

Toilet Etiquette



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The campaign *Toilet Etiquette* is an initiative of the Water and Sewage Services Administration of Nynäshamn (hereafter WSS) in cooperation with the Nature School and Agenda 21. The campaign aims to increase public knowledge on what may and may not be washed down the drain, thereby improving the quality of sludge produced in the region and reducing the amounts of nutrients and harmful chemicals released into lakes and seas. According to the law, each municipal district must take care of the sludge it produces. In order to use the sludge as a farmland fertilizer, it cannot contain environmentally harmful substances. **Foreign objects or chemicals disturb wastewater treatment resulting in harmful substances ending up in sludge or released into lakes and seas.** What households wash down the drain is crucial for the usability of sludge as a fertilizer in agriculture (private households release an amount of chemicals equal to that of the industrial sector). In recent years traces of drugs have been found in soil and water. These substances have been transported there via the sewage system and can, among other things, cause drug-resistant bacteria to develop.

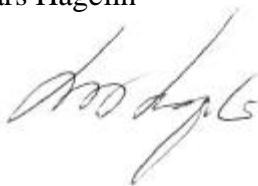
Objects and chemicals washed down the drain do not only cause environmental problems, they also add to the cost of the WSS. Every week the WSS must dispose of 400 kg of rubbish that does not belong in the wastewater. Also pump stations must be mended and pipes must be cleaned out because of objects that do not belong in the sewage system. The annual cost of this adds up to 100,000 SEK.

The educational gain of the campaign is that children get to see how the municipal district's sewage system works and how it is possible, using wastewater treatment, to recycle nutrients. Our ambition is for the campaign to show a complete chain of events; starting from what every individual washes down the drain at home, to wastewater treatment facilities, to sludge and back to farming. By tying the rather complex issues of recycling to everyday events and personal responsibility, we can increase understanding of our environmental issues.

How can you contribute?

- Keep a pedal-bin in your bathroom. Use it to dispose of anything that shouldn't be flushed or washed down the drain.
- Use eco-labelled washing powder and detergents.
- Dispose of environmentally harmful materials at your local hazardous waste collecting point.
- Return left-over drugs to your local pharmacy.
- Post the tips for environmentally friendly cleaning on the inside of your cleaning cabinet.
- Apply the correct amount of washing powder (there is a 0.3 dl difference in dosage between different water types). Use the dose for soft water in Sunnerby-Spångbro and Marsta and for moderately hard water in Nynäshamn, Ösmo and Grödbby.

Lars Hagelin



The Water and Sewage Services Administration,
Eco-municipality of Nynäshamn


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How to use this material

Home Investigation: Copy the two-sided handout and distribute to pupils. There is one handout for younger and another for a little older children (pages 15-18).

Environmentally Friendly Cleaning Tips: Folder to hand out to pupils together with the home investigation.

Things That Shouldn't Be Flushed: Folder to hand out to pupils together with the home investigation.

Sticker: Sticker to post somewhere in the bathroom or on the toilet seat.

Books: *My Friend Molly* for pupils in grade 1 and *The Water Book* for pupils in grade 7 (See page 7).

Educational Videos: Can be borrowed from the Nature School (see page 11).

Drugs and the Environment: 66-page book from the National Pharmacy. Distributed to all grade 4-9 teachers. The main themes of the book are drugs and how they end up in lakes and seas (pages 21-33), antibiotics and ecology (pages 35-50) and the effect on aquatic life (pages 51-59). The abstract might also be of interest (pages 6-7)

Choosing Environmentally Friendly Washing Powder and Detergents: An easy to read book with an index of chemical substances found in detergents. This book has been sent to each school's environmental group representative. A list of useful words from the book has been included in this text (see page 12).

Observation List: The Swedish Chemicals Inspectorate's list of substances of special concern. This list has been sent to each school's environmental group representative.

Working internationally: Science Across the World (see page 9).

Purpose

The campaign *Toilet Etiquette* aims to increase public knowledge on what may and may not be washed down the drain, thereby improving the quality of sludge produced in the region and reducing the amounts of nutrients and harmful chemicals released into lakes and seas. With improved sludge quality phosphorus, a nutrient and a limited natural resource, can be recycled and used as a farmland fertilizer. Environmentally harmful substances hurt plants and animals and in the long run humans. They also disrupt the wastewater treatment process, thereby causing a higher discharge of nutrients into our environment. Everyone participating in the campaign is helping to recycle nutrients!

