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MATERIAL HEALTH OVERVIEW

The documents included here introduce the issue of synthetic chemicals in the interior environment and should help you communicate to students how they impact human health. Use this as a reference to develop assignments and class exercises.



**For many of us our interior
environments are where we
spend most of our time**

We are the first generation to spend 90% of our time indoors.*

*US Environmental Protection Agency



Indoor air may be
3-5 x
more contaminated
than outdoor air



Healthy Materials Lab, 2019

THE BODY BURDEN

167

chemicals found in 9 adult bodies

76

are linked
to **cancer**

86

are known
**endocrine
disruptors**

79

can cause **birth
defects &
developmental
delays**

BodyBurden: The Pollution in People, Environmental Working Group



Healthy Materials Lab, 2019

HARMFUL CHEMICALS IN THE HOME

ARE YOU IN-THE-KNOW?

Are you aware of all the potentially harmful toxins and chemicals hidden in everyday objects at home? You might be surprised to learn that common objects such as plastics, produce, and even some paper products can have properties that disrupt hormone balance, compromise your immune system, or even lead to cancer. Take a look at some of the leading offenders and learn how to avoid them.

PHTHALATES

EFFECTS:

- CAN DAMAGE REPRODUCTIVE SYSTEM
- LINKED TO DECREASE IN SPERM COUNT
- INCREASED RISK OF DIABETES
- TIED TO EARLY PUBERTY IN GIRLS

HOW TO AVOID:

- AVOID PVC PLASTICS AND PLASTICS MARKED WITH RECYCLING LABEL #3
- KEEP CLEAR OF PRODUCTS THAT HAVE "ADDED FRAGRANCE" ON THE LABEL
- EAT MORE ORGANIC FRUIT AND VEG

LEAD

EFFECTS:

- CAN LOWER IQ AND LEAD TO BRAIN DAMAGE
- CAN CAUSE HEARING AND VISION IMPAIRMENT
- CAN DISRUPT HORMONAL DEVELOPMENT IN FETUSES AND PREMATURE BIRTH
- CAN LOWER SPERM COUNT

HOW TO AVOID:

- AVOID OLD PAINT THAT IS CHIPPED OR CRUMBING
- INVEST IN A GOOD WATER FILTER
- DON'T WEAR OUTDOOR SHOES INDOORS TO AVOID LEAD FOUND IN SOIL

PERFLUORINATED CHEMICALS

EFFECTS:

- RELATED TO BREAST CANCER
- CAN DISRUPT SEX HORMONE LEVELS AND SPERM COUNT
- CAN HARM THE IMMUNE SYSTEM
- CAN CAUSE KIDNEY PROBLEMS

HOW TO AVOID:

- COOK WITH CERAMICS AND GLASSWARE INSTEAD OF NON-STICK PANS
- FIND OUT IF THERE ARE PFCS IN STAIN-RESISTANT CARPETS, CLEANING PRODUCTS AND COOKWARE

ORGANOPHOSPHATE PESTICIDES

EFFECTS:

- LINKED TO PARKINSON'S DISEASE
- TIED WITH NEUROTOXIC EFFECTS
- CAN CAUSE DECREASES IN MALE TESTOSTERONE
- LINKED WITH A VARIETY OF CANCERS

HOW TO AVOID:

- EAT MORE ORGANIC PRODUCE
- ENSURE PRODUCE IS THOROUGHLY WASHED BEFORE CONSUMPTION
- REMOVE OUTER LEAVES OF VEG SUCH AS LETTUCE TO AVOID CONTACT WITH PESTICIDE RESIDUE

BPA (BISPHENOL A)

EFFECTS:

- CAN DISRUPT HORMONAL DEVELOPMENT IN FETUSES
- CAN INCREASE RISK OF BREAST CANCER
- LINKED TO OBESITY AND HEART DISEASE

HOW TO AVOID:

- TRY TO AVOID RECEIPTS AND GO DIGITAL INSTEAD
- CUT DOWN ON PLASTIC MARKED WITH RECYCLING LABEL #7
- OPT FOR FRESH FOOD OVER CANS.

