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Information for Art Class Teachers

Chemical Safety



Canada

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Published by authority of the Minister of Health.

Information for Art Class Teachers: Chemical Safety

is available on Internet at the following address:

<http://hc-sc.gc.ca/cps-spc/pubs/indust/2012-iat-ipa-cs-sc/index-eng.php>

Également disponible en français sous le titre :

Information à l'intention des professeurs d'arts : Sécurité des produits chimiques

This publication can be made available on request in a variety of alternative formats.

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HC Pub.: 120001

Cat.: H129-10/2012

ISBN: 978-1-100-54144-0

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1.0 Preface

Visual Arts are forms of expression that both children and adults participate in. However, precautionary safety measures are not always considered when using art materials. When people think of potential arts and crafts hazards, cuts from knives or scissors usually come to mind, but many art products contain chemicals with various levels of toxicity, which may pose a hidden risk. Health Canada has regulations in place to help protect Canadians by setting requirements for labelling, packaging and warning information, such as the *Consumer Chemicals and Containers Regulations, 2001* (CCCR) and the *Surface Coating Materials Regulations*. In addition to regulations, Health Canada produces education material to provide information on the safe use of products.

When undertaking any art project, Health Canada recommends that professionals and consumers be well aware of the techniques and products and their potential hazards. Health Canada has developed this resource guide to help teachers involved in art classes to become aware of these chemical risks and how to minimize them. In addition, this guide can help teachers educate students, in particular children, about chemical safety, how to properly read labels and use art products.

Teaching art must include enforcing safety rules, informing students how to perform a task safely and effectively, and showing them how to work in a safe environment.

Students need to be able to:

- 1. recognize that potential hazards exist**
- 2. know how to deal with existing potential hazards**
- 3. know what various resources to consult to minimize and manage risk**

This guide will help teachers achieve this. Its main purpose is to promote health and safety of both children and adults who are creating art and for the end users who will be receiving or using the art.



2.0 Chemical Safety: Aim for Safety, Target the Label

Household chemicals are safe if used and stored in the recommended way. Chemical products are commonly found throughout the home and school. These products include, but are not limited to, cleaning liquids and powders, polishes, drain cleaners, paint thinners, art supplies and windshield washers.

Product labels typically appear on all chemical products. Labels with hazard symbols and safety warnings, give instructions you need to know to use the product safely and first aid in the event of an unintentional incident. Learn the symbols. Follow the instructions and you could prevent an injury. You could save a life.

Safety Tips

- Teach children that the hazard symbols mean: **DANGER! DO NOT TOUCH.**
- Keep all chemical products out of sight and out of reach of children.
- Always store chemicals in their original containers. Make sure the symbols and labels on containers are not removed or covered up.
- Read the label before each use. If there is anything in the label instructions that you do not understand, ask for help.
- Never mix chemicals together. Some mixtures can produce harmful gases.
- Make sure that child-resistant containers are working.
- Close the cap on the container all the way even if you set it down for just a moment. Child-resistant does not mean child-proof.
- Know where your closest eye wash station or water supply is.

Keep emergency numbers by the phone.

If someone is injured as a result of chemical contact:

- Call the Poison Control Centre immediately. This number is available on the first page of your telephone book.
- Give the information from the product label to the person answering.
- Bring the safely stored chemical container with you if you go for medical help.

The **SYMBOL** on a container shows a **PICTURE** inside a **FRAME**.

The **PICTURE** tells you the **TYPE** of danger.



EXPLOSIVE

The container can explode if heated or punctured. Flying pieces of metal or plastic from the container can cause serious injury, especially to eyes.



CORROSIVE

The product can burn your skin or eyes. If swallowed, it will damage your throat and stomach.



FLAMMABLE

The product or its fumes will catch fire easily if it is near heat, flames or sparks. Rags used with this product may begin to burn on their own.



TOXIC

If you swallow, lick, touch, or in some cases, breathe in the chemical, you could become very sick or die.

The **SIGNAL WORD** tells you more information about the **TYPE** of danger:

- **CAUTION** means temporary injury may be frequent. Death may occur with extreme exposure.
- **DANGER** means may cause temporary or permanent injury or death.
- **EXTREME DANGER** means exposure to very low quantities may cause death or temporary or permanent injury.

The back or side label of containers that pose a risk will have some type of bordered area. Inside the border, you will find safety instructions, the words **FIRST AID TREATMENT** along with instructions in case of injury and a list of harmful substances in the product.

Whenever you use a new material, find out about it. Check everything there is to know about the material before you use it. Always read the labels very carefully. Labels should specify: how the product should be used, what its potential hazards might be, how hazards can be minimized, what safety equipment is required for handling and how the chemical should be disposed of.

For professional art supplies, you can typically find this information on the Material Safety Data Sheet (MSDS) provided with the product or if one has not been provided, contact the manufacturer or supplier to obtain a copy. The MSDS will identify the product, give a list of potentially harmful chemicals within and their physical properties, with a summary of its possible potential hazards and any precautions that should be taken.

