Name _____ Date _____ Class _____

CHAPTER 2

Project

Winning Strategies

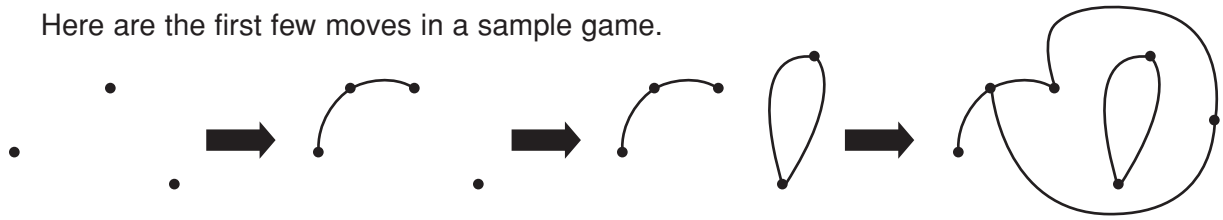
Activity 1: Sprouts *Use after Lesson 2-1*

The game of sprouts is a paper-and-pencil game for two players. It was invented in 1967 by two mathematicians, John Conway and Michael Paterson.

1. Start the game by drawing three dots on a piece of paper. Players take turns making moves. To make a move, draw a curve joining two dots (or joining a dot to itself) and place a new dot on the curve. Be sure to follow these rules:
   - No curve can cross another curve.
   - No dot can have more than three curves coming from it.

   The winner is the player who makes the last legal move.

   Here are the first few moves in a sample game.



2. Play several games of sprouts with a partner. Record the total number of moves in each game.

3. Use inductive reasoning to make a conjecture about the minimum number of moves that can occur in a game of sprouts. _____

4. What is the maximum number of moves that can occur? _____

5. Describe a strategy that will enable you to win if you make the first move. _____

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Activity 2: Puzzling Digits *Use after Lesson 2-3*

Deductive reasoning can come in handy for solving puzzles.

1. In this puzzle, each letter represents a different digit.

$O + O = E$
$O \times O = E$

$$\begin{array}{r} HAT \\ +\ MAT \\ \hline LEVE \end{array}$$

$M \times M = OM$

$T \times V = OL$
$H \times I = I$

   Use the above clues to determine which letter represents each digit.

2. Arrange the letters in numerical order to spell a secret phrase.

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