liquids
- Pyrophoric solids
- Self-reactive substances and mixtures

4.4 Groups and Classes Overview

Groups and Classes Overview

Physical Hazards

Physical hazard classes defined by WHMIS include:

- Self-heating substances and mixtures
- Substances and mixtures which, in contact with water, emit flammable gases
- Oxidizing solids
- Oxidizing liquids
- Organic peroxides
- Combustible dusts
- Corrosive to metals
- Simple asphyxiants
- Pyrophoric gases
- Physical hazards not otherwise classified

4.5 Groups and Classes Overview

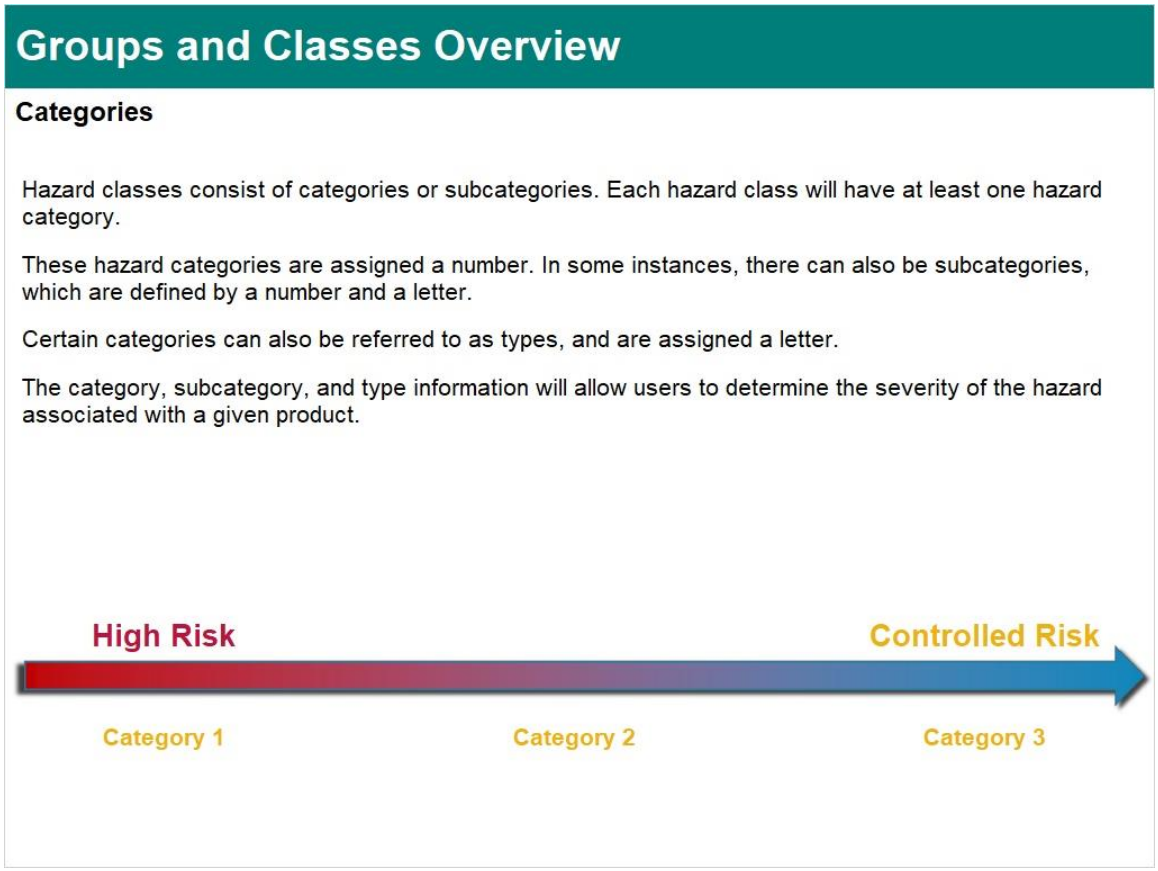
Groups and Classes Overview

Health Hazards

Health hazard classes defined by WHMIS include:

- Acute toxicity
- Serious eye damage/eye irritation
- Skin corrosion/irritation
- Respiratory or skin sensitization
- Germ cell mutagenicity
- Carcinogenicity
- Reproductive toxicity
- Specific target organ toxicity – Single exposure
- Specific target organ toxicity – Repeated exposure
- Aspiration hazard
- Biohazardous infectious materials and
- Health hazards not otherwise classified

4.6 Groups and Classes Overview



4.7 Groups and Classes Overview

Groups and Classes Overview

Categories

As a worker, it is important to remember that Category 1 is always more hazardous than Category 2 or 3. Similarly, subcategory 1A is always more hazardous than subcategory 1B or 1C.

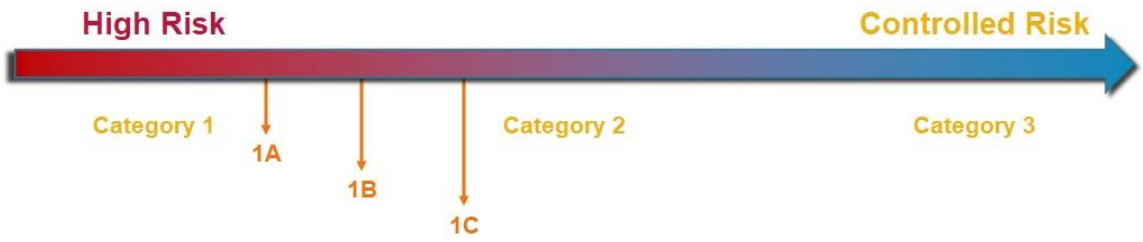
For example, *Flammable liquids* is a hazard class. Within this class, there are four divisions or categories, each with different flash points and/or initial boiling point cut-off values:

Category 1: Flash point <23°C and initial boiling point <35°C (most flammable)

Category 2: Flash point <23°C and initial boiling point >35°C

Category 3: Flash point >23°C and <60°C

Category 4: Flash point >60°C and <93°C



4.8 Knowledge Check

(Matching Drop-down, 10 points, unlimited attempts permitted)

Knowledge Check

Using the drop-down lists, select the appropriate key terms for the descriptions.

The two major groups include physical and health. — Hazard Groups

Uses a number to indicate the severity of the hazard present. — Hazard Category

The description of the hazard that the product presents. — Hazard Class

Correct	Choice
The two major groups include physical and health.	Hazard Groups
Uses a number to indicate the severity of the hazard present.	Hazard Category
The description of the hazard that the product presents.	Hazard Class

Feedback when correct:

That's right!

You selected the correct answer.

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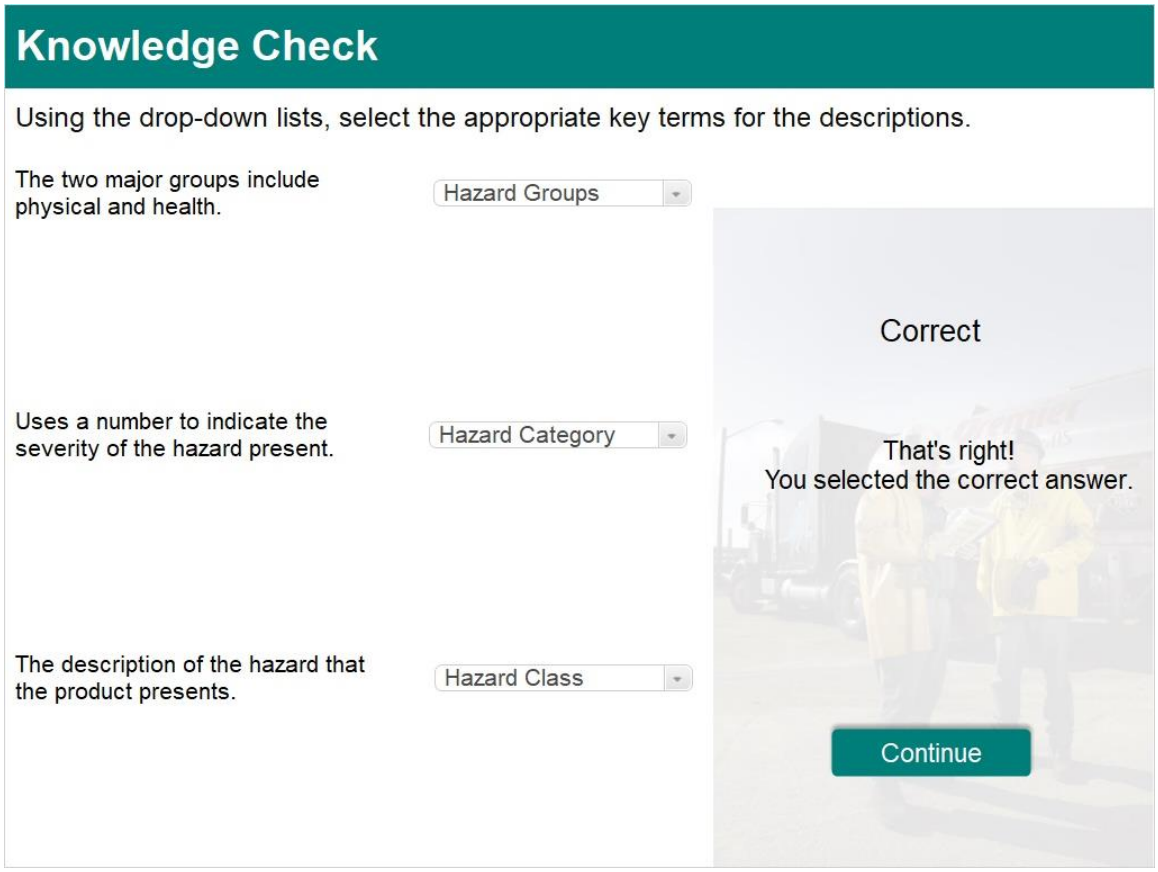
Feedback when incorrect:

You did not select the correct answer.

Correct (Slide Layer)



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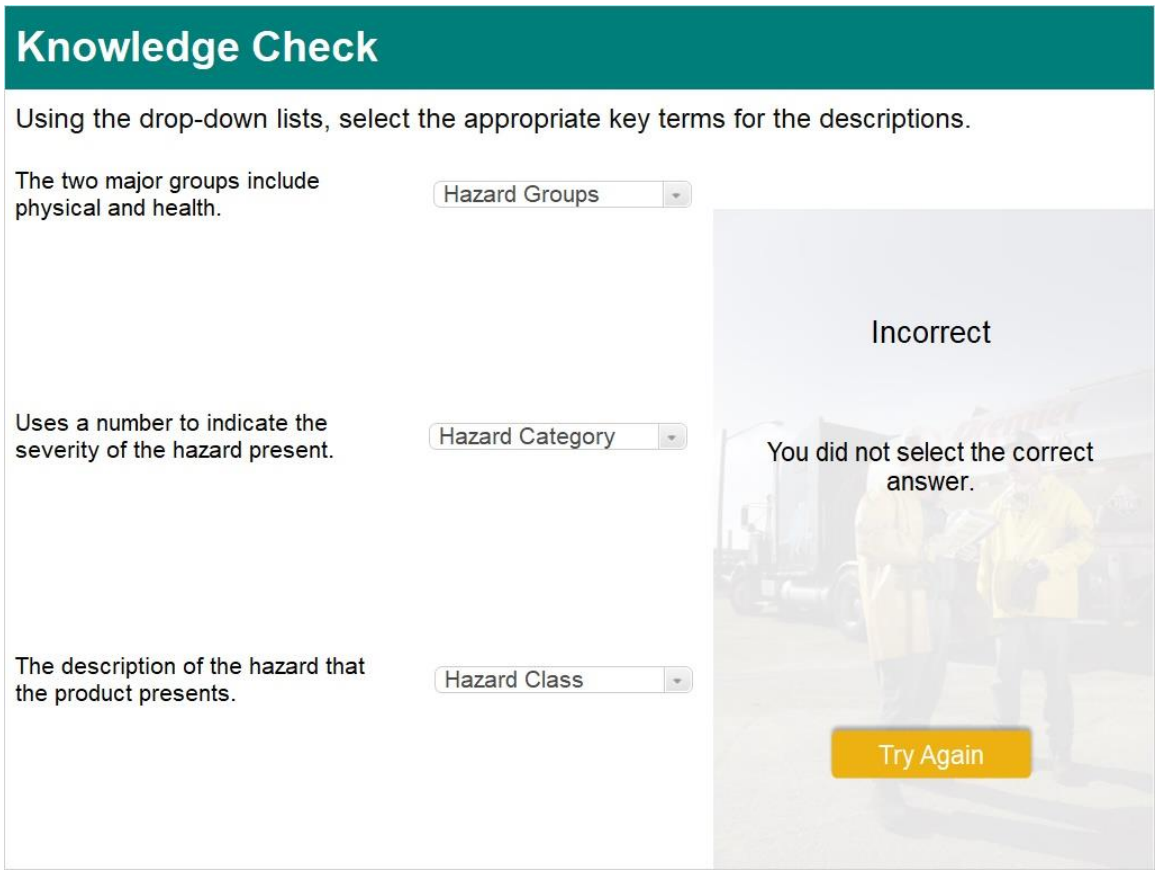

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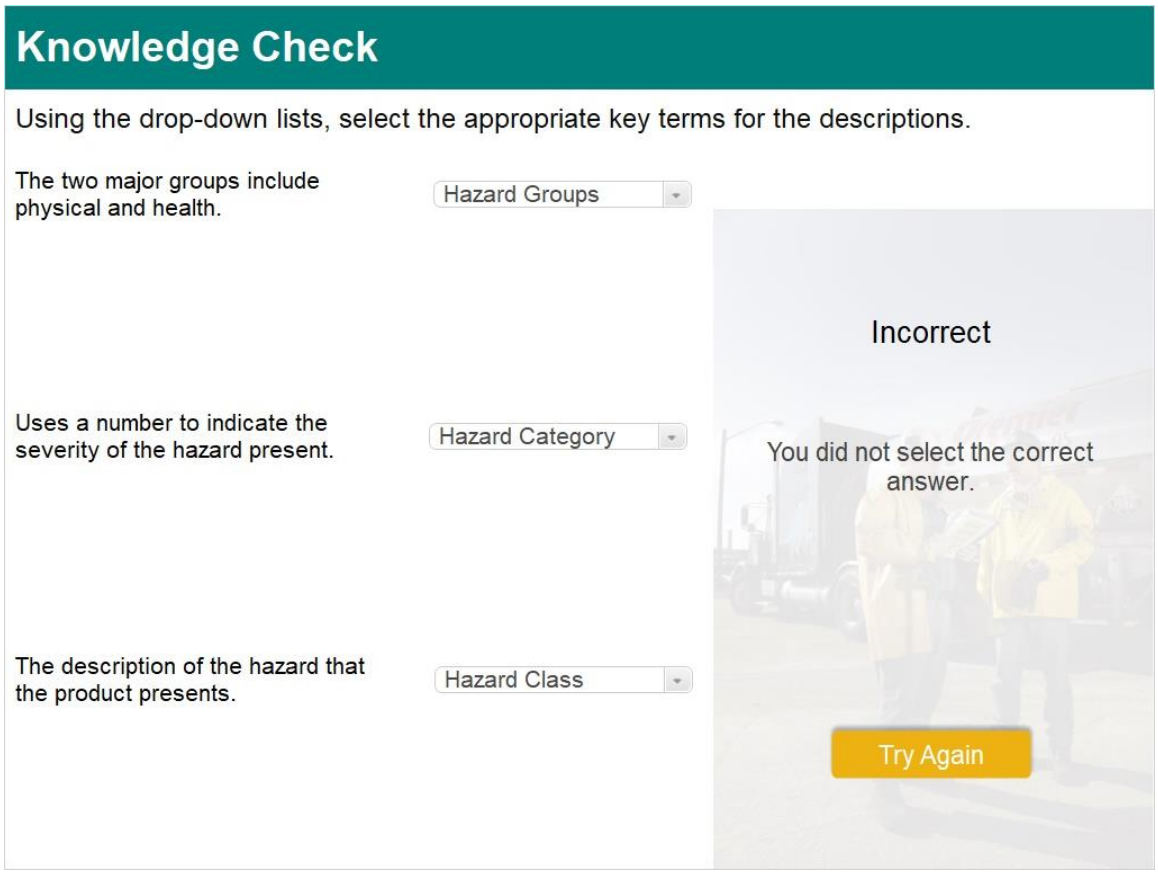
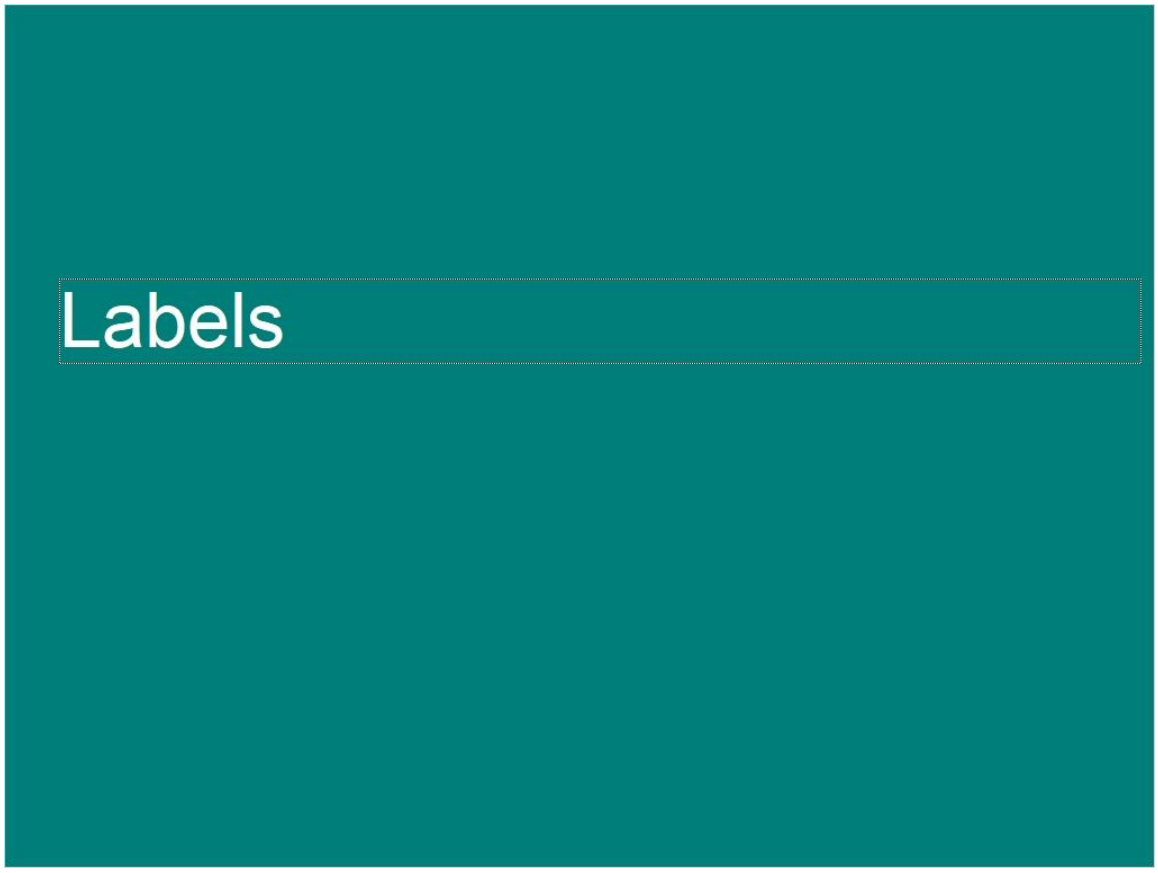


5. Labels

5.1 Divider



5.2 Why are Labels Important?

Labels

Label Types

One of the main elements of WHMIS is labelling.

Labels are required by law on all hazardous products. To ensure this requirement is met, labels are the responsibility of both the supplier and employer. As such, there are two types of labels that can be affixed to hazardous products.

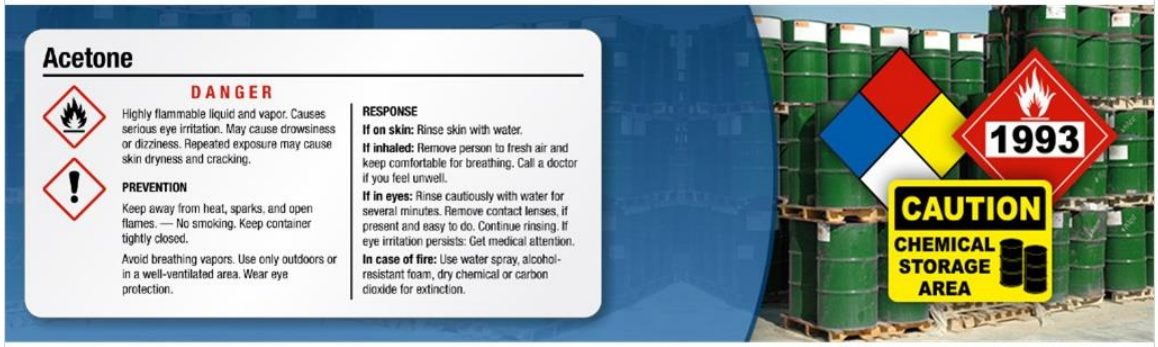
5.3 Why are Labels Important?

Labels

Label Types

The first type of label is the S*upplier* label. All hazardous products received from a supplier are required to have a supplier label.

If a hazardous product is always used in its original container with a supplier label, no other label is required.



5.4 Legal Requirements

Labels

Label Types

The second type of label is the W*orkplace* label.

Workplace labels are used when the supplier label is no longer on the original container or has become damaged, if the hazardous material has been transferred to a different container, or if a hazardous product is produced and in use in the workplace.

5.5 Legal Requirements

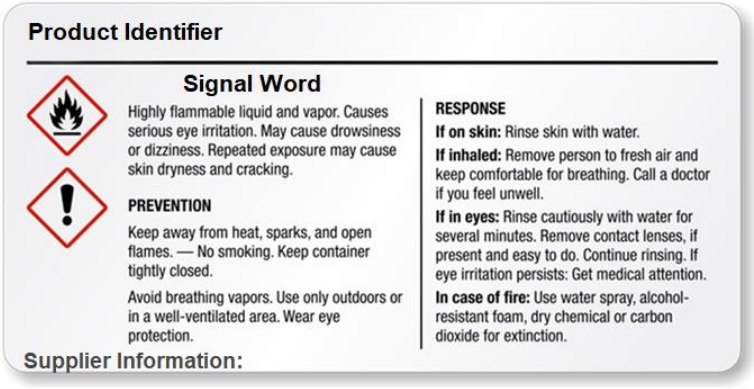
Labels

Why are Labels Important?

Labels are designed to alert employers and workers to the hazards of the product and to the precautions to be taken when someone is handling or working with the product.

Listed below are the components of a GHS-compliant label which include:

- **Product Identifier**
- **Signal Word**
- **Pictograms**
- **Precautionary Statements**
- **Hazard Statements**
- **Supplier Information**



(Please note: Actual label design and layout may vary in your workplace.)

Sorry (Slide Layer)

Labels

Why are Labels Important?

