API® Lesson 6 | Understanding Filtration

This lesson plan provides information about the importance of filtration with an in-depth look into mechanical, chemical and biological filtration. Filtration is an important part of a closed natural ecosystem to naturally balance fish waste to maintain optimal water quality.

For Instructor/Teacher/Parent

Make sure to read through the entire lesson plan before beginning this with students/family members as materials may need to be purchased and information prep will need to be done. Prior to starting this lesson identify three filter types (internal, hang-on-the-back, cannister) that you can either display or have literature showing the breakdown of each filter.

Learning Objectives

After completing the activities outlined in this lesson plan, students should be able to:

- To explain the three parts of any filtration
- Understand how to evaluate a filter and determine if any improvement is needed
- Clearly explain nitrification and how filtration can play a key role
- How to determine when action is needed to maintain better water quality based on nitrogenous waste
- Understand how to maintain clear water and actions needed to improve filtration for better water clarity

Length

This activity will take 4 to 6 weeks for completion of the nitrogen cycle when using a new aquarium setup (recommended) or 2 hours if just using existing aquarium with diagrams.

Materials

- Newly setup aquarium based on lesson 1 starting from day one
- Existing Aquarium, Aquarium Cover, Aquarium Light, Aquarium Stand (if you have completed lesson 1, you will already have an aquarium set up)
- Filter
- API FRESHWATER or SALTWATER MASTER TEST KIT
- Water Conditioners and Bacterial Products
    - API STRESS COAT™ water conditioner – treating tap water and fish conditioner
    - API QUICK START™ – live nitrifying bacteria
    - API STRESS ZYME™ – live cleaning bacteria
    - API ACCU-CLEAR – water clarifier
- API BIO-CHEM STARS biological filtration material
- 12" x 18" (30cm x 45cm) typical window screen
- ½ cup – household Baking flour
- 35 ml (2 tablespoons + 1 teaspoon) of tap water
- Dry Cleaning Sponge

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- Magnet
- Paper clip
- Fish
- Small dish or clear glass

Key Terms

Review key terms (printable sheet included at the end of the lesson) with students/family members.

1) MECHANICAL FILTRATION
2) CHEMICAL FILTRATION
3) BIOLOGICAL FILTRATION
4) TOTAL AMMONIA NITROGEN (NH_3/NH_4)
5) NITRITE NITROGEN (NO_2)
6) NITRATE NITROGEN (NO_3)
7) ADSORPTION
8) ABSORPTION

Warm Up

Ask a couple of questions to warm up for the lesson:

- How do you think excrete waste?
- What does a filter do for an aquarium or pond?
- What are toxins to fish?
- What cause cloudy water?
- How do you think we can control toxins to protect our fish?
- Are bacteria good or bad?

Before You Start

1) For this setup we are going to proceed using the basics from the tropical community aquarium ecosystem (see Lesson 1).
   a) Note: The best way to truly evaluate nitrification with a hands-on approach is to setup a new aquarium, with clean gravel and treated tap water and fish. Follow Lesson Plan 1 for further details.
2) You will need to identify three type of filters – Internal Filter, Hang-on-the-Back Filter (also called a power filter), Canister Filter
3) Perform an exercise on how to use the test kits. It is best to use an existing aquarium as a water source. Test for ammonia, nitrite and nitrate to understand how stable or safe the water is based on the results.
4) Look at your filter and attempt to determine what parts are mechanical, chemical and biological. Not all filters contain all three.

