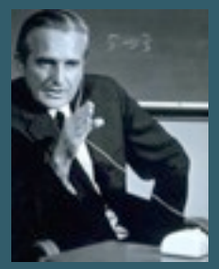
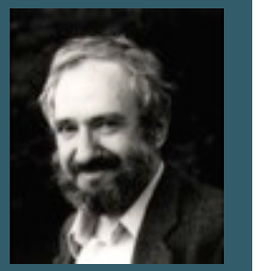
A Farewell to the Digital Mesolithic: Resources and Spaces for Student-Centered Learning

Ruben R. Puentedura, Ph.D.

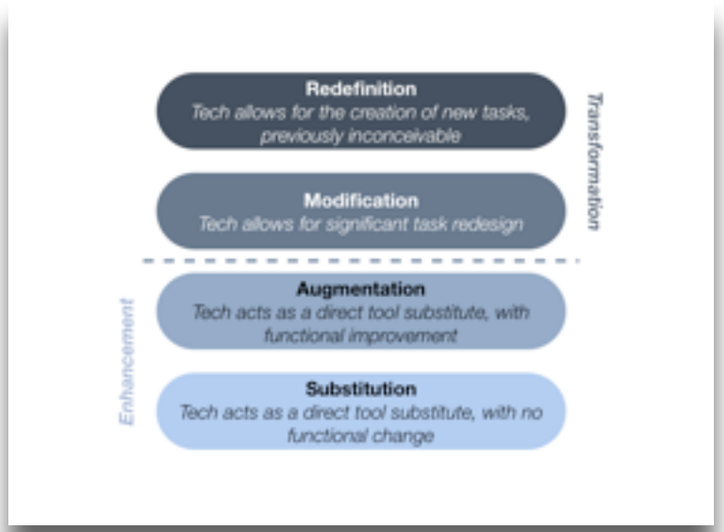
The Backdrop

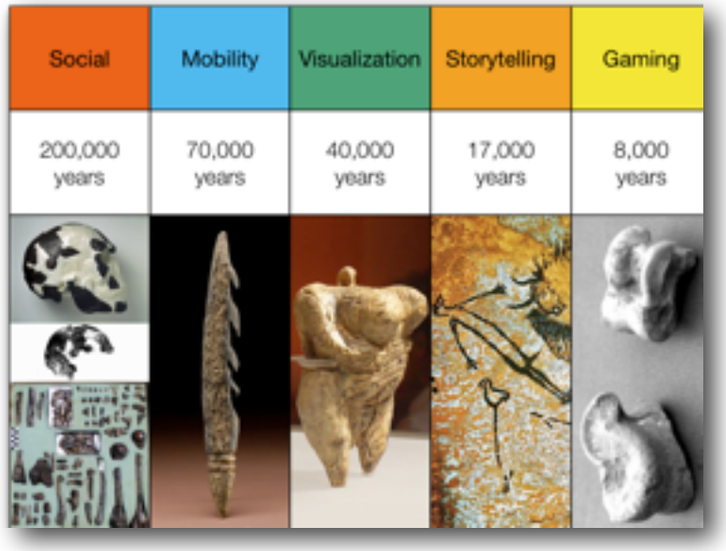



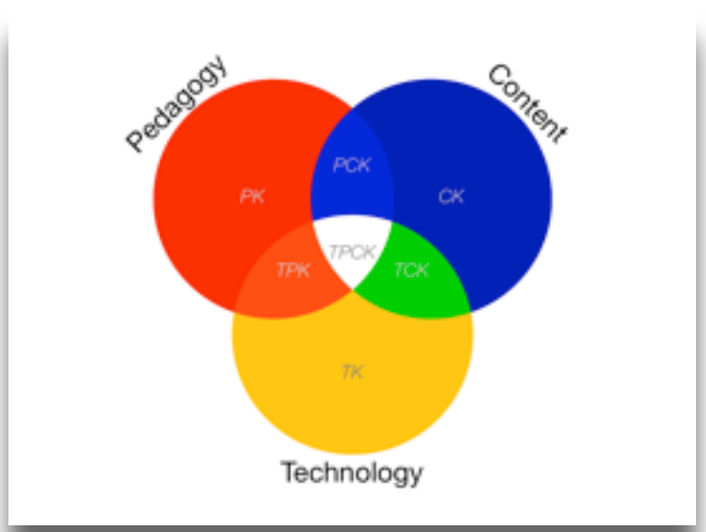
Augmenting Human Intellect & Learning Capacity