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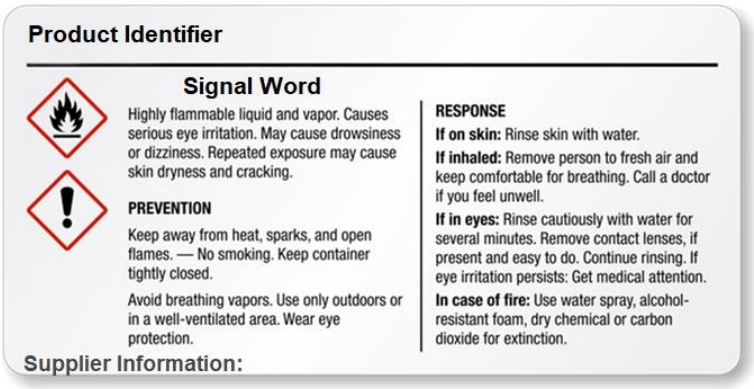
Listed below are the components of a GHS-compliant label which include:

- Product Identifier
- Signal Word
- Pictograms
- Precautionary Statements
- Hazard Statements
- Supplier Information



(Please note: Actual label design and layout may vary in your workplace.)

Sorry
You must review all the content on this slide before proceeding.

5.6 Worker Responsibilities

Labels

Worker Responsibilities

As a worker, what do I have to do?

- Check to see if there is a label.
- Read, understand, and follow the instructions on it. Follow your workplace's safe work procedures.
- Ask for a new label when the old one cannot be seen or read properly.
- Make sure that a workplace labels' attached when you transfer a chemical to a new container.

Important Notice;
Used together, the pictogram, the signal word, and the hazard statements indicate the nature and severity of the hazard(s) presented by the product.

5.7 Workplace labels

Labels

Workplace labels

A workplace label provides the following required information:

- A product identifier identical to the one found on the hazardous product's safety data sheet.
- Safe handling information of the hazardous product.
- A reference to the availability of an SDS (if applicable).

Workplace labels may include pictograms and other supplier label information.

ACETONE

No smoking, sparks or flames

Eye, face and hand protection required
Use in well ventilated area

NIOSH approved respirator with organic vapour cartridges required when handling

Safety Data Sheet available

5.8 Workplace labels

Labels

Workplace labels

Workplace labels are required when any of the following apply:

- A hazardous product is produced (made) at the workplace and used in that workplace.
- A hazardous product is decanted (for example, transferred or poured) into another container.
- A supplier label becomes lost or illegible (unreadable)

ACETONE

No smoking, sparks or flames

Eye, face and hand protection required
Use in well ventilated area

NIOSH approved respirator with organic vapour cartridges required when handling

Safety Data Sheet available

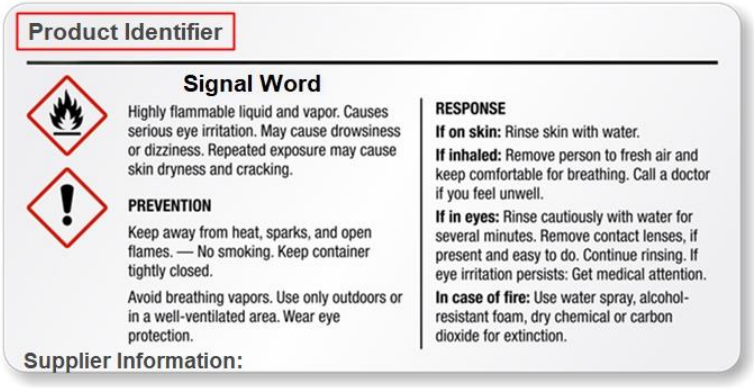
5.9 Product Identifier

Labels

Product Identifier

The product identifier includes information such as;

- the chemical name,
- synonyms,
- brand name or
- generic name of the product.



(Please note: Actual label design and layout may vary in your workplace.)

5.10 Hazard Statements

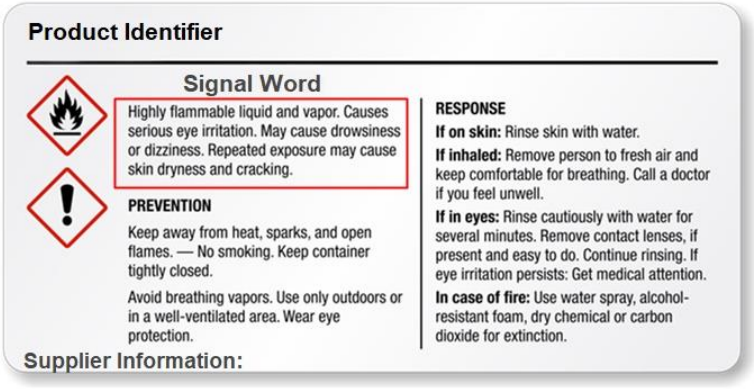
Labels

Hazard Statements

The label will also have hazard statements. Hazard statements are brief, standardized sentences that describe the hazards of the product.

The following are examples of hazard statements:

- Extremely flammable gas
- Contains gas under pressure; may explode if heated
- Fatal if inhaled
- Causes eye irritation
- May cause cancer



(Please note: Actual label design and layout may vary in your workplace.)

Important Notice

The wording of the hazard statement helps to describe the degree of the hazard.

5.11 Precautionary Statements

Labels

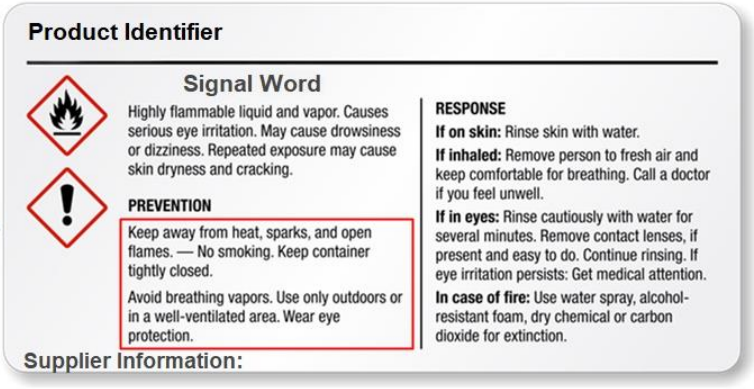
Precautionary Statements

Precautionary statements provide standardized advice on how to minimize or prevent harmful effects from the product.

These statements can include instructions about storage, use, first aid, personal protective equipment, and emergency measures.

There are many precautionary statements, including:

- Keep container tightly closed.
- Wear protective gloves, protective clothing, eye protection and/or face protection.
- If exposed or concerned: Get medical advice and/or attention.
- Fight fire remotely due to the risk of explosion.
- Protect from sunlight.



(Please note: Actual label design and layout may vary in your workplace.)

Important Notice
Precautionary statements on labels may not identify all of the control measures that are necessary. Check the SDS for more information.

5.12 Signal Word

Labels

Signal Word

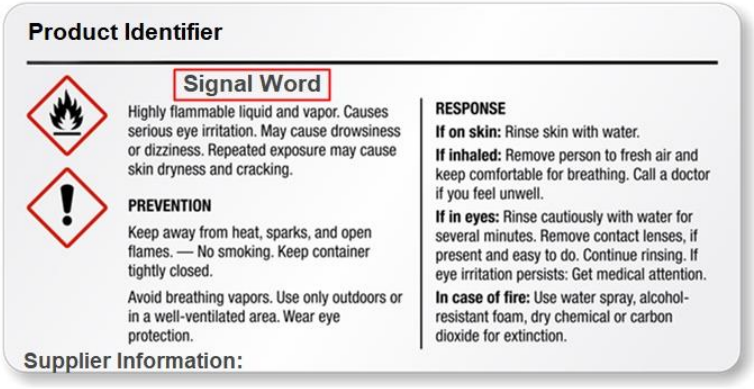
Most labels will show a signal word that indicates the severity of the hazard, if assigned.

There are two signal words: **Danger** and **Warning**.

- **Danger** is used for the more severe hazards.
- **Warning** is used for the less severe hazards.

Only one signal word will appear on the label – the word Danger will be used if both Danger and Warning are assigned.

The regulations specify which of these words is to be used for each hazard class and category.



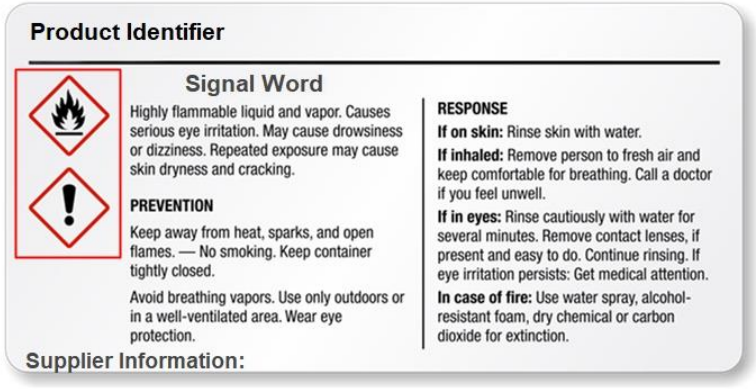
(Please note: Actual label design and layout may vary in your workplace.)

5.13 Pictograms

Labels

Hazard Pictogram

A pictogram is required on the supplier label to allow for a fast hazard assessment by the user.



(Please note: Actual label design and layout may vary in your workplace.)

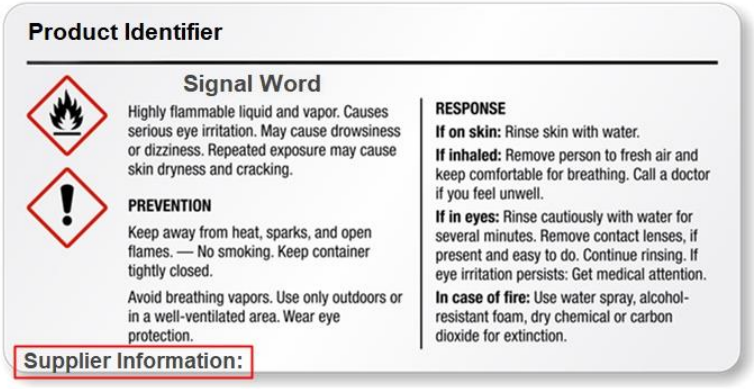
5.14 Supplier Information

Labels

Supplier Identification

This section lists the Canadian Supplier – the company that made or packaged the product, and who is responsible for the label and SDS content.

Contact information is also provided.



(Please note: Actual label design and layout may vary in your workplace.)

5.15 Knowledge Check

(Matching Drop-down, 10 points, unlimited attempts permitted)

Knowledge Check

Using the drop-down lists, select the appropriate ***label element*** for the ***purpose***.

Purpose	Label Element
Alerts to the severity of the hazard.	Signal word
Standardized sentences that describe the hazards of the product.	Hazard statement
Provides standardized advice on how to minimize or prevent harmful effects from the product.	Precautionary statement
Name that matches the SDS.	Product identifier
Name, address, and telephone number of the supplier.	Supplier information

Correct	Choice
Alerts to the severity of the hazard.	Signal word
Standardized sentences that describe the hazards of the product.	Hazard statement
Provides standardized advice on how to minimize or prevent harmful effects from the product.	Precautionary statement
Name that matches the SDS.	Product identifier
Name, address, and telephone number of the supplier.	Supplier information

Feedback when correct:

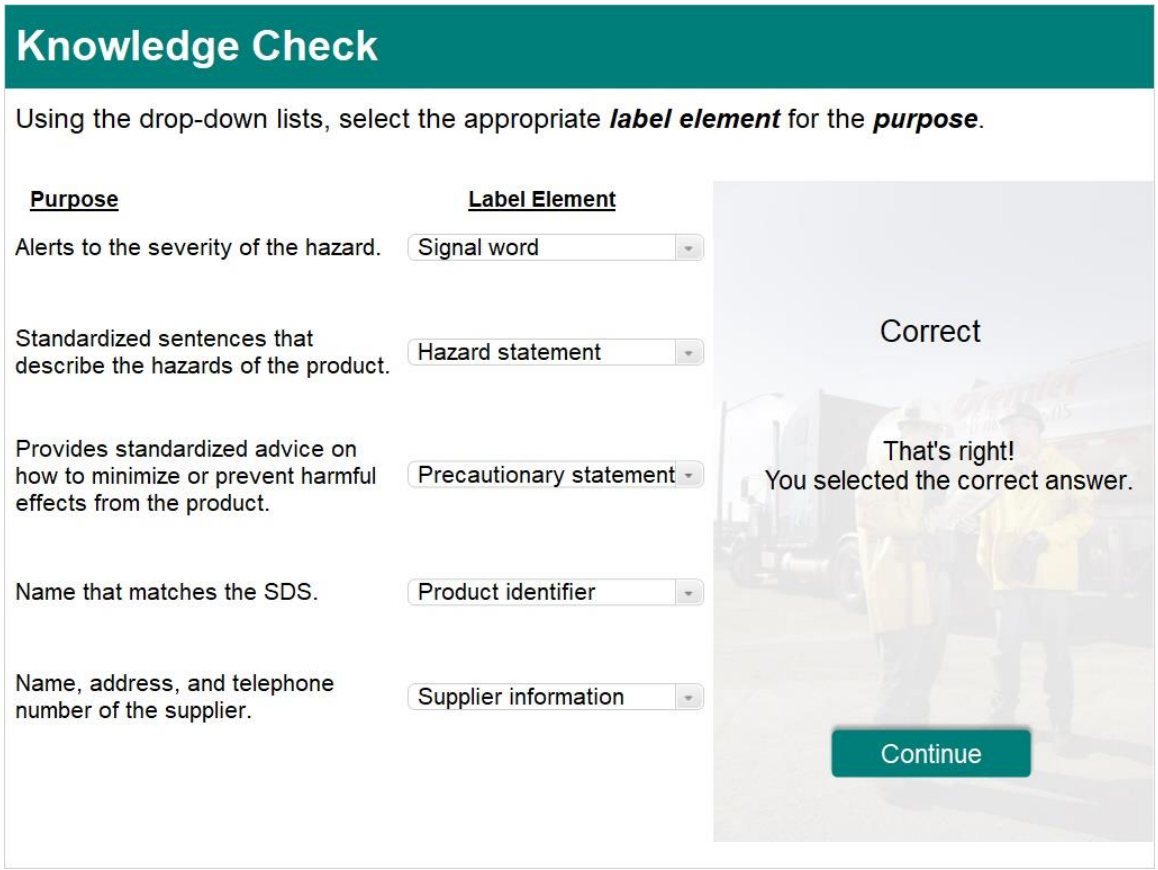
That's right!

You selected the correct answer.

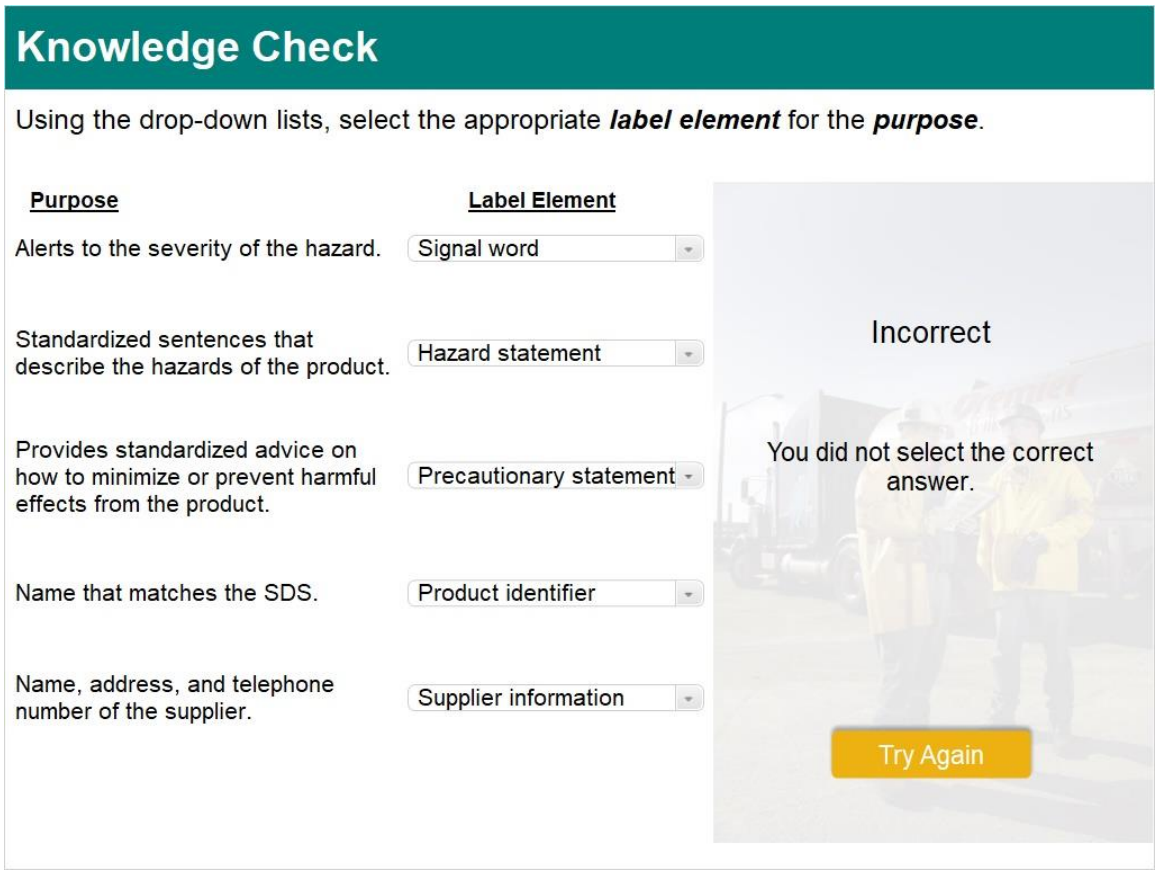
Feedback when incorrect:

You did not select the correct answer.

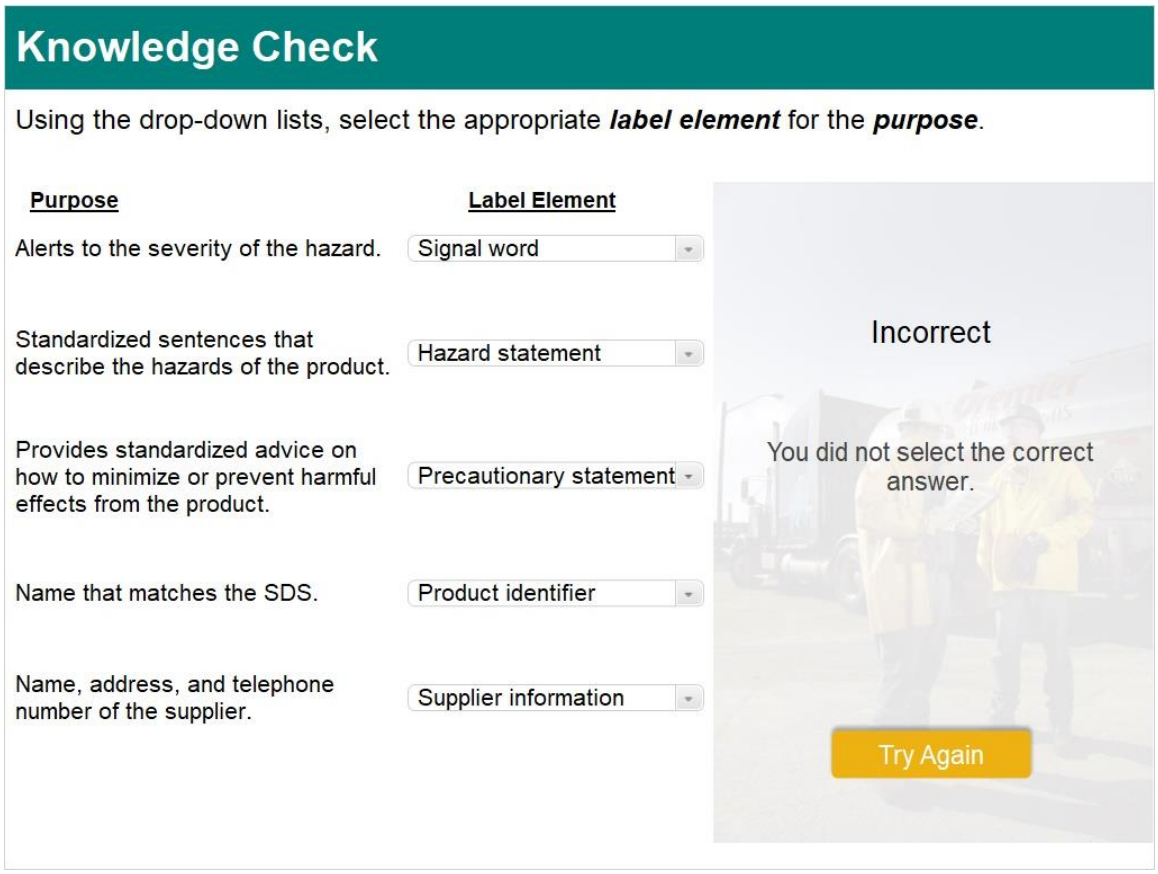
Correct (Slide Layer)



Incorrect (Slide Layer)

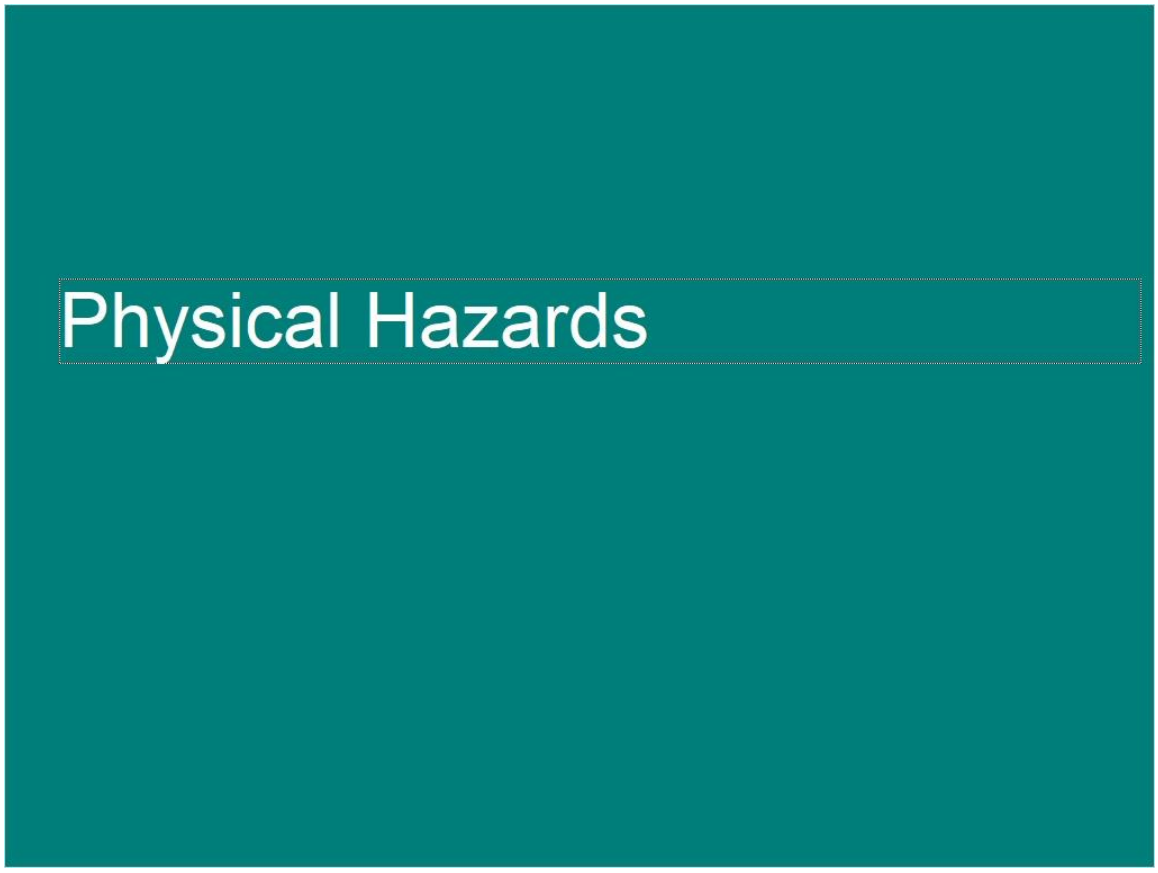


Try Again (Slide Layer)



6. Physical Hazards

6.1 Divider



6.2 Introduction

Physical Hazards

Introduction

In this section of the module we'll take a closer look at the physical hazard classes.

