School Preventive Maintenance Manual

Let's Take Care our School

SCW
Schools for the
Children of the World

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The school is one of the most important places in our community.
In the classrooms our children and young people learn to read and write; they know our history, nature and find explanations of the phenomena around us.

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I. Introduction

The buildings of our schools are special because of the activity for which they are intended, they are the center of discovering, learning and playing of our children. They have a daily use, which causes that the school facilities present small daily deteriorations, which accumulate if they are not attended to in time, causing damages that can prevent to the educational work proper to the schools.

The performance of preventive maintenance activities that prevent deterioration and extend the useful life of school buildings and facilities, as well as small repairs involving a minimum cost and unskilled labor, require the active participation of the various members of the Communities, including children and particularly parents in coordination with teachers and the principal.

This School Preventive Maintenance Manual is a guide that explains what preventive school maintenance is and makes us a proposal for the organization to carry out these actions. It describes the main components of educational buildings, the steps to be taken to carry out the main maintenance activities, the necessary tools and the frequency with which it should perform its task; also mentioned are the failures that require a large investment or the work of a specialist for what are considered as major maintenance.

At the end of the reading you will see that it is not so difficult to ensure that our schools are kept clean, in good condition and ready for our children to be formed in a pleasant, safe and healthy educational environment. But if it can be achieved!

II. Generalities

What is building maintenance and school facilities?

We understand by maintenance all those actions that have to be carried out in a building, in its facilities and furniture with the objective of preserving its original conditions, performance and comfort.

Care should be taken to ensure that the maintenance activities are carried out without interrupting the educational activities of the school buildings, for which they should be planned considering periods of school break and non-working hours. The maintenance activities can be divided into preventive maintenance and corrective maintenance.

Preventive Maintenance
It includes those actions that must be carried out periodically in buildings, installations and furniture, to prevent or avoid deterioration and decomposition. These are simple and practical activities that can be carried out by members of the school community.

Corrective maintenance
They are all those actions that must be carried out in an immediate way with the object of repairing damages or deteriorations caused by natural wear or accidents.

Conservation actions can also be divided by the amount of resources required and by the specialization of the work required for its realization, in major maintenance and minor maintenance.

Minor Maintenance
Minor maintenance actions are those that do not require large resources to carry out, or too many specialized technical knowledge, so they can be performed by anyone with a minimum of information and tools.

Major Maintenance
The major maintenance activities are those that require for their realization of expensive resources or highly skilled labor, so they cannot be performed

III. Objectives of the Manual

The School Preventive Maintenance Manual aims to provide the school community with a basic technical guide for the prevention and correction of damage to the school building as a whole, due to aging, environmental action and the inappropriate use of the installations.

IV. Community Organization

a. What is organization?

Organization is to unite to do something always thinking about the welfare of the community.
When people are grouped, organized and established interpersonal relationships cordial, frank, appreciation and collaboration, these favor teamwork.

b. Maintenance Commission

The main function of the school maintenance commission will be to organize and conduct activities is the benefit of the educational center in order to solve problems in the area of infrastructure and equipment.
The best way to organize a commission is to get people in the community to choose their own representatives.

Members should be selected from community leaders, student parents, center teachers, representatives of community organizations, churches, etc.

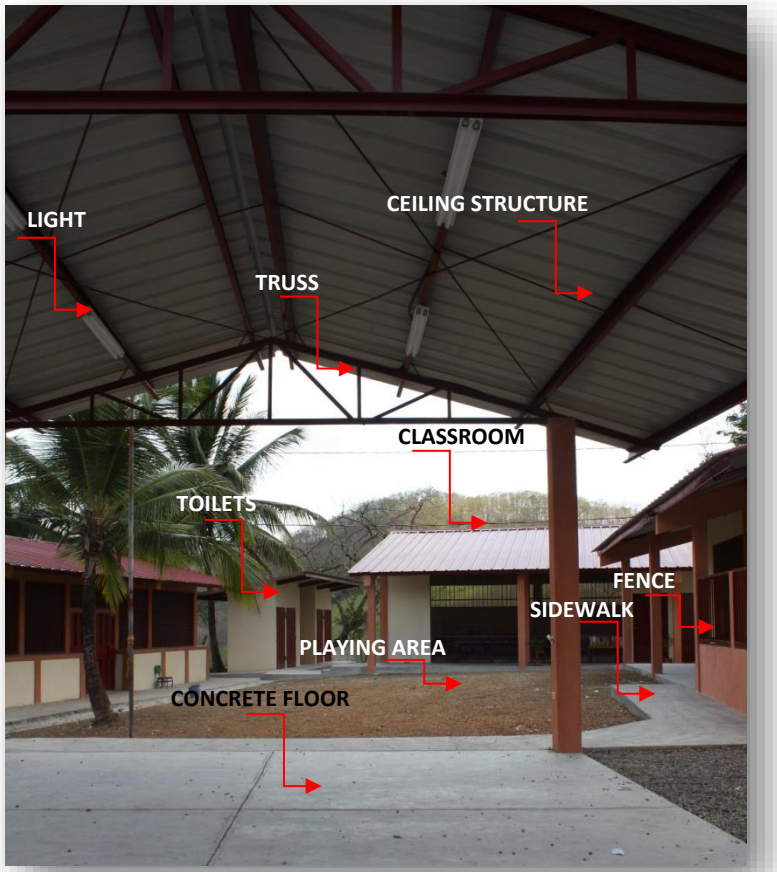
c. School work groups

With the results of the analysis of the school building, the Maintenance Committee can determine the actions that will have to be taken, such as corrective measures, such as periodic maintenance.

To meet them, they will be supported by the whole school community organized in school work groups.
In the school work groups the parents, the students, the teachers and inhabitants of the community, interested in participating in the improvement of the school participate.

