



THINKING ROUTINES

For An AI Classroom

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A classroom culture that values thinking and teaches for understanding will be able to adapt to the challenges & opportunities of artificial intelligence (AI) in education.

As AI tools develop quickly, it is not possible to list all tools and their uses, though it is possible to apply principles of powerful learning design to their adoption.

These resources are created by Stephen Taylor, adapted from the work of Project Zero at Harvard Graduate School of Education. Occasional updates to this booklet will be made as new ideas and applications emerge.

The (If You) USEME-AI model was created by Stephen, and outlines some suggestions on how teachers and schools might adapt to these new technologies.

AI TOOLS & RESOURCES

To Support Learning



WAB Learns: AI Innovation Guide

Resources, models, presentations

learn.wab.edu/innovation/ai/teachers



Education Copilot

Teacher planning assistant & AI Freestyle

educationcopilot.com



PerplexityAI

Search with Bing & GPT tools, with sources

www.perplexity.ai/



Elicit

Academic Research Assistant

elicit.org



ChatGPT

The big one in the news.

chat.openai.com

USEME-AI

ADAPTING TO
USING AI IN SCHOOLS

Innovations in Artificial Intelligence (AI) will have a huge impact on teaching and learning.

Here are some suggestions for how to promote responsible & powerful use of AI.

U UNDERSTAND THE TECHNOLOGY

AI tools are here already and will only get better.

- Understand the purposes & applications of AI.
- Understand opportunities & implications of AI.
- Evaluate & explain outputs of AI tools.

S SUPPLEMENT & SUPPORT LEARNING

AI can augment, not replace, the teacher.

- Opportunities for inquiry, mastery & deep learning.
- Automate administrivia, freeing up time for differentiation, interaction, support & feedback.

E CREATE CLEAR EXPECTATIONS

Value thinking, learning & integrity.

- Academic honesty and intellectual property.
- Responsible use of AI tools for good, not harm.
- Communicate to students, faculty, parents.

M MODEL & MOTIVATE INTERACTIONS

Students learn with role models and peers.

- Model ethical & productive use of AI.
- Iterative design & feedback on work.
- Peer-interaction, discussion & evaluation.

E EVALUATE ETHICAL IMPLICATIONS

Ethical reflection must be integrated with AI use.

- Safe & ethical use with children & society.
- Ethical developments in AI in the news.
- Equity, fairness, sustainability & development.

- The development & accessibility of AI in schools will accelerate the move to powerful learning design that promotes future-ready learners through...

A AUTHENTIC APPLICATIONS

Inquiry that focuses on authentic contexts, problems, creativity and personal connections that cannot be replicated or solved by AI.

I INSPIRING INNOVATION

Design for learning that inspires meaningful action towards purposeful goals and empowers learners to solve problems with creativity and innovation.



(If You) USEME-AI was developed by Stephen to suggest ways in which schools can adapt to AI in education.
learn.wab.edu/innovation/ai/useme-ai

QUESTIONS FOR STUDENTS



- U** Do I **UNDERSTAND** this AI tool, its purpose and how it can be used appropriately?
- S** How does this tool **SUPPORT** my learning and give me opportunities to think more deeply?
- E** Do I know the **EXPECTATIONS** for purposeful learning, academic integrity and safety?
- M** How am I **MODELING** good use of AI in interactions with my peers, through evaluating and discussing our work?
- E** How am I considering the **ETHICS** of AI and the implications & opportunities of AI to make a difference?
-
- A** How can AI support my work in solving **AUTHENTIC** & meaningful problems and making personal connections?
- I** How is my learning **INSPIRING** me to take meaningful action and can AI help with innovation & creativity?



AI & ACADEMIC INTEGRITY

Schools should "highlight the importance of academic integrity throughout both a student's whole learning journey and within assessments." IB. 2022.