Workers should be aware that hazardous chemicals or products might be reactive (that is, they might burn, explode or produce toxic vapours in certain situations).

Workers should also be aware that hazardous chemicals or products might be flammable (that is, they might be capable of igniting easily), especially in terms of how we use, handle or store the products.

Examining classes with similar hazards will help your understanding.

6.3 Flammables

Physical Hazards

Flammables

There are many classes of flammable materials.

Four of the classes for materials that we commonly encounter at work are:

- flammable gases,
- flammable aerosols,
- flammable liquids, and
- flammable solids.

6.4 Flammables

Physical Hazards

Flammables

Other classes that are not common in the workplace and use this pictogram have similar safety concerns.

They are:

- Pyrophoric liquids, solids, and gases,
- Self-heating substances and mixtures, and
- Substances and mixtures which, in contact with water, emit flammable gases.

6.5 Oxidizers

Physical Hazards

Oxidizers

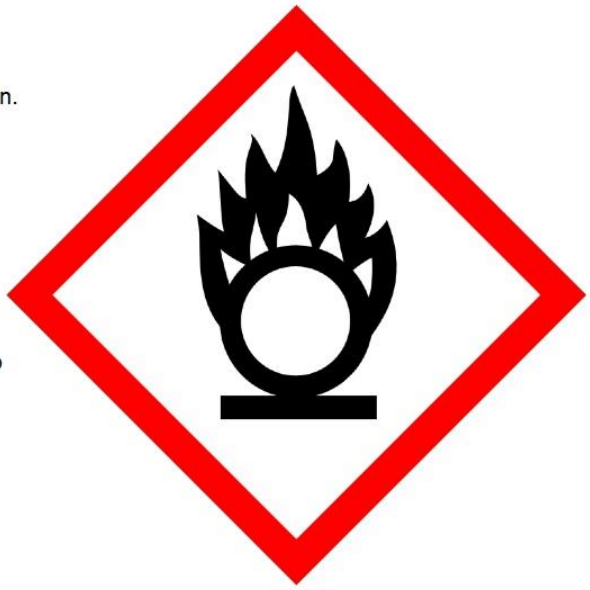
These three classes cover oxidizers, which may cause or intensify a fire, or cause a fire or explosion.

They are:

- Oxidizing gases,
- Oxidizing liquid, and
- Oxidizing solids.

Oxygen is necessary for a fire to burn. Oxidizers do not usually burn by themselves, but they will:

- Increase the intensity of a fire,
- Cause materials that normally do not burn to suddenly catch on fire, sometimes even without an ignition source.



6.6 Gases Under Pressure

Physical Hazards

Gases Under Pressure

These gases are stored under pressure in a container, liquefied, chilled, or dissolved in a carrier.

The main hazards are:

- The cylinder may rocket or torpedo at great speeds if it is ruptured.
- The cylinder or container may explode if heated.
- Leaking gas can be very cold and may cause frostbite if it touches your skin.
- In addition, a leaking cylinder can rapidly release extremely large amounts of gas into the workplace.

6.7 Corrosion

Physical Hazards

Corrosion

Corrosive materials cause severe, irreversible burns to the skin and eyes and, if inhaled, to the respiratory tract.

Materials that are corrosive can also damage or destroy metals (steel and aluminum).

When a corrosive material eats through a container, the contents may spill out into the workplace resulting in health effects, reactivity, or fire damage.

Common corrosive materials are battery acid (which is sulphuric acid), caustic soda (which is sodium hydroxide), chlorine gas and ammonia.

6.8 Other Physical Hazards

Physical Hazards

Other Physical Hazards

This class is meant to cover any physical hazards that are not covered in any other physical hazard class.

Self-reactive substances and mixtures, and **organic peroxides** are two classes that may be explosive or flammable, or both.

Self-reactive substances and mixtures are unstable materials that can cause or increase the intensity of a fire.

Many organic peroxides are unstable, and may be highly reactive or explosive.

If a product is classified in this class, the hazard statement on the label and SDS will describe the nature of the hazard and the specific handling and storage requirements.

6.9 Other Physical Hazards

Physical Hazards

Other Physical Hazards

WHMIS also includes these hazards:

- **Combustible dusts** – means a mixture or substance that is in the form of finely divided solid particles that, upon ignition, is liable to catch fire or explode when dispersed in air.
- **Simple asphyxiants** – gases that may displace oxygen in air, and cause rapid suffocation.
- **Physical hazards not otherwise classified (PHNOC)** – hazards that occur by chemical reaction and result in the serious injury or death of a person at the time the reaction occurs.

For example, injury or death from a violent chemical reaction like hazardous polymerization. These hazards do not fall into another physical hazard class.

Combustible dusts and simple asphyxiants do not require a pictogram. PHNOC requires a pictogram that is applicable to the hazard.

6.10 Knowledge Check

(Multiple Response, 10 points, unlimited attempts permitted)

Knowledge Check

If you see a flame pictogram, in most cases, what does this pictogram indicate?
(Select all that apply.)

- [x] Always store the material according to the directions on the label and safety data sheet.
- [x] The material should be kept away from flames, heat, sparks, or hot surfaces.
- [x] The material will catch fire easily at temperatures below 60 degrees C.
- [ ] Keep ignition sources and fuel sources together.

Correct	Choice
X	Always store the material according to the directions on the label and safety data sheet.
X	The material should be kept away from flames, heat, sparks, or hot surfaces.
X	The material will catch fire easily at temperatures below 60 degrees C.
	Keep ignition sources and fuel sources together.

Feedback when correct:

That's right!

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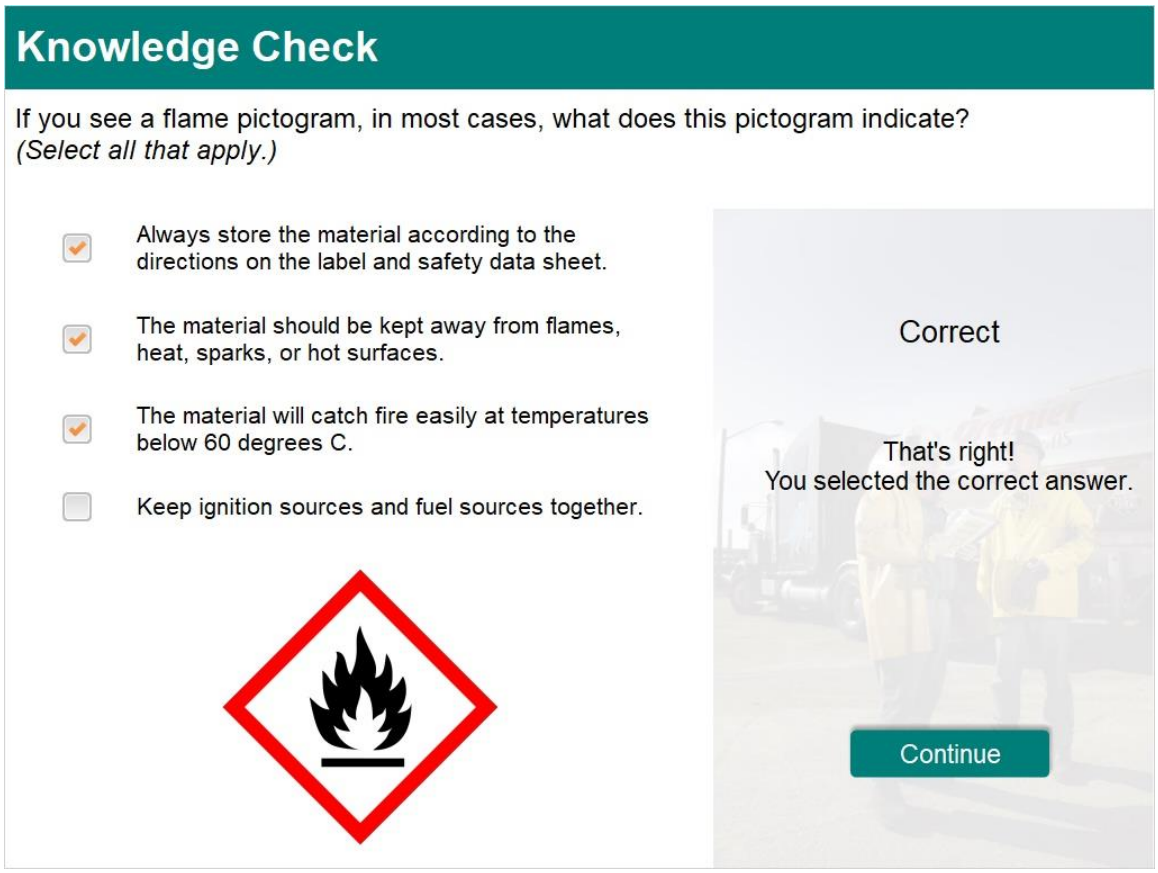
You selected the correct answer.

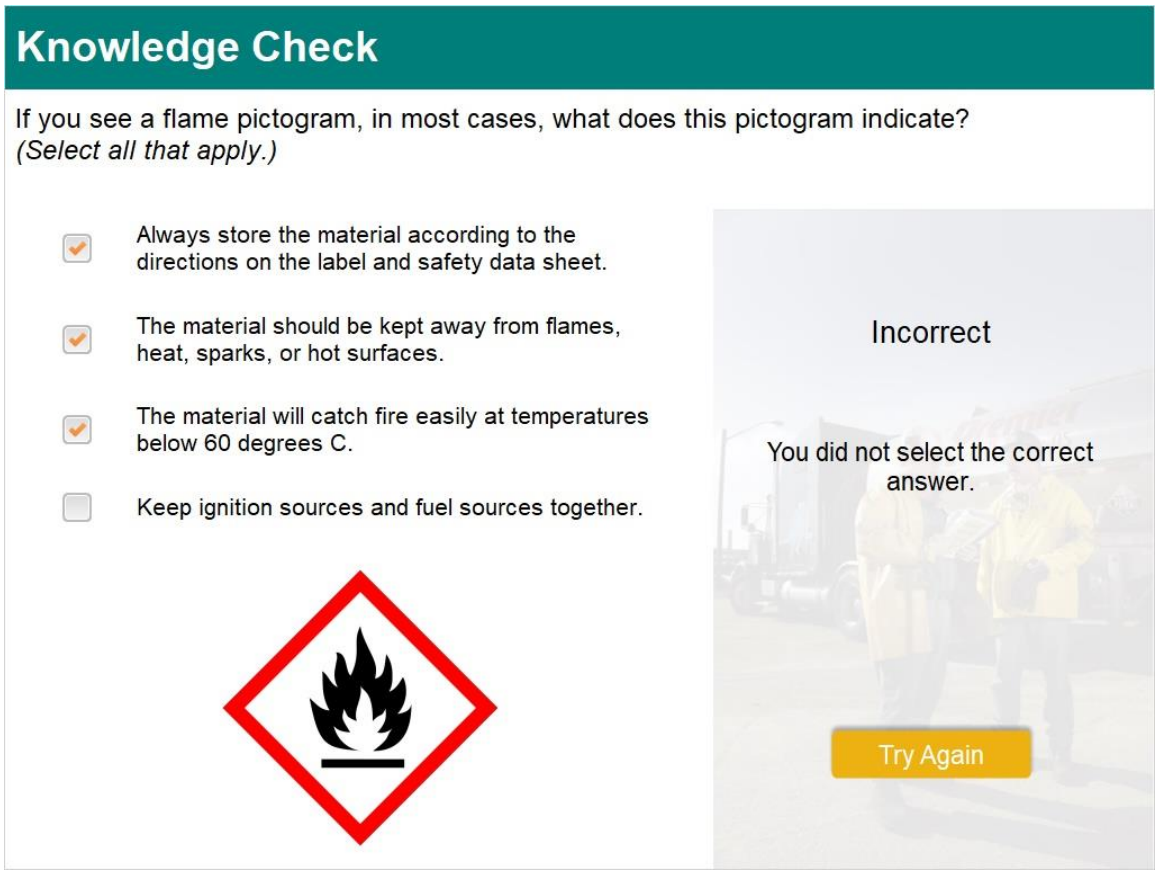
Feedback when incorrect:

You did not select the correct answer.

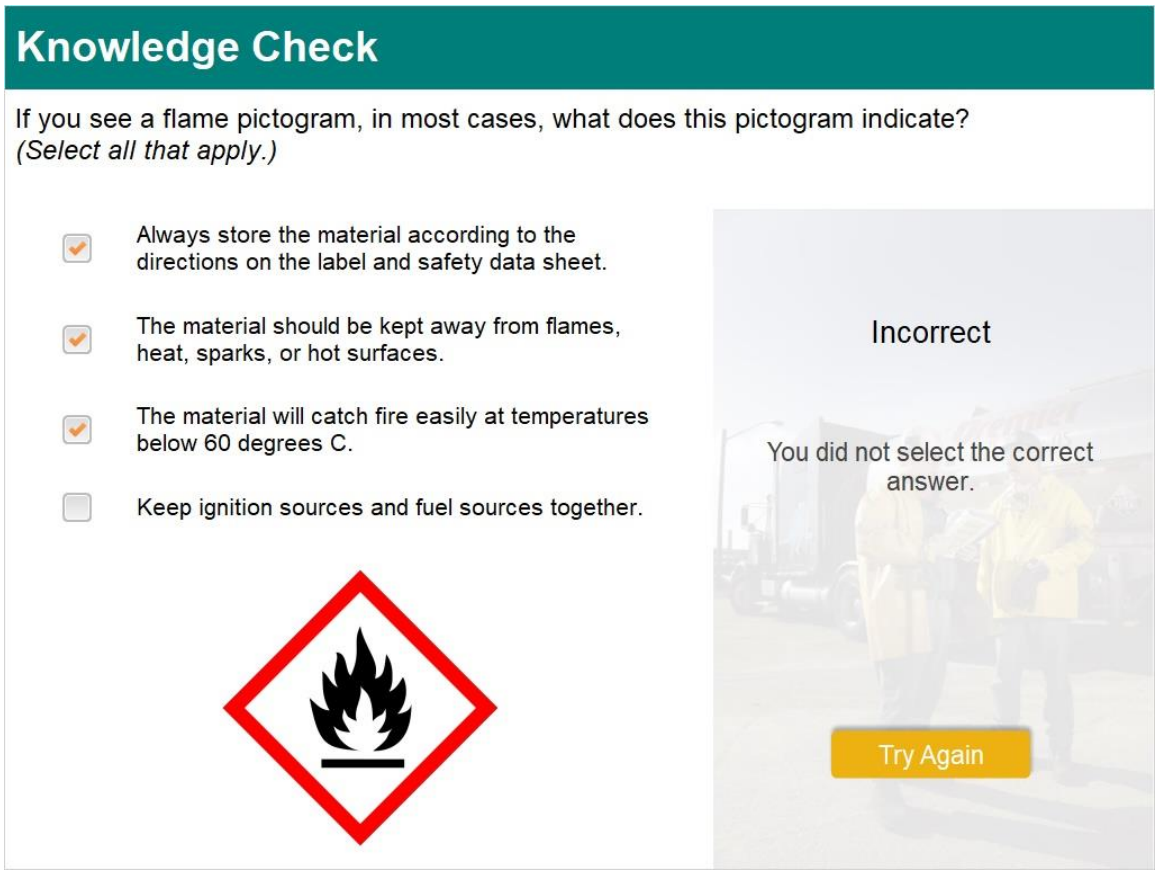
Correct (Slide Layer)



Incorrect (Slide Layer)

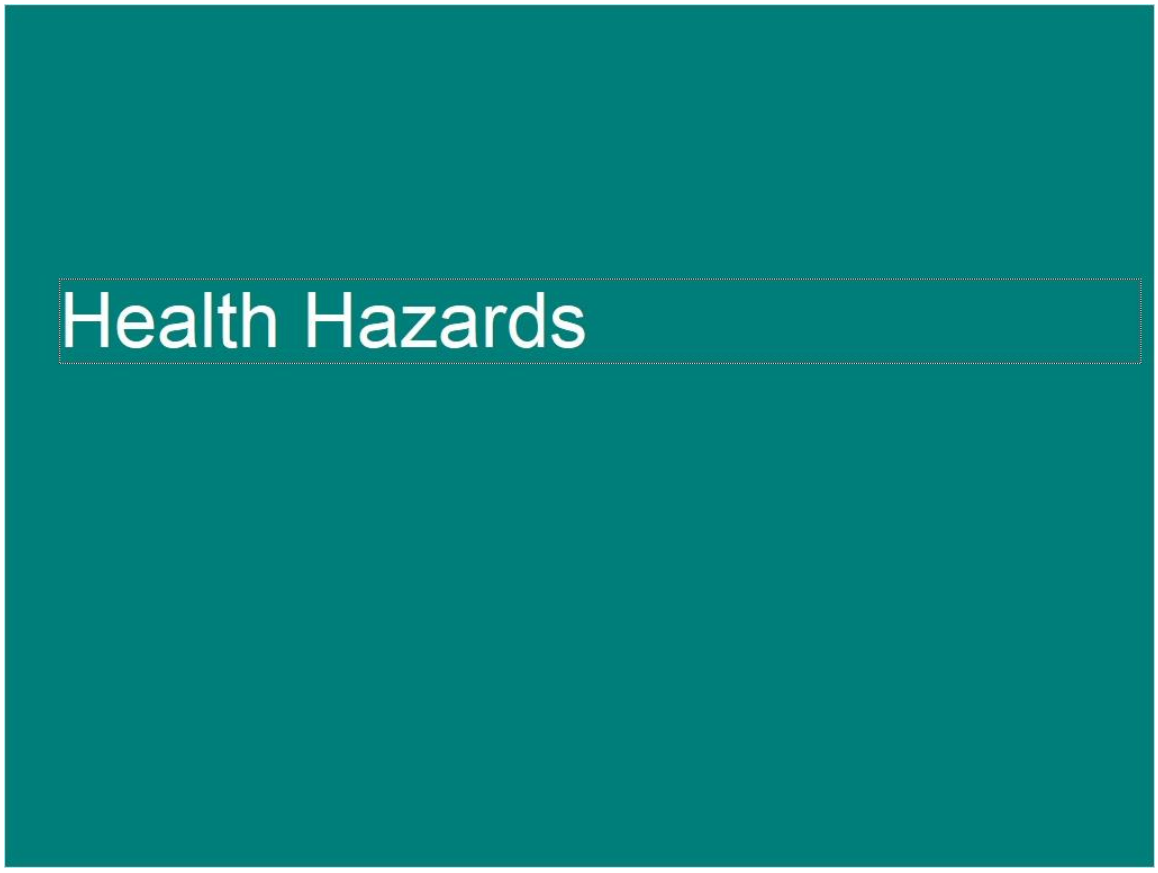


Try Again (Slide Layer)



7. Health Hazards

7.1 Divider



7.2 Introduction

Health Hazards

Introduction

Earlier in this module we learned that the WHMIS health hazard classes are;

- Acute toxicity
- Skin corrosion/irritation
- Serious eye damage/eye irritation
- Respiratory or skin sensitization
- Germ cell mutagenicity
- Carcinogenicity
- Reproductive toxicity
- Specific target organ toxicity – *Single exposure*
- Specific target organ toxicity – *Repeated exposure*
- Aspiration hazard
- Biohazardous infectious materials
- Health hazards not otherwise classified

7.3 Health Hazard Pictogram

Health Hazards

The Health Hazard Pictogram

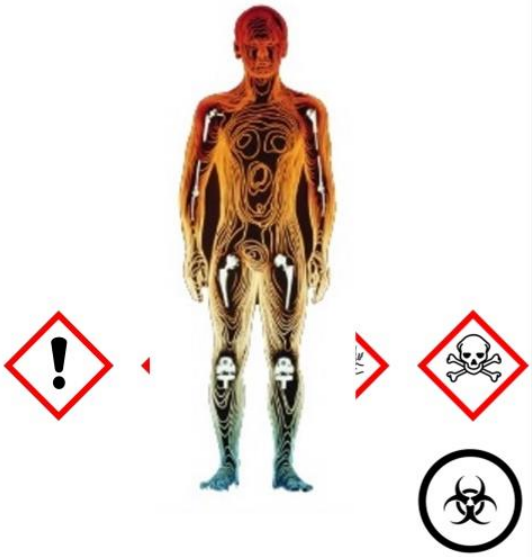
The health hazard pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Respiratory or skin sensitization
- Germ cell mutagenicity
- Carcinogenicity
- Reproductive toxicity
- Specific target organ toxicity – single exposure
- Specific target organ toxicity – repeated exposure
- Aspiration hazard

Be aware that products can belong to one or more classes, depending on their hazards.

Benzene is an example that has many hazards and belongs to several classes.



Respiratory or skin sensitization (Slide Layer)

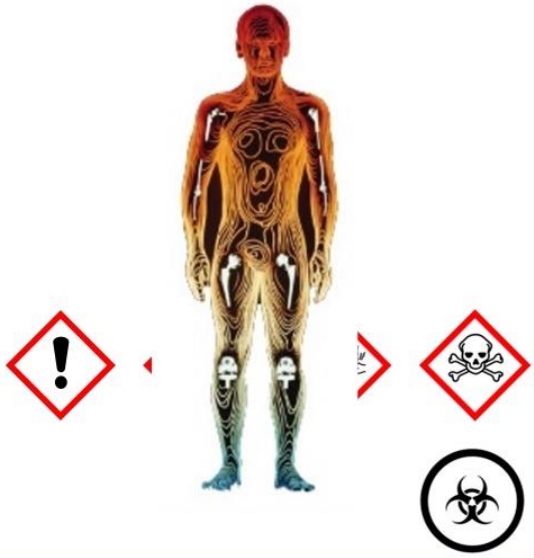
Health Hazards

The Health Hazard Pictogram

The health hazard pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- ***Respiratory or skin sensitization***
- Germ cell mutagenicity
- Carcinogenicity
- Reproductive toxicity
- Specific target organ toxicity – single exposure
- Specific target organ toxicity – repeated exposure
- Aspiration hazard



Be aware that products can belong to one or more classes, depending on their hazards.