Who administers and funds the campaign?

Toilet Etiquette is an initiative of the Water and Sewage Service Administration (phone: +46 (0)8-520 680 00) in cooperation with the Nature School (phone: +46 (0)8-520 735 65) and the municipal district's Agenda 21 coordinator (phone: +46 (0)8-520 682 62).



Agenda 21 Program, 2003-2005

The section on lifestyle and recycling states the following goals:

- A comprehensive view on ecology, careful utilization of natural resources and recycling are to be central concepts in the planning of all operations.
- Human activity is to be seamlessly incorporated into its environment.

The section on water states the following goals:

- The amount of waste discharged into lakes and seas is to be reduced.
- A sustainable process for taking care of nutrients from our sewer systems is to be developed.

The School and Child Care Administration's Plan for Health and Environment

As one of five goals it is stated that:

- A minimum amount of waste is to be burnt and the quality of the municipal district's sludge is to be kept at a high level.

Goals and Budget

In the strategic plan for all public operations it is stated, in the section on Waste and Sewage, that "all materials are to be recycled" (page 15). In the corresponding section for the Water and Sewage Services Administration specifically (page 39) it is stated that "our ambition is to continuously increase the quality of sludge and inform households, industries and other operations of the need to reduce the use of chemicals and to prevent the discharge of heavy metals and other toxic substances into the wastewater".

National Curriculum (Lpo 94)

In the section on norms and values it is stated that:

- The school should strive to ensure that all pupils show respect and care for the immediate environment as well as for the environment in a wider perspective.

In the section on knowledge it is stated that:

- The school is responsible for ensuring that all pupils completing compulsory school have fundamental knowledge of what is necessary to maintain good health and also understand the importance of lifestyle for health and the environment.

School Agenda 2003-2006

The section on health, physical activity and environment states that:

- Every school is to work with environmental knowledge and awareness.



Pipeline Mentality

One of the greatest problems associated with industrialism is that it promotes pipeline mentality. With pipeline mentality we mean thinking in processes where input resources go in one end and waste comes out the other. In the long perspective, these processes will cause both a shortage of input resources and problems of disposing of waste

materials. Our sewage systems are a prime example of pipeline mentality. Via our food, nutrients and energy will eventually be flushed down the toilet. Before wastewater treatment was implemented in Sweden, sewage was simply flushed unprocessed into lakes or the sea. The consequence was eutrophication and beaches unsuited for bathing. Nowadays our wastewater treatment plants produce large amounts of sludge that can be used as an agricultural fertilizer (in some cases the sludge is first left to rot, whereby gas can be extracted). If the sludge contains too many substances that are harmful to us human beings, it cannot be used on our farmlands. Instead it is deposited on the city dump. Only by using sludge as an agricultural fertilizer can we recycle the nutrients found in the sewage.

Recycling mentality

In order to move from pipeline mentality processes to recycling, it is important that all people connected to a process know what may or may not be inserted into the system.



It's Not Just the Toilet

When talking of sewage systems and what may or may not be flushed down the toilet, it is easy to forget all the other ways in which water exits a household. The wastewater treatment plant receives water from all parts of a house, including shower, bathtub, washing machine, dishwasher, sink and the drain in your garage.

The Alhagen Wetland Area

Before sewage from Nynäshamn and Ösmo municipality is discharged into the Baltic Sea, it first passes the Alhagen wetland area. By passing through several different dams, the water is cleaned using a natural process where bacteria move nitrogen from the water (ammonium and nitrates) to the surrounding air (air nitrogen). From August to October, classes in grade 6 and 9 visit the dams at Alhagen to do fieldwork together with the Nature School. The grade 6 pupils make an inventory of the plant and animal life. The grade 9 pupils perform chemical analysis on the water. To see and physically come in contact with the wastewater is a way to show pupils what actually happens on the other end of the sewage pipe. What you flush down the toilet will, in a couple of week's time, affect the water in which life is present both above and beneath the water level at Alhagen.