*"Academic integrity is a principle in education and a choice to **act in a responsible way** so others can trust us. It means conducting all aspects of your academic life in a responsible and ethical manner. The IB expects students to produce genuine and authentic pieces of work, that represent their own abilities." IB. 2022.*



Ten Tips for Teachers Adapting to AI Use in Assessment in Schools

- Create clear expectations for ethical & safe use of AI.
- Train students & teachers how to use AI effectively and for what purpose.
- Create higher-order tasks that require critical thinking and creativity, which AI is not yet capable of.
- Encourage peer-critique and review of assignments so that students can help hold each other accountable.
- Provide clear instructions and rubrics for assignments so that work is meaningful and original.
- Facilitate creative projects such as art, music, and robotics, where AI less likely to be used.
- Encourage students to produce multimedia content and in-person work as a form of assessment.
- Use AI tools to help automate adminstrivia and marking, freeing up time for personalized feedback and support.
- Educate students on potential career pathways and optimistic implications of AI on their future.
- Remember, not all learning needs to use tech.

Ten Tips drafted in part using Craft app GPT3 AI Assistant



Read
More



Creating Cultures of Thinking

by Ron Ritchhart & Mark Church. Project Zero at HGSE.



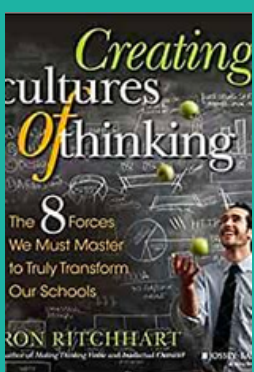
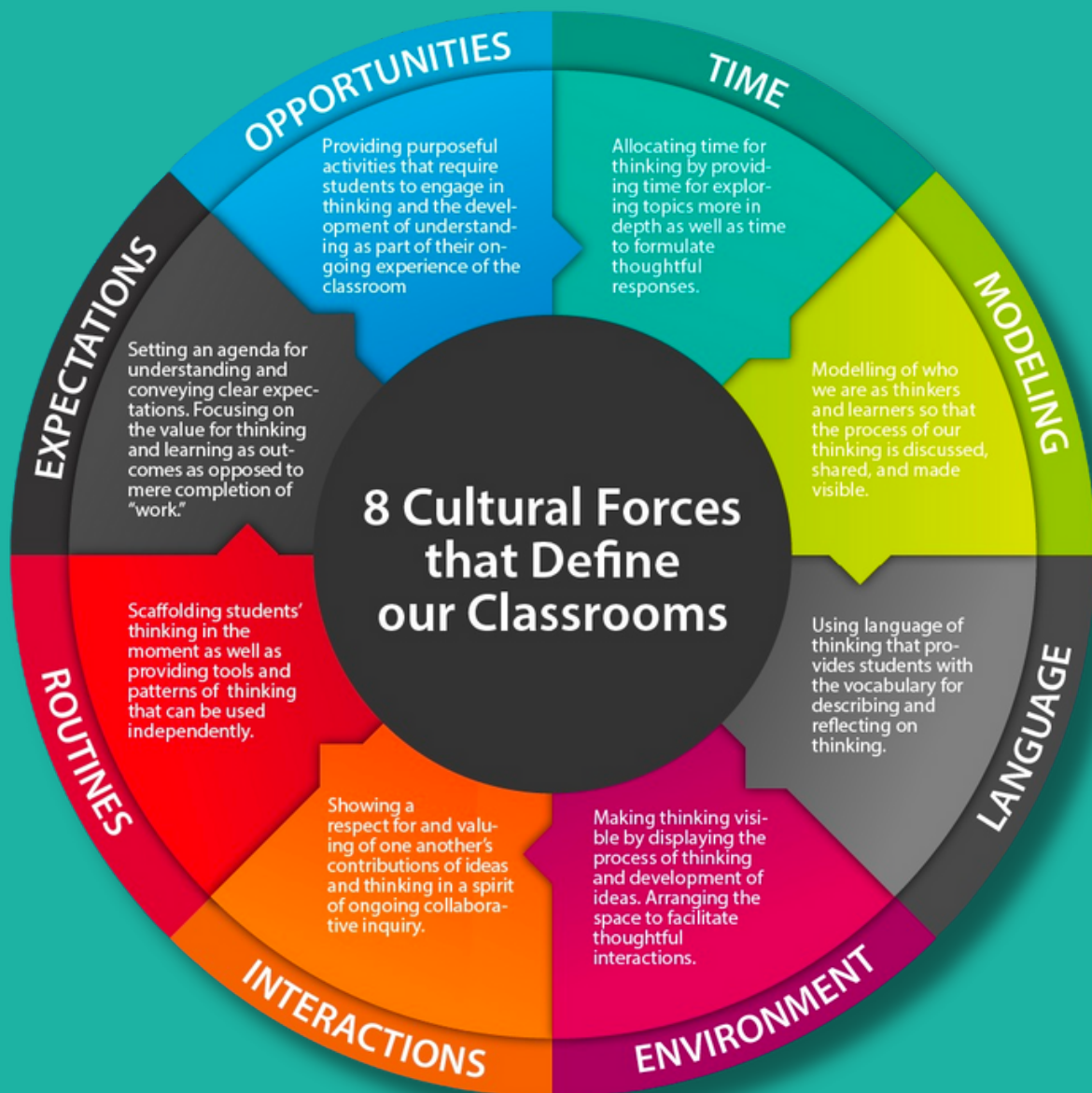
Preparing Learners For A Faster Future