Benzene is an example that has many hazards and belongs to several classes.

A **Respiratory Sensitizer:** May cause allergy or asthma symptoms, or breathing difficulties if inhaled.

Remember that the **Skin Sensitization** category of this class uses the exclamation mark pictogram.

Germ cell mutagenicity (Slide Layer)

Health Hazards

The Health Hazard Pictogram

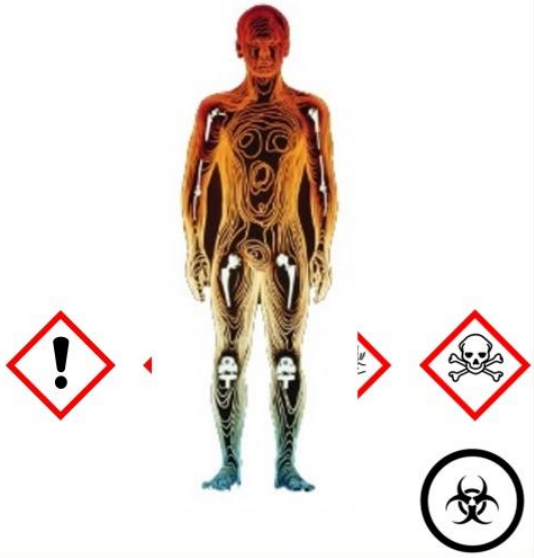
The health hazard pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Respiratory or skin sensitization
- ***Germ cell mutagenicity***
- Carcinogenicity
- Reproductive toxicity
- Specific target organ toxicity – single exposure
- Specific target organ toxicity – repeated exposure
- Aspiration hazard

Be aware that products can belong to one or more classes, depending on their hazards.

Benzene is an example that has many hazards and belongs to several classes.



Germ Cell Mutagenicity: May cause genetic defects or is suspected of causing genetic defects. Mutations can lead to birth defects or cancer.

Carcinogenicity (Slide Layer)

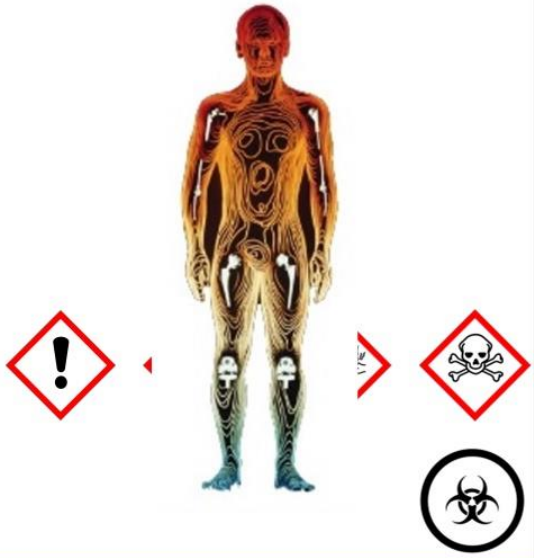
Health Hazards

The Health Hazard Pictogram

The health hazard pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Respiratory or skin sensitization
- Germ cell mutagenicity
- ***Carcinogenicity***
- Reproductive toxicity
- Specific target organ toxicity – single exposure
- Specific target organ toxicity – repeated exposure
- Aspiration hazard



Be aware that products can belong to one or more classes, depending on their hazards.

Benzene is an example that has many hazards and belongs to several classes.

Carcinogenicity: May cause cancer or is suspected of causing cancer.

Reproductive toxicity (Slide Layer)

Health Hazards

The Health Hazard Pictogram

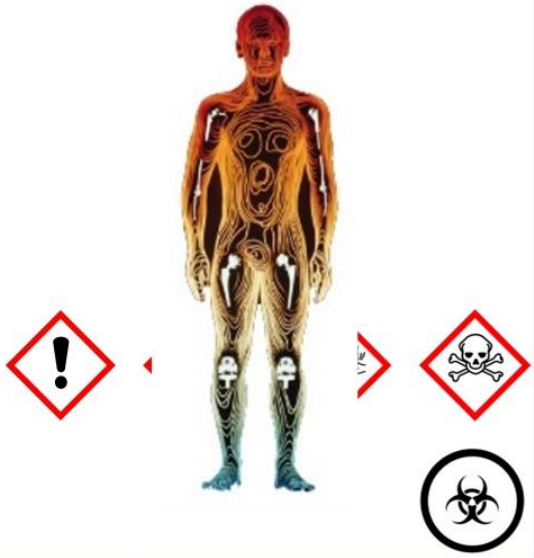
The health hazard pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Respiratory or skin sensitization
- Germ cell mutagenicity
- Carcinogenicity
- ***Reproductive toxicity***
- Specific target organ toxicity – single exposure
- Specific target organ toxicity – repeated exposure
- Aspiration hazard

Be aware that products can belong to one or more classes, depending on their hazards.

Benzene is an example that has many hazards and belongs to several classes.



Reproductive Toxicity: May damage fertility or the unborn child, or is suspected of damaging fertility or the unborn child. May cause harm to breast-fed children.

Specific target organ toxicity – single exposure (Slide Layer)

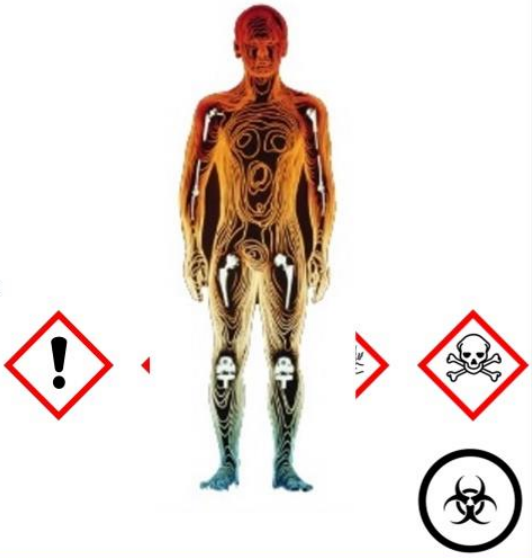
Health Hazards

The Health Hazard Pictogram

The health hazard pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Respiratory or skin sensitization
- Germ cell mutagenicity
- Carcinogenicity
- Reproductive toxicity
- ***Specific target organ toxicity – single exposure***
- Specific target organ toxicity – repeated exposure
- Aspiration hazard



Be aware that products can belong to one or more classes, depending on their hazards.

Benzene is an example that has many hazards and belongs to several classes.

Specific Target Organ Toxicity – Single Exposure: Causes a specific, but not fatal, target organ toxicity that occurs from a single exposure only. Note that Category 3 of this class uses the exclamation mark pictogram for products that may cause drowsiness or dizziness, or that may cause respiratory irritation.

Specific target organ toxicity – repeated exposure (Slide Layer)

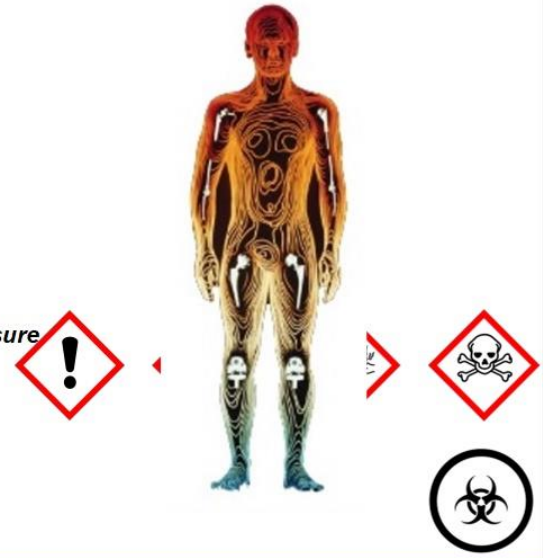
Health Hazards

The Health Hazard Pictogram

The health hazard pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Respiratory or skin sensitization
- Germ cell mutagenicity
- Carcinogenicity
- Reproductive toxicity
- Specific target organ toxicity – single exposure
- ***Specific target organ toxicity – repeated exposure***
- Aspiration hazard



Be aware that products can belong to one or more classes, depending on their hazards.

Benzene is an example that has many hazards and belongs to several classes.

Specific Target Organ Toxicity – Repeated Exposure: Causes or may cause damage to organs through repeated or prolonged exposure.

Aspiration hazard (Slide Layer)

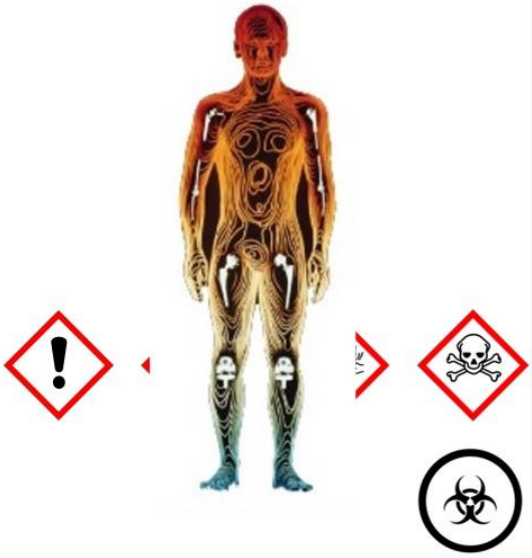
Health Hazards

The Health Hazard Pictogram

The health hazard pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Respiratory or skin sensitization
- Germ cell mutagenicity
- Carcinogenicity
- Reproductive toxicity
- Specific target organ toxicity – single exposure
- Specific target organ toxicity – repeated exposure
- ***Aspiration hazard***



Be aware that products can belong to one or more classes, depending on their hazards.

Benzene is an example that has many hazards and belongs to several classes.

Aspiration Hazard: May be fatal if swallowed and enters the airways.

7.4 Exclamation Mark Pictogram

Health Hazards

The Exclamation Mark Pictogram

Like the health hazard pictogram, the exclamation mark pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Acute toxicity
- Skin corrosion/irritation
- Serious eye damage/eye irritation
- Respiratory or skin sensitization
- Specific target organ toxicity – single exposure

This pictogram indicates products that have health hazards; however, these hazards may not be as severe as other categories in that class.

Acute toxicity (Slide Layer)

Health Hazards

The Exclamation Mark Pictogram

Like the health hazard pictogram, the exclamation mark pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- ***Acute toxicity***
- Skin corrosion/irritation
- Serious eye damage/eye irritation
- Respiratory or skin sensitization
- Specific target organ toxicity – single exposure

This pictogram indicates products that have health hazards; however, these hazards may not be as severe as other categories in that class.

Acute Toxicity: Harmful if swallowed. Harmful in contact with skin. Harmful if inhaled.

Skin corrosion/irritation (Slide Layer)

Health Hazards

The Exclamation Mark Pictogram

Like the health hazard pictogram, the exclamation mark pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Acute toxicity
- ***Skin corrosion/irritation***
- Serious eye damage/eye irritation
- Respiratory or skin sensitization
- Specific target organ toxicity – single exposure

This pictogram indicates products that have health hazards; however, these hazards may not be as severe as other categories in that class.

Skin Corrosion/Irritation: Causes skin irritation.

Serious eye damage/eye irritation (Slide Layer)

Health Hazards

The Exclamation Mark Pictogram

Like the health hazard pictogram, the exclamation mark pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Acute toxicity
- Skin corrosion/irritation
- ***Serious eye damage/eye irritation***
- Respiratory or skin sensitization
- Specific target organ toxicity – single exposure

This pictogram indicates products that have health hazards; however, these hazards may not be as severe as other categories in that class.

Serious Eye Damage/Eye Irritation: Causes serious eye irritation.

Respiratory or Skin Sensitization (Slide Layer)

Health Hazards

The Exclamation Mark Pictogram

Like the health hazard pictogram, the exclamation mark pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Acute toxicity
- Skin corrosion/irritation
- Serious eye damage/eye irritation
- ***Respiratory or skin sensitization***
- Specific target organ toxicity – single exposure

This pictogram indicates products that have health hazards; however, these hazards may not be as severe as other categories in that class.

Respiratory or Skin Sensitization: A skin sensitizer may cause an allergic skin reaction.
Remember that the Respiratory sensitization category of this class uses the health hazard pictogram.

Specific target organ toxicity – single exposure (Slide Layer)

Health Hazards

The Exclamation Mark Pictogram

Like the health hazard pictogram, the exclamation mark pictogram is used for a number of classes:

(Mouse over the titles below to view class description)

- Acute toxicity
- Skin corrosion/irritation
- Serious eye damage/eye irritation
- Respiratory or skin sensitization
- ***Specific target organ toxicity – single exposure***

This pictogram indicates products that have health hazards; however, these hazards may not be as severe as other categories in that class.

Specific Target Organ Toxicity – Single Exposure: May cause respiratory irritation. May cause drowsiness or dizziness.

7.5 Health Hazard Classes

Health Hazards

Health Hazard Classes

Acute Toxicity

These products can cause severe health effects or even death if you breathe them in, if they come in contact with your skin, or if they are swallowed.

The **acute toxicity** hazard class uses the skull and crossbones or the exclamation mark pictogram to indicate products that can cause adverse effects following brief exposure.

The hazard statements for this class will help indicate the seriousness of the effects.

Statements with **fatal** are more serious than **toxic**. **Toxic** is more serious than **harmful**.

Examples of products included in Acute Toxicity hazard class are:

Sodium cyanide is used to extract metals from ores. The hazard statement is: ***Fatal if swallowed and/or Fatal in contact with skin.***

Chlorine is used to disinfect swimming pool water. The hazard statement is: ***Fatal if inhaled***.

7.6 Health Hazard Classes

Health Hazards

Health Hazard Classes

Acute Toxicity

How do you know if the product is classified as fatal, toxic or harmful?

Read the label for more information, including the hazard statements. For example:

Acute toxicity – Inhalation (Categories 1 and 2) is labelled with the skull and crossbones pictogram and the signal word **Danger**. In this case, you see the hazard statement **Fatal if inhaled**.

Acute toxicity – Inhalation (Category 3) is labelled with the skull and crossbones pictogram and the signal word **Danger** and the hazard statement **Toxic if inhaled.**

Acute toxicity – Inhalation (Category 4) is labelled with the exclamation mark and the signal word **Warning**. The hazard statement is **Harmful if inhaled.**

7.7 Health Hazard Classes

Health Hazards

Health Hazard Classes

Specific Target Organ Toxicity – Single Exposure

Specific target organ toxicity – single exposure is the hazard class for products that may cause significant, non-lethal damage to organs following a single exposure.

In addition, products that may cause respiratory tract irritation and/or drowsiness or dizziness are covered in this class.

These products are labelled with either the health hazard or the exclamation mark pictogram.

Like the Acute toxicity class, read the label and look for the pictogram, signal word, and hazard statement to determine the severity level of the hazard.

7.8 Health Hazard Classes

Health Hazards

Health Hazard Classes

Skin and Eye

These products can cause effects ranging from severe skin burns and eye damage (corrosion) to skin irritation or eye irritation.

The corrosion and exclamation mark pictograms are used to indicate the following classes:

- Skin corrosion/irritation
- Serious eye damage/eye irritation

7.9 Health Hazard Classes

Health Hazards

Health Hazard Classes

Skin Sensitization

The exclamation mark is also used for products that can cause allergic skin reactions. This hazard class is known as Skin sensitization.

The signal word is **Warning** and the hazard statement is **May cause an allergic skin reaction**.

Methyl methacrylate is an example of a product that causes skin sensitization.

7.10 Health Hazard Classes

Health Hazards

Health Hazard Classes

Here is a summary that shows how the combination of pictograms, signal words, and hazard statements work together to tell you the degree of the hazard.

Combining the Elements

Class/Category	Serious Eye Damage – Category 1	Eye Irritation Category 2A	Eye Irritation Category 2B
Pictogram			No Pictogram
Signal Word	Danger	Warning	Warning
Hazard Statement	Causes serious eye damage	Causes serious eye irritation	Causes eye irritation

7.11 Knowledge Check

(Matching Drop-down, 10 points, unlimited attempts permitted)

Knowledge Check

Using the drop-down lists, select the appropriate hazard description for the pictogram.

Skin sensitization

Serious eye damage

Acute toxicity

Carcinogenicity

Correct	Choice
Skin sensitization	Skin sensitization
Serious eye damage	Serious eye damage
Acute toxicity	Acute toxicity
Carcinogenicity	Carcinogenicity

Feedback when correct:

That's right!

You selected the correct answer.

Feedback when incorrect:

You did not select the correct answer.

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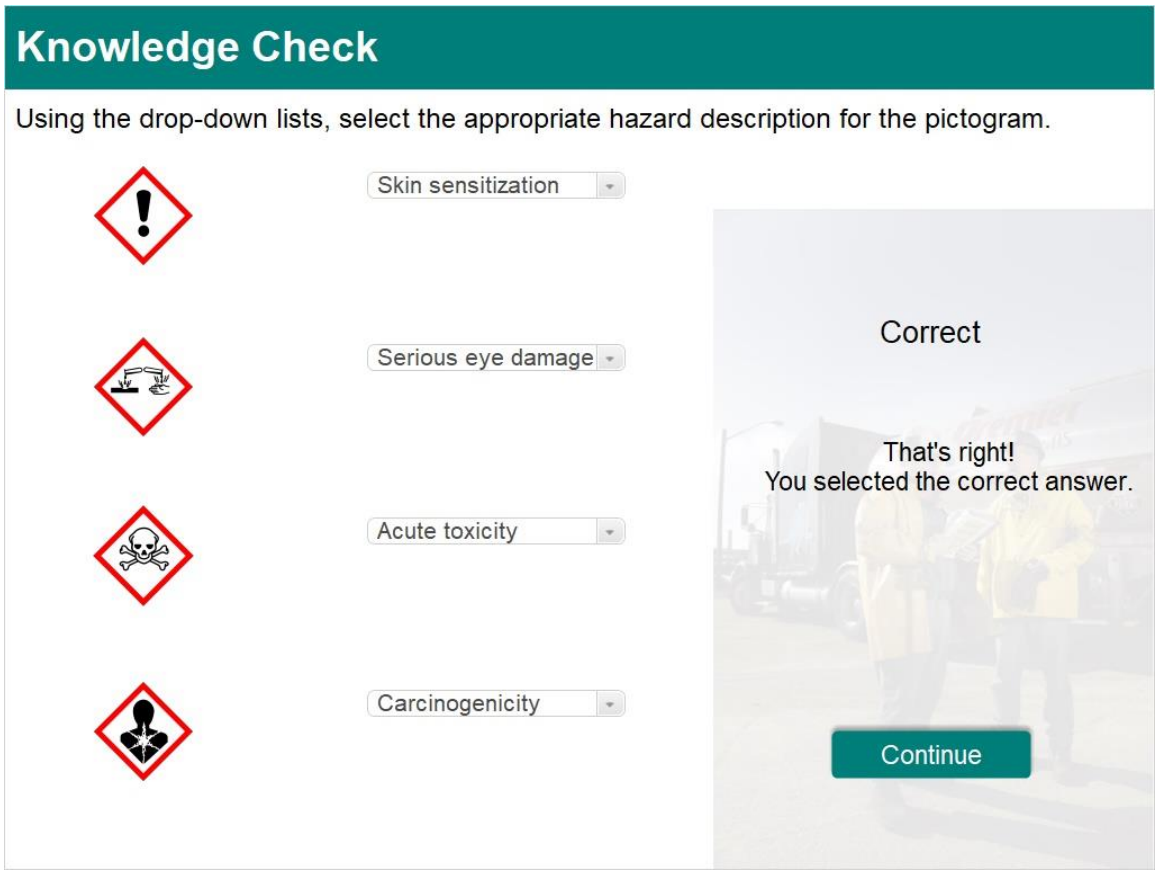
Correct (Slide Layer)



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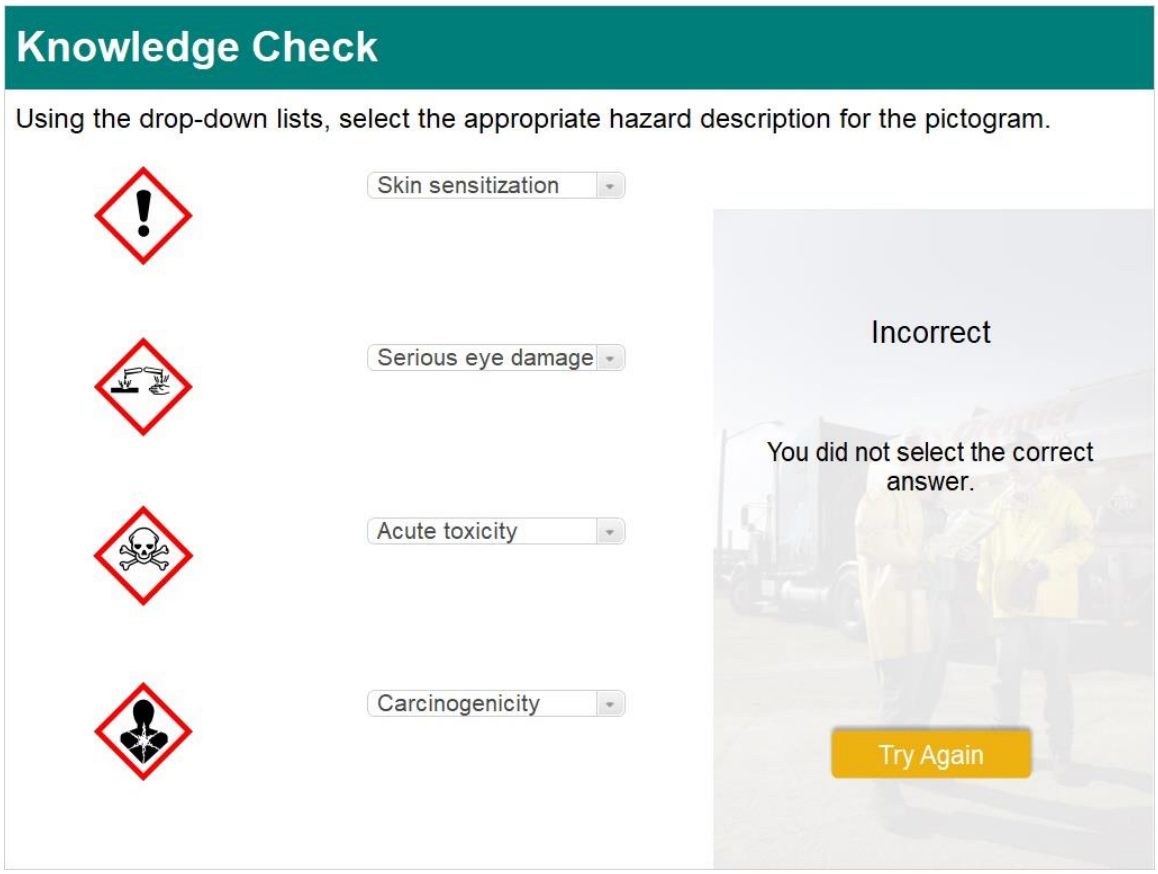
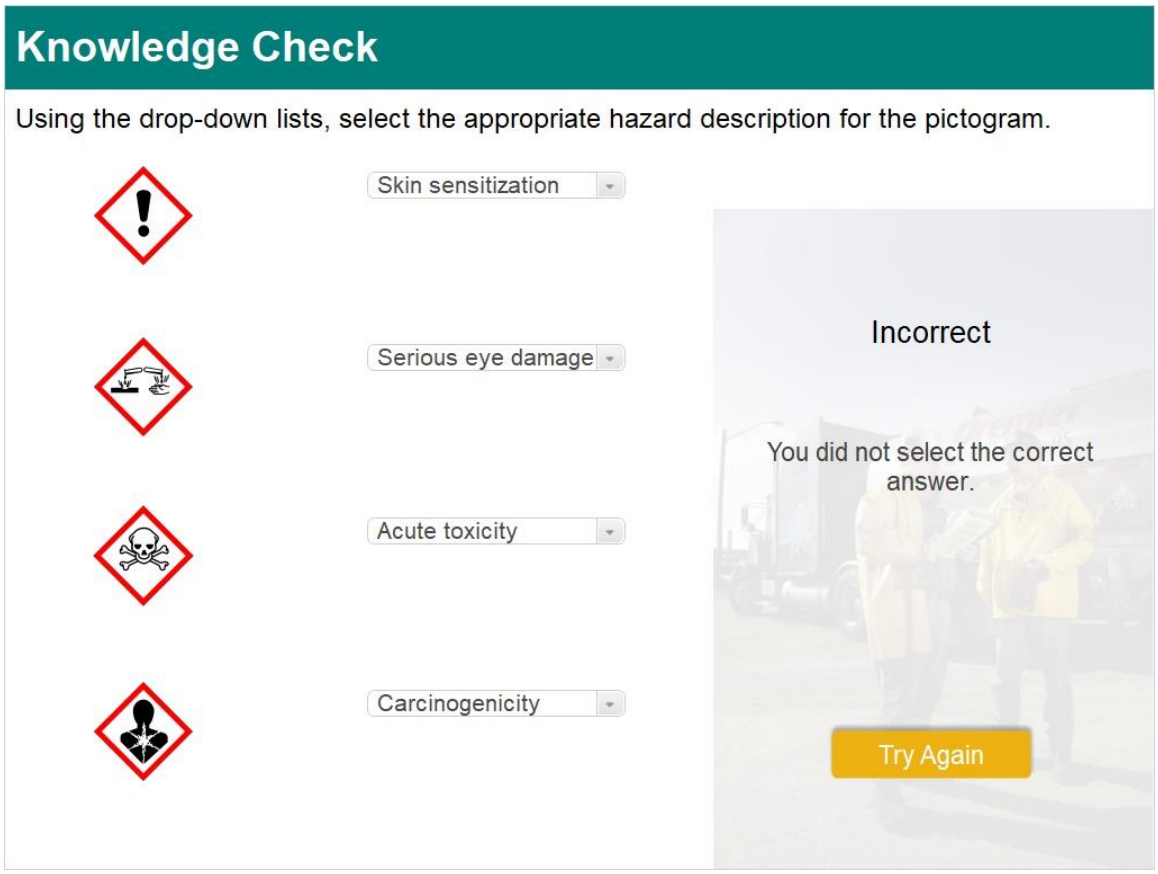


Try Again (Slide Layer)



7.12 Knowledge Check

(Matching Drop-down, 10 points, unlimited attempts permitted)

Knowledge Check

Select the appropriate **hazard category** for the **rank description** (listed as pictogram, signal word, hazard statement).