Phosphor

Phosphor is naturally present in the bedrock and is a vital nutrient for all animals and plants. As the bedrock weathers down the phosphor is released and becomes available to plants. When a piece of land is farmed, large amounts of phosphor are removed from the land with every crop. Therefore, in conventional agriculture, the land is fertilized using mined phosphor (artificial fertilizers). A by-product when mining phosphor is the poisonous heavy metal cadmium, which is also dispersed onto farmlands when using artificial fertilizers.

Washing powder contains phosphor because it's a so called builder, i.e. it combines with magnesium and calcium ions, in effect softening the water. Without wastewater treatment

plants, the phosphor in our food and washing powder would simply be transported through the sewage systems and out into our lakes and seas. The lakes would become overgrown and in the sea the phosphor would finally end up in the bottom sediment. Our wastewater treatment plants are however very efficient when it comes to reducing the levels of phosphor in the wastewater, between 90% and 98% of the phosphor ends up in the sludge. The wastewater treatment plant in Nynäshamn reduces phosphor levels by 96% which means that out of the yearly 14,000 kg, approximately 13,500 kg end up in the sludge (500 kg end up in the Alhagen wetland area or in the sea). 20% of the phosphor in our wastewater comes from washing powder and other cleaning detergents.

If the sludge is of bad quality, the phosphor cannot be reused on the farmlands and the farmers must buy artificial fertilizers containing mined phosphor. Mining phosphor is not an ecologically sustainable solution because the phosphor is a limited resource that, according to some experts, will be depleted within 100 years using today's amount of mining. Therefore it is crucial that phosphor from our wastewater can be reused to secure a productive agriculture for future generations.

Flushing Drugs

Large amounts of legal drugs are used in Sweden. Some have now been traced in soil and water; transported there via the sewer systems. Drugs end up in the sewage either after passing through our bodies, i.e. the drug has been used, or because leftover drugs are disposed of in the toilet. We have very little knowledge of the effects leftover drugs might have on our environment. Some research, however, implies that antibiotics can give rise to resistant bacteria. This means flushing drugs has two negative effects; the wastewater treatment process is interrupted and harmful bacteria, i.e. those that cause diseases, cannot be fought using antibiotics in the future. More information on this subject can be found in the book "Drugs and the Environment" (see page 11).

Toilet Etiquette

As a complement to the campaign on what may or may not be flushed down the toilet, a discussion can be held on how we would like bathrooms to be in order for everyone feel comfortable and not be discouraged to visit them. Always cleaning the toilet after use is natural for some, but not all, people. A simple way to keep the toilet clean, and also to reduce the amount of detergents needed, is for everyone who uses the toilet to also use the toilet brush afterwards. For men, a simple measure is to sit down instead of using the toilet standing up. This reduces the risk of getting the toilet dirty and increases men's understanding of women who must always sit down. If you have to sit on the toilet it also becomes more important that the toilet is clean. As a bonus, men get a good introduction to grown up life. There are some things which may appear trivial, but that can have disastrous effects on the relation between a man and a woman. The classical fights over "not putting the toilet seat down" or "missing the toilet" are matters every relation would do better without.

During the campaign pupils could decorate bathrooms with paintings describing what may or may not be flushed down the toilet.

"Through-The-Wall-Society"

In the book "Environmental Didactics" (Sandell et. al. 2003) the term "through-the-wall-society" it introduced. The term refers to a society where human contact with the surrounding eco-system is primarily through walls using pipes and wires. The pipes and wires transport water, electricity, air, excrements, urine and heat, thereby sustaining human biological life. A modern trend is that humans are transported between buildings without ever having to come

in contact with their surroundings. An example of this would be children being driven to and from school every day. Only two or three generations back people were forced to venture outside the wall in order to fulfil such mundane tasks as going to the lavatory, taking a pee, bringing in wood and food. According to the authors, one of our time's greatest environmental didactic challenges is to open up doors in these walls.

How do we explain to our children and pupils what happens beyond the wall? History, geography, arts, languages, ecology, excursions, outdoor life and outdoor learning can all be used to animate children's ideas of the environment. The campaign *Toilet Etiquette* opens at least one door ajar and is even more effective when followed up by a visit to Alhagen's wetland area through which a large amount of the municipality's sewage passes on its way out into the Baltic Sea.

