

TRETCH'S SPACE ODYSSEY

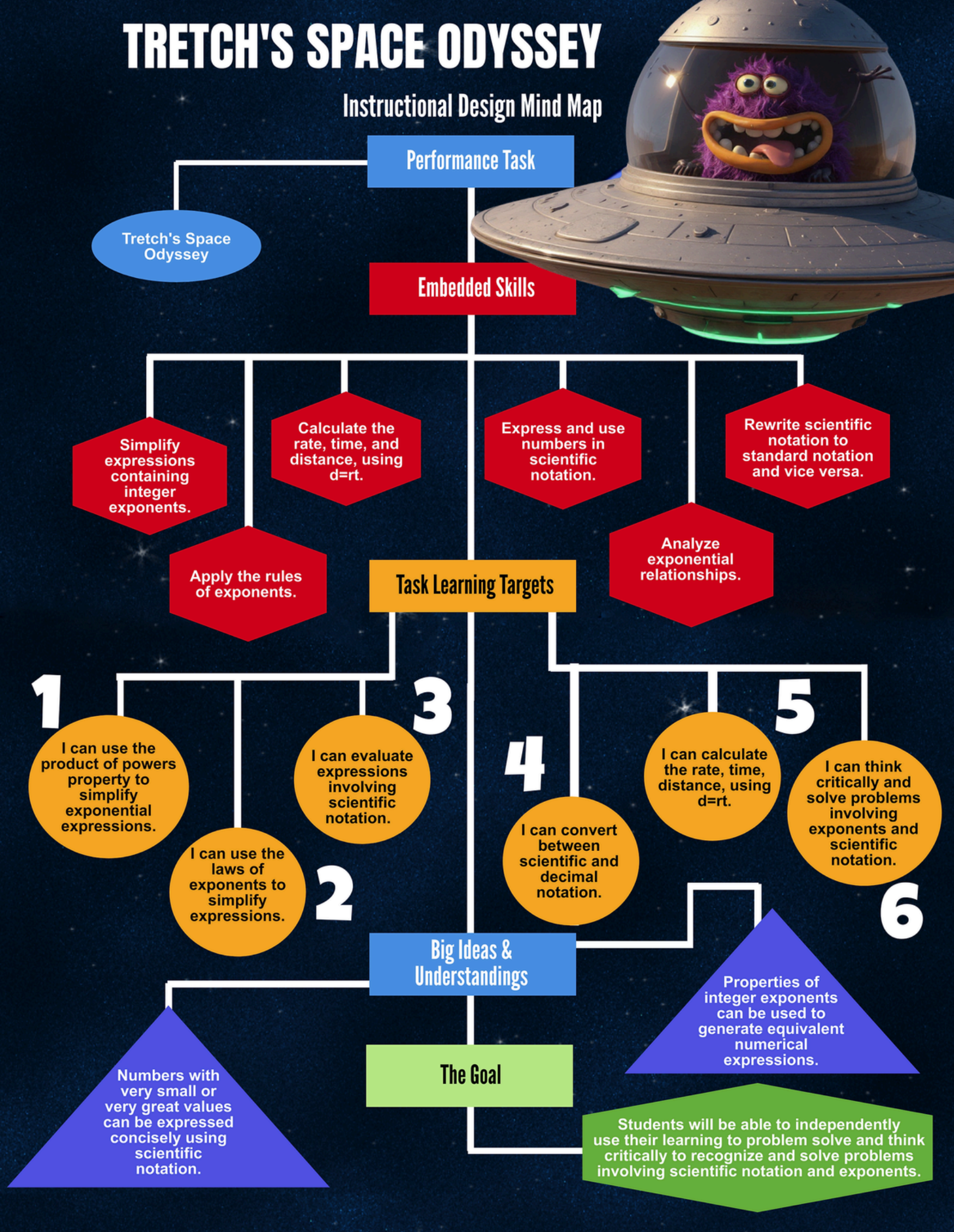


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Brad A. Spicer





Blast off into Tretch's Space Odyssey, where scientific notation and exponents power an interstellar mission to recover the stolen Kleptonic from the grasp of the notorious Lord Burrows. Join Tretch and Witztazma as you tackle high-stakes challenges that demand strategic thinking, precision, and perseverance. Along the way, you will strengthen mathematical reasoning, expand academic vocabulary, and apply your skills in a dynamic, story-driven context. This is a rigorous and engaging task designed to push your thinking while immersing you in an unforgettable adventure.



