

## **Goldfish: The Psychology of Learning**

### **Vision**

Goldfish have one of the most studied senses of vision in fishes. Goldfish have four kinds of cone cells, which are respectively sensitive to different colors: red, green, blue and ultraviolet. The ability to distinguish between four different primary colors classifies them as tetrachromats.

### **Cognitive abilities**

Goldfish have strong associative learning abilities, as well as social learning skills. In addition, their visual acuity allows them to distinguish between individual humans. Owners may notice that fish react favorably to them (swimming to the front of the glass, swimming rapidly around the tank, and going to the surface mouthing for food) while hiding when other people approach the tank. Over time, goldfish learn to associate their owners and other humans with food, often "begging" for food whenever their owners approach.

Goldfish that have constant visual contact with humans also stop considering them to be a threat. After being kept in a tank for several weeks, sometimes months, it becomes possible to feed a goldfish by hand without it shying away.

Goldfish have a memory-span of at least three months and can distinguish between different shapes, colors and sounds. By using positive reinforcement, goldfish can be trained to recognize and to react to light signals of different colors[28] or to perform tricks. Fish respond to certain colors most evidently in relation to feeding.[citation needed] Fish learn to anticipate feedings provided they occur at around the same time every day.

### **Behavior**

Goldfish are gregarious, displaying schooling behavior, as well as displaying the same types of feeding behaviors. Goldfish may display similar behaviors when responding to their reflections in a mirror.

Goldfish have learned behaviors, both as groups and as individuals that stem from native carp behavior. They are a generalist species with varied feeding, breeding, and predator avoidance behaviors that contribute to their success. As fish they can be described as "friendly" towards each other. Very rarely does a goldfish harm another goldfish, nor do the males harm the females during breeding. The only real threat that goldfish present to each other is competing for food. Commons, comets, and other faster varieties can easily eat all the food during a feeding before fancy varieties can reach it. This can lead to stunted growth or possible starvation of fancier varieties when they are kept in a pond with their single-tailed brethren. As a result, care should be taken to combine only breeds with similar body type and swim characteristics.

### **Teaching Your Fish to Follow Your Finger**

Put your finger on the outside of your aquarium tank near your fish. Your goal is to get your fish's attention, and once you get its attention, reward it with food. If your fish responds to your finger right away, award it with food. If your fish does not respond right away, shake your finger and tap the glass until it does notice. You can consider placing your finger in the fish tank for your fish to follow as well. Some types of fish tend to bite, including Bettas, so do some research on your breed fish before putting your finger in their tank.

Get your fish to follow your finger. Move your finger back and forth across the tank, and reward your fish every time it follows your finger. Getting your fish to come to your finger is the first step, but getting your fish to follow your finger as it moves may be a bit more difficult. Move your finger up and down, from side to side, etc. Do not reward your fish until it follows your finger. Use repetition and rewards to train your fish quickly. The fastest and most effective way to train your fish is by using food to reward its behavior. With repetition, your fish will learn to associate following your finger with being fed. Once your fish understands that they will be fed for doing what you instruct them to do, you'll be able to teach them a variety of other tricks. Use Pellets for your training instead of regular fish food. If you use pellets for training rather than normal feeding, your fish will view them as a special treat.

### **Teaching Your Fish to Swim Through Hoops**

Obtain a hoop for your fish to swim through. You'll need a hoop that is big enough for your fish to easily swim through. For smaller fish, using a larger hoop earring or brace-let could work as a hoop. If you want a larger hoop. Make sure to wash the hoop so that it doesn't bring any harmful bacteria or substances into your fish tank. Attach your hoop to a strong or pole if you're uncomfortable putting your hand in your fish tank. Start with a larger hoop to make it easier for your fish to swim through.

Stick the ring in the water. Your hoop should be perpendicular to the side of the aquarium and near the glass, as this will make it easier for you to direct your fish to swim through it. Your fish may be interested in the hoop right away, or it will simply ignore the hoop.

Make your fish follow your finger through the hoop. Teaching your fish to follow your finger will come in handy for this trick. Simply move your finger across the glass of the fish tank so that your fish follows it. Run your finger along the glass where the hoop is, and your fish should swim right through it. This may take a couple tries, but your fish should start to catch on. Reward your fish with a treat every time it swims through the hoop. This will help teach your fish that swimming through hoops will result in being fed. Practice this trick with your fish daily so that it becomes a regular trick. Begin adding additional hoops for your fish to swim through for a more impressive trick.

### **Creating an Obstacle Course for Your Fish**

Decorate your fish tank like an obstacle course. Use hoops, arches, plants, etc. to make your fish tank into an obstacle course. Once you've taught your fish how to swim through hoops, they should be able to swim through and around anything with some guidance. Be patient when teaching your fish how to swim through an obstacle course, as it may take some time.

Lead your fish around the course with your finger or a treat. Your fish will most likely follow your finger around once it has mastered that trick, so lead your fish through its obstacle course. Start with simple obstacle courses, and make them harder once your fish starts to master the obstacles.

Use a treat on a string to lead your fish around instead of your finger. If you want your fish to follow you all around the tank, it may be hard for you to use your finger. Stick a treat on a stick, or string and move it around the course so that the fish follows it. Make sure the fish doesn't get the treat until it's finished the course. Reward your fish with a treat after it completes the obstacle course. Just like all the other tricks, positive reinforcement will help train your fish quickly. Give them a treat every time they complete the obstacle course. If you've had the treat on a hook, make sure to remove it from the hook before feeding it to the fish.

### **Teaching Your Fish to Jump**

Feed your fish by hand every day. This will teach your fish that seeing your hand means that they will be getting fed. Make this a normal routine so that your fish becomes familiar with your hand, and knows what to expect when it comes time for feeding. This will also help your fish begin to develop trust with you.

Train your fish to swim to the surface for feeding. Start by getting your fish's attention by placing your fingertips in the water. This should get them to swim to the surface. If this does not get their attention, hold some food in your fingertips as you place them in the water. Do not release the food into the water, as you should not feed them until they have performed the trick.

Hold your fish's food just above the water. After you've gotten their attention, dangle some of their food just above the water. If your fish does not jump for the food right away, you'll need to encourage them. Place your fingertips full of food on the surface of the water, and pull them from the water as your fish approaches. This should encourage your fish to jump from the water to eat their food. Reward your fish with some treats once they jump out of the water. This positive reinforcement will show them that jumping from the water will get them an extra treat, as opposed to just their regular food.

A 3 page paper on how you trained your goldfish will be required at the end of the course. What behavioral theories did you employ, Operant Conditioning or Classical Behaviorism? What was your S-R, reinforcement schedule, etc.

<http://www.wiki.com/Train-Your-Fish-to-Do-Tricks> 12/12/16