Rec 9/6/2022
AN

Teri Gardner 9-6-22

To the Washington State Apprenticeship & Training Council,

This is a request letter to introduce the program I teach and to ask to be considered as an apprenticeship preparation program.

My name is Creed Tremaine Nelson and I teach at Lindbergh High School in the Renton School District. For the past 16 years I have taught a construction program at Lindbergh. Prior to teaching at Lindbergh I worked for 15 years as a cabinet maker/furniture maker. For the past 12 years we have had ties with a variety of building trades in the area. For the past two years we have been a recognized Core Plus Construction program.

The ethnic make-up of Lindbergh is 26% Asian, 25% White, 23% Hispanic, 16% African American, 9% Two of more races, 1% Pacific Islander. 50% of the population qualifies for free and reduced lunch. Of the graduating Seniors, roughly 20% enter a four year university. One of the main reasons I want our program to be recognized by the state as an apprenticeship preparation program is to provide viable options and opportunities for the students who are not wanting to pursue a college degree immediately after graduation from high school.

The students need to take a pre-requisite course to enter the construction program. The Industrial Tech – Intro class must be passed before entry to Construction. The Intro class goes over shop safety, proper PPE, tool useage, blueprint reading and project completion.

The construction program we have at Lindbergh is full year course. Our classes are 70 minutes long, so the students get 210 hours of prep time in the year. The students that are enrolled in the course are Juniors and Seniors, with the understanding that this is a preparatory class to go into the building trades. The students are exposed to different careers in the trades: the speakers we have had this school year are the Electrical Apprenticeship, the Plumbers and Pipefitters, Laborers, The City of Renton Maintenance Department, Boeing, Kenworth, Nucor Steel, Machinist Inc. Sellen, Lydig, Schuchart, Absher and Rock Construction Management companies. 9*

Prior to the pandemic in 2020, Lindbergh held an annual Trades Fair event where we invited the building trades and training and certificated programs to the school. We held the event in the gymnasium and teachers would bring students through to learn about the opportunities available upon graduation. Students from the other three district high schools and middle schools would also come, and it would service roughly 1,500 students. We hope to hold this event again in the 2022-23 school year.

Attached is a letter of articulation with the Plumbers and Pipefitters Union. The Lindbergh Construction program aligns with the Plumbers and Pipefitters Union through math skills, measurement, problem solving, physical abilities and teamwork.

Additionally, there is a letter of articulation from the Puget Sound Electrical JATC. The Lindbergh Construction program aligns with the Electricians Union with the same skills mentioned above. In addition, we spend two months of the school year working on designing and building residential electrical systems, and after we set them up, we work on a lot of trouble shooting.

Thank you in advance for your consideration-

Creed Tremaine Nelson, Lindbergh High School Construction program 425-204-3296
creed.tremainenelson@rentonschools.us

Focus on Employability

On the first day of class I tell the students that the expectations I have for this class are the same expectations that they will have once they enter the workforce:

- Show up every day
- Show up on time
- Work through the whole period
- Listen carefully to instructions and follow instructions
- Always follow the safety rules of the shop
- Treat each other respectfully
- Work as a team so everyone succeeds

We have many guest speakers and I have them talk to the students about what makes a good worker, and how the speaker got to where they are today. Every student has the ability to be a good worker, they just need to know what the expectations are.

In addition to knowing the expectations, the students also go through and do professional interviews with industry professionals. To prepare for this, the students write a professional resume, a cover letter and a email. This year the students were interviewed by the Plumbers and Pipefitters union, Kenworth Truck Co., Machinist Inc., Nucor Steel, Rock Construction Management.

This year we also have worked with managers from Sellen, Lydig, Schuchart, and Absher Construction companies, and the reps from all of these companies have all spoken to the students about what makes a successful employee and what each student need to get hired and stay employed.

In addition to construction companies as guest speakers, I also have speakers from the Plumbers and Pipefitters, Carpenters, Electricians, Cement Masons,Laborers, and Iron Workers Unions speak with the students on employability and work ethic.

Safety Training:

All students in the construction program go through a thorough safety program. Before taking the construction class the students need to take the Industrial Tech – Intro class. In this class they learn about personal safety in a shop, specific tool safety, and proper usage of PPE. For all of the safety there is a written test and we go over the test verbally in class. Once the students have passed the written test with 100% accuracy, we go into the shop and I will give a demonstration on the specific tool. After watching the demonstration, each student must demo back using the tool safely. The tools we cover in the Intro class are various hand tools, cordless drills, orbital sanders, routers, drill press, band saw, table saw, wood lathe.

For the construction class, we cover all of the safety listed above since I need to see the student use the equipment every year. In addition they are tested on the chop saw, hand circular saw, pneumatic nailers, and pneumatic paint sprayers. In addition, each unit we go over we cover the safety and PPE needed. For instance, when we are doing our framing unit, we talk about hammer safety when working in groups, the importance of safety glasses, and how to safely move large material around the shop. For our electrical unit we cover the importance of knowing how to turn off the power to a circuit, how to use testing equipment to ensure the power is turned off, and the proper PPE of glasses, closed toed shoes and the use of gloves.

In addition to the safety they learn in the shop the students also are enrolled in an online OSHA 10 class. We use Career Safe as the provider. All students are enrolled in the OSHA 10 General Industry course, and those that have passed it in prior years are enrolled in the OSHA 10 Construction course. This year there are 23 students in the program, and 64% have earned their OSHA 10 certification.

Attached are the Industrial Tech – Intro and Construction workbooks which have all of the safety tests in them.

Physical Fitness

Every day before we start our work in the shop we do stretching and strength exercises. We gather in a circle around the shop and we stretch our arms, hands, necks, backs, torsos and legs, and then do strength exercises in the chest and upper body and in the legs and hips. Once we finish our stretching and strength exercises, the students are up and moving for the entire period. Students are moving material around the shop and then stretching to install the materials.

Math

Before we go into the shop we work on trades math problems as a classroom warm-up. I find that the area that most students have difficulties in are fractions, so we do a lot of problems that involve fractions. I have the students work on the problems in their workbooks, I go around to help them out, and then we work on the problem as a group. Attached is a bank of questions that I draw from and am always adding to.

In addition to the formal math we do in the class, we are constantly doing math and calculations in the shop. Examples of math in the shop are students are measuring, and need to measure accurately or their projects won't come out correct. Students need to come up with cut lists for materials and I check over all their lists. I also work with students on estimation when we work on the electrical unit: students need to estimate wire lengths to be able to make electrical connections. This is an example using math where there is not an empirical answer to a problem but a range of correct answers.

Program Participants

Throughout the year I actively recruit students for the program that I feel can benefit from the opportunity. I teach an Industrial Tech – Intro class that is a pre-requisite to the Construction program, and I actively recruit from the Intro class for the construction program. Over 100 students take the Intro class each year. I promote the Construction program heavily in the school and district by sending out emails to staff and district administrators to the amazing projects the students work on. These emails raise awareness as to the opportunities students have in the program, and many teachers and administrators recommend students to the program through this awareness.

Over the past five years, the average is that 26 students are enrolled in the year long program. We have 70% students of color in the program. We currently have 3 females in the program, and I am always working to boost those numbers. I work with our school counselors to recruit under represented groups, and to encourage more females to join the program. I believe if we have a established pathway into the building trades and apprenticeship program, it will attract more females.

The Construction advisory group is 14 members strong. We meet as a group at least twice a year, and we are always wanting industry input. Our committee has members from the Plumbers and Pipefitters Union, the Electricians Union, and from Sellen, Lydig and Schuchart Construction. Our advisory committee provides input on curriculum and on facility needs. As a teacher, I am constantly wanting to know new industry trends and how I can best prepare my students for success.

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ARTICULATION AGREEMENT

Between

Lindbergh High School – Construction, Aerospace & Manufacturing Programs

And

Seattle Area Pipe Trades

PURPOSE

This agreement provides the linkage between Lindbergh High School's Construction, Aerospace and Manufacturing (LHS) Programs and the Seattle Area Pipe Trades (SAPT). This school is committed to providing training opportunities to future Pipe Trades workers and the mentoring of pre-apprentices. The parties acknowledged in this agreement will work together to provide current and recent graduates of the LHS program an opportunity to enter the SAPT apprenticeship program.

It is recognized that the LHS program is an apprenticeship preparation training program serving its high school students, which includes students of color and women enrolled in the Renton School District. Working in partnership, LHS and SAPT, through their commitment to education and job readiness preparation for students, will work to provide LHS graduates a career in the construction industry to make a livable family wage, and to diversify the current Washington state workforce through inclusive and equitable hiring practices. Through this Apprenticeship Cooperative Agreement, LHS and SAPT will work to provide LHS graduates with:

1. Access to apprenticeship training programs (per program standards)
2. Entry level jobs on construction-related worksites

PRE-APPRENTICESHIP TRAINING AGREEMENT

Successful graduates of the LHS programs may have certain application prerequisites satisfied as a result of this agreement. Students who meet the qualifications as stipulated below will be provided an informational mock interview with SAPT and may be granted direct-entry consideration.

The following stipulations are hereby agreed to:

1. Students must meet the minimum qualifications established for entry into the Seattle Area Pipe Trades Apprenticeship program (see below).
2. Students must have successfully completed the LHS program with a "B" grade or better and be ready for LHS graduation to waive the math placement prerequisite.

3. At the time of application to SAPT, LHS students must provide a Certificate of Completion and a letter of Recommendation from a LHS instructor or administrator.

Minimum Qualifications for Seattle Area Pipe Trades Apprenticeship

1. Age: At least 18 years of age (proof of age required).
2. High School Graduate or GED Attainment.
3. All prerequisites per the approved registered apprenticeship program standards.

In addition, the Seattle Area Pipe Trades Apprenticeship agrees to:

1. Inform contractors (training agents) and other member organizations about the goals and activities of the LHS program and encourage their support and involvement in the LHS program.
2. Host at least one co-curricular activity each Academic Year (any cooperative learning experience which benefits the students enrolled in the LHS program – such as providing guest speakers, mentors for student projects, tours of the apprenticeship training program or instructors able to provide certification workshops or lead a training exercise).

This agreement will remain in effect unless canceled by either party. In the event of a conflict with the Program standards, as approved by the Washington State Apprenticeship and Training Council, the Program Standards shall prevail.

	9/1/22
PJ Moss, Training Coordinator	Date

Creed Tremaine Nelson	9/1/22
Lindbergh High School Representative, Title	Date

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Puget Sound
ELECTRICAL APPRENTICESHIP and TRAINING TRUST
550 S.W. 7th STREET • RENTON, WA 98057-2917 • 425/228-1777 • FAX 425/228-1778
www.psejatc.org

Date: September 6, 2022

To: Washington State Apprenticeship & Training Council

Topic: Support for Lindbergh High School Pre-Apprenticeship

On behalf of the Puget Sound Electrical Joint Apprenticeship and Training Committee (PSEJATC), I would like to express our support for the Lindbergh High School Pre-Apprenticeship program. Our apprenticeship program is jointly managed by the Puget Sound Chapter - National Electrical Contractors Association (NECA) and the International Brotherhood of Electrical Workers (IBEW) Local 46. Our program provides the training required to receive certifications in Inside Wireman (Construction) Electrician, Limited Energy/Sound and Communications Electrician, and Residential Electrician occupations.

We are actively engaged in activities and discussions related to the need to maintain a ready and available pipeline of prepared workers for the construction industry. We have witnessed firsthand the efforts made by the Construction/Aerospace/Manufacturing program at Lindbergh High School (LHS) to expose their students to electrical construction and the opportunity of apprenticeship. Their efforts help position us with a well-prepared apprenticeship applicant pool. The availability of individuals that have completed this pre-apprenticeship training program allows us the ability to respond quickly to the continued growth in the construction industry with the placement of qualified applicants into our state-registered apprenticeship program.

With LHS helping to create new workers that understand appropriate workplace behavior, workers that have been trained in the basic skills that are needed on job sites, and workers that have had an opportunity to practice those skills in real workplace environments has been an invaluable asset to all apprenticeship training programs in the building trades.

We offer our support to the important work that is being provided by the LHS program and performed by their staff.

If you have any questions, please feel free to contact me at 425-228-1777 Ext: 101.

Respectfully,

Clay H. Tschillard
Training Director
Puget Sound Electrical JATC

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Renton School District

Industrial Technology - Intro

Student Workbook

Name_____ Period_____

Table of Contents

General Safety

1. Always wear eye protection, wear safety glasses or a face shield.

2. Use only the equipment when the instructor is in the shop.

3. Use only equipment you have been trained on and know how to operate safely. If you have any questions, ask the instructor.

4. Report all accidents or injuries immediately to the instructor.

5. Don't use tools or equipment that is in any way defective or broken. Tell the instructor if a tool is dull or broken or not working properly.

