Chapter 15 Darwin's Theory of Evolution   **Exploration**

Modeling Adaptation

In this game, three families land on an alien planet. At home, the Hunter family had survived by hunting in the cold north. The Seeder family had farmed in the temperate zone. The Fisher family had lived on a tropical island. In this investigation, you will model how well each family survives in a new environment.

Problem

How do organisms survive in new habitats?

Material

- coin

Skills Using Models, Using Tables and Graphs, Calculating

Procedure

1. Work in groups of three, with each member playing a Hunter, Seeder, or Fisher.

2. Flip a coin. Record the result as 1 for heads, 0 for tails. Toss the coin three more times to produce a series of four 1s and 0s. This 4-digit number is the code for your new habitat.

   Habitat code: _____ _____ _____ _____

3. If the first digit in your code is 1, you live in a hot area. If it is 0, the climate is cold. If the second digit is 1, the climate is wet. If it is 0, it's dry. If the third digit is 1, you have a dry cave to live in. If it is 0, you sleep under the stars. If the last digit is 1, there is enough food. If it is 0, food is scarce.

   Record a description of your habitat here: _____
   _____
   _____
   _____
   _____
   _____
   _____

4. Find your family in the table at the top of the next page. Then, record each number in your row that falls under a heading that describes your habitat (hot or cold and so forth). Record the total of these 4 numbers. This total represents the energy you have accumulated from your food.

   Energy from food: _____

Name _____ Class _____ Date _____

Energy Points for Survival								
	Temperature		Water		Shelter		Food	
	Cold	Hot	Dry	Wet	None	Cave	Scarce	Plenty
Hunter	8	–2	0	4	–6	7	–5	8
Seeder	0	3	2	2	–1	2	–2	6
Fisher	–5	8	–2	5	0	1	–1	4

5. Subtract 8 from your total to model the energy you must use to survive. If you don't have enough energy to do this, you're out of the game. The player with the most energy wins. Record the score and habitat of each family in the data table below.

Data Table		
	Score	**Habitat**
Hunter		
Seeder		
Fisher		

6. Predicting Record a prediction of what would happen if you reversed each player's habitat code by changing all the 1s to 0s and all the 0s to 1s.

Prediction: _____

_____

_____

_____

_____

7. Reverse your habitat code as described in step 6. Play a second round with these conditions.

Analyze and Conclude

1. **Comparing and Contrasting** In which habitat were you most successful? Was it similar to your home environment?

   _____

   _____

   _____

   _____

   _____

   _____

   _____

2. **Using Models** The numbers in the table are different for each family. How did this fact help you model the survival of different organisms?

   _____

   _____

   _____

   _____

   _____

   _____

   _____

3. **Drawing Conclusions** Is one habitat best for all players? Explain in terms of adaptation.

   _____

   _____

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