21st Century Learning







One-to-One Technologies

Redefinition
Tech allows for the creation of new tasks, previously inconceivable

Modification
Tech allows for significant task redesign

Transformation

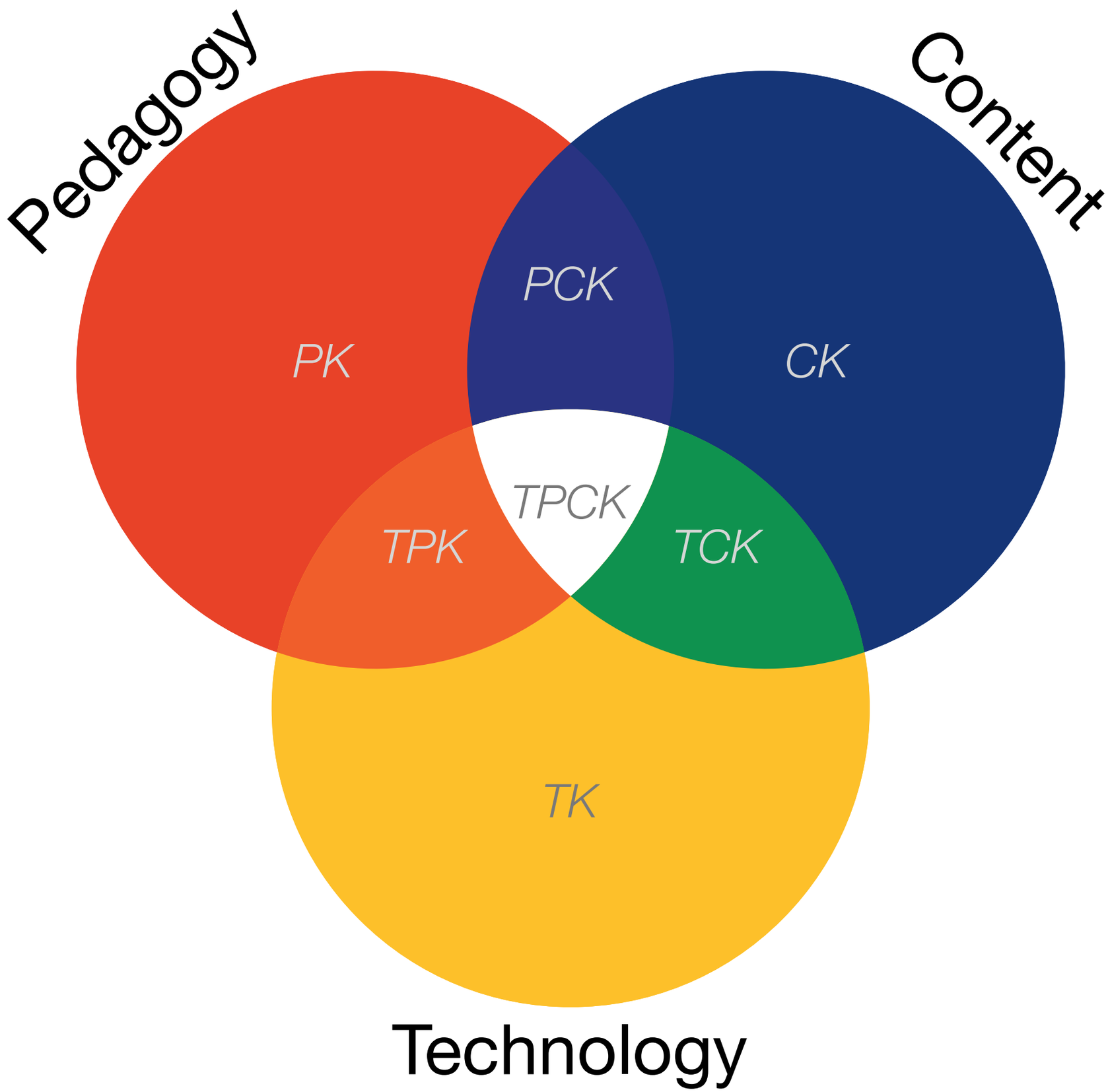
Augmentation
Tech acts as a direct tool substitute, with functional improvement

