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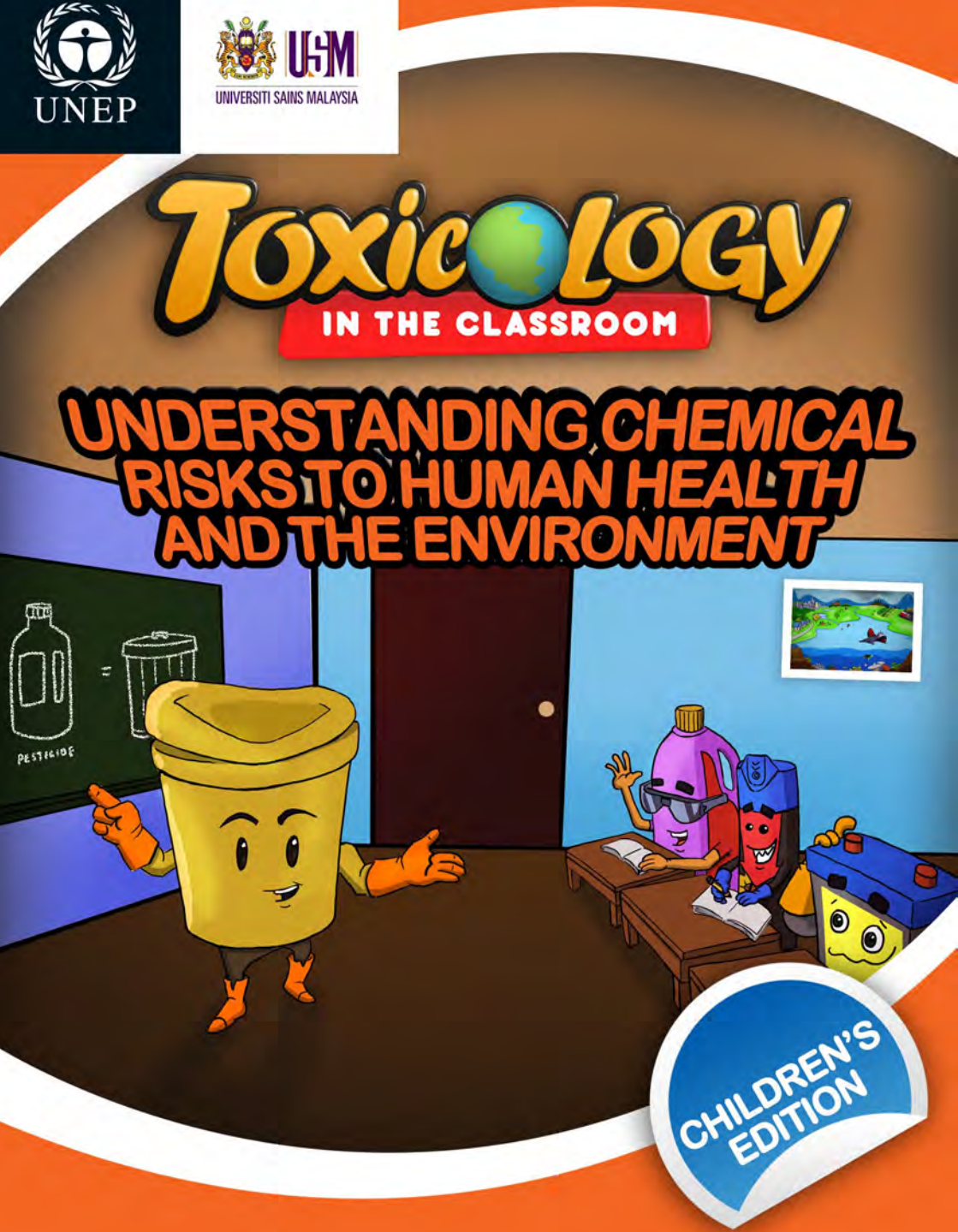
Toxicology
IN THE CLASSROOM

UNDERSTANDING CHEMICAL RISKS TO HUMAN HEALTH AND THE ENVIRONMENT



CHILDREN'S EDITION

TOXICOLOGY IN THE CLASSROOM

UNDERSTANDING CHEMICAL RISKS TO HUMAN HEALTH AND THE ENVIRONMENT

CHILDREN'S VERSION

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Introduction

Infants and children are affected more by pesticides and other harmful chemicals because their bodies are still growing and developing. They also face greater exposure compared to adults because of their hand-to-mouth behavior. Children living in farming areas or whose parents are involved in agricultural activities are also at greater risk to pesticide exposure than children in other environment.

It is therefore important for children to be educated and informed on the harmful effects of pesticides and other hazardous chemicals so they learn from young age to protect themselves, their siblings and the environment.

Although some chemical uses are necessary, e.g. in agriculture and for domestic purposes, exposure to its harmful effects can be minimized or controlled with correct usage, proper handling and storage.

Objective

The project aims to raise awareness and educate young schoolchildren on the adverse effects of hazardous chemicals. This book aims to provide basic understanding of chemical risks. It is illustrated with easy-to-understand text, pictures and prompt questions to help young schoolchildren have a better knowledge of the harmful effects of toxic chemicals and how to deal with them. Children are encouraged to use this knowledge to learn to protect themselves, their families and the environment from the dangers of toxic chemicals.

Who developed the tool?

This book is developed by the United Nations Environmental Programme (UNEP) and the National Poison Centre of Universiti Sains Malaysia (NPS-USM). It is developed following the recommendations made from the testing of the Toxicology in the Classroom for teacher's version in Malaysia, Argentina and Ghana.

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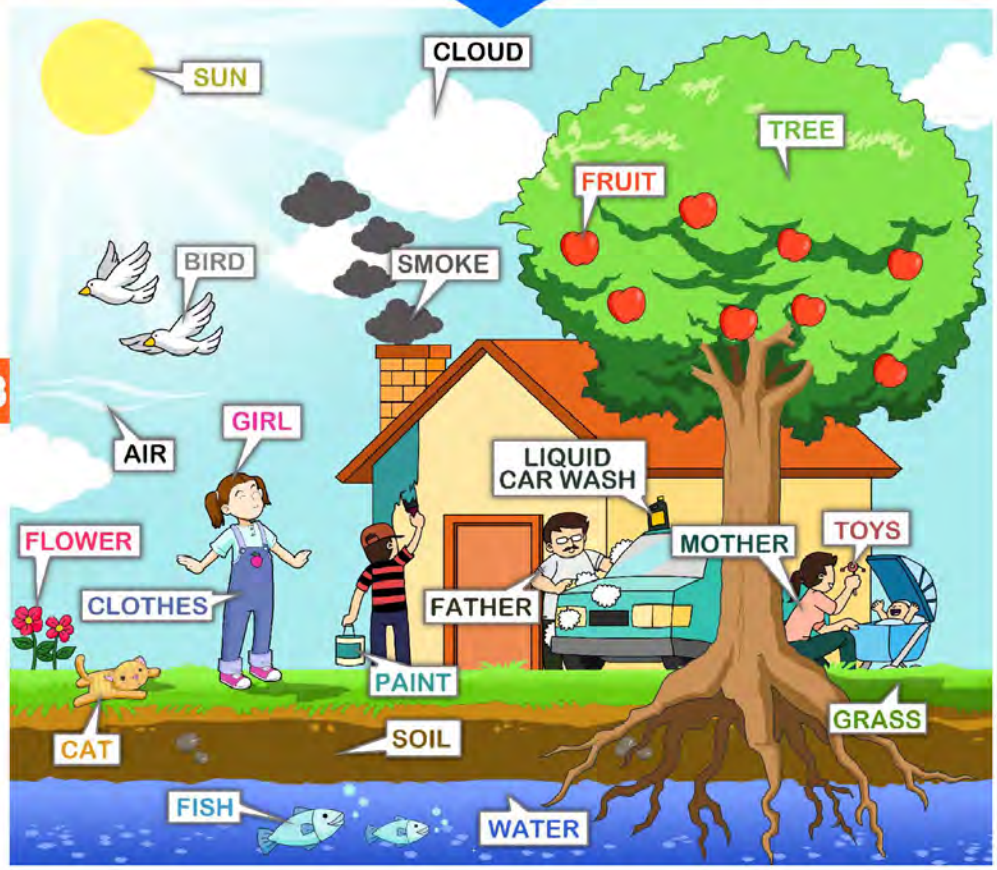
CONTENT

1 What are chemicals?

Chemicals around us

Do you know that all of us are made of chemicals ?



Everything is made of chemicals. Plants, animals, human, air, water, soil are made of chemicals. They use and pass chemicals from one to another.

Observe the pictures above and name all the things you see.

Can you identify the chemicals around you and their functions?

Liquid detergent and dye


Beauty products


Diaper and toys


Mother cooking vegetable with salt, oil on gas stove in the kitchen


Insecticide spray


Paint


Pesticide spray


Fire extinguisher


Milk bottle

Discuss with your friends more examples of chemicals around you and their functions.

2 What are Hazardous Chemicals?

Chemicals can be hazardous and toxic to both human and the environment.

Toxic chemicals can make you ill, pollute the water, air and soil, harm plants and animals through immediate contact or over time.

Some chemicals can explode, burn or react easily with other chemicals.

Other chemicals can stay in living things and cause harm to the body and pass to others.

Can you give examples of what chemicals can damage the environment.

How do we know which are the toxic ones?

1 Observation

Scientist observe people exposed to chemicals

2 Study and Examination

Scientist study the toxic effects of chemicals on lab animals, environment and people who are exposed to them.

3 Testing

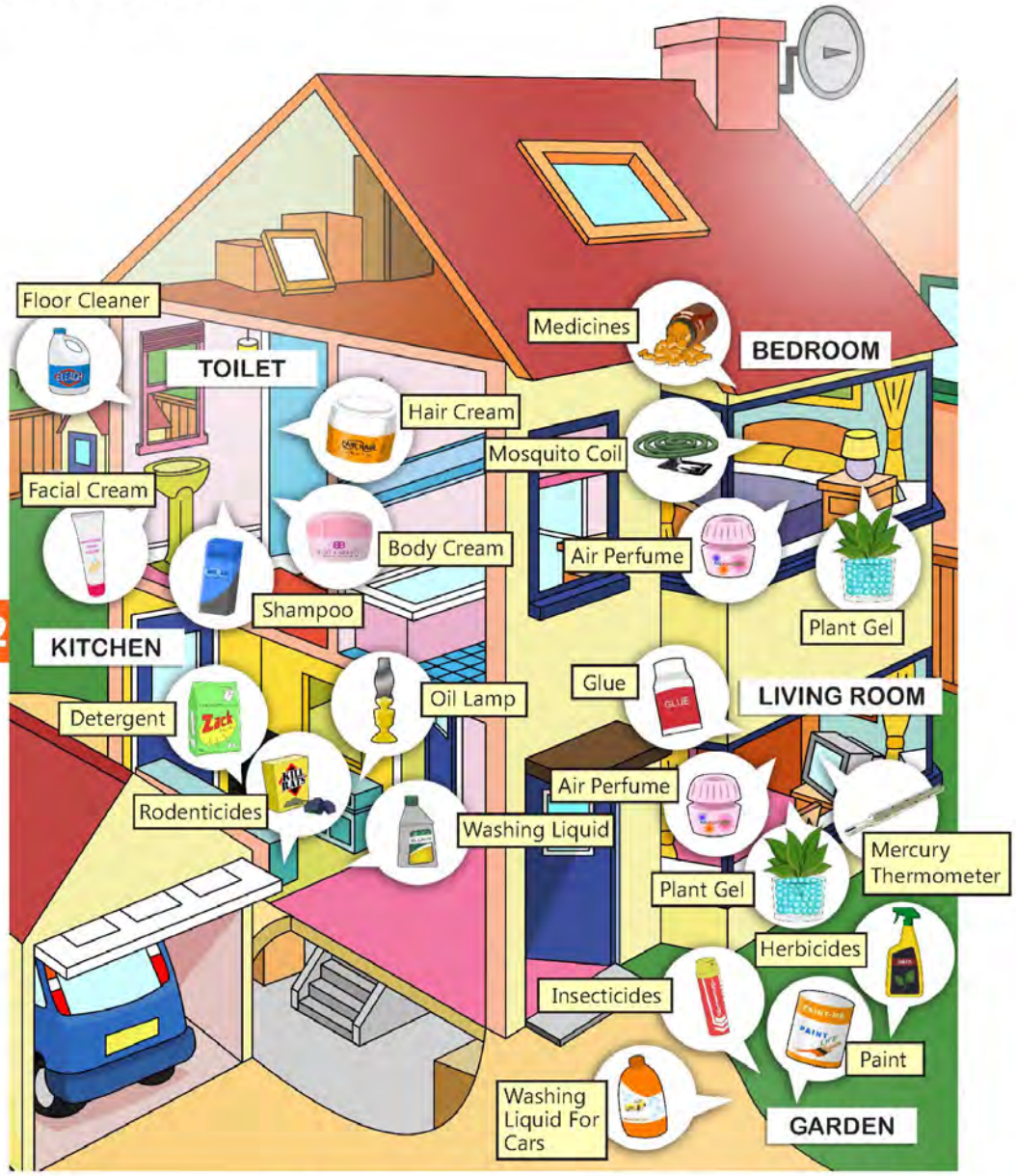
Scientist carry out tests to determine level of harmfulness or toxicity.

4 Labelling

Scientist classify and label chemicals based on their toxicity.

Have you noticed any of these labels on the chemicals containers in your home?

What chemicals should children and family members be worried about at home?



Can you name other chemicals found in your home?

What pesticides should children and family be worried about at home?