1

The tranquil planet of Jaspiobus, extolled for its peace and serenity, harbors a powerful secret widely known as The Kleptonic making it the envy of the galaxy. Nestled deep within its core, the Kleptonic is a dazzling gem that radiates harmony, allowing peace to flourish among its inhabitants. Its rare beauty and mystical power have drawn the attention of darker forces, especially the sinister Lord Ghastly Burrows of Planet Zaslohiri. Obsessed with seizing the Kleptonic to revive his bleak world, Lord Burrows and his army of Burrow Bots continually hatch diabolical schemes to claim it.

2

Jaspiobus is packed with fascinating lifeforms, but none are quite like Tretch. Tretch is a maverick alien with unmatched ingenuity and known for doing things his own way. His claim to fame? Constructing The Revenant, a rough-looking rocket that zips like lightning. Around Jaspiobus, they say if you spot a blur in the sky, it's probably Tretch being, well, Tretch.

Welcome to Jaspiobus



1. In paragraph 1, the narrator states “The Planet of Jaspiobus extolled for its peace and serenity has become the envy of the galaxy.” The term *extolled* in this context means?

- a. to praise enthusiastically
- b. to condemn
- c. to denounce
- d. to castigate

2. How do the inhabitants of Zaslohiri view the Kleptonic?

- a. They covet the Kleptonic.
- b. They wish to destroy the Kleptonic.
- c. They abjure that the Kleptonic contains the gateway to peace.
- d. They dislike the powers of the mighty Kleptonic.

3. In paragraph 2, which of the following best describes Tretch?

- a. Tretch is one of a kind with extraordinary talents.
- b. Tretch is an ordinary space alien with minimal talents.
- c. Tretch is the best spaceship builder in Jaspiobus.
- d. Tretch has an unimaginative personality lacking innovation.

Mind Check 1

Read paragraphs 1 and 2 of “Welcome to Jaspiobus” and then complete Mind Check 1, a set of reading-comprehension questions. Comprehending the context of the story is critical when engaging in math performance tasks.



When Harmony Shatters

3

The peaceful planet of Jaspiobus long feared the envy of others, especially from Planet Zaslohiri and its villainous leader, Lord Ghastly Burrows. After several failed attempts, Burrows finally succeeded in stealing the Kleptonic using his BurrowBots, plunging Jaspiobus into chaos.



4

In response, the Jaspiobus Council summoned Tretch, the planet's only hope. Armed with careful research and a daring plan, Tretch set out for Zaslohiri to reclaim the Kleptonic. Aware of Burrows's ability to mass-produce BurrowBots, Tretch prepared to face defenses stationed on the south side of the planet and at Burrows's ship, the Warhammer. Success would require skill, strategy, and courage.



Mind Check 2

Read paragraphs 3 and 4 of “When Harmony Shatters” and then complete Mind Check 2, a set of reading-comprehension questions. Comprehending the context of the story is critical when engaging in math performance tasks.



1. The narrator states that the residents of Jaspiobus were “stymied” from the thought that the precious treasure of their planet could be gone. The term “*stymied*” in this context means?

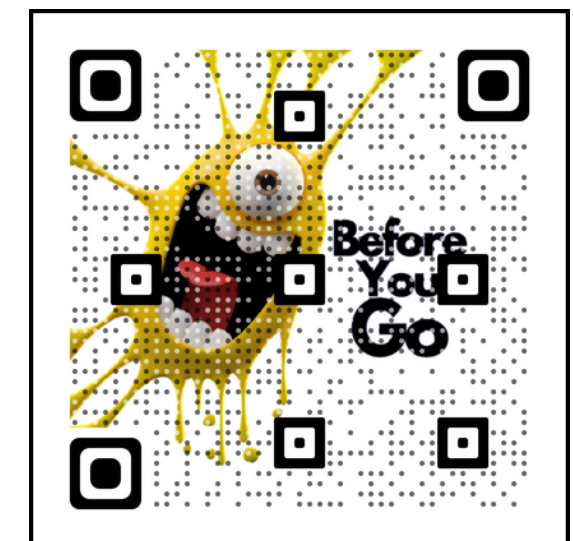
- a. mystified
- b. enlightened
- c. persuaded
- d. delighted

2. Which of the following best describes Lord Ghastly Burrows?

- a. persistent
- b. benevolent
- c. auspicious
- d. honorable



Before continuing on to the next part of Tretch’s Space Odyssey, you’ll need to confirm that your mathematical tools are mission-ready. The “**Before You Go**” activity will check whether the required skills are secured.



Tick Tock

Utilizing the information provided, determine how long it will take Tretch to reach Planet Zaslohiri.

- Determine how long it will take Tretch to reach Planet Zaslohiri from Planet Jaspiobus. Outline the steps needed to calculate the time of the journey. Be sure to show all calculations.



