Name: _____ **Date:** _____

Lab Partners: _____

GloFish Mendelian Genetics & Chi-Square Investigation

Observe and Record (For Each Tank)

Tank #: _____

Work with your group to observe a tank of GloFish. Each tank contains offspring from one male × one female fish.

1. **List the different phenotypes** you observe (color, glow, stripe, etc.).

2. **Count how many fish** show each phenotype.

3. Fill out the chi-square data table below.

Chi-Square Table

Phenotype	Observed (o)	Expected (e)	d = o – e	d^2	d^2/e
Total					χ^2 =

Degrees of Freedom (df): _____ (Number of phenotypes – 1)

P-value (range): _____

Conclusion: What does your chi-square result tell you about your hypothesis?

Step 2: Form a Hypothesis

- Based on the phenotype data and patterns you see, propose a **genetic hypothesis**.
- Use **Punnett squares** to help support your reasoning.

Hypothesis for this clutch:

Step 3: Analyze Your Results

- Use your hypothesis to calculate the expected numbers of each phenotype.
- Complete the chi-square table (Step 1) to compare observed vs. expected.
- Interpret your P-value to decide whether to accept or reject your hypothesis.

Use this space for calculations or notes:

Repeat for Additional Tanks

Repeat **Steps 1–3** for each tank of fish (e.g., Tank 2, Tank 3, etc.) on new copies of the table above.

Male vs. Female Phenotype Ratios (Tanks 5 & 6)

Chi-Square Table – Male/Female Analysis

Fill this out for each tank separately and then for the combined data.

Phenotype (Sex)	Observed (o)	Expected (e)	d = o – e	d^2	d^2/e
Male					
Female					
Total					$\chi^2 =$

- **Degrees of Freedom (d): _____**
- **P-value: _____**
- **Conclusion:** What might this tell you about gender inheritance in zebrafish?

Final Step: Set Up a Test Cross

1. Choose one hypothesis to test based on your data.

Hypothesis Being Tested:

---

2. Set up a single-pair mating.

- **Female phenotype: _____**
- **Male phenotype: _____**

- **Expected offspring phenotypes & ratios:**

Fill this out for each tank separately and then for the combined data.

Phenotype (Sex)	**Observed (o)**	**Expected (e)**	**d = o – e**	**d^2**	**d^2/e**
Male					
Female					
Total					**χ^2 =**

- **Degrees of Freedom (d): _____**
- **P-value: _____**

Was your expected ratio similar to your observed ratio? Explain your results.