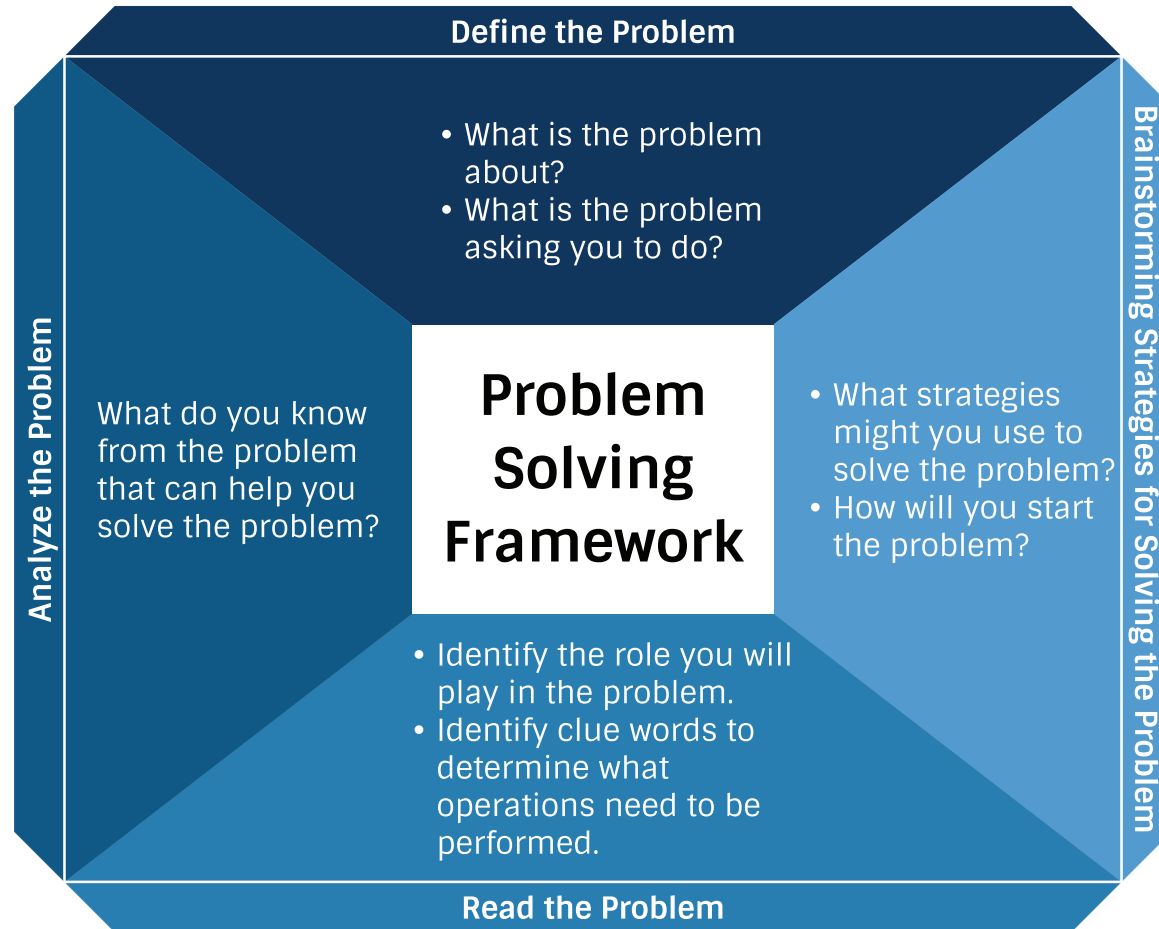


It's in the Design

Problem Solving Framework



It's in the Design

Performance Task Rubric



Skill: Write and evaluate numerical expressions involving whole number exponents.

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none">• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none">• Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

Skill: Write, read, and evaluate expressions in which letters stand for numbers.

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none">• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none">• Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

Skill: Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient).

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none">• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none">• Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

Skill: Evaluate expressions at specific values of their variables.

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none">• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none">• Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

It's in the Design

Performance Task Rubric



Skill: Apply the properties of operations to generate equivalent expressions.

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none">• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none">• Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

Skill: Identify when two expressions are equivalent.

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none">• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none">• Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

Skill: Solve real-world and mathematical problems by writing and solving equations.

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none">• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none">• Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

Skill: Use variables to represent two quantities in a real-world problem that change in relationship to one another.

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none">• Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none">• Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none">• Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

It's in the Design

Performance Task Rubric



Skill: Write an equation to express one quantity.

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none"> Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none"> Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none"> Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none"> Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

Skill: Identify the dependent and independent variable in a relationship of two quantities.

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none"> Shows complete understanding of the embedded skill and applies the skill beyond the parameters of the task. | <ul style="list-style-type: none"> Shows complete understanding of required mathematical knowledge for the specific skill. | <ul style="list-style-type: none"> Shows some understanding of the required mathematical knowledge for the specific skill. | <ul style="list-style-type: none"> Shows limited or no understanding of the mathematical knowledge for the specific skill. |
|---|---|---|---|

Planning and Execution

- | | | | |
|--|---|---|---|
| <ul style="list-style-type: none"> Uses an appropriate and complete strategy for solving the problem. Uses clear and effective diagrams, tables, charts or graphs if required. | <ul style="list-style-type: none"> Uses an appropriate but incomplete strategy for solving the problem. Appropriate but incomplete use of diagrams, tables, charts, and graphs if required. | <ul style="list-style-type: none"> Uses an inappropriate strategy or application of strategy is unclear. Limited use or misuse of diagrams, tables, charts or graphs if required. | <ul style="list-style-type: none"> Works haphazardly with no particular strategy for solving the problem. Does not show use of diagrams, tables, charts, or graphs if required. |
|--|---|---|---|

Persistence

- | | | | |
|---|---|--|--|
| <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> Works hard on the task and only gets help after attempting many strategies. Completes the task and works diligently at the harder parts. | <ul style="list-style-type: none"> Can do less difficult parts of the problem with little help. Begins work on the harder parts, but unless help is provided gives up. | <ul style="list-style-type: none"> Needs help, even for the simple parts of the task. Gives up quickly, often just wanted the answer giving. |
|---|---|--|--|

It's in the Design

Performance Task Rubric



Communication:

- 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.