Pesticides are examples of toxic chemicals found in homes. We should use these pesticides with caution. These include:

- Rodenticides (poison for rats and mice)
- Insecticides (sprays and baits against cockroaches, termites, ants or moths)
- Shampoos to rid lice
- Insect repellents (mosquito repellent)
- Herbicides (weed killers)
- Fungicides (to prevent mould or mildew)
- Flea and tick shampoos, powders, and dips for pets

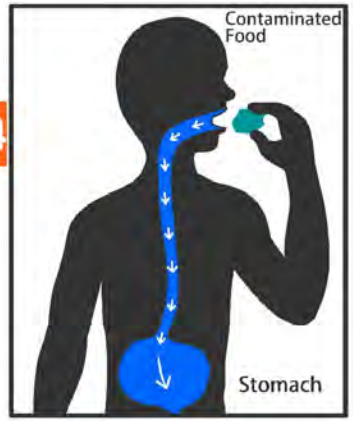
Pesticides used in gardens, farms and fields are often more dangerous than household pesticides and should not be used at home.

These chemicals should be used according to the instructions on the product label.

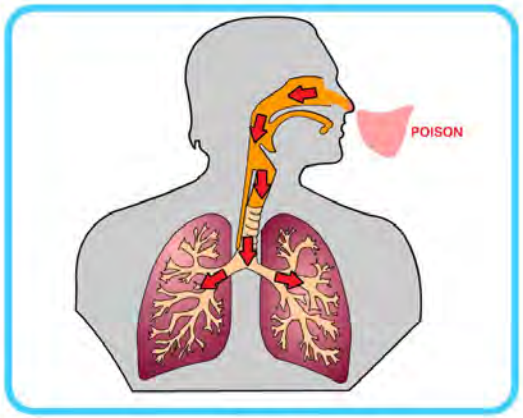
Ask your parents if they use any of the pesticides listed above.

3 What is Poisoning?

Poisoning occurs when a substance adversely interferes with normal body functions after it is ingested, inhaled, or absorbed.



Ingested



Inhaled

Discuss with your friends substances that may make you ill if they are ingested, inhaled, injected or absorbed.

What chemicals should children and family members be worried about at home?

Toxic Chemicals		Exposure and Effects	
Man-made chemical- Paint thinner			Dizzy after inhalation
Man-made chemical- Pesticides			Nausea and vomitting after inhalation
Natural chemical- Insects stings			Bites. Skin rashes, faint
Man-made chemical- Shampoos			Through absorption. Rashes
Natural chemical- Venom from snake			Bites. Muscle cramp
Natural chemical- Venom from Jellyfish bite			Bites. Muscle cramp
Man-made chemical- Medicines *(If not used as instructed, or by others and children by mistake)*			Ingestion. Reaction

Discuss with your friends substances that can make you ill if not used according to instructions.

4 What is Toxicology?

Do you know that:-

- All substances are poison
- The dose will determine whether it can cause poisoning or not.

Paracelsus

A well-known scientist who defined **POISON**.

What is Toxicology?

Studies about **POISONS** and their EFFECTS.

What does Toxic mean?

Substances that can make you sick or even cause death.

Nausea

Diarrhoea

Dizziness

Death

Vomiting

Illness

Weakness

Shivering

Have you ever experienced these symptoms? Share your experience with your parents or teachers.

What is Toxicity?

Toxicity is the ability of the chemical to cause poisoning.

The higher the toxicity, the more harmful or dangerous the chemical is.

DOSE: A large amount makes you ill

DOSE: A small amount makes you ill

Dose

Dose is the amount of chemical your body takes in. Dose determines toxicity.

Duration

Acute: short term/period

Acute Exposure: Single or short term exposure to a harmful substance (not lasting more than a day)

Acute Toxicity: The ability of the chemical to cause injury or instant illness or death, after short time exposure.

Many substances can lead to acute poisoning from a single exposure (one time contact). Other substances can cause poisoning after repeated exposures.

Discuss with your teachers or parents chemicals that are less toxic and very toxic found in your home.

Examples of an acute effect is getting drunk from alcohol.

Chronic: Long term/period
Chronic Exposure: Long term exposure
Chronic Toxicity: The ability of the chemical to cause injury or illness after exposure to small amounts for a long period of time.

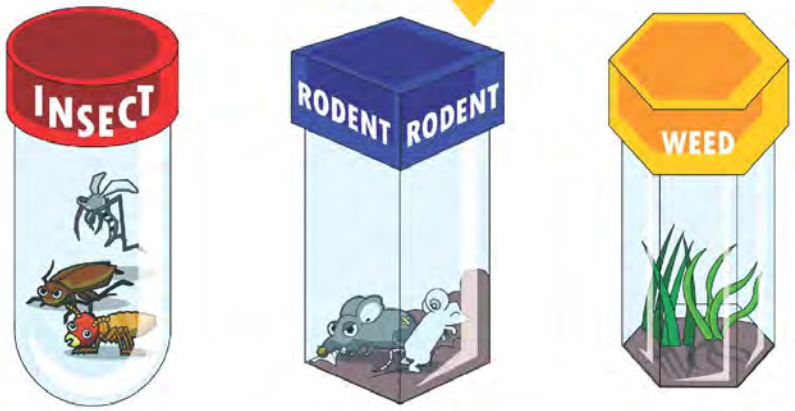
Excessive drinking of alcohol for long periods can cause chronic poisoning including cirrhosis (liver cells die), dementia (forgetfulness) in old age.

Discuss with your teachers or parents chemicals that will harm you immediately or over a long period of time.

5 What is a Pest?

Examples of pests:

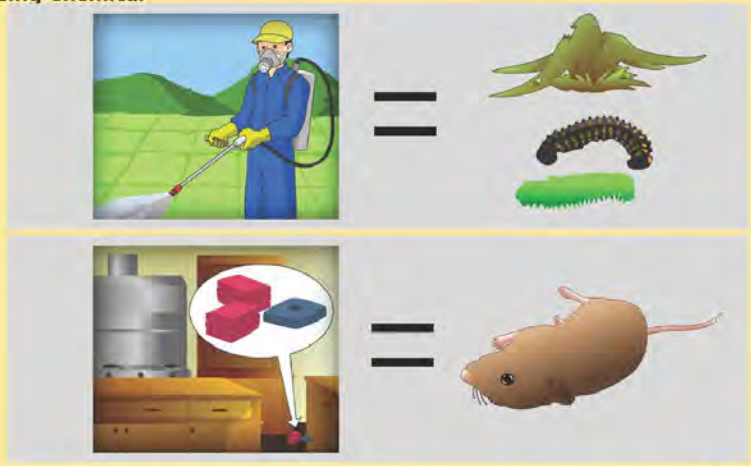
Pests are living things that can harm crops, humans and buildings.



How to manage pests

Pests can harm crops, animals, human and even buildings. Therefore we need to manage pests wisely. There are two ways to manage pests:

- **Using Chemical**



Explore your house and garden to search for pests.

Non-chemical methods.

Examples of non-chemical methods in or around the house:

Removing mosquito breeding places.

Proper disposal of food leftovers to discourage the presence of insects and rodents.

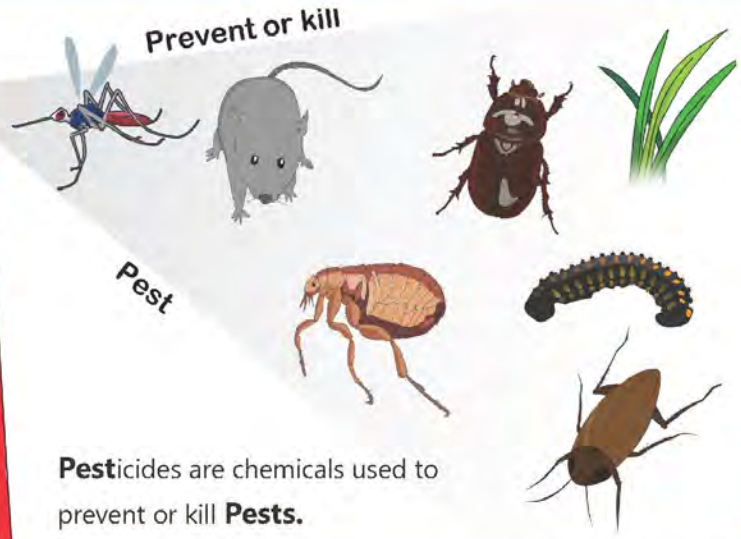
Filling up cracks in the walls to prevent insects and rodents from hosting.

RESPONSIBLE USE
IPM
ACCREDITED

The best way is to apply Integrated Pest Management (IPM) that combines the use of chemical and non-chemical methods.

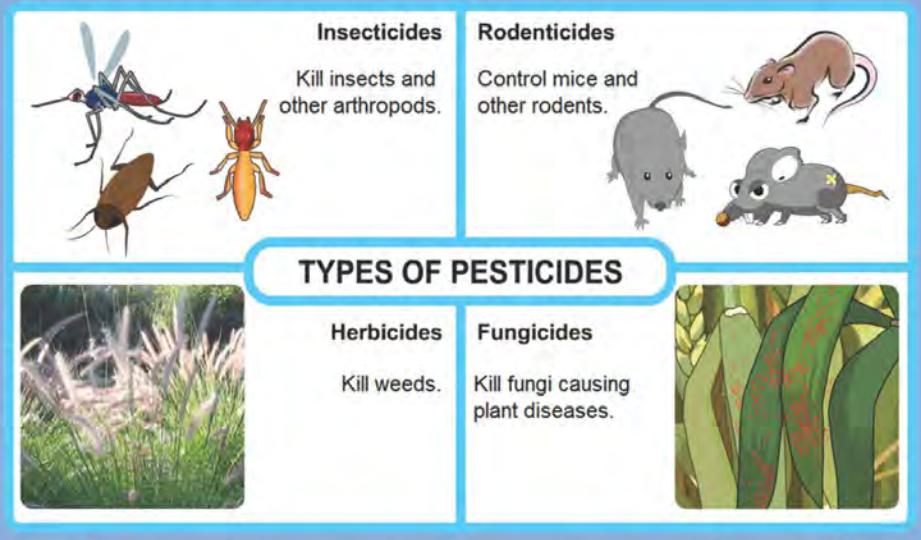
Discuss with your friends, parents or teachers more examples of non-chemical methods to avoid pests.

6 What is a Pesticide?



Pesticides are chemicals used to prevent or kill **Pests.**

Types of Pesticides



Discuss types of pesticides used by your parents in the house or farms.

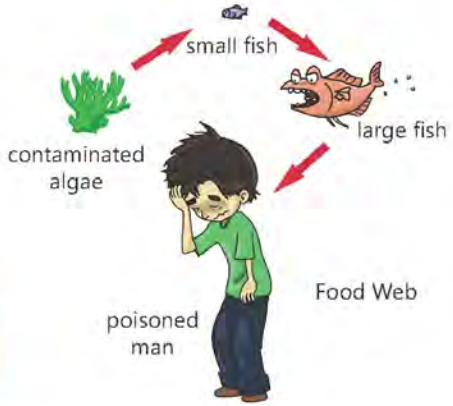
Some pesticides are POPs

POPs are **P**ersistent **O**rganic **P**ollutant**s**. Persistent means that the chemicals remain undamaged in the environment for long periods because they do not easily decay.

POPs

Persistent Organic Pollutants

POPs gradually build up in the body of living things, increase in amount through food webs, cause harmful effects on wildlife and cause a risk for human health.



Affected wild life

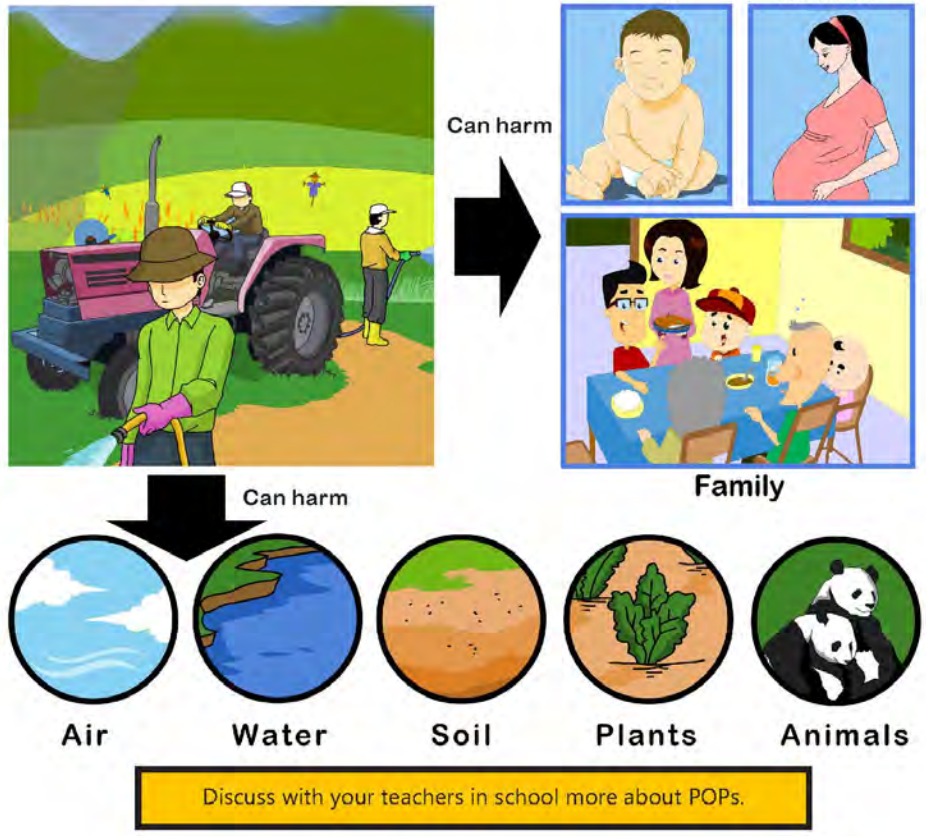
POPs in fish travel far from where the chemicals has been used. For example, POPs have been found in the blood of Inuit people in the Artic where such chemicals have never been used.