Nine Principles for "What's Next" from Global Online Academy.



CREATING CULTURES OF THINKING

A classroom that leverages the eight Forces that shape classroom culture includes a focus on deep learning, through purposeful design and careful attention.



Thinking Routines are one of the eight Forces that shape classroom culture. Read more about Creating Cultures of Thinking in Ron Ritchhart's book.

pz.harvard.edu/projects/cultures-of-thinking



SIX MESSAGES IN A CULTURES OF THINKING CLASSROOM

Learning is a product of thinking.



Learning and thinking are as much a collective enterprise as they are an individual endeavor.

Learning occurs at the point of challenge.



Learning is an active process and involves getting personally involved.

Questions not only drive learning but also are outcomes of learning as well.



Our learning is often provisional and frequently changes with time.

UNDERSTANDING MAP

Teaching for understanding is more important now than ever before, as the world struggles with polarities, misinformation, uncertainty and the challenges & opportunities of AI.

The Understanding Map can help shape thinking, learning and classroom interactions, and is easily adapted to integrating AI.

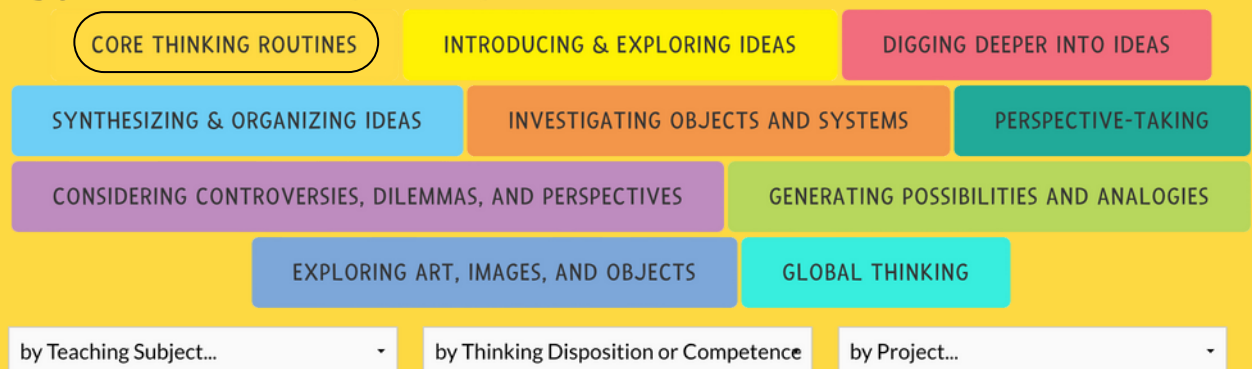




THINKING ROUTINES TOOLBOX

Thinking Routines shape classroom interactions and ensure all students are engaged in the process and cognitive apprenticeship of learning for understanding.