6. Keep clothes tucked in and sleeves rolled up. Clothing can easily get caught in machinery.

7. Tie back long hair to keep it out of the way.

8. Remove or tuck in any jewelry so it doesn't get caught in the machinery.

9. Always use the right tool for the job. Use the tool designed for what you want to do.

10. Wear closed toed shoes. Do not wear sandals in the shop

11. Wear a dust mask when working around a lot of dust. Ask instructor for one.

12. Clean up liquid spills immediately. Don't leave anything on the floor someone could slip in.

13. Throw away oily rags in a metal container with a metal lid. Oily rags can ignite through spontaneous combustion.

14. Clamp your work piece down to a bench so you have both hands to use the tool properly.

15. Keep cabinet doors and drawers closed. Vices are to be closed when not in use.

16. Don't leave anything on the floor that can be tripped over, and don't run, walk.

17. When lifting anything heavy, lift with your legs and not your back.

General Safety Written Test

1. Always wear eye _____, wear safety glasses or a _____ _____ .

2. _____ work on the _____ when the instructor is in the shop.

3. Tie back _____ _____ to keep it out of the way.

4. Report all _____ or _____ immediately to the instructor.

5. Use only equipment you have been _____ on and know how to operate _____. If you have any _____, ask the instructor.

6. Wear _____ _____ shoes. Never wear _____ in the shop.

7. Wear a _____ _____ when working around a lot of dust. Ask instructor for one.

8. Keep cabinet doors and drawers _____. Vices are to be _____ when not in use.

9. _____ your work piece down to a _____ so you have both hands to use the tool properly.

10. Throw away _____ _____ in a metal container with a metal lid.

11. Don't leave anything on the _____ that can be tripped over, and don't _____, walk.

12. When lifting anything heavy, lift with your _____ not your _____.

13. Throw away _____ rags in a _____ container with a metal lid. Oily rags can _____ through spontaneous combustion. Really!

14. Remove or tuck in any _____ so it doesn't get _____ in machinery.

15. Clean up _____ spills immediately. Don't leave anything on the _____ someone could slip in.

16. Don't use any tools or equipment that is in any way_____ or _____. Tell the _____ if a tool is dull or broken or not working _____.

Hand Tool Safety

1. Always wear eye protection, wear safety glasses or a face shield.

2. Before you use a tool, check to be sure it is clean and in good condition.

3. Before you use a tool, know how to use it safely and properly. Ask the instructor if you have any questions how to use a tool.

4. Never run your fingers along a tool blade to check for sharpness, you'll cut yourself.

5. Never use a dull, broken or defective tool. Report any defective tools to the instructor.

6. Always carry tools by the handle, with the blade pointed down.

7. Clamp your work piece down to a bench so you have both hands to use the tool properly.

8. Never aim a cutting tool towards your arms, hands or body. Aim the tool away from yourself and from others.

9. Always keep your hands and arms out of the path of a cutting tool.

10. When you are finished with a tool, return it to the storage area. Don't leave tools laying around.

11. Always use the right tool for the job. Use the tool designed for the work you want to do.

12. Be sure the handle is fitting tightly into the tool before you use it.

Hand Tool Safety Written Test

Fill in the blanks:

1. Always wear _____ _____, wear safety glasses or a _____ ____+____.

2. Never run your _____ along the tool blade to check for _____, you may cut yourself.

3. When you are finished with a tool, return it to the _____ _____.

4. Always carry a tool by the _____, with the blade pointed _____.

5. Always use the _____ _____ for the job. Use the tool that is designed for the work you want to do.

6. Never use _____, _____, or defective tools. Report any defective tools to the instructor.

7. Always keep your _____ and _____ out of the path of a cutting tool.

8. Never aim a _____ _____ towards your arm, hands or body. Aim the tool away from yourself or from others.

9. Before you use any tool, learn how to use it _____ and _____.

10. Clamp your work piece down to a _____ so you will have both hands to use the tool properly.

Device Holder

Materials needed:
(1) 8” X 1 ½” X 1 ½” piece of Spruce.
(1) 5” X ¾” X ¼” piece of Spruce.
(1) 4” X 1 ¼” X ½” plywood.
(1) 1/4” X 10” dowel.
Tools used:
Cordless Drill, Hammer, orbital sander, block plane, sanding block.

1. Obtain the materials from the instructor.

2. Using an orbital sander, sand the 8” piece smooth on all six sides.

3. Take the 8” piece, and the 5” piece. Place the 5” piece on one of the edges so it is flush, or even. Center the 5” piece on the 8” piece, and nail down with (2) 1” nails. Put the nails in 5/8” from the ends of the 5” piece.

4. Using a block plane, Plane down the edge of the 5” piece so the block sits at an angle.

5. On the side of the 8” piece that the 5” piece is flush with, install the 4” piece. Have the 4” piece sticking up ¼” on the top, and center it on the 6” piece. Pre-drill two holes ½” from the bottom, and 5/8” in from the sides. Using (2) 1 ¼” screws, attach the 4” piece to the 8” piece.

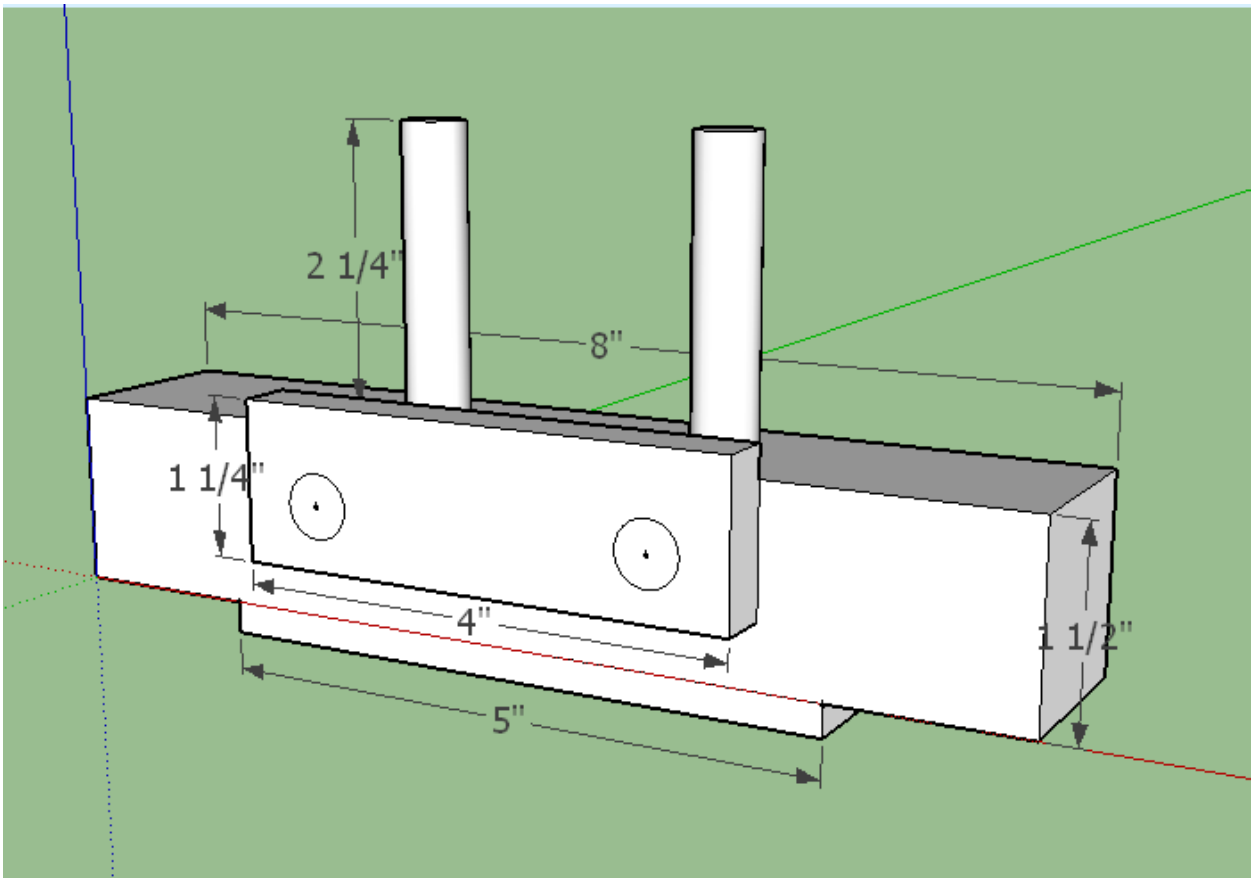
6. Using a ¼” drill bit, you will drill the (3) holes. For the (2) top holes, they are located ½” from the back edge, and 1 ¼” on either side of the center line. The back hole is located on the center line, and ½” up from the bottom edge. Drill each hole ½” deep.

7. Mark your 10” X ¼” dowel for three lengths at 3 ¼”. Place dowel in “V” blocks and cut the three pieces with a hand saw.

8. Finish sand your project, and break all the edges of the project.

9. Place (1) drop of glue in each of the three holes. With a hammer, lightly tap the three dowels in place.

10. Fill out evaluation sheet and get project graded.


2 1/4"
8"
1 1/4"
4"
5"
1 1/2"

Device Holder grade sheet

Directions: Complete all 3 question below to the best of your ability. Use complete sentences and use technical terms to explain your answers. Once completed, have a student grade your project using the rubric posted in the shop. Finally, submit project to instructor for final grading.

1. What did you do well on this project? _____
_____
_____
_____

2. What could you have improved on this project? _____
_____
_____
_____

3. What new skill did you learn while working on this project? _____
_____
_____
_____

Peer Grade Name of peer :

Time Mgmt.	Craftsmanship	Assembly	Finish	Eval. Form
/4	/4	/4	/4	/4

Total: /20 x 2=

Instructor Grade

Time Mgmt.	Craftsmanship	Assembly	Finish	Eval. Form
/4	/4	/4	/4	/4

Total: /20 x 2=

To receive extra credit have your parent/ guardian sign below and share any comments they might have about your hard work.

Parent/guardian signature _____

Comments _____
_____
_____
_____

Power Equipment and Portable Power Tool Safety

1. Always wear eye protection, wear safety glasses or a face shield.

2. Don't use any of the power tools unless you have been instructed how to use them correctly and safely.

3. If you don't feel well or you can't concentrate, tell the instructor. Don't use any of the equipment unless you can give it your full attention.

4. When you approach a machine, be sure the person who used it last turned it off, it is completely stopped, and they cleaned up their waste.

5. Check to see that all the safety guards are working properly.

6. Never remove safety guards without the instructors permission.

7. If a machine doesn't sound right or if it doesn't work properly, don't use it.

8. Minor adjustments should always be made with the machine turned off and completely stopped.

9. Keep yourself balanced, don't overreach or put your weight on the machine.

10. Check the condition of the wood, it must be clean and free of defects.

11. Wait for machine to come up to full speed before starting the cut.

12. Use an even, steady pressure to make cut. Don't force or overload machine.

13. If the material is large or heavy, get some help. Ask someone to "tail-off" for you. The "tail-off" helper supports the material during the cut.

14. Get permission to use special set-ups, jigs or attachments. Ask instructor to double-check set-ups before you use them.

15. Don't let anyone distract you while you are using machinery. Stay focused!

16. Stay out of the danger zones when someone is using equipment, and make sure others stay clear while you are using the equipment.

17. Use a brush to clean off the equipment, and a broom to sweep the floor of debris.

Power Equipment and Portable Power Tool Safety Written Test

1. Always wear eye _____, wear safety glasses or a _____ _____ while on the lathe.

2. Don't use any of the equipment unless you have been shown how to _____ and _____.

3. Before you turn a machine on, check to see that all the _____ _____ are working properly.

4. Keep yourself _____, don't _____ or put your weight on the machine.

5. Use an even, _____ _____ to make a cut. Don't force or _____ a machine.

6. Wait for a machine to come up to _____ _____ before making a cut.

7. If the material is large or heavy, get some help. Ask someone to _____ _____.

8. Don't let anyone _____ you while you are using machinery. Stay focused.

9. If a machine doesn't _____ right or it doesn't work properly, don't use it.

10. Stay out of the _____ _____ when someone is using the equipment, and make sure others stay _____ while you are using the equipment.

11. Never remove _____ _____ without the instructors permission.

12. Minor adjustments should be made with the machine _____ _____ and completely stopped.

13. When you approach a machine, be sure the person who used it last _____ _____ _____, it is completely _____, and they cleaned up their _____.

Portable and Table Router Safety

1. Always wear safety glasses or a face shield while operating a router.

2. To prevent items from getting caught in the spinning bit, tie back any long hair, eliminate loose clothing and remove any jewelry.

3. Be sure that the switch is off before plugging in a router.

4. Make sure that the collet chuck is tight and secure before operating.

5. Unplug the router before making any adjustments such as changing the bit.

6. Clamp down your work piece and check that the router can travel free of obstructions.

7. If you are using a bearing bit, be sure that the bearing will be riding on the wood before you start.

8. Hold the router tightly with both hands before turning it on. The router starts with a jolt, so be sure you can control it.