Substitution
Tech acts as a direct tool substitute, with no functional change

Enhancement

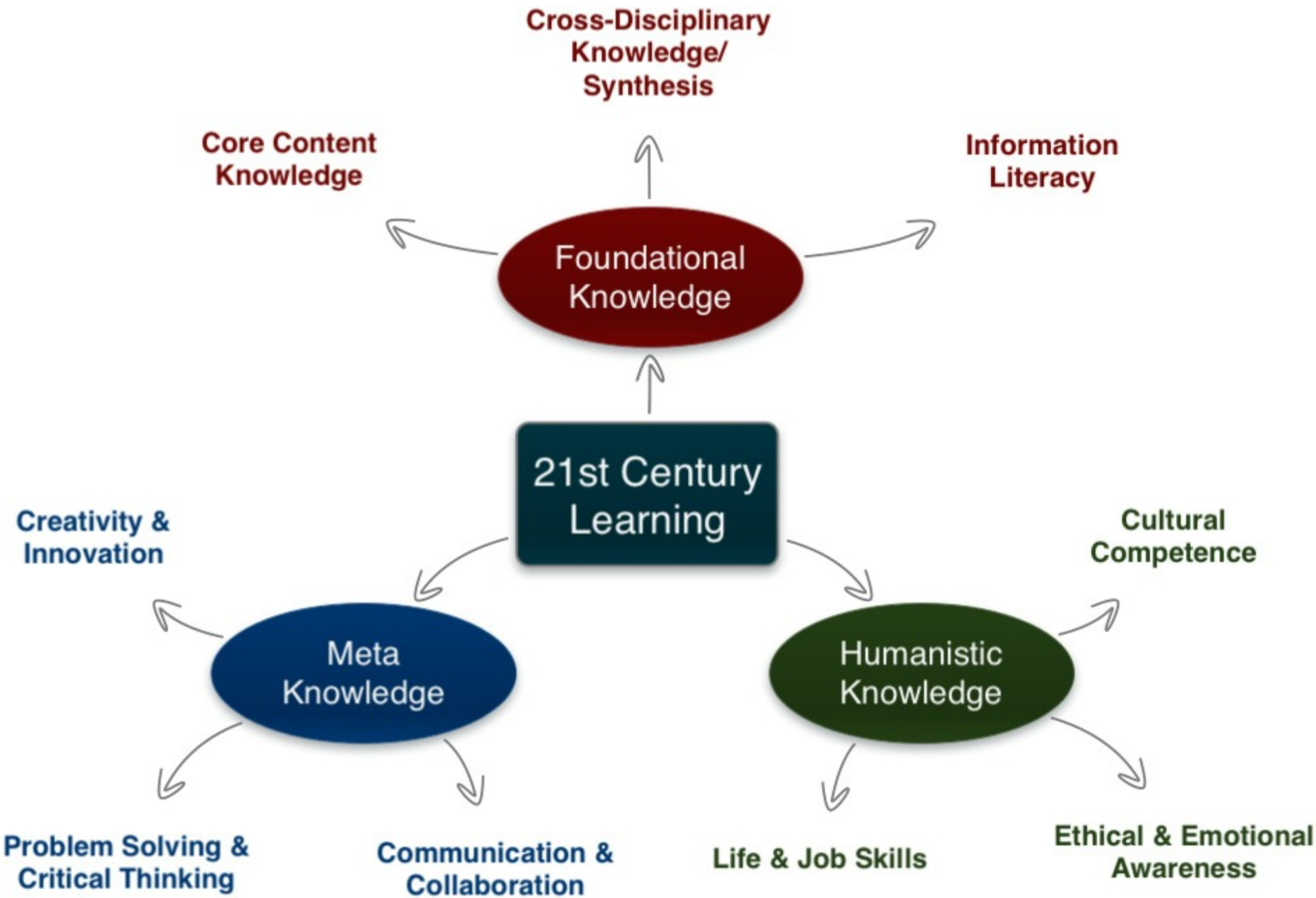
The SAMR Ladder: Questions and Transitions

- **Substitution:**
  - What will I gain by replacing the older technology with the new technology?
- **Substitution to Augmentation:**
  - Have I added a feature to the task process that could not be done with the older technology at a fundamental level?
  - How does this feature contribute to my design?
- **Augmentation to Modification:**
  - How is the original task being modified?
  - Does this modification depend upon the new technology?
  - How does this modification contribute to my design?
- **Modification to Redefinition:**
  - What is the new task?
  - Will it replace or supplement older tasks?
  - How is it uniquely made possible by the new technology?
  - How does it contribute to my design?



