

# A Clock for All Lessons

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*Teachers-in-training get a first-hand look at what makes projects tick for students.*

**E**VEN a simple project, such as a clock, can be designed to teach all the necessary lessons in a beginning wood technology class. Students in the Industrial Technology Education (ITE) beginning wood technology class I used to teach at the University of Nebraska/Lincoln were asked to develop a clock project that would include the use of hand and power tools and that would teach basic shop safety practices. I challenged my ITE students to develop a clock that all beginning wood-working students could build and learn from, and that would give them the freedom to use their own creativity for the final product.

## Design Considerations

I provided students with a set of plans for making a clock. We discussed such subjects as whether students should be required to make a project selected by the teacher, what the cost of the project should be, whether all students would be able to afford the project if it was required, whether the students or school should

supply the necessary materials, whether students would be able to use their own creativity on the project, and whether the project would be simple, yet challenging enough, for students to learn the necessary skills.

The answers my students came up with supported making a clock. They answered that students in a beginning woods class should be required to make a project assigned by the teacher. This would provide the teacher the opportunity to teach developed lessons, have necessary tools and material available, plus provide troubleshooting support to each student as the need arose. My students stated that no matter what project was assigned, it should provide students with a learning experience and have a useful purpose. That is, when a student took the project home it would be used, not stored away in a closet. The cost of the clock will vary depending on the type of lumber selected by each student. Parent permission slips would be recommended before beginning the project to ensure that students will be able to pay for material used. No matter what

type of material the students select to build with, they will have the option of finishing the clock to meet their needs.

To better use the clock project to teach all the tools and equipment in a wood laboratory, we established some boundaries to ensure that a variety of construction methods would be used to make the clock. Although there were easier ways to cut and assemble the clock, we made changes in the plan of procedure to ensure that students learned all necessary techniques.

Finally, each student was allowed to finish the clock as desired. Some students finished the clock to match their furniture at home, some chose to give it as a gift to friends or relatives, and some wanted the clock for their own use. Adding their personal touches to the clock enabled students to be creative plus kept them interested in the project.

## The Beginning

After we had selected the project, students had to be prepared for learning how to make the clocks. We first discussed

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Photo 1—Getting it straight, clamping, and gluing process

Photo 2—Students take pride in their projects. Notice how each clock is different.



shop safety practices, the general rules for being in a shop, from wearing safety glasses to cleaning up at the end of each day. We also gave students a tour of the shop and taught them where all the tools, equipment, and materials were kept. All tools and supplies for this project were kept in a cabinet for easy access and teacher convenience. We developed a plan of procedure, along with a bill of materials. The bill of materials included calculating board feet of lumber needed and types and cost of lumber. At this point, we reviewed fractions and how to read a ruler. Different options for finishing and modifying the project were discussed so students could plan how they wanted to finish their project.

## Plan of Procedure

Students reviewed the plans as a class and developed a plan of procedure to make the clock. At this time, we discussed boundaries: Fasteners had to be used when installing the face and front of the clock, instead of just gluing them on. Requiring fasteners taught students to counter bore, use the drill press, use a depth gage, measure for screw pilot holes, and install buttons. Next, we required the face (12" × 12" × 3/4") to be made from two pieces of lumber glued together with a butt joint.

This face had to be hand-planed on one side and power-planed on the other. The smaller pieces, front, top, and bottom, were cut first using handsaws, both rip- and crosscut. Students learned to square these pieces using squares, tape measures, and hand planes. Dado and rabbet joints were also cut with hand tools. By the time students had these pieces squared and correctly sized, they were familiar with the use of all the hand tools in the shop.

Once the three smaller pieces were cut and squared by hand, we brought power tools into use. First students were taught machine tool safety. The power equipment they would need to finish the project included a jointer, table saw, drill press, planer, and band saw. Students already had developed general shop, hand-tool safety, and squaring-lumber principles, so using power tools safely and correctly came easily to them. We provided plastic templates so those students could all make the same curve cuts on the face, sides, and front. Three routers were used for the cuts needed on the project in order to avoid bit changes.

Gluing and assembling procedures came next. We also covered how to apply glue and remove excess glue, as well as how to sand. Various methods of staining, finishing, and

painting were the last lessons taught on this project. Grading the project was a difficult part of this project, as it is with any project. Projects were graded on five different categories for a total of 150 points.

**Appearance.** Beauty is in the eye of the beholder; what looks good to one person might not be to another, so this category did not count very high. 10 points

**Correct size.** The project could be measured for correct size and templates used for correct curves. 40 points

**Quality of fit.** It all goes together well, and pieces are square. 40 points

**Joint construction.** All joints are tight and to correct size. 40 points

**Finish.** Project is sanded correctly, excess glue is removed, and finish is on smoothly. 20 points

## The Finished Project

Allowing students to be creative produced different and unusual, yet quality clocks. Students took pride in the finished product. The finished projects ranged from being engraved with team logos, such as the Chicago Cubs; to being painted white with teddy bears (instead of using numbers); and of course our favorite at Nebraska, the clock that was painted all red with a big white N. ©

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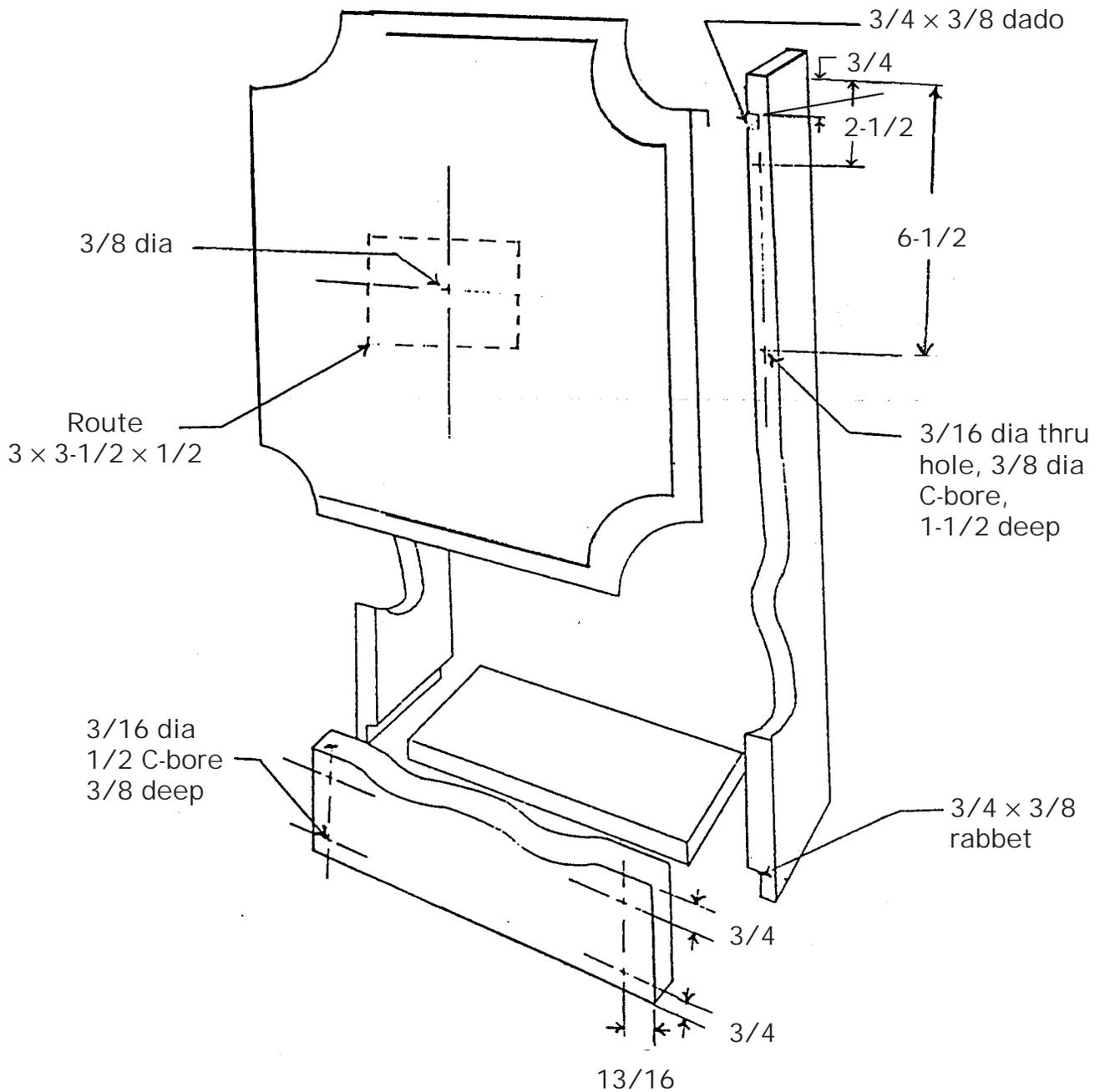


Fig. 1—Wall clock plan sheet