



Scoutmaster Bucky

MODEL DESIGN AND BUILDING

Merit Badge Workbook

This Workbook has been developed to help aid in organizing notes and references while working on the Model Design and Building Merit Badge Requirements.

Visit www.ScoutmasterBucky.com for more information

SCOUT'S INFORMATION	MERIT BADGE COUNSELOR INFORMATION
Name _____ Phone _____ Organization _____	Name _____ Address _____ City State Zip _____ Phone _____ Mobile _____ Email _____
WORKBOOK INFORMATION	
Scoutmaster Bucky Workbook based off of <i>Boy Scout Requirements – 2011 Edition</i> Visit www.ScoutmasterBucky.com for more information.	
REQUIREMENT 1: STUDY AND UNDERSTAND THE REQUIREMENTS FOR PERSONAL SAFETY WHEN USING SUCH MODELMAKER HAND TOOLS AS: KNIVES, HANDSAWS, VICES, FILES, HAMMERS, SCREWDRIVERS, HAND DRILLS AND DRILL BITS, PLIERS, AND PORTABLE POWER TOOLS, AND WHEN TO USE PROTECTIVE EQUIPMENT SUCH AS GOGGLES WHEN GRINDING OR DRILLING.	
Personal Safety Requirements when using Knives:	
Personal Safety Requirements when using Handsaws:	
Personal Safety Requirements when using Vices:	



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Personal Safety Requirements when using Files:

Personal Safety Requirements when using Hammers:

Personal Safety Requirements when using Screwdrivers:

Personal Safety Requirements when using Hand Drills and Drill Bits:

Personal Safety Requirements when using Pliers:



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Personal Safety Requirements when using Portable Power Tools:

Personal Safety Requirements when to use protective equipment such as Goggles...

...in general

...when grinding

...when drilling



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REQUIREMENT 1: KNOW WHAT PRECAUTIONS TO TAKE WHEN USING FLAMMABLE OR HAZARDOUS PRODUCTS SUCH AS GLUE, EPOXY, PAINT, AND THINNERS.

Precautions to take when using flammable or hazardous products (in general):

Precautions to take when using Glue:

Precautions to take when using Epoxy:

Precautions to take when using Paint:

Precautions to take when using Thinners:



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REQUIREMENT 1:

DISCUSS THESE (PRECAUTIONS) WITH YOUR COUNSELOR BEFORE YOU BEGIN YOUR MODELMAKING PROJECT AND TELL WHY THEY ARE IMPORTANT.

Notes:

REQUIREMENT 2:

EXPLAIN THE USES FOR EACH OF THE FOLLOWING TYPES OF MODELS: ARCHITECTURAL, STRUCTURAL, PROCESS, MECHANICAL, AND INDUSTRIAL. DO RESEARCH INTO THE DIFFERENT TYPES OF MATERIALS THAT COULD BE USED IN MAKING THESE MODELS.

Use for Architectural models:

Types of materials used for Architectural models:



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Use for Structural models:	Types of materials used for Structural models:
Use for Process models:	Types of materials used for Process models:
Use for Mechanical models:	Types of materials used for Mechanical models:
Use for Industrial models:	Types of materials used for Industrial models:



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REQUIREMENT 3:

WITH YOUR COUNSELOR'S ADVICE, SELECT A SUBJECT FROM REQUIREMENT 4 FOR YOUR MODEL PROJECT (NO KITS). PREPARE THE NECESSARY PLANS TO THE PROPER SCALE. MAKE A LIST OF MATERIALS AND A LIST OF THE REQUIRED TOOLS. THIS MODEL SHOULD BE YOUR OWN ORIGINAL WORK. TELL WHY YOU SELECTED THIS SUBJECT.

Type of Model and subject selected from Requirement 4:

List of materials needed:

List of tools needed:

Why you selected this subject:



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DO ONE OF THE FOLLOWING (4A, 4B, 4C, 4D, OR 4E) IN REQUIREMENT 4

REQUIREMENT 4A: MAKE AN ARCHITECTURAL MODEL. BUILD A MODEL OF A HOUSE TO A SCALE OF $\frac{1}{4}' = 1' 0''$ (50:1 METRIC). DISCUSS WITH YOUR COUNSELOR THE MATERIALS YOU INTEND TO USE, THE AMOUNT OF DETAIL REQUIRED, OUTSIDE TREATMENT (FINISH, SHRUBBERY, WALKS, ETC.) AND COLOR SELECTIONS. AFTER COMPLETING THE MODEL, PRESENT IT TO YOUR COUNSELOR FOR APPROVAL.