An example of POPs is a chemical called DDT. DDT was very widely used and caused problems for wildlife and human. An example is eggshell thinning in predatory birds and the presence of DDT in human milk.

eggshell thinning

DDT in human milk

Exposure to pesticides.



Discuss with your teachers in school more about POPs.

What to do before using pesticides?

Before buying/using pesticides or toxic chemicals, the following questions should be considered:

Discuss with your teachers or parents answers to those questions.

7 Use of pesticides

Use of pesticides in farming

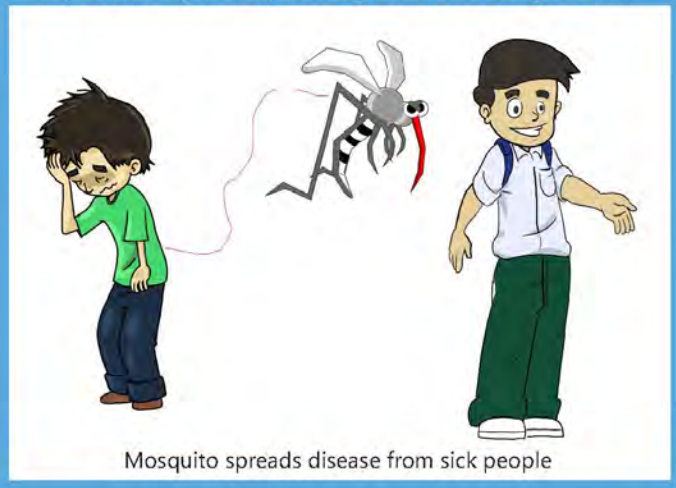
Why do farmers use pesticides?

In farming, pesticides are often used to prevent or kill pests such as plant insects, snail, rodents and weeds.

However, pesticides may also harm other plants, animals and human.

Use of pesticides in vector control

Vectors of disease are living things (often insects) that can transfer disease. An example is mosquitoes spreading malaria or dengue fever.



Mosquito spreads disease from sick people

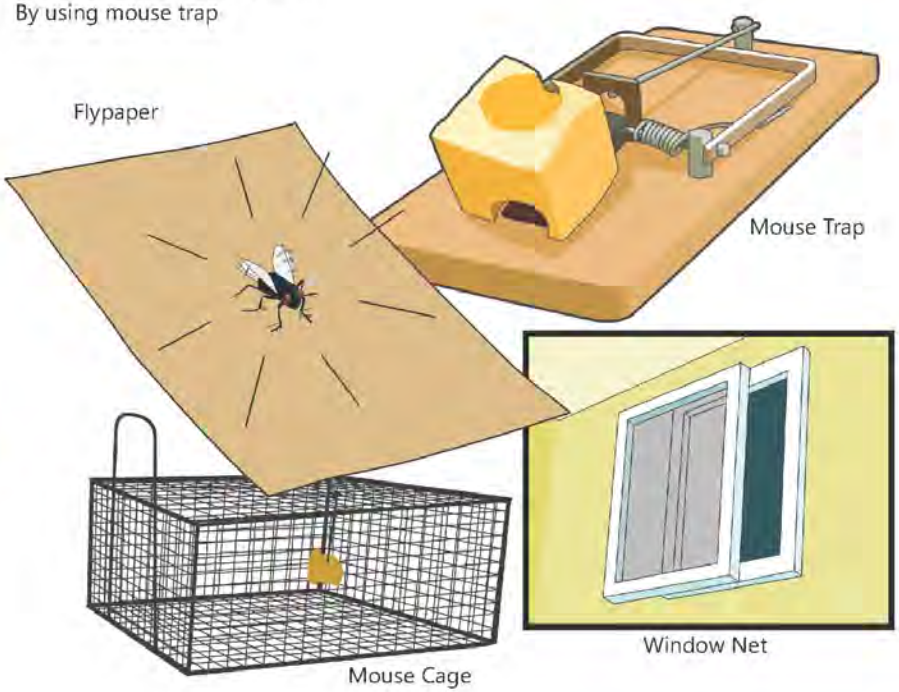
Insecticides are often sprayed to kill mosquitoes.

Discuss with your parents reasons for using pesticides.

Use of pesticides in homes

The use of pesticides in homes are normally to kill insects such as cockroaches, mosquitoes, ants, lice, rodents and fungi. It should only be used as a last resort. It is better to prevent pests by using non-chemical ways, for example:

- By using screen or net to prevent them from entering the house
- By using fly paper to trap flies
- By using mouse trap



Important reminders before using pesticides:

- Choose insecticides which are least toxic to people.
- Use treated bed nets
- Use both chemical and non-chemical ways to eliminate breeding places.

- Avoid clean stagnant water where mosquitoes can multiply such as flowering pot plates and unused tyres.
- Try to use less pesticides.
- Use non-chemical methods e.g. introducing predators.

Spiders are important predators of rice pest, parasitic wasp. This predator eats as many as 20 rice pests per day.

When pesticides are needed.

- Choose the right pesticides for the pest. Not every pesticide is suitable for every pest. Never use farm pesticides in the house and garden.
- Choose the least toxic chemical available.
- During spraying, people, pets, food and drinks should be removed
- Do not enter the sprayed rooms before opening the windows
- Use the amount written on the label. Using more might harm other animals, plant and human.
- Use baits to reduce pesticide use.

Discuss with your teachers or parents non-chemical methods to prevent pests.

8 Effects of Pesticides on People

What are the effects of pesticides on people?

Many pesticides are toxic, some are very hazardous (dangerous). Pesticides may be harmful in short term (Acute poisoning) and in long term (Chronic poisoning).

Acute poisoning

The immediate common signs and symptoms of acute poisoning with pesticides are:

Chronic poisoning

Poisoning over a long period of time may cause:

- Muscle weakness and numbness
- Loss of memory (difficult to remember), sight (problem to see) or ability to think clearly
- Cancer
- Death

Compare signs and symptoms of acute and chronic poisoning.

9 What to do in case of Poisoning

What to do in case of Poisoning

In case of poisoning, inform parents or adults to see a doctor as soon as possible.

The important necessary steps when seeking treatment are:

Inform the doctor which pesticide the person has been exposed to.

If you still have the container, show the container to the doctor. At least, give the name of the pesticide (from the label) to the doctor.

Share with your parents or teachers what to do in case of poisoning.

What can you do to help when poisoning occurs

Ingested poison

1 **Remove** anything remaining in the mouth.

DO NOT force vomiting by sticking your fingers inside the person's mouth (This procedure is very dangerous.

2 Give a small amount of water to drink.
Unless
the person is unconscious, having a seizure or cannot swallow.

DO NOT try to neutralize the poison or make the person vomit by giving milk, raw eggs, salt water, mustard, vinegar or citrus fruit juices.

3 **Call** Poison Centre for advice. Send the person to the doctor.

Share with your parents or teachers what to do in case of ingested poison.

Poison in the eye

1 **Remove** all foreign materials from the eyes, e.g. contact lenses.

2 **Flush/wash** eye for 10 minutes with flowing water, e.g. from the tap.

DO NOT: Use any eye drops.

3 **Call** Poison Centre for advice. Send the person to the doctor

Share with your parents or teachers what to do in case of poison in the eye.

Poison on the skin

1 **Remove** contaminated clothing.

2 **Rinse** the skin that is exposed to poison with large amount of water.

3 **Wash** the skin with soap and warm water.

**If exposed, remember to wash hair & under the finger nails.*

4 **Call** Poison Centre for advice. Send the person to the doctor.

Inhaled Poison

1 Get the exposed person to **fresh air** as soon as possible.

2 **Avoid** breathing fumes.

3 **Call** Poison Centre for advice. Send the person to the doctor.

- **DO NOT PANIC**

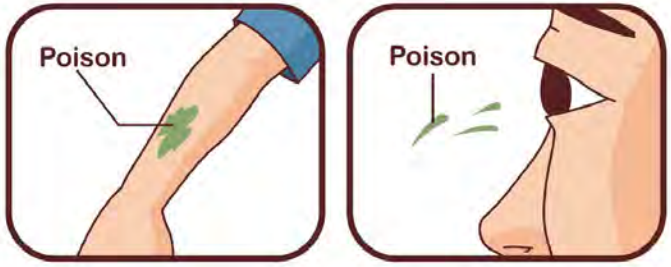
Share with your parents or teachers what to do in case of poison on the skin and inhaled poison.

10 How poisons get into your body

Route of entry:

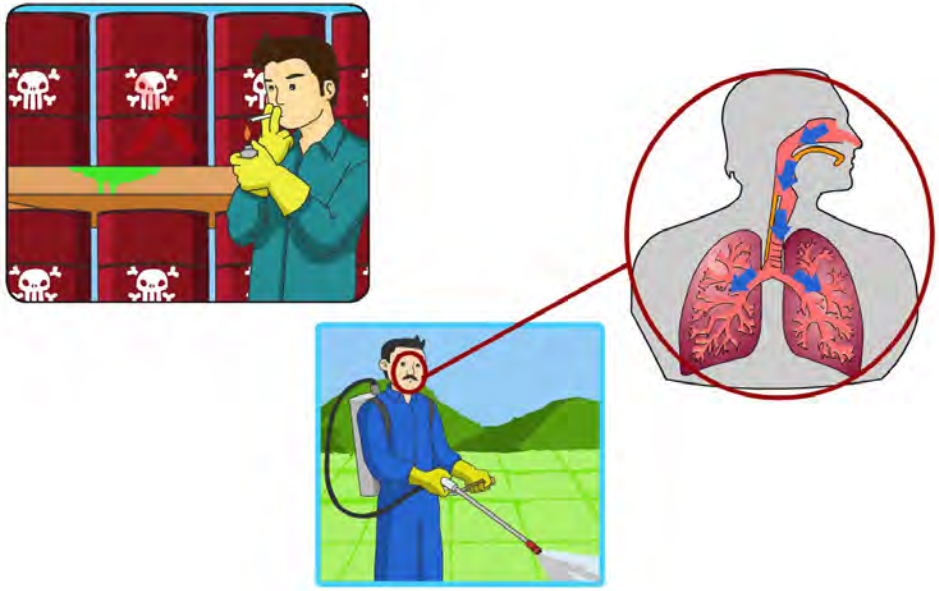
Route 1 : Skin

Some pesticides go through the skin or eyes easily and this can cause poisoning.



Route 2 : Inhalation

Inhalation (breathing in) is a common route of exposure to pesticides.