9. Be sure to firmly hold the router and use a slow, even pressure while cutting.

10. Make a trial cut with a scrap piece of similar wood to your actual piece.

11. Make sure the bit is completely stopped before setting the router down on a workbench.

12. Pull the portable router towards you from left to right, and feed from right to left on the router tables.

13. When you are finished, sweep up your waste, coil up the cord and return to the cabinet.

Portable and Table Router Written Test

1. When operating a router, you must wear _____ _____ or a _____ _____.

2. To prevent items from getting caught in the router bit, _____, _____ and _____.

3. Be sure the _____ _____ _____ before plugging in the router.

4. Hold the router _____, and use a slow, even _____ when cutting.

5. _____ the router before making any adjustments such as changing a bit.

6. Be sure that the _____ _____ is tight and secure before operation.

7. Clamp down your _____ _____ and check that the router can travel _____ of obstructions.

8. Hold the router tightly with _____ _____ before turning it on. The router starts with a _____, so be sure you can control it.

9. Make a trial cut with a _____ _____ of similar wood.

10. If you are using a _____ _____, be sure that the _____ is riding on the wood before you start.

11. Make sure that the bit is _____ _____ before setting the router down.

12. Pull the portable router towards you from _____ to _____, and feed from _____ to _____ on the router table.

13. When you are finished, _____ up your waste, coil up the cord and _____ to the cabinet.

Drill Press Safety

1. Always wear your safety glasses when operating a drill press.

2. Tie back long hair, remove jewelry, and eliminate loose clothing.

3. Select proper drill bit for the job, tighten in chuck and remove key.

4. Have scrap wood under material and clamp material down to table.

5. Make all your adjustments with the power off. Set the table height and adjust the depth stop before the power is turned on.

6. Use your left hand to hold the work piece, and your right hand to turn the pilot wheel.

7. Use slow, steady pressure while drilling. Draw the bit out of the hole to clean out the debris for smoother drilling.

8. Do not panic if a drill bit catches a piece of work. Do not try to stop it by hand for you could get injured. Turn off the power and stand back.

9. Select the speed carefully. The larger the drill bit the slower the speed, and the harder the wood the slower the speed.

10. Use a "V-block" for drilling round or irregular sized wood. Use a drill press clamp when drilling smaller objects.

11. When finished, wait for the bit to stop and brush off table with a hand brush.

Drill Press Written Test

Fill in the blanks:

1. Always wear your _____ _____ when operating the drill press.

2. To prevent yourself from getting caught in the spinning motor, tie back _____ _____, remove _____, and eliminate loose _____.

3. Select the drilling speed carefully. The larger the drill bit, the _____ the speed. The softer the wood, the _____ the speed.

4. Do not _____ if your work piece gets caught by the drill bit, simply _____ _____ the power and then remove the piece.

5. When drilling, use a _____, _____ pressure. Draw the bit _____ of the hole to clean out the debris.

6. Select the proper drill bit for the job, tighten the chuck, and _____ _____.

7. Use a _____ _____ to drill round or irregular shaped wood.

8. As with any machine, if the drill press is not working properly, you should _____ _____.

9. Set the _____ _____ and the _____ _____ with the power off.

10. Use your _____ hand to hold the work piece, and your _____ hand to turn the pilot wheel.

11. When finished, wait for the _____ to stop and clean off the table with a _____ _____.

Tic Tac Toe Game

Directions: Follow each step in sequence to complete this project. Make sure the read the steps below and review the drawings before you begin.

Tools required: Router Table, Drill Press **Materials**: Pine and Red Oak.

1. Obtain a (1) Pine blank from the Instructor
2. Set up the router table with a V-Groove cutting bit and adjust the fence to be exactly 1 1/4" to the tip of the bit
3. Cut 4 V-Grooves 1/8" deep into the pine blank using the router table
4. Layout all 9 game piece locations by drawing lines in each square with a straight edge and pencil
5. Layout the locations for marble storage exactly 1" from each edge on the long grain of the pine blank, and centered top to bottom. (See figure 1)
6. Layout the location for the wood screw on the long grain of the pine blank (See figure 1)
7. Set up the drill press with a 1/2" forstner bit
8. Bore all 9 game piece locations exactly 1/8" deep with the 1/2" forstner bit
9. Set up the drill press with a 11/16" forstner bit
10. With a Jorgenson clamp, clamp pine blank on edge in order to bore marble storage holes safely.(See instructor for demonstration)
11. Bore both marble storage locations exactly 3 1/8" deep with the 11/16" forstner bit
12. Obtain (1) 3" strip of hardwood from the Instructor.
13. Set up the drill press with a 1/8" twist bit and drill the location for the wood screw exactly 1" deep and centered in the side of the block with the 1/8" twist bit.
14. Set up the drill press with a 3/16" twist bit and bore a hole in the strip of hardwood for the woodscrew to pivot on. Use a Jorgenson clamp to safely hold the hardwood strip.
15. Finish sand the whole project using 100-220 grit sandpaper
16. Apply a Danish oil finish and wipe off any excess oil. Let dry over night.
17. Obtain (1) 1" #8 wood screw from the Instructor
18. Assemble the marble storage cover to the game board with a screw driver
19. Obtain 10 marbles from the instructor
20. Complete project evaluation form and submit for grading

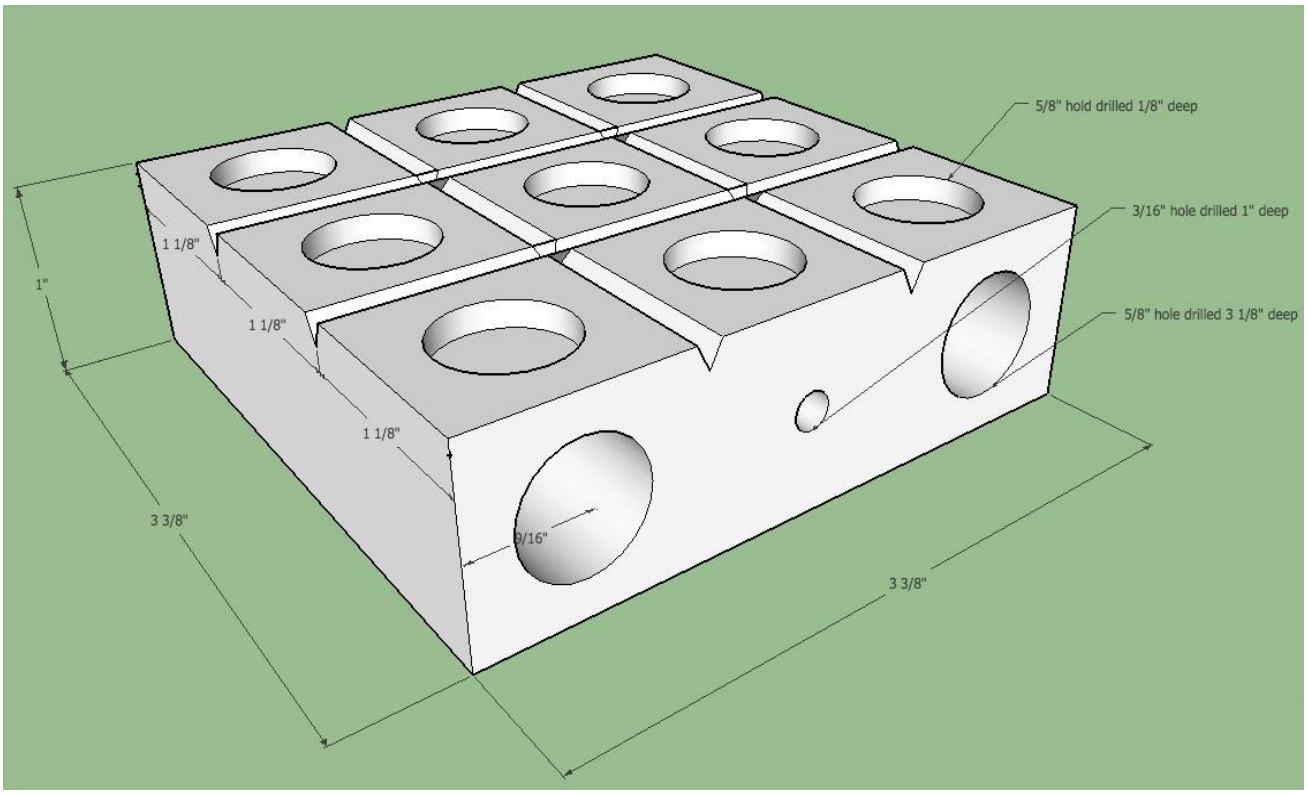


Figure 1.

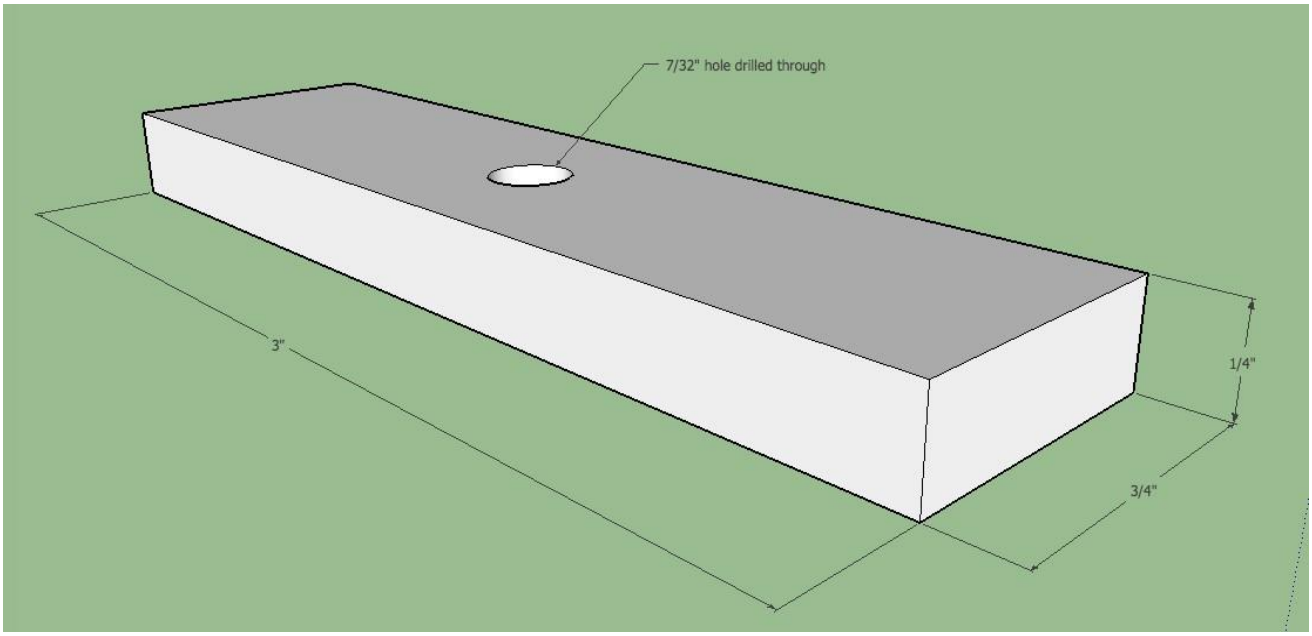


Figure 2

Tic tac toe grade sheet Date: _____

Directions: Complete all 3 question below to the best of your ability. Use complete sentences and use technical terms to explain your answers. Once completed, have a student grade your project using the rubric posted in the shop. Finally, submit project to instructor for final grading.

1. What did you do well on this project? _____
_____
_____
_____

2. What could you have improved on this project? _____
_____
_____
_____

3. What new skill did you learn while working on this project? _____
_____
_____
_____

Peer Grade **Name of peer :**

Time Mgmt.	Craftsmanship	Assembly	Finish	Eval. Form
/4	/4	/4	/4	/4

Total: /20 x 2=

Instructor Grade

Time Mgmt.	Craftsmanship	Assembly	Finish	Eval. Form
/4	/4	/4	/4	/4

Total: /20 x 2=

To receive extra credit have your parent/ guardian sign below and share any comments they might have about your hard work.

Parent/guardian signature _____

Comments _____
_____
_____
_____

Safety Presentation

Instructions: Using the materials provided in the list below, you are tasked with planning and delivering a presentation on shop/tool safety to the class. You will work with 1-3 students on this activity. You may choose from the following methods to deliver your presentation: (PowerPoint, Video, Skit, Poster, Song, Game)

Materials/ Supplies:

Student Workbook

Presentation Planning Worksheet

Computer

Poster Paper

Art Supplies

Guidelines

1) Each group will have 4 class periods to develop their safety presentation. Presentations will be delivered on day 5 of this activity. Be sure to manage your time wisely and be prepared to deliver your presentation on day 5.

2) **Day 1:** At the beginning of class the instructor will divide the students up into groups of 2-4 and assign them a topic for their safety presentation. Next, the instructor will go over the safety presentation activity, the presentation planning worksheet, the grading rubric and deliver an example safety presentation (General Safety). If time permits the groups will begin working on their presentation

3) **Day 2-4:** Each group will begin by deciding on the method that will be used to deliver their presentation. Next, the groups will read the safety manual and inspect machinery to become familiar with their topic. Lastly, the groups will consolidate what they know into a dynamic presentation and practice delivering it to the class.