V. Basic Concepts

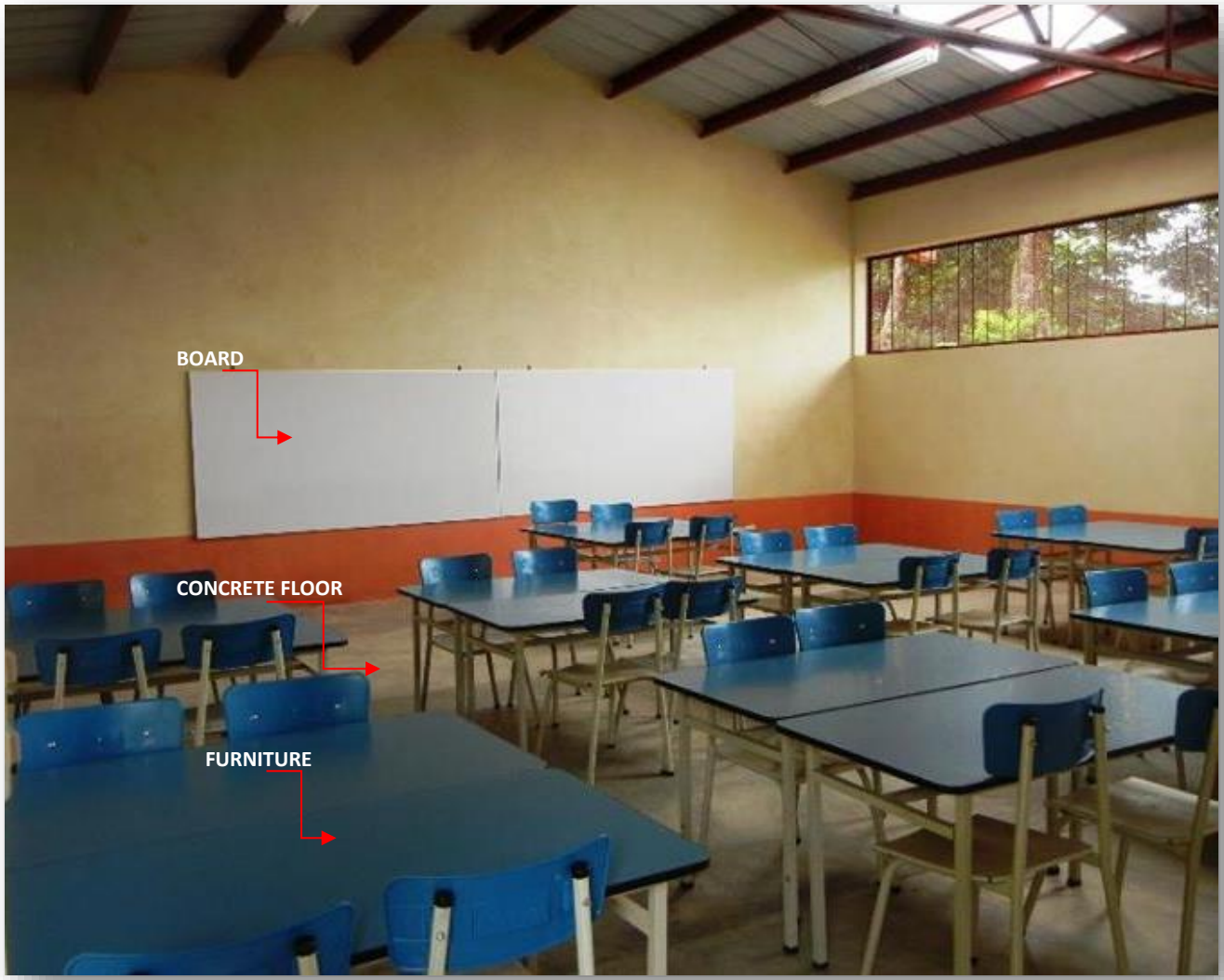
a. School Set



School set

EXTERIOR CLASSROOM MODULE

b. Classroom Interior



KNOWING THE TOOLS

Cinta Métrica
Para medir.

Segueta
Para cortar metal y aluminio.

Tijera de Metal
Para cortar lámina metálica.

Martillo
Para clavar.

Punta
Para picar paredes y piso.

Cincel
Para picar paredes y piso.

flat bar
to open holes in the earth

hoe
to mince and move the earth

pickaxe
to prick the earth and make trenches

shovel
to move materials move earth and make mix

wig cap
to scrape paint and metal structure

Spatula
Para raspar

brush
to paint and remove dust

Roller
Para compactar

wheelbarrow
to carry material and mix

Sieve
For sanding sand

Sieve
To sieve sand

Iron bending wrenches
To bend iron

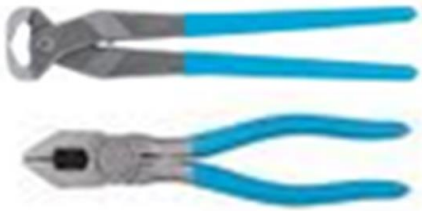
double wrench
to remove or fix ceiling pins and bolts

Adjustable wrench
to remove or put keys and valves

screwdriver
for screwing and unscrewing

Chisel
to remove or fix ceiling pins and bolts

Trowel
to move mixture and to clean



Pliers
for bending amd cutting wire

VI. Walls and Finishes

a. Damage and Maintenance Chart

damage and maintenance chart					
ELEMENTDESCRIPTION	**FREQUENT DAMAGE**	**CAUSES**	**EFFECTS**	**RECOMMEND MAINTENANCE**	**FREQUENCY**
WALLS AND CONCRETE BLOCK WALLS	DETERIORATED, NAILED BY NAILS, CRACKED LACK OF CLEANING	DAILY, nails, BLOWS, CALTERES PLACEMENT IN WALLS AND uncleanliness, MOISTURE	lack of cleanliness decreases the useful life of the building. deterioration of the material. bad appearance	clean the walls inside and outside the classroom. crack screams and holes. locate moisture and apply sealant. paint. do not stick posters on walls	Every 3 months
PLASTER AND POLISHING	DAMAGED, HOLES FOR NAILS, CRACKED uncleanliness	DAILY USE, NAILS, BEATS, lack of cleaning moisture	lack of cleanliness decreases the useful life of the building. deterioration of the material. bad appearance	clean the walls inside and outside the classroom. crack screams and holes. locate moisture and apply sealant. paint. do not stick posters on walls	Every 6 months
STUCCO	DETACHMENT AND DETERIORATION	Daily use. placement of posters on walls. humidity. lack of cleanliness	lack of cleanliness decreases the useful life of the building. deterioration of the material. bad appearance	wash the walls and avoid outbreaks of moisture. in case of not being able to improve its appearance washing the area must apply painting	Every 6 months
PAINT	DETACHMENT AND LACK OF PAINT. PAINTING IMPAIRMENT	Daily use. placement of posters on walls. humidity. lack of cleanliness	lack of cleanliness decreases the useful life of the building. deterioration of the material. bad appearance	scraping previous paint, cleaning walls, cleaning with paint putty, apply sealant	Every 2 years

b. Color

A school with color is a factor of motivation and good relationships within the educational community. Color in the right places and in the right combinations will produce the maximum benefits within the school.