You think that a product is a health hazard but are not sure how hazardous it is. Using the label, how would you know what level of hazard is present?

Rank Description	Hazard Category
Skull and crossbones. Danger. Toxic if inhaled	3
Exclamation mark. Warning. Harmful if inhaled.	4
Skull and crossbones. Danger. Fatal if inhaled.	1

Correct	Choice
Skull and crossbones. Danger. Toxic if inhaled	3
Exclamation mark. Warning. Harmful if inhaled.	4
Skull and crossbones. Danger. Fatal if inhaled.	1

Feedback when correct:

That's right!

You selected the correct answer.

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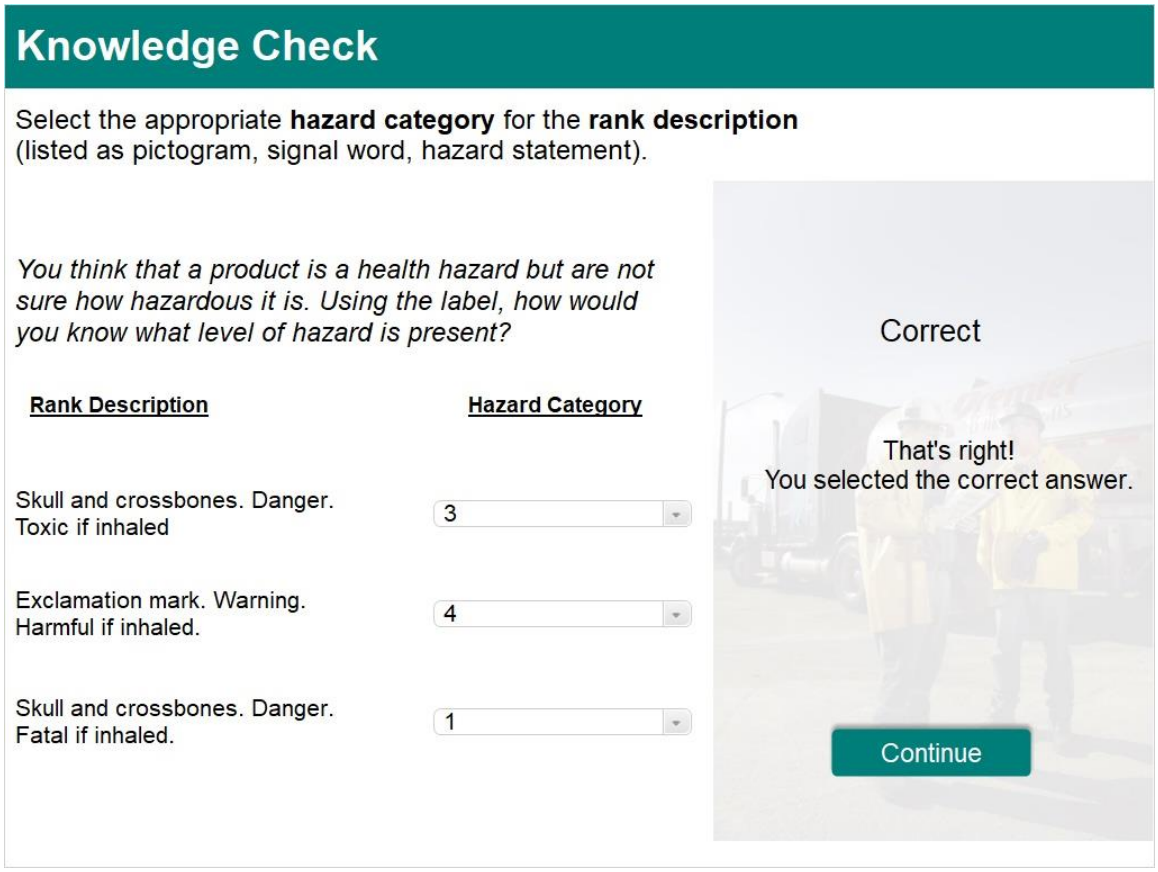
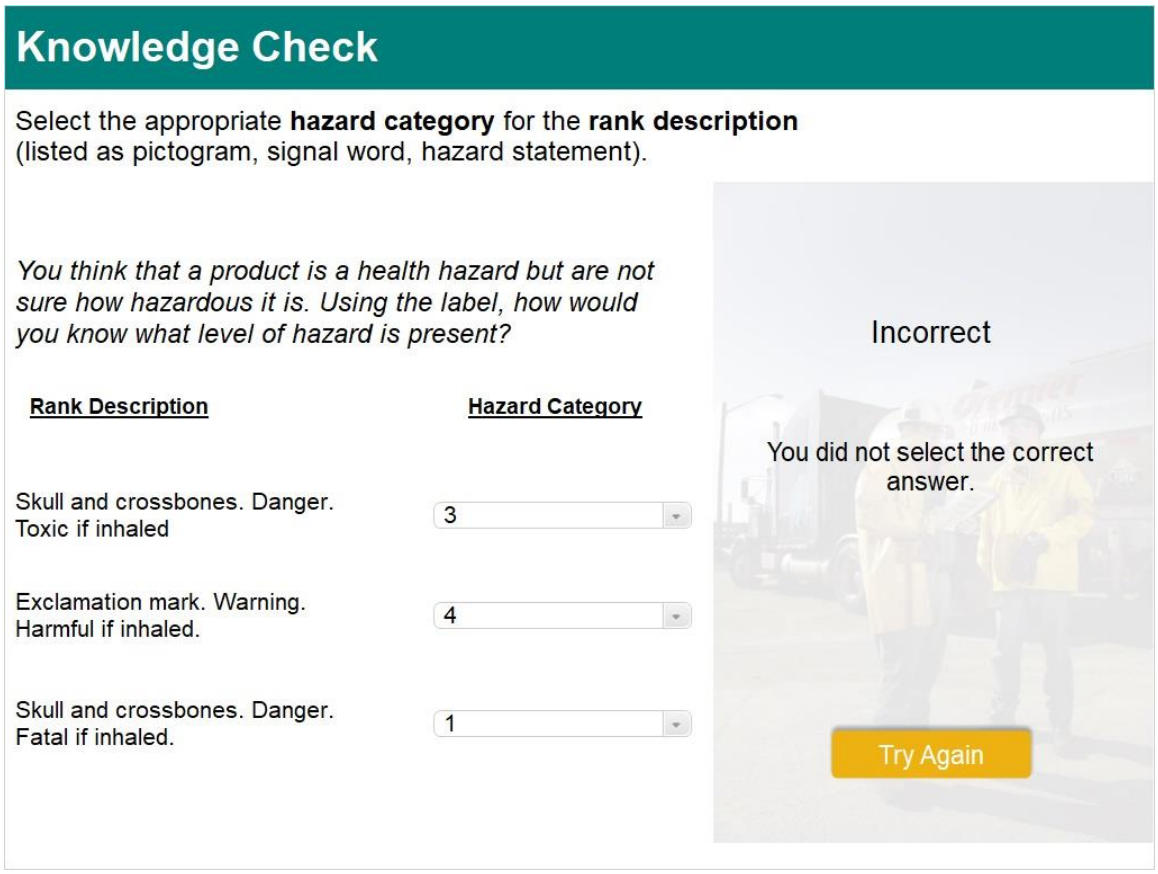
Feedback when incorrect:

You did not select the correct answer.

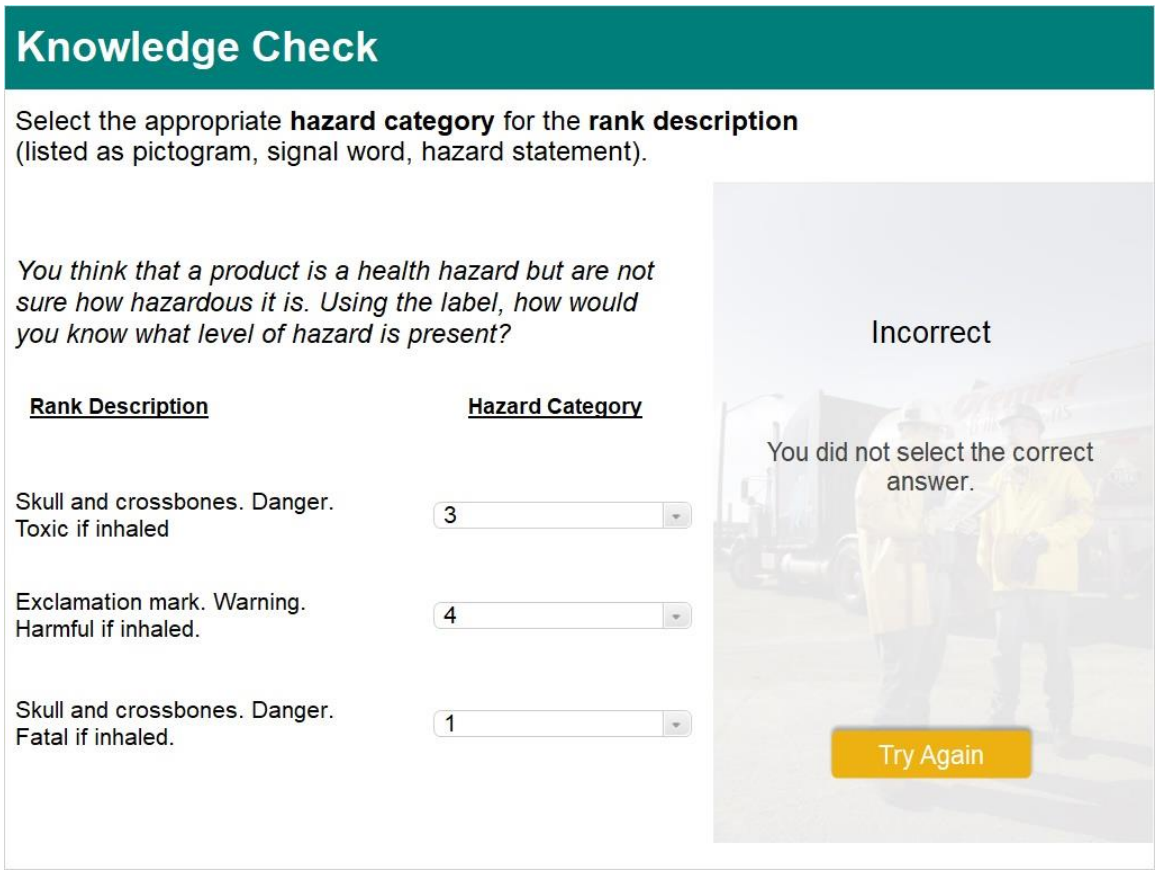
Correct (Slide Layer)



Incorrect (Slide Layer)



Try Again (Slide Layer)



7.13 Knowledge Check

(Multiple Response, 10 points, unlimited attempts permitted)

Knowledge Check

There are a lot of classes and categories under the amended WHMIS system. While it is important to know the class names, what else can you use to know what the nature and severity of the hazards are?

(Select all that apply)

- [x] Read the hazard statements.
- [x] Understand the pictogram.
- [x] Check what signal word is present (Danger or Warning).

Correct	Choice
X	Read the hazard statements.
X	Understand the pictogram.
X	Check what signal word is present (Danger or Warning).

Feedback when correct:

That's right!

You selected the correct answer.

Feedback when incorrect:

You did not select the correct answer.

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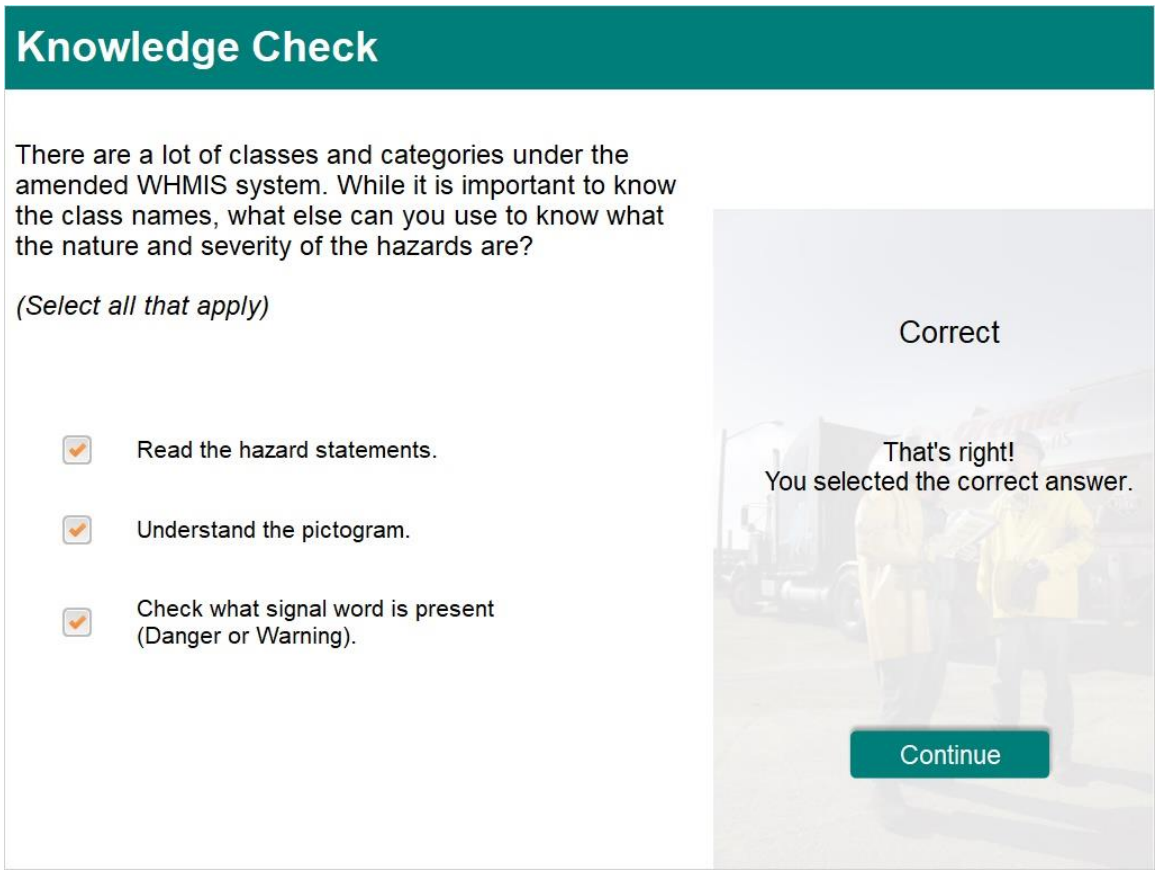
Correct (Slide Layer)



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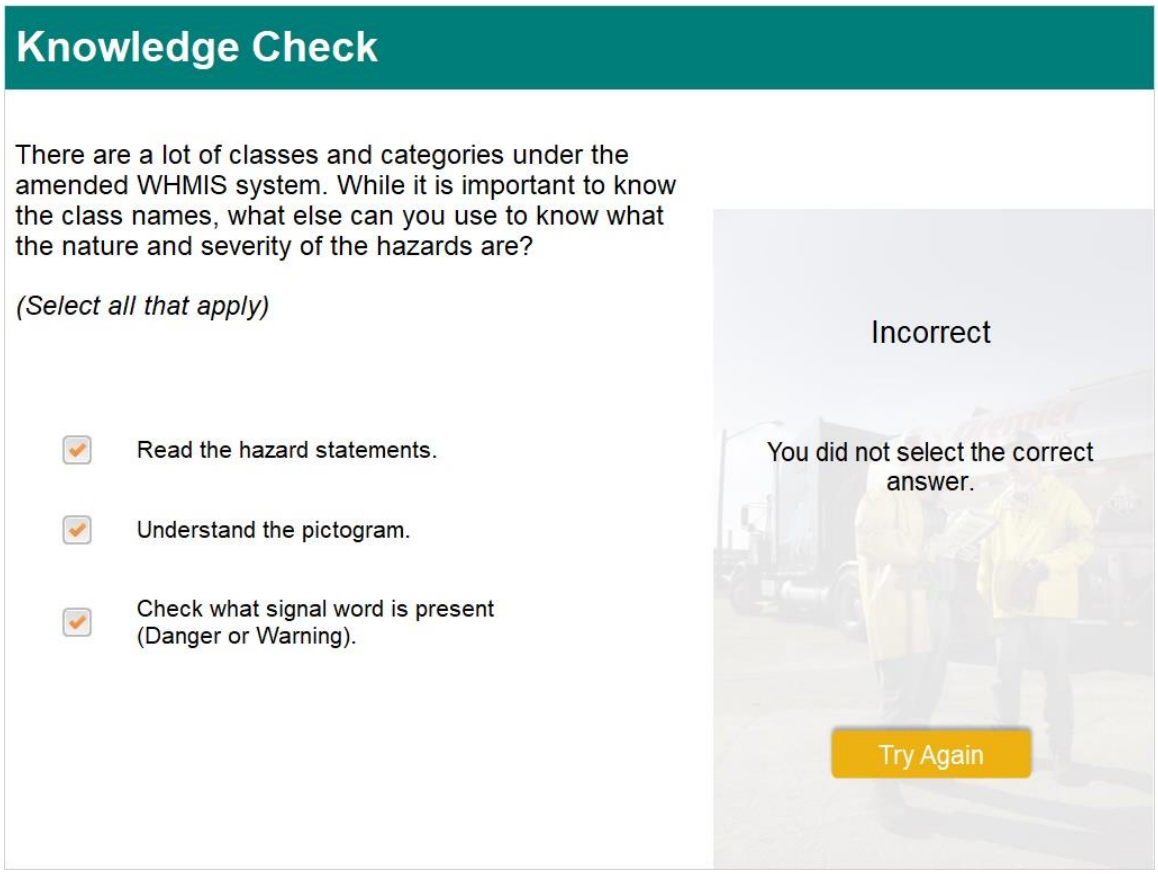

