Lab Framework

Text: Applied Mathematics

Unit number and title: Unit 1 Wood Duck Box

Short Description: Applying problem solving to building Wood duck box's

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Lab Title
Unit 1 Wood Duck Box

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**
  Students will use the 4 step problem solving process in building wood duck boxes.
- **Statement of pre-requisite skills needed**
  Basic math skills, measurement, wood working skills
- **Vocabulary**
  Computation, estimate, graphical solution, perimeter, factor, plan for solution, problem, problem solving method, solution
- **Materials List**
  Plywood, table saw or panel saw, screws or nails, duck box dimensions or plans
- **GLEs (State Standards) addressed**
  Math: 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.3, 4.1, 5.1, 5.3
  Reading: 1.2, 1.3, 2.2, 3.2, 3.3,
  Writing: 2.2
- **Leadership Skills**
  Works with others as a team member. Communicates with others in the group. Helps community and habitat.
- **SCAN Skills/Workplace Skills**
  Basic Skills are used in Arithmetic, Mathematics, Listening. Also, thinking skills using creative thinking, decision making and problem solving
- **Set-up information**
  The situation is that due to flooding and the forest service needs 15 Wood Duck boxes in a hurry. They asked on Friday and need them in the morning next Friday. The shop already has 3 sheets of plywood (not sure it is enough). We are not sure we can produce 15 in that period of time. We are not sure how much it will cost us. A sheet of plywood costs $58.00. Students are given a work sheet with the dimensions of the duck box. They must use the 4 step problem solving technique to solve this problem.
- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; **-Timeline required)**
  Students will work individually on the problem solving work sheet. After the problem solving, student may then work cooperatively on building the Wood duck box.

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- **Teacher Assessment of student learning** (scoring guide, rubric)
  Problem solving worksheet on this scenario.
- **Summary of learning** (to be finished after student completes lab)
  Discuss real world application of learning from lab with students and use discussion as an opportunity for students to share/present learning
  Rather then just building a Wood Duck Box the problem gives the students an opportunity to use problem solving steps in real hands on application
- **Optional activities**
  Change the scenario and the projects. Have them practice it again with a different scenario. Doesn't have to be with the actual constructing of a project the problem solving steps be understood after the wood duck box.
- **Career Applications**
  Problem solving is a skill useful in almost any career and our daily lives.

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LAB TITLE: Wood Duck Box
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
  The situation is that due to flooding and the forest service needs 15 Wood Duck boxes in a hurry. They asked on Friday and need them in the morning next Friday. The shop already has 3 sheets of plywood (not sure it is enough). We are not sure we can produce 15 in that period of time. We are not sure how much it will cost us. A sheet of plywood costs $58.00. Students are given a work sheet with the dimensions of the duck box. They must use the 4 step problem solving technique to solve this problem.

- **Grouping instructions and roles**
  Work on problem solving worksheet by your self. After completing the problem solving worksheet you may work with a partner constructing a wood duck box.

- **Procedures** – steps to follow/instructions
  You may use the unit 1 text, the wood duck box dimensions, a calculator, a 4' x 8' sheet of plywood, or blank piece of paper to help you solve the problem on the problem solving worksheet.

- **Outcome instructions**
  Restate the problem
  - What you know and what you don't know

  Make a plan
  Carry out a plan
  Check your results
  Build a wood duck box

- **Assessment instructions** (peer-teacher)
  Student assessment will be made using the wood duck box problem worksheet.

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Lab Data Collection

Student: _____ Date: _____

Unit: _____

Lab Title:

Criteria: Write the problem/objective in statement form
Problem:

Data Collection: Record the collected/given data
Plan:

Calculations: Complete the given calculations to solve for an answer(s)
Carry out plan:

Summary Statement:
Check results:

Other Assessment(s)

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Name_____

Unit 1 Wood Duck Box Lab
Student Worksheet

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The situation is that due to flooding and the forest service needs 15 Wood Duck boxes in a hurry. They asked on Friday and need them in the morning next Friday. The shop already has 3 sheets of plywood (not sure it is enough). We are not sure we can produce 15 in that period of time. We are not sure how much it will cost us. A sheet of plywood costs $58.00. Students are given a work sheet with the dimensions of the duck box. They must use the 4 step problem solving technique to solve this problem. You may use a sheet of plywood to help with this scenario.

