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ORNAMENTAL FISH Culture

UNIVERSITI MALAYSIA TERENGGANU

KEMENTERIAN PENDIDIKAN MALAYSIA

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TOPIC 9
CULTURE SYSTEMS

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Keynotes

- What is an aquarium?
- What are the main components of an aquarium system?
- How do I select the ideal aquarium system or design?

What is an aquarium?

- **vivarium of any size** with
- **one transparent side** in which
- **water-dwelling plants or animals**
- **transparent fish tank which is used for display**

Aquaria come in many different shapes and sizes.
A simple bowl with a goldfish inside.

Is it a misconception just a bowl is adequate for your fish.

What is the most basic of components for a viable aquarium system?

Tank system components

Light- ensures fish can be viewed

Heater/ chiller - manipulates water temperature

Tank- the place the fish and water is placed

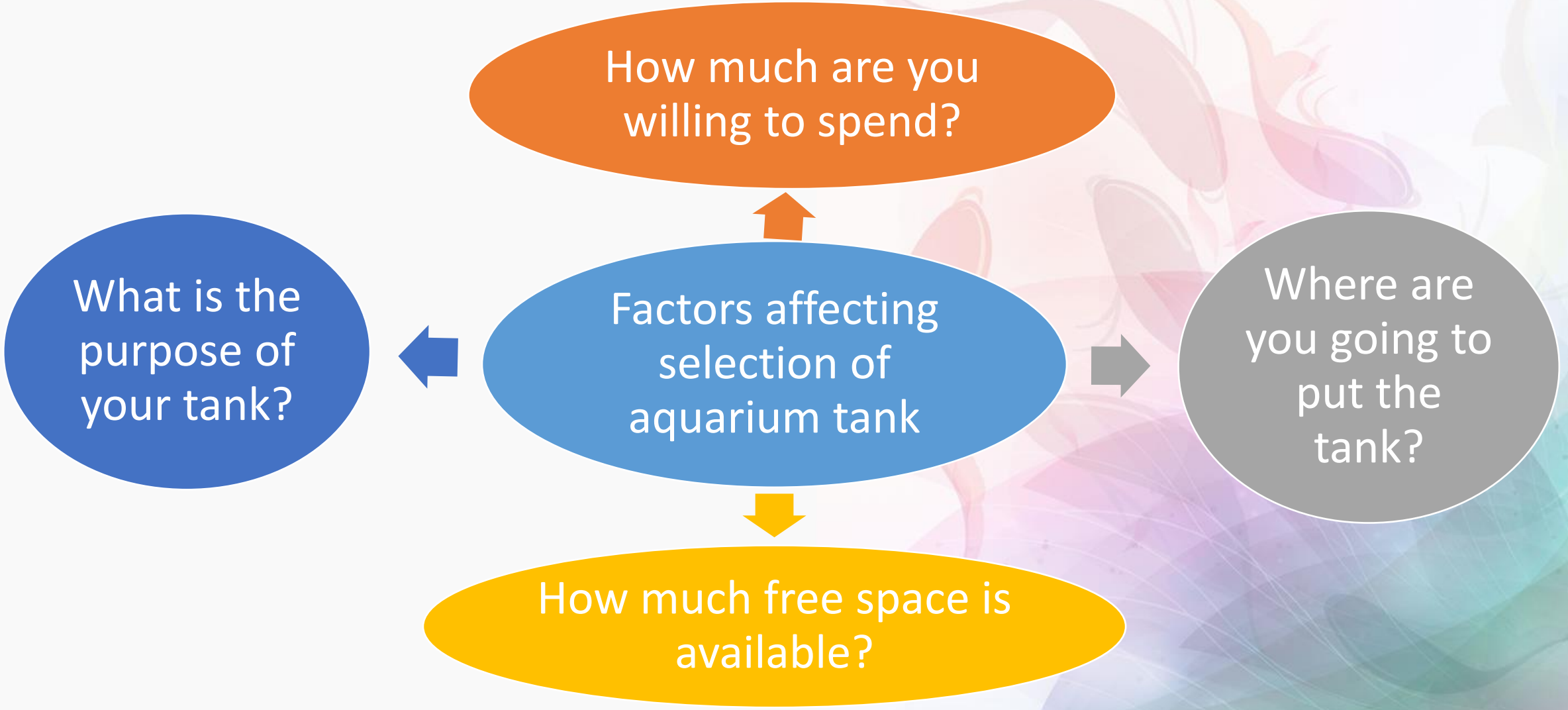
Filter- Cleans the water

Pump – moves the water through the filtration system

Stand – moves the water through the filtration system

ORNAMENTA

HOW do you choose?