Converting Theory into Action

In *Environmental Research* (vol. 6, 2002) professor Anna Lisa Lindén writes on the great challenge of everyday life; changing to a more environmentally friendly lifestyle. She claims that young people have a good theoretical understanding of nature, society and our environment, but that young people have yet to adapt to an environmentally friendly lifestyle. Older people's habits are to a greater extent friendly to the environment. They use public transportation, they separate their garbage, they turn off the lights before leaving home, etc. They do all this despite having less theoretical knowledge of nature, society and the environment. The older generation seem to have an unconscious practical knowledge of how to act to spare the environment. This knowledge dates back to the time when there was a lack of resources in society and the economical use of these was important. Anna Lisa Lindén means that in the future, this practical knowledge will die out and be replaced with the theoretical knowledge of younger generations.

A great challenge for modern day teachers is thus to convert the theoretical knowledge of the young generation into action. In the campaign *Toilet Etiquette* we try to translate the theoretical knowledge of how nutrients flow through our society into practical actions by which every individual can adapt so that nutrients are recycled.

Example Assignments

Ages 7-9

My Friend Molly: A good book to read aloud while the children draw illustrations and then discuss what they have learned. This book is distributed to all grade 1 teachers. Molly the molecule embarks on a journey through time and space. The book fits nicely in the natural sciences area but can also be used in history or geography. A good complement to the book is "A Drop of Water", available on the Nature School's First Class homepage.

Environmental Detectives: Two-sided handout that can be copied and distributed to pupils. The results of the investigation can be used as discussion material on different symbols and what they mean. Why do we have these symbols and for whom are they meant? Distribute the two folders and the sticker together with the investigation (see page 11).

Sludge – No Dirty Business: Video that can be borrowed from the Nature School. The 12 minute program is about sludge and how we can avoid polluting our wastewater.

Ages 10-12

The Water Book: A book that can be lent to all pupils in grade 6. The 24 pages discuss water and sewage systems, are richly illustrated, and easy to read. After use the book is collected

and saved for reuse next year. The books can be used in preparation for the visit to the Alhagen wetland area. The book can be used in a variety of subjects:

Natural sciences: What is the natural flow of water in our environment? What is acidification and eutrophication? What is sludge? How is the Baltic Sea affected by what you wash down the drain? What are nutrients, where do they come from and where do they end up?

Social sciences: What do your municipal area's fresh and wastewater facilities look like? Who is responsible for keeping the systems running?

Home economics: What is hard and soft water? How can stains be removed from clothing in an environmentally friendly way? What is dirt? Is a garment full of fabric softeners (tensides) really clean? How do you avoid allergies in your home?

Mathematics: If you wash two machines a week, how much washing powder do you use in a year? If you use the recommended dose for hard water despite the fact that your water is soft, how much washing powder is used unnecessarily in a year?

The Water Book – Teachers Manual: 26 page manual containing much important knowledge for the teacher and with clear references to the pupils' book. Distributed to all grade 6 teachers.

As Long as There's Life – There's Water and Sewage: Video that can be borrowed from the Nature School. It's 26 minutes long and about both fresh water and wastewater treatment. Experiments on water treatment can be found in the compendium "Nature and Environmental Experiments" pages 27, 37 and 42. The compendium is available on the Nature School's First Class homepage.

Home Investigation: Handout to copy and distribute to pupils. The results can be used in math class or to discuss eco-labelling. The chemical substances can be used for discussion and experiments. The class could also work internationally with Science Across the World (see ages 13-15). Distribute the two folders and the sticker together with the handout (see page 11).

The Nature School and the Alhagen Wetland Area: A 30 minute video on the natural denitrification process at the Alhagen wetland area. The video also shows the work of grade 6 and 9 pupils during a day at the wetland area in the autumn semester. The video can be used to prepare grade 5 pupils for the trip or for repeating what was learned with pupils in grade 6.

Ages 13-15

Household chemicals are an excellent introduction to the world of chemistry. They are concrete examples of how chemicals are used and it is simple to show their function. What do all those bottles at home actually contain? Doing a home investigation can help pupils take the first step into the subject of chemistry (see handout, see page 17). Distribute the two folders together with the handout (see page 11).

Choosing Environmentally Friendly Washing Powder and Detergents: An easy to read book with an index of chemical substances found in detergents. This book has been distributed to environmental group representatives at each school.