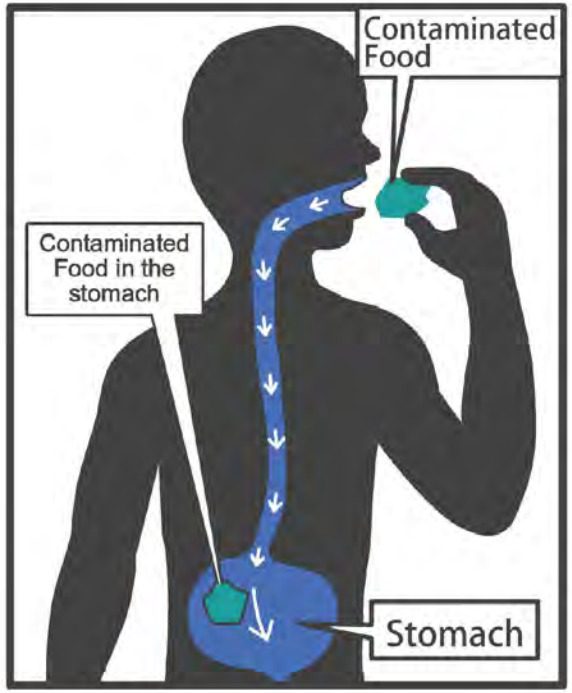
Route 3 : Ingestion

Eating with contaminated hands

Eating/drinking when spraying

Eating/drinking contaminated food

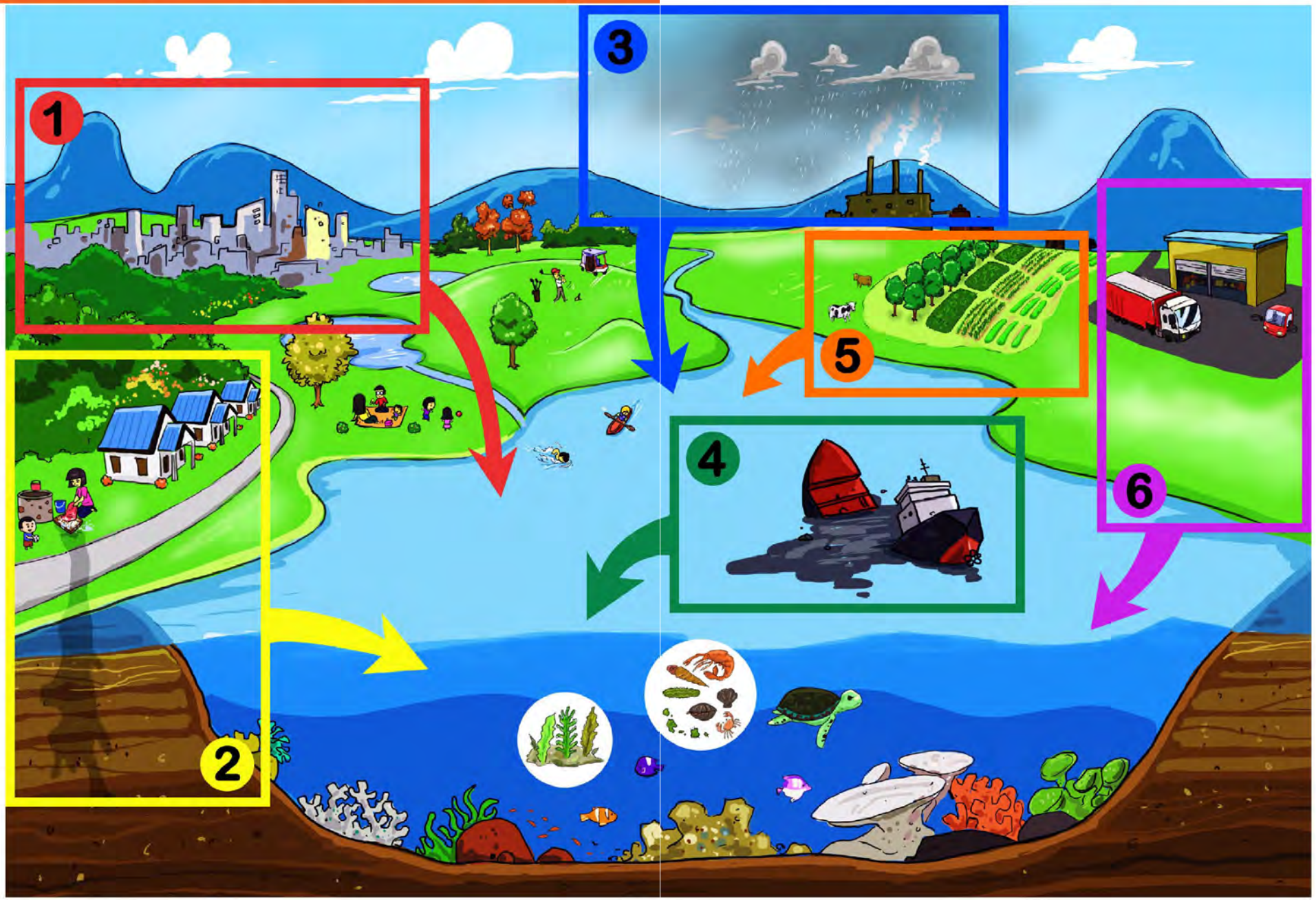
Pathway of contaminated food/drinks when ingested.



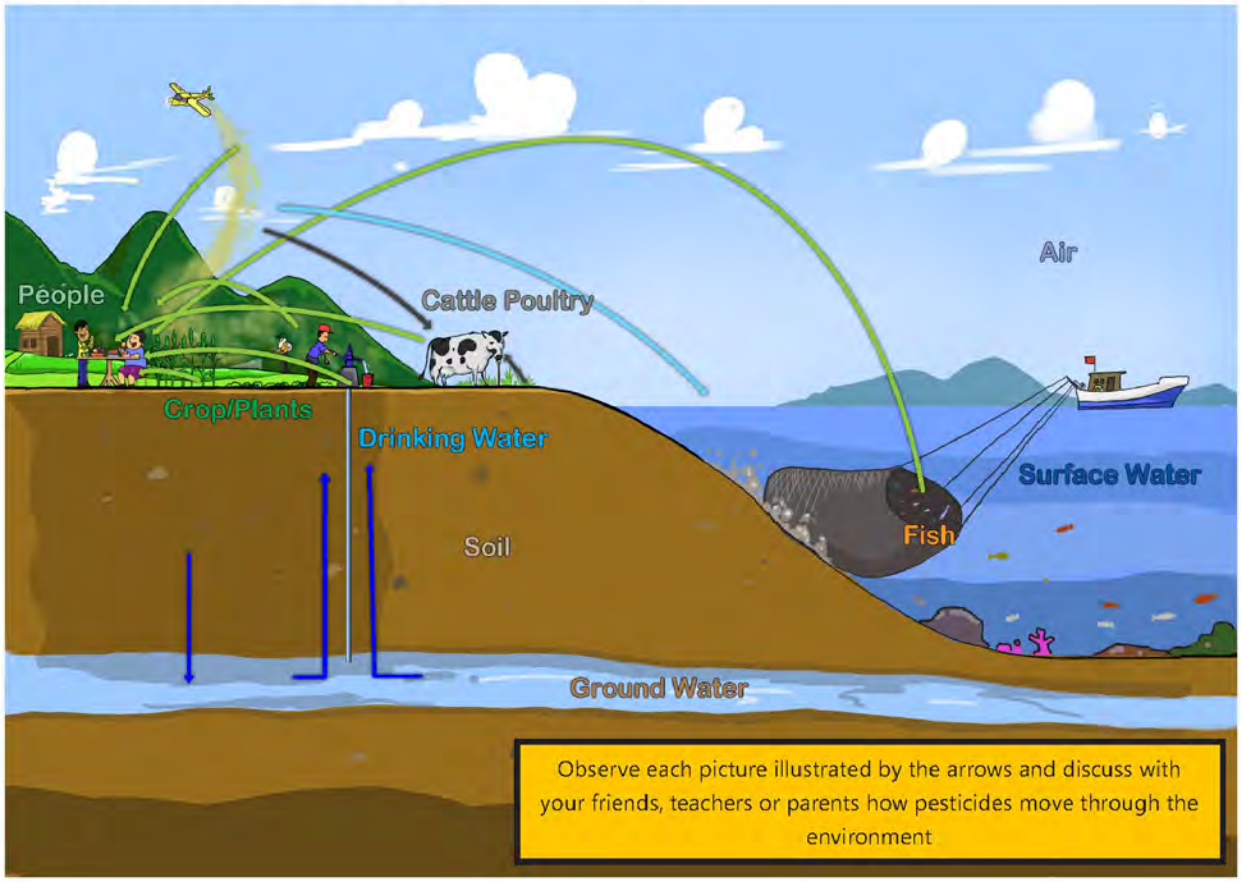
Discuss with your parents or teachers the common routes that poisons can enter the body.

11 Pathways Through the Environment

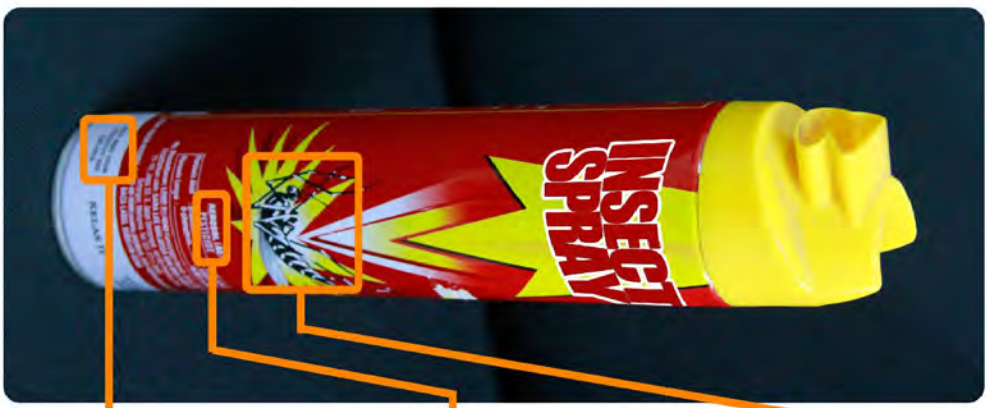
Observe each picture frame and discuss with your friends, teachers or parents how pesticides move through the environment



How pesticides move through the environment



12 How to Identify a Toxic Compound, Product and Understand the Label



VISUAL LABEL

TEXTUAL LABEL

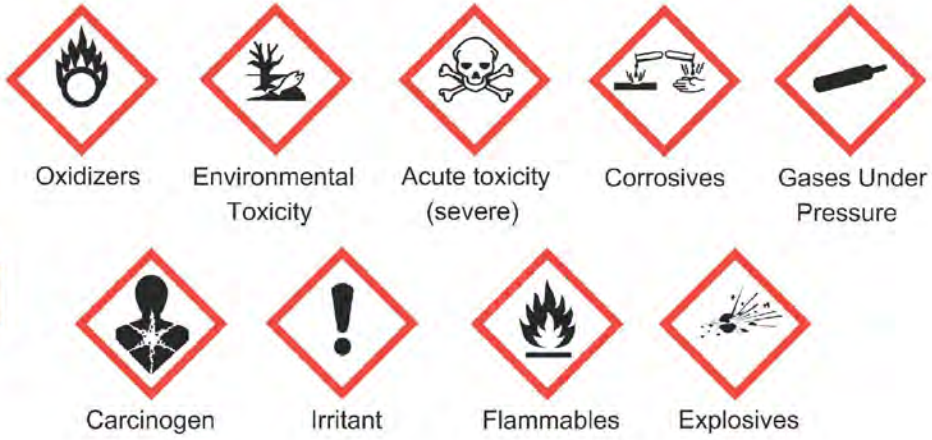
WARNING

Explore chemical containers in your home and read the labels.

Hazard symbols for chemicals (pesticides)

- Hazard is the adverse health effect the chemical is capable of causing.
- Hazards are identified by symbols

GHS Pictograms and Hazard Classes



13 Risky Situations with Chemicals/ Pesticides

Children and family members may accidentally ingest pesticides if..

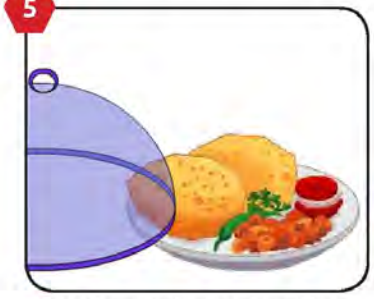
1. pesticides are mistaken for water or drinks

2. food is contaminated by a leaking container during transportation or storage

3. used or empty pesticide containers are left around where children might play with them

4. empty pesticide containers or bottles are used for other purposes, such as storing milk

5. food is left uncovered during indoor residual spraying during public health operations



6. equipment and/or pesticides-ridden clothes are left accessible to children

Share any risky situations encountered in your home.

14 Personal Protection when using Pesticides

Parents or adults who intend to use pesticides MUST use proper protection. When handling pesticides, contamination should be prevented as follows:

The head and neck must be protected to avoid contact with pesticides

Eyes must be protected especially when spraying pesticides

Hands must be protected by gloves to avoid contact with pesticides

A Respirator should be worn to avoid inhalation.

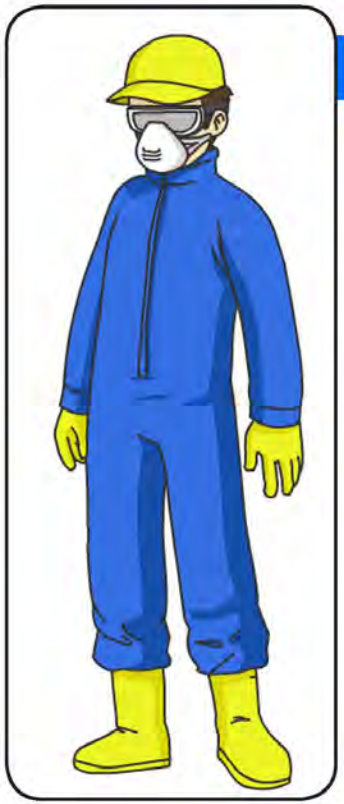
Overalls or shirts with long sleeves

Long Trousers

The feet must be covered entirely to avoid contact with pesticides

Check with your parents if they have these protective gears.

VERY HAZARDOUS PESTICIDES should only be applied by persons **WEARING FULL PERSONAL PROTECTIVE EQUIPMENT.** The user must be trained / taught first before using pesticides.



Full Personal Protective Equipment

After using pesticides, wash all the clothing and equipment.

The clothes SHOULD NEVER BE WASHED WITH THE CLOTHES OF THE FAMILY.

Ask your parents if they have taken precautions with their clothes after using pesticides.

15 Protecting Younger Children, Sisters and Brothers

Why it is important?

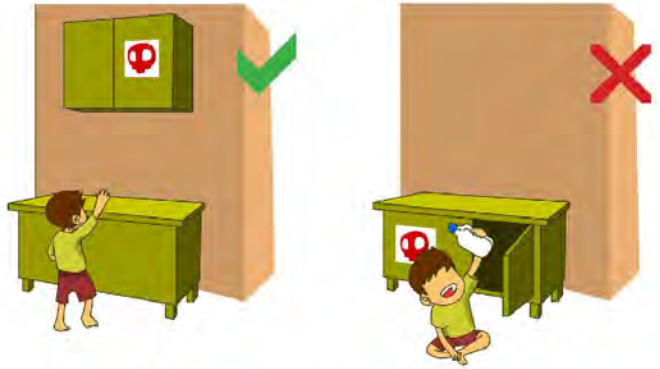
Children and infants are especially vulnerable to pesticides and other toxic chemicals because:

- They are more likely to come in contact with pesticides as they tend to put things in their mouth, crawl and play on floors or soils which may be contaminated.
- Their organs are still developing, may be more sensitive to and/or less capable of coping with toxic substances;
- Their skin area for exposure is greater. They eat and drink more per unit of body weight than an adult.

Carry out an investigation and list most frequent causes of poisoning in your home.

How to protect

Protection in the house:



- Keep chemicals out of reach of children

- Try using other ways of controlling pests instead of using pesticides
- Use the safest possible chemicals
- If you are using chemicals and you are interrupted by a phone call or doorbell remember to put the chemicals out of reach
- Do not put toxic chemicals in empty food or drink containers

List down ways of protecting younger children from chemicals in your home.