DIOXIN

EFFECTS:

- STUDIES SUGGEST IT CAN LOWER SPERM QUALITY
- CAN DAMAGE THE IMMUNE SYSTEM
- CAN DAMAGE THE REPRODUCTIVE SYSTEM

HOW TO AVOID:

- CUT DOWN ON ANIMAL PRODUCTS AND EAT MORE ORGANIC FRUIT AND VEG
- TRY TO AVOID CHLORINE-BASED BLEACH
- AVOID BLEACHED PAPER IN PRODUCTS LIKE DISPOSABLE DIAPERS AND TOILET PAPER

FLAME RETARDANTS

EFFECTS:

- LINKED TO THYROID HORMONES DISRUPTION
- LINKED WITH AUTISTIC SYMPTOMS
- CAN LOWER SPERM COUNT

HOW TO AVOID:

- USE VACUUMS CLEANERS THAT INCLUDE A HEPA FILTER
- USE FACE MASKS WHEN CLEANING CARPETS
- AVOID REUPHOLSTERING YOUR FOAM FURNITURE

SOURCES & CITING

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www.bodylogicmd.com

Body Logic MD, 2014

THE NEW SCHOOL
PARSONS
 HEALTHY
 MATERIALS LAB

Take Action to Improve Air Quality in Every Room

Asthma is a serious, sometimes life-threatening respiratory disease that affects the quality of life for millions of Americans.

Environmental asthma triggers: are found around the home and can be eliminated with simple steps.

- Don't allow smoking in your home or car.
- Dust and clean your home regularly.
- Clean up mold and fix water leaks.
- Wash sheets and blankets weekly in hot water.
- Use allergen-proof mattress and pillow covers.
- Keep pets out of the bedroom and off soft furniture.
- Control pests—close up cracks and crevices and seal leaks; don't leave food out.

Children are especially sensitive to secondhand smoke, which can trigger asthma and other respiratory illnesses.

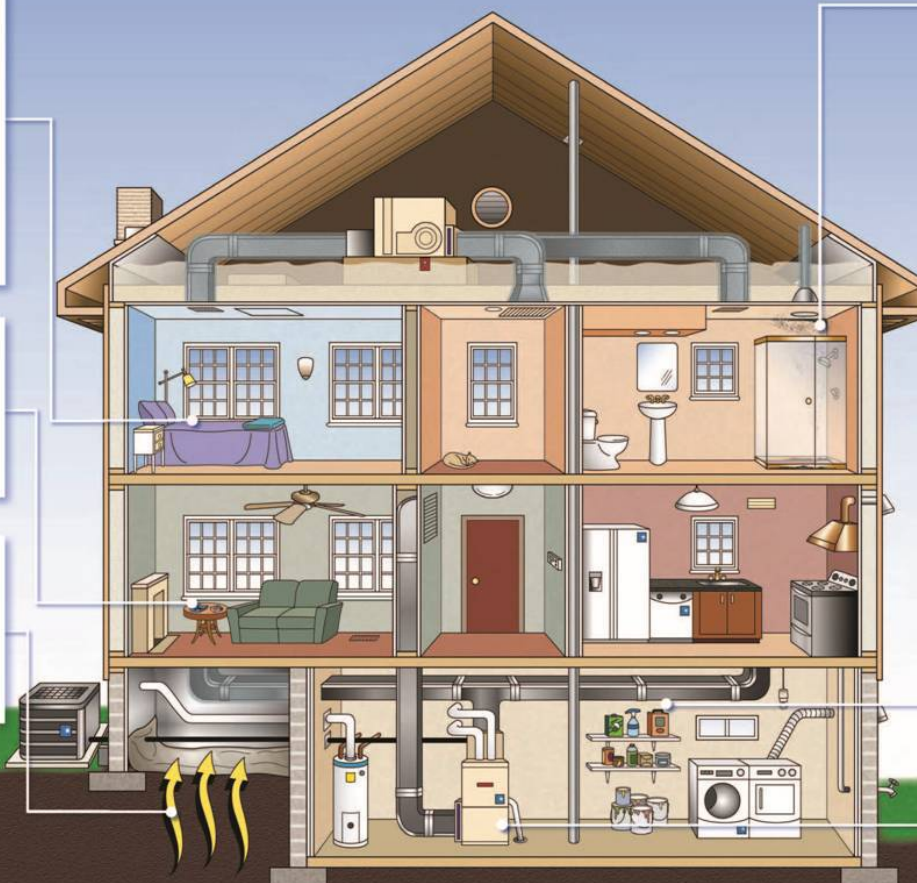
Secondhand smoke: smoke comes from burning tobacco products such as cigarettes, pipes, and cigars.

