

WHAT IS STEM EDUCATION?

STEM IS...

STEM IS NOT...

connecting science, technology, engineering, and mathematics to real-world phenomena

1

a "siloed" approach where subjects like biology, programming, electrical engineering, and algebra are each taught separately as disconnected content

appropriate for all students, across all grade levels

2

appropriate only for high-performing secondary students



science: the testing and subsequent explanation of real-world phenomena

3

science: a list of scientific terms and disconnected/irrelevant facts

technology: any tool that expands human abilities and/or solves problems (e.g., scissors)

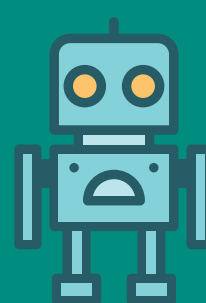
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technology: electronics or other digital tools (e.g., a tablet)

engineering: a process for developing solutions to real-world problems

5

engineering: related only to coding or robots



mathematics: a common language to measure, describe, and identify patterns in what we observe

6

mathematics: addition and subtraction (plug-and-chug problem solving)

a storyline of connected concepts that build ideas about phenomena in the real world

7

discrete, disconnected learning objectives



content standards taught through relevant, purposeful, project-based learning

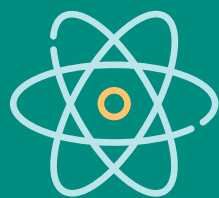
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content standards taught through textbooks, lecture, and worksheets

teacher-facilitated constructivist learning

9

teacher-driven direct instruction



provides explanations and options for an evolving career path

10

provides an academic pathway for naturally talented students

discovering or creating solutions to real-world problems

11

identifying prescribed correct answers from lectures or text material

discourse and argumentation, giving students voice and choice

12

only one answer



assessed through rubrics and personalized feedback

13

assessed through multiple choice and single-word responses



creativity and innovative thinking

14

conformity and routine

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REFERENCES and CREDITS

Bybee, Roger W. (2013). The Case for STEM Education: Challenges and Opportunities. pg. 3-7.
Gerlach, Jonathan. (2012, April 11). STEM: Defying a Simple Definition. Retrieved from <http://www.nsta.org/publications/news/story.aspx?id=59305>
Hom, Elaine J. (2014, February 11). What is STEM Education? Retrieved from <https://www.livescience.com/43296-what-is-stem-education.html>
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