



Lesson #6: Drywall (10 class periods)

Objectives

Students will be able to...

- Understand the drywall industry overview
- Calculate an estimation of how much drywall is needed for a floor plan
- Install drywall
- Match texture and patch drywall

Standards

LS 11-12.6

RSIT 11-12.2

RLST 11-12.2

Writing 9-10.5

Residential and Commercial Construction pathway D2.1, D2.2, D2.3, D3.1, D3.3, D3.5, D3.7, D4.4, D6.2, D6.3, D6.4

Problem Solving and Critical Thinking 5.1, 5.2, 5.3

Health and Safety 6.2, 6.6, 6.7, 6.8, 6.10, 6.12

Responsibility and Leadership 7.3, 7.4, 7.5, 7.6, 7.7, 9.2, 9.3, 9.6, 9.7

Materials

Drywall Industry Overview Handout

Drywall Floor Plan Estimating Worksheet

Drywall Installation Information Handout

Drywall Project Rubric

Professional Drywall Patch Order of Operations

Lesson Sequence

- Review the *Drywall Industry Overview Handout* together. Have students highlight important information and answer any questions students may have.
- Review the *Drywall Floor Plan Estimating worksheet* together. Model how to estimate how much drywall is needed.

- Pass out the *Drywall Installation Information Handout*. Review together and answer any questions students may have.
- Pass out the *Drywall Project Rubric*. Review together as a class and have students begin. Monitor students work and answer any questions and assist as needed.
- Review the *Professional Drywall Patch Order of Operations*. Have students follow steps.

Assessment

Informal observations

Check for understanding through questioning

Grade student drywall skills and ability to follow directions

Grade student drywall patch work and ability to follow directions and match texture

Accommodations/Modifications

Visuals

Extra Time If Needed

Model

One on One Support

Peer Support

Drywall Industry Overview Handout



The drywall contractor industry in the US includes over 20,000 businesses with combined annual revenue of \$25 billion. Large companies include Performance Contracting Group, Masco Contractor Services, and US Builder Services. Nearly 60 percent of the companies in the industry are small with fewer than five employees. The average company brings in about \$2 million in annual revenue.

New construction accounts for about 70 percent of total industry revenue, the rest is from renovations. **Commercial construction** accounts for 60 percent of revenues, especially construction of office buildings, commercial space, schools, apartments, hospitals, and hotels; single family residential construction accounts for the rest.

Competitive Landscape

Demand is driven heavily by new building construction. The **profitability** of individual companies depends on a steady volume of work, accurate job estimating, and good cost controls. Large companies have an advantage in bidding on large jobs. Small companies can compete effectively by specializing in either residential or commercial work. Residential contractors have competition from many independent workers. The industry is **labor-intensive**: average annual revenue per employee is just over \$100,000. This is not to say that this is the average income of a drywall installer, rather the average income that a journeyman has the potential to produce. According to Salary Wizard, as of November 2009, the average drywall installer, which is the labor side of the market, ranged between 34,000 and 50,000 a year. On 40-hour work week that could be up to \$27/hour.

Commercial contractors install the metal framing that underlies walls in commercial buildings and the gypsum wallboard that covers it. They also install other types of walls (such as movable partitions or stone veneer), acoustic and specialty ceilings, and various types of insulation and fireproofing. Many commercial contractors are sales representatives for manufacturers of floor, wall or ceiling products, from companies such as USG, Armstrong, and Johns Manville.





Residential contractors install heat and sound insulation, ceilings, and interior walls in single-family homes. Walls and ceilings are typically made from various types of gypsum panels nailed into place over wood framing installed by the builder. Various finishing work hides joints and prepares the surfaces for painting. Insulation materials typically are fiberglass pads and foam panels but may also be sprayed or loose materials like cellulose.

As in many trades, commercial contractors may have an **Internet site** that allows potential customers to view projects and see samples of the types of materials they've worked with. Computer technology may be used in project cost estimating, materials ordering, and project coordination with the primary contractor.



Drywall Installation Information Handout

Materials Needed:

- Building Lumber
- Drywall (2' x 4' sheet each)
- Corner Bead
- Drywall Mesh Tape
- Drywall Tape
- Drywall Tools
- Drywall Mud and Topping

Lesson Plan Text:

Once your wallboards are hung, there are three separate parts to getting wallboard (also referred to as gypsum wallboard and drywall) ready for primer and paint. They are:

1. finishing nail or screw indentations
2. finishing corners
3. finishing joints

Fortunately, all three parts can be worked at the same time.

The nature of joint compound, hereafter referred to as mud, is that it shrinks as it dries. As it shrinks, it is normal for it to crack. Mud generally requires three separate coats to compensate for this cracking and shrinkage. Each subsequent coat of mud should be spread with a wider knife than the previous coat. Each coat requires 24 hours drying time between applications. Depending on your skill level, you may need to do some light sanding between applications. The final coat will always require sanding. You can use a finishing sander to speed up the job.

When sanding, it's best to start at the outer edges of the dried mud and work your way toward the center. Use circular motions applying just enough pressure to remove the imperfections.