1) Write what you think is the problem in your own words. Write what you know and what your don't know.

2) Make a plan on what to do

3) Carry out a plan

4) Check your results

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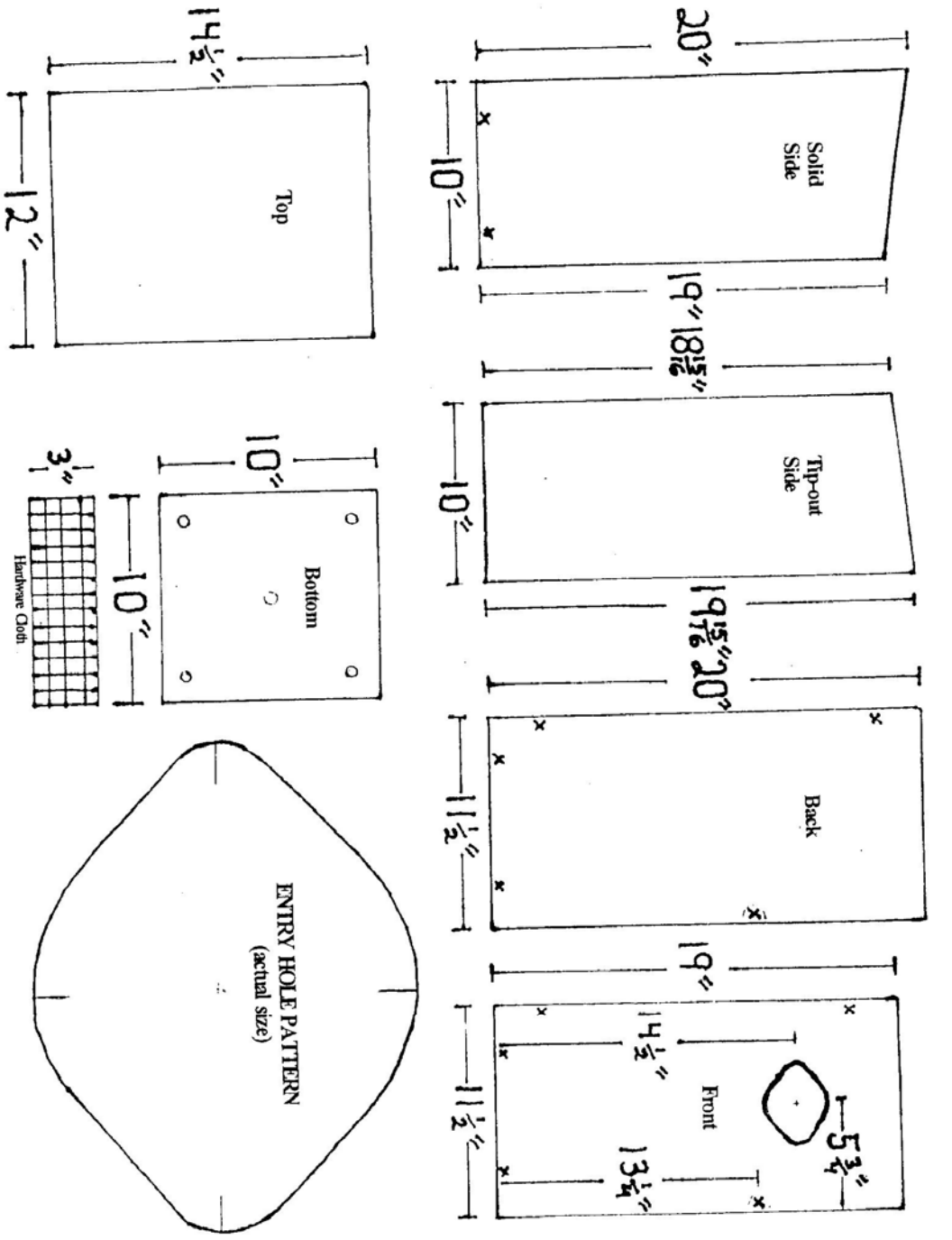
20"
Solid Side
10"
19"
18 5/8"
Tip-out Side
10"
19 5/8"
20"
Back
11 1/2"
19"
14 1/2"
Front
11 1/2"
5 3/4"
13 1/4"
14 1/2"
Top
12"
3"
10"
Bottom
10"
Hardware Cloth
ENTRY HOLE PATTERN
(actual size)