Creativity

Embracing Growth: Education as a Transformative Journey

Presented by Elise Naramore
Pascack Hills High School

reimaginedschools.com

"Embracing Growth: Education as a Transformative Journey

- Welcome
- Goals of this presentation
  - i. Present practical applications
  - ii. Suggest useful assessment criteria
  - iii. All grade levels and courses

Challenges when assessing creativity

Subjective

Vague language

"I know it when I see it"

Lack of training and background knowledge

The effect of our educational system on creativity

- George Land designed a creativity test.
- Children at 3 different ages in their lives.
- Sample size: 280,000 adults!

Age in years	Creative Performance
5	98%
10	30%
15	12%
adults	2%

Conclusion: "non-creative behavior is learned"

- If we begin our lives with such access to our creativity, what happens once we enter school?
- Why is there such a precipitous drop from kindergarten to fourth grade?
- And can we do anything about it?

Creativity...

- Can be learned.
- Should be learned.
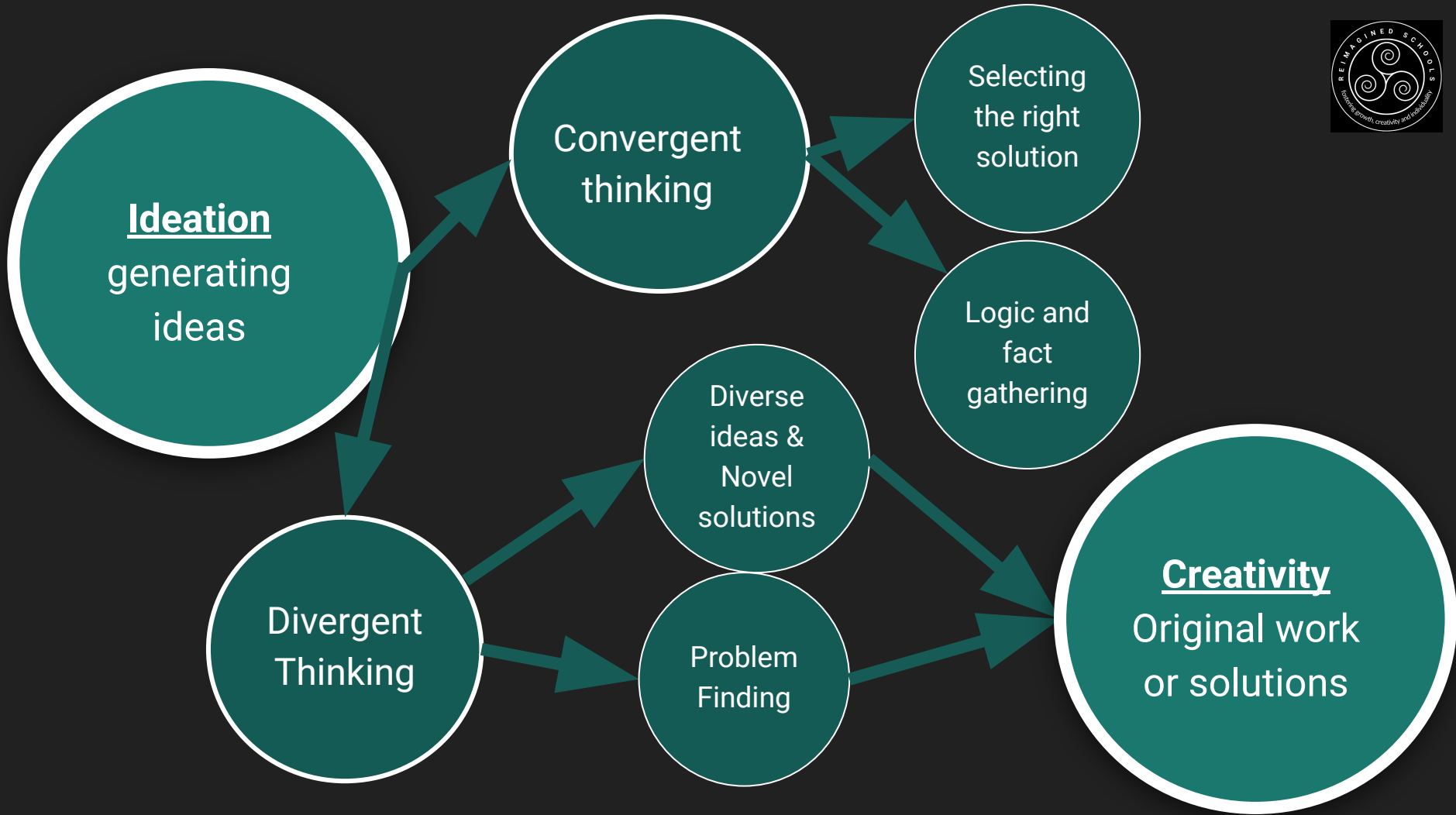- Can be objectively and consistently evaluated.

