

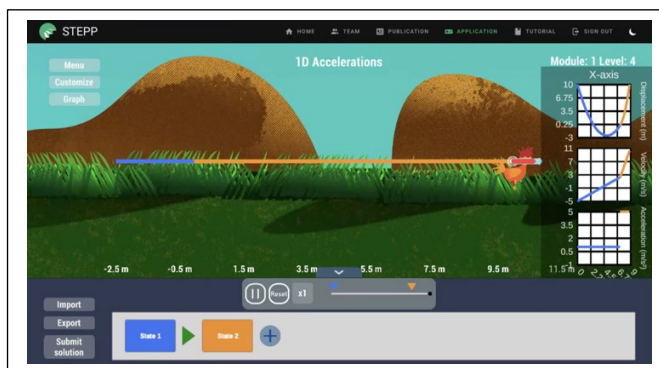


STEPP into Kinematics and Newton's Laws



What is STEPP?

STEPP stands for **Scaffolded Training Environment for Physics Programming**. No knowledge of a programming language is required. Instead, students and teachers program STEPP through a scaffolded graphical interface and the computer science approach of state diagrams to program their own simulations of motion. Students build computational thinking (CT) skills



simultaneously with their physics skills and conceptual understanding. For CT, STEPP students engage in with decomposition (breakdown problems to solve) and algorithmic problem solving as they model the motion of objects through state diagrams. Synchronized dynamic displays include multiple representations of animations, graphs, number lines, vectors. The user can select or hide displays to manage cognitive load, both dynamic such as graphs static such as equations, and customize simulations with a variety of characters and backgrounds.

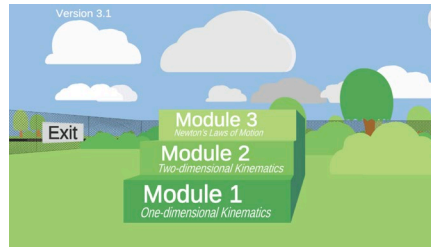
STEPP is designed to work with *your* existing curriculum and the problems you assign your students.

Try out the customize option to make the simulation you or your students create work better for the problem you are solving, or just to make it more fun.

STEPP at a Glance

STEPP is broken up into multiple modules. The current modules are as follows:

- Module 0: An Introduction/Review of Concept Maps
- Module 0.5: Bridging Concept Maps to State Diagrams
- Module 1: One Dimensional Kinematics
- Module 2: Two Dimensional Kinematics and Uniform Circular motion
- Module 3: Newton's Laws



Modules 1-3 are simulations found on the STEPP website. Module 1-3 is broken up into various levels as outlined below:

	Module 1 (1D Kinematics)	Module 2 (2D Kinematics)	Module 3 (Forces & Newton's Laws)
Level 1	Natural Language	Displacement	Newton's First Law in 1D
Level 2	Displacements	Velocity	Newton's First Law in 2D
Level 3	Velocity	Acceleration	Newton's Second Law in 1D
Level 4	Acceleration	Uniform Circular Motion with Natural Language	Newton's Second Law in 2D
Level 5	Vertical Acceleration	Uniform Circular Motion with Simplified Inputs	Inclined Planes
Level 6		Circular Motion + Projectile Motion	Uniform Circular Motion w/ Forces
Level 7			Newton's Third Law in 1D (Collisions)



STEPP into Kinematics and Newton's Laws



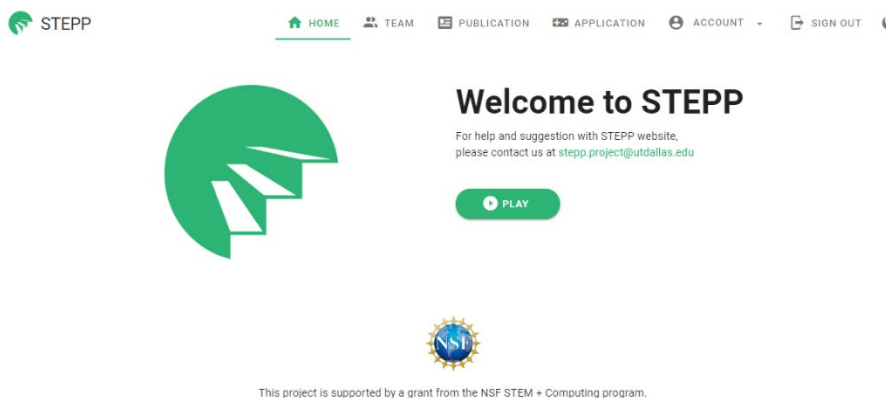
STEPP in the Classroom

The purpose of STEPP is to augment current instruction in introductory physics at the high school level. STEPP is designed to work synergistically with what you are already doing in your classroom.

If you feel like you need supplementary practice problems, feel free to look at the practice problems written by the STEPP team.

The STEPP Website

STEPP underwent field testing in two North Texas high schools and at the University of Texas at Dallas.



STEPP is ready for **your** classroom this coming fall!

Ready to Get Started?

Go to: stepp.utdallas.edu

STEPP is supported by the National Science Foundation STEM+C award 1741756. Any opinions, findings, conclusions, or recommendations in this material are the findings of the authors and do not necessarily represent those of the National Science Foundation.



STEPP into Kinematics and Newton's Laws



STEPP Tutorial Video List

These are the links to all of the videos related to the STEPP field test. Tutorial videos will be updated to reflect updates and new features that are added. The best place to search for the most up to date videos is on the STEPP website.

Module 0: https://youtu.be/yS5dVy4e_SU

Module 0.5: <https://youtu.be/PFnng973N-4>

Module 1 Tutorial Videos:

- Level 1: <https://youtu.be/5cVXG54rZ8k>
- Level 2: <https://youtu.be/jRRZ-q-FQyQ>
- Level 3: <https://youtu.be/LwsMDTNyQq8>
- Level 4: <https://youtu.be/Dy2y9HpoNSM>
- Level 5: Coming Soon

Module 2 Tutorial Videos:

- Level 1: <https://youtu.be/nxZrC9FLC5w>
- Level 2: <https://youtu.be/quBCQvOY7j4>
- Level 3: <https://youtu.be/5ftW5WFjCWM>
- Level 4: <https://youtu.be/04VxSepr428>
- Level 5: https://youtu.be/j90-xnS_7w4
- Level 6: <https://youtu.be/6G0wgjbLM30>

Module 3 Tutorial Videos:

- Level 1: <https://youtu.be/SFvxGHNrgKA>
- Level 2: <https://youtu.be/NzVmytIh1gM>
- Level 3: <https://youtu.be/DPI2XAKkQuU>
- Level 4: <https://youtu.be/0tYh6ApaLY8>
- Level 5: Coming Soon
- Level 6 (Previously was Level 5): <https://youtu.be/miFHxgXbm7E>
- Level 7 (Previously was Level 6): <https://youtu.be/3r6XiVfedCE>