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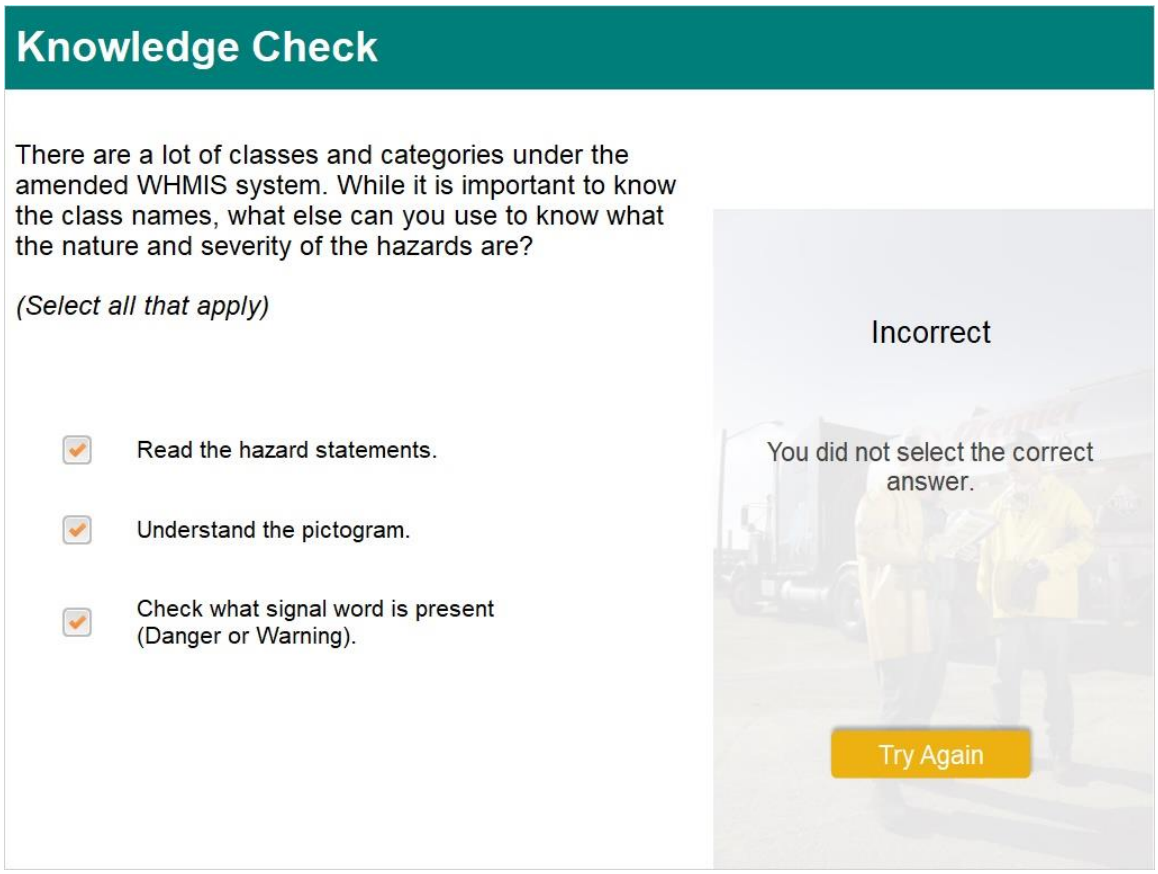
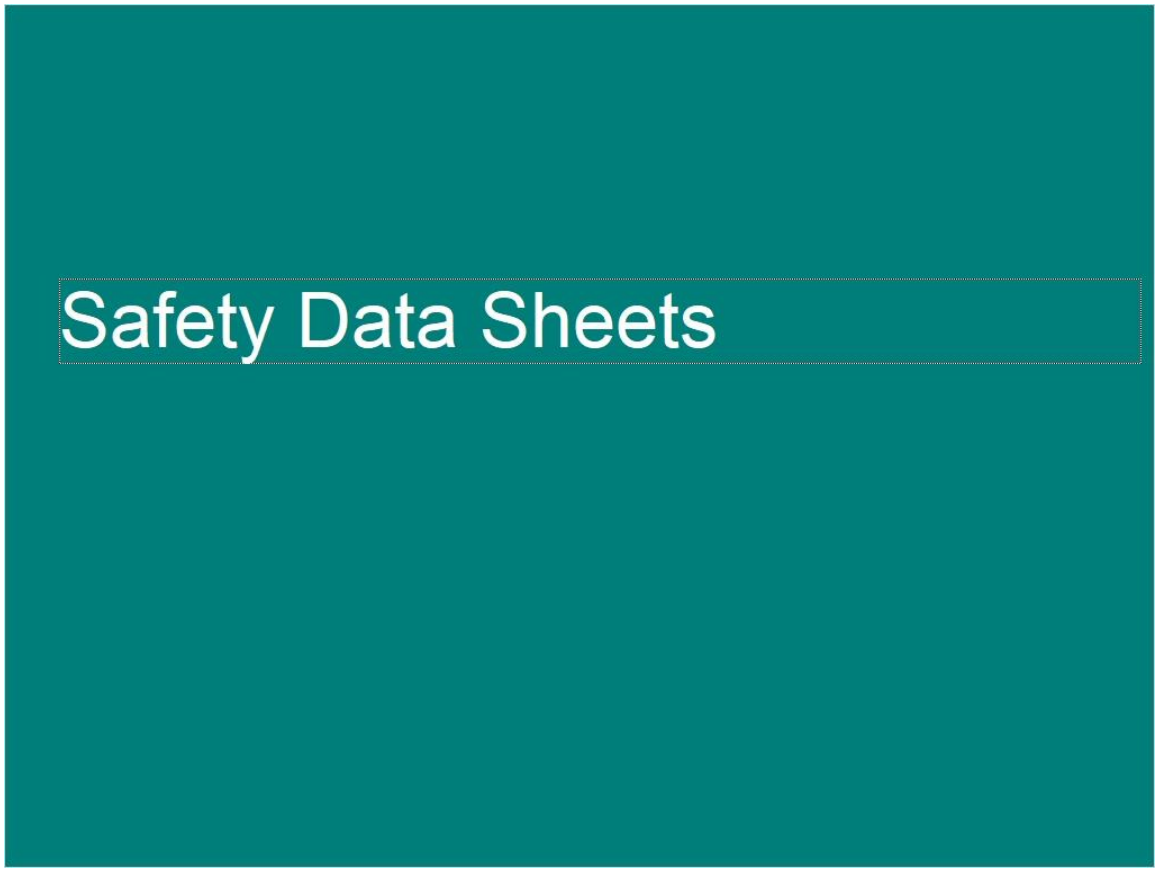


8. Safety Data Sheets (SDSs)

8.1 Divider



8.2 Introduction

Safety Data Sheets

Introduction

The final component of WHMIS 2015 is Safety Data Sheets, or SDSs.

All products that are considered a hazardous product require an SDS.

The purpose of the SDS is to provide more detailed information regarding the hazards of a particular product in comparison to the label.

In the workplace, SDSs must be accessible to all workers.

This means storing them in a readily accessible place and informing workers of their location, or alternatively, a computerized SDS system can be used.

Workers are also recommended to reference the SDS and understand its content prior to handling any hazardous products in the workplace.

8.3 Introduction

Safety Data Sheets

Why do you need an SDS?

There are 4 basic questions that are answered by the SDS:

- What are the identities of the product and the *supplier?*
- What are the *hazards?*
- What *precautions* should I take to work safely with this material?
- What do I do in the case of an *emergency?*

8.4 SDS Components

Safety Data Sheets

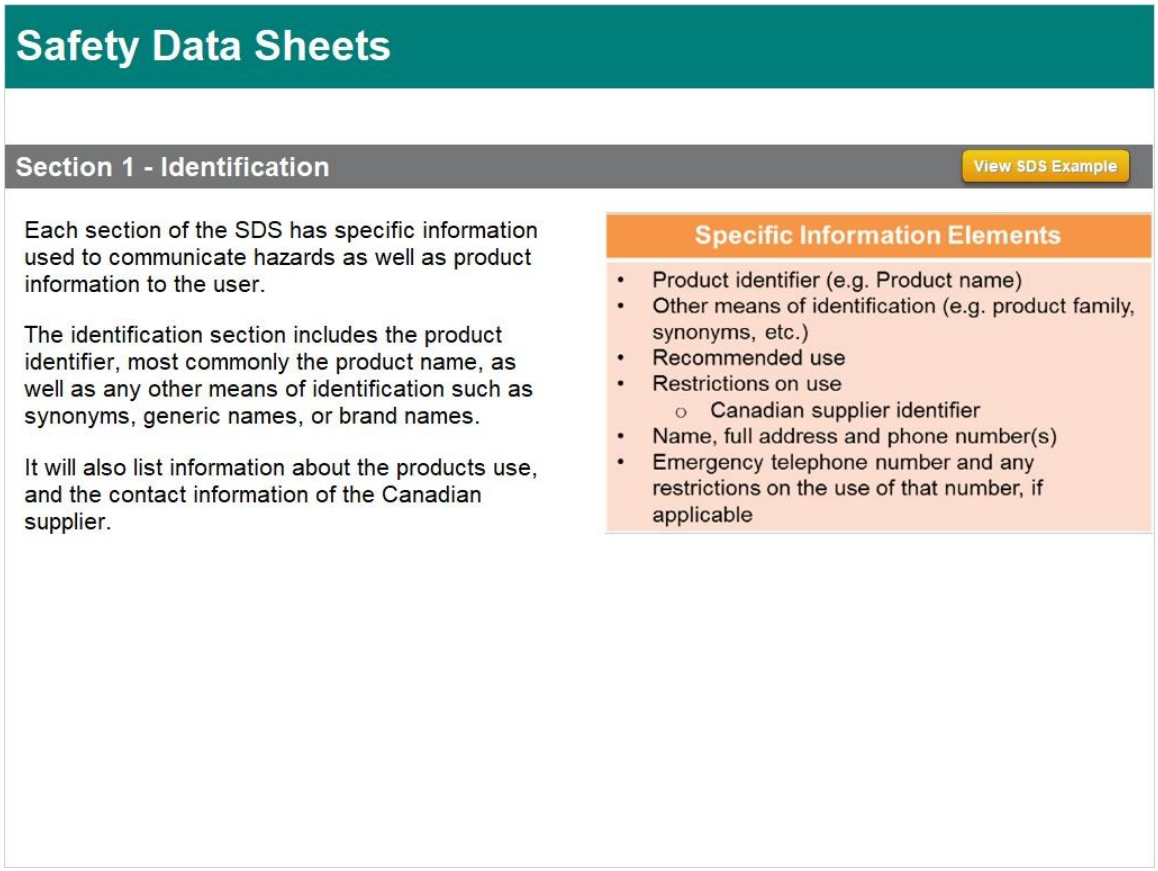
SDS Components

The following sections and their respective headings are found on the SDS.

There is a standardized format for the SDS. The information must always be in the same section, regardless of which supplier created the SDS.

Section	Hazardous Products Regulations Heading
1	Identification
2	Hazard identification (including classification and label text)
3	Composition/information on ingredients
4	First-aid measures
5	Fire-fighting measures
6	Accidental release measures
7	Handling and storage
8	Exposure controls/personal protection
9	Physical and chemical properties
10	Stability and reactivity
11	Toxicological information
12 - 15	Ecological, transport and regulatory information, disposal considerations
16	Other information

8.5 Section 1 - Identification



8.6 Section 2 - Hazard identification

Safety Data Sheets

Section 2 - Hazard identification

View SDS Example

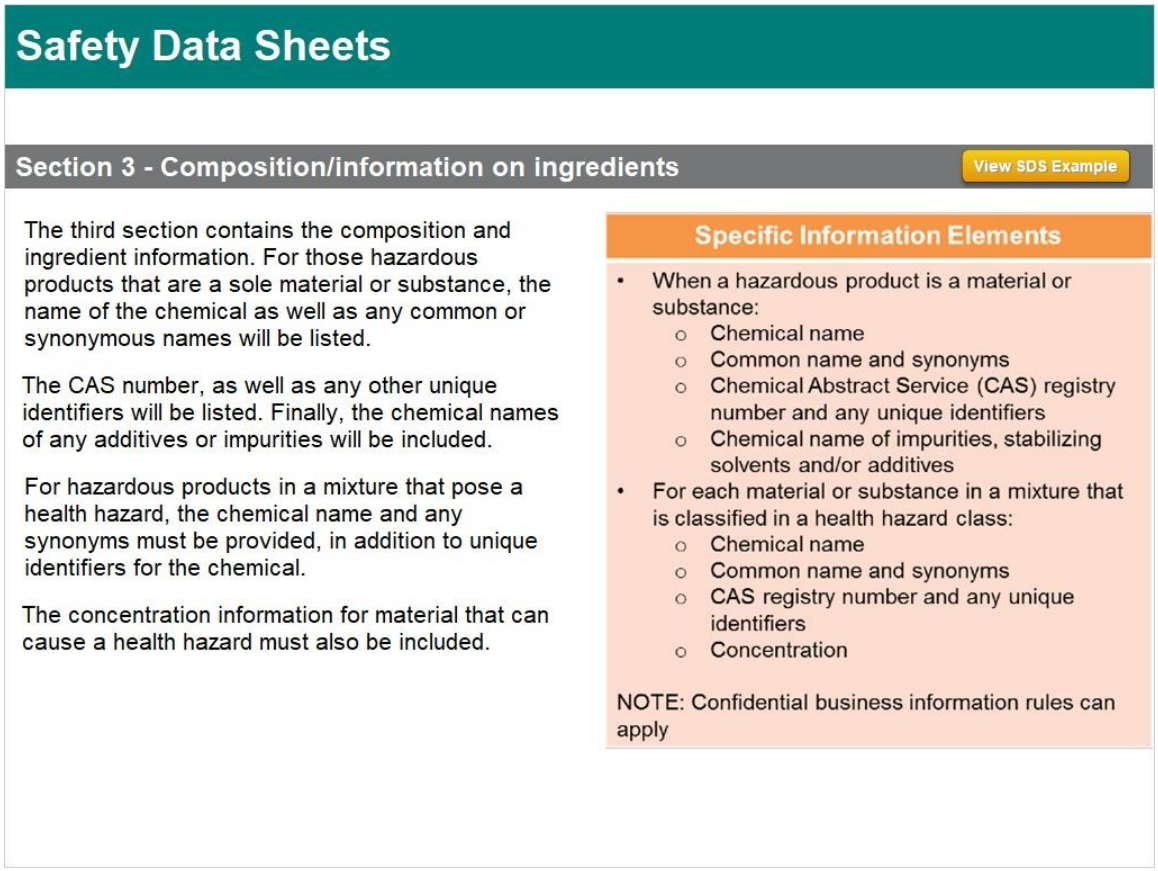
The hazard identification section will have the hazard classification information, such as the hazard class or category, as well as other information found on the supplier label, including the symbol, signal word, hazard statements, and precautionary statements for that product.

Additional hazards that may not be classified can also be included in this section.

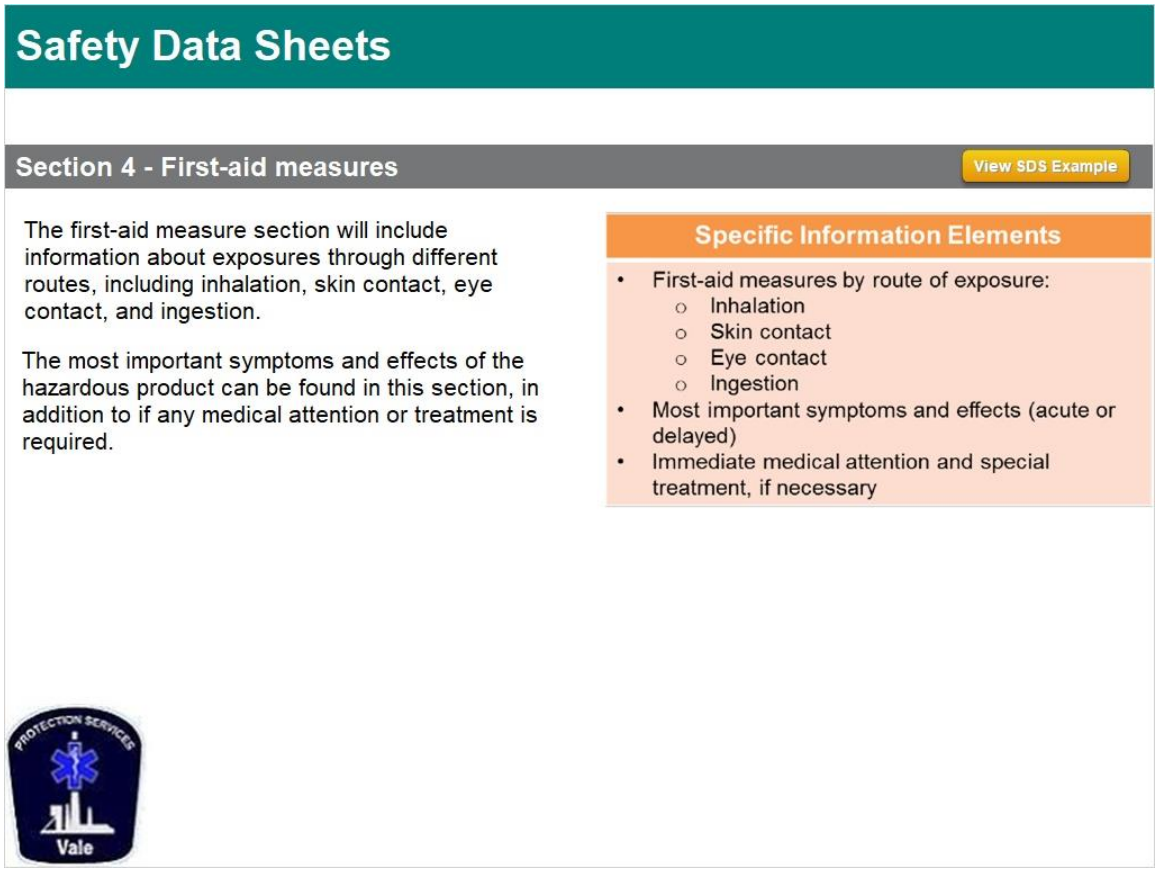
Specific Information Elements

- Hazard classification (class, category) of substance or mixture or a description of the identified hazard for Physical or Health Hazards Not Otherwise Classified
- Label elements:
  - Symbol (image) or the name of the symbol (e.g., flame, skull and crossbones)
  - Signal word
  - Hazard statement(s)
  - Precautionary statement(s)
- Other hazards which do not result in classification (e.g., molten metal hazard)

8.7 Section 3 - Composition/information on ingredients



8.8 Section 4 - First-aid measures



8.9 Section 5 - Fire-fighting measures

Safety Data Sheets

Section 5 - Fire-fighting measures

View SDS Example

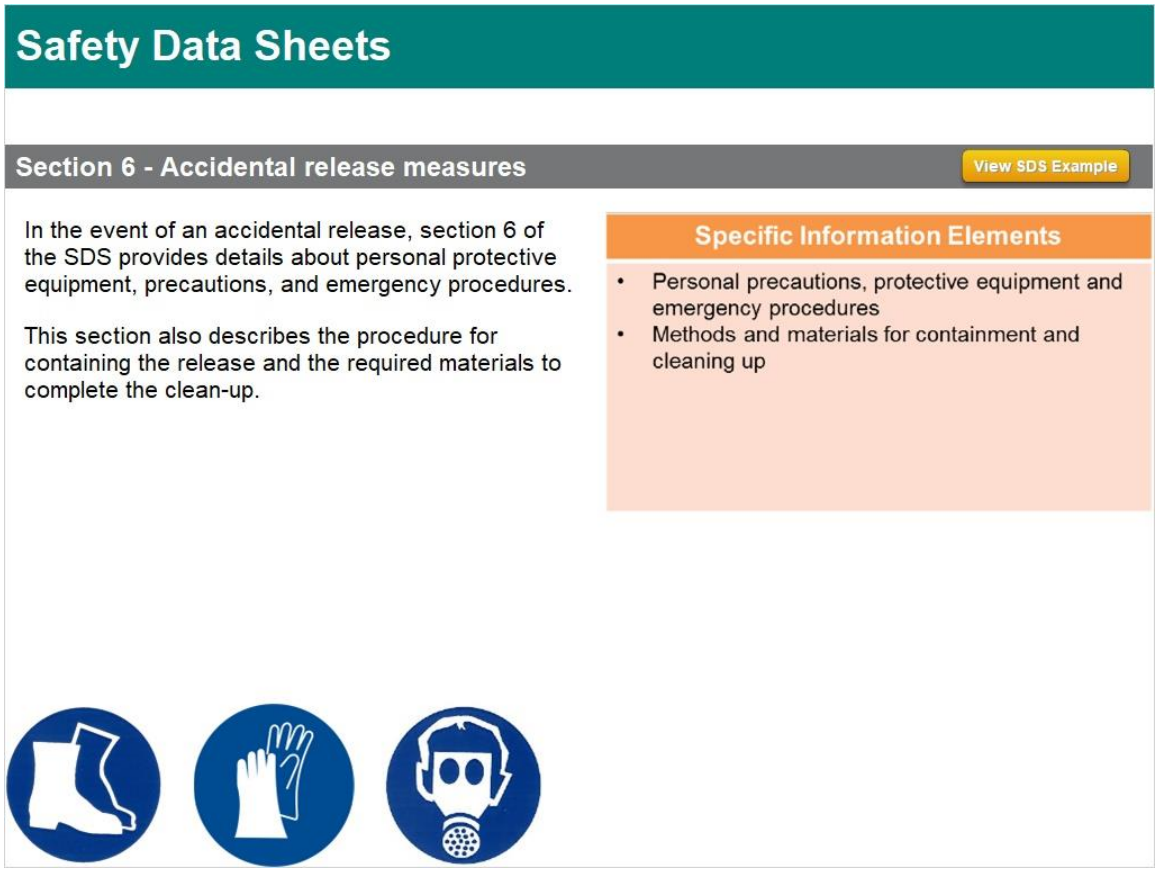
Section 5 covers the best actions to take in the event of a fire or an explosion. (For example, the SDS might list which type of fire extinguisher to use).

This section of the SDS also provides details about hazardous by-products of combustion and personal protective equipment and precautions for fire-fighters.

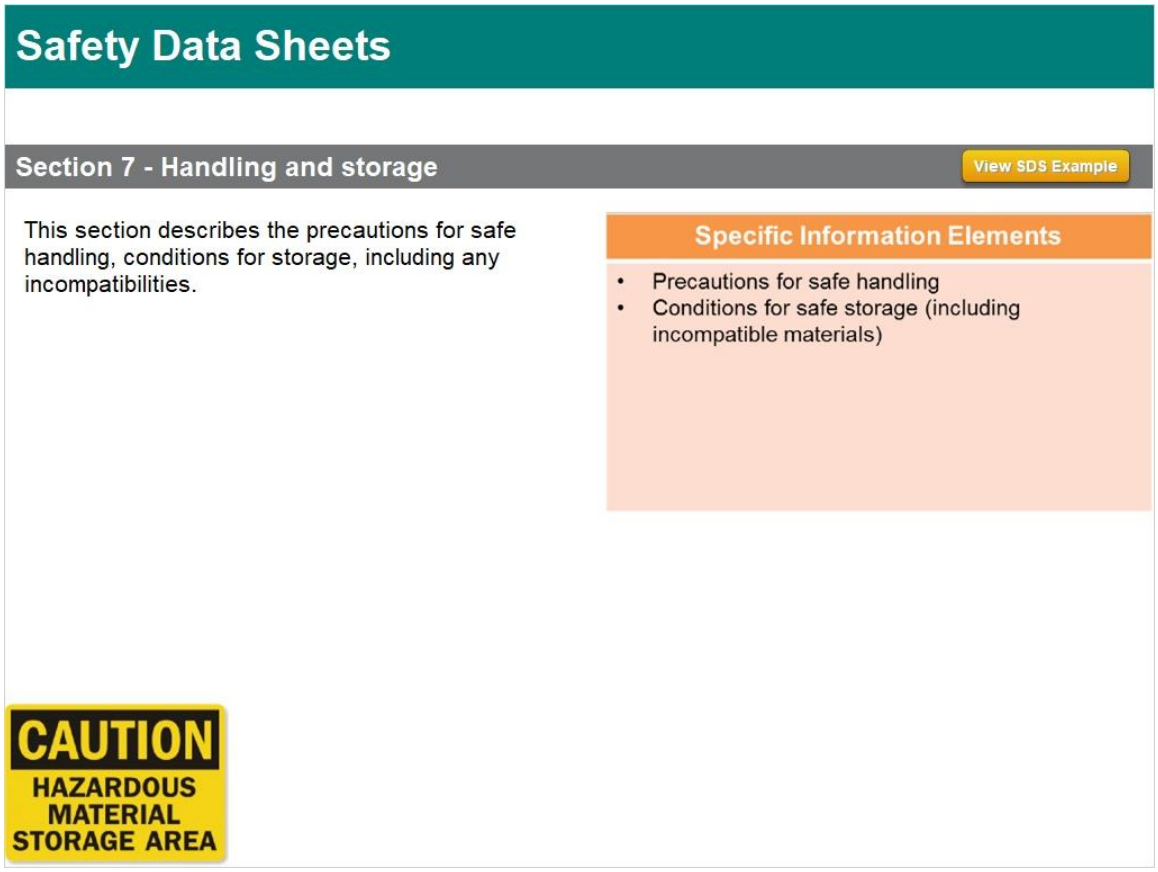
Specific Information Elements

- Suitable extinguishing media
- Unsuitable extinguishing media
- Specific hazards arising from the hazardous product (e.g., hazardous combustion products)
- Special protective equipment and precautions for fire-fighters

8.10 Section 6 - Accidental release measures



8.11 Section 7 - Handling and storage



8.12 Section 8 - Exposure controls/personal protection

Safety Data Sheets

Section 8 - Exposure controls/personal protection

View SDS Example

Information on controlling exposures and personal protection can be found in section 8.

