**Scenery Construction and Shop Safety** by Summer Brown Lewis

**Objective**: Students will demonstrate their understanding of set construction by taking quizzes and building a flat.

**Class Level**: Beginning

**Main Concepts**: construction of set, materials, tools, shop safety

**1994 National Standards:** STANDARD 3: Designing and producing by conceptualizing and realizing artistic interpretations for informal or formal productions.

**Description**: This unit was created for block classes as an introduction to the tools used in the scene shop to create sets.

**Lesson Plans**

Lesson 1: Basic Hand and Electric Tools

Students will be introduced and become familiar with basic construction tools, both hand and electric.

Lesson 2: Stock Scenery

Students will learn about the three basic types of stock scenery—flats, platforms, and stairs. They will become familiar with the names and pieces of the scenery and learn about measuring the dimensions for the construction of each type of scenery. They will begin work in groups on a piece of stock scenery.

Lesson 3: Constructing Stock Scenery

Students will continue work in groups on their pieces of stock scenery. These may be completed in class.

Lesson 4: A Basic History of Set Construction and Safety Guidelines

Students will gain an understanding of the evolution of theatre scenery and construction. They will become familiar with the safety guidelines inherent and necessary in set construction.

Lesson 5: Wood and Paint

Students will learn about and become familiar with different types of wood and cuts of lumber and their use in set construction. They will also learn about different types and techniques of painting and its use in theatre.

Lesson 6: Set Construction Quiz and Conclusion

Students will complete any unfinished construction projects. They will demonstrate their understanding of basic construction tools (practical) and safety(written) in a quiz.

**Author's Notes:**

ASSESSMENTS

Lesson 1: Class Participation-5 pts

Lesson 2: Class Participation-5 pts

Hand out completion-10 pts

Lesson 3: Class Participation-5 pts

Lesson 4: Class Participation-5 pts

Cut list completion-10 pts

Lesson 5: Class Participation-5 pts.

Lesson 6: Class Participation-5pts.

Finished Flat-20 pts

Tool Quiz-10 pts

Safety Quiz-20 pts

Total: 100 pts.

**1: Basic Hand and Electric Tools**

**Objective**

Students will be introduced and become familiar with basic construction tools, both hand and electric.

**Materials Needed**

Remind students to bring their journal, and they might want to bring clothes they can work in. Also tools or a scene shop that houses tools.

**Related Documents**

* Tools Handout
* Tools Handout Key

**Lesson Directions**

**Anticipatory Set/Hook**

With a partner, see how many construction tools you can list in 1 minute. Talk about the lists. Let’s go to the scene shop to look at the tools we have available to us.

**Instruction**

INSTRUCTION: Introduce a variety of the major tools used in set construction here. Divide into the four major types of tools. Ask students first if they can name any in each area. For each tool, ask what you would use it for/to make?, and have a student demonstrate the use of it (don’t forget safety!).

Remind students to write down the names and purposes of each tool.  
1. Measuring and Marking Tools: flexible steel measuring tape, carpenter’s square, levels, chalk-line/snap-line.  
2. Cutting and Shaping Tools:   
a. Saws-handsaws, rip saws and cross-cut saws, circular saws, jigsaws, table saws, radial arm saws, band saws, miter-box saws. Utility knife.  
b. Others-chisels, planes, shears, files and rasps, routers  
3. Fastening Tools: Hammers, staplers, screwdrivers, drills.  
4. Gripping Tools: Pliers, wrenches, vise grips, crescent wrench.

MODELING: Built in by having students use the tools while learning about them.

CHECK FOR UNDERSTANDING: Do a memory game, gathering the portable tools and having the students group them by their uses, or trying to line them up alphabetically so they remember the names.

CLOSURE and ASSESSMENT: Have the students return the tools to their proper spots. Give students hand out on tools to take home and fill out.

**Assessment**

Students can be assessed through class participation and by filling out a hand out that will help them become more familiar with the tools.

**2: Stock Scenery**

**Objective**

Students will learn about the three basic types of stock scenery—flats, platforms, and stairs. They will become familiar with the names and pieces of the scenery and learn about measuring the dimensions for the construction of each type of scenery. They will begin work in groups on a piece of stock scenery.