In Canada, potentially hazardous consumer chemical products, which include some arts and crafts materials, will be labelled with health warnings according to mandatory labelling requirements as specified in the *Consumer Chemicals and Containers Regulations, 2001* issued under the *Canada Consumer Product Safety Act*.

Art and Creative Material Institute (ACMI) Labels

The *Art and Creative Materials Institute* (ACMI) is an independent U.S. association that provides seals on products they have evaluated and tested, taking into account how the product is used as well as its chemical content. So, when you see the seal, you know it has been evaluated and tested for both acute and chronic potential hazards.

The *Art and Creative Materials Institute* (ACMI) maintains that the “knowledge of materials and their proper use makes them safe. Be sure to read the label on all products you use so you will know they have been evaluated and are non-toxic or need special handling to avoid possible health potential hazards from misuse.”¹

Although it is not a legal requirement in Canada, many art materials you buy will have one of the following ACMI labels on them:



According to the ACMI, the **AP (Approved Product) seal** “identifies art materials that are safe and that are certified in a toxicological evaluation by a medical expert to contain no materials in sufficient quantities to be toxic or injurious to humans, including children, or to cause acute or chronic health problems.”



According to the ACMI, the **CL (Caution Required) seal** “identifies products that are certified to be properly labelled in a program of toxicological evaluation by a medical expert for any known health risks and with information on the safe and proper use of these materials.”

On the label, you may also see **Conforms to ASTM D 4236**. This does not mean the product is “non-toxic.” It means that the product has been reviewed by a qualified toxicologist, that the label lists all the ingredients that are potential acute or chronic hazards,² and if the product does contain a substance with an acute or chronic hazard, it comes with instructions for using it safely.

Always read the labels carefully. Purchasing properly labelled products for young children, the physically or mentally handicapped, and any persons who cannot read or understand the safety labelling on product packages will help minimize the likelihood of exposure to potential hazards.

Taking these precautionary measures will enable you and your students to have a safer and more enjoyable experience.

1. See <http://www.acminet.org/Safety.htm> to learn more about the ACMI.

2. **Acute** means a sudden onset of symptoms and usually short term; **chronic** means symptoms that are slow to develop and of long duration.



3.0 Impact: How Arts Materials Can Affect You and Your Students

While practising various arts and crafts activities you and your students may come across many different potential health hazards. Anyone who uses art materials and art procedures can be at risk if they do not use them correctly. Some people, such as children, the disabled, the chronically ill, the unborn child of a pregnant woman, and the elderly can be more vulnerable to these potential hazards than others. This is why, as an art teacher, you need to be aware of the materials you are using and the potential hazards associated with them. Even if you have used a similar product/procedure before:

- always verify the product labels to ensure they meet acceptable standards or regulations before purchasing and/or using a product (see section on *Chemical Safety* for guidelines on what to look for);
- ensure you follow the instructions properly; and
- know the procedures of the art technique well before teaching it to others.

You also need to consider **risk factors** which make it more or less likely that you and your students will be affected by a material and/or a procedure.³ Risk factors you need to be aware of are listed below.

- **Conditions of Exposure:** how much material you or your students are unintentionally exposed to either by inhalation, ingestion, or by contact with the skin. How long and how often a product is used is also an important consideration.
- **Toxicity:** defined as a chemical's inherent ability to cause bodily harm, either in the long or short term. Generally speaking, most chemicals are not dangerous at low levels, unless otherwise indicated on the label.

Also keep in mind that some chemicals have acute health effects, while others have chronic effects and some have both. Acute reactions to chemicals are those that appear soon after exposure (such as a rash or a burn) and last a relatively short time. Chronic effects such as cancer or developmental disorders may develop more slowly, often after frequent exposure to chemicals, and have longer lasting effects. Taking all these things into consideration will help you to make safer choices for you and your students.

3. Michael McCann and Angels Babin, *Health Potential hazards Manual for Artists*, Globe Pequot Press: Guilford, 2008, Page 8-9.



3.1 Routes of Entry

Chemicals can enter the body in various ways, mainly through the mouth, nose, eyes and skin.

The following are some examples of how this can occur:

Route of Entry	Mechanism of Entry
Mouth	ingestion, inhalation of gases, vapours, mists, fumes, dusts, or smoke
Nose	inhalation of gases, vapours, mists, fumes, dusts, or smoke
Eyes	absorption from fumes, splashing, or eye rubbing
Skin	absorption into the body from direct contact, or a local effect at the site of exposure (for example, a rash or burn)

3.2 Adverse Health Effects from Chemicals

Health effects are changes to a person's normal health resulting from exposure to a substance. Health effects are important considerations in arts and crafts. Some arts materials can cause chemical burns or illness if you spill them on your skin, get them in your eyes, breathe in or swallow even a bit of them just once. Repeated exposure to small amounts of certain materials over a period of time may cause a variety of health effects, some severe.

