



Creativity

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Center for Innovation in Teaching and Learning

Summer Series

Learning Skills



critical thinking



creativity



collaboration



communication

critical thinking • creativity • collaboration • communication



June: Learning Skills

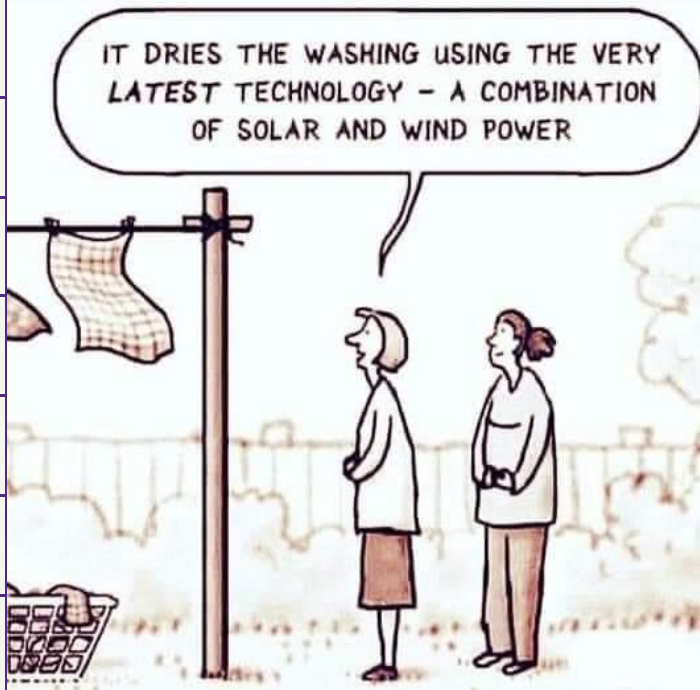


6/7 – Critical Thinking

6/14 – Creativity

6/21 – Collaboration

6/28 – Communication



Creativity in action

What are some examples of creativity in your field?

What do I want us to know & do?



Creativity can be relative.



Creativity can be practiced.



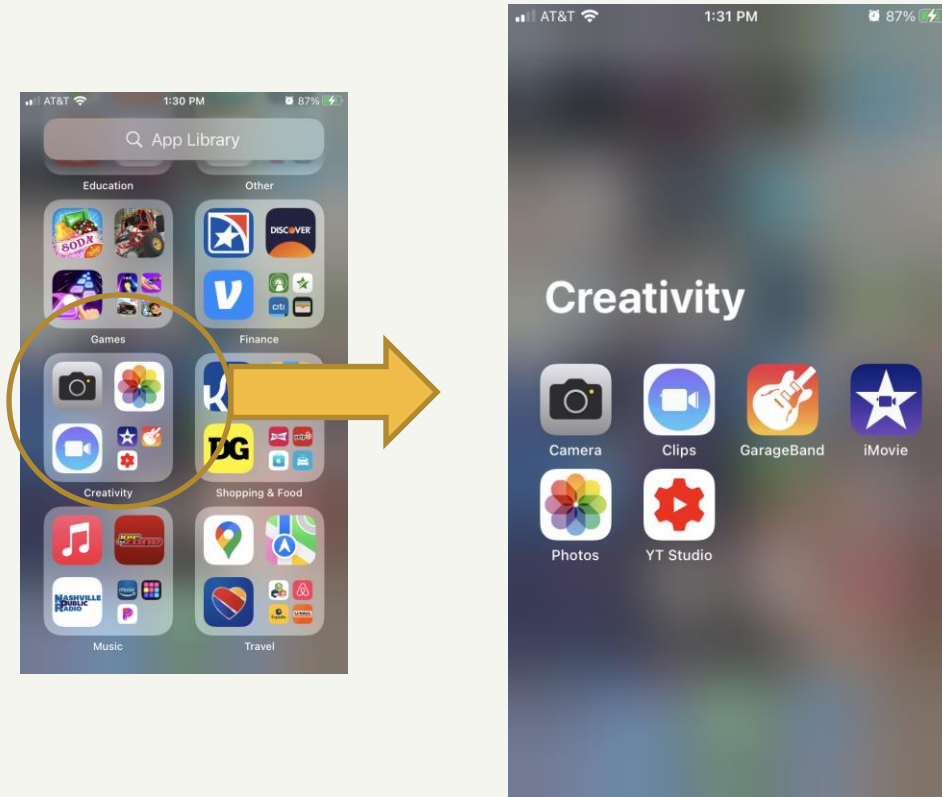
Creativity can be encouraged.



Creativity Can Be Relative

What are some ways to think about what creativity *is*?