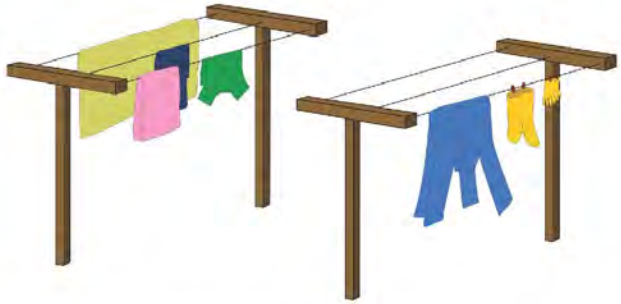
- Make sure no children are present. Remove food and toys etc when applying pesticides.
- Do not let children re-enter sprayed rooms before they have been properly ventilated.
- Never use pesticides which are meant for another purpose.

Protection of young children on a farm and other areas

Adults or older children should ensure farm and other areas children might play must be safe from the harmful chemicals.

- Use pesticides only as a last resort

- Do not mix or spray when children are present.
- Keep children out of pesticides spraying drift
- Clean up spills immediately
- Respect waiting times for re-entry to fields and for eating sprayed food.
- Wash clothes and equipment after spraying



- Keep work clothes separate from family wash

- Store pesticides, leftovers, wastes, containers, equipment or pesticide ridden clothes locked in a shed.

ADVICE

Children living in rural areas should not play in areas where toxic wastes have been dumped.

Ask your parents to list ways of protecting children from chemicals in farm

16 Protecting the Environment

There are wild species we enjoy watching like beautiful butterflies or birds.

Many animals, insects and plants are useful to people because they supply food such as fish, honey, rice, wheat and corn. Some insects produce silk for fabrics.

These organisms are not harmful to us. We should protect them so that they will not be harmed or become extinct.

Do you know that pesticides can kill them?

When using pesticides to kill pests such as cockroaches and mosquitoes, we should be very careful not to kill non-target organisms. Non-target organisms are beneficial organisms that we are not suppose to kill. They have a very important role in our environment.

Aquatic organisms

Beneficial Insects

Predators / Wild Animals

Pollinators

Domestic animals

Micro organism/small organisms living in the soil

Explore your house or garden and search for beneficial animals.

Many organisms are important to our environment.

Micro-organisms and earthworms in the soil help break down dead plants and animals into nutrients that plants need to grow.

Pollinators are needed for many tree species to produce fruits.

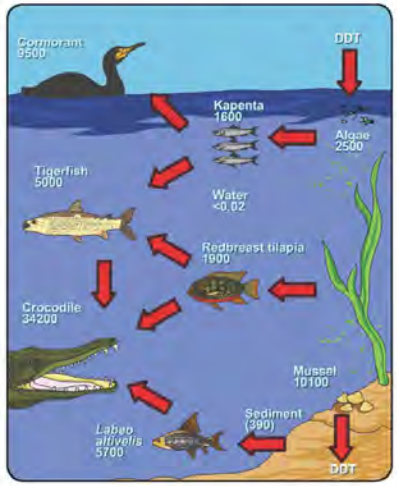
Harmful insects can be kept under control by other insects, for example by tiny wasps that grow in the eggs of the harmful insects and damage their eggs.

Predators such as predatory insects and spiders are important for agriculture because they eat the pests that feed on the crops. When these predators are killed by pesticides, the number of pests that eat the crops will increase, thus reducing crop production.

Observe beneficial animals found in your home or garden and find how they live.

Pesticides can harm these organisms!

Pesticides such as DDT can harm and kill useful animals such as birds and corals in the sea.



Some pesticides do not easily decay. These pesticides can be transfered from one animal to another in the food chain.

Places sensitive to pesticides

There are places and resources that are sensitive, and should be protected from pesticides:

- School, houses
- Places where food is stored for people and domestic animals
- Water, surface water and groundwater
- National parks/nature reserves/ natural areas/wildlife

Give more examples of places where beneficial animals can be found.

School

National Park

17 Disposal of Toxic Wastes

How to dispose of toxic waste

Chemical/toxic waste should be disposed of appropriately. This is important as not to harm others.

How to dispose chemical containers

Puncture the containers so that they cannot be reused. Take them to a recycling centre.

Before disposing toxic wastes

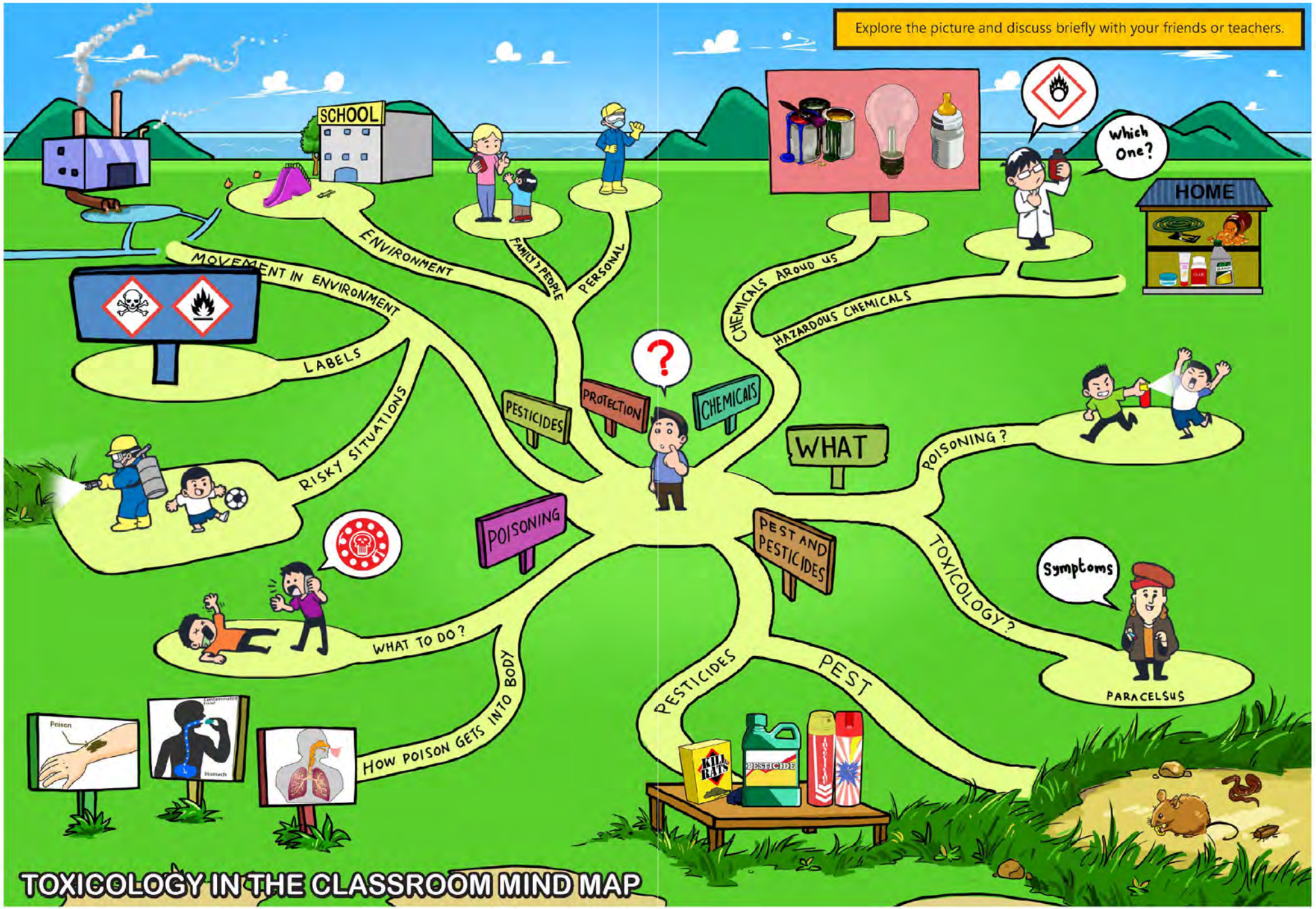
Separate chemical waste from other household waste.

Store them behind lock and key so that they are out of reach until they can be properly disposed of.

Do not BURN toxic waste because DANGEROUS FUMES can be released at lower temperatures

Do not BURY toxic waste because they can contaminate soil and/or water

Find out from your parents how they dispose of toxic wastes.


Explore the picture and discuss briefly with your friends or teachers.
SCHOOL
ENVIRONMENT
FAMILY & PEOPLE
PERSONAL
MOVEMENT IN ENVIRONMENT
LABELS
RISKY SITUATIONS
WHAT TO DO ?
HOW POISON GETS INTO BODY
Poison
Stomach
PESTICIDES
PROTECTION
CHEMICALS
POISONING
?
CHEMICALS ARoud us
HAZARDOUS CHEMICALS
Which One?
HOME
WHAT
POISONING ?
PEST AND PESTICIDES
TOXICOLOGY ?
Symptoms
PARACELSUS
PESTICIDES
PEST
KILL RATS
PESTICIDE
TOXICOLOGY IN THE CLASSROOM MIND MAP

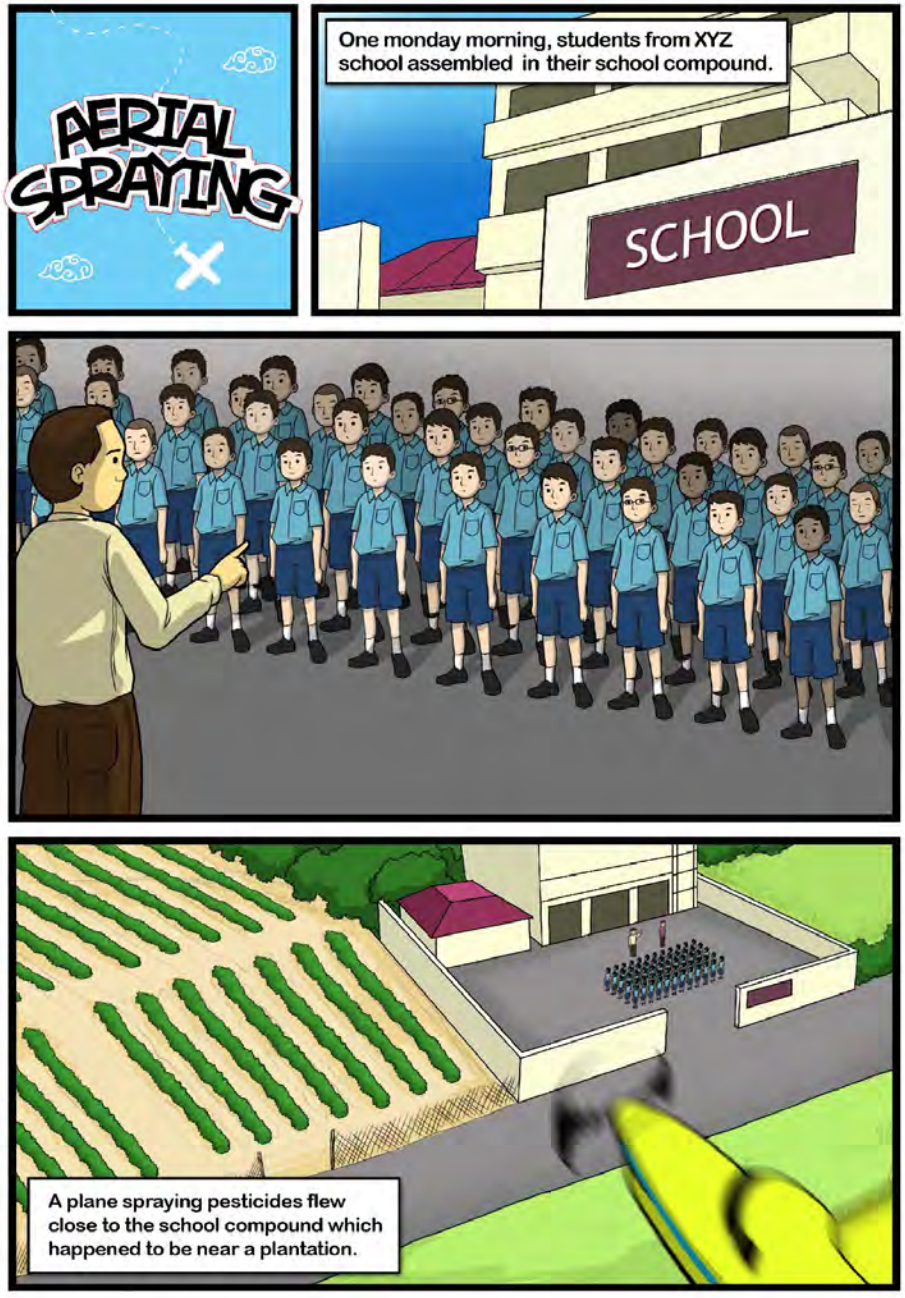
Story Telling

COMIC 1


Oh my goodness!
What happened to the ENVIRONMENT
It is very dirty and ugly
Why is it so dirty and ugly?
I think these are the EFFECTS of not keeping the environment clean..
You see..when we take good care of the ENVIRONMENT..


..we can maintain the BEAUTY of mother nature and create a PEACEFUL place to live in..

COMIC 2


AERIAL SPRAYING
One monday morning, students from XYZ school assembled in their school compound.
SCHOOL
A plane spraying pesticides flew close to the school compound which happened to be near a plantation.


The plane sprayed chemicals without any safety precautions.
SHHHSHSHSHHSHSHHHH!!!
The chemical was dispersed to the school compound by strong wind.
All the students and teachers were exposed to the chemical. Some of them vomitted. Others fell unconscious.
UHUK! UHUK!
UHUK! UHUK!
UHUK! UHUK!
This situation could have been avoided if the plantation had used other methods instead of aerial spraying by a plane.
AMBULANCE

Carelessness Can Cause Dangerous Consequences

Mummy is cooking in the kitchen.

But as she is cooking, a swarm of flies starts to fly around her cooking pot.

So, mummy decides to do something to get rid of flies. She takes a blue spray-can with poison written on the label.