Remember too that the toxic effects of chemicals are often more serious for young children than for adults. Young children are also more likely to be exposed to hazardous arts and crafts materials because they are curious and have a natural habit of putting things into their mouths.⁴ Anyone working with potentially hazardous materials should take precautions. Following this advice is also important for pregnant women (some chemicals can harm a fetus during its development), and for someone who takes medication or has an ongoing medical condition. If you have a serious medical condition, you should check with your doctor before starting any arts and crafts activity that involves exposure to chemicals.

Numerous studies have shown that artists can develop a variety of ailments from exposure to chemicals such as contact dermatitis, lead poisoning, silicosis, liver and kidney damage, nerve damage, reproductive problems, carbon monoxide poisoning and cancer.⁵ For example, inhalation of chemicals such as lead chromate and irritants like silica dust can irritate respiratory passages and cause breathing difficulties or lung disease. Always be aware of any reactions, allergies or allergic symptoms when conducting an art class, both in you and your students. Keep an eye out for anyone who is having trouble breathing, anyone who suddenly develops a visible skin irritation or anyone in distress. If you notice any of these symptoms, seek medical attention immediately.

4. Health Canada, *It's Your Health: Safe Use of Arts and Crafts Materials*.

5. Michael McCann and Angels Babin, *Health Potential hazards Manual for Artists*, Globe Pequot Press: Guilford, 2008, Page 3.



4.0 Using Arts Materials Safely: Tips and Advice

There are different things to keep in mind when planning and performing art tasks. Some basic ones to remember:

- know your materials and avoid or minimize exposure to harmful ones
- read labels thoroughly and follow instructions carefully
- keep your work area clean and clutter free
- have good ventilation
- store materials properly and question the safety of any unlabelled materials
- wear the proper protective equipment if necessary
- keep eating and drinking activities completely separate from art activities
- wash your hands thoroughly after completing any art activity

We will be talking about specific safety tips in the following sections on art safety for children and art safety for adults.

The following are some general guidelines

Choosing Safer Materials

When teaching an art class for children, make sure the products being used are labelled for children's use. Use the labels as your guide. For help on what to look for, see the section on *Chemical Safety* in this booklet.



REMEMBER THIS

- ✓ always use the safest materials you can find that are age appropriate
- ✓ avoid solvents and solvent containing products (if solvent materials must be used, choose the least toxic ones such as water-based solvents)
- ✓ be very specific about the type of products parents should buy when sending supply lists home

Housekeeping

The environment where art is created in will also impact how safe the entire art process is. It is essential that you keep art classrooms clean, neat and organized at all times with proper storage, labelling and clean up. Establishing good housekeeping practices helps keep you and your students safe.



REMEMBER THIS

- ✓ make all storage easily accessible to the teacher to avoid exposure incidents
- ✓ choose appropriate, well marked containers (keep in original containers where possible)
- ✓ store chemicals that will react with each other separate
- ✓ keep containers covered/closed at all times
- ✓ pour substances slowly and carefully
- ✓ control dust by wet mopping or vacuuming (never sweep)
- ✓ clean up spills immediately
- ✓ dispose of waste art materials safely by contacting your local municipality for information
- ✓ do not work straight out of the original container, instead place the substance in another, smaller container (such as a yogurt cup or egg carton) but do not store the substance in the container
- ✓ keep harmful substances locked out of sight and out of reach of children

Personal Hygiene

There are standard practices for personal hygiene while partaking in art processes. As a general rule, keep everything out of the mouth. The mouth is the most common route of entry for art products from hand to mouth contact, putting paint brushes in the mouth, inhaling airborne chemicals or even wiping the mouth with a dirty hand.



REMEMBER THIS

- ✓ do not eat or drink in the art classroom
- ✓ ensure hands are washed thoroughly after completing a task
- ✓ avoid putting art products in your mouth and make sure your students do the same

Good Ventilation

A source of fresh air protects you from exposure to hazardous levels of potentially harmful airborne substances. An open door or window is not necessarily the most adequate ventilation. The type of art process you are doing will determine the type of ventilation you need. You need appropriate and controlled ventilation when using more harmful substances.

REMEMBER THIS

- ✓ make sure to have the proper ventilation for the art process you are using
- ✓ perform art activities in a spacious room as much as possible

Personal Protective Equipment

It is essential that you learn all you can about the art process you will be undertaking before you do it or teach it to others. Part of this learning process includes being aware of any necessary personal protective equipment you need to wear. Following these guidelines will help keep you and your students safe from harm.

REMEMBER THIS

- ✓ always wear the proper protective equipment that is specified on the label
- ✓ wear gloves when necessary—the kind of gloves to wear depends on what you will be handling (keep in mind that you or one of your students might have an allergy to latex)
- ✓ wear eye protection when necessary—goggles protect the eyes from splatter and debris
- ✓ wear protective clothing (such as a smock)—that suits the application



4.1 Primary and Middle School Children

Most primary and middle school children will work with arts materials for about one hour every week of the school year. You should be careful when planning art activities for children because they are at a higher risk from exposure to harmful chemicals. Primary and middle school children do not fully understand potential hazards the same way that older children and adults do, so children of this age group should not be exposed to hazardous art materials. Young children are more likely to be exposed to harmful substances, such as lead which is found in some art materials, because of their natural habit of mouthing objects. For this reason, only use products labelled for use by children and not products with any sort of hazard symbol. Keep in mind that art safety includes protecting the teacher, student and recipient of the finished product.