Instructions for Learning Activity

1. **Mechanical Filtration –**
    1. Mechanical filtration functions by trapping small particles which include gravel dust, fish waste, uneaten fish food, dead algae, plant materials, etc. The size of the particle and the density of the material determines how fast it will become clogged before cleaning or replacement is necessary.
    2. Any device that catch debris is classified as a mechanical filtration. A piece of cloth will catch debris and a window screen will catch debris. In the case of a window screen it does a great job stopping large materials including insects but does not stop pollen or dust that is in the air. If we were to put a cloth of our window opening air would not flow freely and the room would become stuffy. It would be great to catch unwanted particles but would clog very fast.
    3. Exercise to understand mechanical filtration:
        i. Take a window screen hold it firmly and flat to a surface.
        ii. Take a small portion of baking flour and sprinkle it on the window screen.
            1. How much of the flour went through the screen?
            2. Is a window screen a good mechanical filter?
        iii. Take a ¼ cup of flour and stir in 35 ml (two tablespoons, plus 1 addition teaspoon) of water. Continue to stir to create a large dough ball. Next, Drop the dough ball onto the flat window screen.
            1. How much of the flour went through the screen?
            2. Is a window screen a good mechanical filter?
    4. When working with any filter the mechanical part of the filter material may not catch all the desired particles desired. If the particles are smaller than the smallest pore size of the filtration material than the particles will stay in the water and float around causing a cloudy appearance. Newly established aquariums often develop cloudy water within one week after the addition of fish. Such cloudiness cannot be removed by most aquarium filtration and can also occur in established aquariums. Water changes, filter changes, and gravel cleaning can also stir up dirt and debris, resulting in unsightly, persistent clouds in aquarium and pond water.
    5. Adding a flocculent that clumps the tiny particles together making them larger. The clumps are then captured by the mechanical filter, and water clarity is achieved. API ACCU-CLEAR is a fast-acting flocculent causing these particles to clump together, forming larger particles that are easily removed by the filter.
2. **Chemical Filtration –**
    1. Chemical filtration normally works through passing aquarium water through a substance capable of bonding through a negative or positive charge attracting a substance. The attraction of bond by a negative or positive charge is an example of adsorption. In most cases this process is termed adsorption, a process by which pollutions are transferred from the water to the material held by electrostatic forces. Examples of materials typically used in aquariums include activated carbon, adsorbing clays, ion-exchange resins, calcium carbonate-based materials, etc.
        i. To explain and understand adsorption vs. absorption think about a magnet vs. a sponge. Place a small amount of water in a bowl. Now take a dry sponge and place it in the water. What happens? You will that the water is absorbed into the sponge, absorption.
        ii. Think about the way a magnetic attracts substances like a paper clip. The paper clip never enters the magnet internally but is held to the surface by an electrostatic charge. This would be an example adsorption.
    2. Fish, invertebrates, plants, algae and uneaten fish food release a variety of organic pollutants in the aquarium or pond. Bacterial decomposition of dead plants, aquatic animals, and aquarium foods also increase the level of organic pollutants in the aquarium. Organic pollutants would include hormones, pheromones, phenol compounds, pigments, proteins, and amino acids to name a few. In nature these compounds are carried away by water currents and tides. Aquarium water is only changed periodically. Between water exchanges these compounds build-up in the water. Many of these compounds are stressful or even toxic to fish and invertebrates such as corals.
    3. Addition of chemical filtration materials can reduce unwanted compounds. Materials can be selected specifically to target certain materials. As an example, activated carbon is one of the most effective, economical and easiest methods for removing organic pollutants from the water. For even greater efficiency to ensure the best water quality activated carbon blended with organic scavenging resins such as API BIO-CHEM ZORB work better at

removing both synthetic and naturally occurring metabolic by-products in freshwater and marine aquariums.

4. Ion specific filtration materials are available to target materials such as ammonia, nitrite, nitrate, phosphate and silicate. API PHOS-ZORB is a special chemical filtration material that selectively removes phosphate and silicate ions from freshwater and marine aquariums. In marine aquariums excess phosphate lowers the available calcium and magnesium necessary for the growth of corals.