Three Main Questions:

What do we know about creativity?

How do we teach creativity?

How do we assess creativity?

Creativity is central to the thinking and learning process.

Choosing it as a technique for problem solving.

Construction of new meaning to an individual

Critical element in the development of other analytical skills.

- Significance of creativity in the modern education
- Presence in national standards?

What is needed to be creative?

Domain-relevant skills

Creativity-relevant processes

Intrinsic motivation

Synergic external motivations

Work orientation

Positive affect

Creative ideas must be...

1. Innovative, new
2. Appropriate to the task
3. High quality

For teachers →

1. "New to me"
2. Pertinent to the task
3. ~~High quality~~ demonstrates thinking "outside the box"

Influences on creativity

Culture and multicultural environments

Drugs (both prescribed and illicit)

Genetics

Affect

Physical and mental health

Family background

The 5 A's of creativity

Audience (Environment 1): the school and home settings (social)

Actors (Persons): the teachers and students, where we capitalize on strengths and ameliorate weaknesses.

Actions (Process): how creativity happens

Artifacts (Product): tangible evidence of student effort

Affordances (Environment 2): material factors

The Matrix Model

Involve communication, displaying unique understanding, and the ability to persuade others of one's thinking.

	Open Problem	Closed Problem
Intrinsic Motivation	Proactive Creativity	Contributory Creativity
Extrinsic Motivation	Expected Creativity	Responsive Creativity

Involve scanning and defining skills.

Influenced by curiosity and ability to frame problems.

THE 4 C'S

Mini-C → represents creativity that is personally meaningful to the creator but may not have a broad impact.

Little-c → everyday creativity, involving creative acts that contribute to one's personal growth & satisfaction.

Pro-C → the level of creativity achieved by professionals who engage in deliberate practice, honing their skills and knowledge over years of focused training and effort.

Big-C → the accomplishments of creative geniuses that have a significant and enduring impact on their fields, often recognized posthumously.

REIMAGINED SCHOOLS
fostering growth, creativity and individuality

Fluency, flexibility, originality, & elaboration (F.F.O.E.)