- To help protect children from secondhand smoke, do not smoke or allow others to smoke inside your home or car.

Radon is the second leading cause of lung cancer.

Radon gas: enters your home through cracks and openings in floors and walls in contact with the ground.

- Test your home with a do-it-yourself radon kit. If the test result indicates you should fix, call a qualified radon mitigation specialist.
- Ask your builder about including radon-reducing features in your new home at the time of construction.



Mold can lead to allergic reactions, asthma, and other respiratory ailments.

Mold: can grow anywhere there is moisture in a house.

- The key to mold control is moisture control.
- If mold is a problem in your home, you should clean up the mold promptly and fix the water problem.
- It is important to dry water-damaged areas and items within 24-48 hours to prevent mold growth.

VOCs cause eye, nose, and throat irritation, headaches, nausea, and can damage the liver, kidney, and central nervous system.

Volatile organic compounds (VOCs): are chemicals that evaporate at room temperature. VOCs are emitted by a wide array of products used in homes including paints and lacquers, paint strippers, varnishes, cleaning supplies, air fresheners, pesticides, building materials, and furnishings. VOCs are released from products into the home both during use and while stored.

- Read and follow all directions and warnings on common household products.
- Make sure there is plenty of fresh air and ventilation (e.g., opening windows and using extra fans) when painting, remodeling, or using other products that may release VOCs.
- Never mix products, such as household cleaners, unless directed to do so on the label.
- Store household products that contain chemicals according to manufacturers' instructions.
- Keep all products away from children!

Carbon monoxide causes headaches, dizziness, disorientation, nausea and fatigue, and high levels can be fatal.

Nitrogen dioxide causes eyes, nose, and throat irritation, impairs lung function, and increases respiratory infections.

Sources include: indoor use of furnaces, gas stoves, unvented kerosene and gas space heaters, leaking chimneys, and tobacco products.

- Ventilate rooms where fuel-burning appliances are used.
- Use appliances that vent to the outside whenever possible.
- Ensure that all fuel-burning appliances are properly installed, used, adjusted, and maintained.