3. **Biological Filtration –**
    1. Biological filtration is the natural process of breaking down and/or converting organic waste, uneaten fish food matter, and dead biological material. Heterotrophic bacteria utilize larger organic nitrogenous compounds excreted by fish, dead plant and algae material, and dead animal or insects as a food source and convert them into simple compounds such as ammonia-nitrogen, a process termed mineralization. In addition, the principle waste product of fish is ammonia. The majority of ammonia entering the water from fish is diffused through the gills. In order for the nitrogen cycle to function in a satisfactory manner, the presence of certain forms of bacteria, which uses these materials for their biological processes, must be present. In addition, certain environmental conditions are necessary in order the bacteria to flourish in enough quantities. These nitrifying bacteria oxidize ammonia to nitrite and then to nitrate, a process termed nitrification.
    2. To accomplish the nitrogen cycle via biological filtration in an aquarium or pond, it is important to provide an environment with enough oxygen, temperature and surface area for the bacteria to grow. The biological filter efficiency greatly increases with available surface area and oxygenated water. The nitrifying bacteria can be found on any surface area in the aquarium/pond that is exposed to water in the presence of oxygen.
    3. Bacteria of the genus Nitrosomonas utilize the excreted ammonia in the water as an energy source and oxidize it into nitrite. A second bacteria of the genus Nitrobacter, oxidize nitrites into nitrate. All aquariums need nitrifying bacteria to keep water quality safe for fish and other animals. When fish are added to an aquarium, they immediately begin to release toxic ammonia. Because new aquariums have no active biological active biological filter it is advised to add nitrifying bacteria to eliminate the build-up of toxic ammonia or nitrite. API QUICK START contains the important bacteria (Nitrosomonas and Nitrobacter species) that convert ammonia to nitrite and then to nitrate. API QUICK START significantly shortens the development time of the biological filter in aquariums, whether newly setup or additions of new fish, thus reducing serious early stress in aquatic environments.
    4. Providing ample space for nitrifying bacteria to grow ensure they can multiply and colonize for the removal/oxidation of ammonia and nitrite. Providing the optimal space and surface area for the bacteria varies greatly from material to material. As an example, nitrifying bacteria will grow on gravel and rocks however when these external surfaces become dirty overtime and the bacteria are covered as well losing efficiency and many cases will die. Placing a specialized biological filtration to promote the growth of nitrifying bacteria in the filter can enhance conversion from ammonia to nitrite to nitrate. API BIO-CHEM STARS is a black polymer with ideal pore size for nitrifying bacterial growth and rapid transfer of water and oxygen. BIO-CHEM STARS are completely porous with internal and external pores allowing water and oxygen to pass through, which keeps bacterial colonies healthy and alive. BIO-CHEM STARS float on the water surface in external power (hang-on the back) filters. Fits in most power filters, canister filters and many internal filters.
        i. Exercise to understand internal and external usage of a material.
            1. Obtain one (1) BIO-CHEM STAR and place it in a small dish or clear glass.
            2. Look at the material, can you see the small pores throughout the BIO-CHEM STAR where the bacteria can grow? Are they uniform throughout?
            3. Now take one teaspoon (5ml) of water and pour it into the small dish or clear glass. What happens to the water? Where does it go?
            4. Does this show the ability for bacteria to utilize external or internal or both areas of this unique filtration material?

4. **Position of filtration materials**
    1. Many filters do not have three separate areas for mechanical, chemical and biological filtration. When possible, it is advised to position filtration materials so mechanical is the first filtration water encounters. Removing particles before chemical and biological filtration is important as dirt and debris can clog the other filtration materials reducing their efficiency. The second stage is often chemical, this allows removal of unwanted materials and nutrients. The final stage is most often biological. As the bacteria are living

organisms, we want to provide the cleanest water possible and well oxygenated so the bacteria can efficiently remove the ammonia and nitrite.

5. **Detoxifying Ammonia and Nitrite**
    1. As mentioned earlier, ammonia is released directly from fish and invertebrates, as well as in their solid waste and urine. These waste products, in addition to decomposing plants, algae, and uneaten fish food, can increase the level of toxic ammonia in the aquarium. Normally, ammonia is detoxified by biological filtration from the nitrifying bacteria. However, when nitrifying bacteria are not fully established both ammonia and nitrite can build up to highly toxic levels. Even in an established, an ammonia surge can result from over feeding, addition of new fish, or an unnoticed fish death or even dead algae.
    2. The addition of API Ammo-Lock detoxifies ammonia instantly. Although ammonia will still be present in aquarium water, Ammo-Lock converts it to a form that is nontoxic to all aquatic life. This non-toxic form is removed by nitrifying bacteria in the filter.
        i. Ammo-Lock neutralizes ammonia but does not remove it from aquarium water. Consequently, ammonia test kits will still show a positive result for ammonia when testing water treated with Ammo-Lock.
    3. The addition of API NITRA-ZORB is a chemical filtration media made of natural and synthetic ion-exchange resins that selectively remove ammonia, nitrite and nitrate in freshwater. When starting a new aquarium as the bacteria in the biological filter are becoming established NITRA-ZORB will keep these substances at safe levels. Even in well-established aquariums, elevated ammonia and nitrite levels can occur when fish breed, over cleaning of the biological filter, over feeding, or the addition of new fish. NITRA-ZORB will successfully reduce ammonia and nitrite in each of these stress producing instances to improve water quality.
        i. NITRA-ZORB ion-selective resins binds the ammonia, nitrite and nitrate to the resins. As ammonia, nitrite and nitrate are now bound these are removed from the water and testing will show the removal. The NITRA-ZORB resins will gradually become exhausted and will need to be recharged or exchanged. As with any chemical filtration material they can become fouled overtime with organic matter, thus replacement is the only option. Ensuring that proper mechanical filtration is the first part of your filter will with this fouling.