Zaslohiri

1.54×10^4 miles

Speed

The Revenant can sustain
a speed of 

5.4805×10^3 miles per hour

Jaspiobus



5

Tretch was tasked with a high-risk mission: infiltrate Zaslohiri and recover the Kleptonic from the clutches of Lord Ghastly Burrows. With BurrowBots stationed across the Southside and guarding the Warhammer, Tretch devised a precise plan. However, upon arrival, he was overwhelmed by the sheer number of enemy bots and called for backup. The Jaspiobus Council sent Wiztasma, a brilliant warrior armed with her sonic-phasma "SHE" freeze blaster. Together, they launched a coordinated assault, disabling the BurrowBots and reaching the Warhammer, only to face a final challenge. Now, standing at the Warhammer's gate, the final test awaited: a mind-bending puzzle guarding the path to victory.



Complete the square
such that every row,
column, and
diagonal has an
equal sum. Each
square must
correspond to a
distinct value from 1
through 9, with no
repetitions. All values
must be shown using
mathematical
expressions with
exponents.



	$2^3 + 2^0$	$\frac{4^2}{2^3}$

After Tretch and Witztama solved the puzzle, the blast door opened and they were one step closer to the Kleptonic. Tretch and Witztasma had no idea what was waiting for them when they entered. As they entered the main chamber, they found Lord Burrows guarding the Kleptonic.