Tools:

3" drywall taping knife
6" drywall taping knife
10" drywall taping knife
Finish sander
Outside corner beads
Joint tape
Joint compound
Fine or medium grit sandpaper
Old sheets, plastic or painter's canvas

Finishing

Use a 3" drywall knife to spread mud into the indentations left by nails or screws. Scrap away excess mud. Repeat until indentations are relatively flush and then sand.

Finishing Corners

There are two types of corners: inside corners and outside corners.

Metal beads are available and recommended for outside corners. Finish the outside corners by positioning the bead. Drive drywall nails or screws into the smaller holes about every five inches. Each nail or screw should attach to a wall stud that is located behind the wallboard. Using a 3" knife, spread about 1/8" of mud over the entire bead, one side at a time. Be sure to feather out the mud about 2 inches on both sides of the bead. Allow to dry. Sand lightly if needed. Repeat the process using 6-inch knife feathering out the mud and additional 2 inches on both sides. Allow to dry. Repeat the process for the final time feathering the mud an additional 2 inches using your 10-inch knife. Sand away the minor imperfections.

A similar procedure is used for inside corners. You may elect to use paper inside corner beads or to embed paper joint tape into the corner. To embed joint tape spread about an eighth inch of mud into the corner. Make sure the mud is spread wider than the tape. Fold the tape along the crease and position into the corner. Starting at the top, use a 3" knife to embed the tape and squeeze out the excess mud by placing the blade flush against the tape and pulling down while applying pressure. Do one side at a time but work quickly as the mud will begin to surface dry if you take too long. Apply a second 1/8th inch coat of mud over the tape. Allow to dry. Add subsequent coats feathering out the mud an additional two inches or so. Finally, sand out any imperfections with medium or fine grit sandpaper.

To finish tapered joints (joints where two pieces of drywall meet and where the edges are tapered), spread mud into the joint using a 3" or 4" knife. Allow 24 hours to dry. Repeat the process using a 6" knife. Allow to dry. Use a 10" knife for the final application.

Allow 24 hours to dry. Sand away any imperfections.

Sometimes you may have joints joined where they are not tapered - often called butt joints. In this case you may have to feather the mud out as much as 2 feet on each side of the joint to give the wall the illusion of being perfectly flat.

Tip: Finishing drywall is more of an art than a science. Production speed comes with experience. Professional finishers make the job look easy because they have acquired years of experience perfecting their technique. Work patiently and don't worry too much about mistakes. They are relatively easy to correct. However, don't prime and paint until you've corrected your mistakes.

Controlling Dust

Dust control is an important part of finishing drywall. Unless you're working in a newly constructed area, you'll want to prepare for the dust caused by sanding. Always wear a dust mask and goggles to protect your eyes and lungs from the nontoxic dust. Open windows and consider using a box fan to exhaust the dust. Drape sheets or a canvas over large items and remove small items from the work area.

Drywall Project Rubric

Directions: Using your Drywall Installation Information General "How-To" sheet, complete the following steps. Please call your instructor after each completed step for a total grade.

- Frame 90 Degree Wall – L=35 ½" x 26 ¼" (x2) /10 pts
 - Add Plywood as Top Plates for Strength /10 pts
 - Hang Drywall (Drywall Screws 6" O.C.) /10 pts
 - Install Corner Beads /10 pts
 - Tape /10 pts
 - Mud (Joint Compound) First Coat (24 Hours) /10 pts
 - Sand /10 pts
 - Mud (Joint Compound) Second Coat (24 Hours) /10 pts
 - Sand /10 pts
 - Skim (Topping) Last Coat (24 Hours) /10 pts
 - Sand /10 pts
 - Texture (Dry-Time 2 – 5 Min) /10 pts
 - Knock-Down Texture (24 Hours) /10 pts
 - Light Sand Texture /10 pts
- Total: /130 pts**

Note: Turn in each step for a grade

Professional Drywall Patch Order of Operations

Step 1: Hammer a small hole into the drywall that you have just completed.

Step 2: Cut a scrap piece of drywall with a utility knife into a rectangle or square a little bigger than the hole or damaged area. Cutting the area out to the studs is recommended, although, not necessary. Using your piece of drywall as a template place the patch against damaged area, and lightly trace around it with pencil. Carefully saw outlined area with keyhole saw.

Step 3: To hold a wallboard patch in place, insert a small board about 6 inches longer than the long dimension of the hole. Put the board into the hole, center it horizontally, and hold it firmly against inside of wallboard. Fasten the ends of the board to the existing drywall with drywall screws; countersink the screws below surface of drywall. If you have cut out the drywall to the studs simply secure it to the studs with your screws

Step 4: Mix joint compound, just as you did in the Drywall Installation Project. Using a six inch putty knife, mud and tape the edges of your drywall patch. Try to get as smooth of a finish on your dry wall as possible. Let compound dry at least several hours. Sand the dry wall to a smooth finish. You will have to repeat a joint compound second coat before moving onto Step 4.

Step 5: After your joint compound has dried, spread topping over your patch. Purposefully spread approximately 3 to six inches beyond your patch borders. This will ensure a smooth transition from the patch to the existing drywall.

Step 6: After your topping has dried. Spray texture over the patch, with your greatest attempt at matching the existing drywall texture.

You will be graded on the integrity of your patch and the matching of your texture.

_____/100 pts

Drywall Floor Plan Estimating Worksheet

