# Grade 6 Math Enrichment - Unit 3 - Strategic Problem Solving

## Unit Focus

Enrichment students will be presented with a variety of complex problems to solve. Problems are designed to challenge students to apply algebraic thinking and logic, to be creative in their problem solving as they seek multiple solutions and to expand their spatial reasoning skills. Selected problems will be presented in paper-and-pencil format, others are video-based open-ended 3-Act Math tasks and some are game-based with students first learning how to play a challenging logic game and then working to analyze the underlying logic needed to win. Students will need to think backwards and analyze their work to determine what worked, what did not and what decisions can guarantee success.

## Stage 1: Desired Results - Key Understandings

### Standard(s)

**Common Core**
Mathematics: 6

- Make sense of problems and persevere in solving them. (CCSS.MATH.MP.1)
- Look for and make use of structure. (CCSS.MATH.MP.7)
- Look for and express regularity in repeated reasoning. (CCSS.MATH.MP.8)

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- Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2)

### Transfer

*Students will be able to independently use their learning to...*
**T1** Initiate a plan using a variety of methods/strategies appropriately, execute it, and evaluate the reasonableness and accuracy of the solution.
**T2** Identify and generalize patterns and structure in numbers, expressions, data and objects.
**T3** Apply an understanding of known patterns to new problems and make connections between concepts.
**T4** Construct viable arguments using clear and appropriate mathematical language and critique the reasoning of others.

### Meaning

| Understanding(s) | Essential Question(s) |
|---|---|
| *Students will understand that...*<br>**U1** Mathematicians work to make sense of the problem before trying to solve it.<br>**U2** Mathematicians monitor progress while problem solving, change course if necessary and evaluate the reasonableness of their solution.<br>**U3** Mathematicians see patterns to make generalizations about structures and relationships. | *Students will keep considering...*<br>**Q1** What do effective problem solvers do when they get stuck?<br>**Q2** What patterns are present?<br>**Q3** What generalizations can be made from this pattern? |

### Acquisition of Knowledge and Skill

| Knowledge | Skill(s) |
|---|---|
| *Students will know...*<br>**K1** that games can sometimes be analyzed to find a strategy to improve outcomes.<br>**K2** that recognizing and applying patterns can lead to understanding and finding solutions to novel problems.<br>**K3** Problem analysis is critical to successful problem solving: understanding the question asked and the relevant information given are essential first steps in identifying strategies to approach complex problems. | *Students will be skilled at...*<br>**S1** Analyzing problems for critical information<br>**S2** working backwards to solve a problem<br>**S3** Recognizing and applying patterns to solve novel problems.<br>**S4** Evaluating the reasonableness of answers. |