When teaching art, you need to pass on safe habits to your students and lead by example. Working safely and using safe products will enable you and your students to have an enjoyable experience.

As much as possible, use low risk art products. The table below provides examples of lower versus higher risk products:⁶

Lower-risk	Higher-risk
Talc-free, premixed clay	Powdered clay
Water-based paints instead of glazes	Ceramic glazes or copper enamels
Vegetable and plant dyes (such as onion skins, or tea) as well as food dyes	Cold-water, fibre reactive dyes or other chemical-based commercial dyes
Make papier mâché from black and white newspapers and library or white paste	Instant papier mâché that create inhalable dust
Liquid tempera paints or paints and adult pre-mixes	Powdered tempera paints, which create inhalable dust and may contain toxic pigments
Oil pastels, crayons or dustless chalks	Pastels, chalks that create dust or dry markers
Water-based solvents	Solvents such as turpentine, toluene and rubber cement thinner. Also solvent-containing materials, solvent-based inks, alkyd paints and rubber cement
Water-based paints with brushes or spatter techniques	Aerosol sprays
Water-based white glue or library paste	Epoxy, instant glue, aeroplane glue or other solvent-based adhesives
Water-based markers	Permanent felt tip markers (may contain toxic solvents)
Pre-mixed plaster	Dry (powdered) plaster

6. Adapted from table in *Resource Sheet #21: Safety in the Arts* used by permission from the Canadian Child Care Federation.

4.1.1 Various Products and Safety: Commonly Used Ingredients and Applications for Children's Art

Commonly Used Ingredients

Many of these commonly used ingredients in arts materials could affect your health and the health of your students. It is important to know as much as possible about the products you are using, including how to use them safely.

Take a moment to read the following before undertaking any art project:

Ingredient	Hazard	Safe Use	Substitutions
<p>Adhesives An adhesive is a substance that allows two or more surfaces to be bonded or stuck to one another. Common adhesives include tapes, sprays, glues and pastes.</p>	<ul style="list-style-type: none"> • They can cause skin irritation. • Some are respiratory irritants and eye irritants. 	<ul style="list-style-type: none"> ✓ Read and follow labels. ✓ Always use good ventilation. ✓ Do not use fast acting "super" glues or glues based on organic solvents with children. ✓ Primary or junior school children should not have access to large amounts of adhesive (in case they try to swallow it). 	Use water-based glues and pastes.
<p>Pigments Pigments are colouring agents that can be made from many different materials including plants, artificial dyes, animal extracts and minerals. When these are ground up finely and mixed with a solvent, they make paint, for example, powdered paints.</p>	<ul style="list-style-type: none"> • They can be dangerous in their powder form if inhaled. • Lead, chromates, cadmium, barium or arsenic may be present and could be harmful. 	<ul style="list-style-type: none"> ✓ Read and follow labels. ✓ As a general rule, avoid mouthing and skin contact. ✓ If pigment must be mixed wear proper personal protective equipment. ✓ The greatest concern arises if pigments are swallowed or if their dusts are inhaled. ✓ If mixing of pigments is necessary, teachers should do it before the children arrive. Children should never mix pigments. 	Use pre-mixed paints and dyes.

Ingredient	Hazard	Safe Use	Substitutions
<p>Solvents A solvent is a substance, usually a liquid, in which other substances are dissolved. It is commonly used for cleaning, thinning and mixing art products. One of the most common, most useful solvents is water.</p>	<ul style="list-style-type: none"> • Some solvents, like oil based solvents, can be poisonous if swallowed or inhaled in sufficient quantity. • They could cause dermatitis after sufficient skin contact and can irritate and damage the skin, eyes and respiratory tract. 	<ul style="list-style-type: none"> ✓ Read and follow labels. ✓ Due to their toxicity, solvents (other than water) should not be used for grades six and under. ✓ If solvents must be used, use water based solvents and solvents with low evaporation rates. 	<p>Use water-based or less toxic solutions.</p>
<p>Corrosives A corrosive can be an acid or a base such as chlorine bleach.</p>	<ul style="list-style-type: none"> • They burn, irritate or damage tissue on contact. • When highly concentrated they can cause severe, permanent injury to skin tissue. • When concentrated they can also give off vapours which can damage respiratory tissues. • When acids and bases are mixed, this can cause harmful fumes or even explosions. 	<ul style="list-style-type: none"> ✓ Read and follow labels. ✓ Only teachers should handle corrosive materials. ✓ Use the smallest amount necessary. ✓ Avoid direct contact with skin. ✓ Use in well ventilated area. ✓ Do not mix corrosives unless you are aware of the reactions and take appropriate precautions. ✓ Wear appropriate protective equipment. 	<p>Replace highly concentrated corrosives with more dilute solutions.</p>



Commonly Used Applications

Although there are many different forms of art applications, the ones listed below are some of the most commonly used for children’s arts and crafts in the classroom and at home. For more detailed information, please refer to the resources listed in *Appendix B: References*.