More Information: http://tpck.org/

Social	Mobility	Visualization	Storytelling	Gaming
200,000 years	70,000 years	40,000 years	17,000 years	8,000 years



P. Mishra and K. Kereluik. *What is 21st Century Learning? A review and synthesis*. SITE2011 Conference Presentation. (March, 2011)

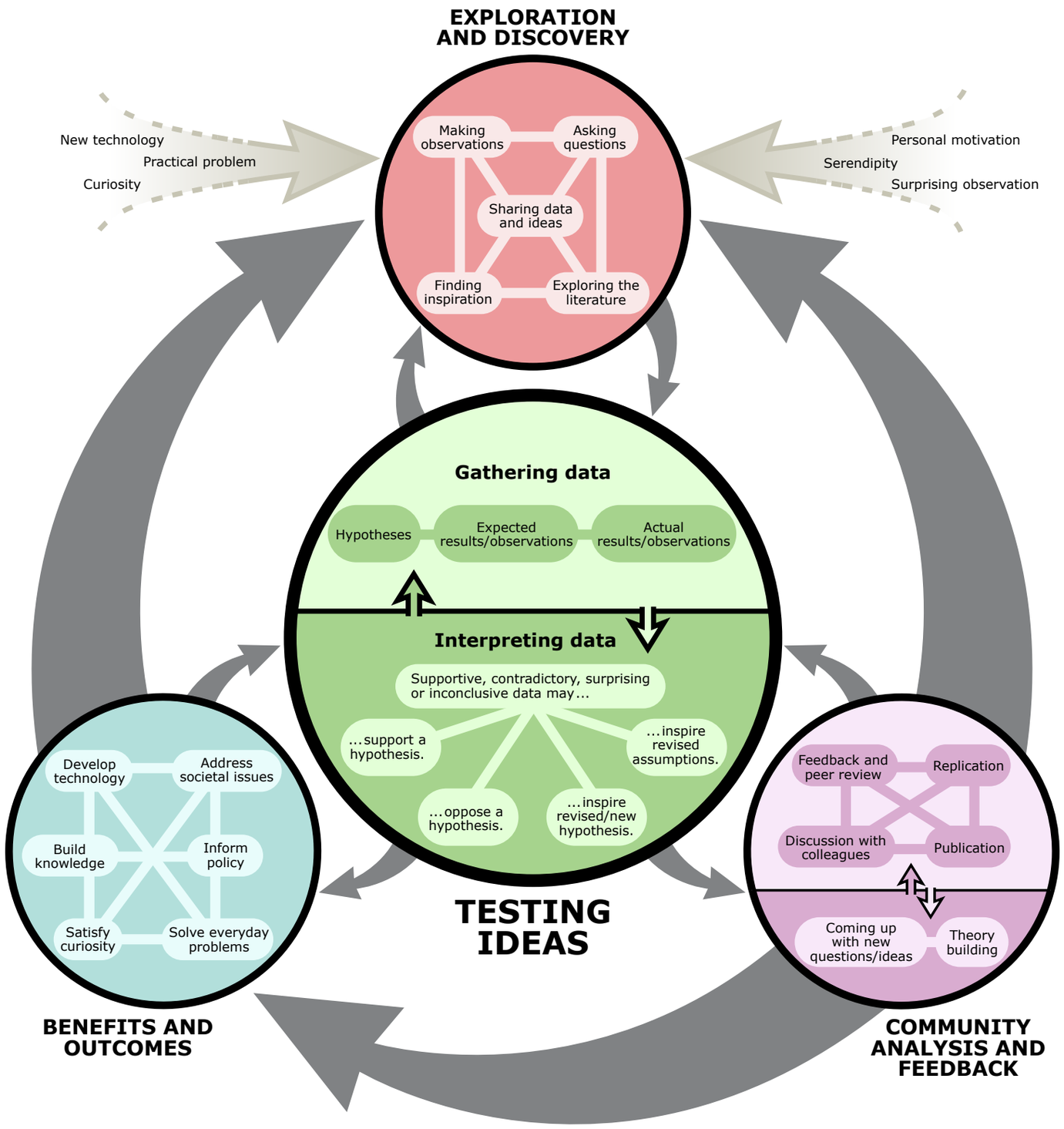
P21 Common Core Toolkit

A Guide to Aligning the Common Core State Standards with the Framework for 21st Century Skills

Partnership for 21st Century Skills

It is imperative that the CCSS be considered the "floor"—not the "ceiling"—when it comes to expectations for student performance in the 21st century.

Understanding Science: How Science Works



Lesh: Teaching History – Concepts and Criteria

- **Core Concepts:**
  - Causality
  - Chronology
  - Multiple Perspectives
  - Contingency
  - Empathy
  - Change and Continuity Over Time
  - Influence/Significance/Impact
  - Contrasting Interpretations
  - Intent/Motivation
- **Guiding Criteria:**
  - Does the question represent an important issue to historical and contemporary times?
  - Is the question debatable?
  - Does the question represent a reasonable amount of content?
  - Will the question hold the interest of middle or high school students?
  - Is the question appropriate given the materials available?
  - Is the question challenging for the students you are teaching?
  - What organizing historical concepts will be emphasized?

