





So the archer fish allows for this distortion by shooting 'off-target'.

They also calculate where the insect will fall into the water and grab it in one tenth of a second.

The archer fish has a groove along the roof of their mouth and a ridge-shaped tongue. When they press their gills shut, they push their tongue against the groove to shoot out jets of water.

As soon as the insect starts to fall off its 'perch' and into the water, the archer fish turns and darts over to the spot where the insect will land. If the archer fish dawdles, other fish nearby will swoop in and gobble up the insect.

The archer fish seems to calculate where their lunch will land before the insect hits the water.

Because archer fish shoot prey of different sizes which fall at different speeds, scientists think that their calculations of where prey will land are quite complex.

Humans track a falling ball (such as a cricket ball hit high by a batsman) by watching, calculating and moving to the spot where the ball is likely to land.

Unlike humans, archer fish cannot keep watching their target (the falling insect) until it lands.

Instead, the archer fish seems to dislodge the insect, calculate the landing spot (using a few simple ballistic calculations within 100 milliseconds), then swims over to the landing spot in a direct, straight lined route.

Scientists tested this by sitting a dead fly (tethered by a string) over a tank containing an archer fish.

They allowed the archer fish to spit at and dislodge the fly from its perch.

Just after the fly started falling, scientists pulled the fly up in mid-air and stopped the fly from landing in the water. Even though the fly stopped in mid-air, the archer fish continued to rush to the predicted landing spot.

Scientists also placed the fly on a glass plate above the tank and slid the fly horizontally over the tank.

When the archer fish spat at and hit the fly, the fish still swam to the position where the fly should have landed if the fly was able to fall downwards into the water.

From this, scientists believed that the archer fish was calculating the fly's height and initial velocity rather than extrapolating where the fly would land.