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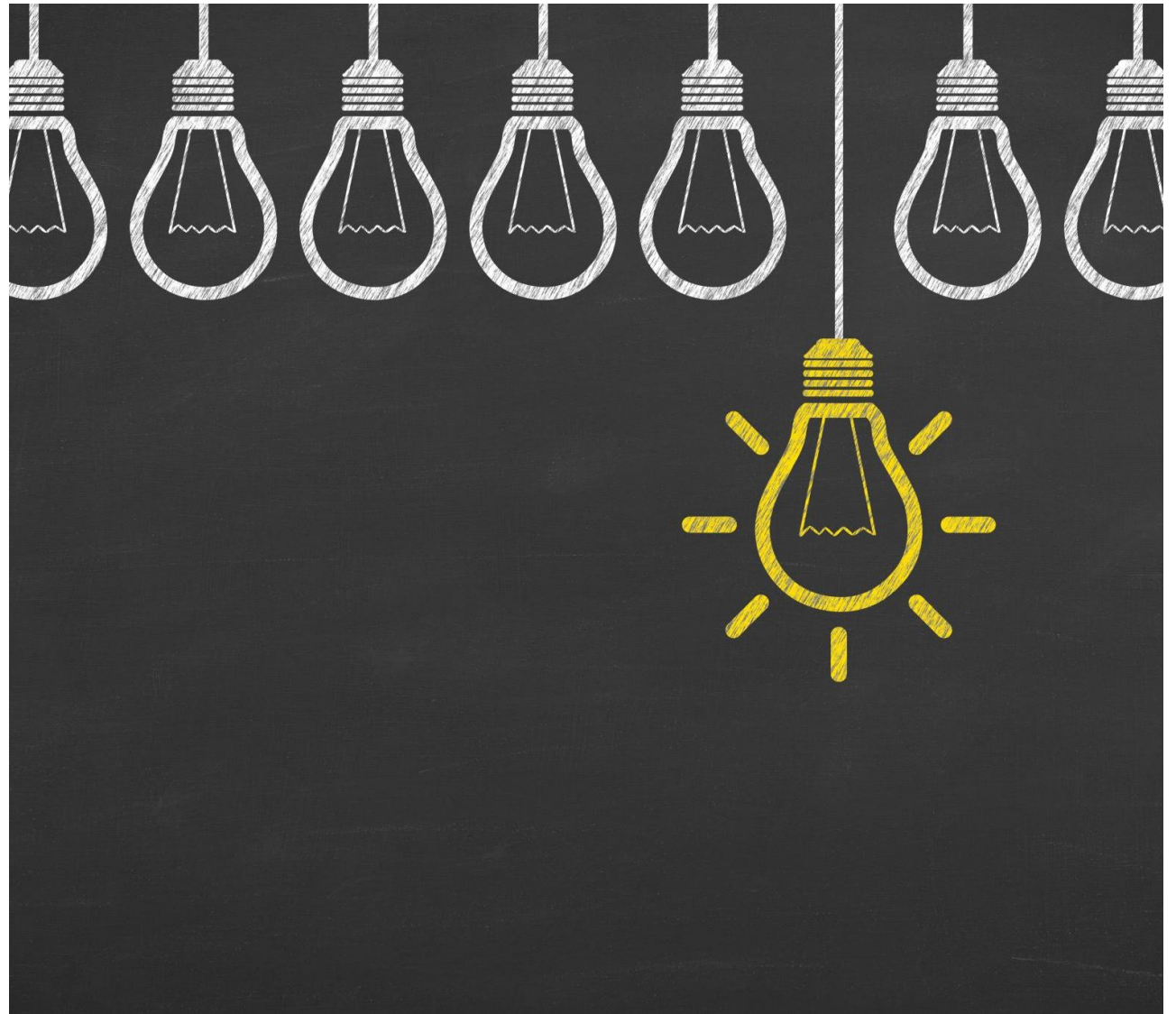
# STEAM Education

**Berlin - Michela Graciotti**



# What are the 21st Century Skills?

- The term refers to a broad set of knowledge, skills, work habits, and character traits that are believed to be critically important to success in today's world, particularly at school and in contemporary workplaces.