Observation list: The Swedish Chemicals Inspectorate's list of substances of special concern. The list has been distributed to environmental group representatives at each school. The list is also available in pdf-format at www.kemi.se/publikationer/trycksaker_sc.htm.

School Chemistry: A homepage from Umeå University with examples of how to get pupils interested in chemistry using experiments with household substances. www.chem.umu.se

Science Across the World (SAW): The fundamental idea of SAW is; perform experiments locally, share knowledge globally. SAW maintains a homepage for pupils aged 12-16. The purpose of the theme “Chemistry in Our Lives” is to teach pupils more about household chemicals and the symbols found on packaging. Pupils also learn to make their own chemical substances and the important role of chemistry in the economy of their home country. The homepage is in English but documents can also be downloaded in German, French, Italian, Portuguese and Spanish. There are tutorials for both pupils and teachers. The material contains a form to be filled out by the pupils. The results of this form are then shared with pupils from other countries. Through a database the class can come in contact with classes from other countries who are interested in cooperating. Should there at the moment be no class available, there is a library of previous forms from all around the world. SAW also has other themes than “Chemistry in Our Lives” that the Nature School has information on. The homepage can be found at: www.scienceacross.org. Simply call The Nature School to be provided with a password.

Alhagen, nitrogen and phosphor: For pupils in grade 9 the connection to the Alhagen wetland area is very natural. After working at Alhagen the pupils have good knowledge of nitrogen and how it naturally occurs in our environment. But where does phosphor come from and where does it go? Why can our sources of phosphor be depleted when we have nitrogen in abundance? How is phosphor extracted and how long will our resources last? Where does phosphor occur naturally in our environment? Why are both nitrogen and phosphor such important nutrients?

Subject integration: A lot of starting points for school work in natural sciences can be found above, but other school subjects can also be integrated.

Social science: How are water and sewer systems managed, who is responsible and how is the service paid for?

History: How was water and sewage disposal handled 100 or 1000 years ago? From where were farming nutrients gathered 100 or 1000 years ago? How did your grandma/great grandma do her washing?

Home economics: What washing instructions are printed on washing powder packages? What does hard and soft water mean? What eco-labels are there? What separates KRAV-labelled food from other foods, and how is this connected to our use of nutrients and fertilizers?

Mathematics: How much washing powder would the wastewater treatment plant receive unnecessarily if everyone over-dosed? How much money can be saved every year by applying the correct dose?

Language and Geography: What is the current state of water and sewage systems in France, Iran, India, China, Chile and Canada? Are there eco-labelled products in these countries? What washing powder do they use? What do toilets look like in other countries?

Religion: Is water, sewer systems or an ecologically sustainable way of living mentioned in the bible or in the holy writings of other religions?

The Nature School's First Class Homepage

The homepage can be reached by clicking the "folder" icon on the quick menu on the desktop (just like when you send an email). In the dialog pattern enter "the Nature School" and then double click the on the Nature School in the list of names. Click on the link in the presentation of the Nature School.

- **From Archimedes to Glasses Filled To the Brim.** 18 creative water experiments. A compendium for anyone interested in working with water.
- **A Drop of Water** (instructions for teachers teaching grade 1 and 4). For anyone wanting to work with water as a theme.
- **Nature and Environmental Experiments.** 66 pages of experiments to boost pupils interest in the natural sciences. Experiments on pollution and cleaning through filters can be found on pages 27, 37 and 42.
- **Grocery Store Investigation** (instructions for pupils in grade 5). A good way to follow up on the home investigation is to let pupils make an inventory of eco-labelled products in their local grocery store.
- **Car Investigation** (instructions for pupils in grade 9). Investigate the eco-labels on care maintenance products, detergents and how waste is disposed of at the local mechanic's shop.