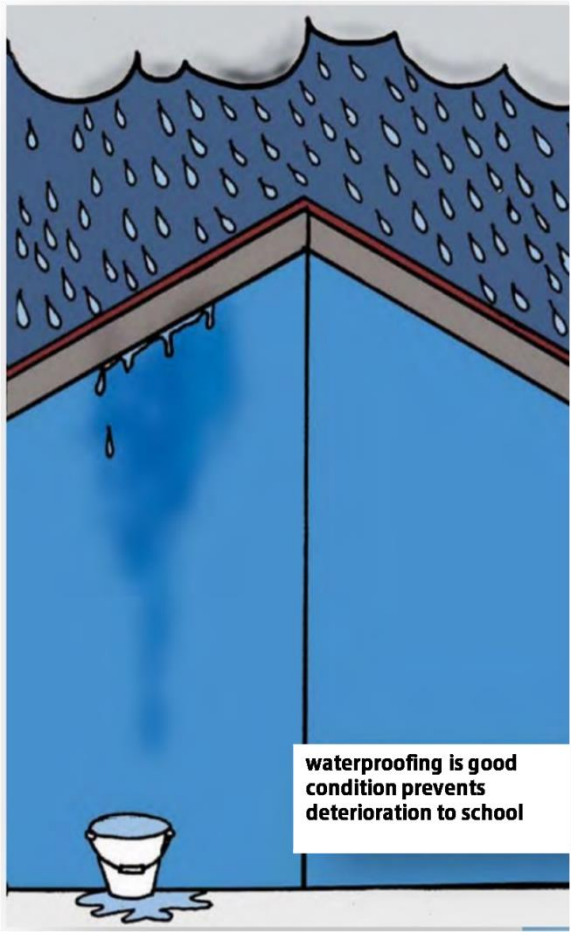
Experience also shows that color creates a cleansing air that will invite neatness and promote learning. So we recommend the use of light colors.

VII. Floors

When the floors show cracks, trim the concrete 5 cm around the crack to make the new concrete reposition. This activity must be done by a mason.

a. Sidewalks and drainage canal

They can suffer frequent damages by high traffic. It is advisable to carry out weekly inspections to schedule your repairs in the short term, as well as weekly cleaning of the drainage channels because besides being aesthetics, it is more affected in times of rain causing floods when they are not clean. In addition the grids should be maintained by stripping, cleaning with lacquer and applying a red anti-corrosion paint finish. This should be done every 6 months to avoid corrosion especially after the rainy season passed



VIII. Roofs

a. The roofs or roofs protect the upper part of the school building thus fulfilling a function of protection against inclement weather and especially rain.

Some frequent roof damage can be leaks, bends, and lack of fastening screws, oxidation, accumulated dirt, cracks and other. These damages can be generated by daily use, climatic factors, blows or

lack of cleanliness, resulting in deterioration of the roof, deterioration of the supports of the roof structure, deterioration of internal furniture and humidity. That is why it is recommended to carry out the following activities every 6 months;

- Check and clean the roof cover, if there are parts that cannot be repaired, they must be changed
- Cover leaks with drip cap leaks
- Check overlaps and fastening screws
- Cleaning of the translucent sheet to allow the passage of light, this can only be replaced by another translucent sheet.

b. Structure

All the structure present in the school building is iron so that oxidation, scales, dirt, lack of paint and this is caused by lack of maintenance, weather factors or by the same daily use, thus causing the complete deterioration of the material leaving an unstable structure

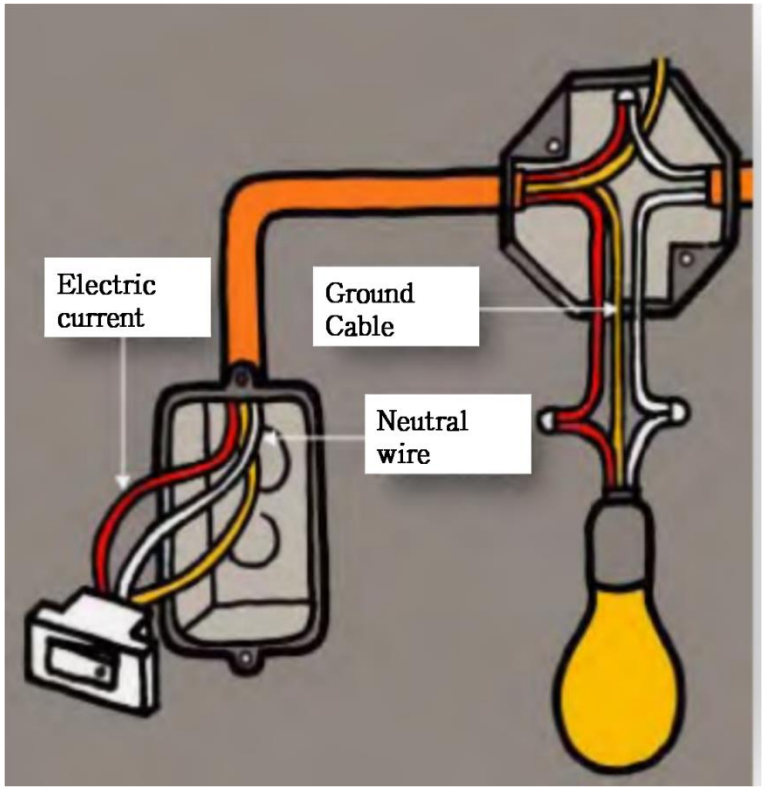
The following is recommended:

- Periodic cleaning every 6 months
- Check roof structure, if corroded it must be sanded, cleaned with lacquer thinner and then painted with red anthracite. If the part is badly damaged, you must cut the affected part and replace it with a new one, then apply the same treatment. This should be done every 12 months.

IX. Doors and Windows

All doors, windows and frames are made of iron, which can cause damages such as oxidation, deterioration of locks, hinges, pins, etc., dirt and other things that can be caused by climatic factors, blows, lack of paint, accumulation of humidity, etc.

