**High School STEM Class: Summer School 2025**

**Course Title:** Hands-On STEM: Chemistry, Physics, and Computer Science **Duration:** 4 Weeks **Grade Level:** High School **Instructor:** Broom

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## Course Overview:

This 4-week STEM course will integrate hands-on activities in Chemistry, Physics, and Computer Science. Students will explore fundamental concepts through experiments, coding challenges, and engineering applications. The course emphasizes critical thinking, collaboration, and problem-solving while applying scientific principles in engaging, practical activities.

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## Course Objectives:

- Conduct hands-on experiments in chemistry and physics to understand core scientific principles.
- Develop coding and computational thinking skills through interactive programming projects.
- Apply physics and engineering concepts in real-world problem-solving activities.
- Collaborate in teams to design and execute experiments and projects.
- Analyze data and communicate findings effectively.

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## Daily Schedule:

**8:30 - 8:35 AM** - Attendance & Daily Overview
**8:40 - 9:10 AM** - Science World News
**9:10 - 10:30 AM** - Computer Science Lesson
10:30 - 10:45 AM - Break
**10:45 - 11:15 PM** - STEM Job
**11:15 - 11:30 PM** - Minute to Win It!
**11:30 - 12:30 PM** - Lunch

**12:30 - 1:00 PM** - Game Time
**1:00 - 3:00 PM** - Science Lesson & Experiment
**3:00 - 3:30 PM** - Clean Up, Wrap-up, and Reflection in journal

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## Course Topics:

### Chemistry - Reactions & Properties of Matter

- Introduction to chemical reactions and states of matter
- Hands-on Experiments: Elephant Toothpaste, Oobleck, Crime Scene Investigations, Lava Lamps, and more!

### Physics - Motion, Forces, and Energy

- Newton's Laws of Motion and real-world applications
- Hands-on Experiment: Balloon-Egg drop challenge
- Exploring energy transformations with roller coasters
- Measuring velocity and acceleration through hands-on activities

### Computer Science

- Design Your Own Home - project-based activity introducing students to architecture and home design.
- Make Your Own Music
- Animate This! - Students will learn how animation works and see immediate results!
- Car Talk & Research
- Logo Design - Marketing entrepreneurs in the making! Where product development and marketing come together.

### Capstone Project & Presentation

- Forming teams and choosing a STEM challenge
- Designing and testing a solution
- Analyzing results and refining the project
- Final presentations and peer evaluations
- Reflection on learning outcomes and future STEM pathways

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## Grading & Assessment:

- Class Participation & Collaboration: 30%
- Weekly Hands-on Activities: 50%
- Capstone Project: 10%
- Reflection & Presentation: 10%

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## Materials Needed:

- Notebook and writing materials

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## Classroom Expectations:

- Active participation and teamwork
- Respectful collaboration and communication
- Creativity and willingness to experiment
- Commitment to problem-solving and innovation

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By the end of this course, students will have gained hands-on experience in chemistry, physics, and computer science, developing critical thinking skills and applying STEM concepts to real-world challenges.