Bruce Lesh. ''*Why Won't You Just Tell Us the Answer?*'' *Teaching Historical Thinking in Grades 7-12*. Stenhouse Publishers. (2011)

Collecting Resources

Unsworth: Scholarly Primitives

- **Discovering**
  - searching, browsing, accessing, collecting
- **Annotating**
  - categorizing, providing commentary, analyzing
- **Comparing**
  - find differences, similarities and create meaning from them
- **Referring**
  - linking, referencing
- **Sampling**
  - selecting according to a criterion, showing relationships of items selected to the original set
- **Illustrating**
  - showing an example, highlighting features within an example
- **Representing**
  - changing depiction mode, publishing

John Unsworth. *Scholarly Primitives: What Methods Do Humanities Researchers Have in Common and How Might Our Tools Reflect This?* Humanities Computing, Formal Methods, Experimental Practice Symposium, Kings College, London. (May 2000)

Muller *et al*: Community Types

- **Communities of Practice**
  - A group of people with a common interest or practice who share information and/or network.
- **Teams**
  - Communities working on a shared goal for a particular project or function.
- **Technical Support Groups**
  - Provide technical support for a particular software or hardware tool.
- **IdeaLabs**
  - Communities in which members brainstorm around a set of questions or issues for a limited period of time, usually one to three days long.
- **Recreation**
  - Communities devoted to recreational activities unrelated to work.

Muller, M., Ehrlich, K., Matthews, T., Perer, A. A., Ronen, I., and Guy, I. *Diversity among enterprise online communities: Collaborating, teaming, and innovating through social media*. 2012 ACM SIGCHI Conf. on Human Factors in Computing Systems (2012)

Muller *et al*: Communities and Toolkits

	CoP	Teams	Tech	IdeaLabs	Rec
Bookmarks					
RSS Feeds					
Forums					
Activities					
Blogs					
Files					
Wikis					

The Toolkit

- Bookmarks: Delicious
- RSS Feeds: Google Reader
- Forums: Google Groups
- Activities: Google Forms; Google Calendar
- Blogs: Twitter; Blogger
- Files: Google Docs; Picasa; YouTube; Google Drive
- Wikis: Etherpad; Google Sites

Rheingold: Key Information Literacies

- Attention
- Junk Detection
- Participation
- Collaboration
- Network Awareness

Howard Rheingold. *Net Smart: How to Thrive Online*. MIT Press (2012)

Knowledge and Assessment

Bloom’s Taxonomy (Revised)

	Remember	Understand	Apply	Analyze	Evaluate	Create
Factual Knowledge						
Conceptual Knowledge						
Procedural Knowledge						
Meta-Cognitive Knowledge						

Lorin W. Anderson and David R. Krathwohl (Eds.), *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom’s Taxonomy of Educational Objectives, Complete Edition*. Longman. (2000)

Critical Thinking: Cognitive Skills and Subskills

Skill	Subskills
Interpretation	●Categorization ●Decoding Significance ●Clarifying Meaning
Analysis	●Examining Ideas ●Identifying Arguments ●Analyzing Arguments
Evaluation	●Assessing Claims ●Assessing Arguments
Inference	●Querying Evidence ●Conjecturing Alternatives ●Drawing Conclusions
Explanation	●Stating Results ●Justifying Procedures ●Presenting Arguments
Self-Regulation	●Self-examination ●Self-correction

Peter Facione, *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction - Executive Summary*. "The Delphi Report". American Philosophical Association, Committee on Pre-College Philosophy. California Academic Press, 1990

Black and Wiliam: Defining Formative Assessment

"Practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers, to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that was elicited."