This information includes:

- Occupational exposure information for chemical and biological exposures and appropriate control mechanisms
- Engineering controls
- Personal protective equipment recommendations

Specific Information Elements

- Control parameters, including occupational exposure guidelines or biological exposure limits and the source of those values
- Appropriate engineering controls
- Individual protection measures (e.g. personal protective equipment)

8.13 Section 9 - Physical and chemical properties

Safety Data Sheets

Section 9 - Physical and chemical properties

View SDS Example

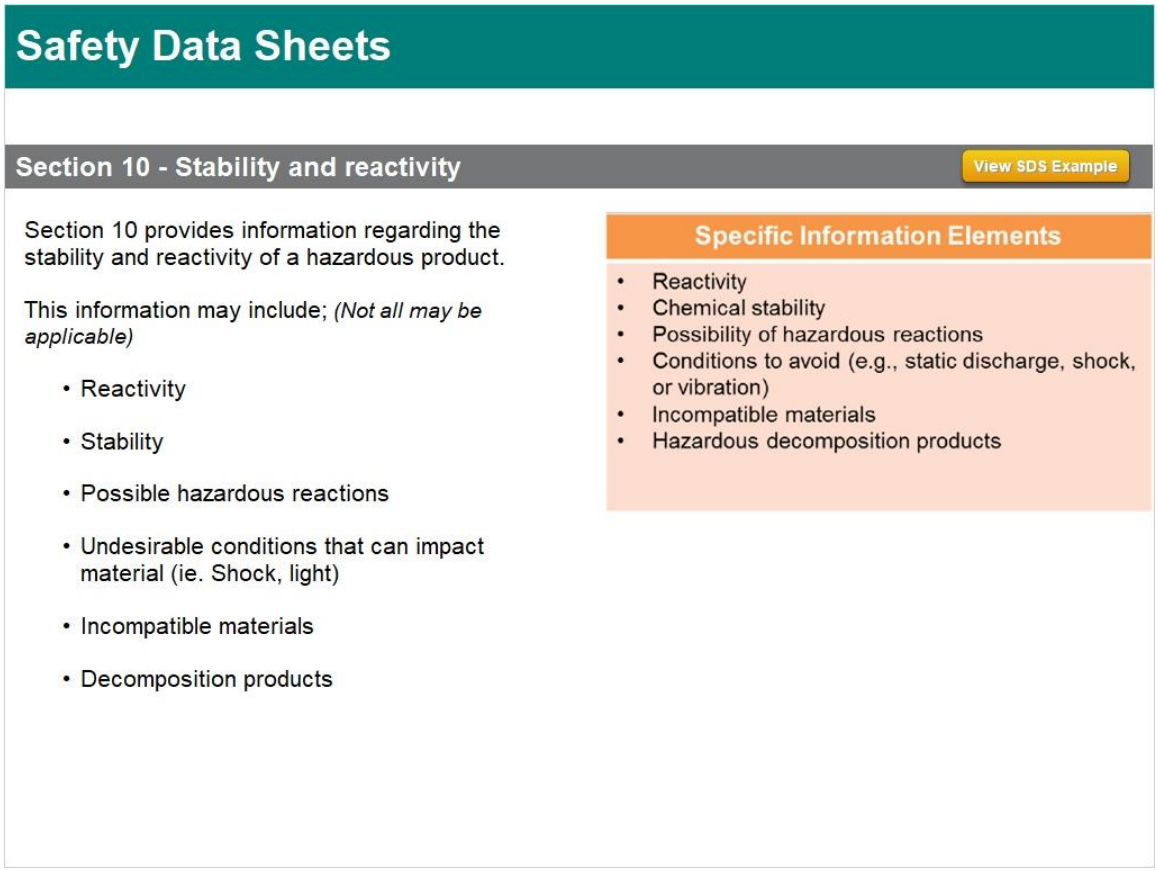
The physical and chemical properties of a hazardous product are found in section 9.

It is important to note that not all properties will pertain to or will information be available for a hazardous product. *(Not all may be applicable)*

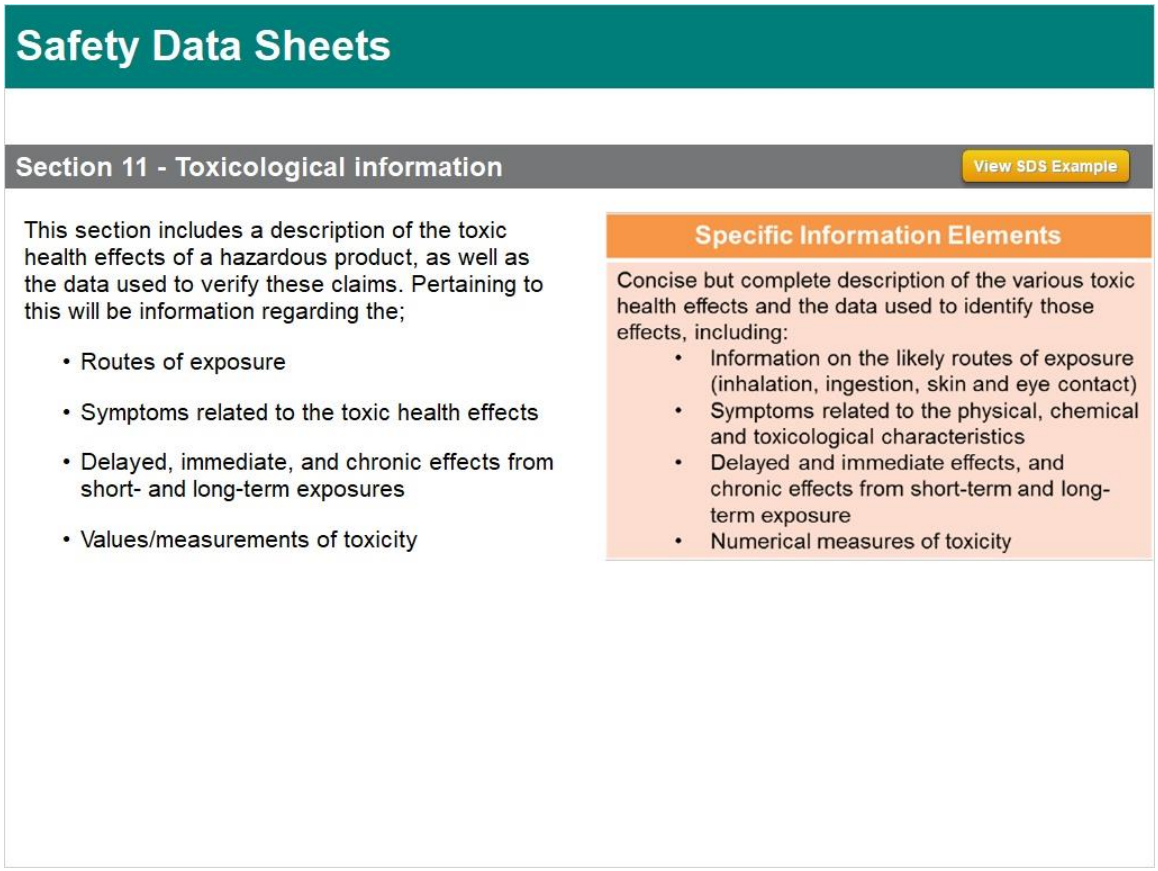
Specific Information Elements

- Appearance (physical state, colour, etc.)
- Odour
- Odour threshold
- pH
- Melting point/Freezing point
- Initial boiling point/boiling range
- Flash point
- Evaporation rate
- Flammability (solid; gas)
- Lower flammable/explosive limit
- Upper flammable/explosive limit
- Vapour pressure
- Vapour density
- Relative density
- Solubility
- Partition coefficient - n-octanol/water
- Auto-ignition temperature
- Decomposition temperature
- Viscosity

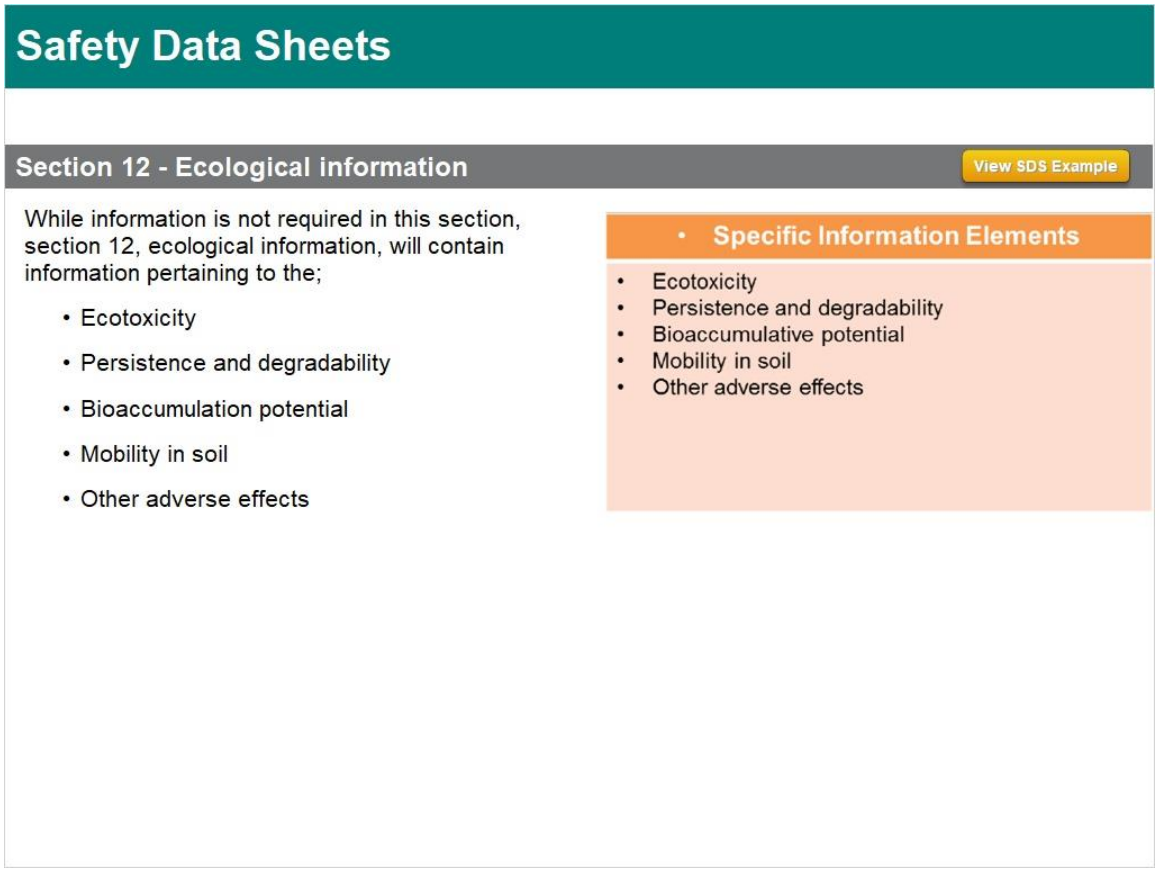
8.14 Section 10 - Stability and reactivity



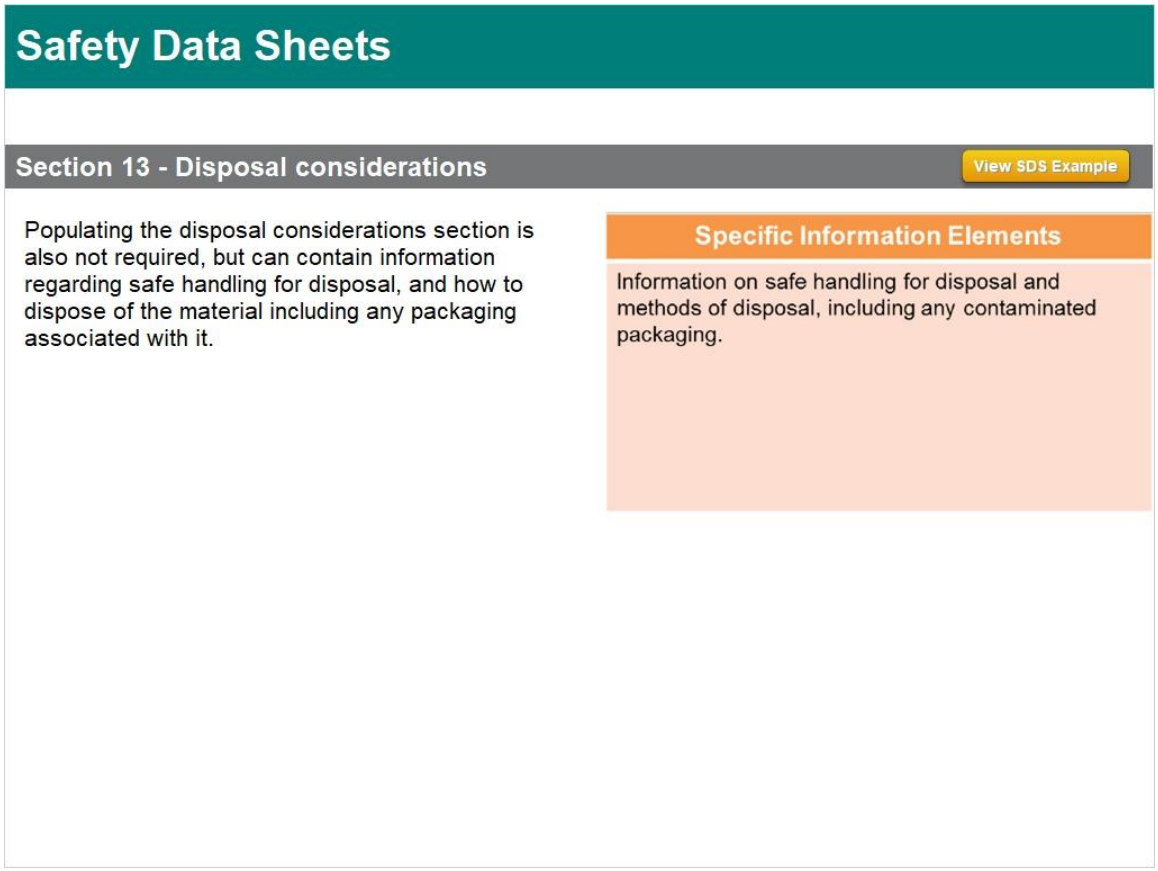
8.15 Section 11 - Toxicological information



8.16 Section 12 - Ecological information



8.17 Section 13 - Disposal considerations



8.18 Section 14 - Transport information

Safety Data Sheets

Section 14 - Transport information

View SDS Example

Section 14, the transport information section, provides additional information including the;

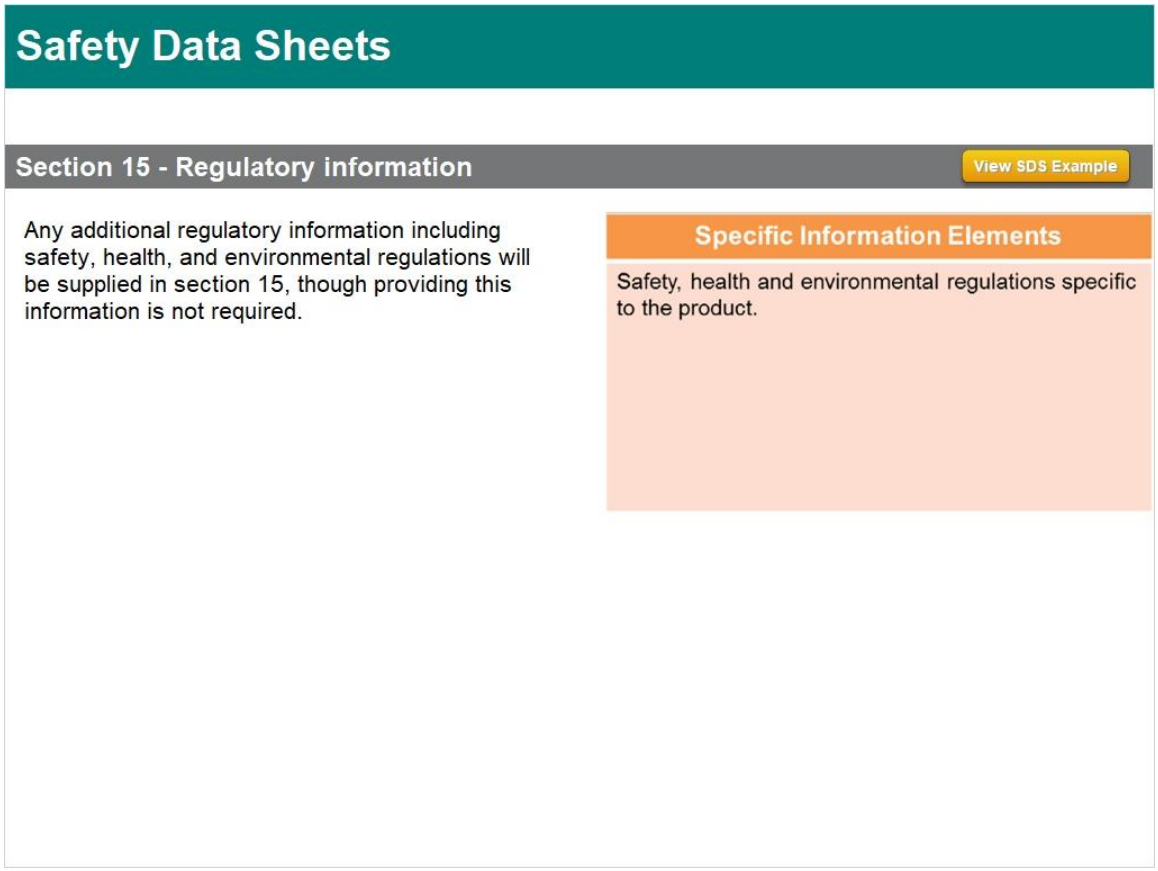
(Information may not be on SDS)

- UN number
- UN proper shipping name
- Transport hazard class(es)
- Packing group
- Environmental hazards
- Transport in bulk
- Special precautions

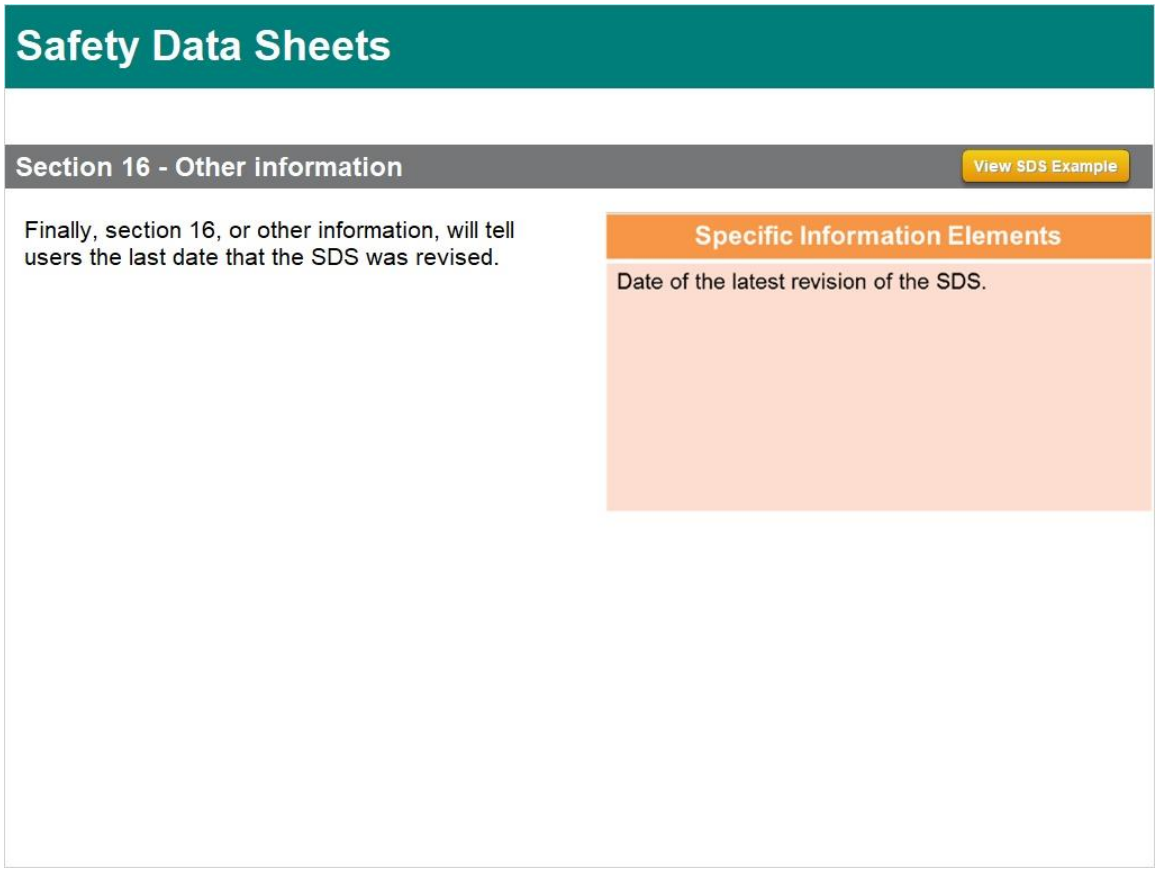
Specific Information Elements

- UN number
- UN proper shipping name
- Transport hazard class(es)
- Packing group
- Environmental hazards
- Transport in bulk, if applicable
- Special precautions

8.19 Section 15 - Regulatory information



8.20 Section 16 - Other information



8.21 Knowledge Check

(Multiple Response, 10 points, unlimited attempts permitted)

Knowledge Check

The information provided on the SDS answers some of the basic questions about the product.

Which options are correct?
(Select all that apply)

- [x] What are the hazards of the product?
- [x] What precautions should I take?
- [x] What do I do in an emergency?

Correct	Choice
X	What are the hazards of the product?
X	What precautions should I take?
X	What do I do in an emergency?