It's in the Design

Critical Thinking/ Creative Thinking Problem Solving Rubric



Ideation/Brainstorming:

- | | | | |
|--|--|--|---|
| <ul style="list-style-type: none">• 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. | <ul style="list-style-type: none">• The learner often produces new and unique ideas with little or no support. | <ul style="list-style-type: none">• The learner occasionally produces new and unique ideas but only with guidance. | <ul style="list-style-type: none">• The learner is unable to produce new and unique ideas without significant guidance and encouragement. |
|--|--|--|---|

Realization

- | | | | |
|---|--|--|--|
| <ul style="list-style-type: none">• 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. | <ul style="list-style-type: none">• 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. | <ul style="list-style-type: none">• The learner considers new ideas or approaches to a problem only with strong encouragement. The risk of failure constrains the learner. | <ul style="list-style-type: none">• 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

- | | | | |
|--|---|---|---|
| <ul style="list-style-type: none">• 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. | <ul style="list-style-type: none">• 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. | <ul style="list-style-type: none">• 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. | <ul style="list-style-type: none">• The learner is unable to identify the key elements of the problem without a great deal of assistance. |
|--|---|---|---|

It's in the Design

Critical Thinking/ Creative Thinking Problem Solving Rubric



Process:

- | | | | |
|--|--|---|---|
| <ul style="list-style-type: none">• The learner develops strategies that are insightful and uses logical reasoning to reach accurate results with no assistance. | <ul style="list-style-type: none">• The learner develops strategies that are insightful and uses logical reasoning to reach accurate results with little assistance. | <ul style="list-style-type: none">• The learner develops strategies that are insightful and uses logical reasoning to reach accurate results with assistance. | <ul style="list-style-type: none">• The learner is unable to develop strategies that are insightful and logical without a great deal of assistance. |
|--|--|---|---|

Justification

- | | | | |
|---|---|---|--|
| <ul style="list-style-type: none">• The learner clearly justifies the choices made for solving the problem.• The learner can clearly explain new understandings gained from the problem. | <ul style="list-style-type: none">• The learner justifies the choices made for solving the problem.• The learner can explain new understandings gained from the problem. | <ul style="list-style-type: none">• 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. | <ul style="list-style-type: none">• 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

- | | | | |
|---|---|--|---|
| <ul style="list-style-type: none">• The learner clearly identifies strengths and weaknesses in their thinking.• The learner clearly identifies improvements that would be made to solve the problem. | <ul style="list-style-type: none">• The learner identifies strengths and weaknesses in their thinking.• The learner identifies improvements that would be made to solve the problem. | <ul style="list-style-type: none">• 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. | <ul style="list-style-type: none">• 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. |
|---|---|--|---|

It's in the Design

Collaboration Rubric



Participation:

- | | | | |
|--|---|--|--|
| <ul style="list-style-type: none"> • The group member participated fully and was on task. | <ul style="list-style-type: none"> • The group member participated and was on task most of the time. | <ul style="list-style-type: none"> • The group member participated but did not take full advantage of the time to work on the problem/task. | <ul style="list-style-type: none"> • The group member did not participate and worked on other material during the problem/task. |
|--|---|--|--|

Leadership

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> • The group member assumed a leadership role by: <ul style="list-style-type: none"> • helping keep the group on task • encouraging group participation • posing solutions to the problem • portraying a positive attitude | <ul style="list-style-type: none"> • The group member sometimes assumed a leadership role in an appropriate way. | <ul style="list-style-type: none"> • The group member usually allowed other members to assume a leadership role or often attempted to dominate the group. | <ul style="list-style-type: none"> • The group member did not assume a leadership role or assumed it in a non-productive manner. |
|--|---|--|---|

Listening:

- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none"> • The group member listened carefully to others' ideas and contributions. | <ul style="list-style-type: none"> • The group member usually listened to others' ideas and contributions. | <ul style="list-style-type: none"> • The group member sometimes did not listen to others' ideas and contributions. | <ul style="list-style-type: none"> • The group member did not listen to others' ideas and contributions. |
|---|---|---|---|

Feedback

- | | | | |
|--|--|---|---|
| <ul style="list-style-type: none"> • The group member offered detailed, constructive, and specific feedback when appropriate. | <ul style="list-style-type: none"> • The group member offered constructive feedback when appropriate. | <ul style="list-style-type: none"> • The group member sometimes offered constructive feedback but sometimes the comments were inappropriate or not useful. | <ul style="list-style-type: none"> • The group member did not offer constructive or useful feedback. |
|--|--|---|---|

It's in the Design

Collaboration Rubric



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



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:

- | | | | |
|--|--|--|---|
| <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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. |
|---|--|---|---|

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Post Task Reflection Activity