Black, P. and Wiliam D. "Developing the theory of formative assessment." *Educational Assessment, Evaluation and Accountability*. 21:5-31 (2009)

Stiggins: Seven Principles of Assessment

- **Where Am I Going?**
  - Provide a clear and understandable vision of the learning target
  - Use examples and models of strong and weak work
- **Where Am I Now?**
  - Offer regular descriptive feedback
  - Teach students to self-assess and set goals
- **How can I close the gap?**
  - Design lessons to focus on one aspect of quality at a time
  - Teach students focused revision
  - Engage students in self-reflection, let them keep track of and share their learning

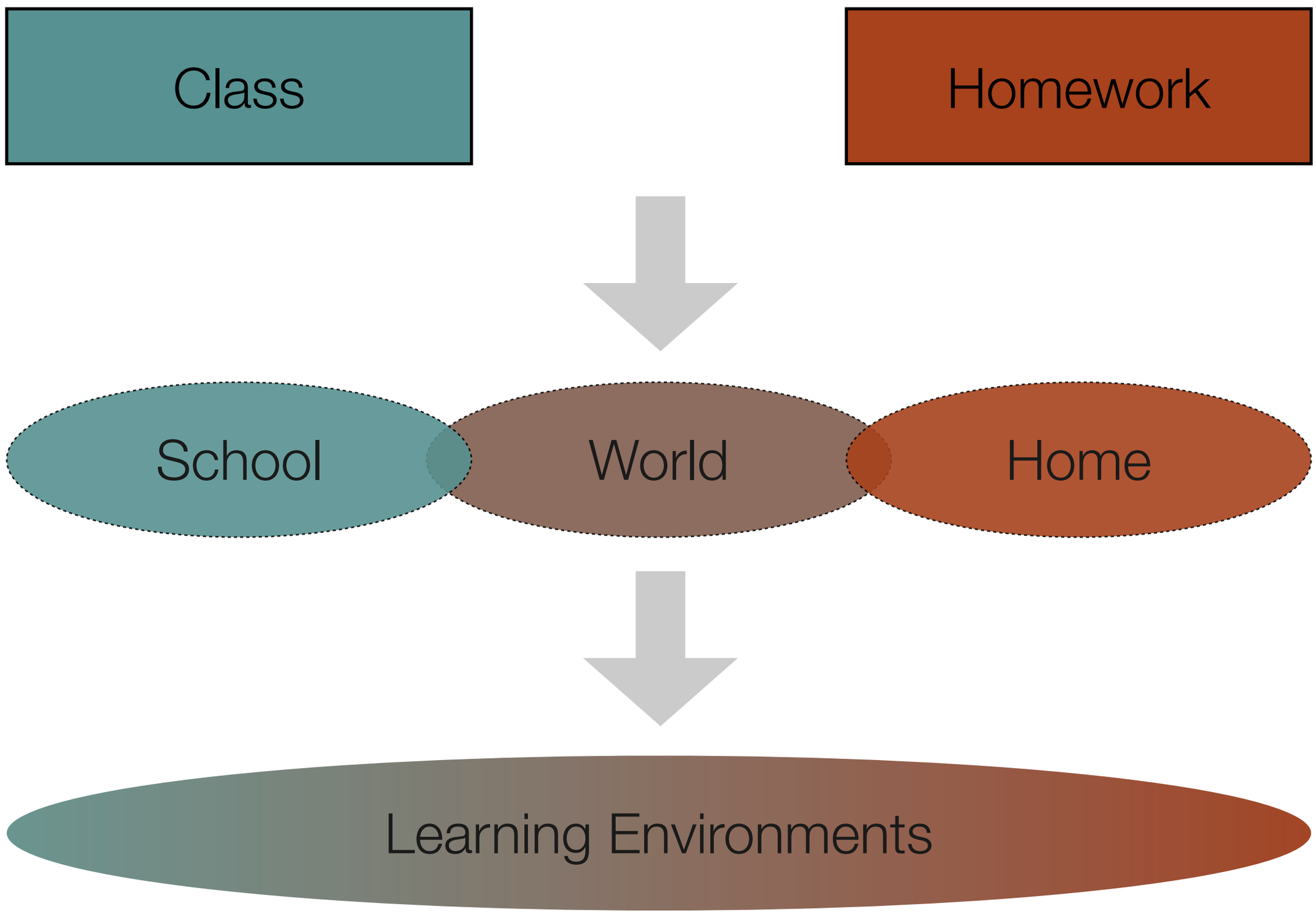
Stiggins, R. J., Arter, J. A., Chappuis, J., & Chappuis, S. *Classroom assessment FOR student learning: Doing it right—using it well*. ETS Assessment Training Institute. (2004)