4) **Day 5:** Each group will deliver their safety presentation to the class. Each group will be evaluated based on the rubric that was discussed on day 1. If more time is required to complete this activity and extra presentation day may be announced.

Safety Presentation

Format	1 (Basic)	2 (Developing)	3 (Good)	4 (Outstanding)
Time	Less than 2 minute or over 4 minutes.	Between 2-2:30 minutes or over 3:30 minutes	More than ± 10 seconds but less than ± 30 seconds	3 minutes ± 10 Seconds
Organization	Audience has minimal understanding because of no sequence of information	Audience has difficulty following because of lack of organization	Audience can follow information in a logical sequence	Audience can follow information and it creates follow up questions
Graphics	Few of the items covered. Pictures of poor quality. Many grammatical and factual errors.	Some of the items covered. Pictures of fair quality. Some grammatical and factual errors.	most of the items covered. Pictures of good quality. Few grammatical and factual errors.	All of the items covered. Pictures inserted were high quality and appropriate. No grammar or factual errors.
Presentation	poor eye contact with audience and poor body language, and poor verbal communication	Poor in one area: eye contact, body language or verbal communication	Good eye contact and positive body language and good verbal communication	Good eye contact and positive body language, in professional dress.

Safety subject _____

Team members _____

Score _____/16

Table Saw Safety

1. Operate only with instructor's permission and you have received instruction.

2. Remove all jewelry; eliminate loose clothing and tie back long hair.

3. Always wear eye protection when operating the table saw.

4. Make sure all the guards are in place and operating properly.

5. Adjust the height of the blade so that is raised 1/4" above the wood to be cut.

6. Stand to the left side of the blade, not in line or to the right. This is to help prevent kickbacks.

7. Always keep control of the wood between the fence and the blade, and do not release it until it is past the blade.

8. Set the fence to the exact size of cut you need, and make sure the fence is securely locked down.

9. Before you start your cut, be sure no one is standing in the "Danger Zone".

10. A push stick must be used when you are cutting a piece 4" or narrower.

11. Ripping means to cut along the length of a board, and crosscut means to cut along the width. There are different saws set up for each specific cut, and use the correct saw for your cut.

12. Determine before you start your cut if you will need assistance and someone to "tail-off" for you, and get that person in place.

13. While cutting, material must be held tight against the fence and table.

14. Before starting your cut, be sure no one is standing in line with the blade that could be hit with a kickback.

15. Do not become distracted while on the table saw; stay focused on the cut you are making. Don't talk to anyone when your on the table saw, stay focused!!

16. Wait for the table saw to completely stop, then clean up your wood scrap and place it in a trashcan.

Table Saw Written Test

1. Always wear _____ _____ when operating a table saw.

2. Remove all _____, eliminate _____ _____ and tie back _____ _____.

3. Make sure that the blade is installed with the _____ _____.

4. Adjust the height of the blade so that it is raised _____ above the wood.

5. While cutting, material must be held _____ against the _____ and table.

6. A push stick must be used when cutting a piece _____ or _____.

7. Always control the wood between the _____ and the _____, and do not release it until it is past the _____.

8. Stand to the _____ side of the blade, not in line or to the _____. This is to prevent kickbacks.

9. Ripping means to cut along the _____ of the board, and crosscut means to cut along the _____. Use the correct saw for each cut.

10. Make sure all the _____ are in place and operating _____.

11. Set the _____ to the exact size of cut that you need, and make sure that the fence is _____ _____.

12. _____ you start your cut, determine if you will need assistance and someone to _____ _____ for you.

13. Wait for the table saw to _____ _____, then clean up your _____ and put it in the trash can.

14. Before you start your cut, be sure _____ one is standing in the _____ _____.

15. Do not become _____ while on the table saw, stay _____ on the cut you are making.

Wood Lathe Safety

1. Always wear eye protection, either safety glasses or a face shield, while working on the lathe.

2. Long hair, jewelry and loose clothing must me appropriately confined so as they don't get caught in the spinning wood stock.

3. Be sure that all the guards are in place and operating properly.

4. The tool rest needs to be within 1/8" inch to the work when using cutting tools.

5. The cutting tools must be kept sharp and in good working order.

6. Turn off the machine to feel for smoothness of your work.

7. The work must be centered, balanced and secure. Double-check all your adjustments to be sure that they are locked down tight.

8. Examine setup before turning on power. Rotate the spindle by hand to check to be sure that your setup is safe before turning on the power.

9. Select the correct cutting tool for the cut you wish to make.

10. The tool rest must be removed before sanding.

11. All adjustments on the lathe must be made with the power off.

12. When you are finished on the lathe, clean the machine with a hand brush and the floor with a broom.

Wood Lathe Written Test

1. Always wear _____ _____, either _____ _____ or a _____ _____, while working on the wood lathe.

2. To help prevent injury by getting caught in the spinning wood stock, _____ _____ long hair, _____ jewelry and _____ loose clothing.

3. The _____ tools must be _____ and in good working order.

4. Select the correct _____ _____ for the cut you wish to make.

5. Examine _____ before turning on the power. Rotate the spindle by _____ to check to be sure your setup is safe.

6. The _____ _____ needs to be within _____ to the work when using cutting tools.

7. The work must be _____, _____ and _____. Double-check all your adjustments to be sure they are _____ _____ tight.

8. The _____ _____ must be removed before you start sanding.

9. All adjustments must be made with the _____ _____.

10. When you are done on the lathe, clean the machine off with a _____ and the floor with a _____.

Band Saw Safety

1. Always wear your safety glasses while operating a band saw.

2. Tie back long hair, remove jewelry, and eliminate loose clothing.

3. Use properly secured and adjusted guards at all times.

4. Adjust the guide and guard to within ¼ inch of your work.

5. Avoid backing out of a cut, or kerf.

6. Hold the work piece on either side of the cutting line. Never put your hands or fingers in the cutting line of the blade. Use a push stick if necessary.

7. Use a "V-block" to cut round or irregular shaped wood.

8. Never force your work piece into the blade. Let the blade do the work.

9. Cut sharp curves on the scroll saw. Cutting to sharp of a curve on the band saw can break the blade.

10. Blades to occasionally break. It the blade breaks, do not panic. Turn off the machine and let the instructor know and you can help install a new blade.

11. Use a push stick or a clamp to cut small material.

12. Do not leave the machine until it is completely stopped. After the blade has stopped, use a brush to clean your scrap off the table and put it in a trashcan.

13. Lower the guard all the way down to the table once the blade has stopped, leave the guidepost loose.

Band Saw Written Test

1. Always wear your _____ _____ when operating the band saw.

2. To prevent yourself from getting caught in the band saw, tie back _____ _____, remove _____, and eliminate loose_____.

3. Do not leave the band saw until it has _____ _____.

4. Use a "V-block" to cut _____ or _____ shaped wood.

5. Never put your hands or fingers in the _____ _____ of the blade.

6. Avoid _____ _____ of a cut or Kerf.

7. Never force your work into the _____. Let the blade do the _____.

8. Adjust the _____ to within _____ of the wood.

9. Use a push _____ or a _____ to cut small material.

10. Blades do _____ _____. If a blade does break, do not_____ Turn off the machine, and let the instructor know.

11. After the blade has completely _____, use a _____ to clean your scrap off the table.

12. Lower the _____ down to the table once the _____ has stopped.

Disc and Belt Sander Safety

1. Always wear eye protection while operating the disc and belt sander.

2. Long hair, jewelry and loose clothing must be appropriately confined.

3. Inspect the sanding disc and belt to be sure that they are in good condition before turning on the motor.

4. Keep your hands and fingers at least one inch away from the disc and belt.

5. When using the disc sander, only do your sanding on the left side of the sanding table. Sanding on the right side can cause injury.

6. The material being sanded must be placed flat on the table. Never tilt your material up or attempt to sand freehand.

7. Use moderate pressure and move the material back and forth to avoid clogging the belt or disc.

8. Sand only items that are 3" or larger.

9. Make sure that the tables are within 1/16" of the abrasive belt or disc.

10. Check to make sure the table is 90 degrees to the belt or disc.

11. Only one person at a time can use this machine. Do not have one person on the belt sander and one person on the disc sander at the same time.

Disc and Belt Sander Written Test

1. Always wear _____ _____ protection while operating the disc and belt sander.

2. When using the disc sander and the belt sander, tie back _____ _____, remove _____, and eliminate _____ _____.

3. Sand items that are _____ or_____.

4. Check to make sure that the table is _____ _____ to the belt or disc.

5. Keep your hands and fingers at least _____ _____ away from the disc or belt.

6. When using the _____ sander, only do your sanding on the _____ _____ of the table.

7. The _____ being sanded must be placed _____ on the table.

8. Use _____ pressure and move the material _____ and _____ to avoid clogging up the belt or disc.

9. Only _____ person can use this _____ at a time.

Napkin Holder

1. Gather your materials- 1 @ 1 X 6 X 18", 1 block @ 10" X 1 ¾" X 1 ¾".

2. On the crosscut table saw cut your bottom piece at 7", and your two sides at 5"

3. On the Dado Saw, have the instructor cut the 3/8 deep slots in your two side pieces.

4. Cut the two slots in your sides. Find the center of 5 ½" and draw a line down the Center. Draw two lines ½" on either side of the center line for a 1" slot. Tape your Two sides together.

5. On the drill press use a 1" paddle bit and drill a hole in the center of the sides 1 ½" from the top. Drill the hole all the way through both sides.

6. On the band saw, cut out the remainder of the slot.

7. Draw a design on your sides to give it style. Keep your pieces taped together And use the band saw to make your cuts.

8. On the lathe set up your 10" X 1 ¾" X 1 ¾" block. Once you have turned your Piece round on the lathe, turn the sections that fit into the slots down to 7/8" Diameter. Use a set of calipers to ensure that your diameter is 7/8". Add bold Designs to you piece in the middle section.

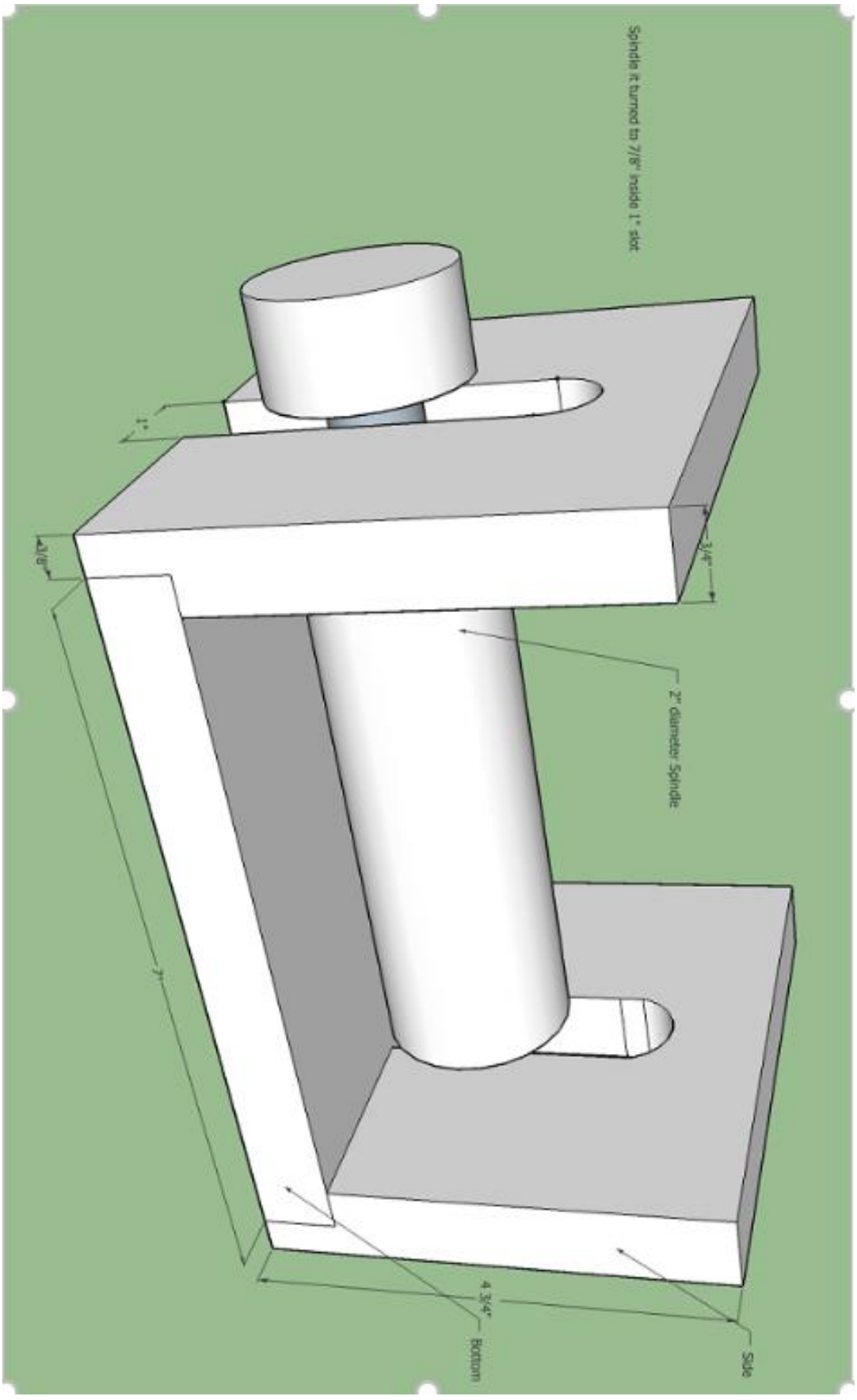
9. Fit all your pieces together with clamps to ensure that everything is Accurately sized <u>before you put on the glue</u>. Once it all fits together, put glue In the dado slots and clamp it together. Remember to put the turned piece Into the center before you glue it!