The recommended maintenance is as follows;
• Check and clean all parts every month
• Check and repair, frames, counter frames, unfolded mesh, supports, hinges, keys, etc. Every six months
• Protect from moisture every 6 months

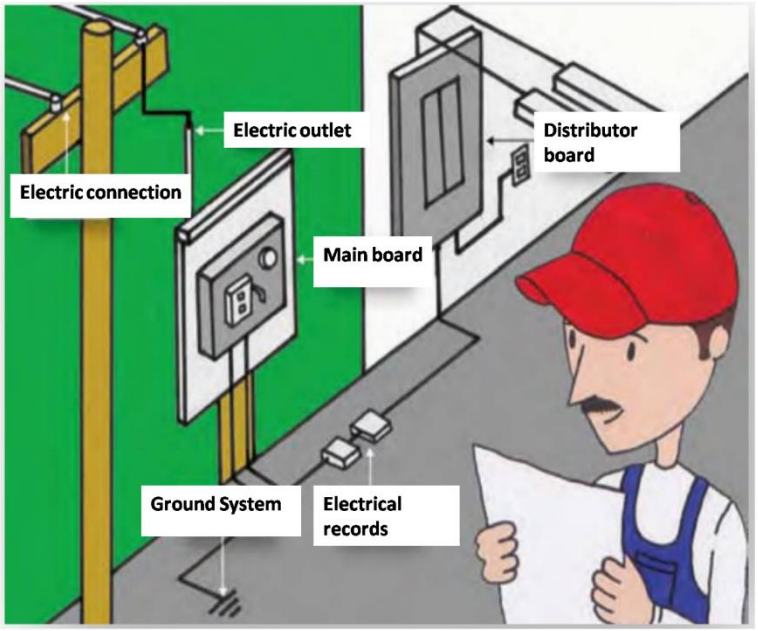


• Sand, clean with lacquer and paint with anti-convulsion every 12 months.
• The fittings (locks, hinges, etc.) should be oiled regularly, preferably using suitable spray

X. Electrical Installations

a. Components of the electrical installation

The components of the electrical installation, from the place of connection of the supplier company to the last exit of energy of the educational spaces of a school, roughly we can identify the following:
• Conductors (cables)
• Switches
• Load centers
• Power outlets
• Lamps



b. Preventive maintenance Actions

It is always important to promote the good use and care of the electrical elements.
As required, install screws for boxes and plates.
As required, secure piping to roof structure with galvanized wire.
Every 6 months, replace boxes.
Every 3 months, cleaning the elements

Use:

Know the power supply capacities and resistances of the electrical circuits of our installations in order not to overload them

- Do not use extensions of inferior resistance to the rest of the installation
- Do not connect more apparatus or equipment than those established by electrical outlet (use of multi-contacts)
- Keep equipment and facilities free from moisture
- Check the condition of the fuses
- Do not use electrical devices and installations other than the power supply (for example, to decorate decorative items such as paintings, lamps, ornaments, etc.)

Cleaning:

It is important to keep the various components of our electrical installations, such as dust in wires and in lamps and luminaires, food residues, poorly painted paint and without any loss of humidity. Always electrical installations must be free of moisture.

b. Minor Maintenance

It should be remembered that leaks and losses, however small, as well as dangerous, mean significant annual losses. Visible bare wires in electrical conduits should not be tolerated.

• The connections and fastening screws must be tightened. A loose or poorly tight connection heats the post, damages the insulation of the cable and propitiates short circuits.

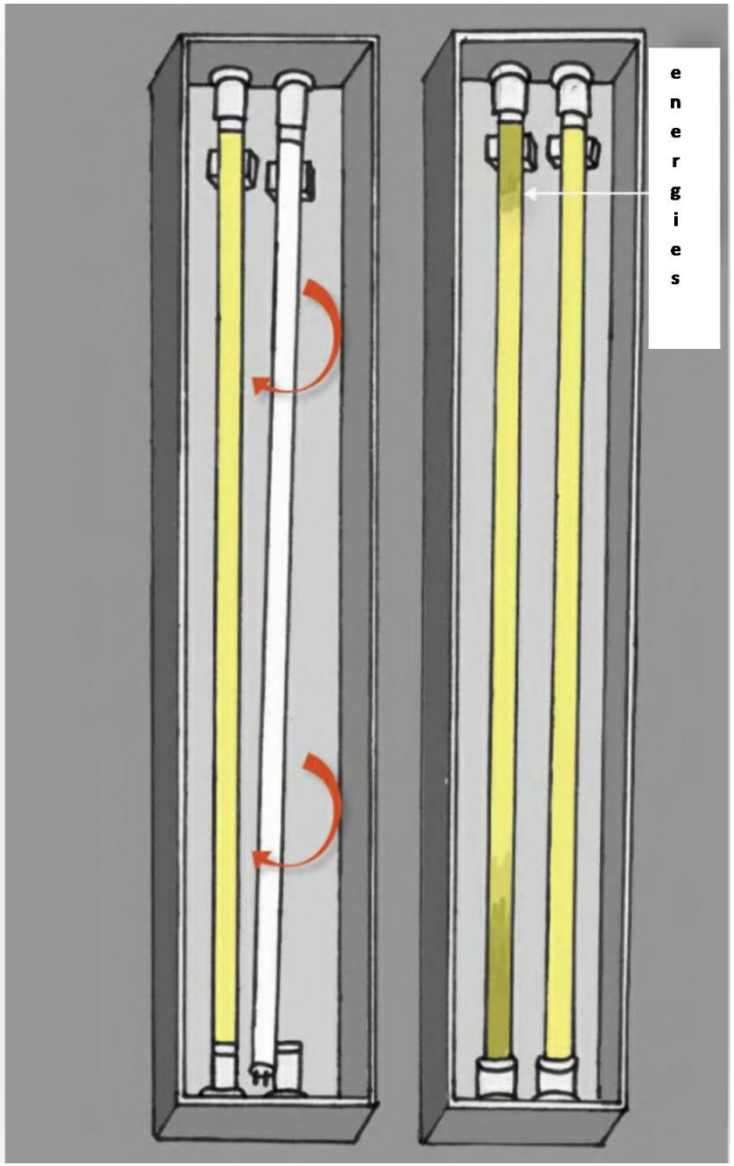
• All points, whether they are sockets, switches or boards, must have their corresponding protective cap firmly attached.

• Burned or damaged lamps should be replaced.

• Check that the light circuits are turned off and on from each room.

• Label the circuit. Enter information about voltage, number of phases, codes, name of the manufacturer.

• Do not exceed the nominal capacities of the jacks with equipment that has superior power to them.



Lamps

Replace the tubes in the presence of blinking or black spots at their ends, as this indicates that their useful life has come to an end.

• If an unexpected fault occurs, check that the internal connections of the lamp have not loosened or are loose.

• Check that the supply voltage to the lamp is indicated by the manufacturer (see specifications on the package).