- Underpin various stages of creative development
- Frame the creative thinking <u>processes</u>
- Transcend disciplinary boundaries
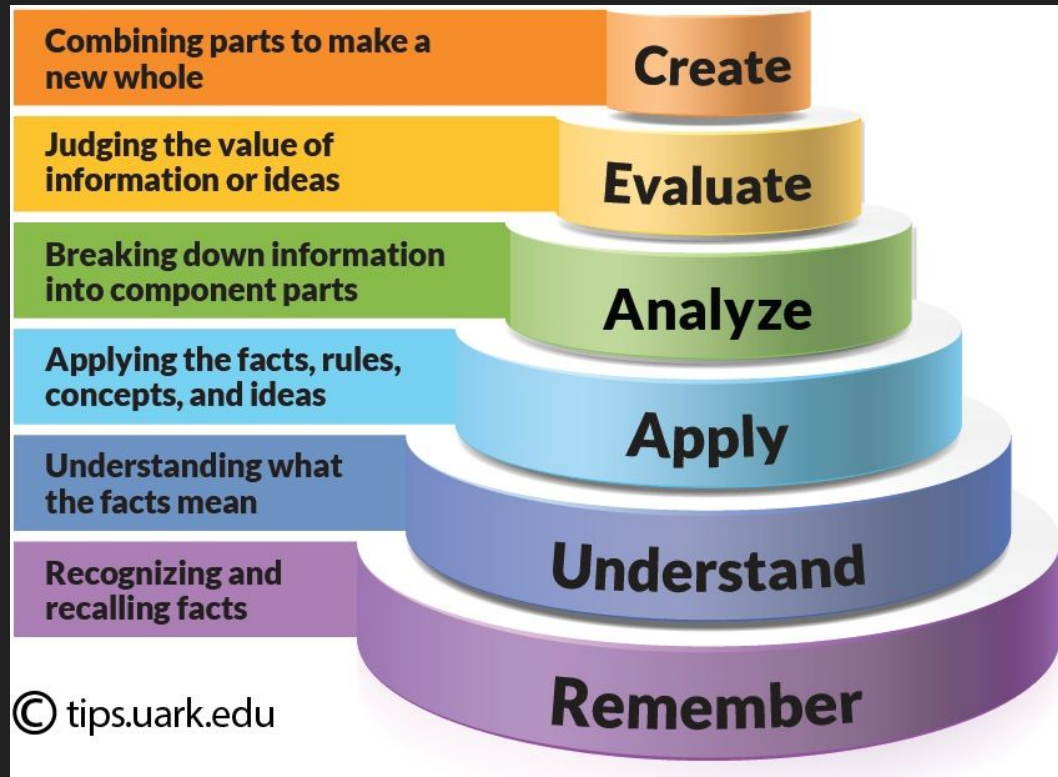
Explorating diverse angles and viewpoints

Adding depth and detail to concepts

Generating numerous ideas, promoting extensive exploration.

Producing ideas or products that are unprecedented and distinct

Also complemented by Bloom's model

- Before you can understand a concept, you must remember it.
- To apply a concept you must first understand it.
- In order to evaluate a process, you must have analyzed it.
- To create an accurate conclusion, you must have completed a thorough evaluation.

Combining parts to make a new whole	**Create**
Judging the value of information or ideas	**Evaluate**
Breaking down information into component parts	**Analyze**
Applying the facts, rules, concepts, and ideas	**Apply**
Understanding what the facts mean	**Understand**
Recognizing and recalling facts	**Remember**

© tips.uark.edu

Nurturing Creativity in the classroom

Characteristics of creative people:
- Persistent
- Tolerant of Ambiguity
- Resilient
- Empathetic
- Open-minded
- Resourceful
- Curious

Educators can:

Value diverse thinking

Encourage risk-taking

Reward experimentation

Embrace uncertainty

Rather than a static trait, creativity is an outcome of actions taken.

The most essential aspects of creativity, as discussed in the past 5 chapters, seem to be:

1. Understanding and use of the creative process
2. Effective and Engaging Communication with an audience
3. Evidence of Fluency, Flexibility, Originality, and Elaboration.
4. Meets the criteria of the definition of creativity: new, appropriate to the task, and high quality (adapting to mini-c and/or little-c)
5. Encouraging attributes that contribute to fostering creativity, such as risk-taking and tolerance of ambiguity.
6. Acknowledging the roles of motivation, affect, and knowledge (insofar as to embrace – or remain open to – intrinsic motivation, positive affect, and deep versatile domain knowledge).
7. Understanding that creativity is not innate, but is dynamic, comes in different forms, and can be learned.

How do we assess creativity?

feedback -oriented

low risk

often

"Classroom assessment practices can have a profound influence on creativity in the classroom. This is because assessment signal to students what is REALLY valued and important."

Unless teachers include expectations for creativity in their assignments and assessments, then the message is quite clear: creativity really doesn't matter."