10. Once the project dries overnight, sand the sides and break the edges.

11. If you want to add a design, you can wood burn an image on your project.

12. Wipe on an oil stain to protect your project and wipe off the excess oil. Write your name on the bottom of your project!

13. Fill out your evaluation sheet and have your project graded.


Spindle it turned to 7/8" inside 1" slot
1"
3/8"
3 1/4"
2" diameter Spindle
7"
4 3/4"
Bottom
Side

Napkin holder grade sheet Date: _____

Directions: Complete all 3 question below to the best of your ability. Use complete sentences and use technical terms to explain your answers. Once completed, have a student grade your project using the rubric posted in the shop. Finally, submit project to instructor for final grading.

1. What did you do well on this project? _____
_____
_____
_____

2. What could you have improved on this project? _____
_____
_____
_____

What new skill did you learn while working on this project? _____
_____
_____
_____

Peer Grade Name of peer :

Time Mgmt.	Craftsmanship	Assembly	Finish	Eval. Form
/4	/4	/4	/4	/4

Total: /20 x 2=

Instructor Grade

Time Mgmt.	Craftsmanship	Assembly	Finish	Eval. Form
/4	/4	/4	/4	/4

Total: /20 x 2=

To receive extra credit have your parent/ guardian sign below and share any comments they might have about your hard work.

Parent/guardian signature _____

Comments _____
_____
_____
_____

Biscuit Joiner Safety

1. Safety glasses must be worn while operating the biscuit joiner.

2. To safely operate the biscuit joiner, you must tie back long hair, eliminate loose clothing and remove any jewelry.

3. Mark all of the cuts you need to make clearly on your wood with a pencil so they can be sanded off later.

4. Secure your work piece down to a workbench with a clamp or vice.

5. Make all of your adjustments with the power cord disconnected.

6. Never put your hand in front of the blade when the power cord is plugged in.

7. Place the biscuits between 8” to 10” apart, and 2” from the edge of the wood.

8. Use the correct size biscuits for the size slot cut into the wood.

9. When gluing boards together, place glue along one edge of the wood, and glue into both sets of cut slots.

10. When finished with the biscuit joiner, sweep up any sawdust and return the tool to the cabinet.

Biscuit Joiner Written Test

1. Safety glasses must be _____ while operating the biscuit joiner.

2. To safely operate the biscuit joiner, you must _____ _____ long hair, _____ loose clothing and _____ any jewelry.

3. Use the correct size _____ for the size slot cut into the wood.

4. Mark all of the cuts you need to make _____ on your wood with a _____ so they can be _____ off later.

5. Place the biscuits between _____ to _____apart, and _____ from the edge of the wood.

6. Make all of your adjustments with the _____ cord disconnected.

7. When gluing boards together, place _____ along one edge of the wood, and _____ into both sets of cut slots.

8. Never put your _____ in front of the _____ when the power cord is plugged in.

9. Secure your work piece down to a workbench with a _____ or _____.

10. When finished with the biscuit joiner, sweep up any _____ and return the tool to the _____.

Miter/Chop Saw Safety

1. Always wear eye protection while operating the miter/chop saw.

2. Long hair, jewelry, and loose clothing must be appropriately confined so as they don't get caught in the saw blade.

3. Always hold the work piece firmly against the table and the fence. If the work piece is warped and cannot be held firmly against the fence, flip it over to the other side.

4. Be sure to check that no scrap wood was left on the table that may prevent your work piece to be held firmly against the fence.

5. Allow the blade to come to full speed before starting the cut.

6. Never start the blade with it touching the work piece. It is libel to throw the work piece from your hands.

7. Make sure that the guard is in place and operating properly.

8. Be sure that all adjustments in the miter gauge are locked down and secure.

9. Always check the gauge setting before starting your cut. Never assume the person before you needed the same angle cut.

10. Wait for the motor to stop fully before starting your next cut.

11. Wait for the motor to fully stop before leaving the machine. Once the motor has stopped, clean up your scrap and throw it in a waste can.

Miter/Chop Saw Written Test

1. _____ _____, _____ and _____ _____ must be appropriately confines so as they don't get caught in the blade.

2. Be sure to check that no _____ _____ was left on the table that may prevent you from holding your work piece _____ against the fence.

3. Allow the blade to come to _____ _____ before starting your cut.

4. Be sure that the _____ is in place and operating _____.

5. Always wear _____ _____ when operating the miter/chop saw.

6. Never start the blade with it _____ the work piece, or you may get it _____ from your hands.

7. Be sure that all the _____ in the _____ _____ are locked down and secure.

8. Always hold your work piece _____ against the table and the _____.

9. Wait for the motor to _____ _____ before leaving the miter/chop saw. Clean up your _____ and throw it away in the _____can.

Square Table

For This project, you will be using a 8’ length of 1” X 6” Spruce. There is NO scrap left after building it, so measure and make your cuts carefully.

1. Obtain (1) 1X6 8’ spruce board from the instructor
2. Cut (3) 15” pieces for the top of your table on the chop saw.
3. Using the table saw:
    a. Set the fence to exactly 5 ¼” and rip one edge of all 3 boards
    b. Set the fence to exactly 5” and rip the last 3 factory edges (These three pieces will now make a top of 15” X 15”)
4. Using a biscuit jointer, cut a total of 12 pockets into the table top boards. Biscuit locations are 3”, 7.5” and 12” from the end.
5. Glue and clamp table top. Use 3 clamp to make sure the table top is perfectly flat and square.
6. Scrape and rough sand table top.
7. Using a table router, cut an attractive profile on the top edge of the table top.
8. For the legs, cut two lengths of boards at 14” from the remaining 1x6 material on the crosscut table/ chop saw.
9. To layout leg parts, draw a diagonal line the length of the leg shown in figure 3. You will now have the outline of your legs that are 3 ½” at the top and taper down to 2”.
10. Cut the diagonal line on the band saw.
11. Using the belt sander, sand the newly cut edge on each table leg.
12. The tops and bottoms of each leg need to be cut at a 10-degree angle on the chop saw. The bottom 10-degrees can be cut first, then set a stop on the chop saw and cut all the tops to the same exact length. (See instructor for demonstration)
13. The skirt of the table is cut out of the remaining 1x6 material. On the table saw, rip the board in half at 2 11/16”.
14. Using the chop saw miter each skirt at a 45 degree angle on each side. * Each angle should be opposing each other*. Each skirt must have an exact length of 11”.

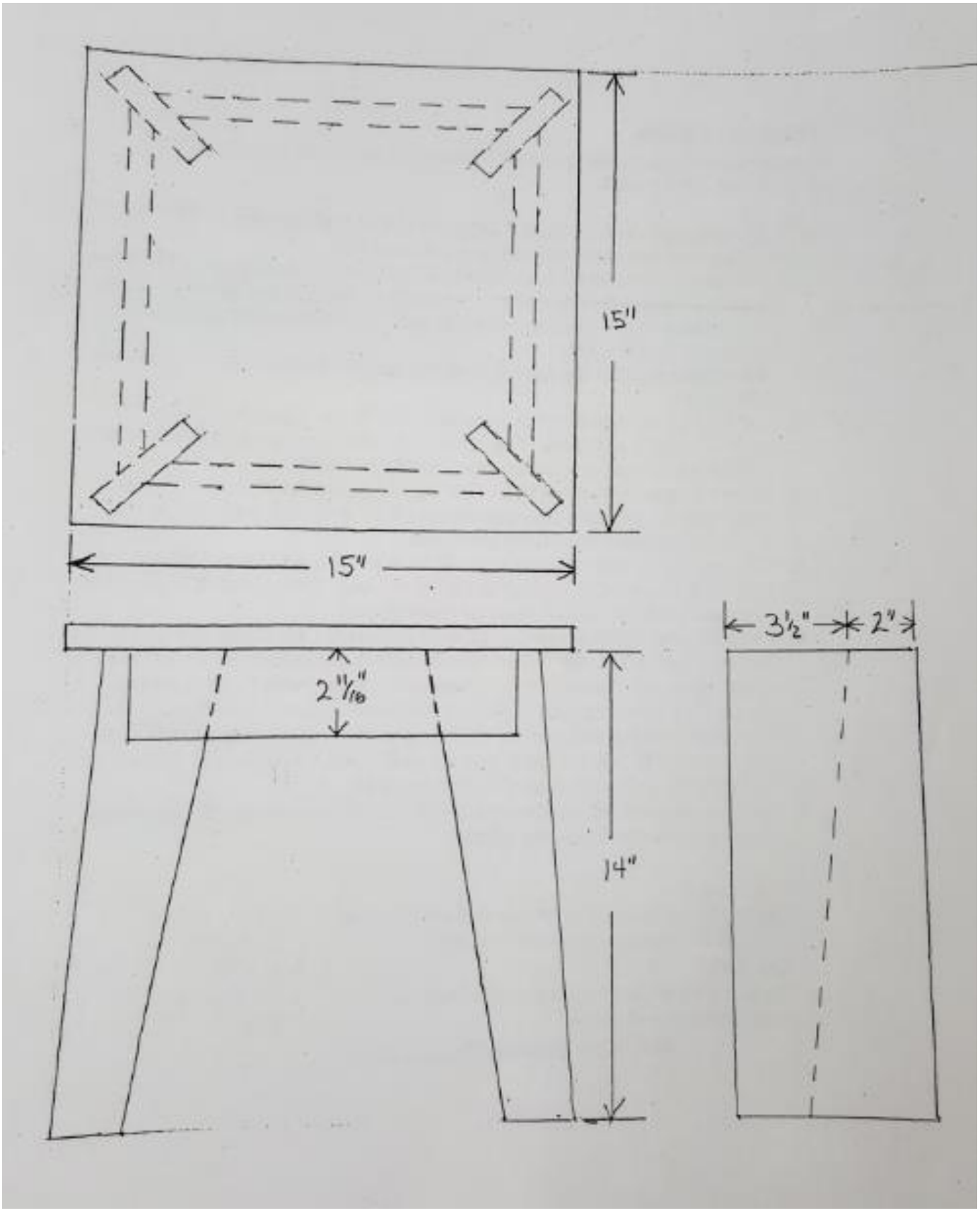
15. Using a combination square, layout fastner locations on the underside table top:
    a. First, draw a 45 degree line from each corner 4.5” long

    b. Second, draw two lines parallel from the center line exactly 3/8”
    c. Third, draw a perpendicular line 1” from the corner, up the center line, to indicate the location for positioning the leg.
    d. Lastly, mark 2 fastener locations on the center line exactly 2” and 3.5” from the corner.

1. Using a cordless drill, bore all 8 fastener locations from the bottom of the table top using a 1/8” twist bit.
2. Using a cordless drill with a 3/8” counter sink bit, bore a counter sink hole exactly 3/8” deep from the top of the table top board.
3. The legs must be positioned within the layout marks on the bottom of the table top before screws can be put in. Attach the legs to the top using 1 ¼” wood screws and wood glue. Be sure to get help from a partner with this step.
4. Attach shirt to legs using pocket-hole screws and wood glue. (See instructor for demonstration)
5. To hide the fasteners in the table top, glue 3/8” wood plugs in place. Be sure to use the correct diameter and align the wood grain in the same direction as the table top itself. Once the glue has set up, sand plug flush with the table top.
6. Finish sand all surfaces using 100-220 grit sandpaper. Be sure to break all edges and remove any visible scratches.

7. Finish the table with two coats of water-based varathane. Complete

   project evaluation form and submit for grading


15"
15"
3½"
2"
2"1/16"
14"

Square table grade sheet Date _____

Directions: Complete all 3 question below to the best of your ability. Use complete sentences and use technical terms to explain your answers. Once completed, have a student grade your project using the rubric posted in the shop. Finally, submit project to instructor for final grading.