Interructors

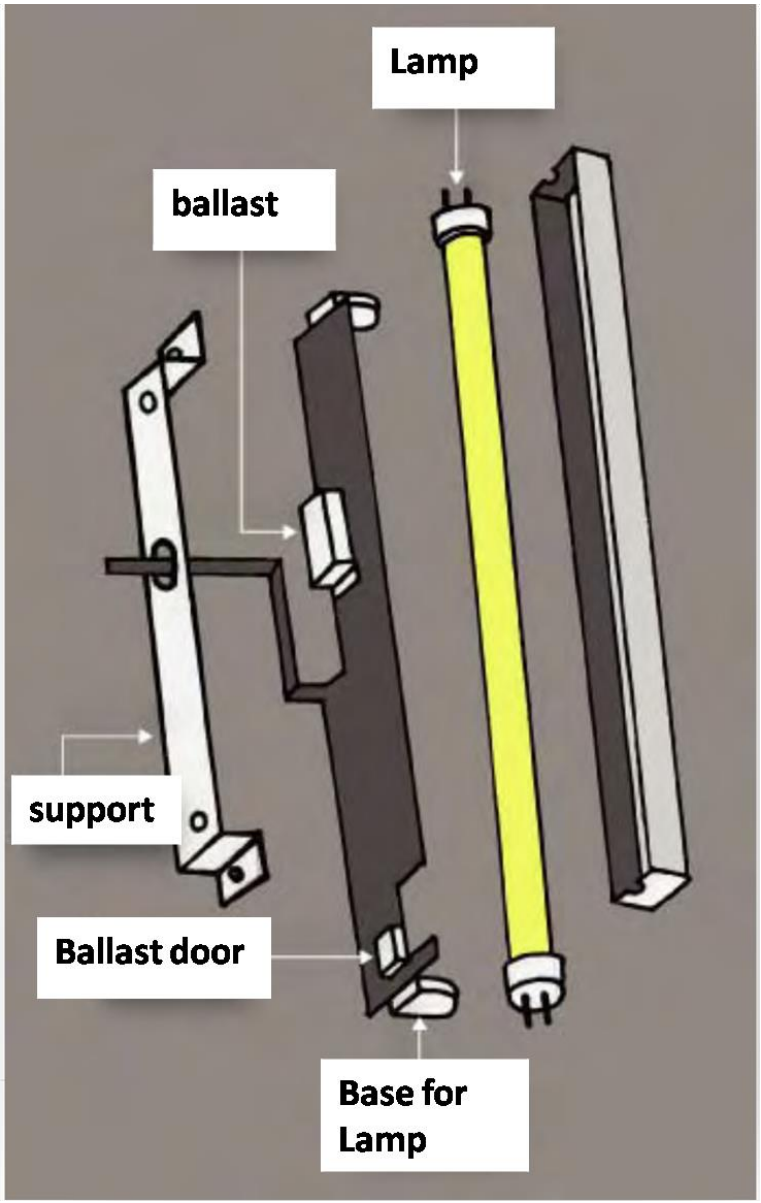
Check that the outer protective covers are in good condition and correctly fitted.

• Check that the connections to the terminals are firm.

• Check that the capacitance in amps is adequate to the load connected to the circuit it controls.

• An intercooler must be replaced in case of

• break or fail, or show signs of burnout such as deformation and carbonization.



Cables(conductors)

Checking the insulation of cables in their terminal sections, where it is connected to devices and equipment (lamps, dampers, contacts, ballasts, etc.).

Generally, insulating materials that are deteriorated and harden, totally losing their insulation capacity, which can cause discharges and short circuits.

This must repair, when the length of the cable does not allow new cuts, it is necessary to proceed to replace the entire section (rewiring) of the circuit where the deterioration occurs (from the previous record or device), in no case should be made splices or ties of cable inside the pipe, these must always be done in the registration boxes.

Load Center

Noise or buzz inside the circuit board, which generally indicates that there is a loose or poorly connected connection, that one of the protection switches is damaged or that one of the circuits is overloaded

XI. Plumbing and Sanitary Equipment

a. Components of hydraulics and sanitary facilities

The hydraulic system, is composed of the set of pipes of a plastic material (PVC); as well as valves and connections destined to asurtir of water to each of the furniture and sites of the building that require it. The majority of the components of this installation are usually hidden in the floors and walls of the building, the components that are located in the areas outside the buildings are buried. Also part of this installation is the water pumping and storage equipment (cisterns).

b. Preventive maintenance Actions

As in the rest of the installations, the main measures for the maintenance of the hydraulic and sanitary systems are the preventive type, among which we can emphasize the correct and responsible use, as well as all cleaning measures.

The placement of heavy objects on sanitary furniture, their use as steps to reach elevated sites are
frequent practices, which lead to the anticipated deterioration of our hydraulic and sanitary facilities.

We must take into account that there are components of our facilities that have a short shelf life, such as the fittings and accessories of the flush tank of the toilets, as well as the packaging of the keys and valves of our facility, so we must do permanent monitoring of these components to replace them in a timely manner, avoiding leaks that could lead to further deterioration

c. Corrective Maintenance

- **Pipelines**
  The pipes are the elements that are used for the conduction of the water, they are divided according to their function in: distributing pipes (drinking water) and collecting waste water or waste (sewage).