If classroom assessments are too focused on convergent thought, then students will quickly get the message that this is what matters most.
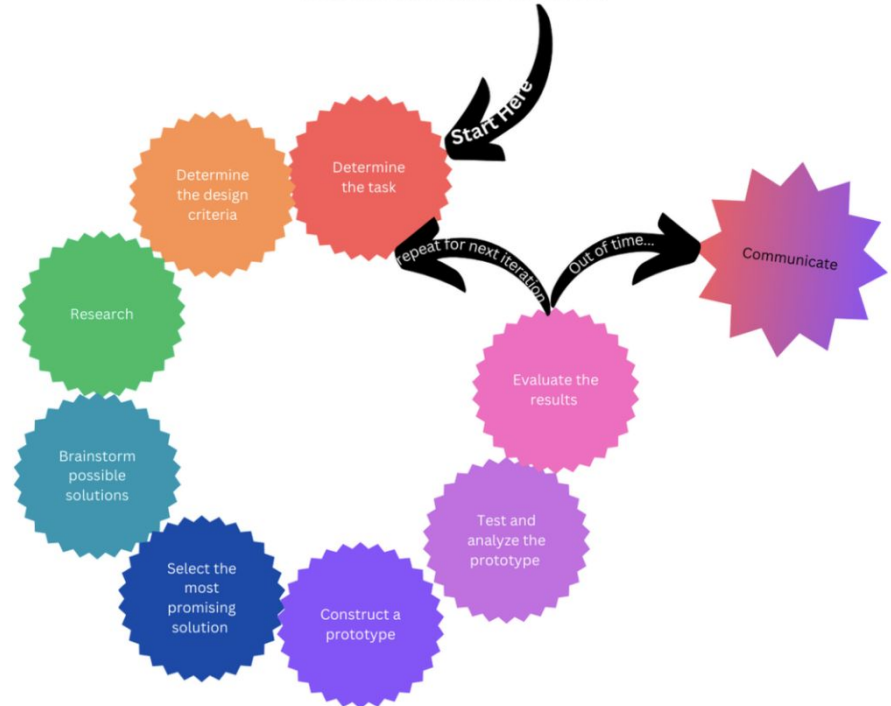
Possible applications of the creative process in STEM

The Engineering Design Process

A SPECIFIC AND ITERATIVE SET OF STEPS USED TO REFINE POTENTIAL SOLUTIONS TO ENGINEERING CHALLENGES.

There are 8 basic steps which are repeated until the best solution possible has been found in the time allotted.

Start Here

Determine the task

Determine the design criteria

Research

repeat for next iteration

Out of time...

Communicate

Evaluate the results

Brainstorm possible solutions

Test and analyze the prototype

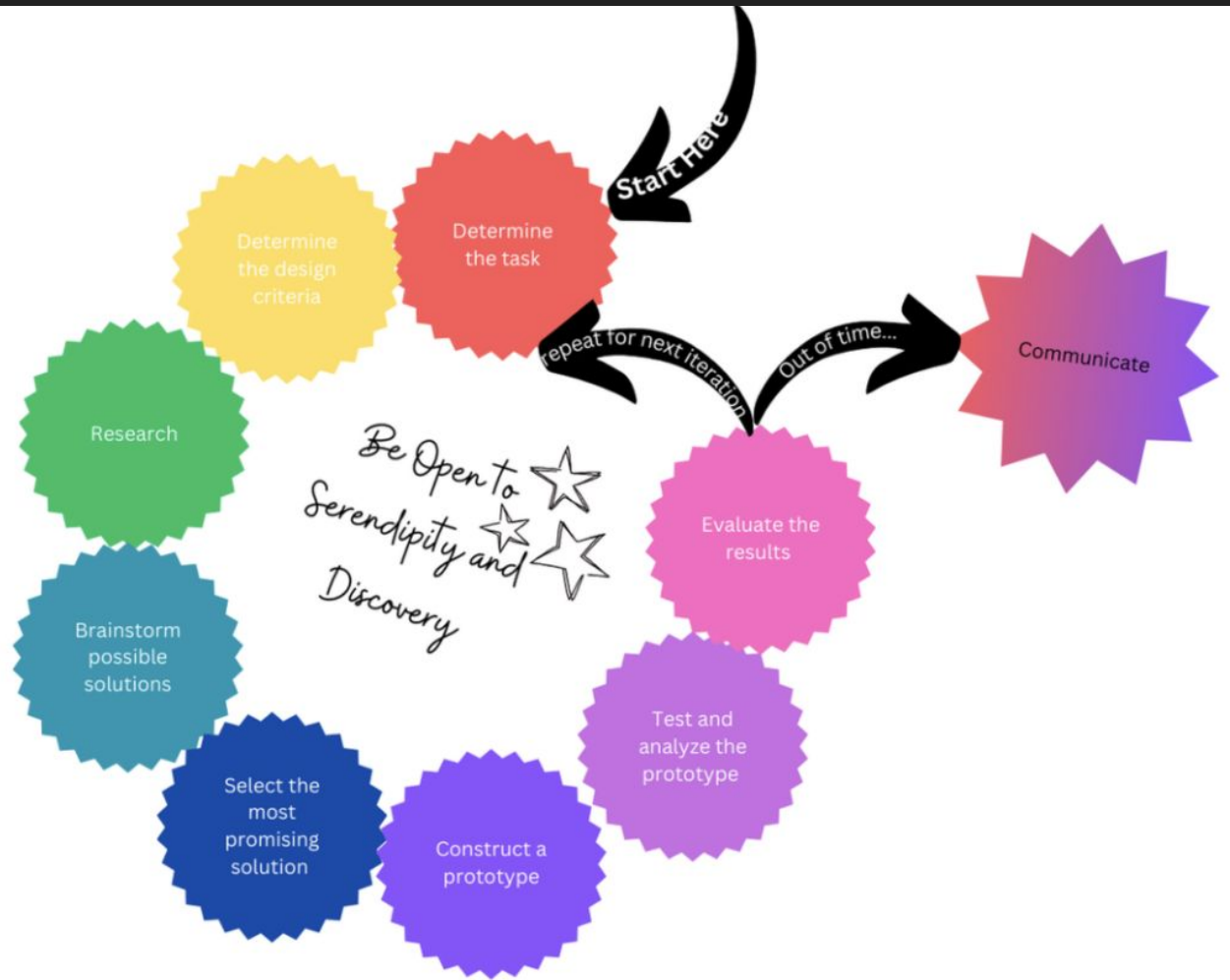Select the most promising solution

Construct a prototype

According to the Next Generation Science Standards (NGSS), engineering design encompasses identifying a problem by specifying criteria for success and constraints, generating a range of potential solutions, evaluating these solutions against the criteria and constraints, and ultimately selecting the most suitable solution for implementation (NGSS Lead States, 2013).

The creative process lives in many different contexts

Description	Creative Process	Scientific Method	Design Thinking	Engineering Design
Problem Identification	Yes	Yes	Yes	Yes
Research	Yes	Yes	Yes	Yes
Experimentation	No	Yes	No	Yes
Prototyping	Yes	No	Yes	Yes
Testing	Yes	Yes	Yes	Yes
Evaluation	Yes	Yes	Yes	Yes

The creative process

Start Here

Determine the task

Determine the design criteria

Research

Brainstorm possible solutions

Select the most promising solution

Construct a prototype

Test and analyze the prototype

Evaluate the results

repeat for next iteration

Out of time...

Communicate

Be Open to Serendipity and Discovery

Achievement Levels for the creative process.

Includes detailed, thorough, focused evidence of understanding and embracing the creative process.

The evidence convincingly links the data (or feedback) to the final design. The documentation applies the correct, methodical and iterative steps of the creative process.

Clearly communicates how the steps of the creative process were used to evolve the product. The steps are correct and cycled through more than once

Communicates how the creative process was used in the evolution of the product and presents evidence of the steps used.

Uses one or more of the steps of the creative process.

A rubric for the creative process.

Not Enough Evidence	Beginning	Developing	Proficient	Advanced	Expert
I do not present any evidence of using the creative process.	I use the steps of the creative process (CP).	I communicate how I used the CP in the evolution of my product. I present evidence of what I have described.	The Creative Process shows the evolution of my product so that my thought process is easy to follow. The steps of the creative process are correct. I worked through the CP multiple times.	I provide convincing evidence to link the collected data/feedback to the final design. The steps of the creative process are correctly applied. My presentation documents the methodical and iterative steps of the creative process to show how I developed my product.	I provide ample evidence that I understand and embrace the creative process. My final presentation completely documents my understanding of the essential steps of the creative process by highlighting the details without being repetitive or off-topic.