# 21st Century Skills

- ▶ Learning skills (the 4 C's) are acquirable abilities and habits that allow a person to learn and work efficiently.

## 21st Century Skills

### Learning Skills



critical thinking



creativity



collaboration



communication

### Literacy Skills



information



media



technology

### Life Skills



flexibility



leadership



initiative



productivity



social skills

# Learning Skills



**Critical thinking:** the process of questioning sources and challenge assumptions to make well-informed judgements based on solid evidence.



**Creativity:** Making something that was not there before. Rearranging existing elements in a surprising way.



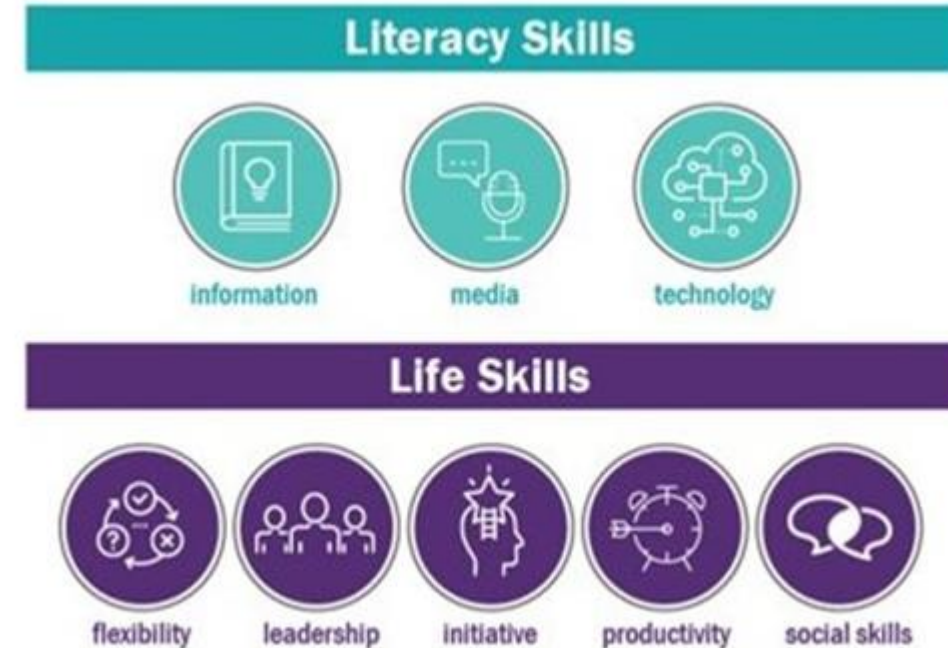
**Collaboration:** Working with others efficiently to achieve a common goal.



