


Engaging Minds Through STEAM Learning:

Creativity, Collaboration and Problem-Solving Lead to Positive Classroom Behaviors


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Our Mission and Goals




- Serve public schools serving grades 5-12
- Address the high demand for innovative, STEAM learning best practices
- Model hands-on, STEAM centered lessons with teachers and students *simultaneously* in the classroom setting
- Emphasize design thinking to solve a real-world challenge
- Inclusive - designed for all learners
- Focus on WV Career Exploration and pathways and workforce preparation
- Provide Teachers...
 - Embedded professional development
 - Standards-based instruction
 - Follow-up lesson extensions focusing on cross-curricular topics
 - Free educational materials and technologies
 - Resources to help guide STEAM learning beyond the initial visit



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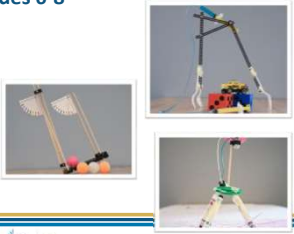

Our STEAM Curriculum



Immersion Experiences for grades 6-8

Foundation:

- Collaborative Engineering Design
- Hands-on, interactive
- Problem solving
- Critical thinking mindsets
- Interdisciplinary applications
- WV career opportunities

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STEAM Learning is Active Learning

Intellectually Active

- Inquiry and problem-solving activities
- Develop critical thinking with real-world scenarios
- Integration of multiple content areas
- Expose and ignite curiosity in STEAM career paths

Socially Active

- Collaborative activities
- Immersive lesson plans and experiences
- Develop design thinking skills within groups
- Peer Feedback

Physically Active

- Design challenges
- Hands-on activities
- Competitions
- Data Collection/Analysis

Adapted from: Why active learning?, Opportunity Education, (2024, April 5)

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STEAM Learning & Student Engagement

- provides opportunities for creativity and innovation
- forms connection between classroom learning and real-world applications
- builds confidence
- active learning = stronger peer relationships
- leads to achievement

STEAM TAC teacher post-visit feedback:

- **82%** high school and **73%** middle school teachers noted "Significant Improvement" in student engagement.

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Research shows...


connection between **student engagement and academic performance**.
Low engagement leads to poor performance in school and then later in the workplace.

A recent Gallup poll of students revealed:

- engagement **begins to decline in Grade 5**, and continues to drop each year through Grade 12.
- **engaged students are 2.5 times more likely** to say that they get excellent grades and do well in school
- more than **50% of high school students struggle** to be active in their education
 - 29% reporting "not engaged"
 - 24% "actively disengaged"


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Cultivating Intrinsic Motivation




STEAM learning:

- driven by curiosity and passion
- serves as a platform for exploration and self-discovery
- improves retention
- encourages lifelong learning habits





"I have a few students that I struggle with to engage in activities/lessons. These students became highly engaged with this activity, it was really encouraging to see these students get excited and motivated about something."
Fayette County Math Teacher




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Promoting Positive Attitude and Self-Image


STEAM learning:

- fosters growth mindset
- offers failure as an option and trials/iteration as a norm
- encourages resilience in the face of challenges
- celebrates diversity and individual strengths within STEAM fields




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Why Wiggle Bot?



- to demonstrate and walk you through not only creativity, problem solving, collaboration
- to experience challenges, problems, trials, failure as an option from student perspective
- Teachers receive a pre-visit presentation filled with standards-based content knowledge.
 - Science, art, social studies, ELA
 - Kits/materials left with teacher
 - Expansive post-visit lesson plans available

Note: WB is the middle school immersion that does not give students explicit directions allowing for open ended exploration and design challenges.




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Scribble Bot Challenge


Design a Wiggle-Bot to make artwork!


Attach markers to your Wiggle-Bot, then let it loose on a big piece of paper or poster board!


Redesign your Wiggle-Bot to draw as many marker patterns as you can!





This is an example scribble-bot. Yours will look different!

Zig-Zags



Loops


Dashes


Solid Lines


Dots


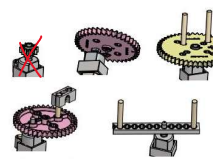
Want to learn more about waves? Download the Wave Lab at teachergeek.com/wiggle Ages 8+



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Make It Vibrate

Attach different components to your motor, in different places. Can you make it vibrate slow or fast? Vibration (wobbling) can make your Wiggle-Bot move.





Building Tips

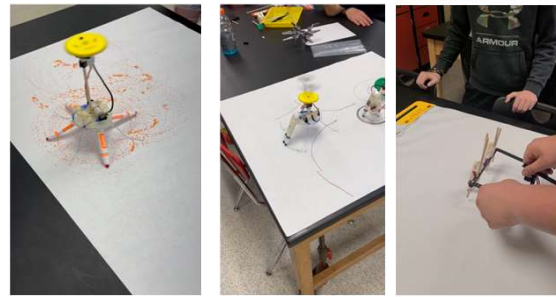

Design your Bot so that it is off balance. This will help it wobble.

Change the weight to help it move faster or slower.

Tape down the wires on the motor.

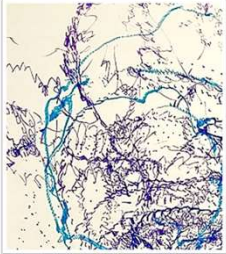



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Your Challenge:



- Work in a group
- Design a Wiggle Bot (use the motor and materials to make your Wiggle Bot off-balance)
- Attach markers to your bot to create art/waves



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Questions and Discussion

Think: Pair: Share

- Your personal experiences with active learning vs passive learning
- Reflections on today's hands-on lesson
- Share best practices to improve student engagement.

- Best advice to new teachers wanting to add more active learning into their lessons?



Big takeaway:
What is **one thing** you learned today that you can implement in your classroom tomorrow?



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Wiggle Bot Extension Lesson

Off to the Races!



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West Virginia's STEAM Technical Assistance Center is committed to helping educators and students fall in love with STEAM experiences so West Virginia's next generation can hone essential skill sets that will prepare them for college and STEAM-based careers.

Make STEAM-TACULAR memories in your classroom!

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Visit our Website



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WV STEAM Learning Resources



STEM MINDED WV

CAREERTECHWV

STEMIPIOSIUM

July 10, 2024
Stonewall Resort
Reno, NV

Collaboration for Inspired Learning

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