



BUILDING INDUSTRY TECHNOLOGY ACADEMY

Promoted by the California Homebuilding Foundation

CURRICULUM OVERVIEW

BITA LEVEL 1 (YEAR 1)

Unit 1: BITA Orientation and Safety

- Students will be introduced to BITA 1 (scope and expectations), the building industry and the career opportunities it contains. Occupational safety, data analysis, mathematics, and principle of effective teamwork will also be explored.

Unit 2: Measurement

- Students will be introduced to measurement; history, units, addition, subtraction, application.

Unit 3 & 4: How to Use a Textbook/Hand Tool Project

- Students are taught how to use a textbook. Students learn about woodworking hand tools, while being introduced to schematics/working drawings reading and scale. Students will construct a hand tool project.

Unit 5: Introduction to Machine Tools: Table and Radial Arm Saws

- Students are introduced to the table and radial arm saws: identification, use, operation, safety.

Unit 6: Introduction to Machine Tools: Radial-Arm and Band Saws

- Students are introduced to the radial-arm and band saws: identification, use, operation, safety.

Unit 7: Introduction to the Band Saw and Miter (Chop) Saw

- Students are introduced to the Band saw and Miter saw: identification, use, operation, safety.

Unit 8 & 9: Materials and Fasteners

- Students complete their last machine tool safety exam. Students will be introduced to the American Lumber Industry. Students will explore the process of taking trees "from logs to lumber," and the environmental issues surrounding the harvesting of trees on both public and private lands. Students will also investigate the history and use of the three major types of fasteners: Glue, Nails, and Screws.

Unit 10 – 12: Machine Project #1 (Tool Box)

- Students will deepen their knowledge of schematics/working drawings. They will also be introduced to blueprint reading while developing a bill-of-materials for their first machine tool project. Students will also be introduced to project cost estimation in preparing to build their project. Finally students will build project #1, grade it, and write a short report on their performance.

Unit 13: Introduction to the Routers, Sander and Drills/Drivers

- Students will be introduced to routers, sanders and drill/drivers: identification, use, operation and safety.

Unit 14 – 16: Machine Tool Project #2 (Jewelry Box)

- Students will deepen their knowledge of blueprint reading while developing a bill-of-materials for their second machine tool project. Students will continue to build their skills in project cost estimation in preparing to build their project. Build project #2

Unit 17: Introduction to Pneumatics: Nailers, Staplers and Compressors.

- Students are introduced to the air nailer and stapler as well as the air compressor: identification, use, operation, safety.

Unit 18: Introduction to Construction Company Organization and Operations

- Students will learn how to function effectively within a group through the development of their own construction companies. Students will also be introduced to organizational flow charts and resume building.

Unit 19: Introduction to Architectural Prints and Reading Schematics and Blueprints

- Students will learn the history of duplicating architectural prints, their component parts, and how to efficiently and effectively use them.

Unit 20: Building Code, Construction History and Floor Framing

- Students will be introduced to the history of building codes, with particular emphasis on residential building code. Students will learn to use the IRC and/or CBC code book, blueprint components, as well as, examine vocational vocabulary. In addition, students will also be exposed to the theory, tools, techniques and materials specific to floor framing.

Unit 21 – 24: Scale, Floor Framing Model

- Students will use lineal measurement taken from a set of floor framing prints to develop a bill-of-materials. Students will learn how to write a check and use an accounting ledger. The lesson culminates with students companies constructing a one inch scale model floor.

Unit 25: Introduction to Wall Framing

- Students will be introduced to wall framing theory, terminology, assembly techniques and codes. Students companies will construct 1" scale walls to be placed on their model floors frames.

Unit 26 – 29: Scale Model Wall Framing

- Student companies will layout, assemble and stand the walls to their 1" scale model homes.

Unit 30: Introduction Roof Framing

- Students will be introduced to roof framing theory, terminology, assembly techniques and codes. Student companies will construction 1" scale roof trusses and attach them to their model homes' walls.

Unit 31 – 34: Scale model truss roofing framing

- Student companies will construct 1" scale roof trusses and attach them to their model homes' walls. They will use applicable roof framing theory, terminology, assembly techniques and codes in the completion of their models.

BITA LEVEL 2 (YEAR 2)

Unit 1: BITA Orientation and Safety

- Students will be introduced to BITA 2 (scope and expectations) measurement, drawings and blueprints reading, and the use of construction math.

Unit 2: Measurement

Unit 3 & 4: Introduction to Steel and Light Gauge Structural Steel

- Students will be introduced to the general history of steal and metallurgy. They will also explore steelmaking, recycling, forming, and uses of this versatile material. Students will learn the terminology, tools, theory, assembly techniques, and codes associated with Light Gauge Structural Steel Framing.