Discussion: Evaluation of a Filter

1. Now you can understand that looking a filter requires evaluating the efficiency based on its parts.
    ii. First, determining what will be needed for the type of aquarium and type of fish that are be kept is essential. Planted aquariums often need mechanical filtration to catch any decaying or floating plant materials. Reef aquariums often produce very fine particulate materials and require enhance chemical filtration for removal of phosphate or nitrates. Aquariums or ponds with very large fish create larger particulate matter from their waste.
    iii. Next will be to understand how involved is changing the filter materials. Can the mechanical be changed independently from the chemical filtration versus an all-in-one design? If the filtration design is such that it is easy to change any material, then the maintenance will be less of chore and most likely be done more often.
    iv. Can more filtration be added to the filter is an important consideration. If the aquarium or pond needs additional biological media or unique chemical filtration to remove unwanted materials such as phosphate, nitrate, ammonia or nitrite. A filter that provides flexibility to add addition filtration material may be an important consideration.
    v. Understanding how the filter in current use can be enhanced is an important consideration. As an example, understanding that cloudy water may not require a change of filtration material but simply the addition of flocculant material like API ACCU-CLEAR. Looking at filters and thinking about enhancement of existing filters may simply require the addition of unique chemical filtration materials, different mechanical filtration materials with fine pore size, or advanced biological materials to provide better areas for more efficient bacterial growth.
    vi. How flexible is the filter you have or are planning to use? Once you identify the different parts of the filter determine if they will meet your needs or can they be enhanced or improved. Many filters have one part of the filter that is better than another. The filter design in hand or aquarium system in general may have a strong mechanical or chemical or biological section but not all three are adequate. This is the key to understanding the simple question, Is my filter good enough?
2. Now you understand mechanical, chemical and biological filtration determine what parts of your filter perform which function. Some may perform multiple functions in one. A filter pad which has activated filter carbon inside would be both mechanical and chemical filtration. Does your filter contain a separate area such as a plastic grid, ceramic rings, bio-balls? These would be areas for bacteria to grow and be considered a biological filter.
    a. Draw your filter and label the parts that mechanical, chemical and biological.
3. After finishing the items above including the questions and key terms, engage students/family members in a brief discussion about the lesson: What kind of filter do we have in the aquarium?
    a. Determine what parts of the filter perform mechanical, chemical and biological
    b. Is there any part of the filter that could be improved?
    c. Why are bacteria important?

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Additional Support Information

