Thank you for your interest in participating in our upcoming merit badge workshop. We are very excited to be able to offer this workshop to help you complete the necessary requirements to earn your badge while also carrying out the hands-on activities in an enriching and fun way. This workbook describes the workshop’s activities and prerequisites. Most of these prerequisites are primarily research and reading activities that will better prepare you for the merit badge workshop.

*Activities we will complete in the workshop are colored blue.*

*Prerequisites are colored red.*

BEFORE you attend this merit badge workshop you MUST do the following prerequisites:

1. Item 1
2. Item 2
3. Item 6

Please note: The merit badge counselor will not sign “blue cards” for scouts not demonstrating completed prerequisites on this workbook.
1. Study and understand the requirements for personal safety when using such modelmaker hand tools as knives, ________________________________
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handsaws, ____________________________________________________________
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vises, ____________________________________________________________
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files, ____________________________________________________________
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hammers, ____________________________________________________________
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screwdrivers, ____________________________________________________________
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hand drills and drill bits, ____________________________________________________________
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pliers, ____________________________________________________________
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and portable power tools, ____________________________________________________________
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and when to use proper protective equipment such as goggles when grinding or drilling. ____________________________________________________________
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Know what precautions to take when using flammable or hazardous products such as glue, epoxy, paint, and thinners. ____________________________________________________________
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Discuss these with your counselor before you begin your modelmaking project and tell why they are important. ____________________________________________________________
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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.

__________________________________________________________

__________________________________________________________

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__________________________________________________________

__________________________________________________________

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. ____________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

_________________________________________________________
4. Do ONE of the following:

☐ a. Make an architectural model. Build a model of a house to a scale of ¼" = 10" (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.

-OR- ☐ b. Build a structural model. Construct a model showing corner construction of a wood-frame building to a scale of 1 ½" = 10" (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.

-OR- ☐ c. 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 ¾" = 10" (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.

-OR- ☐ d. 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.

-OR- ☐ e. Make an industrial model. Build a model of an actual passenger-carrying vehicle to a scale of 1" = 10" or ½" = 10" (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.

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:

☐ a. Study aircraft, submarines, and naval ships for design ideas.

☐ b. Arrange and assemble the parts.

☐ c. Sketch your completed model.

☐ d. Write a short essay in which you discuss your design, scale, and materials choices. Describe how you engineered your model and discuss any difficulties you encountered and what you learned.
6. List at least six occupations in which modelmaking is used and discuss with your counselor some career opportunities in this field.

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**Online Resources** *(Use any Internet resource with caution and only with your parent’s or guardian’s permission.)*

Boy Scouts of America: [scouting.org](http://scouting.org) • [Guide to Safe Scouting](http://guide.scouting.org) • [Age-Appropriate Guidelines](http://www.scoutstuff.org) • [Safe Swim Defense](http://www.scoutstuff.org)

- [Scout](http://www.scoutstuff.org) • [Tenderfoot](http://www.scoutstuff.org) • [Second Class](http://www.scoutstuff.org) • [First Class](http://www.scoutstuff.org) • [Rank Videos](http://www.scoutstuff.org) • [Safety Afloat](http://www.scoutstuff.org)

Boy Scout Merit Badge Workbooks: [usscouts.org](http://usscouts.org) • [meritbadge.org](http://meritbadge.org) • Merit Badge Books: [www.scoutstuff.org](http://www.scoutstuff.org)

Fine Scale Modeler: [http://www.finescale.com](http://www.finescale.com)

Model Airplane News: [http://www.modelairplanenews.com](http://www.modelairplanenews.com)

Modeltec magazine: [http://www.thecrookstons.com/modeltec](http://www.thecrookstons.com/modeltec)

Scale Auto Magazine: [http://www.scaleautomag.com](http://www.scaleautomag.com)

Organizations and Web Sites: [http://www.modelaircraft.org](http://www.modelaircraft.org)

Association of Professional Model Makers: [http://www.modelmakers.org](http://www.modelmakers.org)

International Plastic Modelers’ Society USA: [http://www.ipmsusa.org](http://www.ipmsusa.org)