Links

www.scienceacross.org	Working internationally.
www.snf.se	Swedish Society for Nature Conservation. Homepage listing products labelled with the Good Environmental Choice logo (the falcon).
www.svanen.nu	Homepage of Nordic Eco-labelling with listings of products labelled with the Swan.
www.hsr.se	Homepage of the Keep Sweden Clean Foundation.
www.svensktvatten.nu	On water issues.
www.miljomarkarna.se	On eco-labelling
www.ieh.se	Swedish Institute for Ecological Sustainability.
www.lib.kth.se	Database with interesting environmental links
www.edu.linkoping.se/deckarna	Computer game where pupils must perform practical experiments to advance through the levels. Includes garbage memory and the toilet game.
www.skolverket.se/skolnet	The Swedish Agency for School Improvement's database with links on teaching, etc.
www.miljo.goteborg.se	On car care products.
www.chem.umu.se	Click on school chemistry. Homepage to stimulate interest for chemistry through experiments with household chemicals (Umeå University).
www.kemi.se	Homepage of the Chemical Inspectorate.
www.scb.se	Homepage of the Swedish Statistics Agency with environmental statistical data, etc.
www.smf.su.se	Stockholm Marine Research Centre with information on the Baltic Sea
www.vattenkikaren.gu.se	Auqascope (University of Gothenburg).



The Waterbook (for pupils in grade 6, can be borrowed from the Nature School)



The Waterbook, Teachers Manual (for all grade 6 teachers)



My Friend Molly (for all grade 1 teachers)



Environmentally Friendly Cleaning Tips (for pupils in grades 1-9)



Sticker (for pupils in grades 1-9)



Things That Shouldn't Be Flushed (for pupils in grades 1-9)



As Long as There's Life – There's Water and Sewage (video, 26 minutes, can be borrowed from the Nature School, for grades 4-9)



Sludge – No Dirty Business (video, 12 minutes, can be borrowed from the Nature School, grades 1-3)



The Nature School and the Alhagen Wetland Area, Year 2000 (video, 30 minutes, available at schools and libraries)



www.sciencecross.org Exchange knowledge and ideas globally on this homepage devoted to environmental issues.



The Swedish Chemical Inspectorate's Observation List. One copy distributed to each school's environmental group representative.



Drugs and the Environment (for all grade 4-9 teachers).



Choosing Environmentally Friendly Washing Powder and Detergents (one copy distributed to each school's environmental group representative).

List of Chemical Substances Commonly Found in Washing Powder and Detergents.



Tensides (Surfactants)	A large group of active substances used to remove grease. More or less poisonous to aquatic organisms. Can cause blemishes or dry skin.
Anionic Tensides	Negatively charged ion. Becomes inactive if the water is too hard.
Non-ionic Tensides	Neutral; does not ionize. Not sensitive to hard water.
Cationic Tensides	Positively charged ion. Non-active. Clings to a surface and makes it soft. Used in fabric softeners and hair conditioners.
Amphoteric Tensides	Changes ionic charge depending on the pH value of surrounding substances.
Alkalines e.g. ammoniac, potassium hydroxide (lye), Sodium hydroxide (lye), Sodium metasilicate, Sodium hydrogen carbonate (baking soda)	Boost the cleaning effect on textiles and are the main ingredients of dishwasher detergents. High pH-value. No environmental effects if diluted or neutralized. Can irritate skin or cause alkaline burns. Can cause irritated skin if clothes are not rinsed properly after being washed.
Acids e.g. phosphor acid, hydrochloric acid, hyaluronic acid (found in some toilet cleaners)	Used to remove deposits of urine, rust and calcium oxide. Low pH-value. No environmental effects if diluted or neutralized. Irritates skin and causes acid burns. Warning! If you clean your toilet with an acidic detergent and simultaneously apply chlorine, the extremely poisonous chlorine gas will result!
Builders (surfactants) e.g. phosphates, EDTA, Zeolites, NTA, carboxylates, phosphonates	Soften hard water in order for detergents to clean effectively (see anionic tensides). Combine with calcium and magnesium ions. Phosphates are the most common builders. Wastewater treatment plants clean out 90-98% of the phosphates (96% in Nynäshamn); this material ends up in the sludge.
Bleach e.g. sodium hypochlorite, perborates, hydrogen peroxide, peroxyacetic acid, percarbonates	Bleaches stains but also natural substances in textiles, giving them a yellowish shade. Textile colours fade and the fibre structure is affected so that the life of the fabric is shortened. Sodium hypochlorite, found in chlorine, combines with acids creating chlorine gas.
Solvents e.g. acetone, alcohols (ethanol, methanol, isopropanol, glycol, glycerol), aromatic hydrocarbons (toluene, xylene, benzene), esters, glycol ethers (acetates), chlorided substances, paraffin esters	Dissolve fat, painting colours and many other substances. Commonly found in solutions such as turpentine or in pure form as acetone, ethanol and toluene. Often vaporize at room temperature and are easily inhaled, thereby affecting the body. Dissolve natural fat from the skin and can cause blemishes. Some solvents pollute the air, contribute to global warming and degrade the ozone layer. Most solvents are highly flammable.
Preservatives e.g. Benzisothiazolone, BHA & BHT, ethanol, formaldehyde, chloracetamid	Prevent bacterial growth in water based chemical products. Due to their function, they are poisonous to aquatic life and categorized as environmentally harmful. In pure form preservatives can cause allergies and hypersensitivity, at levels found in common detergents there is however no danger.