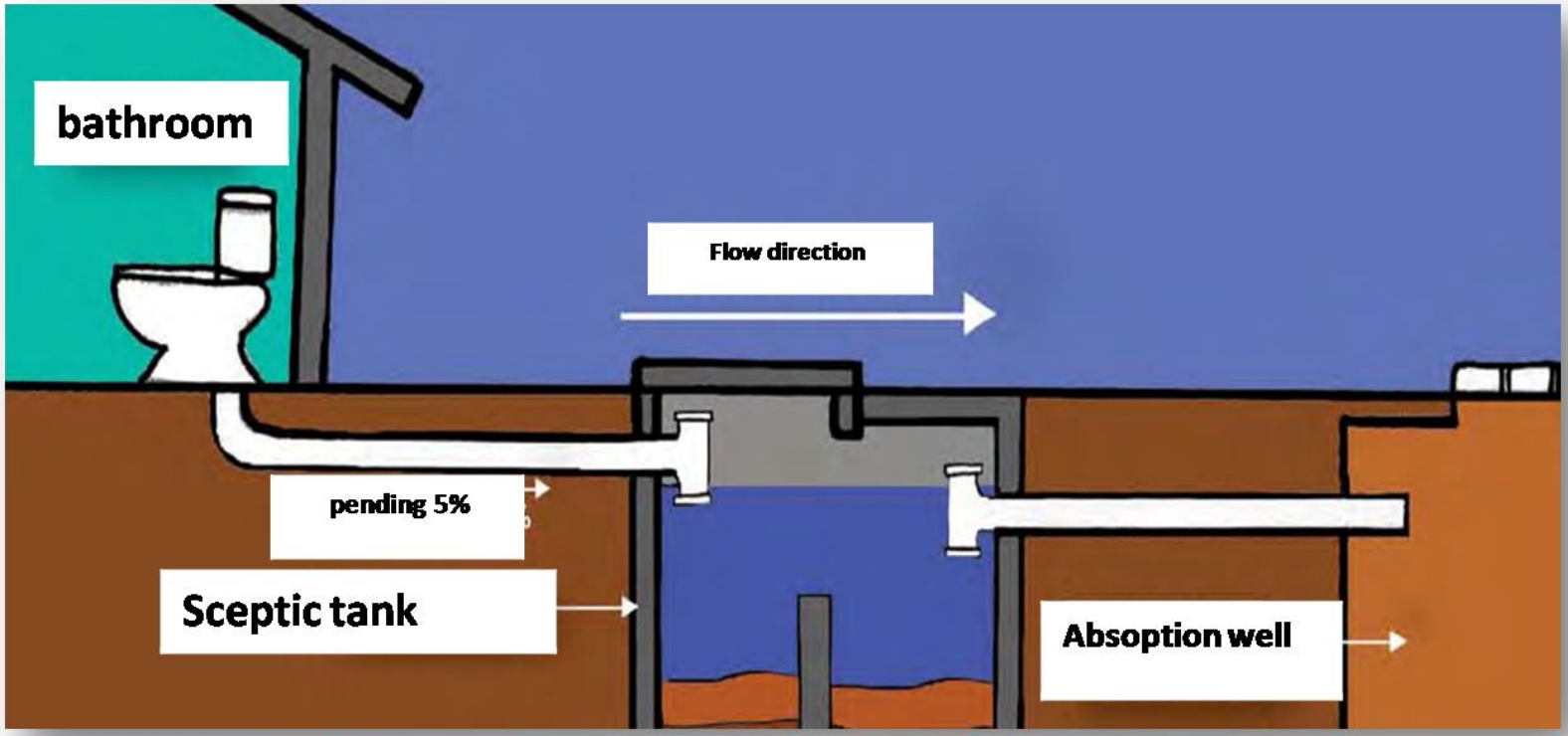
- **Water distribution pipelines**
  They serve for the distribution of the potable water to the sites of the building that require it for its operation, they are characterized because they work under pressure. The way of joining the tube sections in the PVC is with glue or PVC additive.
- **Collection pipes for sewage and rainwater**
  They are the ones that are used to dislodge of the buildings and installations the waters already used or coming from the rain, are made of the plastic (PVC).

Main problems that may arise in pipelines
Obstruction or rupture of pipes: the main cause of detachment in the sewage collection network is the inadequate use of the same, since they are poured through the toilet, the coladeras or the lavabos, solid waste that when not able being transported by the water accumulate impeding the outflow.

In the external network, as a result of the lack of control over trees and gardens, the development of roots and fungi that break or obstruct the pipes is frequent.
The rupture of pipes is often related to settlements of the ground or with a very shallow installation in an area of intense circulation of people and automobiles. Black water pipes should be cleaned periodically in order to ensure the free flow of the sewage liquid. The same as the registration boxes to avoid the accumulation of residues and insects.

Sceptic Tank

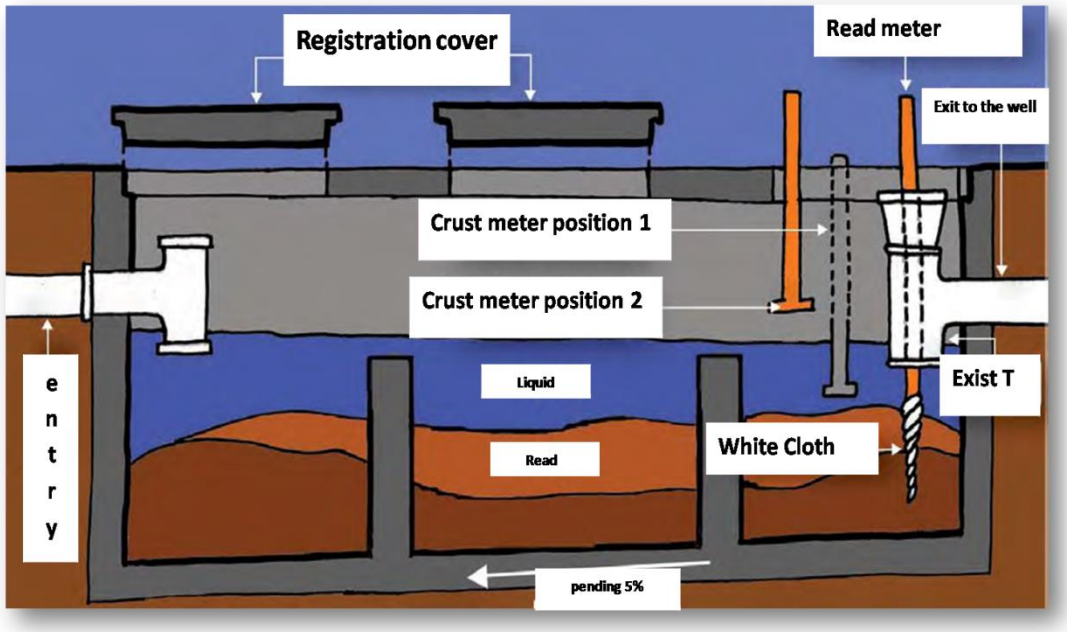
The septic tank is part of a system for the treatment of black or residual water, consists of an impermeable container built under the floor level, where it is discharged from black water and is retained for a period of time (minimum 24 hours) necessary to perform the separation of solids and liquids through a settlement process.
Separation of the waste allows the treated water to pass into the absorption well, where it is incorporated into the soil, eliminating impurities through oxidation, while the solid waste that was not digested by the bacteria accumulates at the bottom of the septic tank from where they must be removed once the established limit is exceeded so that they do not pass to the absorption well.



Maintenance of the septic tank

The septic tank cleaning is carried out by extracting the contents of the tank, for this there are companies with the necessary equipment and properly registered with the Health Secretariat. The empty tank should not be washed or disinfected, it is advisable to leave a little sludge (5 cm thick) so that the decomposition process inside the tank does not stop.

It is important to note that for the proper functioning of the septic system no soap water should be used, nor should it be added chlorine or lime, as this will disrupt the process of degradation and digestion of bacteria.
To facilitate the maintenance of the septic tank is convenient to have a plane with its exact location within the land, as well as of the distribution
(pipes, chambers and absorption well).



No toilet paper, or trash of any kind (newspaper, napkins, bags, rags, etc.) should be deposited in the system, since they alter the degradation process of the excrement.