Unit 5 – 8: 8x8 LGSS Framing Exercise

Unit 9 – 11: Drywall, Plumbing and Tile

Unit 12 – 16: Introduction to Construction Company Organization and Operations

- Students will learn about and identify the basic organization of a corporation, its officers and their responsibilities, and the functions a hierarchical organization. Students will learn how to work effectively within a group through cooperative learning. The lesson concludes with student teams developing their own construction companies and selecting positions within their companies.

Unit 17 & 18: Print Reading

- Students will learn the history of duplicating architectural prints, their component parts, and how to efficiently and effectively use them.

Unit 19: Introduction to Electricity: History and Safety

- Students will be introduced to the theory, discovery, history, and use of electricity through time. Students will also examine the individuals who have contributed to the advancement and use of the electricity in modern society. The unit will conclude with the study of static, magnetism, and current (alternating) electricity.

Unit 20 – 22: Residential Electrical

- Students will be introduced to electrical safety, tools, materials, and techniques of the electricians' trade. Emphasis will be placed on the law of charges, generation, transmission, circuits, Ohm's law, and Direct and Alternating current.

Unit 23: Electrical Wiring Lab

- Students will learn how to properly install a functioning electrical circuit through hands-on application.

Unit 24 – 27: Surveying

Unit 28 & 29: Unit Review

BITA LEVEL 3 (YEAR 3)

Unit 1: BITA Orientation and Safety

- Students will be introduced to BITA 3 (scope and expectations) exploring various trades in depth using construction labs. Unit 2: Conversion Chart, Measurements (Metric), Fractions

Unit 2: Measurement

Unit 3: Solar Energy

- This is an 8 week unit. Students will be introduced to basic technology used in the solar photovoltaic industry which includes the history, terminology, safety. At the conclusion of this unit, the students will have an introduction to solar panel installation.

Unit 4: Rough Framing of Stairs

- Students will learn the theory behind stair construction and the history that has led to the systems we use today. Students will be introduced to stair construction and review the safety, tools, materials, and techniques of stair framing. With the completion of this lesson the student should be able to figure, layout, cut, and frame a set of stairs; whether it is a straight, platform or radius set of stairs.

Unit 5: Cabinetry

- This is a 6 week unit. Students will be introduced to the history, styles, and vocabulary of cabinetry, as well as the different joinery in cabinetry and what tools are used. Students will learn about codes involved with cabinetry and the process of designing your own kitchen. They will deepen their knowledge of schematics/working drawings and be introduced to project plans and bill of materials. Students will learn how to calculate necessary components of a cabinet from working drawings. At the conclusion of this unit, students will get the chance to build a cabinet with a raised panel door; drawer and face frame, grade their own work and write a review of the project.

Unit 6: Drafting

- Students will learn the history of drafting and design techniques. The students will be able to understand and

identify the drafting tools used for the development of drawings and how to create a drawing that would be used in the industry. Students will develop a simple three-view drawing.

Unit 7: Advanced Roof Framing

- Students will be able to identify and describe the differences between a conventional and truss roof which includes, members, cuts, load paths and assemblies involved. Students will also be able to use 2 types of construction calculators to determine rafter length regardless of roof or rafter type and estimate materials needed to build a conventional and truss roof.

Unit 8: Concrete, Artisan

Unit 9: Advanced Wall Framing

- Students will research various wall types and complete 4 different labs by building 4 different types of walls. Presentations will be made to the class by each student upon completion.

Unit 10: Project Planning

BITA LEVEL 4 (YEAR 4)

BITA Level 4 is a self-directed, project-driven class that will encompass the entire school year (34 weeks) to complete.

- Students will plan and record the progress, completion and submission of their BITA 4 Project and report. The projects should benefit an organization other than BITA. The project plan must be approved by the organization benefitting from the effort, the BITA instructor, and the Administrator of Instructional Programs before starting.
- The team project for BITA does not have to be original, but it certainly could be. The team may pick a project that has never been done before, but the team must accept responsibility for planning, directing, and following to its successful completion.
- Limitations for the project are:
 - Projects may not be performed for businesses or an individual.
 - Projects may not be of a commercial nature.
 - Projects may not be a fundraiser. Fundraising is permitted only for securing materials needed to carry out the project.
 - Donors to the projects must be aware of what entity is benefitting from the project, and that it clearly is not BITA.
 - Any funds raised for a project and not used for the purchase of project materials must be returned to the donors.
 - No minimum number of hours is required.
- There are no specific size requirements as long as the project is helpful to a religious institution, school, or community. The amount of time spent by the team in planning the project and the actual working time spent in carrying out the project should be equal to the real world of work (40 hours a week).
- Examples of BITA 4 projects are:
 - Construction of a counter for the school library and attendance office.
 - Construction of a medical facility inside a metal shipping container. The container was delivered to Africa to serve remote populations.
 - Construction of a playhouse to compete in a "Project Playhouse Competition" to be auctioned off to benefit a non-profit organization.
 - Work in conjunction with a local utility company to build a net-zero energy usage structure.
 - Construction of a high school snack shack.
 - Construction of a "Senior" park area on high school campus or other campus beautification projects.