Achievement Levels for the creative product.

The project is original and of high quality. Resources are used efficiently.

The final product is the best possible model, showing some distinctive or remarkable ideas yet are on-task.

The product meets the task's goals and requirements. Develops multiple models to refine initial ideas. May show some innovation.

The product addresses the assigned task. Includes *new-to-me* ideas.

Submit evidence of the required product.

A rubric for the creative product.

Not Enough Evidence	Beginning	Developing	Proficient	Advanced	Expert
My work doesn't align with the task's requirements or purpose. The work lacks quality; it's incomplete, poorly executed, or filled with errors.	I submit evidence of the required product.	I produce a product that addresses the assigned task. I attempt to include original ideas; they are new-to-me.	I produce a product that matches the task's goals and requirements, I developed multiple models before the final product in order to refine and polish it. My ideas include some distinctive or remarkable elements that add value/insight to the assignment *and/or* connect well with the task.	My final product is the best possible model based on the collected data. My ideas include some distinctive or remarkable elements that add value/insight to the assignment and connect well with the task.	The efficient use of resources is a driving factor in the design process. My ideas showcase a high degree of originality, introducing innovative elements that significantly enhance the quality of the assignment.

Not Enough Evidence	Beginning	Developing	Proficient	Advanced	Expert
My work doesn't align with the task's requirements or purpose.	I submit evidence of the required product.	I produce a product that addresses the assigned task.	I produce a product that matches the task's goals and requirements,	My final product is the best possible model based on the collected data.	The efficient use of resources is a driving factor in the design process.
The work lacks quality; it's incomplete, poorly executed, or filled with errors.		I attempt to include original ideas; they are new-to-me.	I developed multiple models before the final product in order to refine and polish it.	My ideas include some distinctive or remarkable elements that add value/insight to the assignment and connect well with the task.	My ideas showcase a high degree of originality, introducing innovative elements that significantly enhance the quality of the assignment.
			My ideas include some distinctive or remarkable elements that add value/insight to the assignment *and/or* connect well with the task.		

Originality

High quality

Appropriateness to the task

CREATIVE ASSESSMENTS: QUESTIONS

If you could invent a new element with unique properties, what would it be, and how could it potentially transform modern technology or society?

How would you design a city of the future to be completely sustainable, considering energy, waste management, transportation, and living spaces? Be as creative and detailed as possible.

Imagine discovering a new planet. Describe its geology, atmosphere, potential for life, and how humans could explore or colonize it.

If you could enhance the human body with one 'super' ability or function (e.g., enhanced vision, ability to breathe underwater), what would it be and how would it work biologically?

CREATIVE ASSESSMENTS: ACTIVITIES

A "mystery substance" investigation where students are given a set of unknown substances and must use a limited range of tests (e.g., pH, conductivity, solubility) to identify them.

A mini-competition where students must construct paper airplanes designed to achieve a specific goal (e.g., longest flight time or highest accuracy)

A debate over the use of a local land area where students represent different stakeholders (e.g., farmers, city planners, environmentalists).

A "design a creature" task where students must create an organism adapted to survive in an extreme environment (e.g., deep sea, desert), focusing on anatomical and physiological adaptations.

CREATIVITY ASSESSMENTS: PROJECTS

Design a balloon racer that has the greatest possible acceleration in its first meter of travel.

Design an airbag that can safely catch an egg.

Design a model ecosystem in a terrarium that demonstrates the interdependence of organisms and their environment.

Develop a wearable device that mimics a physiological process (e.g., breathing, heartbeat) and visually represents data about the process in real-time.

What can you do?

Strengthen the language used in your existing rubrics.

Regularly include creative, relevant assessments.

Overtly teach specific skills that build the creative characteristics, creative processes, and/or the creative product.

Raise awareness and expectations about what it means to be creative, including the theories and strategies when developmentally appropriate.

Embracing Growth

by Elise Naramore

reimaginedschools.com

Please use me as a resource.

Email me at edutransformationgrp@gmail.com.

Loads of resources at

https://reimaginedschools.com/