Technique	Hazard	Safe Use
<p>Ceramics Ceramics is the art of making objects of clay and firing them in a kiln. This includes earthenware and porcelain, as well as sculpture. Enamelling is also a ceramic technique.</p>	<ul style="list-style-type: none"> • Clay—inhalation of silica dust from dry clay is highly toxic. • Glaze—may contain toxic metals such as lead, barium, cadmium and lithium. 	<ul style="list-style-type: none"> ✓ Clay—children should work only with wet clay. ✓ Glaze—look for wet glazes that are labelled “lead-free”. ✓ Generally, children should not make objects for use with food and drink. ✓ Know hazards associated with the technique and always read and follow labels. ✓ Ensure there is active supervision at all times.
<p>Drawing Drawing is a visual art which makes use of any number of drawing instruments to mark a two-dimensional medium. Common instruments include graphite pencils, pens, inked brushes, colour pencils, crayons, charcoals, chalk, pastels and markers.</p>	<ul style="list-style-type: none"> • In general, the materials often used in drawing classes in the early grades (such as crayon, charcoal, chalk and ordinary pencil) pose no health risks to students and teachers. • Many permanent markers use solvents. • Children may sniff or put scented markers in their mouth. • Chalk dust can be an irritant, for example when banging chalkboard brushes together. • Fixatives in aerosol cans can be dangerous for children’s use. 	<ul style="list-style-type: none"> ✓ Always make sure to use non-toxic, water-based materials designed for use by children. ✓ Teachers should be the only ones to apply fixatives. ✓ Learn everything there is to know about your technique and always read and follow labels. ✓ Ensure there is active supervision at all times.

Technique	Hazard	Safe Use
<p>Painting Painting is the process by which colour is applied to a surface using paint or other surface coating material.</p>	<ul style="list-style-type: none"> • The pigments can be hazardous in powdered form. • Some paints may contain harmful solvents. • Poster paints or other water based paints and food dyes commonly used in the early grades pose little potential hazard with normal use. • Many paints contain traces of preservatives that could be harmful if large amounts of paint are swallowed. • Do not use household paints for art projects. 	<ul style="list-style-type: none"> ✓ Choose water-based, non-toxic, pre-mixed paint labelled for children's use. ✓ Avoid paint in powder form. ✓ Ensure that you have adequate ventilation. ✓ Always wash hands after finished. ✓ When finger painting, use paints labelled as finger paints. ✓ Teacher should allot paint amounts to children using smaller containers (such as egg cartons or yogurt cups). ✓ Learn everything there is to know about your technique and always read and follow labels. ✓ Ensure there is active supervision at all times.
<p>Printmaking Printmaking is the process by which a work of art can be recreated in quantity from a single image that is usually prepared from a stamp (for primary students stamps could include household objects such as fruits and vegetables).</p>	<ul style="list-style-type: none"> • Solvent based inks are typically used and might contain lead, chromate or cadmium. 	<ul style="list-style-type: none"> ✓ Use water-based inks whenever possible. ✓ Use stencils made from water-soluble glues or paper cutouts. ✓ Avoid lithography, etching, making woodcuts and engraving. ✓ Learn everything there is to know about your technique and always read and follow labels. ✓ Ensure there is active supervision at all times.
<p>Sculpture Sculpture is creating a three-dimensional work of art using stone, plaster, wax, plastic or wood that is carved, modelled or cast.</p>	<ul style="list-style-type: none"> • Dry clay can be highly toxic when ingested or inhaled. • The casting of body parts with plaster can irritate the skin. • Children may sniff or put scented modelling clay in their mouth. 	<ul style="list-style-type: none"> ✓ Do not expose children to dusts and clay in dry form. ✓ Only use modelling clay made for children or a homemade clay recipe suitable for children. ✓ Do not cast body parts or apply directly to the skin. ✓ Learn everything there is to know about your technique and always read and follow labels. ✓ Ensure there is active supervision at all times.

4.2 Secondary School Students and Adults

Art is a common hobby for adults of all ages. Many secondary school programs have arts classes as part of their curriculum. There are also a number of other institutions teaching art to adults at night or on the weekends. **Art Safety is important at any age and you should always make sure to work as safely as possible.** Always learn as much as you can about the technique and products you will be using by reading labels and researching. In addition to the potential physical risks associated with some art techniques, there are many health risks from exposure connected to art products, so always be aware. Keep in mind that art safety includes protecting the teacher, student and recipient of the finished product.

When teaching art, you need to pass on safe habits to your students and lead by example. Working safely and using safe products will enable you and your students to have an enjoyable experience.



