

Lab Report: Guppy Hereditary Study

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5th Grade Science Fair
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# Question

What will happen if I release 2 female and 4 male guppies into my fish tank, and let them breed freely?

# Hypothesis

I thought the guppies would have babies and based off some initial research I thought later generations would turn a very dull gray in color.

# PROCEDURE

To test my hypothesis I purchased two female and four male guppies from PetSmart. I chose to put more males in because they have the more beautiful tails. Here are the steps I went through:

1. Established a twenty gallon tank with appropriate ammonia levels to support guppies livelihood
2. Release two female and four male guppies of the following types (see **Figure 1** for different guppy tail and fin types):
	1. Female:
		1. Yellow Body and Round Tail
		2. Gray Body and Black Round Tail
	2. Male:
		1. Rainbow Body and Delta Tail
		2. Blue/Red Body and Black Veil Tail
		3. Flame (striped orange and black) Body and Fan Tail
		4. Leopard Body and Delta Tail
3. Care for fish by maintaining consistent food and water temperature levels
4. Purchased a breeding net cage to isolate pregnant females so babies would not be eaten by other guppies after birth
5. Allowed free breeding for span of fourteen months
6. Monitored closely for first three generations of babies, but then became confusing on inter-generational mixing



**Figure 1:** Tail and Fin Shapes of Guppies

# observations

The guppies had babies. They had lots and lots of babies. They had a ton of babies. They had…I think you get the idea. They had seven to thirteen babies every three weeks and those babies can have more babies in about one month. It did take a month for the initial babies to be born. That means that since I have been doing this project for about fourteen months, I have approximately twelve generations in my tank! That’s a lot.

The first three generations were very fairly easy to track, but as more and more generations produced it became difficult to track the generations. I started with six guppies and now I have about seventy-five guppies today and I have given some away. **Figure 2** shows the mixing of the first three generations of guppies.

I was surprised to observe as the grandchildren started coming along they were getting fancier and not duller as I had initially thought.

This experiment has helped me “understand that traits are passed from the parent organisms to their offspring, and that sometimes the offspring may possess variations of these traits” [green science fair project information sheet]

# conclusions

The results of the guppy breeding showed the offspring were actually a lot more interesting (visually appealing) than their ancestors. I also was able to figure out the dominant trait in many guppies by looking at which trait was passed down most; several traits would seem to disappear, but then come out again several generations later!

I also think that controlled breeding with guppy parent pairs in a separate tanks and a good log book to better track generations would have helped out a ton; these were two key lessons learned to help me improve future science experiments.

**Figure 2:** Examples of Mixing of First Three Guppy Generations (not all inclusive)

**Third Generation**

**(Resulting Males)**

**Second Generation (Resulting Males)**

**First Generation**

Unknown Mother?

Unknown Mother?

Unknown Mother?

Male Rainbow Body Yellow Tail Black Border

Male Black Spot Zebra

Male Yellow Leopard

Male Rainbow Body Yellow Tail

Male Flame Body and Black Tail

Male Zebra

Male Flame Zebra

Male Flame Body and Red Tail Circle

Male Rainbow Body and Delta Tail

Male Blue/Red Body and Black Veil Tail

Male Flame Body and Fan Tail

Female Gray Body and Black Round Tail

Female Yellow Body and Round Tail

Male Leopard Body and Delta Tail