1. Benefits of Internal Colonization of biological filtration materials
    a. Many products have internal surface area but cannot sustain live nitrifying bacterial colonies. Activated carbon, for example, has a vast internal pore network. But these pores "dead-end" inside carbon particles and are too small in diameter to permit bacterial growth. Thus, water and oxygen are unable to permeate, once bacterial growth has filled up the pores. In BIO-CHEM STARS, the open pore structure assures no "dead-ends." All pores are interconnected so that water and oxygen can always surround growing bacteria.
    b. The black coloration of BIO-CHEM STARS prevents light from penetrating into the star. Thus, bacterial colonies located there-in are protected from growth-inhibiting exposure to light. As oxygen and nutrients diffuse into the star, metabolic byproducts produced by colonizing bacteria (carbon dioxide and nitrate) diffuse out. In addition, living bacterial cells are continuously being pushed out of the pores to make way for new cells within. The self-purging action keeps the pores clean; stars remain active indefinitely, support a vigorous healthy biological filter.
    c. In contrast, the smooth surfaces of plastic balls promote "water shear", a high velocity water current that washes over the surface of smooth materials. Water shear limits bacteria from permanently attaching to the plastic smooth surface and thus prevents bacterial colonization. Exposure to light also discourages the growth of nitrifying bacteria on surface areas. Scientific studies prove that few colonies can grow normally under these conditions.
2. The Nitrogen Cycle is important.
    a. The fish produce waste from their gills and fecal matter in the form of ammonia. A chemist would write ammonia as NH_3, that is nitrogen and hydrogen. The beneficial nitrifying bacteria consume/converts the ammonia from NH_3 to NO_2 this is called nitrite. Both ammonia and nitrite are bad/toxic for fish. In nature another beneficial nitrifying bacteria consumes/converts the NO_2 (nitrite) to NO_3 (nitrate). Nitrate is safe but not in large amounts. When you make routine water changes the nitrate is diluted.
    b. The chemical process from NH_3 to NO_2 to NO_3 is called the nitrogen cycle. To determine the success of your nitrogen cycle, test your water using the API Master Test Kit. Add API QUICK START provide the nitrifying bacteria important for nitrogen cycle. As the fish produce more waste more bacteria are needed to maintain the proper balance. Over the first few weeks after setting up your aquarium the nitrogen cycle is becoming established. When the ammonia and nitrite remain at zero your nitrogen cycle is considered established and functioning properly.
3. Adding bacteria to ensure the biological filtration is functioning properly.
    a. Add API QUICK START essential beneficial bacteria. This kick starts the biological filter aka the Nitrogen Cycle. QUICK START contains the bacteria that convert poisonous ammonia (fish waste) into nitrite (also harmful to fish) and then into nitrate. API QUICK START ensures your biological filter is established this process is called the nitrogen cycle, and it occurs in all underwater ecosystems. These bacteria continue to grow as your aquarium ages – living on the top layers of the aquarium substrate, decorations and filter media.
4. Sources of Phosphate and Silicate in the aquarium
    a. There are both natural and man-made sources of phosphate found in freshwater and marine aquariums. Tap water sources contain phosphate due to the natural weathering of phosphate-containing minerals such as apatite. Run-off from farmland also add phosphate to water supplies. Both well and municipal water supplies contain phosphate. Some municipal water treatment plants even add phosphate-containing chemicals (polyphosphates) to prevent corrosion of water pipes and boiler equipment, as well as to reduce iron and manganese in drinking water. Additionally, products that are added to the aquarium, primarily pH buffers, can be a source of phosphate. The phosphate in food is released into the aquarium via fish waste. And finally, decaying organic matter, such as dead algae cells and uneaten fish food, contribute phosphate to fresh and saltwater aquariums.
    b. Silicate enters ground water naturally through the weathering of mineral deposits. Sodium silicate is added to tap water by some municipal treatment plants to reduce iron and manganese levels.

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Routine Care and Maintenance