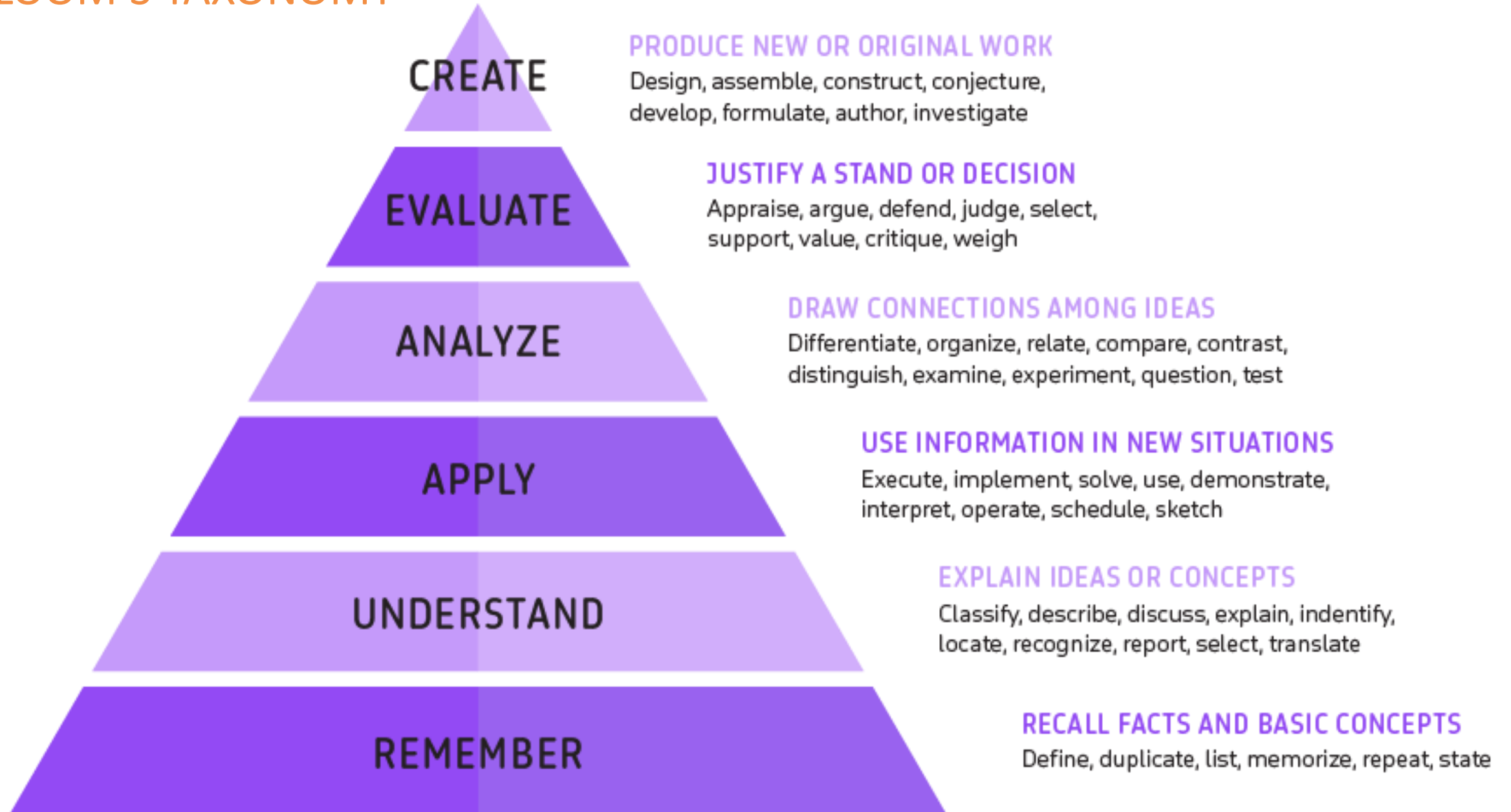
**Communication:** conveying ideas in an effective way by using a variety of methods.

# Literacy and Life Skills

- ▶ Literacy skills focuses on how a person can discern facts, pieces of information and the technology behind them. The focus is on determining trustworthy sources and to separate them from the misinformation that floods the Internet.
- ▶ Life skills focus on intangible elements of a student's everyday life. These intangibles focus on both personal and professional qualities.



# BLOOM'S TAXONOMY



# What is STEAM?

STEAM stands for:



Science



Technology



Engineering



Arts



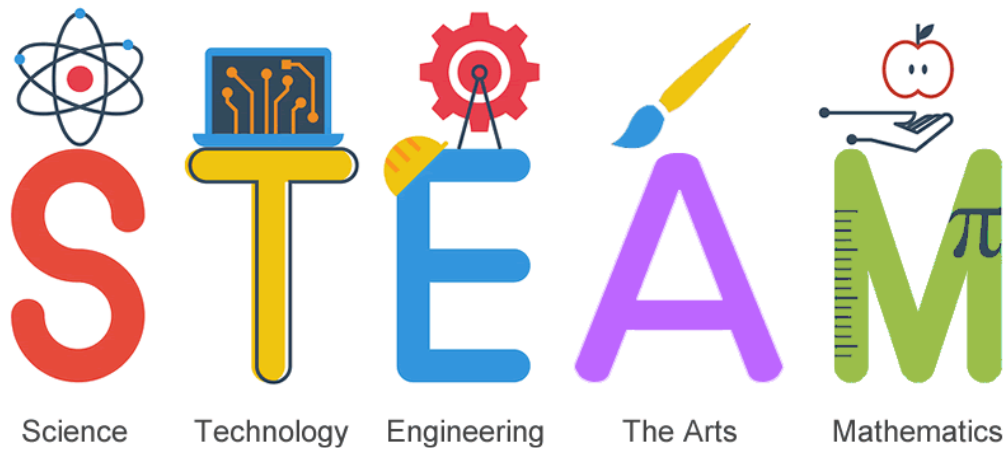
Math

# What is STEAM Education?

**STEAM** Education is an approach to learning that uses Science, Technology, Engineering, the Arts and Mathematics as access points for guiding student inquiry, dialogue, and critical thinking.

***Susan Riley***





allows students to connect their learning in the STEM areas together with arts practices, elements, design principles, and standards to provide a wider, interdisciplinary learning experience and let them discover unexpected links between subjects.

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# Some Arts Cognitive Competencies

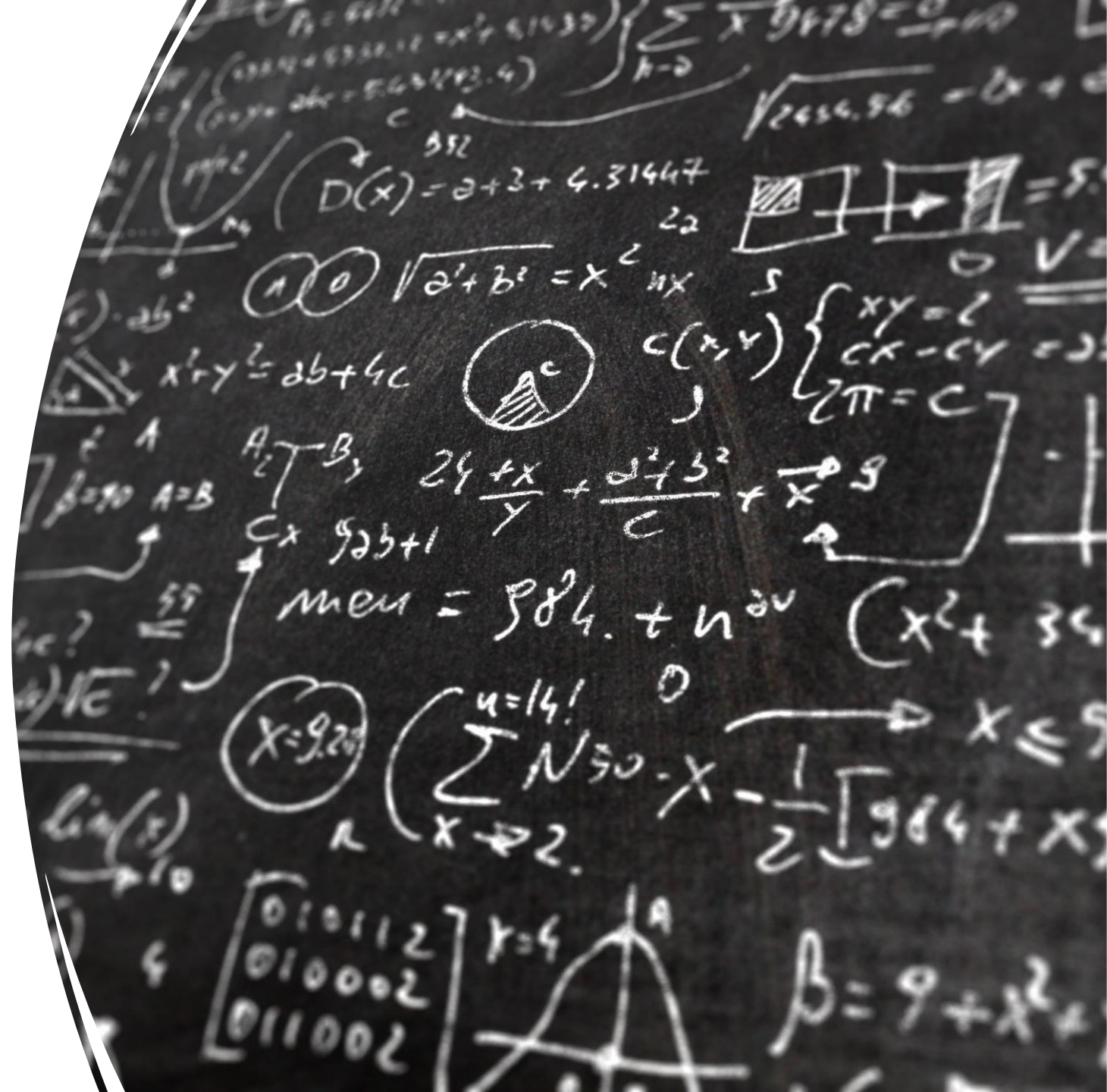
- *The perception of relationship.* Creating art teaches students to understand how parts of a system interact. This skill helps executives see how one system affects others and biologists understand how changes in an ecosystem impact various components and other systems.
- *An attention to nuance.* The arts teach that small details can have big impacts. Whether it's the subtle choices in form and color in art or the precise use of allusion in writing, attention to nuance is crucial. This skill is invaluable, such as when scientists explain complex ideas to normal people.
- *The perspective that problems can have multiple solutions, and questions can have multiple answers.* Good things can be achieved in various ways. Schools often stress finding one right answer, but in business and life, complex problems need exploring multiple options, each with its pros and cons.