With enthusiasm mummy starts to spray the insecticide all over the place hoping that the flies would die. Never spray in places where food is cooked or stored.

Carelessness Can Cause Dangerous Consequences

She continues to spray and more poison from the insecticide is in the air.

Once mummy was satisfied that she had got rid of all of the flies, she left the harmful spray-can on the kitchen counter unaware of the danger that it might cause.

Mummy leaves the kitchen.

Shortly after, her son enters the kitchen. The little boy sees the bright-colored spray-can and decides to have a little fun of his own, unaware of it's poisonous content.

Not aware of its consequences, he continues playing this extremely dangerous game.

Carelessness Can Cause Dangerous Consequences

Then the little boy decides to spray in the direction of the cooking pot on the stove.

Disaster strikes. "BOOMMMMM" a loud noise is heard followed by the sound of pots and pans flying and hitting the kitchen floor and the wall. It is too late now to do anything as the damage is done.

Who's fault is it?? Who should we blame??

- The mummy because she was negligent?
- Or the curious and naive little boy who just wanted to have fun?

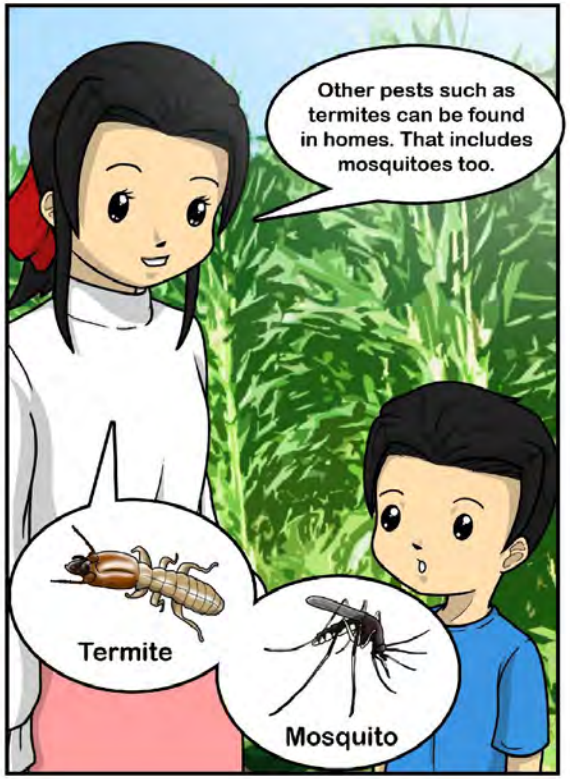
OR

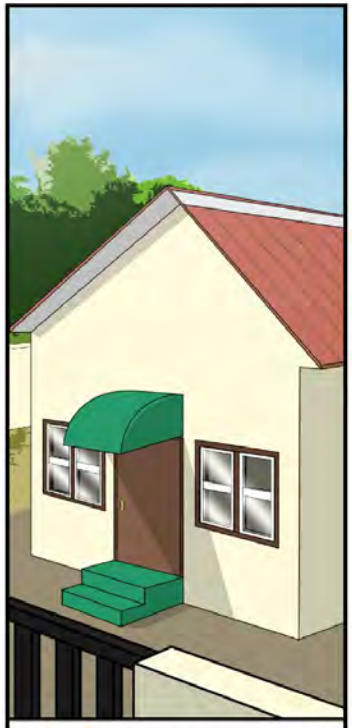
- The fact that they weren't careful and didn't practise safety rules and procedures?

- Therefore, we must always be extra careful, learn the rules and safety procedures and practise how to keep poisonous and dangerous items in safe storage away from children.

COMIC 4

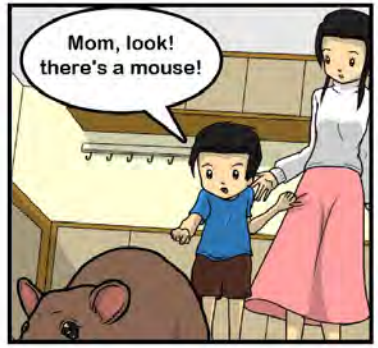
Kent and his mother just came back from shopping.

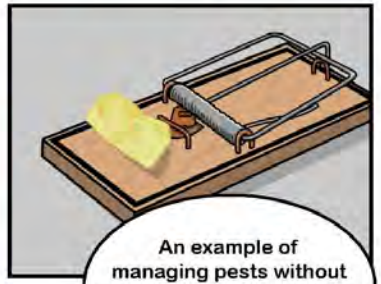




At Kent's Home

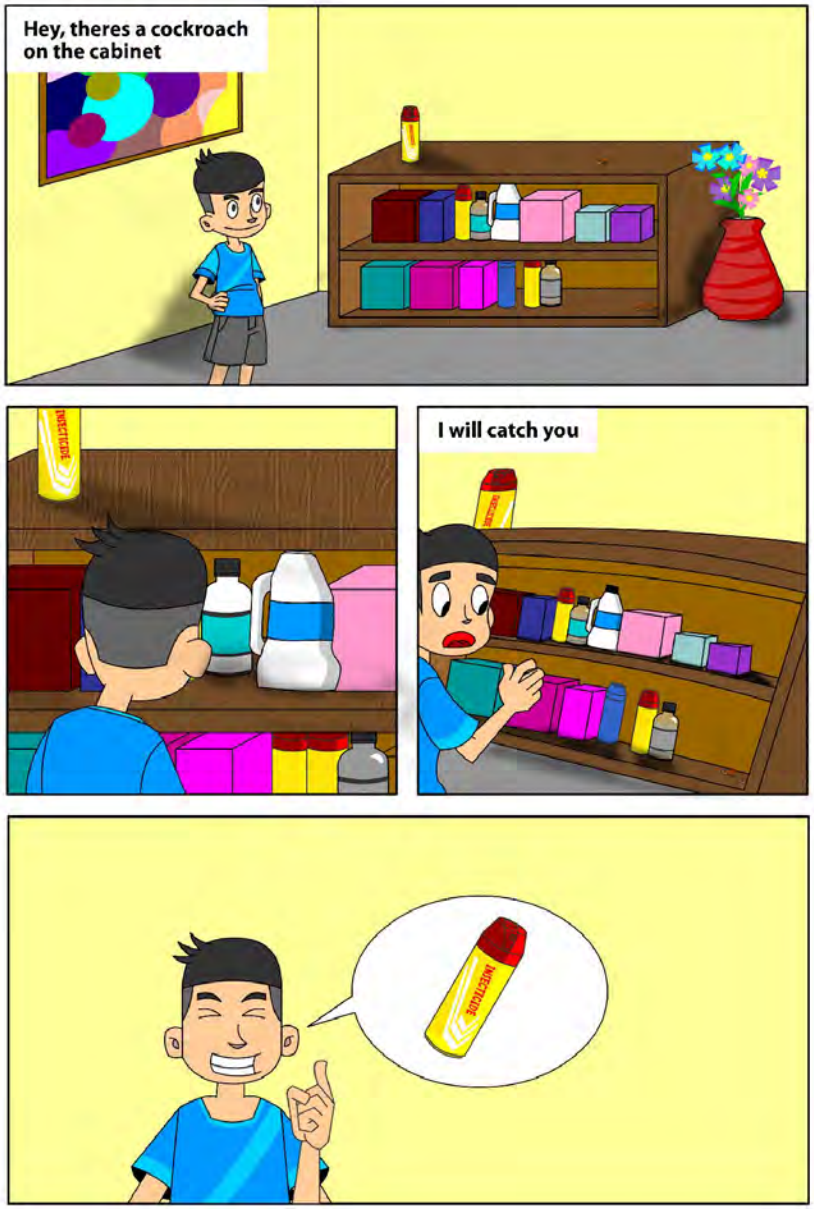
Suddenly he saw something moving behind him.

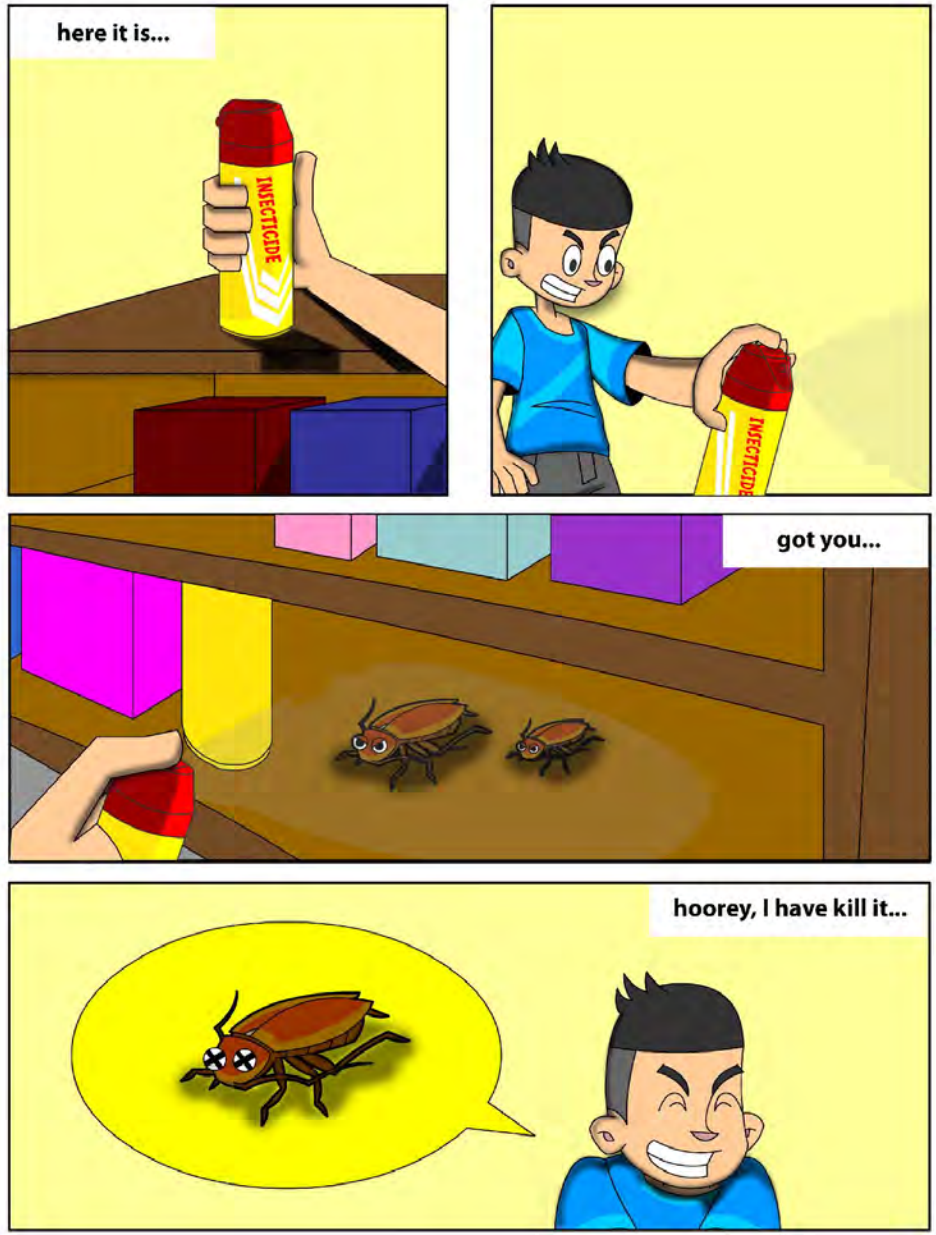




By using this method, we can avoid using dangerous chemicals in the house.

COMIC 5


Hey, theres a cockroach on the cabinet
I will catch you
INSECTICIDE


here it is...
INSECTICIDE
got you...
hoorey, I have kill it...

Never use pesticides when children are around.
Never play with chemicals.

COMIC 6


The Fate Of A Big
Green Tree
One sunny day, a big tree was happily swaying with the wind. Purple flowers are blooming under its shade, and insects are seen climbing and flying around it...


The tree seems so happy that it is surrounded by beautiful flowers, colourful butterflies and other little creatures.


Suddenly, the tree sees a man in mask carrying a tank full of pesticides.

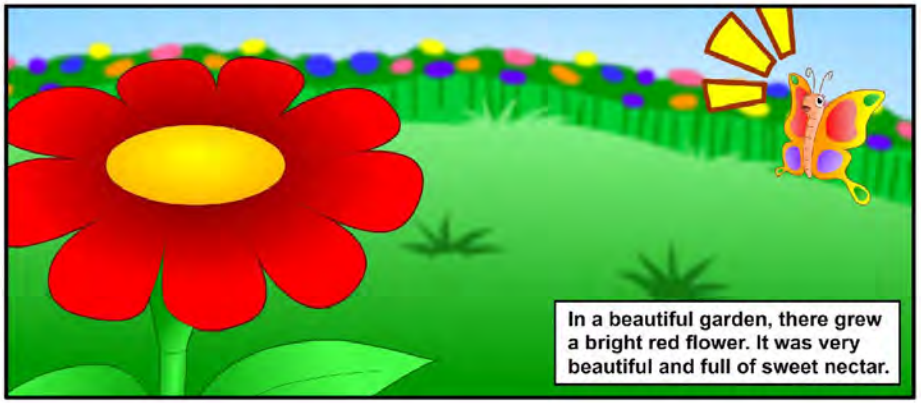

Oh! No! He is going to spray poisonous pesticides on us and all my insects friends will die!