Types of Thinking Categories



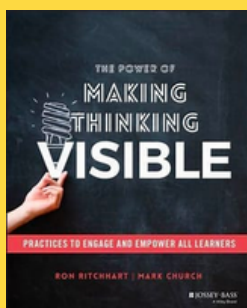
www.pz.harvard.edu/thinking-routines



Core Thinking Routines

Simple routines that are applicable across disciplines, topics, and age groups, and can be used at multiple points throughout a learning experience or unit of study. (A good place to start if you or your students are new to thinking routines.)

Circle of Viewpoints
Claim, Support, Question
Compass Points
Connect, Extend, Challenge
I Used to Think... Now I Think...
See, Think, Wonder
Think, Pair, Share
Think, Puzzle, Explore
What Makes You Say That?



Read more about Making Thinking Visible in Ron Ritchhart & Mark Church's books.

<http://pz.harvard.edu/projects/visible-thinking>



ADAPTING ROUTINES WITH AI TOOLS

The following pages include some examples of how AI tools can be leveraged through the adapted use of Thinking Routines. When we design engagements for students, it is an opportunity to create powerful learning.

In all learning with technology, we must first consider:

Safety

Are the tools age-appropriate, safe to use and do they handle student personal data properly?

Ethics

Is this an ethical use of the tool to promote positive values?

Does the tool have an ethical background?

Does it promote accurate information?

Fair Use

Is the tool using and encouraging the fair use of information, images and data?

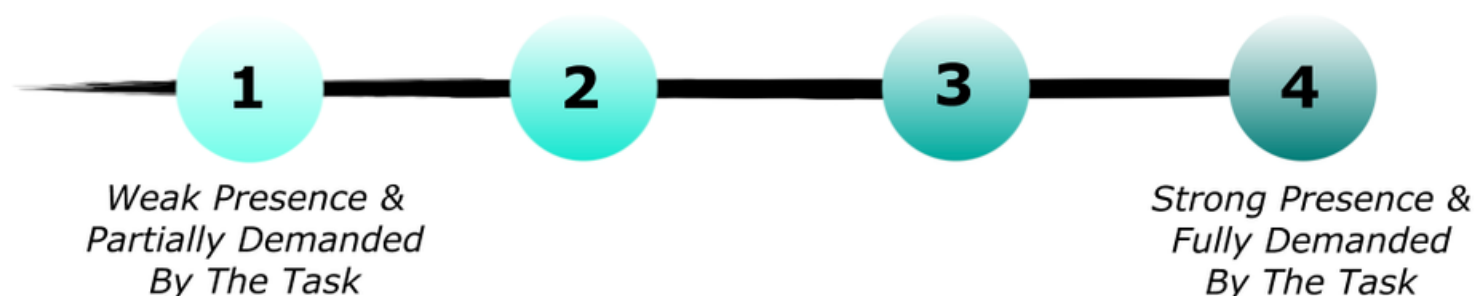
Integrity

Through the process of learning, how are we encouraging academic integrity, acknowledging sources and creators?

CREATING POWERFUL LEARNING OPPORTUNITIES FOR STUDENTS

The four criteria below can be useful in **shaping classroom activities** to more effectively promote the kinds of **authentic intellectual engagement** that leads to **deep understanding**. Each of these qualities may exist *to a greater or lesser extent* in the various tasks, lessons, and assignments we create for students.

As such, each of the four criteria represents a **continuum** ranging from:



NOVEL APPLICATION

Applying, organizing, interpreting, evaluating or synthesizing prior knowledge to solve novel problems or form new judgments.



MEANINGFUL INQUIRY

Developing new understandings & insights that go beyond the obvious and extend one's current understanding.