Disinfectants e.g. alcohols, aldehydes, chlorhexidines, Quaternary ammonium compounds, Amphoteric Tensides, chlorine compounds, strong acids and alkalines	Used in food production, at restaurants and in hospitals to prevent growth of micro organisms, thereby reducing the risk of contamination. The best way to spare our environment is to only use disinfectants when they are really needed. Often simple cleaning measures are enough to prevent the growth of micro organisms.
Waxes, Resins and Polymers e.g. acrylic resins, alginates (from algae), alkyd resins, amino resins, carnauba wax (from palm trees), cellulose derivatives, colophony (from pines), lanolin (from wool), polymers with metallic ions, montan wax (from coal), paraffin wax (from petroleum), polyethylene wax, polyethers, polystyrene, silicone polymers, cetyl alcohol.	Waxes are fatty, often solid, publishable substances that can have natural sources in form of fatty acid esters with high-order alcohol molecules; for example bee wax, lanolin, cetyl alcohol or carnauba wax. There are also mineral waxes such as paraffin and montan wax. Synthetic waxes are polymers, e.g. polyethylene wax and silicones. Resins are organic, often solid, substances that cannot be dissolved in water. Resins can be natural or synthetic. Natural resins are colophony, rubber, arabicum, mastic and French polish. Artificial resins are polymers such as acrylic and silicone resins. Natural resins are assumed to put little strain on the environment. Colophony, however, can cause allergies. Some substances in the resins can be harmful to aquatic life and it should be avoided that they are released into water environments. Polymers are so called monomers connected in chains or networks. The problem of polymers is that they are often difficult to break down. These three groups of chemical substances are not very well researched and are from an environmental point of view labelled as “incompletely investigated”.
Perfumes	Are added to increase the feeling of cleanliness or to conceal a foul smell from another ingredient. Artificial perfumes are more pure than natural perfumes that often contain by-products that can affect health, for example by causing allergies of the skin. As only small amounts of perfumes are used, they are probably no great strain to the environment. A good rule of thumb is to, when possible, choose products without perfume and when this is not possible, products where the perfume has been added according to IFRA’s guidelines (International FRagrance Association)
Other additives	
Bleach Activators e.g. TEAD	Enables textiles to be bleached at temperatures down to 40 degrees Celsius.
Emulsifiers	Most commonly tensides that separate oil and fat, thereby creating an emulsion.
Enzymes	Degrade substances in stains. Not harmful to the environment.
Fatty acids	Sometimes found in detergents.
Extra filling usually sodium sulphate (not environmentally harmful)	Used in washing powder to increase volume. This increasing the package size but makes using the right dose and storing easier. New compact washing powders do not contain such substances.
Colour additives	Used in small amounts but often difficult to biodegrade.
Skin care substances e.g. betaine	Tensides that counteract other tensides effect of drying the skin.
Thickening agents e.g. salts, urea, cellulose derivatives, starch, organic polymers	Used to achieve a functional consistency of the product.
Corrosion protection	Protects metals from being corroded during the washing process.

Commonly sodium silicate (not environmentally harmful)	Corrosion is mainly caused by bleach in the washing powder.
Dissolving agents often alcohols but can also be tensides	Keep chemicals dissolved in some fluid detergents.
Softeners Often phthalates	Mostly found in detergents for cleaning floors.
Optical whiteners	Transform UV-light which makes garments look whiter. The major part of the chemical ends up in the sludge and is environmentally harmful.
Salts	Contribute to better cleaning properties and consistency.
Foam reducers e.g. fatty alcohols, silicones, pine oil	Reduce the amount of foam. Usually not readily biodegradable.
Abrasive additives Quartz dust, chalk	Used in some detergents. Basically a mineral powder.
Stabilizers Often EDTA, phosphonate	Stops bleaching chemicals from reacting when in the package.
Pine oil	Raw material for tensides in many soft soaps. Contains fatty acids and resins. Not environmentally harmful if the amount of resins is no larger than 5%.
Thinners	Used in floor polish. Usually more or less poisonous fluoride tensides that are not readily biodegradable
Protectors	Prevent dirt from attaching itself to surfaces that have been cleaned. Phosphates and CMC.