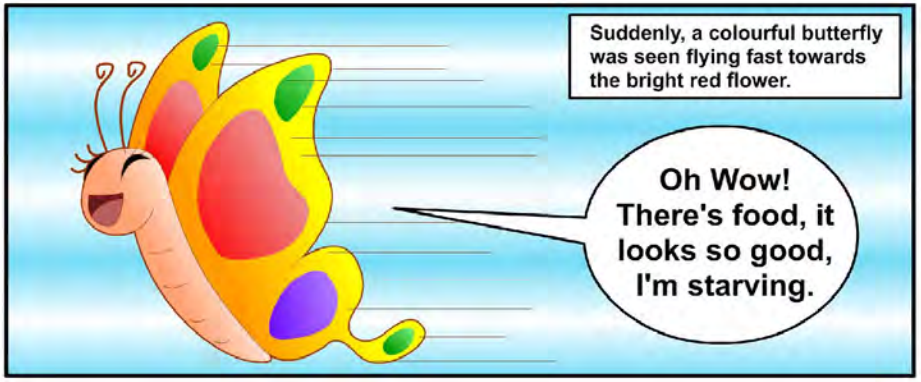

Now the tree is sad. Its friends, the beautiful flowers, colourful butterflies, and all the other little creatures have died. The tree is now all alone.

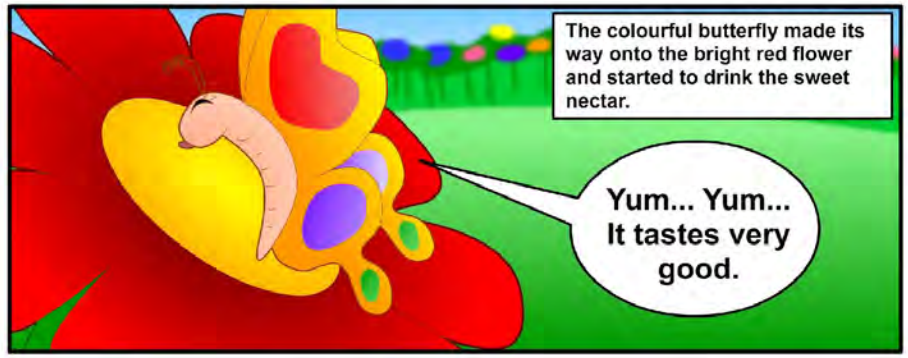

Day by day, it's beautiful, lush green leaves fell one by one. In the end the tree was left with only its trunk and a few dried branches.
The tree was so sad and extremely unhappy. It cried all alone until it finally died.

COMIC 7

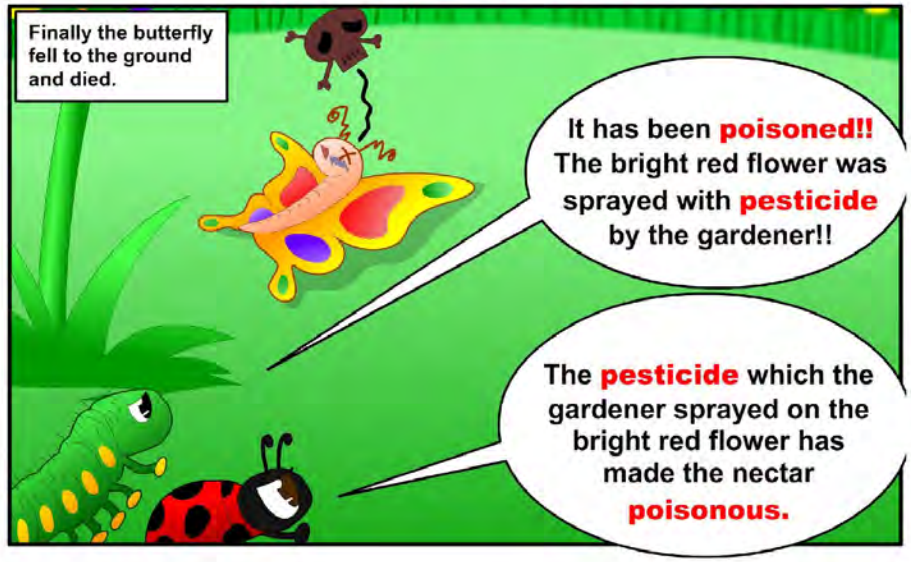

The Fate Of The Beautiful Butterfly


In a beautiful garden, there grew a bright red flower. It was very beautiful and full of sweet nectar.

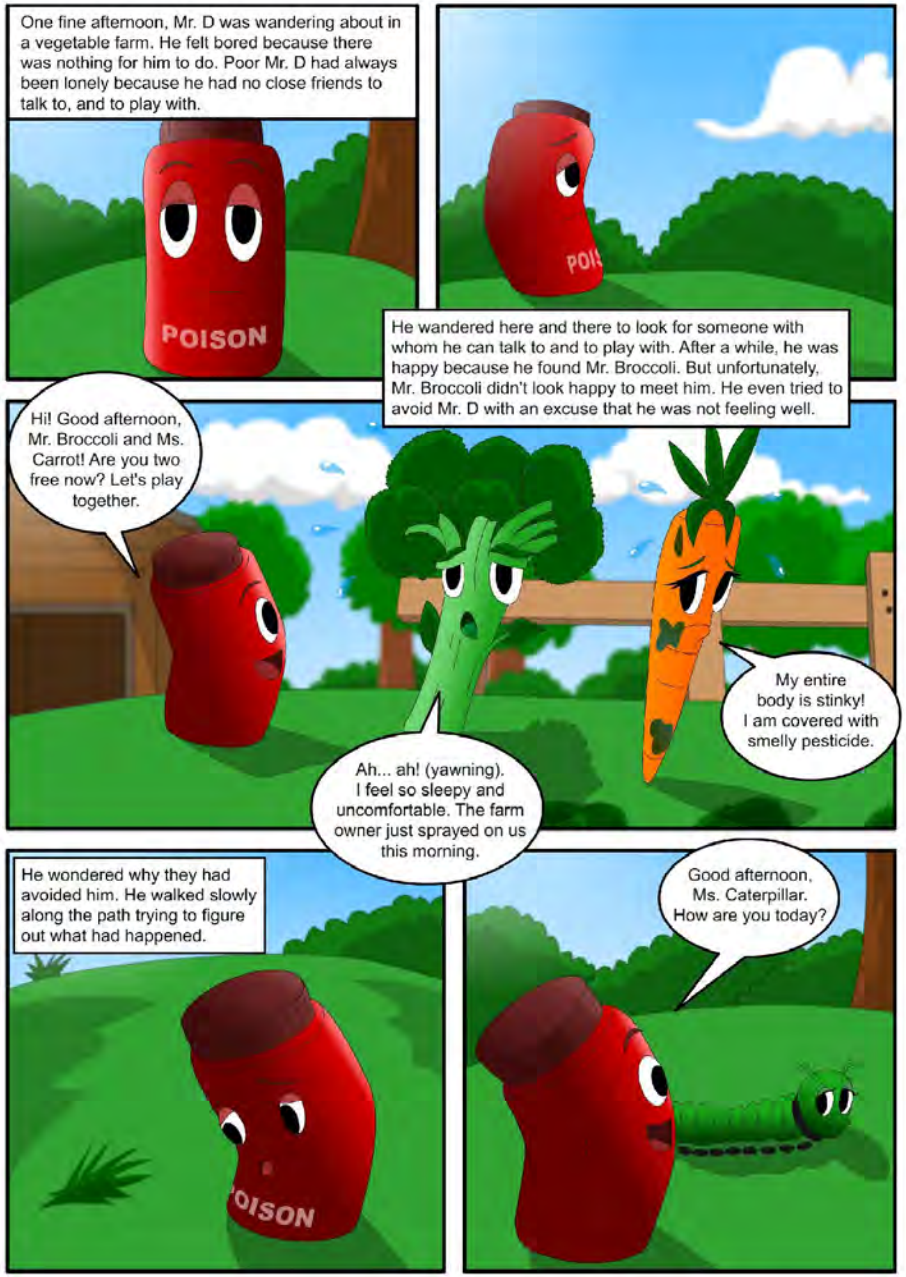

Suddenly, a colourful butterfly was seen flying fast towards the bright red flower.
Oh Wow! There's food, it looks so good, I'm starving.

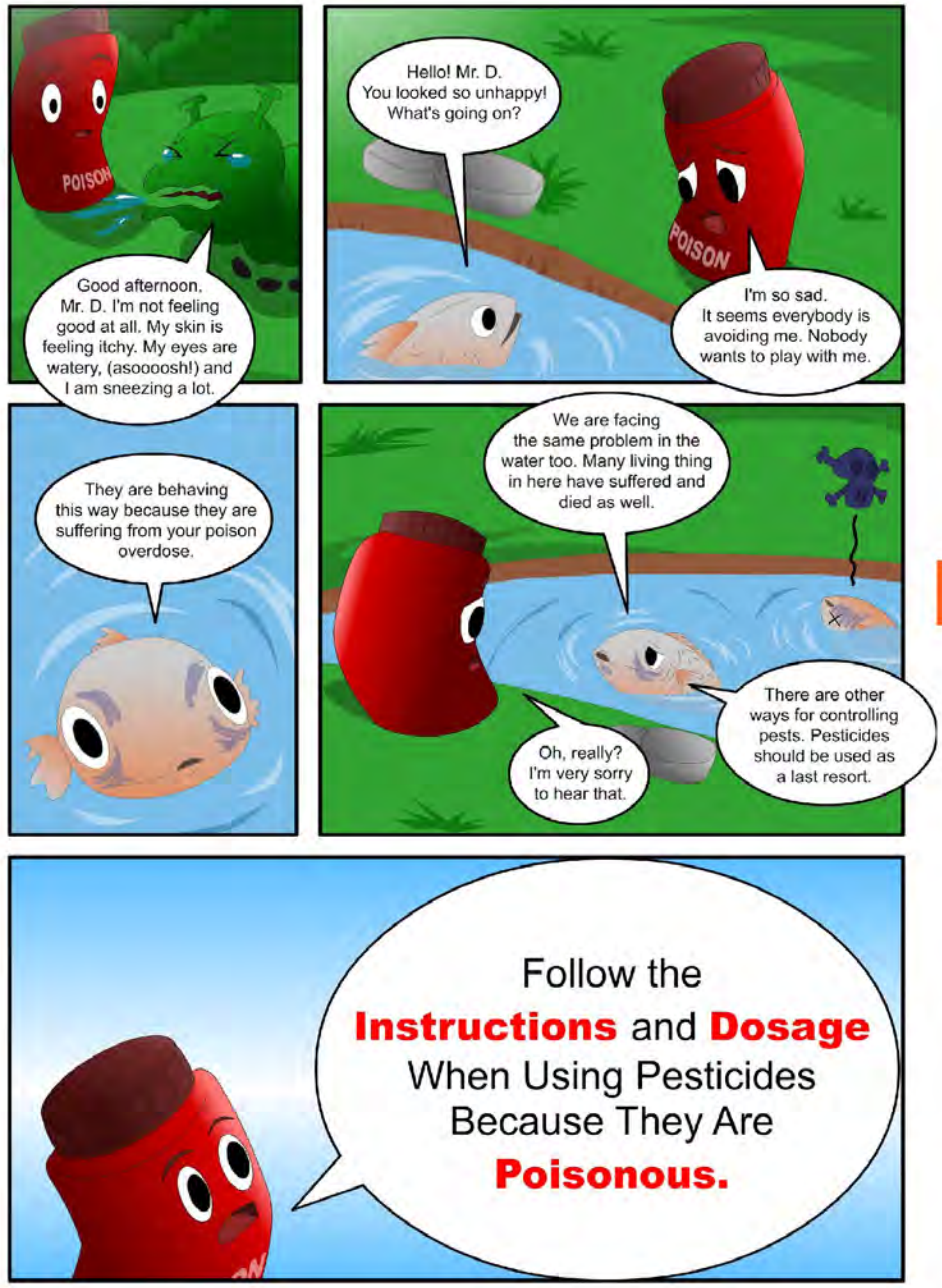

The colourful butterfly made its way onto the bright red flower and started to drink the sweet nectar.
Yum... Yum... It tastes very good.


But suddenly the butterfly felt a bitter taste and begun to feel dizzy.
Oh! No! I don't feel very well. What is happening? Is there something in the nectar?


Finally the butterfly fell to the ground and died.
It has been poisoned!! The bright red flower was sprayed with pesticide by the gardener!!
The pesticide which the gardener sprayed on the bright red flower has made the nectar poisonous.

COMIC 8


One fine afternoon, Mr. D was wandering about in a vegetable farm. He felt bored because there was nothing for him to do. Poor Mr. D had always been lonely because he had no close friends to talk to, and to play with.
POISON
He wandered here and there to look for someone with whom he can talk to and to play with. After a while, he was happy because he found Mr. Broccoli. But unfortunately, Mr. Broccoli didn't look happy to meet him. He even tried to avoid Mr. D with an excuse that he was not feeling well.
Hi! Good afternoon, Mr. Broccoli and Ms. Carrot! Are you two free now? Let's play together.
My entire body is stinky! I am covered with smelly pesticide.
Ah... ah! (yawning). I feel so sleepy and uncomfortable. The farm owner just sprayed on us this morning.
He wondered why they had avoided him. He walked slowly along the path trying to figure out what had happened.
Good afternoon, Ms. Caterpillar. How are you today?