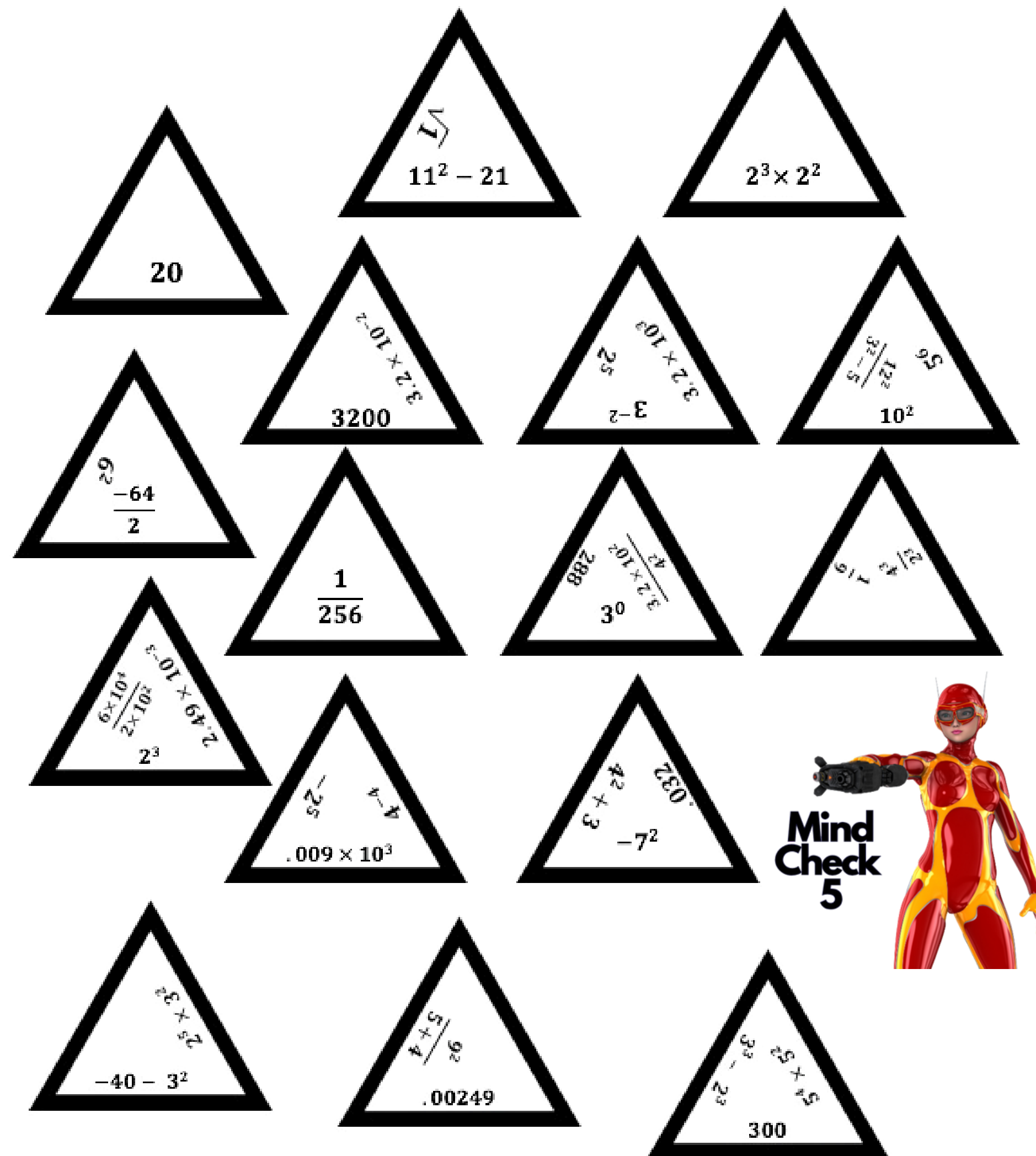
The Kleptonic Triangle

Tretch not only noticed Burrows and the Kleptonic, but he also saw sixteen equilateral triangles spread around on the floor. All of a sudden there was a cloud of smoke, and Lord Burrows and the Kleptonic were gone but the triangular pieces remained. As the smoke cleared, a digital timer began to count down and the chamber doors locked. Lord Burrows set a trap and when the timer expired a deadly poisonous gas would be released. Without hesitation, Tretch and Wiztasma focused on the triangles on the floor. Surely, the triangles were a clue and maybe could save the duo and the Kleptonic.



Tretch and Wiztasma worked diligently on trying to make the puzzle pieces fit into place. The twosome collaborated with hopes of not only an escape but also recapturing the Kleptonic.

- Evaluate the triangular pieces and put the puzzle together to stop the deadly gas from being released. Cut out the triangles to create the puzzle pieces.



Tretch and Wiztasma are fleeing from Lord Burrows in the spacecraft *Revenant*. They leave a quarter of an hour (0.25 hours) before the enemy ship *Warhammer* begins pursuit.

The Race to Jaspibus

As the timer whittled its way down close to zero, Tretch and Wiztasma finally put the last piece of the puzzle in place. As the last piece went into place, the *Kleptonic* reappeared, and the main door opened. Wiztasma quickly snatched the *Kleptonic*. The duo had to hurry to get back to their ships and head back to Jaspibus. Tretch and Wiztasma made their way to their ships and quickly took flight to escape. They had a short window to get through the *BurrowShield*. The *BurrowShield* would create a barrier making it impossible for Tretch and Wiztasma to get away. As the dynamic duo accelerated, they quickly noticed the *Warhammer* was close behind.

The *Revenant* travels at a constant speed of 5.5×10^3 miles per hour, and must travel 8.5×10^3 miles to escape beyond the *BurrowShield*.

The *Warhammer* travels faster, at a speed of 6.8×10^3 miles per hour.

Do They Escape?

- Will Tretch and Wiztasma escape before the *Warhammer* catches them?
- Show all work using scientific notation, and explain your reasoning clearly.



