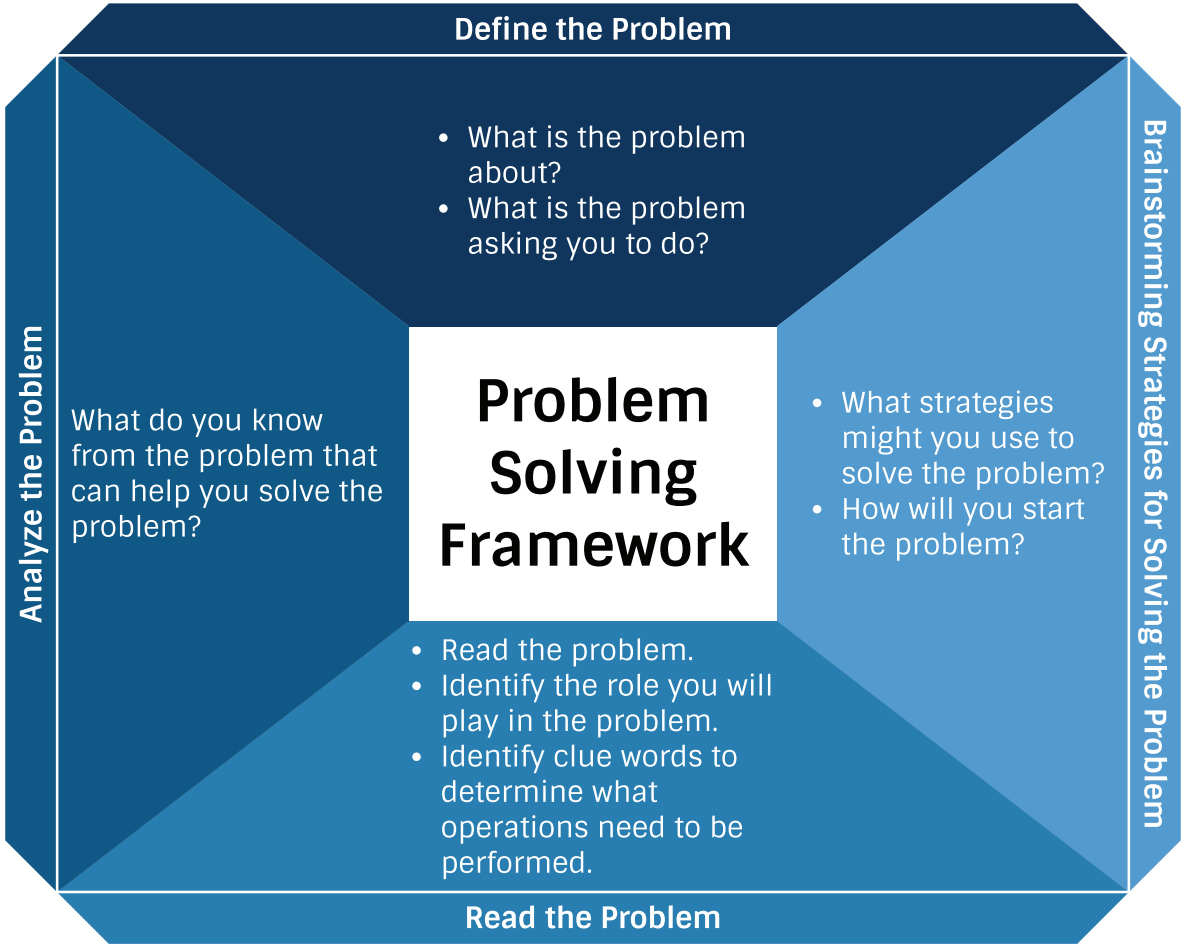
Robbery in Skullzton

Problem Solving Framework



THINKING ABOUT MATH

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Performance Task Rubric

Target Area

4: Exceeds	3: Meets	2: Approaching	1: Beginning
Skill: Compare and contrast permutations and combinations.			
• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task.	• Shows complete understanding of required mathematical knowledge for the specific skill.	• Shows some understanding of the required mathematical knowledge for the specific skill.	• Shows limited or no understanding of the mathematical knowledge for the specific skill.
Skill: Construct vertex-edge graphs to describe a counting situation.			
• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task.	• Shows complete understanding of required mathematical knowledge for the specific skill.	• Shows some understanding of the required mathematical knowledge for the specific skill.	• Shows limited or no understanding of the mathematical knowledge for the specific skill.
Skill: Calculate the total permutations or combinations of (n) objects over time.			
• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task.	• Shows complete understanding of required mathematical knowledge for the specific skill.	• Shows some understanding of the required mathematical knowledge for the specific skill.	• Shows limited or no understanding of the mathematical knowledge for the specific skill.
Skill: Apply the Fundamental Counting Principle.			
• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task.	• Shows complete understanding of required mathematical knowledge for the specific skill.	• Shows some understanding of the required mathematical knowledge for the specific skill.	• Shows limited or no understanding of the mathematical knowledge for the specific skill.