Creativity according to my phone





An exercise in creative thinking

Name ten uses for a shoe

Plucker's definition (2014): "Creativity is ...



the interaction
among aptitude,
process and
environment



by which an
individual or group
**produces a
perceptible
product**



that is both **novel**
and **useful**



as defined **within a
social construct.**"

The Steering Wheel Desk Tray



[The 15 Most Useless Inventions Of All Time](http://theclever.com)
(theclever.com)

The Shoe Umbrella



The 15 Most Useless Inventions Of All Time
(theclever.com)

Briggs's definition (2014): Creativity includes...



"...the ability to identify multiple possibilities."

"...divergent thinking."

"And although some of us may associate creativity with things like art and emotion, the research shows that divergent thinking actually stems from logical, unbiased thinking"



Creativity Can Described

What are some frameworks we can use to understand creativity?

Can you dictate the process?

Lucas & Mai (2022)

1

The Insight Model






- "preparation"
- "seed the ground for breakthrough ideas to come"
- simmering of ideas until "a-ha" moment arrives

2

The Production Model

- "actively push ideas forward through trial and error"
- brainstorming, clustering, list making, talking
- rapid prototyping

Frameworks & output

	Archetypal Frame	Dominant Model	Contingent Model	Creative Process Behavior Prioritization	Idea Output
	Nonstarter	--	--	--	Novelty ↓ Feasibility ↓
	Erratic Artist	Insight	--	Preparation	Novelty ↑ Feasibility ↓ (variance ↑)
	Cookie-Cutter Contributor	Production	--	Production	Novelty ↓ (variance ↑) Feasibility ↑
	Reliable Artist	Insight	Production	Preparation by default; can switch to Production	Novelty ↑ Feasibility \bar{X}
	Inventive Contributor	Production	Insight	Production by default; can switch to Preparation	Novelty \bar{X} Feasibility ↑



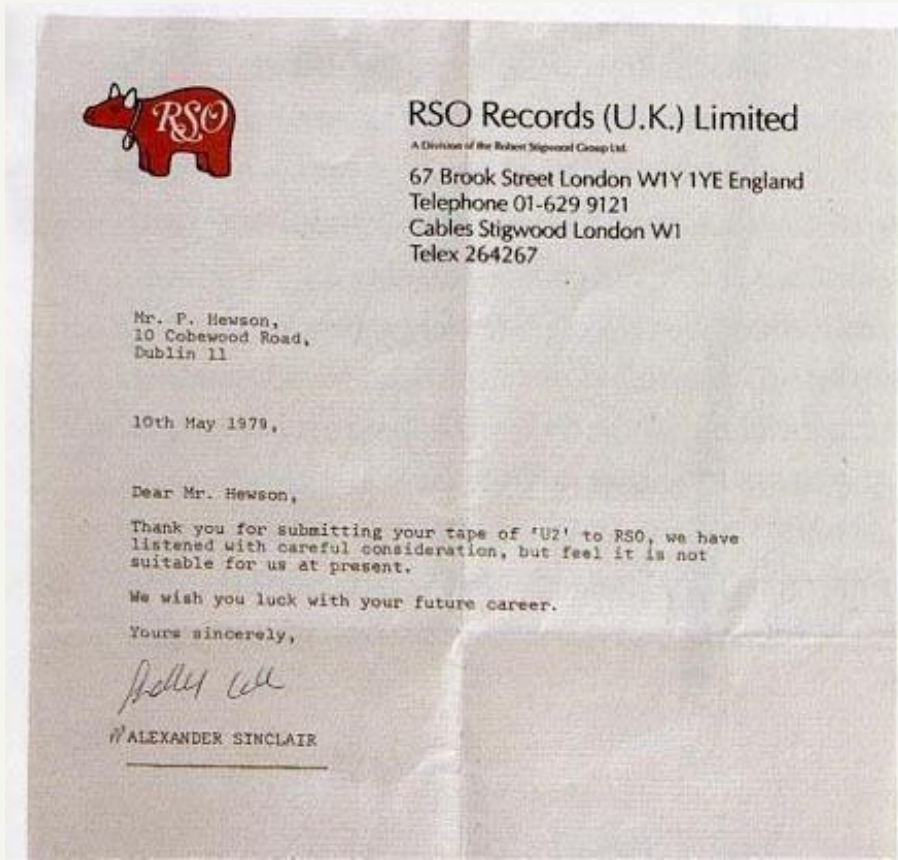
Creativity Can Be Encouraged

What are tools we can use and conditions we can create to encourage creativity?

Seelig's "Innovation Engine," 2017



Contextualize failure



LESS JUDGMENT...