Wiliam: A Framework for Formative Assessment

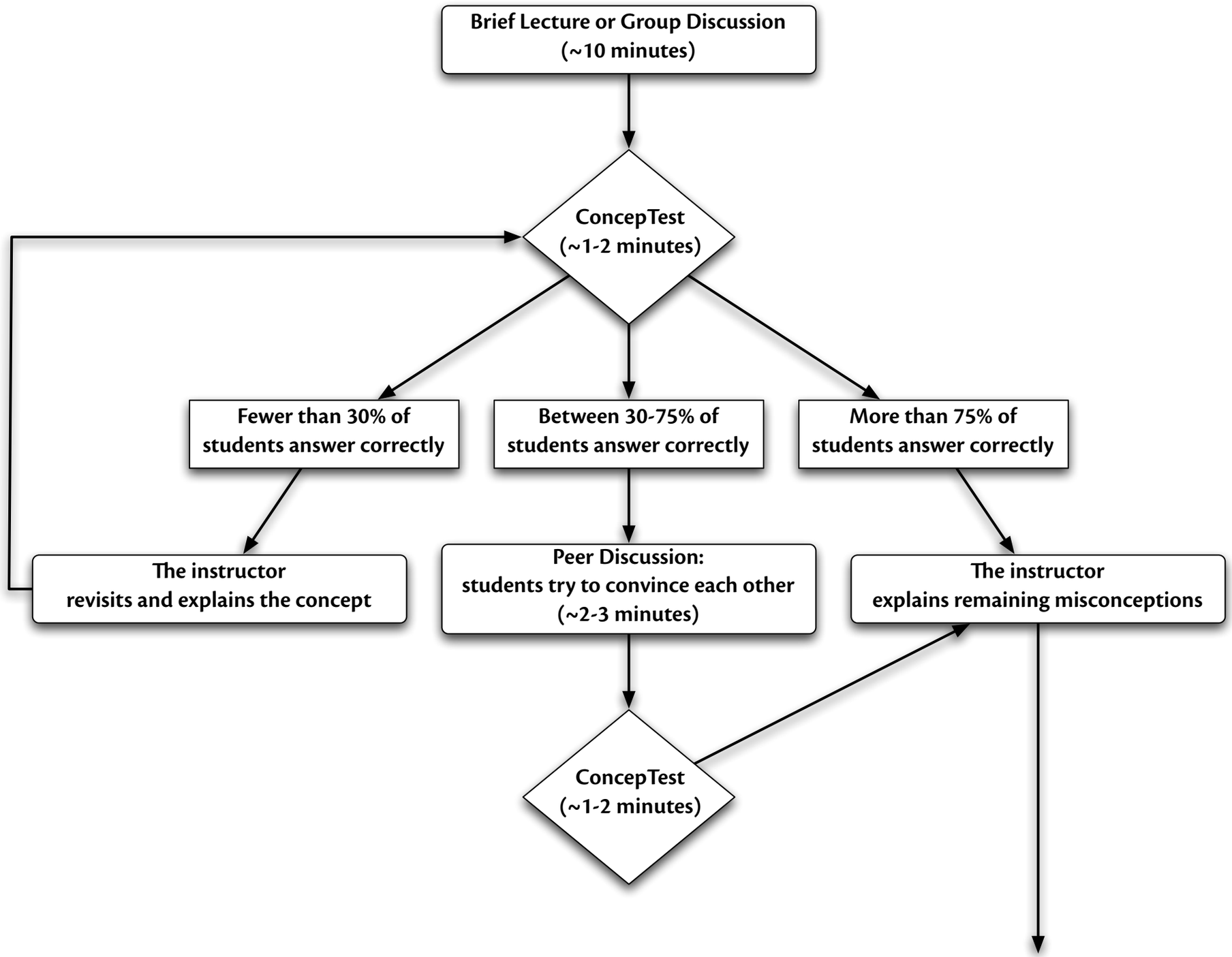
	Where the learner is going	Where the learner is right now	How to get there
Teacher	Clarifying learning intentions and criteria for success	Engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding	Providing feedback that moves learners forward
Peer	Understanding and sharing learning intentions and criteria for success	Activating students as instructional resources for one another	
Learner	Understanding learning intentions and criteria for success	Activating students as the owners of their own learning	

Dylan Wiliam, *Embedded Formative Assessment*. Solution Tree (2011)

Learning Environments


Class
Homework
School
World
Home
Learning Environments

Flipping the Classroom: ConcepTests



Mazur, E. *Peer Instruction - A User's Manual*. Prentice Hall (1997)

Which of these scenarios does not describe an acceleration?

A. A car going round a circular racetrack at constant speed.

B. A car traveling on a straight racetrack at constant speed.

C. A stone falling from the top of a building.

D. A simple pendulum.

Which of these would best be described as the "Crossing of the First Threshold" in *The Matrix*?