1. Feed your fish twice a day when possible and only the amount they will consume within 3 minutes, always follow the feeding directions on the label. Feeding the correct nutritional content is essential to keep your fish healthy and active.
2. Testing water is the best way to ensure your biological aquarium filtration is in balance.
    a. Weekly testing is advised in established aquarium, and testing water every other day in new aquarium or after adding new fish, is a great way to learn about the nitrogen cycle. Record all test result and develop a chart to show the changes to water chemistry as the beneficial nitrifying in API QUICK START become established consuming the unwanted ammonia and nitrite from the aquarium.
3. Every 2 to 3 weeks perform a partial (20 to 25%) water change. Always remember to treat the water you are adding with API STRESS COAT. Routine water changes are the best way to prevent most problems that could occur. Routine water changes will help to decrease any accumulation of nitrate and phosphate over time.
4. Keeping your aquarium clean - Add API STRESS ZYME weekly to help keep your aquarium clean. Stress Zyme contains five different strains of beneficial bacillus bacteria that digest uneaten fish food, fish waste, decaying plant materials and other organic matter. The bacteria in STRESS ZYME specifically selected for their unique ability to consume organic matter that accumulates in aquarium. The strains of bacteria in STRESS ZYME are different from the nitrifying bacteria in API QUICK START.
5. When performing routine water exchanges it is always a best practice to siphon clean the gravel and bottom area of the aquarium. In the gravel and substrate materials accumulate. Siphon cleaning removes large visible organic matters very efficiently and allows bacterial additives like Stress Zyme to work more efficiently. After siphon cleaning and adding new water the addition of ACCU-CLEAR will flocculate the very fine particles floating in the water to become larger allowing your mechanical filter to be more efficient.
6. Algae is expected in any aquarium. Algae is not harmful in aquariums, but it is not always something we may want to see as it takes from the serene setting. Algae attaches to the glass, rocks, gravel and decorations. If you scrap it away from the glass, you can then remove it. You can buy fish that will eat it, Otocinclus catfish another smaller algae-eating fish. You can also buy algae removing water treatment such as API ALGAEFIX™. API ALGAEFIX is a plant safe algaecide.
7. Fish need a balanced and complete diet. In nature fish eat whenever they are hungry and often rely on eating live food. Things change when they are kept in aquarium setting. Overfeeding or improper inferior diets leads to poor water quality. Fish need the some of the same things we do proteins, carbohydrate, vitamins, minerals and fats. Providing these in the correct balance is important because feeding too little is bad for them and feed to much will pollute their environment. API Fish Food have been formulated to provide your fish with all the ingredients fish need in the correct balance.
8. Feed your fish once or twice a day that amount they will consume in a few minutes. The food should be completely eaten. Over feeding will cause cloudy water and produce more ammonia in the water. Any food that is not eaten that is left over decays on the bottom and pollutes the water even more. Feeding is a good time to check your fish. Watch them carefully to make everyone is eating. Observe them to assure their fins and body are in proper condition. Observe their behaviors and colors.

Quiz

- Once you've finished the discussion, pass out the Quiz worksheet (printable sheet included
- at the end of the lesson) to each student/family member.
- Have them complete the quiz and then review the answers/have an open discussion about the answers with them. Answers are below.

1. Describe the type of filter you have, internal filter, hang-on-the-back power filter, canister filter. Draw your filter and label the parts of the filter.
    - Answer: Once they describe and draw their filter, they should label it for mechanical, chemical and biological filtration.
2. Name the three primary areas in proper filtration.
    - Answer: Mechanical, Chemical, and Biological
3. What type of bacteria grow in our filter to remove toxins?
    - Nitrifying bacteria, Nitrosomonas and Nitrobacter
4. What toxin is release into the water from fish and mostly from where on the fish?
    - Answer: Ammonia from the gills
5. Which of three types of filtration should be the first for the water to encounter in the filter?
    - Answer: Mechanical
6. Ion-exchange resins is what type of filtration?
    - Answer: Chemical
7. In terms of the nitrogen cycle which of the following comes first nitrate or nitrite?
    - Answer: nitrite is prior to nitrate, the typical direction for the biological filter is ammonia to nitrite and nitrite to nitrate.
8. A flocculant will enhance which type of filtration to work more efficiently?
    - Answer: Mechanical

APPENDIX

See items below to be passed out to family members or students for the lesson.

KEY TERMS

MECHANICAL FILTRATION

Catches debris

CHEMICAL FILTRATION

Removes what cannot be seen

BIOLOGICAL FILTRATION

Uses life (bacteria, plant, sponge) to remove toxins

TOTAL AMMONIA NITROGEN (NH_3/NH_4)

Combination of toxic ammonia and ammonium

NITRITE NITROGEN (NO_2)

Toxic By-product from biological filtration

NITRATE NITROGEN (NO_3)

