EVOLUTION CARD GAME

Purpose of the Activity

This game models natural selection by showing how different **trait combinations** affect survival in changing environments. Students experience how populations shift over time based on environmental pressures.

Materials Needed

- ~30 trait cards (each with one or two traits)
- Scenario list (3 sets provided)
- Space for students to stand, sit, and move

Card Types

Neck Length Traits

- Long Neck
- Short Neck

Bonus Traits

Options include:

- Disease-Resistant
- Extra Strong
- Injured
- Fast Runner
- Camouflage Pattern
- Clumsy

Card Structure

Each card contains either:

- **One trait**
    - Long Neck
    - Short Neck

OR

- **Two traits**
    - Long Neck + Disease-Resistant
    - Short Neck + Extra Strong
    - Long Neck + Injured
    - Short Neck + Fast Runner
    - Long Neck + Camouflaged
    - Short Neck + Disease-Resistant

Preparing the Cards

- Create ~30 cards so students get a varied mix, or use the cards provided.
- Ensure both neck lengths appear frequently.
- Include bonus traits in smaller numbers to mimic real populations.

How to Run the Game

1. Distribute Traits

Each student draws **one card** and stands.

2. Read a Scenario

Read one environmental scenario aloud.

3. Students Check Survival

Students look at their card and will determine if their traits survive that scenario.

4. Natural Selection Happens

- Students who **do not survive** sit down.
- Students who **survive** "reproduce" by trading their card with a student who sat down.
- Everyone stands again with their new card.

5. Repeat

Continue through several scenarios to show how the population changes over time.

What Students Will Learn

This activity demonstrates the following:

- Traits are helpful only in certain environments.
- Some traits matter only when paired with another trait.
- Neutral traits can become important when conditions change.
- Rare traits (like disease resistance) can suddenly become essential.
- Evolution acts on trait combinations, not single traits.
- Populations shift unpredictably as environments change.

This game models real ideas like:

- Polygenic traits: Some traits come from many genes working together, not just one.
- Trade-offs: A trait that helps in one situation might cause problems in another.
- Environment-dependent survival: Whether a trait is helpful depends on what the environment is like at that moment.
- Natural selection and reproduction: Animals with traits that help them survive are more likely to live long enough to have babies and pass those traits on.

REFLECTION QUESTIONS

1. Which traits or trait combinations ended up being the most successful across multiple scenarios, and why do you think that happened?
2. Did any trait that seemed unhelpful at first suddenly become important later? What does that tell us about how evolution works in changing environments?
3. How did having two traits instead of one change your chances of survival?
4. Did the population's traits change from the first round to the last? What patterns did you notice?
5. Were any traits helpful in one scenario but harmful in another? How does that show trade-offs in evolution?
6. If you could design a new trait to help survive the scenarios, what would it be and why?