Feedback when correct:

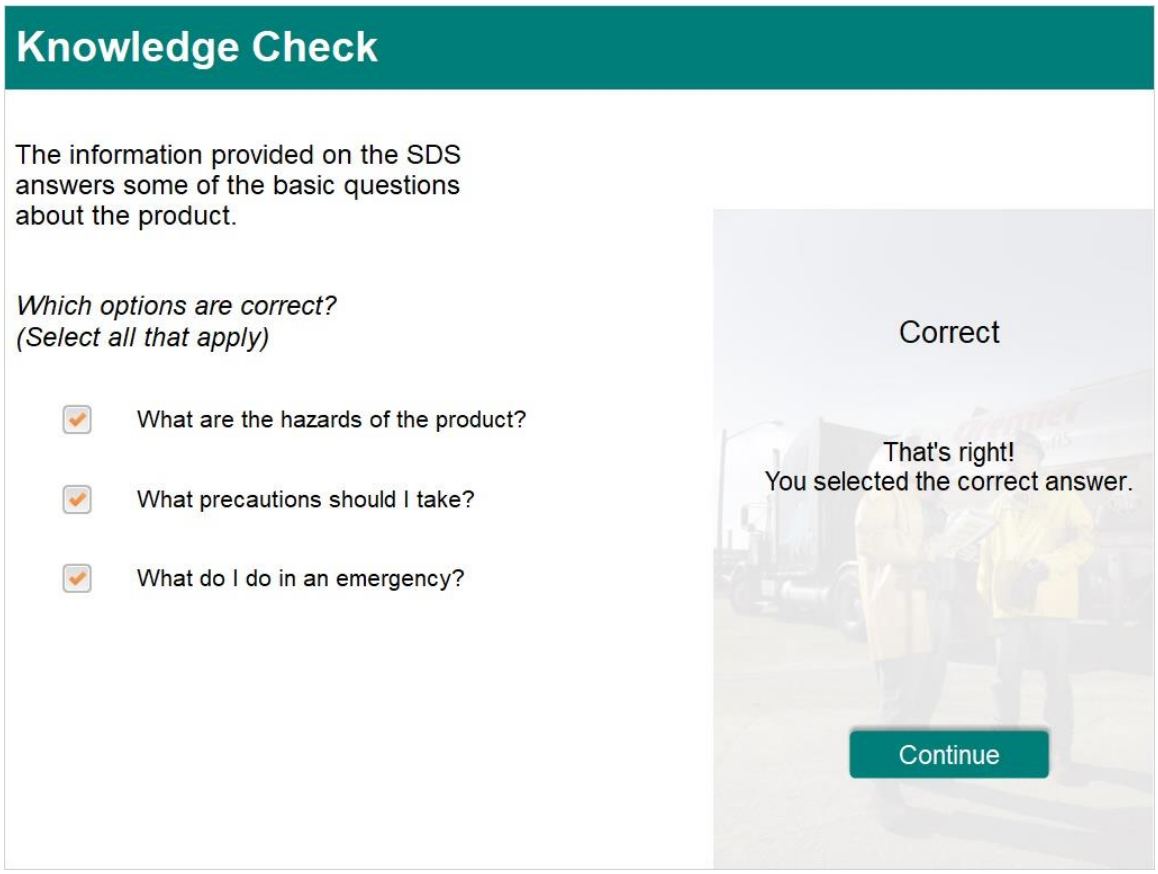
That's right!

You selected the correct answer.

Feedback when incorrect:

You did not select the correct answer.

Correct (Slide Layer)



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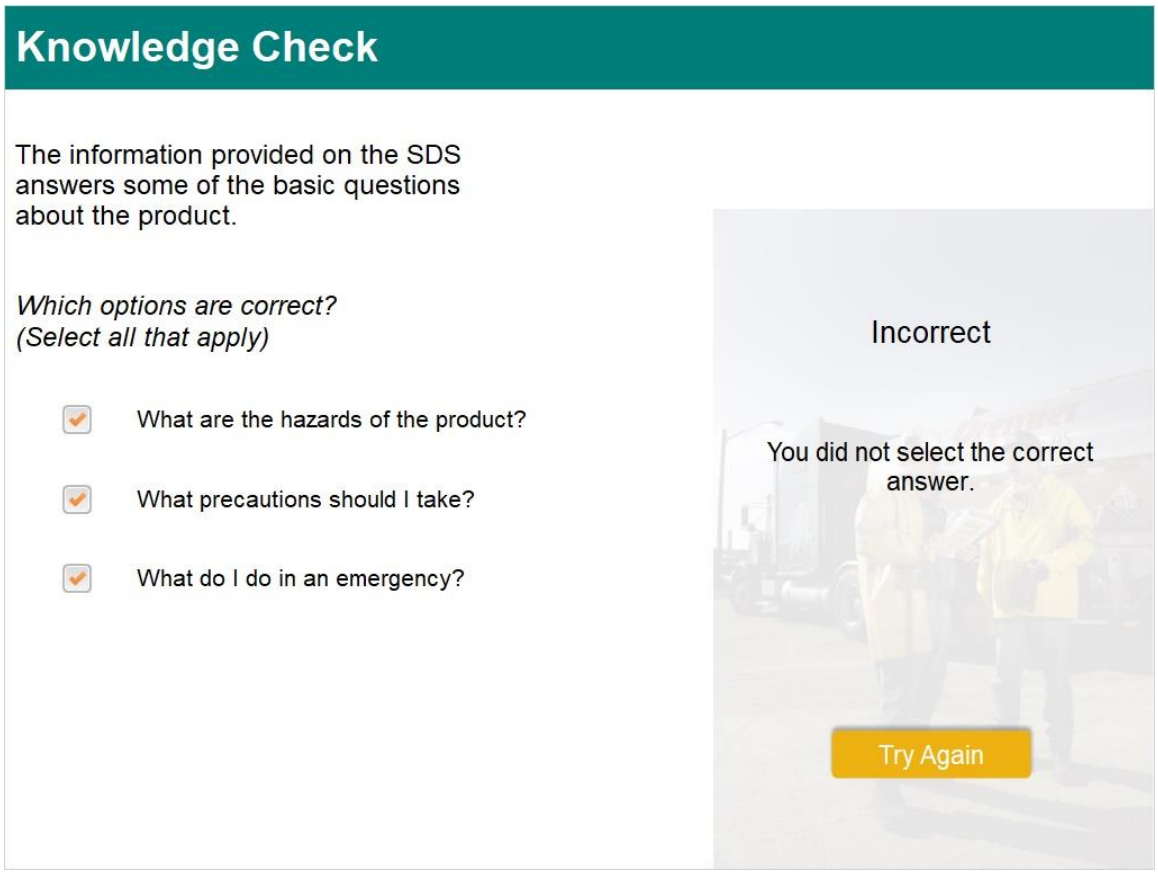

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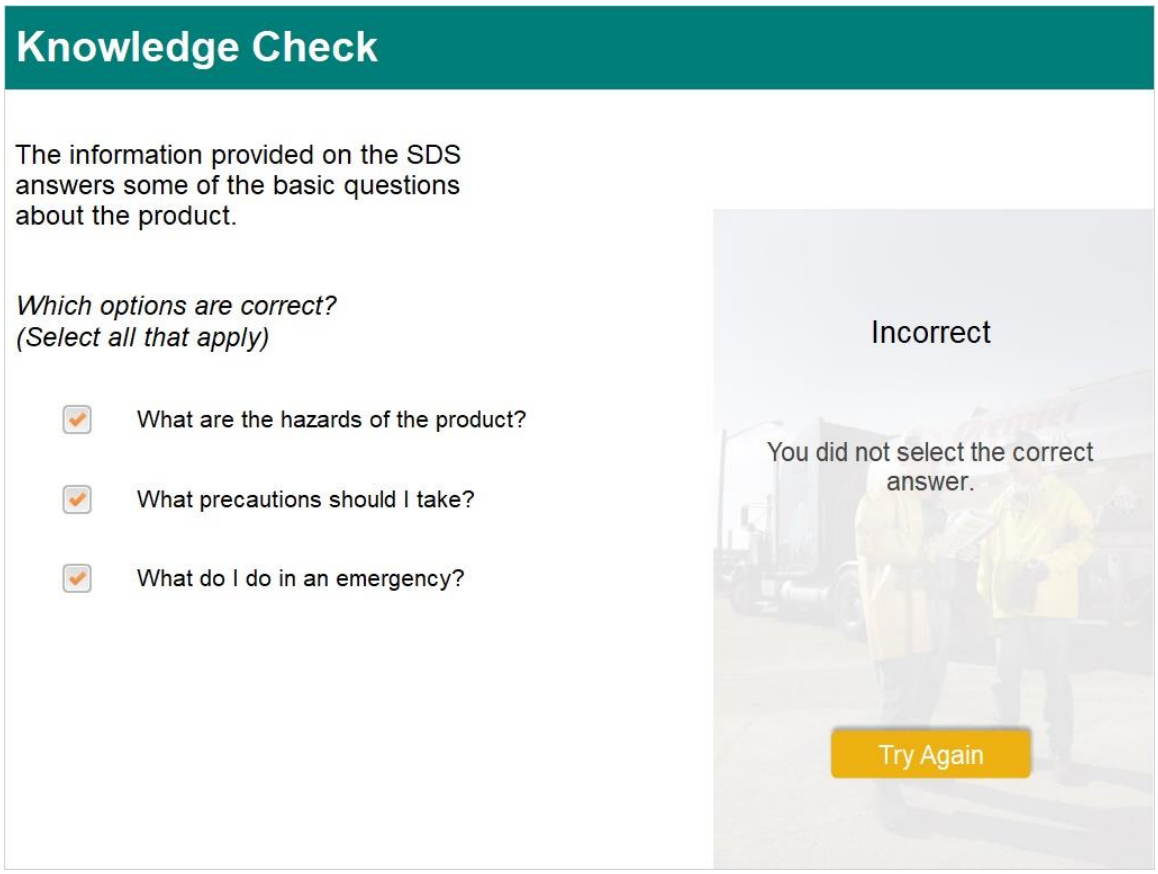


8.22 Knowledge Check

(Multiple Choice, 10 points, unlimited attempts permitted)

Knowledge Check

A worker has splashed a product into his (her) eyes. Reading the information on the SDS could have prevented this accident.

What personal protective equipment would have been recommended?

- ○ Hard hat.
- ○ Gloves.
- ◉ Goggles.

Correct	Choice
	Hard hat.
	Gloves.
X	Goggles.

Feedback when correct:

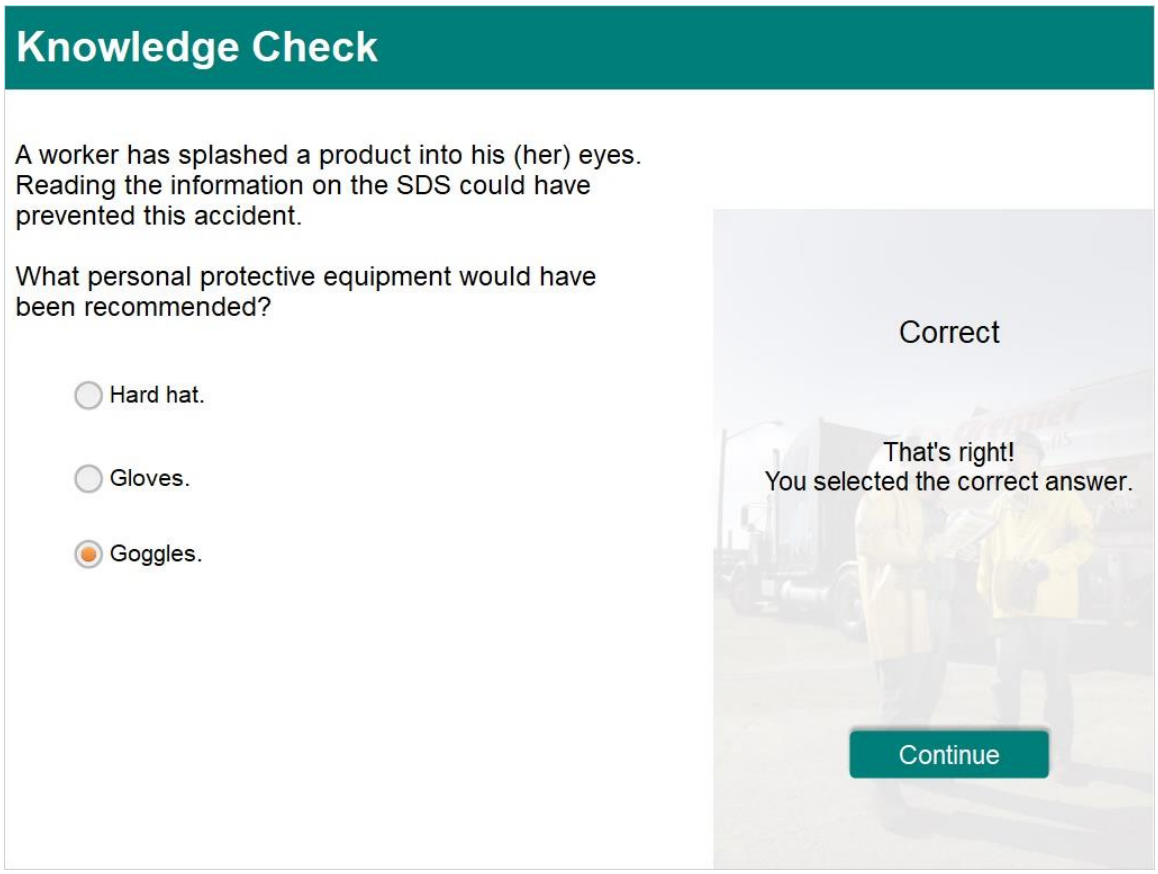
That's right!

You selected the correct answer.

Feedback when incorrect:

You did not select the correct answer.

Correct (Slide Layer)



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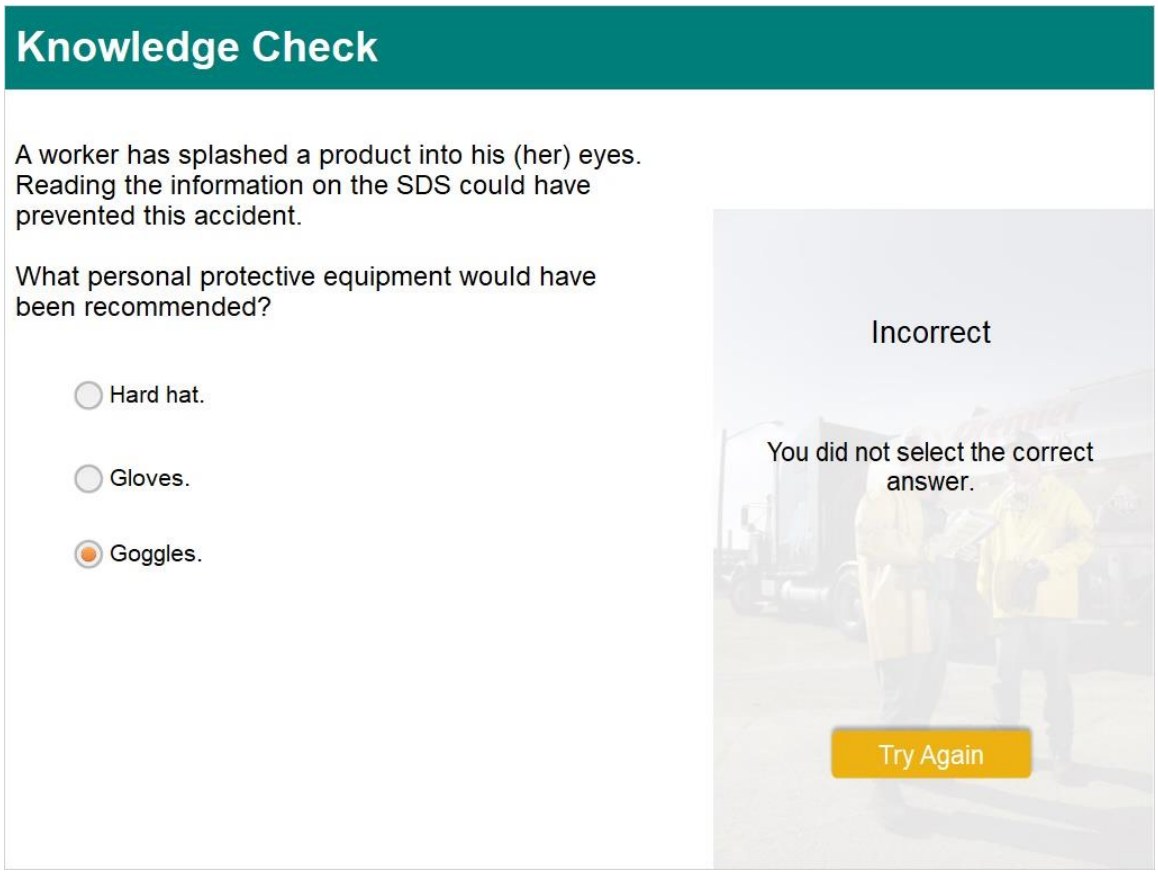

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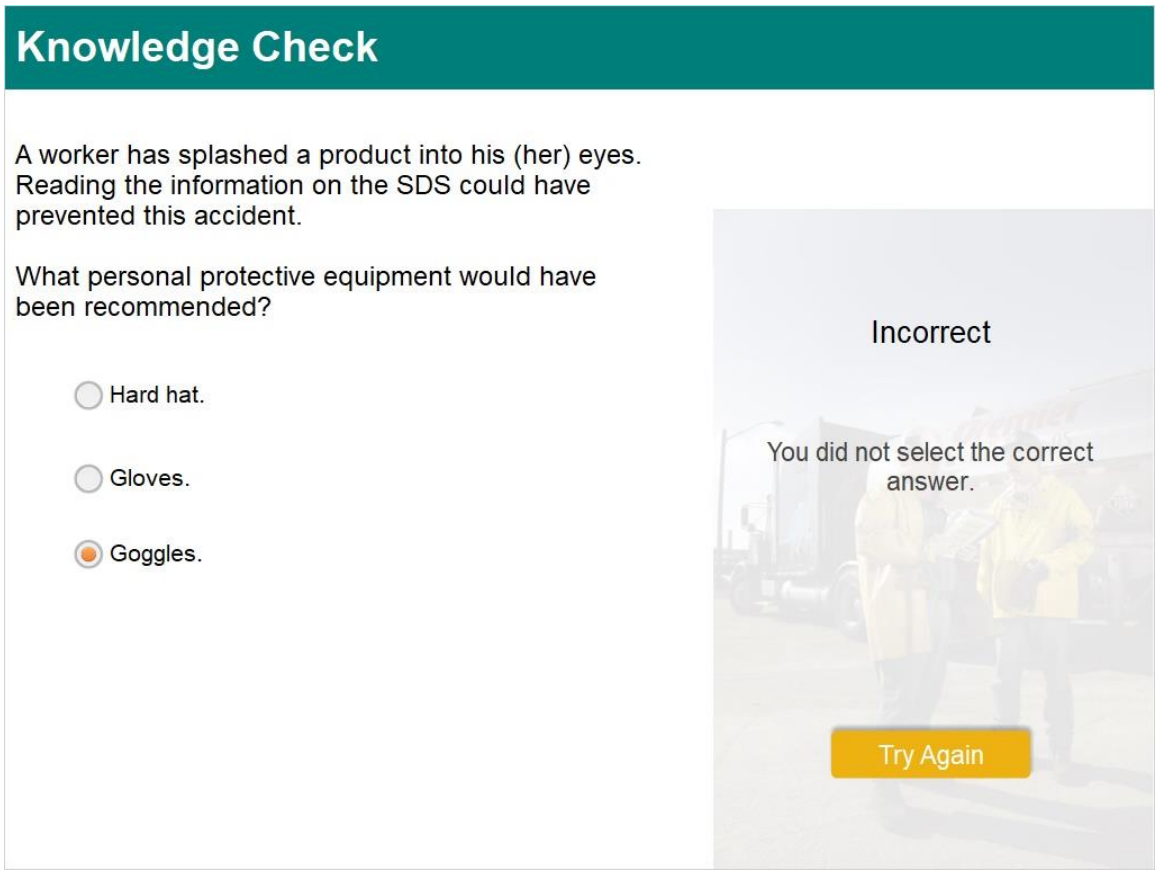
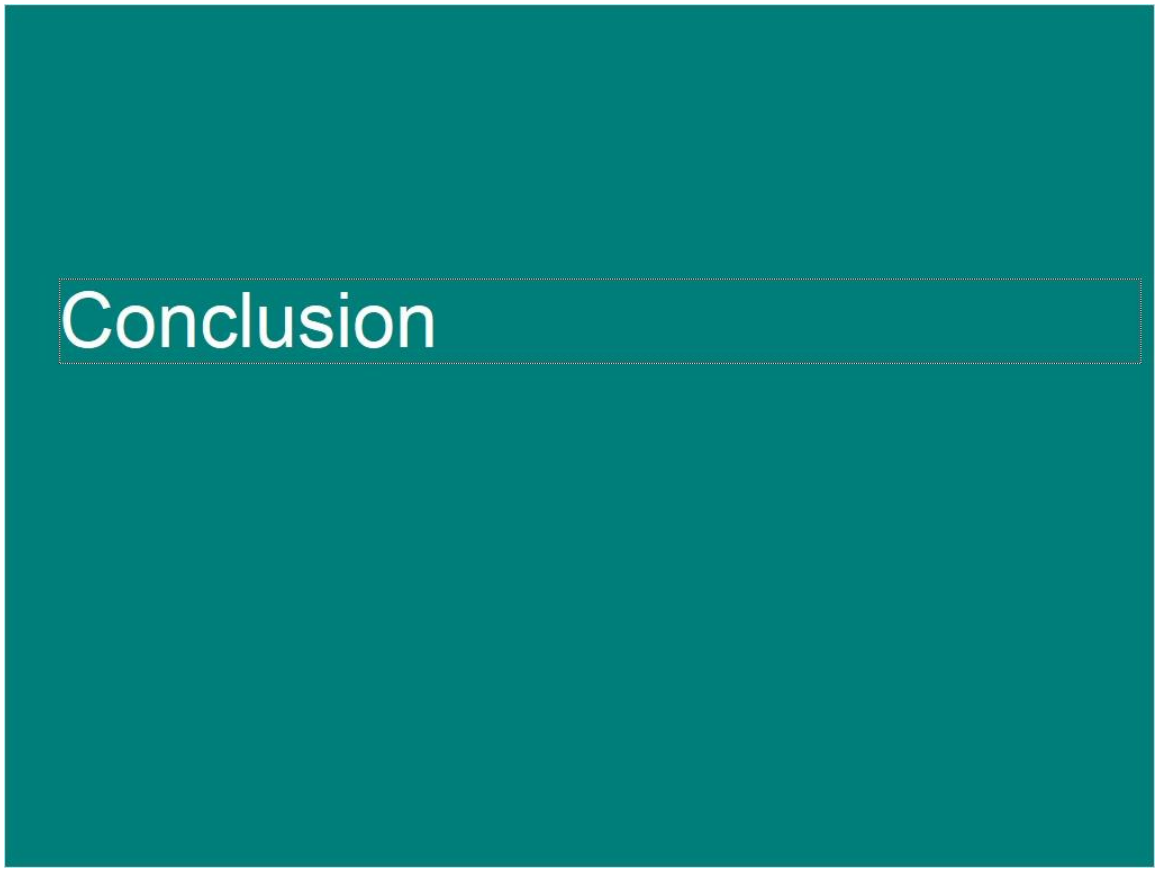


9. Conclusion

9.1 Divider



9.2 Conclusion

Conclusion

This concludes your review of the WHMIS 2015 for Workers module.

You have learned how to;

- Understand labels.
- Recognize the pictograms (symbols) and understand the hazards that they represent.
- Identify the hazards represented by each hazard class.
- Find additional information about hazards and protective measures on safety data sheets (SDSs).