3. What did you do well on this project? _____
_____
_____
_____

4. What could you have improved on this project? _____
_____
_____
_____

5. What new skill did you learn while working on this project? _____
_____
_____
_____

Peer Grade **Name of peer :**

Time Mgmt.	Craftsmanship	Assembly	Finish	Eval. Form
/4	/4	/4	/4	/4

Total: /20 x 2=

Instructor Grade

Time Mgmt.	Craftsmanship	Assembly	Finish	Eval. Form
/4	/4	/4	/4	/4

Total: /20 x 2=

To receive extra credit have your parent/ guardian sign below and share any comments they might have about your hard work.

Parent/guardian signature _____

Comments _____
_____
_____
_____

Do Now Worksheets

1

Renton School District

Construction

Student Workbook

Name_____ Period_____

Table of Contents

General Safety

1. Always wear eye protection, wear safety glasses or a face shield.

2. Use only the equipment when the instructor is in the shop.

3. Get the instructors permission before you use the equipment.

4. Use only equipment you have been trained on and know how to operate safely. If you have any questions, ask the instructor.

5. Report all accidents or injuries immediately to the instructor.

6. Don't use tools or equipment that is in any way defective or broken. Tell the instructor if a tool is dull or broken or not working properly.

7. Keep clothes tucked in and sleeves rolled up. Loose clothing can get caught in machinery.

8. Tie back long hair to keep it out of the way.

9. Remove or tuck in any jewelry.

10. Wear closed toed shoes. Do not wear sandals in the shop

11. Wear a dust mask when working around a lot of dust.

12. Clean up liquid spills immediately. Don't leave anything on the floor someone could slip in.

13. Throw away oily rags in a metal container with a metal lid. Oily rags can ignite through spontaneous combustion.

14. Know where the fire extinguishers are located and how to use them before an emergency happens.

15. Keep cabinet doors and drawers closed.

16. Don't leave anything on the floor that can be tripped over.

17. Vices are to be closed when not in use.

18. When you turn off a machine, stay with it until it has completely stopped. Clean up any debris and replace guards.

19. When lifting anything heavy, lift with your legs and not your back.

General Safety Written Test

Fill in the blanks:

1. Always wear eye _____, wear safety glasses or a _____ _____ while on the lathe.

2. Only work on the equipment when the _____ is in the shop.

3. Tie back _____ _____ and _____ in or _____ any jewelry.

4. Report all _____ or _____ immediately to the instructor.

5. Wear _____ _____ shoes. Never wear _____ in the shop.

6. When you _____ _____ a machine, stay with it until it completely stops. Clean up any _____ and replace any guards.

7. Keep cabinet doors and drawers _____. Vices are to be _____ when not in use.

8. Know where the _____ _____ are and how to use them.

9. Throw away _____ _____ in a metal container with a metal lid.

10. When lifting anything heavy, lift with your _____ not your _____.

11. Remove or tuck in any _____ so it doesn't get caught in machinery.

12. Don't use any tools or equipment that is in any way_____ or _____.

13. Get the _____ permission before you use the equipment.

14. Never _____ in the shop, walk!

Hand Tool Safety

1. Always wear eye protection, wear safety glasses or a face shield.

2. Before you use a tool, check to be sure it is clean and in good condition.

3. Before you use a tool, know how to use it safely and properly. Ask the instructor if you have any questions how to use a tool.

4. Never run your fingers along a tool blade to check for sharpness, you'll cut yourself.

5. Never use a dull, broken or defective tool. Report any defective tools to the instructor.

6. Always carry tools by the handle, with the blade pointed down.

7. Clamp your work piece down to a bench so you have both hands to use the tool properly.

8. Never aim a cutting tool towards your arms, hands or body. Aim the tool away from yourself and from others.

9. Always keep your hands and arms out of the path of a cutting tool.

10. When you are finished with a tool, return it to the storage area. Don't leave tools laying around.

11. Always use the right tool for the job. Use the tool designed for the work you want to do.

12. Be sure the handle is fitting tightly into the tool before you use it.

Hand Tool Safety Written Test

Fill in the blanks:

1. Always wear _____ _____, wear safety glasses or a _____ _____.

2. Never run your _____ along the tool blade to check for _____, you may cut yourself.

3. When you are finished with a tool, return it to the _____ _____.

4. Always carry a tool by the _____, with the blade pointed _____.

5. Always use the _____ _____ for the job. Use the tool that is designed for the work you want to do.

6. Never use _____, _____, or defective tools. Report any defective tools to the instructor.

7. Always keep your _____ and _____ out of the path of a cutting tool.

8. Never aim a _____ _____ towards your arm, hands or body. Aim the tool away from yourself or from others.

9. Before you use any tool, learn how to use it _____ and _____.

10. Clamp your work piece down to a _____ so you will have both hands to use the tool properly.

Power Equipment and Portable Power Tool Safety

1. Always wear eye protection, wear safety glasses or a face shield.

2. Don't use any of the power tools unless you have been instructed how to use them correctly and safely.

3. If you don't feel well or you can't concentrate, tell the instructor. Don't use any of the equipment unless you can give it your full attention.

4. When you approach a machine, be sure the person who used it last turned it off, it is completely stopped, and they cleaned up their waste.

5. Check to see that all the safety guards are working properly.

6. Never remove safety guards without the instructors permission.

7. If a machine doesn't sound right or if it doesn't work properly, don't use it.

8. Minor adjustments should always be made with the machine turned off and completely stopped.

9. Keep yourself balanced, don't overreach or put your weight on the machine.

10. Check the condition of the wood, it must be clean and free of defects.

11. Wait for machine to come up to full speed before starting the cut.

12. Use an even, steady pressure to make cut. Don't force or overload machine.

13. If the material is large or heavy, get some help. Ask someone to "tail-off" for you. The "tail-off" helper supports the material during the cut.

14. Get permission to use special set-ups, jigs or attachments. Ask instructor to double-check set-ups before you use them.

15. Don't let anyone distract you while you are using machinery. Stay focused.

16. Stay out of the danger zones when someone is using equipment, and make sure others stay clear while you are using the equipment.

17. Use a brush to clean off the equipment, and a broom to sweep the floor of debris.

Power Equipment and Portable Power Tool Safety Written Test

1. Always wear eye _____, wear safety glasses or a _____ _____ while on the lathe.

2. Don't use any of the equipment unless you have been shown how to _____ and _____.

3. Before you turn a machine on, check to see that all the _____ _____ are working properly.

4. Keep yourself _____, don't _____ or put your weight on the machine.

5. Use an even, _____ _____ to make a cut. Don't force or _____ a machine.

6. Wait for a machine to come up to _____ _____ before making a cut.

7. If the material is large or heavy, get some help. Ask someone to _____ _____.

8. Don't let anyone _____ you while you are using machinery. Stay focused.

9. If a machine doesn't _____ right or it doesn't work properly, don't use it.

10. Stay out of the _____ _____ when someone is using the equipment, and make sure others stay _____ while you are using the equipment.

11. Never remove _____ _____ without the instructors permission.

12. Minor adjustments should be made with the machine _____ _____ and completely stopped.

13. When you approach a machine, be sure the person who used it last _____ _____ _____, it is completely _____, and they cleaned up their _____.

Miter/Chop Saw Safety

1. Always wear eye protection while operating the miter/chop saw.

2. Long hair, jewelry, and loose clothing must be appropriately confined so as they don't get caught in the saw blade.

3. Always hold the work piece firmly against the table and the fence. If the work piece is warped and cannot be held firmly against the fence, flip it over to the other side.

4. Be sure to check that no scrap wood was left on the table that may prevent your work piece to be held firmly against the fence.

5. Allow the blade to come to full speed before starting the cut.

6. Never start the blade with it touching the work piece. It is libel to throw the work piece from your hands.

7. Make sure that the guard is in place and operating properly.

8. Be sure that all adjustments in the miter gauge are locked down and secure.

9. Always check the gauge setting before starting your cut. Never assume the person before you needed the same angle cut.

10. Wait for the motor to stop fully before starting your next cut.

11. Wait for the motor to fully stop before leaving the machine. Once the motor has stopped, clean up your scrap and throw it in a waste can.

Miter/Chop Saw Written Test

1. _____ _____, _____ and _____ _____ must be appropriately confines so as they don't get caught in the blade.

2. Be sure to check that no _____ _____ was left on the table that may prevent you from holding your work piece _____ against the fence.

3. Allow the blade to come to _____ _____ before starting your cut.

4. Be sure that the _____ is in place and operating _____.

5. Always wear _____ _____ when operating the miter/chop saw.

6. Never start the blade with it _____ the work piece, or you may get it _____ from your hands.

7. Be sure that all the _____ in the _____ _____ are locked down and secure.

8. Always hold your work piece _____ against the table and the _____.

9. Wait for the motor to _____ _____ before leaving the miter/chop saw. Clean up your _____ and throw it away in the _____can.

The Portable Circular Saw

Portable Circular Saw Safety

1. Wear safety glasses and hearing protection.

2. Stock must be well supported so the kerf will not close, bind the blade, and cause a kickback

3. Support thin materials near the cut; Clamp small pieces to a sturdy base before cutting.

4. Adjust the depth of cut so the ends of three teeth are visible as the blade extends through the stock, 1/4" teeth extension is maximum.

5. Before using a saw, check the base and angle adjustments to be sure they are tight.

6. Locate the electrical cord so it will not become entangled in the work or be cut by the saw blade.

7. Always place the saw base on the stock with the blade not touching the material before starting the saw.

8. Keep both hands on the saw if two handles are provided.

9. Make sure the saw blade has stopped rotating before putting the saw down.

10. Always unplug the saw to make adjustments or to change blades.

11. Always use sharp blades and keep the blade guard functional.

12. Do not overextend or over reach and lose your balance when using the portable circular saw.

13. Try to saw materials so that saw dust will not be thrown or blown in the operators face.

Portable Circular Saw Operating Procedures

1. Select the correct blade for the type of cut being made and the type of material being cut.

2. Adjust the saw base so the blade extends through the material being cut by no more than 1/4"

3. Mark material so that a good visible line is present to help guide the cut.

4. Align the saw blade on the waste side of the cut line. The line should still be visible after the cut has been made.

5. Use one hand to grasp the saw guard lift handle and retract the retractable (movable) guard a little to get the cut started.

6. Align the cut line on the material with the proper notch or mark on the saw base to get the desired location of the cut. Most saws will have more than one notch or mark so the operator can adjust the saw position to get the desired cut.

7. Push the saw through the material at a steady pace. Avoid going too fast, this condition can be recognized by noticeable reduction in the RPM's of the saw blade.

8. For long straight cuts a guide can be clamped to the material and the saw base can be pushed along the guide.

9. For long cuts the operator may desire to lock the trigger switch in the "on" position. Be sure to check and see that the ON/OFF lock on the trigger switch is functioning properly.

10. To make a "plunge" or internal cut in a piece of material rest the front of the base on the material, retract the retractable guard, hold the saw good and sturdy, turn the switch on, and slowly lower the saw blade into the material. Continue to push the saw blade down until the blade cuts completely through the material.

The Portable Circular Saw Safety Test

1. When operating the circular saw you must always wear _____ and eliminate any loose _____.

2. Adjust the depth of cut so the _____are visible as the blade extends through the stock, _____extension is maximum.

3. Always _____to make adjustments or to change blades.

4. Locate the _____so it will not become entangled in the work or be _____ by the saw blade.

5. Stock must be _____so the kerf will not close, bind the blade, and cause a _____.

6. Always unplug the saw to make _____ or to _____.

7. Always place the saw base on the _____with the blade _____ before starting the saw.

8. Do not _____ or over reach and _____ _____ when using the portable circular saw.

9. Mark material so that a good _____ is present to help _____ the cut.

10 Align the saw blade _____ of the cut line. The line should _____ after the cut has been made.

11. Use one hand to grasp the saw _____ and retract the retractable guard a little to get the _____.

Wall Framing

Go to:https://www.okcareertech.org/educators/cimc/resources/downloads-1/skills-to-rebuild-construction-training-resources/TE3300WallFraming2005.pdf

Or http://www.visualdictionaryonline.com/house/structure-house/frame.php

Define these terms as they would be used in building a wall, put definition is in your own terms!