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Performance Task Rubric

Target Area

4: Exceeds	3: Meets	2: Approaching	1: Beginning
Skill: Construct networks to model counting situations.			
• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task.	• Shows complete understanding of required mathematical knowledge for the specific skill.	• Shows some understanding of the required mathematical knowledge for the specific skill.	• Shows limited or no understanding of the mathematical knowledge for the specific skill.
Planning and Execution			
• Uses an appropriate and complete strategy for solving the problem. • Uses clear and effective diagrams, tables, charts or graphs if required.	• Uses an appropriate but incomplete strategy for solving the problem. • Appropriate but incomplete use of diagrams, tables, charts, and graphs if required.	• Uses an inappropriate strategy or application of strategy is unclear. • Limited use or misuse of diagrams, tables, charts or graphs if required.	• Works haphazardly with no particular strategy for solving the problem. • Does not show use of diagrams, tables, charts, or graphs if required.
Persistence			
• Works hard on the task and doesn't need much help • Students may extend their thinking beyond the problem and make new connections or make new problems.	• Works hard on the task and only gets help after attempting many strategies. • Completes the task and works diligently at the harder parts.	• Can do less difficult parts of the problem with little help. • Begins work on the harder parts, but unless help is provided gives up.	• Needs help, even for the simple parts of the task. • Gives up quickly, often just wanted the answer giving.

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Performance Task Rubric

Communication:

4: Exceeds	3: Meets	2: Approaching	1: Beginning
• There are clear effective explanations for the solutions when prompted to explain or describe. • Mathematical representations are actively used as means of communicating ideas. • There is precise and appropriate mathematical terminology used.	• There is clear explanation • There is appropriate use of accurate mathematical representation. • There is effective use of mathematical terminology.	• There are incomplete explanations. • There is some use of appropriate mathematical representations. • There is some use of appropriate mathematical terminology.	• There are no explanations for the solutions. The explanations cannot be understood or is unrelated to the task. • There is no use or inappropriate use of mathematical representations. • There is no use or mostly inappropriate use of mathematical terminology.

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Critical Thinking/ Creative Thinking Rubric

Target Area

4: Exceeds	3: Meets	2: Approaching	1: Beginning
Ideation/Brainstorming:			
• The learner frequently sees the links between unrelated ideas. The learner is able to produce well-developed results that are fresh and new with no support.	• The learner often produces new and unique ideas with little or no support.	• The learner occasionally produces new and unique ideas but only with guidance.	• The learner is unable to produce new and unique ideas without significant guidance and encouragement.
Realization			
• The learner actively seeks out and follows through with new ideas or approaches to a problem. The risk of failure is a real possibility but does not constrain the learner.	• The learner is willing to consider and follow through on ideas or approaches to a problem. The risk of failure is a possibility and puts some constraint on the learner.	• The learner considers new ideas or approaches to a problem only with strong encouragement. The risk of failure constrains the learner.	• The learner will not consider new ideas. The learner strictly stays within the constraints of the problem, which ensures that there is little risk of failure.
Communication			
• The learner identifies the main idea of the problem with numerous supporting details and examples, which are organized logically and coherently within the Problem Solving Framework with no assistance.	• The learner identifies the main idea of the problem with some supporting details and examples in an organized manner within the Problem Solving Framework with little assistance.	• The learner identifies the main idea of the problem with few details or examples in a somewhat organized manner within the Problem Solving Framework with assistance.	• The learner is unable to identify the key elements of the problem without a great deal of assistance.

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Critical Thinking/ Creative Thinking Rubric