Visit www.epa.gov/iaq

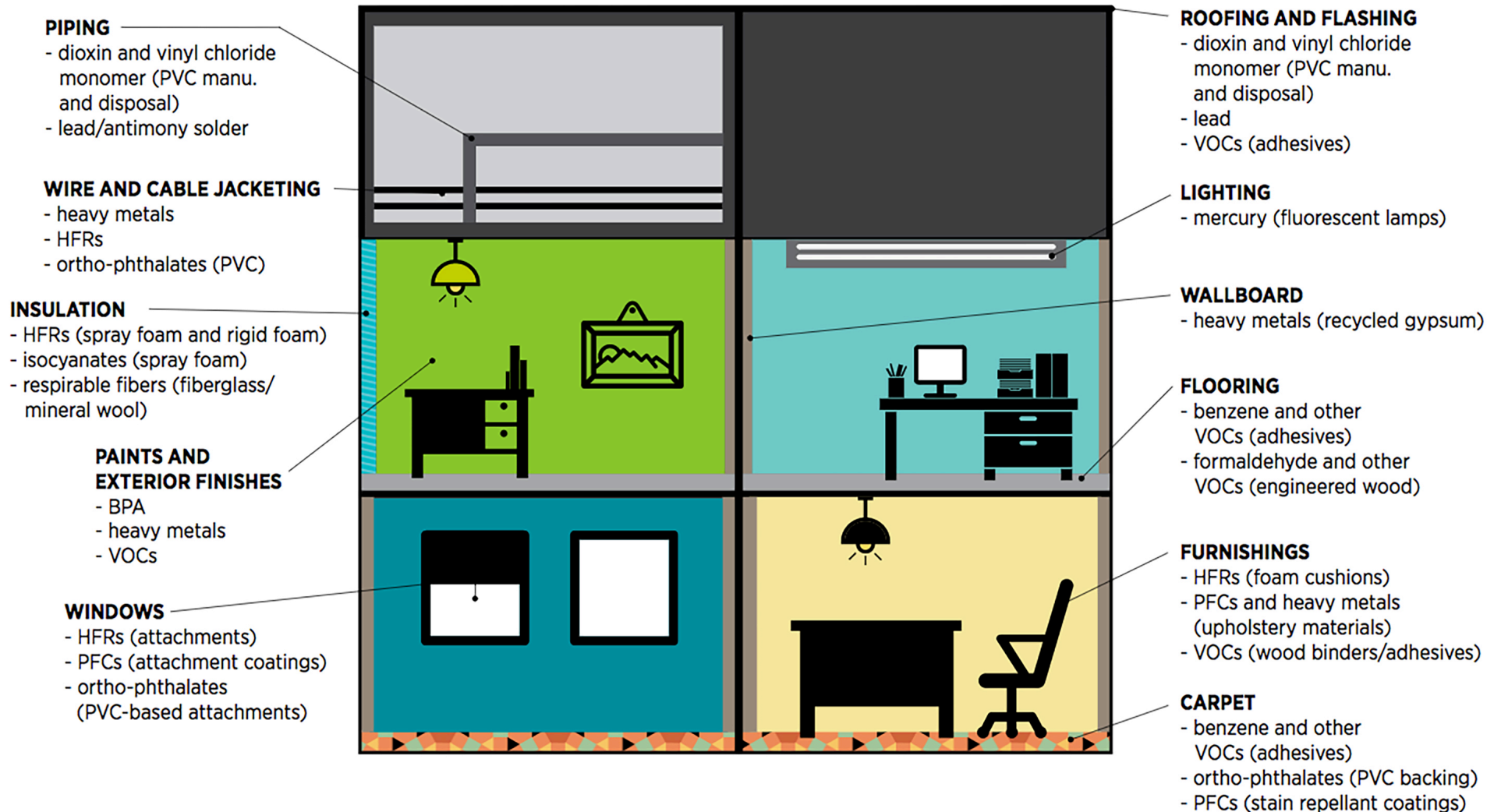


Figure 2-5. Examples of building material ingredients and byproducts that may be harmful during one or multiple stages of the materials life cycle
 A typical structure can contain many substances that pose a hazard during the manufacturing phase, use phase, or other stage of the life cycle. Building professionals should be aware of these, and other examples, and evaluate trade-offs between alternative materials.

Conducting an IAQ investigation

- Treat IAQ concerns seriously and promptly.
- Collect health complaint data using a questionnaire specific for your workplace. You may need assistance from an expert.
- Look for patterns.
- Meet affected people to clarify your findings.
- Check the heating, ventilating and air-conditioning (HVAC) system with the building operator/engineer.



Indoor Air Quality

Take a preventative approach to IAQ



- Provide an adequate volume of outdoor air
- Ensure that air is properly distributed
- Prevent outdoor pollutants from entering the building
- Provide separate ventilation for special-use areas
- Promote the use of unscented products
- Choose building materials, paints and furniture with low emissions
- Discourage mould growth
- Follow standards and best practices for your building's ventilation, thermal comfort, and pollutant control



Symptoms

Dryness and irritation of the eyes, nose, throat, and skin
 Headache
 Fatigue
 Shortness of breath
 Hypersensitivity and allergies
 Sinus congestion
 Coughing and sneezing
 Dizziness
 Nausea

People generally notice their symptoms after several hours at work and feel better after they have been away from the building.

IAQ issues

Common Causes

- Lack of outdoor air for HVAC system
- Poorly designed or maintained HVAC system
- Pollutants from the outdoor air
- Emissions from inside sources
- Poor temperature and humidity control

Sources

Building occupants



Carbon dioxide, tobacco smoke, perfume, body odours

Building materials



Dust, fibreglass, asbestos, gases

Carpets, fabric, foam chair cushions



Dust mites

Off-gas emissions furniture, carpets, paints, workplace cleaners, solvents, pesticides, disinfectants and glues



Gases, vapours, odours, volatile organic compounds (VOCs)

Damp areas, stagnant water and condensate pans



Microbial contaminants, fungi, moulds, bacteria

Photocopiers, electric motors, electrostatic air cleaners



Ozone



What the law says: All jurisdictions include the 'general duty clause' which requires employers to provide a healthy and safe workplace. This includes the provision of healthy indoor air. In addition, IAQ is implied in most building codes as design and operation criteria.

CCOHS.ca
 Canadian Centre for Occupational Health and Safety