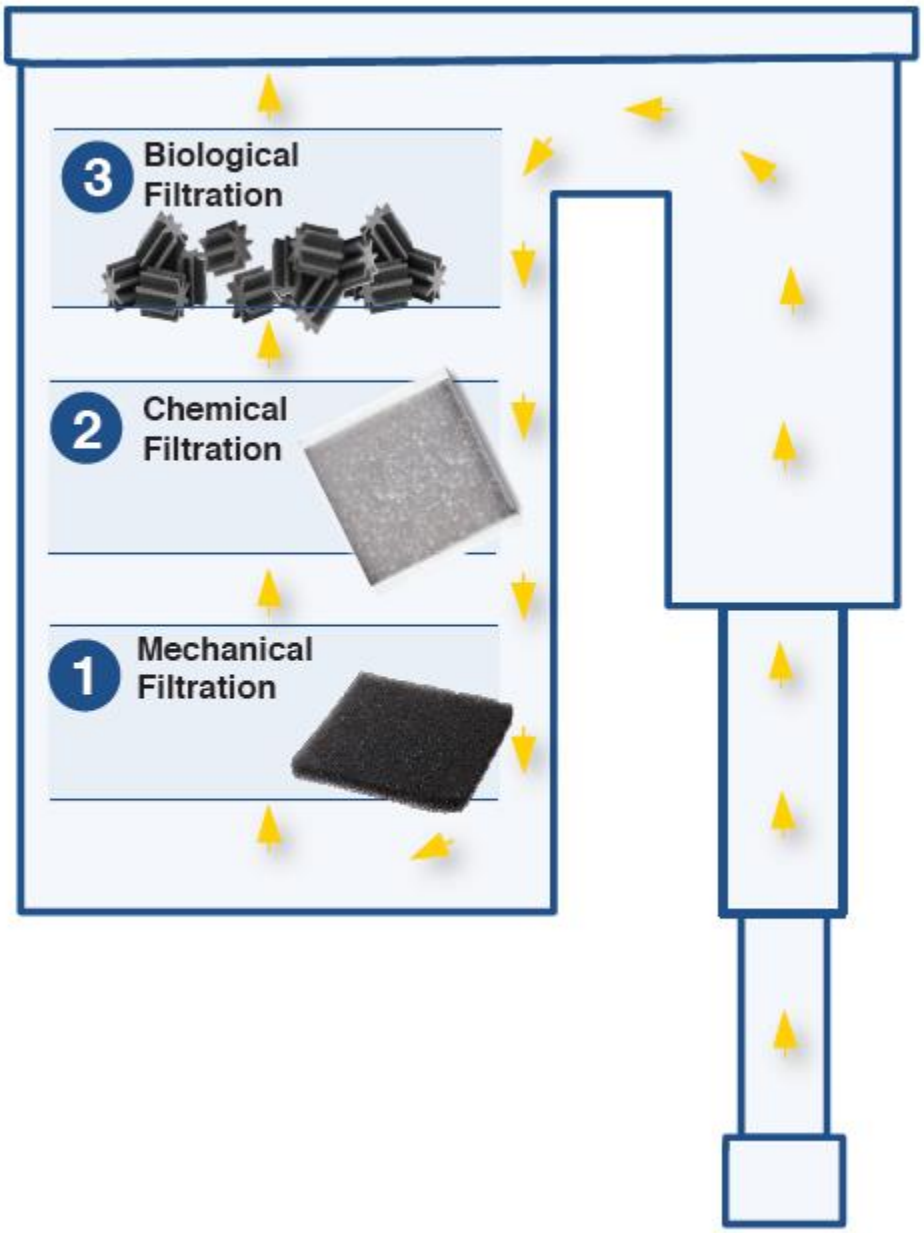
Relatively non-toxic By-product from biological filtration

ADSORPTION

The ability for a material to attract a substance to the surface typically based on electrostatic charge. Having a pie in the face is an example of adsorption.

ABSORPTION

When a material is assimilated into a material. Eating pie is an example of absorption. When materials are taken into a cell this is absorption.


3
Biological Filtration
2
Chemical Filtration
1
Mechanical Filtration

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QUIZ

1. Describe the type of filter you have, internal filter, hang-on-the-back power filter, canister filter. Draw your filter and label the parts of the filter.

2. Name the three primary areas in proper filtration.

3. What type of bacteria grow in our filter to remove toxins?

4. What toxin is release into the water from fish?

5. Which of three types of filtration should be the first for the water to encounter in the filter?

6. Ion-exchange resins is what type of filtration?

7. In terms of the nitrogen cycle which comes first nitrate or nitrite?

8. A flocculant will enhance which type of filtration to work more efficiently?

CONTACT US & ADDITIONAL RESOURCES

For more information regarding this lesson plan, API® brand, or any general fishkeeping questions and/or comments, feel free to contact us below.

- Website: https://apifishcare.com/
- Telephone Number: 1-800-847-0659