Target Area

4: Exceeds	3: Meets	2: Approaching	1: Beginning
Process:			
• The learner develops strategies that are insightful and uses logical reasoning to reach accurate results with no assistance.	• The learner develops strategies that are insightful and uses logical reasoning to reach accurate results with little assistance.	• The learner develops strategies that are insightful and uses logical reasoning to reach accurate results with assistance.	• The learner is unable to develop strategies that are insightful and logical without a great deal of assistance.
Justification			
• The learner clearly justifies the choices made for solving the problem. • The learner can clearly explain new understandings gained from the problem.	• The learner justifies the choices made for solving the problem. • The learner can explain new understandings gained from the problem.	• The learner attempts to justify the choices made for solving the problem. • The learner can explain some things learned in the problem but are not entirely clear about new understandings.	• The learner shows limited attempts to justify the choices made for solving the problem. • The learner struggles to explain important new understandings gained from the problem.
Reflection			
• The learner clearly identifies strengths and weaknesses in their thinking. • The learner clearly identifies improvements that would be made to solve the problem.	• The learner identifies strengths and weaknesses in their thinking. • The learner identifies improvements that would be made to solve the problem.	• The learner attempts to identify strengths and weaknesses in their thinking. • The learner attempts to demonstrate the improvements that would be made to solve the problem.	• The learner shows little attempt to identify strengths and weaknesses in their thinking. • The learner shows little attempt to identify the improvements that would be made to solve the problem.

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Collaboration Rubric

Target Area

4: Exceeds	3: Meets	2: Approaching	1: Beginning
Participation:			
• The group member participated fully and was on task.	• The group member participated and was on task most of the time.	• The group member participated but did not take full advantage of the time to work on the problem/task.	• The group member did not participate and worked on other material during the problem/task.
Leadership			
• The group member assumed a leadership role by: • · helping keep the group on task • · encouraging group participation • · posing solutions to the problem • · portraying a positive attitude	• The group member sometimes assumed a leadership role in an appropriate way.	• The group member usually allowed other members to assume a leadership role or often attempted to dominate the group.	• The group member did not assume a leadership role or assumed it in a non-productive manner.
Listening:			
• The group member listened carefully to others' ideas and contributions.	• The group member usually listened to others' ideas and contributions.	• The group member sometimes did not listen to others' ideas and contributions.	• The group member did not listen to others' ideas and contributions.
Feedback			
• The group member offered detailed, constructive, and specific feedback when appropriate.	• The group member offered constructive feedback when appropriate.	• The group member sometimes offered constructive feedback but sometimes the comments were inappropriate or not useful.	• The group member did not offer constructive or useful feedback.

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Collaboration Rubric

Target Area

4: Exceeds	3: Meets	2: Approaching	1: Beginning
Cooperation:			
• The group member treated others respectfully and shared the workload fairly.	• The group member usually treated others respectfully and shared the workload fairly.	• The group member sometimes treated other group members disrespectfully or did not share the workload.	• The group member often treated other members disrespectfully or did not share the workload fairly.
Time Management			
• The group member completed assigned parts of the problem on time.	• The group member usually completed assigned parts of the problem and did not hold up progress on the problem due to incomplete work.	• The group member often did not complete parts of the problem on time and held up the completion of work for the group.	• The group member did not complete most of the assigned parts of the problem and often forced the group to make last minute adjustments to accommodate missing work.

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Writing in Math Rubric

Target Area

4: Exceeds	3: Meets	2: Approaching	1: Beginning
Mathematical Correctness:			
• Demonstrates complete understanding of the mathematical concept.	• Demonstrates adequate understanding of the mathematical concept.	• Demonstrates partial understanding of the mathematical concept.	• Demonstrates unsatisfactory understanding of the mathematical concept.
Language and Vocabulary:			
• Skillful and accurate math vocabulary is utilized within the writing.	• Adequate and appropriate use of math vocabulary is utilized within the writing.	• Vague and weak use of math vocabulary is utilized within the writing.	• Ineffective or incorrect use of math vocabulary is utilized within the writing.
Organization and Fluency:			
• Writing is easy to follow after initial reading and all the following are incorporated: • Clarify topic in introduction • Proper transitions are utilized • Elaborate paragraphs with supporting details • Appropriate word choice • Strong concluding sentence	• Writing is generally easy to follow after one reading and most of the following are incorporated: • Clarify topic in introduction • Proper transitions are utilized • Elaborate paragraphs with supporting details • Appropriate word choice • Strong concluding sentence	• Writing is difficult to understand after one reading and limited use of the following are incorporated: • Clarify topic in introduction • Proper transitions are utilized • Elaborate paragraphs with supporting details • Appropriate word choice • Strong concluding sentence	• Writing is very difficult to read and understand and none of the following are incorporated. • Clarify topic in introduction • Proper transitions are utilized • Elaborate paragraphs with supporting details • Appropriate word choice • Strong concluding sentence
Explanation			
• Writing clearly translates computational strategies into written language with very limited use of numerals with no errors.	• Writing translates computational strategies into written language with some use of numerals with few errors.	• Writing translates some computational strategies into written language with the use of numerals and few errors.	• Writing translates some computational strategies into written language with the use of numerals and few errors.