... MORE CURIOSITY



Create a culture of exploration



versus

the
P&G
Scientists

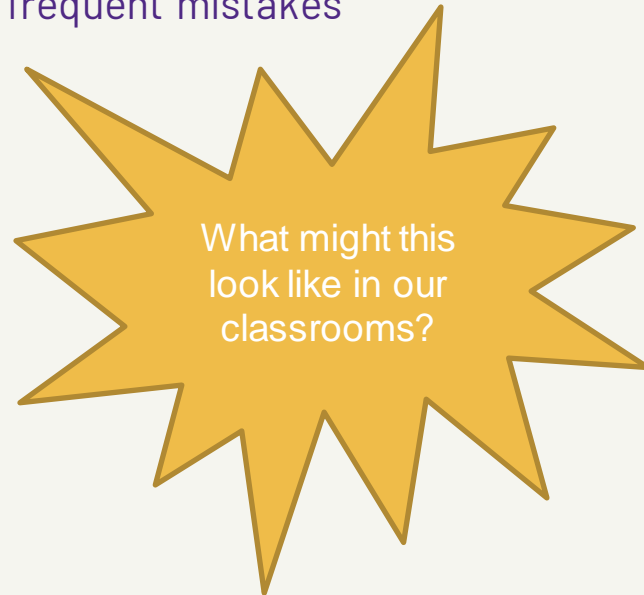
Revisiting the 21st Century Skills: "Think Creatively..."

- Use a wide range of idea-creation techniques (such as brainstorming)
- Create new and worthwhile ideas (both incremental and radical concepts)
- Elaborate, refine, analyze, and evaluate their own ideas in order to improve and maximize creative efforts



and ... "Work Creatively with Others"

- Develop, implement, and communicate new ideas to others effectively
- Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work
- Demonstrate originality and inventiveness in work and understand the real-world limits to adopting new ideas
- View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes



Think, Pair, Share

A routine for active reasoning and explanation.

Think, Pair, Share involves posing a question to students, asking them to take a few minutes of thinking time and then turning to a nearby student to share their thoughts.

Purpose: What kind of thinking does this routine encourage?

This routine encourages students to think about something, such as a problem, question or topic, and then articulate their thoughts. The *Think, Pair, Share* routine promotes understanding through active reasoning and explanation. Because students are listening to and sharing ideas, *Think, Pair, Share* encourages students to understand multiple perspectives.

Think- Pair-Share



See, Think, Wonder

A THINKING ROUTINE FROM PROJECT ZERO, HARVARD GRADUATE SCHOOL OF EDUCATION

See, Think, Wonder

A routine for exploring works of art and other interesting things.

- What do you **see**?
- What do you **think** about that?
- What does it make you **wonder**?

Purpose: *What kind of thinking does this routine encourage?*

This routine encourages students to make careful observations and thoughtful interpretations. It helps stimulate curiosity and sets the stage for inquiry.

3-2-1 Bridge

Before Learning

3 Words/Ideas
2 Questions
1 Metaphor or Simile

After Learning

3 Words/Ideas
2 Questions
1 Metaphor or Simile

Bridge

Explain how your new responses connect to or changed from your initial responses.

3-2-1 Bridge

Purpose: What kind of thinking does this routine encourage?

This routine helps students understand their own process of learning by considering their conceptions of a topic *before* and *after* a learning experience and how their conceptions changed.



Options Explosion

A THINKING ROUTINE FROM PROJECT ZERO, HARVARD GRADUATE SCHOOL OF EDUCATION

Options Explosion

A routine for creative decision making.

1. List the obvious options. There would not be a decision unless there were at least two or three obvious options.
2. Now brainstorm all sorts of different options to find the "hidden" options. Often there are hidden options that are the real best choices. Be imaginative! Piggyback on ideas already up, combine ideas to get new ones, look for ideas of a very different kind, imagine you are in different roles and suggest ideas from the perspective of those roles, etc.
3. Ask: What have we learned about the situation from finding these options? This is a way of understanding the situation better.

You may want to go on to a routine for comparing and choosing among options.

Purpose: What kind of thinking does this routine encourage?

This routine fosters creative thinking. It helps explore "hidden" options in a decision making situation. Often people don't make good decisions because they miss the hidden options. It is also relevant to understanding. It helps in building an understanding of decision-making situations even when you are not the real decision maker.



Options Diamond

A THINKING ROUTINE FROM PROJECT ZERO, HARVARD GRADUATE SCHOOL OF EDUCATION

Options Diamond

A routine for exploring the tensions of decision making.

1. Identify a couple of obvious options. Usually there are trade-offs or tensions between them that make the decision hard: Choose one and you get X but lose Y; choose the other and you lose X but get Y.
2. Make a diamond diagram, putting at the left and right corners the one or two main trade-offs (the X's and Y's) pulling in opposite directions (see example in PDF).
3. Now have students brainstorm one to three solutions for each corner of the diamond. Left side: go with that trade-off. Right side: go with that trade-off. Bottom: compromise between them. Top: Clever solutions that combine the seeming opposites and get the best of both.
4. Ask: What have we learned about the situation from finding these options? This is a way of understanding the situation better.