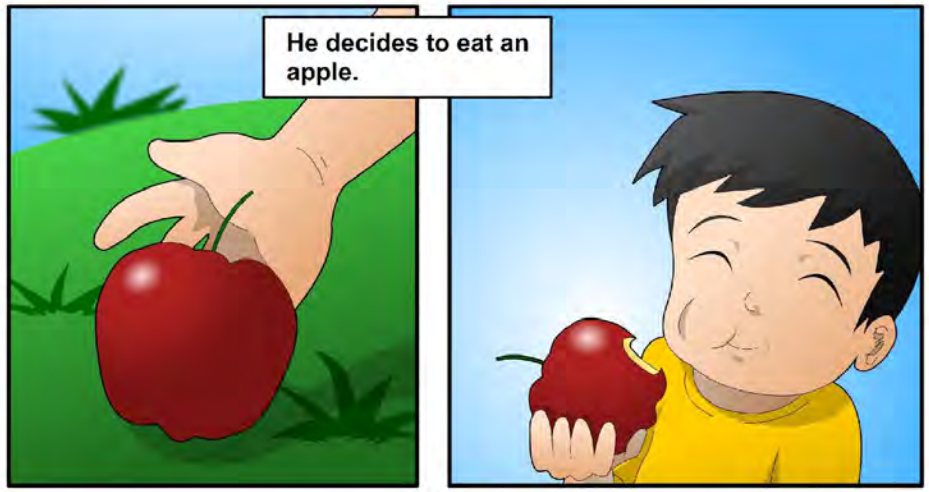

POISON
Good afternoon, Mr. D. I'm not feeling good at all. My skin is feeling itchy. My eyes are watery, (asoooosh!) and I am sneezing a lot.
Hello! Mr. D. You looked so unhappy! What's going on?
POISON
I'm so sad. It seems everybody is avoiding me. Nobody wants to play with me.
They are behaving this way because they are suffering from your poison overdose.
We are facing the same problem in the water too. Many living thing in here have suffered and died as well.
There are other ways for controlling pests. Pesticides should be used as a last resort.
Oh, really? I'm very sorry to hear that.
Follow the
Instructions and Dosage
When Using Pesticides
Because They Are
Poisonous.

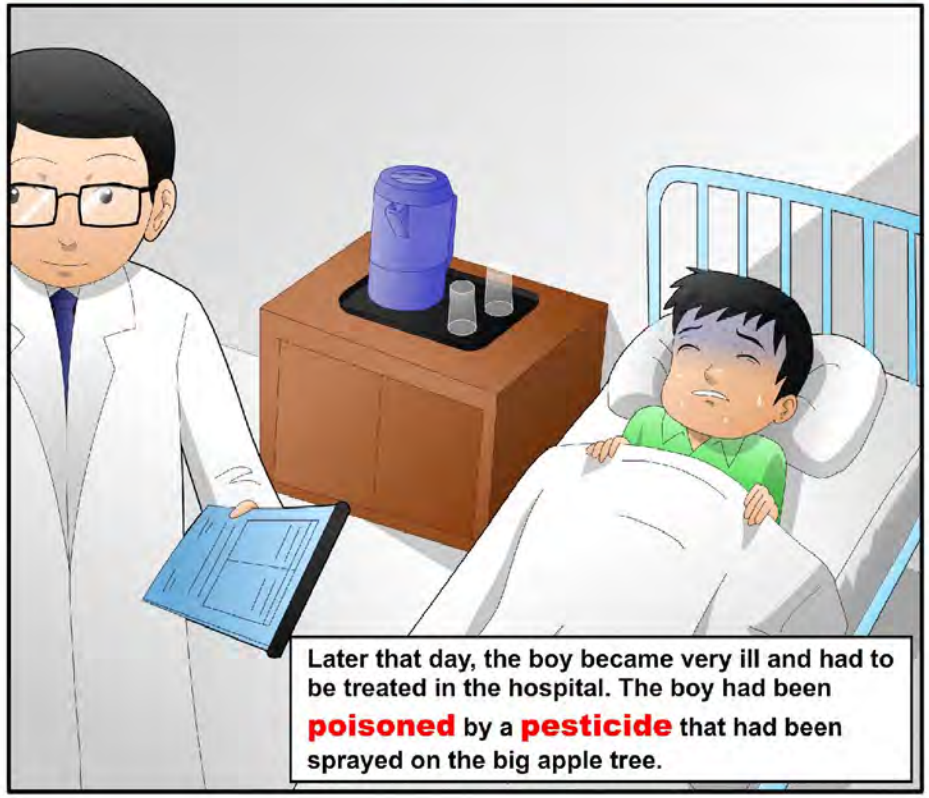
COMIC 9


The Fate Of Playful Children


It is a sunny day. A boy is seen running around the garden.


While he is playing, he sees a big tree full of shiny red apples.


He decides to eat an apple.


Later that day, the boy became very ill and had to be treated in the hospital. The boy had been poisoned by a pesticide that had been sprayed on the big apple tree.

COMIC 10

COMIC 11

Rina has just finished helping her mother painting their house gates.

She wanted to throw away the paint waste near her house.

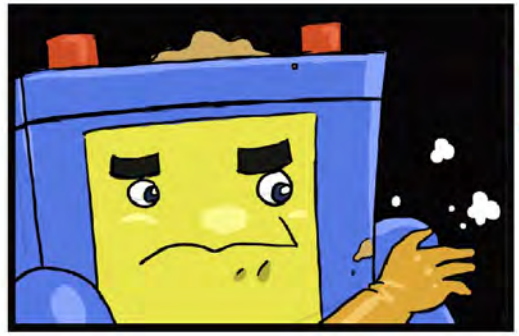
Rina's mother saw her act.

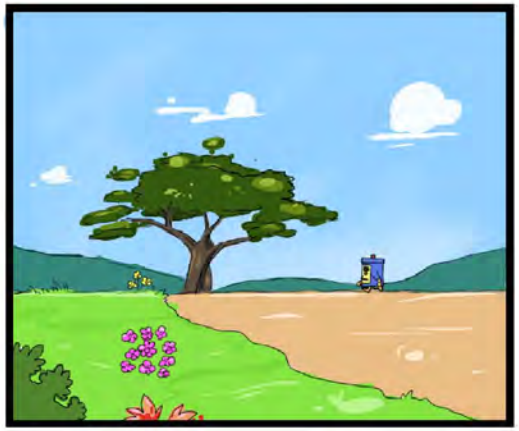
Rina's mother prevented her from throwing away the paint waste.

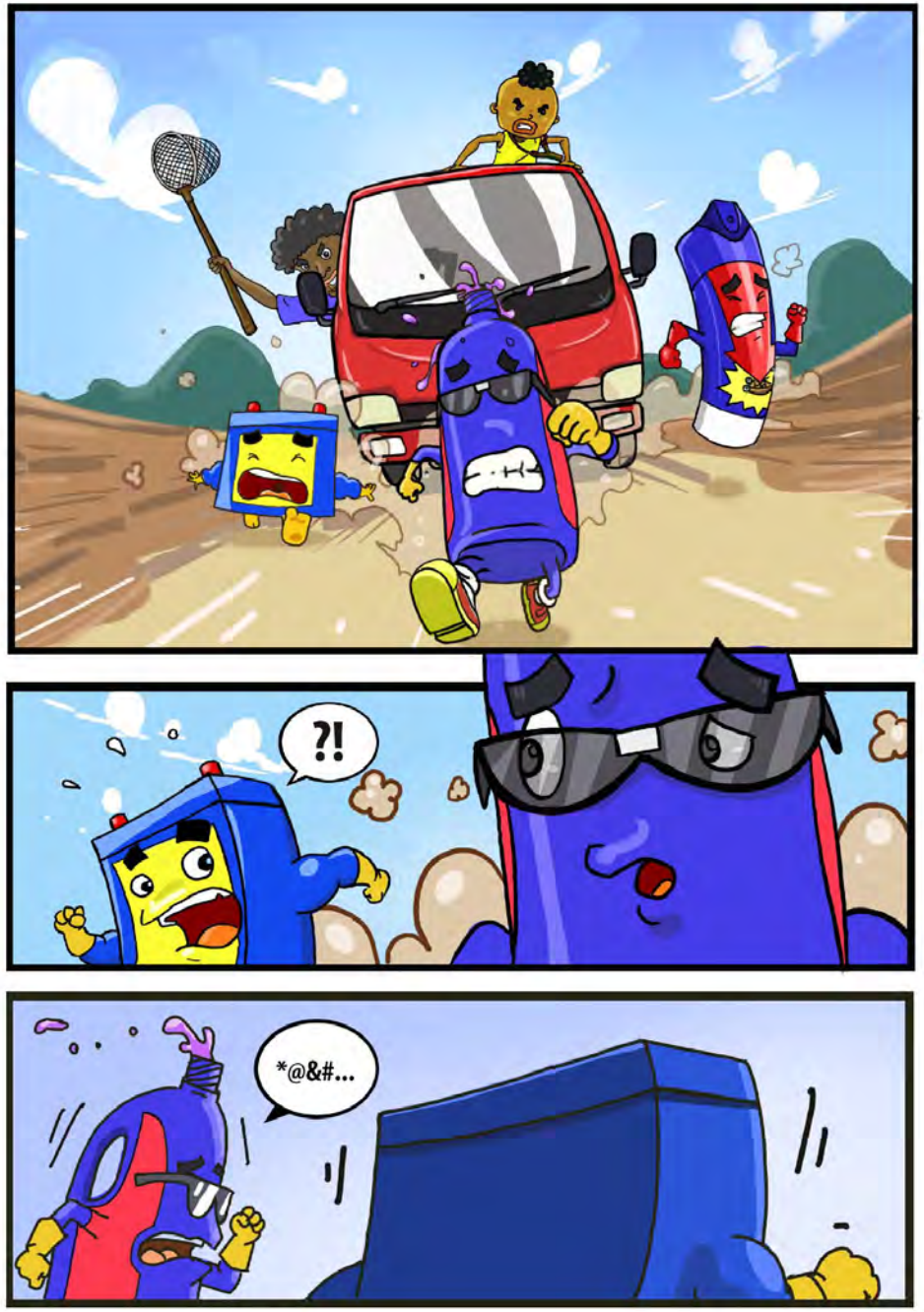

When toxic wastes are dumped without care and not disposed of correctly, they can cause severe health problems and death and also contaminate water and land for decades.
Paint waste is an example of a toxic waste.

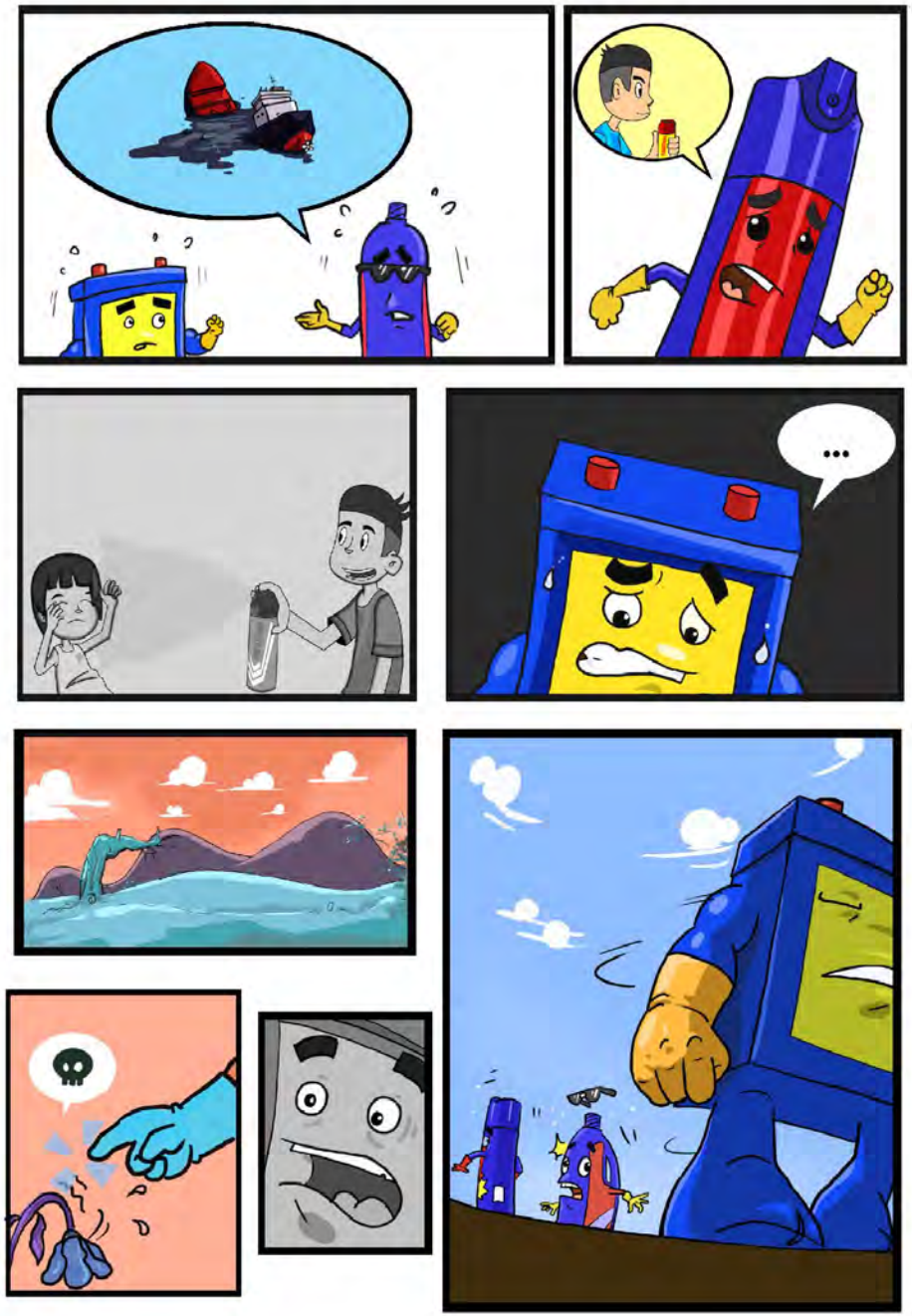

I didn't know my action could cause pollution to the nature.
That's why every toxic waste should be handled carefully.

COMIC 12









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