# How to build a STEAM lesson:

There are 6 steps to creating a STEAM-Centered classroom, no matter what area you teach

1. Focus
2. Detail
3. Discovery
4. Application
5. Presentation
6. Link



# The STEAM Classroom

## 01 FOCUS

### IDENTIFY

the problem or essential question.

## 02 DETAIL

### OBSERVE & DOCUMENT

elements that contribute to the problem or question.

## 03 DISCOVER

### RESEARCH

current solutions.

### TEACH/LEARN

skills needed to address the problem or question.

## 04 APPLY

### CREATE

a new solution or composition using your skills, processes and knowledge.

## 05 PRESENT

### SHARE

your ideas/solution with others.

### FACILITATE

feedback opportunities.

## 06 LINK

### REFLECT

on others' suggestions and your own process.

### REVISE

your solution or composition as needed.

ACTIVITY: real examples



# The Driving Question

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A driving question can be presented as the frame for the project.

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A good driving question is one that “focuses all other questions towards a solution or product”

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It is open-ended

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It engages high-level thinking

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It requires students to synthesize information from multiple sources, experiences, and activities

# VTS - VISUAL THINKING STRATEGIES

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1. What is happening here?
2. What makes you say that?
3. What more can we find?

“Visual Literacy is the ability to find meaning in imagery. It involves a set of skills ranging from simple identification (naming what one sees) to complex interpretation on contextual, metaphoric and philosophical levels. Many aspects of cognition are called upon, such as personal association, questioning, speculating, analyzing, fact-finding, and categorizing. Objective understanding is the premise of much of this literacy, but subjective and affective aspects of knowing are equally important.”

Thoughts on Visual Literacy, *Philip Yenawine*

# The proper Assessment tool



1. It gives space to reflect on both strengths and weaknesses in student work.



2. It doesn't place boundaries on student performance.



3. It works against students' tendency to rank themselves and to compare **themselves to peers** or compete **against** one another.

# GROWTH MINDSET

## Fixed Mindset



- Each person is born with specific characteristics
- Main predictor of success is *ability*

## Growth Mindset

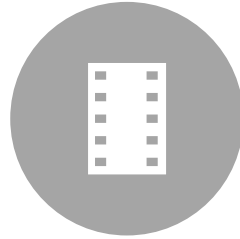


- Genetics are a starting point
- Main predictor of success is *effort*

# Portfolios



a physical or digital collection of student works



Includes: written assignments, tests, artworks, reports & projects



awards, certificates, recommendations, written evaluations by teachers or peers and self-reflections



The digital ones include blogs, websites, videos, multimedia presentations, photographs, or other digital artefacts



Thank you

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