**Materials Needed**

Have all the lumber necessary for each pair in your class to begin construction on various stock sizes of flats. Have an example of each type of stock scenery so you can show the pieces of it. Have listed the types of flats you might need for your stock so you can give the students feasible and useful choices.

**Lesson Directions**

**Anticipatory Set/Hook**

Hey, we are going to start cutting up wood and making stuff today! Who knows what stock scenery is?

**Instruction**

INSTRUCTION: Stock scenery is stuff we can keep in storage because it is so common that we can use it over and over. There are three basic types of stock scenery.  
1. Platforms. If you want to have levels in your show, you need platforms. Platforms can be pretty much any size and must be sturdy enough for your actors to stand/dance/jump on. Platforms are basically a flat connected to a leg unit  
2. Stairs. Well, if you are going to have platforms, you’d best have a way of getting onto them. Stairs for theatre are a bit different than normal stairs, the rise is higher and the tread is shorter so you use up less space going up and down.  
3. Flats. We will be making flats today and the next two class periods. Before we can construct them we need to know the different kinds and the parts of a flat (try to have somewhere where you can sketch this all out and label it for them)  
a. There are two types of flats-Hollywood and Broadway. Hollywood lay the width of the lumber on the ground and broadway puts the thickness on the ground (remember to show T x W x L in order to classify lumber types). This can be further broken down into hard or soft cover flats. Hard cover use plywood and soft cover use canvas. What might you use each type for? Soft cover flats are treated with a mixture of 1 part glue 3 parts water after they have been stapled on. Make sure you cut it too big because it will shrink.  
b. There are several components to a flat, but two basic types, the lumber and fasteners. Lumber first  
i. Rails-These are the top and bottom pieces of lumber that determine the width of the flat  
ii. Stiles-these are the side pieces of lumber that determine the height of the flat. Remember that in the butt joints used to make flats, the rail is on the top of the stile at the top and underneath the stile on the bottom.  
iii. Toggles-these are the pieces of lumber that give support to soft cover flats. They should be placed every 3-4 feet.   
iv. Corner braces-these help keep a soft cover flat square.  
v. Fasteners-corner blocks, for stile and rail joints  
vi. Half-straps, for fastening the corner braces to the rail and stile  
vii. Straps-for fastening the toggles to the stiles.  
c. All of these pieces are fastened together with glue first and then staples or nails. Now we can create a cut list. We need to remember what size of flat we are making, what size of lumber we are using, if it is a Hollywood or Broadway flat, and what the actual dimensions (not nominal) of our lumber is.  
  
MODELING: Create and example cut list on the board. - 4’x 8’ soft cover Broadway flat made with 1x4 lumber (actual ¾” x 3 ½”)  
Rails: (2) ¾” x 3 ½” x 4’ Stiles: (2) ¾” x 3 ½” x 7’ 5”  
Toggle: (1) ¾” x 3 ½” x 3’ 5” Cover: 4’x 8’ canvas  
(2) corner braces (4) corner blocks  
(2) straps (4) half-straps  
  
CHECK FOR UNDERSTANDING: Have the students pick a type of flat and create a cut list on the board together. List what tools will be necessary to cut and build this flat.  
  
GUIDED PRACTICE: Once you are sure the students understand how to make a flat, have each pair or trio come pick a type of flat to make together for the next few class periods. Do not let them begin cutting until you have reviewed their cut and tool list. Make sure that each student has a copy of the cut list and that they also turn one into you. Do not let them begin building until you have reviewed their cut lumber and are confident that they know how to use the glue and other tools that will be necessary.   
  
CLOSURE and ASSESSMENT: Allow time for student to clean up. Have them put the stock scenery away by calling out a type of scenery and having them locate it and put it away. Have them turn in their cut and tool list if it is prepared. If it is not, make sure they know to complete it by the next class period.

**Assessment**

Students can be assessed through class participation and by turning in a form with the dimensions for the type of stock scenery that will be used in their own construction.

**3: Constructing Stock Scenery**

**Objective**

Students will continue work in groups on their pieces of stock scenery. These may be completed in class.

**Materials Needed**

Students' previous work on their flats.

**Lesson Directions**

**Anticipatory Set/Hook**

Hurray for more flat construction! Before we start let’s review the different pieces of a flat. Assign each student to “be” a different piece of a flat and have them construct a flat with their bodies (don’t let anyone be the cover!)