Some points to keep in mind:

- Read the labels carefully when buying art supplies.
- Before starting a project, learn everything you can about the products and techniques you will be using by doing research from books and the Internet.
- Find out if there are safer alternatives to certain products you will be using (such as solvents).
- Ensure your work area is properly ventilated for what you are doing.
- Practice good housekeeping by keeping your work area free from clutter.
- Ensure items are stored in appropriate containers (ideally in the original containers with original labels) in a designated location and kept out of sight and out of reach of children.
- Wear appropriate personal protective equipment when necessary.
- Know what to do in case of an emergency and have an emergency number close by.
- Inform someone of your activities, if you will be working alone.
- Always thoroughly wash your hands after completing any art activity.
- Take the appropriate precautionary measures outlined in the *Primary and Middle School Children* section of this booklet if you will be working with children, or if you are pregnant or nursing.

4.2.1 Various Products and Safety: Commonly Used Ingredients and Applications for Adults' Art

Commonly Used Ingredients

Many of these commonly used ingredients in arts materials could have health effects for you and your students. It is important to know as much as possible about the products you are using, including how to use them safely.

Take a moment to read the following before undertaking any art project:

Ingredient	Hazard	Safe Use	Substitutions
<p>Adhesives An adhesive is a substance that allows two or more surfaces to be bonded or stuck to one another. Common adhesives include tapes, sprays, glues, and pastes.</p>	<ul style="list-style-type: none"> They can cause skin irritation, some are respiratory irritants and eye irritants. 	<ul style="list-style-type: none"> ✓ Read and follow labels. ✓ Always use good ventilation. ✓ Be careful when using fast acting “super” glues or glues based on organic solvents. 	Use water based glues and pastes, whenever possible.
<p>Pigments Pigments are colouring agents that can be made from many different materials including plants, artificial dyes, animal extracts and minerals. When these are ground up finely and mixed with a solvent they make paint.</p>	<ul style="list-style-type: none"> They can be dangerous in their powder form if inhaled. Lead, chromates, cadmium or arsenic may be present and could be harmful. 	<ul style="list-style-type: none"> ✓ Read and follow labels. ✓ Always avoid mouthing and skin contact. ✓ If pigment must be used, wear proper personal protective equipment. The greatest concern arises if pigments are swallowed or if their dusts are inhaled. 	Use pre-mixed paints and dyes.
<p>Solvents A solvent is a substance, usually a liquid, in which other substances are dissolved. It is commonly used for cleaning, thinning and mixing art products. One of the most common, most useful solvents is water.</p>	<ul style="list-style-type: none"> Solvents (other than water) can be poisonous if swallowed or inhaled in sufficient quantity. They could cause dermatitis after sufficient skin contact and can irritate and damage the skin, eyes and respiratory tract. 	<ul style="list-style-type: none"> ✓ Read and follow labels. ✓ Ensure there is proper ventilation. 	Use water-based or less toxic solutions.

Ingredient	Hazard	Safe Use	Substitutions
<p>Corrosives A corrosive is a substance that burns away materials or skin by chemical reaction. This can be an acid or a base such as chlorine bleach, ammonia, hydrogen peroxide, hydrofluoric acid (for etching) and photographic chemicals.</p>	<ul style="list-style-type: none"> • They damage tissue on contact. • When highly concentrated, they can cause severe, permanent injury to skin tissue. • When concentrated, they can give off vapours which can damage respiratory tissues. • Do not mix corrosives unless you are aware of the reactions and take the appropriate precautions. • When acids and bases are mixed, this can cause harmful fumes or even explosions. 	<ul style="list-style-type: none"> ✓ Read and follow labels. ✓ Use the smallest amount necessary. ✓ Avoid direct contact with skin. ✓ Use in well ventilated area. 	<p>Replace highly concentrated corrosives with more dilute solutions.</p>
<p>Aerosols A product that uses compressed gas to spray the coating from its container. For example fixatives, spray paint or adhesives.</p>	<ul style="list-style-type: none"> • Small particles from aerosols can penetrate and remain in the respiratory tract if inhaled. • Aerosols may remain in the air for long periods of time. • Aerosols are highly flammable. 	<ul style="list-style-type: none"> ✓ Only use in short bursts. ✓ Make sure to use in a well ventilated area. ✓ Do not use near a flame. ✓ Keep away from children. ✓ Read and follow labels. 	<p>Use non-aerosol products.</p>



Commonly Used Applications

Although there are many different forms of art applications, the ones listed below are some of the most commonly used in school/hobby visual arts and crafts with adults. For more detailed information, please refer to the resources listed in *Appendix B: References*.