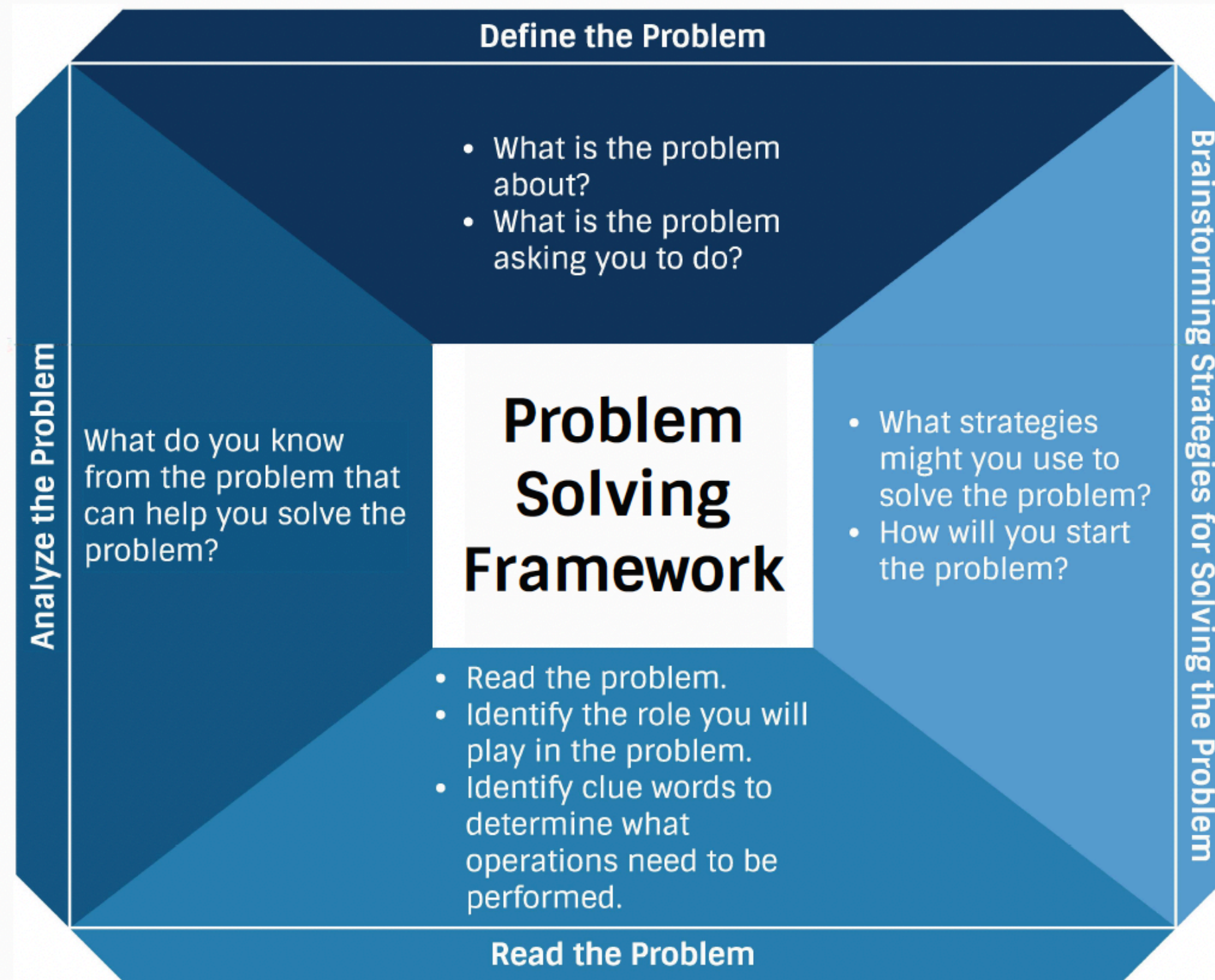
Tretch's Space Odyssey

RUBRICS



Tretch's Space Odyssey

Problem Solving Framework



Tretch's Space Odyssey

Performance Task Rubric



Skill: Simplify expressions containing integer exponents.

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|---|---|---|---|
| • 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: Applying the rules of exponents in real-world (fictional) situations.

- | | | | |
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| • 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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Skill: Calculate the rate, time, and distance using $d=rt$.

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| • 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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Skill: Express and use numbers in scientific notation.

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| • 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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Tretch's Space Odyssey

Performance Task Rubric



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. |
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Persistence

- | | | | |
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| <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. |
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Communication

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| <ul style="list-style-type: none"> • 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. | <ul style="list-style-type: none"> • There is clear explanation • There is appropriate use of accurate mathematical representation. • There is effective use of mathematical terminology. | <ul style="list-style-type: none"> • There are incomplete explanations. • There is some use of appropriate mathematical representations. • There is some use of appropriate mathematical terminology. | <ul style="list-style-type: none"> • 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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Tretch's Space Odyssey

Critical Thinking/ Creative Thinking Rubric



Ideation/Brainstorming:

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| <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. |
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Realization

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| <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. |
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Communication

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| <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. |
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Tretch's Space Odyssey

Critical Thinking/ Creative Thinking Rubric



Process:

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|--|--|---|---|
| <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. |
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Justification

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|---|---|---|--|
| <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. |
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Meet the Author

As education continues to evolve, it's more important than ever to equip students with the skills they need to thrive in a rapidly changing world. As an educator, I take seriously the responsibility of preparing students to become proactive problem-solvers, critical thinkers, and confident individuals ready to tackle complex challenges with resilience and determination. By fostering innovation in the classroom, I strive to create dynamic learning opportunities that promotes collaboration, effective communication, and real-world problem-solving. I believe that true learning builds a strong foundation in conceptual understanding and analytical thinking, while also nurturing reflection as an essential component of lifelong growth.



Brad A. Spicer

I am a passionate advocate for problem-based learning with over two decades of experience as a middle school mathematics educator. Throughout my career, I've remained committed to continuous professional growth, earning three Master's Degrees from Wilmington University in Curriculum & Instruction, School Leadership, and Educational Technology. My teaching philosophy centers on fostering critical thinking and problem-solving skills through innovative, engaging instruction. I develop Core Performance Tasks that blend real-world story-driven tasks with mathematical concepts to help students see the relevance of math in their everyday lives.