Name: _____ **Date:** _____

Section: _____

IVF Simulator Activity

Modeling Human Reproduction and Genetic Inheritance

Phase 1: ENGAGE (5 minutes)

Getting Started: Open peebedu.com and navigate to IVF Simulator

Click '`Introduction`' to understand the simulation.

Initial Observations: What types of gametes are available? _____ What genetic information is shown? _____ What stages of development are modeled? _____

Ethical Consideration: What factors might influence gamete selection in real IVF? _____

Phase 2: EXPLORE (20 minutes)

Part A: Gamete Selection

Explore the genetic profiles of available gametes.

Observations:

- What genetic traits are shown for eggs? _____

- Are all gametes genetically identical? _____

Inheritance Patterns:

- Which traits appear dominant? _____

- Can you predict offspring traits? _____

Part B: Fertilization Process

Observe fertilization attempts.

Key Questions:

- Does every egg-sperm combination work? _____

- What might cause fertilization to fail? _____

Part C: Embryo Development

Monitor embryo development stages.

Development Observations:

- What stages of development do you see? _____

- What factors affect development? _____

Phase 3: EXPLAIN (12 minutes)

Biological Principles

Meiotic Variation:

- Why is each egg genetically unique? _____

- How does this create offspring diversity? _____

Fertilization Success: What factors affect fertilization? _____

- Egg quality: How might this vary? _____

- Environmental conditions: What's needed? _____

Genetic Screening: What can be detected before implantation? _____

- Chromosome number problems: _____

- Why screen embryos? _____

Development Stages: Order these from earliest to latest: ___ Blastocyst (ready to implant) ___ 2-cell stage ___ Zygote (fertilized egg) ___ Morula (ball of cells)

Phase 4: ELABORATE (10 minutes)

Real-World Applications

Age and Fertility:

- Why does maternal age affect success? _____

- How does IVF help with age-related challenges? _____

Genetic Counseling: When both parents carry a recessive allele:

- What inheritance pattern occurs? _____

- What ethical questions arise? _____

Multiple Births:

- Why do IVF pregnancies often result in twins? _____

Phase 5: EVALUATE (3 minutes)

Synthesis Questions

Understanding Inheritance: How does IVF demonstrate:

- Mendelian genetics? _____

- Role of chance in reproduction? _____

Society and Science: Consider the impact of IVF:

- How has it helped families? _____

- What future possibilities worry you? _____

Model Evaluation: What does this simulation show well? _____

What important aspects are simplified? _____

Final Reflection: How has this simulation changed your understanding of human reproduction?
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