Top plate _____

_____

Sole plate _____

_____

Common Stud _____

_____

Double top plate _____

_____

King Stud _____

_____

Header _____

_____

Rough sill _____

_____

Cripple stud _____

_____

Rough Opening _____

_____

Trimmer stud _____

_____

Corner Assembly _____

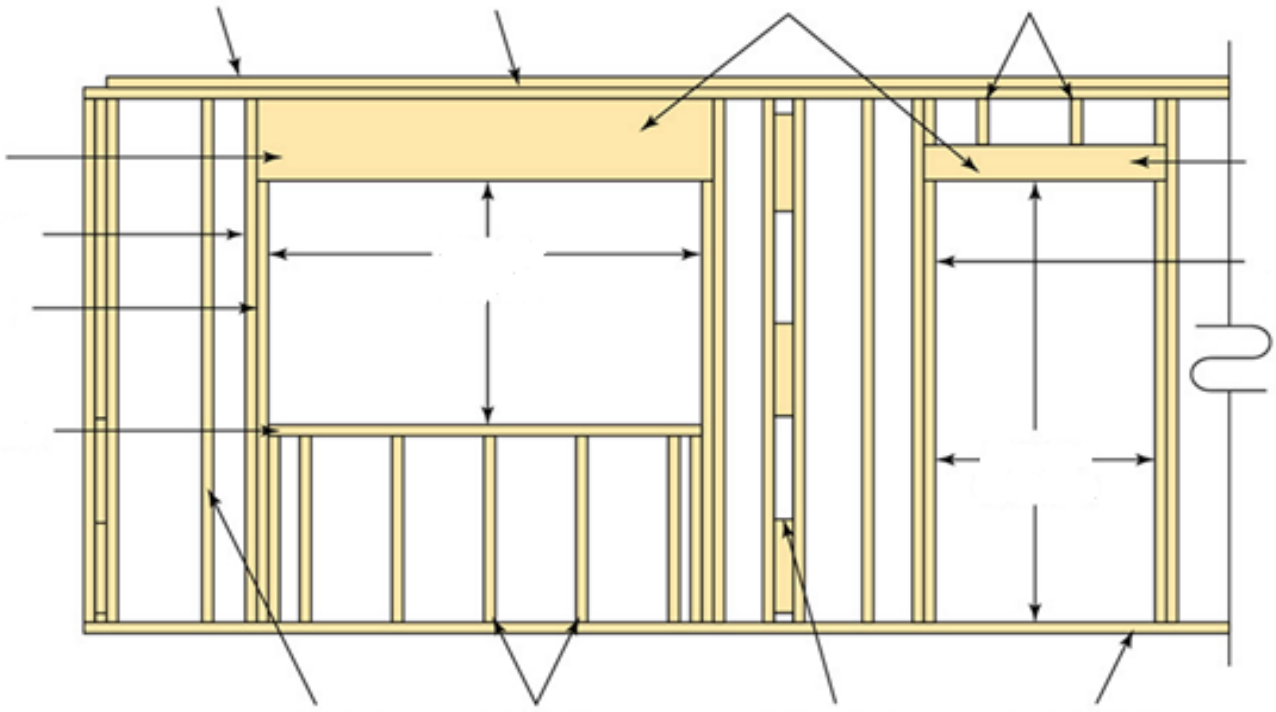
_____

Patrician Wall _____

_____

What is the standard spacing between studs? _____

Label the parts of the wall, using definitions you just looked up



Score _____ / 23

Draw out the framing members of a wall that is 48” long, 8’ tall with a double top plate. After you have drawn the wall, create a cutlist for the parts you would need. All parts will be 2 X 4s. Use a **ruler** for your drawing and **label** your parts.

Cutlist:

Part	Quantity	Length

Score _____ / 15

Draw out the framing members of a wall that is 96” long, 8’ tall, and has a 32” x 80” tall door in the center with a double top plate. After you have drawn the wall, create a cutlist for the parts you would need. All parts will be 2 X 4s. Use a **ruler** for your drawing and **label** your parts.

Cutlist:

Part	Quantity	Length

Score _____ / 20

Wall Framing rubric-

	1 (Basic)	2 (Developing)	3 (Good)	4 (Outstanding)
Height and width of walls	Walls are more than ½" off from plan	All walls are within ½" of the plan.	All walls are within ¼" of the plan	All walls are within 1/8" of the plan
Door and window openings	Openings are more than ½" off from plan	All Openings are within ½" of the plan.	All Openings are within ¼" of the plan	All Openings are within 1/8" of the plan
Stud placement	stud placements are more than ½" off from plan	All stud placements are within ½" of the plan.	All stud placements are within ¼" of the plan	All stud placements are within 1/8" of the plan
Participation	Rarely working, not sure what the project is.	Working partially, only 35 minutes a day	Working most of the time, 45 minutes a day.	Fully participating 55 minutes each day.
Set at 90 degrees	Off by more than 2degrees	Off by 2 degrees	Off by 1 degree	Dead on 90 degrees

Group _____

Height and width of walls _____ X 2 _____

Door and window openings _____ X 2 _____

Stud placement _____ X 2 _____

Participation _____ X 3 _____

Set at 90 degrees _____ X 1 _____ + = Total _____ / 40

Wall Framing Test

Draw out a wall with its framing members that is 8’ tall and 64” wide and a double top plate. Use a **ruler** for your drawing and **label** your parts. (12 pt)

Write up a cut list for this wall, listing the amount of 8’ 2 X 4s needed and the size. (8 pt)

Part	Quantity	Length

If an 8’ 2 X 4 cost $3.05, what would be the material cost of this project? (2 pt) _____

_____

_____

What would the measurement be of the diagonal to make the wall square? (2 pt) _____

_____

_____

_____

For a wall that is 8’ tall and 12’ wide, how many vertical studs will you need? (2 pt) _____

_____

_____

_____

For a wall that is 8 feet tall and 12’ feet long, how many sheets of drywall will it take to cover the wall? Sheets of drywall are 8’ X 48”. (2 pt) _____

_____

_____

How many 2X4’s does it take to build a wall that is 8’ tall and 6’ wide? (4 pt) _____

_____

_____

_____

Score _____ / 32

Stair building

You are to build a stairway that is 28” for your total height.

High many risers will you have? (1 pt.)

How high is each riser? (2 pt.)

How many treads will you have? (1 pt.)

What is the length of each tread? (1 pt.)

What will be your total run for the stairs? (2 pt.)

How high up is your platform? The first step is sitting on top of your platform and even in the front, so you will need to subtract out the height of the platform from your first riser. (2 pt.)

How thick is the tread material? You will need to subtract that out of the height also from the first riser. Draw your stairs with dimensions. (5 pt.)

_____ / 14 Pts.

Stair rubric

	1 (Basic)	2 (Developing)	3 (Good)	4 (Outstanding)
Height and width of stairs	stairs are more than ½" off from plan	All stairs are within ½" of the plan.	All stairs are within ¼" of the plan	All stairs are within 1/8" of the plan
Railing height	Railings are more than ½" off from plan	All railings are within ½" of the plan.	All railings are within ¼" of the plan	All railings are within 1/8" of the plan
Balusters	baluster placements are more than ½" off	All baluster placements equal within ½"	All baluster placements equal within ¼"	All baluster placements equal within 1/8"
Individual participation	Involved less than 80% of the time	Involved 80% of the time	Involved 90% of the time	Fully involved 100% of the time
Overall appearance	Some screws set flush with framing members, many hammer marks or split wood.	screws set flush with framing members, some hammer marks or split wood.	screws set flush with framing members, no unnecessary drilling marks.	All screws set flush with framing members, no unnecessary drilling marks or split wood.

Group _____
Height and width of stairs _____ X 2 _____
Railing height _____ X 1 _____
Balisters _____ X 2 _____
Individual participation _____ X 3 _____
Overall apperance _____ X 2 _____ + = Total _____ / 40

Foreman duties:

Four items a foreman needs to monitor daily:

Safety, Schedule and planning, time and cost, quality control

Safety:

Every day hold a safety meeting. In this meeting, make sure everyone has their PPE: safety glasses, hard hats if needed, hair tied back, close toed shoes. Also at the meeting you need to plan your day with your team so you can see the potential hazards or talk through any concerns. At this point, go over safety for each specific task that will be performed that day.

At the end of each day, make sure the site is safe and free of hazards, and all tools and equipment are properly stored.

Schedule and planning:

Along with your safety meeting, you need to convey to your team what you expect to get done by the end of the day, and who is assigned each task. You also will need to make sure your team has the materials and tools they need to continue working. If they don't have the materials and tools and they are not working, you are wasting money.

Time and cost:

Is everyone on your team being productive? If someone on the team is not working, it is wasting money. Have a list of tasks ready every day, and if someone is not working, have them do a task to get the job done. You also need to monitor the use of materials. Is your team using the materials the best that they can, or is there waste of materials, that will cost you money?

Quality control:

You will need to ensure that the project is following the plan. If the project is not following the plan, you need to stop and have the team fix the problem. For wall framing and drywall work, everything needs to be within 1/8" of what is written on the plan. Make sure you are measuring the work, and that it is of the highest quality possible.

The skills need to be an effective foreman:

Planning, Communication, Interpersonal Relationships, Technical skills

Foreman checklist

Week of _____

Safety:

	Mon	Tues	Wed	Thurs	Fri
Daily safety meeting					
End of day inspection					
Tools and materials stored					

Safety topics discussed:

Mon _____

Tues. _____

Wed. _____

Thurs. _____

Fri. _____

Schedule and planning:

Day	Daily expectations	Were they met?
Mon		
Tues		
Wed		
Thurs		
Fri		

Tasks that need to be done _____

_____

_____

_____

_____

Score _____ /18

Foreman checklist

Week of _____

Safety:

	Mon	Tues	Wed	Thurs	Fri
Daily safety meeting					
End of day inspection					
Tools and materials stored					

Safety topics discussed:

Mon _____

Tues. _____

Wed. _____

Thurs. _____

Fri. _____

Schedule and planning:

Day	Daily expectations	Were they met?
Mon		
Tues		
Wed		
Thurs		
Fri		

Tasks that need to be done _____

_____

_____

_____

_____

Score _____ /18

Foreman checklist

Week of _____

Safety:

	Mon	Tues	Wed	Thurs	Fri
Daily safety meeting					
End of day inspection					
Tools and materials stored					

Safety topics discussed:

Mon _____

Tues. _____

Wed. _____

Thurs. _____

Fri. _____

Schedule and planning:

Day	Daily expectations	Were they met?
Mon		
Tues		
Wed		
Thurs		
Fri		

Tasks that need to be done _____

_____

_____

_____

_____

Score _____ /18

Foreman checklist

Week of _____

Safety:

	Mon	Tues	Wed	Thurs	Fri
Daily safety meeting					
End of day inspection					
Tools and materials stored					

Safety topics discussed:

Mon _____

Tues. _____

Wed. _____

Thurs. _____

Fri. _____

Schedule and planning:

Day	Daily expectations	Were they met?
Mon		
Tues		
Wed		
Thurs		
Fri		

Tasks that need to be done _____

_____

_____

_____

_____

Score _____ /18

Foreman checklist

Week of _____

Safety:

	Mon	Tues	Wed	Thurs	Fri
Daily safety meeting					
End of day inspection					
Tools and materials stored					

Safety topics discussed:

Mon _____

Tues. _____

Wed. _____

Thurs. _____

Fri. _____

Schedule and planning:

Day	Daily expectations	Were they met?
Mon		
Tues		
Wed		
Thurs		
Fri		

Tasks that need to be done _____

_____

_____

_____

_____

Score _____ /18

Foreman checklist

Week of _____

Safety:

	Mon	Tues	Wed	Thurs	Fri
Daily safety meeting					
End of day inspection					
Tools and materials stored					

Safety topics discussed:

Mon _____

Tues. _____

Wed. _____

Thurs. _____

Fri. _____

Schedule and planning:

Day	Daily expectations	Were they met?
Mon		
Tues		
Wed		
Thurs		
Fri		

Tasks that need to be done _____

_____

_____

_____

_____

Score _____ /18

Electrical rubric

	1 (Basic)	2 (Developing)	3 (Good)	4 (Outstanding)
Followed plans for electrical system	More than two wires different from plan	All wires except two are where they show in plan.	All wires except one are where they show in plan.	All wires are where they show in plan.
Instillation of electrical boxes	More than two boxes installed different from plan.	All boxes except two installed like plan, and will all be flush with drywall.	All boxes except one installed like plan, and will all be flush with drywall.	All boxes installed like plan, and will all be flush with drywall.
troubleshooting	Trouble shot more than five times to get system to work.	Trouble shot five times to get system to work.	Trouble shot four times to get system to work.	Trouble shot three times or less to get system to work.
Individual participation	Involved less than 80% of the time	Involved 80% of the time	Involved 90% of the time	Fully involved 100% of the time
Overall appearance	More than two boxed not looking neat, wires may not be nailed	All but two boxes and wires look neat, wire nailed to studs.	All but one boxes and wires look neat, wire nailed to studs.	All boxes and wires look neat, wire nailed to studs.

Group _____
Follow plans for electrical system _____ X 2 _____
Instillation of electrical boxes _____ X 1 _____
Troubleshooting _____ X 2 _____
Individual participation _____ X 3 _____
Overall apperance _____ X 2 _____ + = Total _____ / 40

Grading rubric for individual electrical testing-

Each section you will be graded on a scale of 1-4
1- basic or not seen, 2- developing, 3- just about there, 4- excellent work
Name _____ Station _____

Doing own work	Finish on time	Turn on light	Clean up station	Total
1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	/ 16

Electrical test

How do you wire an electrical outlet? List **all** the steps, tools and procedures. (6 pt.)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

How do you wire an electrical switch and a light fixture? List **all** of the steps, tools and procedures. (6 pt.) _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

If there are two outlets that need to be wired in junction boxes 48” apart, how long will the wire you use need to be? (1 pt.) _____

What is the difference in connection terminals between a switch and an outlet? (1 pt.)

