Name: _____ **Date:** _____

Section: _____

Natural Selection Island Simulation Activity

Island Evolution: Natural Selection in Action

Phase 1: ENGAGE (2 minutes)

Getting Started: Open peebedu.com and navigate to Natural Selection Island Simulation

Click '`Introduction`' to learn about the simulation.

The Setup: You'll observe insects migrating between islands. Each colored island favors insects of matching color!

Quick Prediction:

If red insects start on a green island, they will:

Phase 2: EXPLORE (8 minutes)

Run the Simulation

Start with default settings. Watch for patterns.

Observation 1: Color Matching After 100 frames, which color dominates each island? _____

- Green island: _____

- Red island: _____

Observation 2: Black Insects Black insects can survive on both green AND brown islands.

- Where do most black insects end up? _____

Experiment: Island Isolation Reset and change Water Survival to 0.3 (very low).

- Do insects still migrate? YES / NO / RARELY
- Each island's population becomes: MIXED / PURE

Experiment: Strong Selection Reset and change Green Island Selection to 10 (very high).

- Non-green insects on green island: SURVIVE / DIE QUICKLY
- Green insects spread: FASTER / SLOWER
- Strong selection makes evolution: FASTER / SLOWER

Phase 3: EXPLAIN (7 minutes)

Understanding Evolution

Natural Selection Pattern: Complete the sequence:

Environmental pressure → _____ survival → Population _____

Four Factors of Evolution: Match what you saw to each factor:

- Insects randomly change color = _____

- Insects move between islands = _____

Factors: Natural Selection, Mutation, Migration, Genetic Drift

Isolation Effects: When islands are isolated (low water survival):

- Gene flow: INCREASES / DECREASES
- Each population: STAYS SAME / BECOMES UNIQUE
- New species could: FORM / NOT FORM

Phase 4: ELABORATE (2 minutes)

Real-World Connections

Galápagos Finches: Different islands have different food sources (like different colors). Result: _____

Antibiotic Resistance: If colors were resistance levels and islands were hospitals:

- Migration = _____

Climate Change: As habitats change (island colors shift), populations must: _____

Phase 5: EVALUATE (1 minute)

Show Understanding

Complete the concept map:

Different environments → Apply _____ → Favors certain _____ → Population _____ over time → Evolution

Exit Question: Why don't all insects just become black (the generalist)? What's the advantage of being specialized? _____

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Think About It: How does this simulation help explain why isolated islands often have unique species found nowhere else? _____