Best Materials for Tank

GLASS

VS

ACRYLIC

VS

PLASTIC

GLASS

- A common material used for construction of a tank
- Made by heating of ordinary sand (which is mostly silicon dioxide) to 1700 degrees celcius (3090F)
- The liquefied sand is poured over tin plates to form panes of clear glass
- When it cools, glass is formed

ACRYLIC

Acrylic on the other hand refers to a variety of types materials

- Can be made from 2 basic groups of molecules, methyl methacrylate or polymethyl methacrylate
- Plexiglas, Lucite, Perspex, and Crystallite are some brand names

Best Materials for Tank

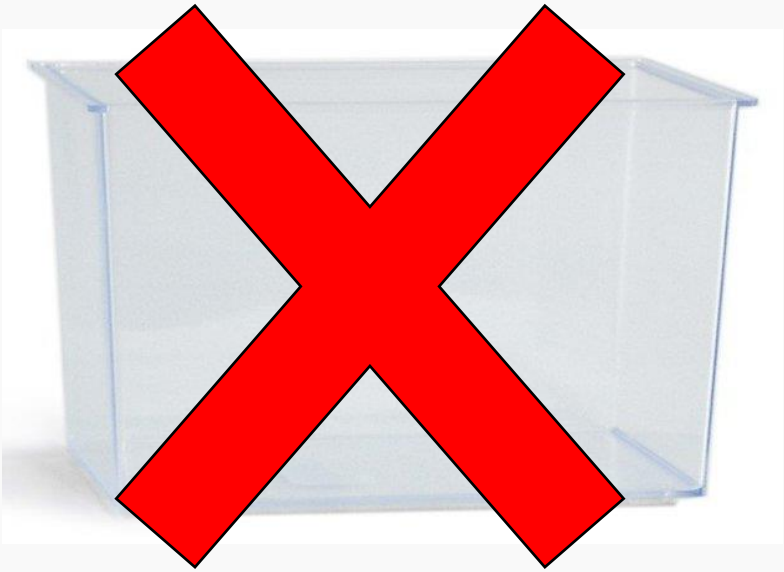
GLASS

PROS
• Cheaper than acrylic • Scratch resistant • Does not discolour
CONS
• Heavy • Limited shapes and sizes

VS

ACRYLIC

PROS
• Lighter • Stronger • Customizable shapes and sizes
CONS
• Scratch easily • Expensive • “Yellow” with time



PLASTIC

Plastic is cheap

However,

- they scratch easily
- yellow with time
- are available in small sizes only and
- even suffer major distortion!!!

Not recommended!!

Larger tanks are preferable compared to smaller tanks

It is easier to maintain water quality in larger tanks

Smaller tanks are prone to fouling In the instance of equipment failure or electrical shortage the change in water paremeters such as temperature and dissolved oxygen might be fatal

How many fish can you place in your aquarium?

The limiting factors in an aquarium include

- the oxygen availability
- filtration processing
- Growth rate
- activity level
- social behaviour
- filtration capacity
- total biomass of plant life

Fish stocking density

Recommended

- 3 cm of adult fish length per 4 litres of water,
- 1 cm of adult fish length per 30 square centimetres of surface area.
- 1 inch of adult fish length per US gallon of water.
- 1 inch of adult fish length per 12 square inches of surface area.

The Stand

Needs to be able to support the tank

Wooden stands usually have a built in cabinet - convenient for storage of equipment
Cons: prone to warping under extreme weights

Iron stands are cheaper but not as attractive visually

Filters

Filters function to:

- remove the debris and waste
- promote the nitrogen cycle
- and also help aerate the water

Pumps

There are 2 types of pump, the water pump and the air pump

Water pump also known as powerhead functions to:

- Drive water in the tank
- Power an undergravel filter or sponge filter
- Circulate water in the tank.

Pumps

Air pump : used to drive air through a tube and into the aquarium

Functions to:

- provide aeration
- drive the filter
- drive the decoration

Heaters

- A piece of aquarium equipment used to keep the fish tank water warm - or, rather, to keep the fish tank from getting below a particular temperature.
- Aquarium heaters can be divided into internal and external heaters, based on the placement in the aquarium.
- All heaters have a thermostat to switch the heater on and off as necessary to maintain the desired temperature.

Internal Heaters

Internal heaters as their name sake are placed inside the aquariums themselves.
Internal heaters come in three varieties: hanging, submersible, and substrate.