EFFECTIVE COMMUNICATION

Expressing, representing, justifying, supporting & communicating one's ideas, understandings, methods & processes effectively using disciplinary tools, symbols & language.



PURPOSEFUL REACH

Producing discourse, products & performances that have value beyond the classroom. Efforts have utilitarian, aesthetic or personal meaning & connect learning to the larger world.

ADAPTING CORE THINKING ROUTINES

Using AI tools as part of the research process.



Think-Pair-AI-Pair-Share

Including AI research in the process.

Suggested by Sarah Dillard (@dillardssarah)

pz.harvard.edu/resources/think-pair-share

twitter.com/dillardssarah/status/1599780722297872384



Circle of Viewpoints

Ask an AI tool to provide a perspective not shared in the group.

pz.harvard.edu/resources/circle-of-viewpoints



Claim, Support, Question

Ask an AI tool to suggest further questions related to student ideas.

pz.harvard.edu/resources/claim-support-question



Connect, Extend with AI, Challenge

Ask an AI tool to provide further extensions or challenges to ideas.

pz.harvard.edu/resources/connect-extend-challenge



I Used To Think, Now I Think, I Still Wonder...

Ask an AI tool to supplement new wonder and question ideas.

pz.harvard.edu/resources/i-used-to-think-now-i-think



EXPLORING VALUES & RELIABILITY

As AI-generated content becomes more widespread, evaluating sources, accuracy and reliability in media, including text and images, becomes more important.



Tug For Truth

Compare & evaluate media artifacts, including those possibly made by AI.

pz.harvard.edu/resources/tug-for-truth



Compass Points

Discuss issues related to AI ethics and developments using compass points.

pz.harvard.edu/resources/compass-points



Facts or Fiction

Create and evaluate AI-generated outputs based on known & new topics.

pz.harvard.edu/node/773312



Imagine If...?

Suggest and test improvements to AI-generated outputs.

pz.harvard.edu/resources/imagine-if



CREATIVE THINKING & EXPLORING IDEAS

Using AI tools, including text and image generators, require learners to develop their literacies in unpacking ideas and explaining their intentions clearly. Many routines can be adapted to encourage these new skills.



Colour, Symbol, AI Image

Use an AI image generator & explain how the metaphor guides the prompt.

pz.harvard.edu/resources/color-symbol-image



How Else & Why?

Rephrase & iterate prompts to generate & evaluate different outputs.

pz.harvard.edu/resources/how-else-and-why



Beauty & Truth

Analyse composition for inspiration & evaluate AI outputs for value & truth.

pz.harvard.edu/resources/beauty-and-truth




Creative Questions

Generate multiple ideas, perspectives, ideas and questions for images & tasks.

pz.harvard.edu/resources/creative-questions





HOW CAN CREATING A CULTURE OF THINKING AND USING ROUTINES HELP YOUR CLASSROOM ADAPT TO NEW TECHNOLOGIES?



*WAB AI Resources:
learn.wab.edu/innovation/ai*

*WAB PZ & COT Resources:
learn.wab.edu/attl/pz*

/imagine

MidJourney Prompts for Images



a group of robot tiger cubs working together around a table, writing on a whiteboard, photorealistic, close angle, detailed fur, natural lighting, octane render, 8k --aspect 2:3



a smiling robot tiger cub working on a laptop in a classroom, bokeh, photorealistic, close angle, detailed fur, natural lighting, octane render, 8k --aspect 2:3



a smiling robot tiger cub holding a small plant in its paws, macro photo, bokeh, photorealistic, close angle, detailed fur, natural lighting, octane render, 8k --aspect 2:3



a smiling robot tiger cub making a mess with colourful paints, bokeh, photorealistic, close angle, detailed fur, natural lighting, octane render, 8k --aspect 2:3



two smiling robot tiger cubs having a conversation about the news, holding an iPad, bokeh, photorealistic, close angle, detailed fur, natural lighting, octane render, 8k --aspect 2:3



Learn more about image prompting and how developing visual literacies can help thinking here:

sjtylr.net/2023/02/11/imagine/

