

MEDICAL ROBOTICS

GRADES 8–12

This document lists the Pennsylvania learning standards addressed by Medical Robotics, True Robotics' grades 8–12 robotics curriculum. Standards are grouped by subject and grade level, with codes and wording as published by the Pennsylvania Department of Education and the Computer Science Teachers Association (CSTA), as adopted by Pennsylvania.

10

SCIENCE

7

CS

17

TOTAL STANDARDS

SCIENCE, TECHNOLOGY & ENGINEERING (STEELS)

10 STANDARDS

Based on the Pennsylvania state standards

GRADE	CODE	STANDARD
8	3.1.6-8.C	Use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
8	3.2.6-8.H	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
8	3.5.6-8.P	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
8	3.5.6-8.M	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
9–12	3.1.9-12.B	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
9–12	3.1.9-12.C	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
9–12	3.5.9-12.T	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
9–12	3.5.9-12.Y	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
9–12	3.5.9-12.I	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
9–12	3.5.9-12.LL	Analyze the stability of a technological system and how it is influenced by all of the components in the system, especially those in the feedback loop.

COMPUTER SCIENCE

7 STANDARDS

Based on the Pennsylvania state standards

GRADE	CODE	STANDARD
8	2-AP-10	Use flowcharts and/or pseudocode to address complex problems as algorithms.
8	2-AP-11	Create clearly named variables that represent different data types and perform operations on their values.
8	2-AP-12	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
8	2-CS-02	Design projects that combine hardware and software components to collect and exchange data.
9–10	3A-AP-13	Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
9–10	3A-AP-17	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
9–10	3A-IC-24	Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.

SOURCES & NOTES

- The official science and computer science standards for Pennsylvania, as published by the Pennsylvania Department of Education and the Computer Science Teachers Association (CSTA), as adopted by Pennsylvania.
- Codes and standard wording are reproduced from the official standards documents. Clarification statements, examples and assessment boundaries are omitted.
- Grade shows the grade level at which True Robotics lessons address each standard. A range (for example K-2) marks a standard written for a grade band.
- Standards text remains the property of its publisher and is reproduced here for alignment reference only.
- A lesson-level crosswalk is available on request at info@truerobotics.org.