CONSTRUCTION INTEGRATION LESSON PLANS FOR THE CLASSROOM AND WORKSITE

**Challenging Students to Discover the Pythagorean Theorem** by Richard Singer, St. Louis YouthBuild

*Construction and Mathematics*

Through this lesson, students will be able to determine the length of the hypotenuse of a right triangle if given the lengths of the two legs by implementing the Pythagorean Theorem. Students will be able to prove the theorem by drawing squares on all three sides of a right triangle.

**Green Building Education Modules** by YBUSA for the DOL TA Collaborative

*Construction, Science, and Mathematics*

The purpose of this workbook is to introduce students to a career in green energy and the basic concepts of the building sciences. With 11 modules and accompanying resources, these lessons span many topics within Green Building that intersect with other subjects such as science and math.

**Energy Sustainability**

*Construction, Science, Soft Skills*

In this lesson, students will give a presentation illustrating one of the major sources of power in the United States. The project can be executed in three phases: research and outreach to trades, creating the presentation and/or graphics, and delivering the presentations.

**Green Professional Energy**

*Construction, Mathematics, Science, ELA*

In this lesson, students will investigate their personal energy consumption. In addition, they will explore ways that they and others can reduce individual carbon
footprint and environmental impact.

**Life Science Ecology**
*Construction, Science*

Students will learn how to create compost and a mini–garden, a video on how to create self-watering container, and write an essay about how they think making a mini-garden will make an impact in a community garden. This is great activity to strengthen students’ reading, writing and research skills while learning about important life skills and environmental concepts.

**PBL Hydroponics**
*Construction, Science*

Students will learn about hydroponics plant growth. Students will monitor a hydroponics classroom garden and present classroom hydroponics to school staff.

**Solar Energy Photovoltaics**
*Construction, Science, Mathematics*

Students will understand and apply the concept of measurements, linear and non-linear equations while developing the ability to analyze scientific and technical information to determine hypothesis, data outcomes, and application of those outcomes. Essentially, students will have developed their ELA and math skills, and the application of Solar Energy as a specific topic, while learning content relevant to the GED content areas of Math and Science.
Math Integration

- **Block Layer** offers various geometric online-calculation tools for concrete blocks, stairs, and other construction design tasks.

- **Construction Center of Excellence Construction Math Toolbox** combines fun, industry-required math lessons with supplemental academic and career guidance information. It was developed by the CCE with numerous state and local partners for the Transition Math Project. The lesson plans align with grade level expectations for 8th, 9th, and 10th grades as a bridge to Essential Academic Learning Requirements identified in the College Readiness Standards. Teachers can use this toolbox to practice problem solving and to help older students prepare their portfolios and/or culminating projects needed for graduation.

- **Vocational Information Center** provides lesson plans and activities for carpentry, construction, electricity, HVACR, plumbing, masonry, painting and repair, engineering, welding, and manufacturing. Math, science, and environmental concepts are embedded into the lessons.

- **National Research Center for Career and Technical Education** provides math-enhanced CTE lessons. Their lessons are written only after CTE and math teacher teams work together to develop a curriculum map that identifies the CTE concepts and intersecting math concepts that are naturally embedded within the CTE curriculum.

- **Mathematics in Construction** is a lesson created by University of Georgia professor Jim Wilson. It covers math concepts such as the Pythagorean theorem and other geometric formulas in a construction context.