XII. Furniture and Equipment

a. Preventive Maintenance

The furniture and equipment, together with the building, form the fundamental material base for the realization of the educational fact. Its conservation and maintenance in optimum conditions will contribute to the efficiency and quality of education. To do this, you must:

- Immediately repair any problems that may occur.
- Replace missing parts before deterioration begins.
- Clean furniture once a week
- If there are parts with rust, remove the same sanding, cleaning with lacquer and then painting with anti-corrosion.

XIII. Outdoor Maintenance

The outer areas of the school are a good of all. The care of green areas, sports courts, pavements, fences and other components of the outdoor area will ensure an excellent relationship between the neighborhood community and the school.

a. Perimeter Fence

It is important to make rectifications of measures of the site polygon with municipal advice because what is lifted is a permanent foundation and is what will make the separation of the neighbors with the school. Provides security for what is important that once raised, every 6 months make the resans in concrete and replacements of parts that have fallen, lost or deteriorated (pua wire, metal tubes, etc.) since it is exposed to the interperie , so it is necessary to make periodic reviews and corrections. Sanding and painting with anticorrosive metal and lime or concrete paint.

b. flagstands and Bases

Every 6 months, check the condition of concrete works (bases of flags) and to make the necessary resans.
Every 12 months, paint the antlers and check the condition of the flag to change if necessary, remember that it is at the intersection and exposed to changes in weather.

c. Green Areas

Green areas and particularly copious trees and shrubs contribute to improving the climate of the areas they occupy, some of their most notable direct benefits are as follows:

- Protection against solar radiation: they protect the buildings built in their proximity (ultraviolet rays are one of the main agents of the deterioration of these installations
- Regulation of the temperature: as a result of the absorption of the solar radiation, the trees and shrubs transpire water through their leaves, which evaporate the lavegetation temperature, the surrounding air, and therefore of the aerial space, making these places cooler .
- In times of cold trees and shrubs act as a curtain avoiding the direct impact of "frost" and air currents on buildings.
- Reducing noise and pollutants in the air.

Important:

Make replenishments of trees, shrubs and plants in June and July to take advantage of the rainy season.

• The fertilization is recommended in growth, development and flowering. Nitrogen and phosphorus in growth and development, and potassium before flowering. Apply organic fertilization.
• Irrigation, as many times as necessary. Try to plant ornamental plants that require little water.
• Applying lime on the stems of trees helps control pests.
• Pruning in trees and shrubs is a necessary activity to control excessive shade and also promotes new vegetation. Perform it in the month of May.

Waste Treatment

The treatment of garbage in schools is an example and teaching for the community, so it is important to carry out this task with the greatest possible care for the environment, since one of the great problems of our society is the excessive production of waste..

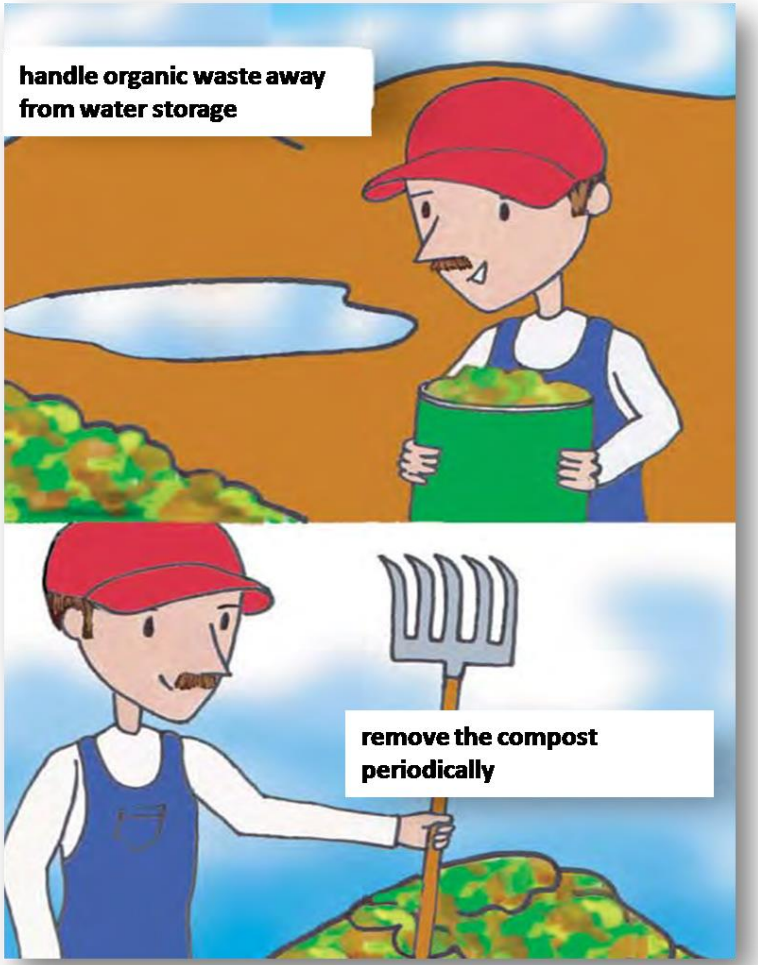
Separate treatment of organic waste (consisting of food scraps, vegetable and fruit peels, leaves of the trees, grass) and inorganic (we refer to wastes of paper, cardboard, cans, glass and plastic, among others) for that suggests using different deposits or cans, clearly indicating which is the respective use. And looking for recycling the garbage if possible.

In case your garbage collection service does not exist in your locality:

• Choose a place where children do not play and that is far from any water reservoir (dam, river, well, etc.).

• Dig a hole one meter long by one meter wide and one meter deep.

• Throw trash in the hole daily and cover with earth



Eliminating organic waste:

The trash that decomposes, such as leaves, food scraps, peels, etc., we can separate it to make it fertilizer and re-integrate it with nature through a process of composting:

- Select and separate organic garbage, food scraps, vegetable peels and fruits, tree leaves, grass (preferably remove debris from meat, bones and fats, as their scent attracts animals such as dogs, cats and mice that dig up the compost and leave their own waste that can alter the decomposition process).
- Dig a hole one meter long by one wide and one meter deep, also located at recreational sites and water reservoirs (rivers, lakes, lagoons and pools).
- I added a layer of sawdust to the bottom and disposed of organic waste.

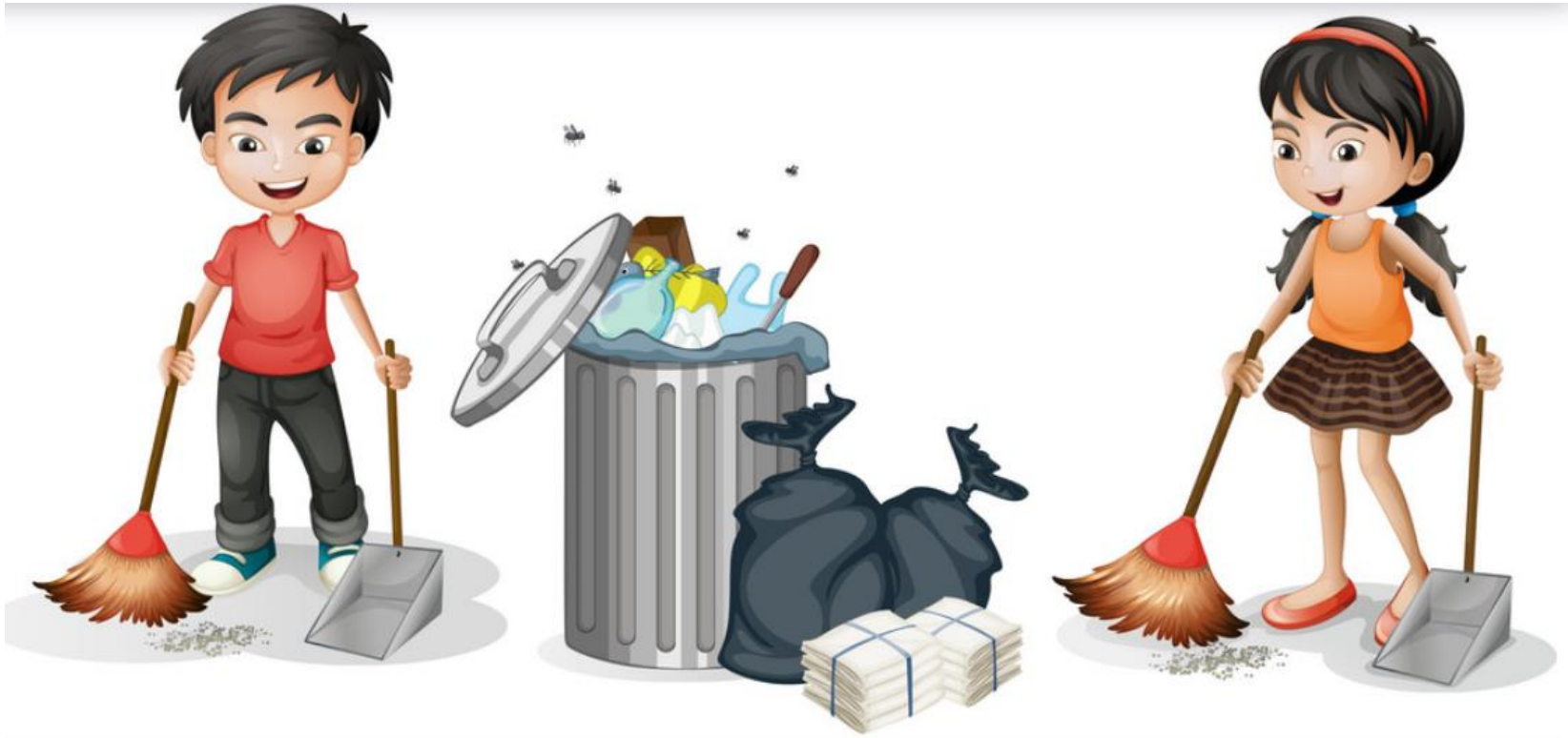
- Cover them with a layer of earth, to avoid cracks and bad odors, to repeat until it seals the hole.

- Under normal conditions you can obtain humus (very fertile black soil) within 3 to 4 months, this can be used to fertilize the garden

XIV. Preventive Maintenance Program

a. Daily tasks

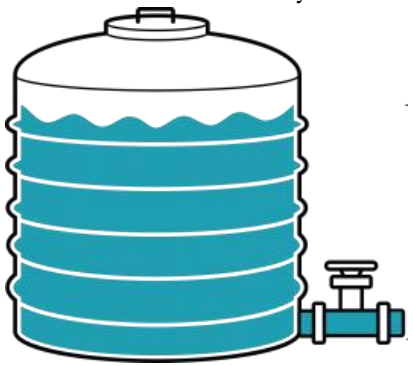
- ☐ Sweep the floors
- ☐ Collect garbage in the classroom around the school and drop it in garbage cans.
- ☐ Check that health services have toilet paper for the next day.



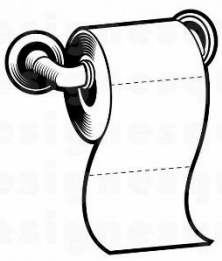
b. Weekly tasks

- ☐ Check that sanitary services and sinks are working properly.
- ☐ Cleaning of sanitary services, including necessary repairs.

- ☐ Check that the tanks have enough water for the next week. But be sure to fill the tank with the resources available in the community.



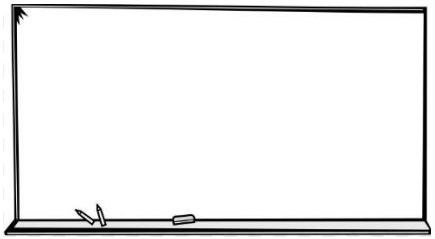
- ☐ Check the inventory of tools necessary for the proper functioning of the school. These include:
  - Toilet paper
  - Bulbs or candles
  - Clean the waste deposits.
  - Cut the grass and prune the trees.



c. Monthly tasks

Review and repair of facilities that may require repair:

- ☐ Slates



- ☐ Power outlets and cover lights.

- ☐ Doors and Windows

☐ Leaks on the roof

☐ Replace the bulb that may be burned or lost.

☐ Review the tables and chairs.

- ☐ Clean or wash dirty walls.

d. Annual tasks

- ☐ If the school is closed in the winter, make sure the doors are locked.
- ☐ Inspect the facilities in the play area and make the necessary repairs.
- ☐ Check the perimeter fence and make sure you make the necessary repairs.

- ☐ If mineral-based water filters are used, develop an effective use plan to maintain the appropriate levels of bacteria.
- ☐ Consider giving access to clean water to the community.

Repair acrylic slates if necessary. When using chalk boards, do the painting maintenance.

- ☐ Repair or replace furniture.
- ☐ Repair or replace if necessary: doors, windows, roof panels, hydraulic installations, electrical installations.
- ☐ Before classes start, do some cleaning work.

e. Tasks every 5 years

- ☐ Clean and paint all surfaces of the school except prefabricated surfaces such as roof panels.
- ☐ Repair, replace, clean and paint playground equipment, except for prefabricated surfaces such as swing frames, etc.