Technique	Hazard	Safe Use
<p>Ceramics</p> <p>Ceramics is the art of making objects of clay and firing them in a kiln. This includes earthenware and porcelain, as well as sculpture. Enamelling is also a ceramic technique.</p>	<ul style="list-style-type: none"> • Clay—inhaling of silica dust from dry clay. • Glaze—may contain toxic metals such as lead, barium and lithium. • When pottery is fired, the clay or glaze can release gases or vapours (such as carbon monoxide or metal fumes) which can be poisonous or damaging to the lungs. 	<ul style="list-style-type: none"> ✓ Clay—housekeeping (wet mop or vacuum with HEPA filter). ✓ Wear personal protective equipment such as mask and gloves. ✓ Avoid any lead and cadmium containing glazes (especially when making something that will be used for food or drink). ✓ Glaze—look for glazes that are labelled “lead-free”. ✓ Use pre-mixed glazes whenever possible. ✓ Glaze and fire pottery only if you have a kiln with exterior exhaust ventilation. ✓ Learn everything there is to know about your technique and always read and follow labels. ✓ Be careful not to eat/drink in your work area.
<p>Drawing</p> <p>Drawing is a visual art which makes use of any number of drawing instruments to mark a two-dimensional medium. Common instruments include graphite pencils, pen and ink, inked brushes, colour pencils, crayons, charcoals, chalk, pastels and markers.</p>	<ul style="list-style-type: none"> • In general, the materials often used in drawing, such as crayon, charcoal, chalk and ordinary pencil pose no health risks to students or teachers. • Many permanent markers use solvents. 	<ul style="list-style-type: none"> ✓ Make sure, whenever possible, to use non-toxic, water based materials. ✓ Learn everything there is to know about your technique and always read and follow labels.
<p>Etching</p> <p>Etching is a process in which a metal plate is marked by exposing it to the corrosive action of an acid.</p>	<ul style="list-style-type: none"> • Contact with the acid is the main hazard, especially when preparing acid etching solutions. • Fumes emanating from the procedure could be irritating to some. • Effects might not be immediate. Pain is not indicator. 	<ul style="list-style-type: none"> ✓ Protective gloves, clothing and goggles must be worn. ✓ Good ventilation is needed. ✓ Use more viscous solutions. ✓ Learn everything there is to know about your technique and always read and follow labels.

Technique	Hazard	Safe Use
<p>Metal Work</p> <p>Metal work is shaping metal into different forms varying from intricate jewellery work to large scale structures. The process may include welding, soldering, grinding and polishing.</p>	<ul style="list-style-type: none"> • Inhalation of toxic and metal fumes and dust can be irritating to eyes, nose and throat. • Chemicals used could cause skin, ear, eye, nose and throat irritation. • Chemical burns can occur from exposure to soldering products. • Melted lead can release hazardous fumes. • Avoid using lead if making children's jewellery. 	<ul style="list-style-type: none"> ✓ Protective gloves, clothing and goggles must be worn. ✓ Good ventilation is needed. ✓ Learn everything there is to know about your technique and always read and follow labels.
<p>Painting</p> <p>Painting is the process by which colour is applied to a surface.</p>	<ul style="list-style-type: none"> • Many paints contain traces of preservatives that could be harmful if large amounts of paint are swallowed. • Artists' paints for adult use can contain a variety of harmful chemicals. • Oil paints contain thinners such as turpentine that can be irritating to the skin and harmful if swallowed or inhaled. • Techniques that produce mists such as air brush or aerosol can produce irritants. 	<ul style="list-style-type: none"> ✓ Whenever possible, use water based, non-toxic paint. ✓ Good ventilation is needed. ✓ Wash hands after finished. ✓ Use non-toxic clean-up materials. ✓ Keep paint and brushes out of mouth. Moisten brush with paper towel or cloth dipped in water. (Never moisten brush with lips or tongue) ✓ Paints containing certain chemicals should not be used by children or pregnant women. ✓ Learn everything there is to know about your technique and always read and follow labels.
<p>Photo Processing</p> <p>A photograph is made with a camera by exposing film to light in order to create a negative. The negative is then used in a darkroom to print the photograph (positive) onto light-sensitive paper.</p>	<ul style="list-style-type: none"> • Chemicals used as developers can be highly toxic; effects may include skin, eye and respiratory tract irritation and sensitization. • Poor ventilation in darkrooms could cause respiratory problems, headaches, dizziness and nausea. 	<ul style="list-style-type: none"> ✓ Protective gloves, clothing and goggles must be worn. ✓ Good ventilation is needed. ✓ Always use the least hazardous materials you can work with. ✓ Follow all safety instructions on the package. ✓ Buy pre-mixed solutions rather than mixing chemicals yourself. ✓ Make the darkroom inaccessible to young children. ✓ Learn everything there is to know about your technique and always read and follow labels.