A. Neo goes to the club.

B. Neo takes the red pill.

C. Neo meets the Oracle.

D. Neo returns to the Matrix to save Morpheus.

Additional Resources – Part I

Augmenting Human Intellect & Learning Capacity:

- Vannevar Bush, “As We May Think”. *The Atlantic Monthly*. (July 1945) Online at: http://www.theatlantic.com/magazine/archive/1969/12/as-we-may-think/3881/
- Douglas C. Engelbart, *A Research Center for Augmenting Human Intellect*. (December 1968 live demo) Archived online at: http://sloan.stanford.edu/mousesite/1968Demo.html
- Alan Kay, “A Personal Computer for Children of All Ages”. *Proceedings of the ACM National Conference*. Boston (August 1972) Online at: http://www.mprove.de/diplom/gui/Kay72a.pdf
- Seymour Papert, “On Making a Theorem for a Child”. *Proceedings of the ACM National Conference*. Boston (August 1972) Online at: http://portal.acm.org/citation.cfm?id=569942

SAMR and TPCK:

- Ruben R. Puentedura, *Transformation, Technology, and Education*. (2006) Online at: http://hippasus.com/resources/tte/
- Ruben R. Puentedura, *As We May Teach: Educational Technology, From Theory Into Practice*. (2009) Online at: http://tinyurl.com/aswemayteach
- *TPCK - Technological Pedagogical Content Knowledge*. (2008-2010) Online at: http://www.tpck.org/tpck/index.php?title=Main_Page
- AACTE (Eds.) *The Handbook of Technological Pedagogical Content Knowledge for Educators*. New York:Routledge, 2008.

Additional Resources – Part II

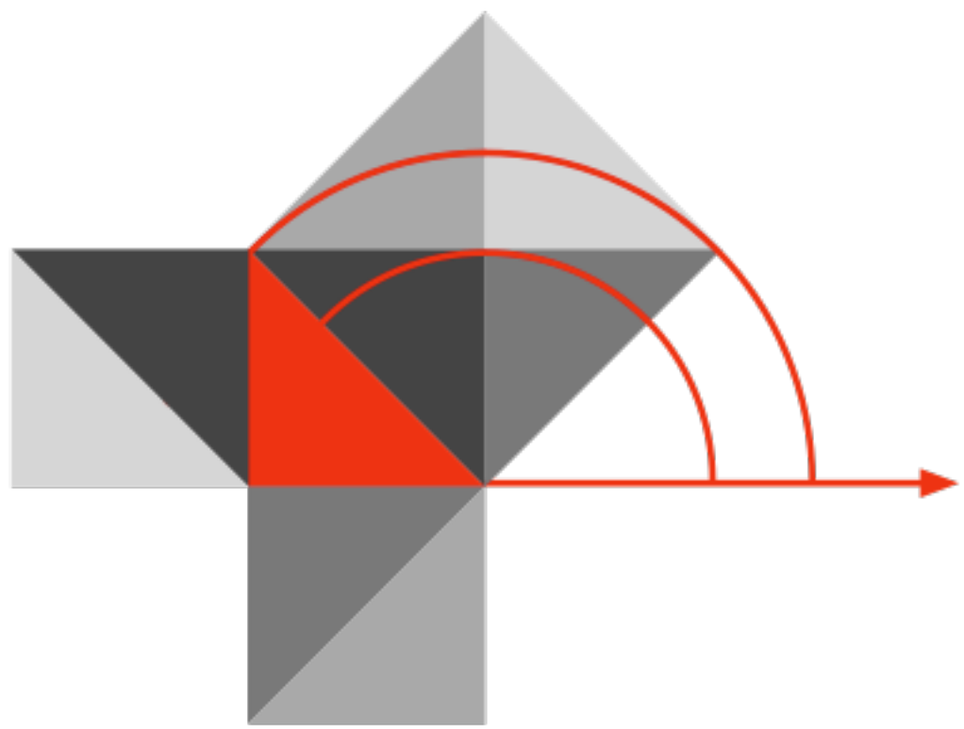
Technology In Education: The First 200,000 Years:

- Ruben R. Puentedura. “Technology In Education: The First 200,000 Years”. NMC Summer Conference, *Ideas that Matter* Presentation. (2012) Online at: http://www.hippasus.com/rrpweblog/archives/000069.html

21st Century Learning:

- P. Mishra and K. Kereluik. “What is 21st Century Learning? A review and synthesis.” SITE2011 Conference Presentation. (2011) Online at: http://punya.educ.msu.edu/presentations/site2011/SITE_2011_21st_Century.pdf

Hippasus



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Email: rubenrp@hippasus.com
Twitter: @rubenrp