Source: *Choosing Environmentally Friendly Washing Powder and Detergents* (2nd edition 1998).

Environmental Detectives

Search for these symbols in the cleaning cabinet and in the bathroom.



The Falcon



The Swan



The Flower

How many bottles or canisters marked with the Falcon did you find? _____

How many bottles or canisters marked with the Swan did you find? _____

How many bottles or canisters marked with the Flower did you find? _____

Skull Detectives

How many bottles or canisters marked with skulls did you find in your cleaning cabinet and bathroom? _____



Draw some of the others symbols you found on bottles and canisters in your cleaning cabinet and bathroom. Use a separate paper if there isn't enough room on her below. What do all these symbols mean?

What is a home investigation and why are we doing it?

This home investigation is a part of the campaign *Toilet Etiquette*, an initiative of the Water and Sewage Services Administration of Nynäshamn (hereafter WSS) in cooperation with the Nature School and Agenda 21. The campaign aims to increase public knowledge on what may and may not be washed down the drain, thereby improving the quality of sludge produced in the region and reducing the amounts of nutrients and harmful chemicals released into lakes and seas. According to the law, each municipal district must take care of the sludge it produces. In order to use the sludge as a farmland fertilizer, it cannot contain environmentally harmful substances. **Foreign objects or chemicals disturb wastewater treatment resulting in harmful substances ending up in sludge or released into lakes and seas.** What households wash down the drain is crucial for the usability of sludge as a fertilizer in agriculture (private households release an amount of chemicals equal to that of the industrial sector). In recent years traces of drugs have been found in soil and water. These substances have been transported there via the sewage system and can, among other things, cause drug-resistant bacteria to develop.

Objects and chemicals washed down the drain do not only cause environmental problems, they also add to the cost of the WSS. Every week the WSS must dispose of 400 kg of rubbish that does not belong in the wastewater. Also pump stations must be mended and pipes must be cleaned out because of objects that do not belong in the sewage system. The annual cost of this adds up to 100,000 SEK.

The educational gain of the campaign is that children get to see how the municipal district's sewage system works and how it is possible, using wastewater treatment, to recycle nutrients. Our ambition is for the campaign to show a complete chain of events; starting from what every individual washes down the drain at home, to wastewater treatment facilities, to sludge and back to farming. By tying the rather complex issues of recycling to everyday events and personal responsibility, we can increase understanding of our environmental issues.

During the campaign we will also distribute a folder containing tips for environmentally friendly cleaning and a campaign sticker.

How can you contribute?




- Keep a pedal-bin in your bathroom. Use it to dispose of anything that shouldn't be flushed or washed down the drain.
- Use eco-labelled washing powder and detergents.
- Dispose of environmentally harmful materials at your local hazardous waste collecting point.
- Return left-over drugs to your local pharmacy.
- Post the tips for environmentally friendly cleaning on the inside of your cleaning cabinet.
- Apply the correct amount of washing powder (there is a 0.3 dl difference in dosage between different water types). Use the dose for soft water in Sunnerby-Spångbro and Marsta and for moderately hard water in Nynäshamn, Ösmo and Grödbby.

Lars Hagelin,
The Water and Sewage Services Administration,
Eco-municipality of Nynäshamn



Home Investigation

How many eco-labelled products can you find in your cleaning cabinet and bathroom? Write the name of the product below the corresponding symbol.

Good Environmental Choice	The Swan	The EU-Flower
		

Examine the products you found in your cleaning cabinet and bathroom. Which of the following chemical substances can you find on the declaration of contents? Write the name of the product next to the corresponding chemical substance.

Chemical Substance	Products
Sodium hypochlorite	
Sodium metasilicate	
Optical whiteners	
Triclosan	
Ammonium	
Anionic Tensides	
Cationic Tensides	
Phosphoric or other acid	

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