Notes:



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REQUIREMENT 4B:

BUILD A STRUCTURAL MODEL. CONSTRUCT A MODEL SHOWING CORNER CONSTRUCTION OF A WOOD FRAME BUILDING TO A SCALE OF $1\frac{1}{2}'' = 1' 0''$ (8:1 METRIC). ALL STRUCTURES SHOWN MUST BE TO SCALE. CARDBOARD OR FLAT SHEET WOOD STOCK MAY BE USED FOR SHEETING OR FLOORING ON THE MODEL. REVIEW WITH YOUR COUNSELOR THE PROBLEMS YOU ENCOUNTERED IN GATHERING THE MATERIALS AND SUPPORTING THE STRUCTURE. BE ABLE TO NAME THE PARTS OF THE FLOOR AND WALL FRAMES, SUCH AS INTERMEDIATE GIRDER, JOIST, BRIDGING, SUBFLOOR, SILL, SOLE PLATE, STUD AND RAFTER.

Notes:



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REQUIREMENT 4C:

MAKE A PROCESS MODEL. BUILD A MODEL SHOWING THE PLUMBING SYSTEM IN YOUR HOUSE. SHOW HOT AND COLD WATER SUPPLY, ALL WASTE RETURNS, AND VENTING TO A SCALE OF 3/4" = 1' 0" (15:1 METRIC). TALK TO YOUR COUNSELOR ABOUT HOW TO BEGIN THIS MODEL, AND PRESENT THE SCALE AND THE MATERIALS YOU WILL USE. AFTER COMPLETION, PRESENT THE MODEL TO YOUR COUNSELOR AND BE PREPARED TO DISCUSS ANY PROBLEMS YOU HAD BUILDING THIS MODEL

Notes:



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REQUIREMENT 4D:

COMPLETE A MECHANICAL MODEL. BUILD A MODEL OF A MECHANICAL DEVICE THAT USES AT LEAST TWO OF THE SIX SIMPLE MACHINES. AFTER COMPLETING THE MODEL, PRESENT IT TO YOUR COUNSELOR. BE PREPARED TO DISCUSS MATERIALS USED, THE MACHINE'S FUNCTION, AND ANY PARTICULAR DIFFICULTY YOU MIGHT HAVE ENCOUNTERED.

Notes:



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REQUIREMENT 4E:

MAKE AN INDUSTRIAL MODEL. BUILD A MODEL OF AN ACTUAL PASSENGER-CARRYING VEHICLE TO A SCALE OF 1" = 1' 0" OR ½" = 1' 0" (10:1 OR 25:1 METRIC). TAKE THE DIMENSIONS OF THE VEHICLE, AND RECORD THE IMPORTANT DIMENSIONS. DRAW THE TOP, FRONT, REAR, AND SIDES OF THE VEHICLE TO SCALE. FROM YOUR PLANS, BUILD A MODEL OF THE VEHICLE AND FINISH IT IN A CRAFTSMANLIKE MANNER. DISCUSS WITH YOUR COUNSELOR THE MOST DIFFICULT PART OF COMPLETING THE MODEL

Notes:



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REQUIREMENT 5:

BUILD A SPECIAL-EFFECTS MODEL OF A FANTASY SPACECRAFT THAT MIGHT APPEAR IN A HOLLYWOOD SCIENCE-FICTION MOVIE. DETERMINE AN APPROPRIATE SCALE FOR YOUR DESIGN - ONE THAT MAKES PRACTICAL SENSE. INCLUDE A COCKPIT OR CONTROL AREA, LIVING SPACE, STORAGE UNIT, ENGINEERING SPACES, AND PROPULSION SYSTEMS. AS YOU PLAN AND BUILD YOUR MODEL, DO THE FOLLOWING:

Notes:

REQUIREMENT 5A:

STUDY AIRCRAFT, SUBMARINES, AND NAVAL SHIPS FOR DESIGN IDEAS.

Notes:

REQUIREMENT 5B:

ARRANGE AND ASSEMBLE THE PARTS.

Notes:

REQUIREMENT 5C:

SKETCH YOUR COMPLETED MODEL.

Notes:



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REQUIREMENT 5D: WRITE A SHORT ESSAY IN WHICH YOU DISCUSS YOUR DESIGN, SCALE, AND MATERIALS CHOICES.

Notes:

REQUIREMENT 5D: DESCRIBE HOW YOU ENGINEERED YOUR MODEL AND...

Notes:

REQUIREMENT 5D: ...DISCUSS ANY DIFFICULTIES YOU ENCOUNTERED AND WHAT YOU LEARNED.

Notes:



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REQUIREMENT 7: LIST AT LEAST SIX OCCUPATIONS IN WHICH MODEL MAKING IS USED AND DISCUSS WITH YOUR COUNSELOR SOME CAREER OPPORTUNITIES IN THIS FIELD.

Occupation #1: _____

Occupation #2: _____

Occupation #3: _____

Occupation #4: _____

Occupation #5: _____

Occupation #6: _____

Career Opportunities in Model Design and Building: