Unit 1: Inductive and Deductive Reasoning
Time Allotted: 2 weeks

Assessment Standards

Number and Logic

General Outcome: Develop number sense and logical reasoning.

1. Analyze and prove conjectures, using inductive and deductive reasoning, to solve problems. [C, CN, PS, R]	1.1 Make conjectures by observing patterns and identifying properties, and justify the reasoning. 1.2 Explain why inductive reasoning may lead to a false conjecture. 1.3 Compare, using examples, inductive and deductive reasoning. 1.4 Provide and explain a counterexample to disprove a given conjecture. 1.5 Prove algebraic and number relationships such as divisibility rules, number properties, mental mathematics strategies or algebraic number tricks. 1.6 Prove a conjecture, using deductive reasoning (not limited to two column proofs). 1.7 Determine if a given argument is valid, and justify the reasoning. 1.8 Identify errors in a given proof; e.g., a proof that ends with 2 = 1. 1.9 Solve a contextual problem that involves inductive or deductive reasoning.
2. Analyze puzzles and games that involve spatial reasoning, using problem-solving strategies. [CN, PS, R, V]	*(It is intended that this outcome be integrated throughout the course by using sliding, rotation, construction, deconstruction and similar puzzles and games.)* 2.1 Determine, explain and verify a strategy to solve a puzzle or to win a game; e.g., • guess and check • look for a pattern • make a systematic list • draw or model • eliminate possibilities • simplify the original problem • work backward • develop alternative approaches. 2.2 Identify and correct errors in a solution to a puzzle or in a strategy for winning a game. 2.3 Create a variation on a puzzle or a game, and describe a strategy for solving the puzzle or winning the game.

What do the Student know from Math 10-C?

No outcomes on Logic and Reasoning-- Student have an outcome on Numbers that may be helpful this unit.

What do Student know from Math 20-1?

No outcomes

What is Coming in Math 30-2

Logical Reasoning	**General Outcome:** Develop logical reasoning.
Specific Outcomes *It is expected that students will:*	**Achievement Indicators** *The following set of indicators may be used to determine whether students have met the corresponding specific outcome.*
1. Analyze puzzles and games that involve numerical and logical reasoning, using problem-solving strategies. [CN, ME, PS, R]	*(It is intended that this outcome be integrated throughout the course by using games and puzzles such as chess, Sudoku, Nim, logic puzzles, magic squares, Kakuro and cribbage.)* 1.1 Determine, explain and verify a strategy to solve a puzzle or to win a game; e.g., • guess and check • look for a pattern • make a systematic list • draw or model • eliminate possibilities • simplify the original problem • work backward • develop alternative approaches. 1.2 Identify and correct errors in a solution to a puzzle or in a strategy for winning a game. 1.3 Create a variation on a puzzle or a game, and describe a strategy for solving the puzzle or winning the game.

Logical Reasoning (continued)	**General Outcome:** Develop logical reasoning.
Specific Outcomes *It is expected that students will:*	**Achievement Indicators** *The following set of indicators may be used to determine whether students have met the corresponding specific outcome.*
2. Solve problems that involve the application of set theory. [CN, PS, R, V] [ICT: C6–2.3]	2.1 Provide examples of the empty set, disjoint sets, subsets and universal sets in context, and explain the reasoning. 2.2 Organize information such as collected data and number properties, using graphic organizers, and explain the reasoning. 2.3 Explain what a specified region in a Venn diagram represents, using connecting words (and, or, not) or set notation. 2.4 Determine the elements in the complement, the intersection or the union of two sets. 2.5 Explain how set theory is used in applications such as Internet searches, database queries, data analysis, games and puzzles. 2.6 Identify and correct errors in a solution to a problem that involves sets. 2.7 Solve a contextual problem that involves sets, and record the solution, using set notation.