**Instruction**

GUIDED PRACTICE: Help the students get out their lumber for their flats and approve each step in their cutting/construction before letting them proceed.   
  
CLOSURE and ASSESSMENT: Allow time for clean-up. Check each groups’ progress before they put it away. Remind them to review the information from this unit for the quiz next class period. Make sure the cut lists and tool worksheets are returned by today.

**Assessment**

Students can be assessed through class participation and their finished piece of scenery, if it is complete.

**4: A Basic History of Set Construction and Safety Guidelines**

**Objective**

Students will gain an understanding of the evolution of theatre scenery and construction. They will become familiar with the safety guidelines inherent and necessary in set construction.

**Materials Needed**

Get any video clips/pictures that might be used. Remind students to bring journal.

**Lesson Directions**

**Anticipatory Set/Hook**

What are some memorable sets you have seen? What are some cool things you have seen happen in plays with the set? Show video clip if possible  
Ideas- Les Miserables-rotating from a street scene to a barricade  
Into the Woods-a growing bean stock  
Phantom of the Opera-The crashing chandelier  
Sets are pretty important for creating the environment of a play.

**Instruction**

INSTRUCTION: A quick overview of the evolution of theatre scenery and construction  
1. Greek amphitheatres and the skene-a “tent” that made the backdrop and changing area for actors, eventually became made of wood  
2. Medieval pageant wagons- Most recognized form was from the York cycle. They were pulled through the streets by guild members, but were quite elaborate-including a rope and pulley platform for Christ’s ascension, and smoking trap doors for the jaws of hell.  
3. French Perspective Painting-Renaissance development, could create the illusion of depth.  
4. Melodrama sets-they would create floating ice chunks on stage, burning buildings, etc. Pretty crazy stuff  
5. Modern- we can do pretty much anything, take into consideration aforementioned examples.  
  
MODELING: Show some pictures, videoclips of these set styles.   
  
CHECK FOR UNDERSTANDING: So, what are the benefits of some of these historical types of sets, what are the downfalls? Let’s look at our theatre space and see how these things might work. Tour space, bring journals.  
  
TRANSITION: Before we can have any type of set, we have to build it, and before we do that we have to understand the safety guidelines involved.  
  
INSTRUCTION: Safety Guidelines in set construction.  
1. if in doubt-don’t do it!  
2. no horseplay!  
3. follow instructions on product  
4. keep tidy-allow time for clean up  
5. heights-be secure, don’t leave things that might fall at high heights  
6. lifting-be careful not to strain your back, lift with your legs  
7. first aid stuff location, know where it is.  
8. tool safety-if you don’t know how to use it, don’t use it!  
9. personal protection (goggles, dust masks, clothing, ventilation, gloves)  
  
CLOSURE and ASSESSMENT: a quick oral quiz on safety guidelines, and a reminder that they will be quizzed. If time permits, allow them to put together quick skits on what might happen in safety guidelines aren’t followed.

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**ssessment**

Students can be assessed through participation in class discussion and note-taking in a theatre journal.

**5: Wood and Paint**

**Objective**

Students will learn about and become familiar with different types of wood and cuts of lumber and their use in set construction. They will also learn about different types and techniques of painting and its use in theatre.

**Materials Needed**

Remind students to bring journals and clothes they can paint in. Meet in the scene shop or other area with access to different types of wood/lumber. Have paint, brushes, and other technique tools available.

**Lesson Directions**

**Anticipatory Set/Hook**

Pull out some pieces of lumber, plywood, wafer board, etc. Ask students if they can name any of them.

**Instruction**

INSTRUCTION: Wood is the stuff that scenery is made of. What types do we have and what are they used for? Whenever a new type of lumber is presented, ask students if they can name it, or tell us what it is used for commonly in set construction.  
1. Lumber: The most common type to use in theatre is common #2 White Pine because it is the best for the right price  
a. Comes in a variety of sizes that we use for different purposes, used mostly for the construction of flats and platforms  
i. 1 x 3 and 1x 4, used the most in making both Hollywood and broadway flats  
ii. 2 x 4, used more in platforms because it is sturdier  
iii. 4x4, also used more in platforms for strength  
b. So let’s measure a 2x4 and see what size it really is…1 ½ x 3 1/2 . Why is this? 2x4 is the name given before the lumber is planed and ready for construction purposes. How does this affect set construction? Measurements have to be based off the actual measurement rather than the nominal one.  
2. Panel wood: We use plywood the most because it is strong and cheap. There are other types.  
a. Plywood. Commonly comes in 4x8 foot sheets. Measure it. It is 4x8 because it is a man made type of panel wood  
b. Wafer board. A cheaper and less sturdy type. What might you use this for?  
c. Particle board. Even cheaper and weaker. Really smooth surface so it is handy for painting into smooth looking surfaces.  
d. Talk about any other types of wood you might have on hand and use regularly.  
  