Purpose: What kind of thinking does this routine encourage?

This routine fosters creative thinking. It helps to explore decision making situations where a trade-off makes it hard to find a really good option. It focuses on resolving opposites. Sometimes, but not always, there are options that partly bring the opposites somewhat together. All this is also relevant to understanding. It helps in understanding situations even when you are not the real decision maker.



Feelings & Options

A THINKING ROUTINE FROM PROJECT ZERO, HARVARD GRADUATE SCHOOL OF EDUCATION

Feelings and Options

Choose a dilemma that you want your students to analyze.

1. **Identify:** Who are the different people involved in the dilemma? What challenge are they facing?
2. **Feel:** What do you think each person in the dilemma is feeling? Why might the situation be hard or challenging for each of them?
3. **Imagine:** Imagine options for how the situation could be handled. Come up with as many ideas as possible. Highlight or circle which option might lead to the most positive outcome, where most people feel good or taken care of.
4. **Say:** Thinking more about the idea you chose for handling the situation, what could the people involved say?

Purpose: *What kind of thinking does this routine encourage?*

Feelings and Options scaffolds perspective taking, empathic problem-solving, ethics spotting, and communication skills for social dilemmas of digital life.



Creative Questions

A THINKING ROUTINE FROM PROJECT ZERO, HARVARD GRADUATE SCHOOL OF EDUCATION

Creative Questions

A routine for generating and transforming questions.

1. Pick an everyday object or topic and brainstorm a list of questions about it.
2. Look over the list and transform some of the questions into questions that challenge the imagination. Do this by transforming questions along the lines of:
 - *What would it be like if...*
 - *What would change if...*
 - *Suppose that...*
 - *How would it be different if...*
 - *How would it look differently if...*
3. Choose a question to imaginatively explore. Explore it by imaginatively playing out its possibilities. Do this by: Writing a story or essay, drawing a picture, creating a play or dialogue, inventing a scenario, conducting an imaginary interview, or conducting a thought experiment.
4. Reflect: What new ideas do you have about the topic, concept, or object that you didn't have before?

Purpose: What kind of thinking does this routine encourage?

Formulating and exploring an interesting question is often as important as finding a solution. This routine encourages students to create interesting questions and then imaginatively mess around with them for a while in order to explore their creative possibilities. It provides students with the opportunity to practice developing good questions that provoke thinking and inquiry into a topic.

Creative Question Starts

A THINKING ROUTINE FROM PROJECT ZERO, HARVARD GRADUATE SCHOOL OF EDUCATION

Creative Question Starts

1. **Brainstorm** at least 12 questions about the topic, concept, artwork or object. Try some of these *Creative Question Starts*.
2. **Review** your list, identify the most interesting questions, and select one to discuss.
3. **Reflect:** What new ideas do you have about the topic, concept, artwork or object that you didn't have before?

Creative Question Starts

Why...?
What if...?
What is the purpose of...?
How would it be different if...?
Suppose that...?
What if we knew...?
What would change if...?

Purpose: *What kind of thinking does this routine encourage?*

This routine provides practice developing questions that provoke thinking and inquiry. Brainstorming such questions helps students explore the complexity, depth, and multi-dimensionality of a topic.



Creative Comparisons

A THINKING ROUTINE FROM PROJECT ZERO, HARVARD GRADUATE SCHOOL OF EDUCATION

Creative Comparisons

A routine for metaphorical thinking.



What do you see in the artwork? / What do you know about the topic?

Compare: Choose a category from the list below or identify your own category.

Imagine: If this topic / artwork was a kind of _____ (category), what would it be?

Explain three ways that it compares.

Purpose: *What kind of thinking does this routine encourage?*

The routine encourages metaphorical thinking – central to the work of any artist and to creative thinking in any discipline. Metaphors provoke our imaginations to create comparisons between dissimilar things, often leading to deeper and richer understanding of each.

Creative Hunt

A routine for looking at parts, purposes, and audiences.

Key Prompts:

- What's the main purpose here?
- What are the parts and their purposes?
- Which are especially smart or creative? – star them!
- Who is the audience for this?

Purpose: What kind of thinking does this routine encourage?

An important part of creativity is recognizing how creative things around us are. This is often inspiring. Because we are too used to things, we do not appreciate their creativity. It is also often practical: we see better the limitations of things and how they might be improved. It's also a good way of understanding things better, by looking into what they are for, how they work, and who their audiences are. Thus, this creativity routine has an understanding bonus.

Creative Hunt



Thank you!

Thoughts & questions?



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