WAMC Lab Template

Math Concept(s): Calculate the hypotenuse of a triangle to layout a building that is square.
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Developed by: Keith Boyd E-Mail: kboyd@cashmere.wednet.edu
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Attach the following documents:

Lab Instructions.

1. Divide into groups of 3.
2. Collect equipment. (Tape measure, Calculator, Survey stakes, hammer, grid paper and clip board, basic house dimension)
3. Proceed outside to field.
4. Begin to layout house with survey stakes
5. Record home dimensions on grid paper with hypotenuse measurements as proof the building has square corners.

Student Handout(s) A field drawing on grid paper of the groups house layout by each student is required for this lab.

Rubric and/or Assessment Tool- A rubric is available on rubistar for this lab.

Indicate "*SPECIFIC*" relationship to Science, Technology, or Engineering

This lab is related to engineering, land surveying and construction.

Short Description (Be sure to include where in your instruction this lab takes place):

Lab Plan

Lab Title: Square House Lab

Prerequisite skills: Scaling drawings, Basic Right triangle calculations

Lab objective: Students will layout a building that is square by figuring the hypotenuse of a triangle.

Standards:

Mathematics K–12 Learning Standards: G.SRT.8 Use Trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
G.GPE.7.Use coordinates to compute perimeters of polygons

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Standards for Mathematical Practice: MP.1, MP.4

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K-12 Learning Standards-ELA (Reading, Writing, Speaking & Listening): Students will be required to write a reflection of this activity.

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Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)

☒ Global Awareness ☐ Financial/Economic/Business/Entrepreneurial Literacy ☐ Civic Literacy
☐ Health/Safety Literacy ☐ Environmental Literacy

21st Century Skills (Check those that students will demonstrate in the above activity.)

LEARNING AND INNOVATION
Creativity and Innovation
☐ Think Creatively
☒ Work Creatively with Others
☐ Implement Innovations
Critical Thinking and Problem Solving
☐ Reason Effectively
☐ Use Systems Thinking
☐ Make Judgments and Decisions
☐ Solve Problems
Communication and Collaboration
☐ Communicate Clearly
☒ Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLS
Information Literacy
☐ Access and Evaluate Information
☐ Use and manage Information
Media Literacy
☐ Analyze Media
☐ Create Media Products
Information, Communications and Technology (ICT Literacy)
☐ Apply Technology Effectively

LIFE & CAREER SKILLS
Flexibility and Adaptability
☐ Adapt to Change
☐ Be Flexible
Initiative and Self-Direction
☐ Manage Goals and Time
☐ Work Independently
☐ Be Self-Directed Learners
Social and Cross-Cultural
☐ Interact Effectively with Others
☐ Work Effectively in Diverse Teams

Productivity and Accountability
☐ Manage Projects
☐ Produce Results
Leadership and Responsibility
☐ Guide and Lead Others
☐ Be Responsible to Others

Teacher Preparation: (What materials and set-up are required for this lab?)

Materials

- Tape measure, Grid paper, Calculator, clip board, survey stakes, hammer

Set-Up Required:

- Have students walk to the field with provided equipment.

Lab Organization Strategies:

Leadership (Connect to 21st Century Skills selected):

- Students will be required to work as a team to create an object in the field that is square.

Cooperative Learning:

- Students will work in groups of 3 for this lab and solve a real world problem as a team.

Expectations:

- Students will be expected to layout the home that their group designs and produce a map of the product verifying it is square.

Timeline:

- This lab will take up one 90 minute block.

Post Lab Follow-Up/Conclusions:

Discuss real world application of learning from lab

- This lab will give students the opportunity to layout a square building like a carpenter or surveyor would do in the real world.

Career Applications

- Carpentry and surveying

Optional or Extension Activities

- An extension activity would be to produce a computer aided drafting document of the home.