Meiosis & Inheritance

SBI3C | Student laboratory assignment | 1 of 4

Prepare for your investigation

Name: _____ Date: _____ Class: _____

Research question

How do meiosis and random fertilization produce variation in offspring?

Learning goal: use the virtual model to gather evidence, explain meiosis & inheritance and communicate a supported conclusion.

Materials: WorksheetGalaxy virtual laboratory, this assignment, calculator or spreadsheet if needed. Virtual observations only; do not recreate hazardous procedures or perform physical fitness tests without teacher approval.

1. Define two relevant scientific terms from the Background Information tab. (K/U)

2. Write a prediction or hypothesis with a scientific reason. (K/U, T/I)

3. Identify the variable or feature compared, the measured outcome and constants or consistent observation criteria. (T/I)

Meiosis & Inheritance

SBI3C | Student laboratory assignment | 2 of 4

Perform the virtual laboratory

Open the corresponding virtual lab and read Background Information. Follow the investigation instructions below. Record authentic simulated results; do not invent data.

• Inspect each of the eight stages in the meiosis visualizer. Record the major event in meiosis I and meiosis II.

• Set a diploid parent genotype (AaBb, AABb, or AaBB). Generate at least 20 gametes and compare the observed types with the expected possibilities.

• Run an inheritance trial using two Aa parents. Record at least 100 offspring and compare observed genotype and phenotype frequencies with the theoretical 1:2:1 and 3:1 ratios.

• Repeat with 500 offspring. Explain why the larger sample often comes closer to the expected proportions.

• Complete the report using evidence from your recorded trials.

• Variables: independent variable = number of simulated offspring; dependent variable = observed phenotype proportions; controlled variables = parental genotypes and inheritance model.

Record each completed observation using the simulator’s record control when available. Use Data & Graphs to review results. Export CSV if available; attach additional rows or screenshots when needed.

Record the exact settings and any changes to the method.

Meiosis & Inheritance

SBI3C | Student laboratory assignment | 3 of 4

Observations & results

Enter the actual results. Keep trial IDs consistent between continued tables. Attach the full exported data or extra sheets when the procedure requires more rows. Include units as displayed.

Data table 1

Trial / item	Parent genotype AaBb AABb AaBB	Gametes to generate	Offspring	Measured result / observation

Qualitative observations / sample calculation (show units where applicable)

Meiosis & Inheritance

SBI3C | Student laboratory assignment | 4 of 4

Analysis, conclusion & assessment

4. Present a labelled graph of a measured relationship, or an annotated diagram / comparison chart for qualitative investigations. Attach it separately. Explain the pattern using recorded evidence. (C, T/I)

5. Why are gametes genetically different? (K/U, A)

6. How does sample size influence observed inheritance ratios? (K/U, A)

Conclusion and evaluation: answer the research question, revisit the prediction using evidence, identify a model limitation and propose an improvement. (T/I, A)

Submit this assignment plus your completed Lab Report (printed or saved as PDF from the lab) and any supporting data/figures.

K/U: accurate concepts /10	T/I: method, data, reasoning /12	C: clear tables, units, report /8	A: explanation, conclusion, transfer /10

Total: /40