Technique	Hazard	Safe Use
<p>Printmaking</p> <p>Printmaking is the process by which a work of art can be recreated in quantity from a single image usually prepared from a plate. This includes screen printing, lithography, intaglio, relief and photo-print techniques. A printmaking ink consists of pigments, which give the ink its colour, vehicles (the liquid—such as water or mineral spirits—in which the pigment is suspended) and modifiers, added to an ink to change its stickiness, its thickness, or the rate at which it dries.</p>	<ul style="list-style-type: none"> • Solvent based inks are typically used and might contain lead, chromate or cadmium or other toxic metals. • See section on Etching, Metal Work and Woodworking for more information on potential hazards and how to protect yourself. 	<ul style="list-style-type: none"> ✓ Protective gloves, clothing and goggles must be worn. ✓ Good ventilation is needed. ✓ Avoid skin contact. ✓ Use water-based inks and glues whenever possible. ✓ Learn everything there is to know about your technique and always read and follow labels.
<p>Sculpture</p> <p>Sculpture is creating a three-dimensional work of art using stone, plaster, wax, plastic or wood that is carved, modelled or cast.</p>	<ul style="list-style-type: none"> • Inhalation of dust can be highly toxic and irritating. • Irritation to eyes and respiratory system. • Plastic sculpture could involve work with toxic monomers. • Heated plastic can release toxic gases. • See also Metal Work for more information on potential hazards and how to protect yourself. 	<ul style="list-style-type: none"> ✓ Protective gloves, clothing and goggles must be worn. ✓ Good ventilation is needed. ✓ If working with wax, keep it at the lowest workable temperature. ✓ Clean dust by wet mop. ✓ Always read instructions carefully. ✓ Learn everything there is to know about your technique and always read and follow labels.
<p>Stained Glass</p> <p>Stained glass techniques involve assembling pieces of coloured glass and setting them in lead comes to form a picture or pattern.</p>	<ul style="list-style-type: none"> • The main potential hazards occur when the pieces are joined (lead comes, soldered copper foil and epoxy adhesives). • Lead and other toxic vapour poisoning from inhalation of fumes as well as skin contact (hands to mouth). • Glass grinders create powdered glass that can be inhaled. 	<ul style="list-style-type: none"> ✓ Protective gloves, clothing and goggles must be worn. ✓ Good ventilation is needed. ✓ Use lead-free solders such as silver, tin, copper and zinc. ✓ Use less toxic fluxes. ✓ Keep fingers out of your mouth. ✓ Learn everything there is to know about your technique and always read and follow labels.

Technique	Hazard	Safe Use
<p>Textile Arts Textile arts are techniques that use plant, animal, or synthetic fibres to create a pattern or decorative objects. This includes batik (involves using heated wax), tie dying, stripping and bleaching.</p>	<ul style="list-style-type: none"> • There are potential hazards to the skin and respiratory from the fabric, dyes and mordants. • Certain dyes may be irritating or hazardous if their dusts are inhaled, or if they are swallowed or get on the skin. • If using wax and it is overheated, it could cause fumes that are irritating as it could burn the skin. 	<ul style="list-style-type: none"> ✓ Protective gloves, clothing and goggles must be worn. ✓ Good ventilation is needed. ✓ Whenever possible, buy pre-mixed dyes. ✓ Avoid procedures that raise dust or mist. ✓ Use the lowest possible temperatures to melt wax (for batik). ✓ Learn everything there is to know about your technique and always read and follow labels.
<p>Woodworking Woodworking is building, carving, making an object out of wood or refinishing existing pieces.</p>	<ul style="list-style-type: none"> • Dust may cause skin or respiratory irritation. • Glues and adhesives, paint removers and paint strippers may cause respiratory irritation. • Some woods can release toxic compounds. 	<ul style="list-style-type: none"> ✓ Protective gloves, clothing and goggles must be worn. ✓ Good ventilation is needed. ✓ Use dust collectors for machines. ✓ Practice good housekeeping by keeping your work area free of debris. ✓ Research the type of wood you will be using. ✓ Learn everything there is to know about your technique and always read and follow labels.



Appendix A: Legislation

The Canada Consumer Product Safety Act (CCPSA) is to protect the public by addressing or preventing dangers to human health or safety that are posed by consumer products in Canada. The Act replaces Part I and Schedule I of the *Hazardous Products Act*.

The *Canada Consumer Product Safety Act* contains rules prohibiting or regulating the manufacturing, sale, advertising or import of products that are, or are likely to be, a danger to human health or safety of the user.

For more information, visit www.healthcanada.gc.ca/cps or contact Consumer Product Safety, Health Canada toll-free at 1-866-662-0666 or by email at CPS-SPC@hc-sc.gc.ca

The *Canada Consumer Product Safety Act* and all associated Regulations can be found at <http://laws-lois.justice.gc.ca/eng/acts/C-1.68/index.html>

Appendix B: References

Art and Creative Materials Institute (ACMI): <http://www.acminet.org/index.htm>

Canadian Child Care Federation. *Resource Sheet #21: Safety in the Arts*.
http://www.cccf-fcsge.ca/docs/cccf/rs021_en.htm

Health Canada. *Art Teacher, Be Aware* (out of print).

Health Canada: Consumer Product Safety Public Education Bulletin. *Aim For Safety, Target the Label*.
<http://hc-sc.gc.ca/cps-spc/pubs/cons/label-letiquette-eng.php>

Health Canada. *It's Your Health: Safe Use of Arts and Crafts Materials*. <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/arts-eng.php>

McCann, Michael and Angela Babin. *Health Hazards Manual for Artists*. 6th Edition, The Lyons Press: Guilford, 2008.

Rossol, Monona. *The Artist's Complete Health and Safety Guide*. Allworth Press: New York, 2001.