MODELING: These are the types of wood we will be using next time to make our flats.   
  
CHECK FOR UNDERSTANDING: Have students pull out some stock scenery or look at current set pieces and name the different types of lumber and paneling that is used.  
  
TRANSITION/hook: Most sets are not supposed to look just like wood. With a partner, list some ways that wood could be transformed to look like something else.  
  
INSTRUCTION: Paint is the most common thing to use. Special paint for scenery does exist, but its really expensive and we probably only have regular house paint on hand anyway. Safety first…there are two types of paint, water-based and solvent based. Where could you find this info? The label! That’s why we don’t rip them off. Solvent based paint fumes are really toxic. We will work with water-based paint today to try out some common set painting techniques  
1. Wood. Yeah, it’s already wood, but from offstage you often can’t tell. Sometimes you want a different color wood or a different grain pattern. First you paint a dark color and then go over with a lighter color on a wood grain roller to create a more visible grain  
2. Stone. You can use roller to create the blocks and then use different painting techniques alone or in combination to pattern it, like spattering, scumbling, drybrush, stippling, ragroll or sponging. Demonstrate these techniques on a scrap piece of wood.  
3. Wallpaper. This requires the most artistic skill. You can create a stencil, which is the best idea for uniformity, or you can freehand it for a very old-fashioned look.  
  
MODELING: Demonstrate different techniques while introducing them.  
  
CHECK FOR UNDERSTANDING: Ask. Any questions?  
  
GUIDED PRACTICE: Pair up and choose a type of background to create and use a scrap piece of panel wood to create the look you want. Try different techniques and pick your favorite.  
  
CLOSURE and ASSESSMENT: After cleaning up, have each pair present their demonstration and have the rest of the class guess what technique(s) they used. Remind students to review the types of lumber and paneling before the next class since we will be using them next time.

**Assessment**

Students can be assessed through their class participation and note-taking in a theatre journal.

**6: Set Construction Quiz and Conclusion**

**Objective**

Students will complete any unfinished construction projects. They will demonstrate their understanding of basic construction tools (practical) and safety(written) in a quiz.

**Materials Needed**

Have the quizzes ready to be taken towards the end of class (the last 45 minutes).

**Related Documents**

* Set Construction Safety Quiz
* Set Construction Safety Quiz Key
* Tools Quiz

**Lesson Directions**

**Anticipatory Set/Hook**

Even more flat construction! Before beginning, do a quick review of safety rules, wood, and tools by having each student put a label on their back (without seeing what it is) and by asking each other yes or no question to figure out what they are.  
  
Labels:  
if in doubt-don’t do it!  
no horseplay!  
follow instructions on product  
keep tidy-allow time for clean up  
first aid stuff location, know where it is.  
tool safety-if you don’t know how to use it, don’t use it!  
personal protection (goggles, dust masks, clothing, ventilation, gloves)  
Measuring and Marking Tools  
Cutting and Shaping Tools  
Fastening Tools  
Gripping Tools  
1x4  
2x4  
4x4  
Plywood  
Particle board  
Medieval pageant wagons  
French perspective painting  
Melodrama spectacle sets  
Greek skene

**Instruction**

GUIDED PRACTICE: Help the students finish the construction of their flats. If they are finished, or finish early, have them work on other current set needs, study for their quiz, or help other students. Make sure they clean up their area once they are finished.  
  
ASSESSMENT:   
The practical quiz will be on tools. Present each student with a group of 5-6 tools and record the names and uses of each of the tools in their group.   
The written quiz will be on safety rules. Have them turn in both quizzes at the end of class.

**Assessment**

Students can be assessed through their finished project and the completion of the oral and written quizzes.