- Hanging heaters the most common and least expensive heaters
- These heaters hang (as the name implies) off the top edge of the fish tank, usually at the back of the aquarium.
- Hanging heaters might be dangerous for marine or brackish water aquariums though, as salt can get into the tube and cause corrosion or electrical shorts.

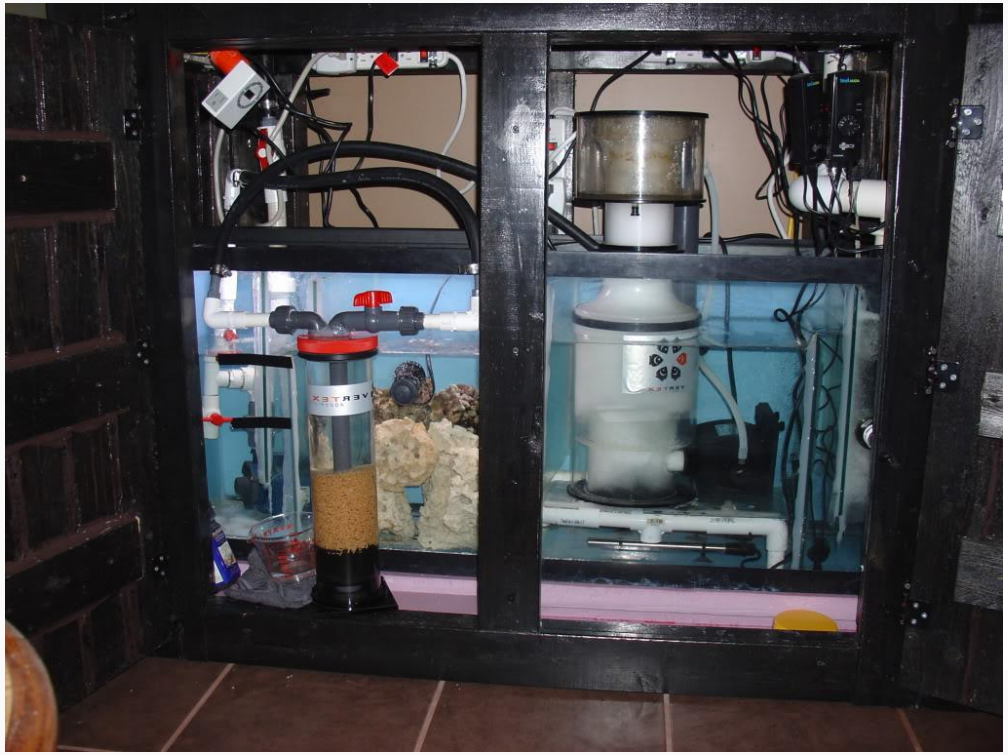
Internal Heaters

Submersible aquarium heaters can be fully immersed in the aquarium water. Because these heaters are completely submersible, they are generally more efficient than the hanging aquarium heaters Submersible aquarium heaters are usually positioned vertically or horizontally. They are usually attached by a clip with suction cups. Things to beware of for this type of heater, keep them off of the gravel, as the difference in heat conductivity between the water and the gravel could result in the glass of the heater cracking.

Internal Heaters

- Aquarium substrate heaters are the least common of the internal aquarium heaters for hobby or pet keeping use. Substrate heaters consist of a coil or grid of wire in an insulator which is buried in the aquarium gravel or substrate.
- Substrate heaters are supposed to be particularly beneficial for planted tanks where the gravel may act as an insulator and keep the plants' roots too cool. With a substrate heater, this concern is alleviated because the heater keeps the gravel nice and warm, and keeps the plant roots happy and comfortable.

External Heaters



- External heaters are located outside of the aquarium in the:
- Sump
- Filter
- Plumbing or along a section of external plumbing

This configuration provides better safety for the fish
It minimizes risk of damage by fish or while cleaning the aquarium.

Aquarium Lighting

- Essential to ensure that the fish in your aquarium can be seen
- Important for the photosynthesis process which provides oxygen
- Light can may be connected to the hood of the aquarium, or it may be seperate
- A seperate light will provide flexibility of for positioning, while a built in light provides less hassle

Flouroscent lighting - suitable for freshwater system. Do not emit heat and provide an even spectrum

Actinic blue lighting - suitable for marine system. They produce long-wave ultra violet radiation.

Metal halides - high red and yellow spectrum which produces a very nice visual effect and are suitable for marine invertebrates. However, they are also very expensive

So which is the best aquarium system or design?

The best aquarium system will therefore depend on various factors, such as the type and size of species being cultured, the amount of money to be invested, the complexity of the aquarium system and etc.