_____

What is the difference in terminals between a single pole switch and three way switch? (1 pt.)

_____

What is material a good conductor of electricity? (1 pt.) _____

What material is a good insulator of electricity? (1 pt.) _____

What is an example of AC, or Alternating Current? (1 pt.) _____

What is an example of DC, or Direct Current? (1 pt.) _____

Draw a diagram of connecting wire in to an outlet. Be sure to **label all the parts**. (7 pt.)

Score _____ /26

Insulation Quiz:

Give three reasons why homes are insulated-

1. _____
2. _____
3. _____

Name three different types of insulation

1. _____
2. _____
3. _____

What is “R-value”? _____

_____

What are four tools needed for insulation?

1. _____
2. _____
3. _____
4. _____

What are three PPE needed for installing insulation?

1. _____
2. _____
3. _____

Score _____/14

Drywall/Paint unit test

What are two reasons you apply primer paint to drywall? (2 pt.)

1. _____

2. _____

How many coats of color paint, at a minimum, do you apply to a wall, and why? (1 pt.) _____

_____

Why do you apply texture to a wall? (2 pt.) _____

_____

_____

What are the procedures for applying texture to a wall? (3 pt.) _____

_____

_____

_____

Name five tools needed to cut drywall? (1 pt.) _____

_____

What are the procedures of hanging drywall and getting it ready to paint? (4 pt.) _____

_____

_____

_____

_____

After you are finished painting, what do you need to do with your equipment? (1 pt.) _____

_____

What is it called when you put two different color paints in a corner of a room? (1 pt.) _____

_____

Why do you put tape on the switches and outlets when you are painting? (1 pt.) _____

_____

Score _____ / 16

Flooring and finish trim work grading rubric

- Flooring finished, trim installed.
- Window or door installed.
- Base molding installed, and molding around door/window.
- All nail holes filled with spackle and sanded.
- All seams between base molding and wall, and wall and sill/jamb caulked.
- Tape wall and paint molding white.
- Tape molding and repaint wall.
- Install outlet covers and switch plates.

Each of the above items will be evaluated. Each item will be given a point value of a 1-4. 4 being of high quality, 1 being of low quality. Each group will receive a score out of a possible 40.

Item	Score 1-4
Flooring finished, trim installed.	
Window or door installed.	_____ X2=____
Base molding installed, and molding around door/window.	_____ X2=____
All nail holes filled with spackle and sanded.	
All seams between base molding and wall, and wall and sill/jamb caulked.	
Tape wall and paint molding white.	
Tape molding and repaint wall.	
Outlet covers and switch plates installed.	

Total score _____ / 40

Plastic Laminate Quiz-

What is the material used under plastic laminate, and why? (1 pt.) _____

_____

What is the glue used to adhere plastic laminate? (1 pt.) _____

_____

List three advantages of plastic laminate countertops (3 pt.)

1. _____
2. _____
3. _____

What is the tool used to trim laminate flush? (1 pt.) _____

_____

Score _____ / 6

Concrete Quiz

Name three parts of concrete-

1. _____
2. _____
3. _____

Name seven uses of concrete-

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Name two types of concrete reinforcement-

1. _____
2. _____

Name the three pieces of PPE you should wear when pouring/mixing concrete-

1. _____
2. _____
3. _____

Score _____ / 15

Construction Careers

Construction Manager

Carpenter

Cabinetmaker

Construction Tradesperson

Construction Laborer

Road Construction and Maintenance Worker

Bricklayer / Stonemason

Building Inspector

Civil Engineer

Concrete Mason

Crane Operator

Elevator Installer and Repairer

Electrician

Glazier

Heating, Air Conditioning, Refrigeration Tech

Heavy Equipment Operator

Insulator

Ironworker

Plumber

Roofer

Sheet Metal Worker

Tilesetter

Drywaller

Painter

Cost Estimator

Woodworker

Construction wall unit presentations-

After you get your molding on and have done all the touch up painting, I want you to have the opportunity to show off your great work. I will be inviting classes to come see your craftsmanship, and you will have the opportunity to talk about the construction of your project.

Each group will talk about one section, and the four sections will be:

- Wall framing
- Electrical wiring
- Drywall, mudding and taping, texture and painting
- Floor installation and window/door installation and molding installation.

Your group will be responsible for each putting together a 4-5 minute presentation about your section, and each group member needs to participate. You will be giving your presentation 2-4 times in a period. You will need to prepare an outline and speaking points, so you will use the rest of the sheet to brainstorm and develop your talking points.

Group members: _____

Your group will speak on: _____

What are the main topics you will speak on?

1. _____
2. _____
3. _____
4. _____
5. _____

What is the order, or outline, of your presentation?

1. _____
2. _____
3. _____
4. _____
5. _____

Score _____ /10

Who Needs Building Codes?

We all do—whether in our homes, offices, schools, stores, factories, or places of entertainment. We rely on the safety of structures that surround us in our everyday living. The public need for protection from disaster due to fire, structural collapse, and general deterioration underscores the need for modern codes and their administration.

HOW RELIABLE ARE THEY? Most aspects of building construction—electrical wiring, heating, sanitary facilities—represent a potential hazard to building occupants and users. Building codes provide safeguards. Although no code can eliminate all risks, reducing risks to an acceptable level helps.

WHAT IS A BUILDING CODE? Practically, it is the government's official statement on building safety. Technically, it is a compendium of minimum safety standards arranged in a systematic manner (codified) for easy reference. It embraces all aspects of building construction—fire, structural, plumbing, electrical, and mechanical.

WHY SHOULD CODES APPLY TO MY OWN HOUSE? For several reasons:

- For your personal safety, and that of your family, and the guests invited into your home.
- To ensure the economic well-being of the community by reducing potential spread of fire and disease.
- For the conservation of energy.
- To protect future home purchasers who deserve reasonable assurance that the home they buy will be safe.

In early America, George Washington and Thomas Jefferson encouraged the development of building regulations to provide for minimum standards that would ensure health and safety. Today, most of the United States is covered by a network of modern building regulations ranging in coverage from fire and structural safety to health, security, and conservation of energy.

To find out about local building codes, go to this link for the City of Renton-

http://rentonwa.gov/business/default.aspx?id=956

Where do you need to go to apply for a building permit? (1 pt) _____

_____

What is the cost of a building permit in the city of Renton? (1 pt) _____

_____

How do I know if I need a building permit? (1 pt) _____

_____

_____

What are the building codes for the city of Renton? (1 pt) _____

_____

Can I do the work on my house, or do I have to hire a licensed contractor? (2 pt) _____

_____

_____

Do I need a permit to build a deck? (1 pt) _____

_____

What are the requirements to get a permit to put a hot tub in my yard? (2pt) _____

_____

_____

In your own words, what are four reasons building codes are needed? (4pt)

1. _____
2. _____
3. _____
4. _____

How reliable are building codes? (3 pt) _____

_____

_____

_____

Score _____ /16

MyBuildingPermit.com
a service of eCityGov.net

CONSTRUCTION TIP SHEET 0
Permits Required
July 1, 2016

This Tip Sheet reflects some permitting requirements resulting from a collaboration of participating jurisdictions.

√ **PERMITS REQUIRED:** Common examples This table provides common examples for home alterations, improvements and additions where permits are typically required. *If work is to be done in a CRITICAL AREA, SHORLINE AREA or SENSITIVE AREA, please check with your local jurisdiction for permit requirements.*	Bellevue	Bothell	Burien	Issaquah	Kenmore	Kirkland	Mercer Island	Mill Creek	Newcastle	Renton	Sammamish	Snohomish County	Snoqualmie	Woodinville
Carports	√	√	√	√	√	√	√	√	√	√	√	☆	√	√
Decks more than 30" above grade (measured vertically to the grade below at any point within 36" of the outer edge of deck)	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Dock repairs and additions	√	√	√	√	√	√	√	NA	√	√	√	√	√	√
Electrical circuits and services	√	↯	√	↯	↯	√	√	↯	↯	√	↯	↯	↯	↯
Exterior doors, windows, and skylights that require a new opening or larger opening	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Fireplaces, wood-burning stoves, and inserts	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Furnaces, air conditioners, and heat pumps	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Garage conversion to living space	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Gas piping	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Home-businesses (home occupations)	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Interior remodels	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Backflow prevention devices	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Mother-in-law apartments (ADU)	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Hose bibs and drinking fountains	√	√	√	√	√	√	√	√	—	√	√	√	√	√
Rockeries and retaining walls over 4' in height or supporting a surcharge	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Spas and saunas that are portable and plug in (requiring no electrical work)	√	√	—	√	—	√	√	—	√	—	—	—	—	√
Spas and saunas that are site built	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Swimming pools, spas, and portable pools (in-ground or above ground) that are more than 2' deep and over 5,000 gallons	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Water heater installation	√	√	√	√	√	√	√	√	√	√	√	√	√	√

√	Permit is required in this jurisdiction	↯	Electrical permits regulated by Washington State Labor & Industries
—	Permit is not required in this jurisdiction	☆	Permit Required if > 200 sq ft inside an Urban Growth Area (UGA) or > 400 sq ft outside of UGA

GENERAL INFORMATION:

- The intent of this Tip Sheet is to provide a general understanding of the code requirements and does not address the subject in great detail.
- Additional information can be obtained from your local participating jurisdiction.

— PERMITS NOT REQUIRED: Common examples This table provides common examples for home alterations, improvements and additions where permits are typically not required*. *If work is to be done in a CRITICAL AREA, SHORELINE AREA OR SENSITIVE AREA, please contact the local jurisdiction to verify that the work listed here is still exempt from a permit.*	Bellevue	Bothell	Burien	Issaquah	Kenmore	Kirkland	Mercer Island	Mill Creek	Newcastle	Renton	Sammamish	Snohomish County	Snoqualmie	Woodinville
Accessory structures (one-story detached) used as tool and storage sheds, tree-supported play structures, playhouses, and similar uses not exceeding _____ square feet	200	200	200	200	200	200	200	200	200	200	200	★	120	120
Bathroom and kitchen fixture replacements without plumbing line modifications such as sinks and toilets (Note: Tub and shower replacement does require a permit.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Decking replacement on decks without changing or adding any other structural members	—	—	—	—	—	—	—	—	—	—	—	—	—	√
Decks less than 30" above grade (measured vertically to the grade below at any point within 36" of the outer edge of deck)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fences not over ____ feet high	8	6	6	6	8	6	6	√	✸	6	6	6	6	6
Interior finish work such as painting, papering, tiling, carpeting, cabinets, countertops, and similar finish work	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Portable appliance replacement in the same location without modification to gas, plumbing lines, or electrical circuits	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Re-roof overlay if limited to 2 total layers of roofing material	—	√	—	—	—	—	—	—	—	—	—	⊕	√	√
Re-roofing (tear off and replace) using same type of roofing provided roof sheathing is not altered	—	√	—	—	—	—	—	—	—	—	—	√	√	—
Retaining walls or rockeries which are not over 4' in height measured from the bottom of the footing to the top of the wall unless supporting a surcharge or supporting sloped ground	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sidewalks and driveways that are not in or connected to the right of way, are not more than 30" above grade and are not over a basement or story below	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Siding replacement when non-structural (except for EFIS - exterior finish and insulation systems - veneer, or stucco)	—	—	—	—	—	—	—	—	—	—	—	—	√	—
Swings, slides, and other playground equipment	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Window and door replacement where opening dimensions are not increased, energy efficiency (U value) is not decreased, and egress window requirements are maintained	—	—	✦	—	—	—	—	—	—	—	—	—	√	—
Window awnings supported by an exterior wall which do not project more than 54" and do not require additional support	—	—	—	—	—	—	—	—	—	—	—	—	—	—

*Even when a permit is not required, work shall still be code compliant

√	Permit is required in this jurisdiction	✸	Permit required if fence is over 6 feet with an additional 2 feet of lattice on top
—	Permit is not required in this jurisdiction	★	Permit Required if > 200 sq ft inside an Urban Growth Area (UGA) or > 400 sq ft outside of UGA
✦	Permit is required if structure is in Airport Noise Reduction Zone 1	⊕	Permit is required if over 1000 square feet

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Building Permits

What are the permit regulations for building a deck? (2) _____

_____

_____

_____

What are the regulations for swimming pools that need permits? (2) _____

_____

_____

If I have an above ground swimming pool, does it need a permit? (1) _____

_____

What are the permit regulations for spas and saunas? (2)_____

_____

_____

_____

If I am putting in a 6' tall retaining wall in my back yard to prevent it from eroding a falling off, will I need a permit? (1)_____

How high of a fence can I build in Renton and not need a permit? (1)_____

What are two instances that I do not need a permit for my deck? (2)_____

_____

_____

_____

Do I need a permit to replace my toilet? (1)_____

Do I need a permit to replace my bathroom tub? (1)_____

Score _____/13 Pts.

MyBuildingPermit.com
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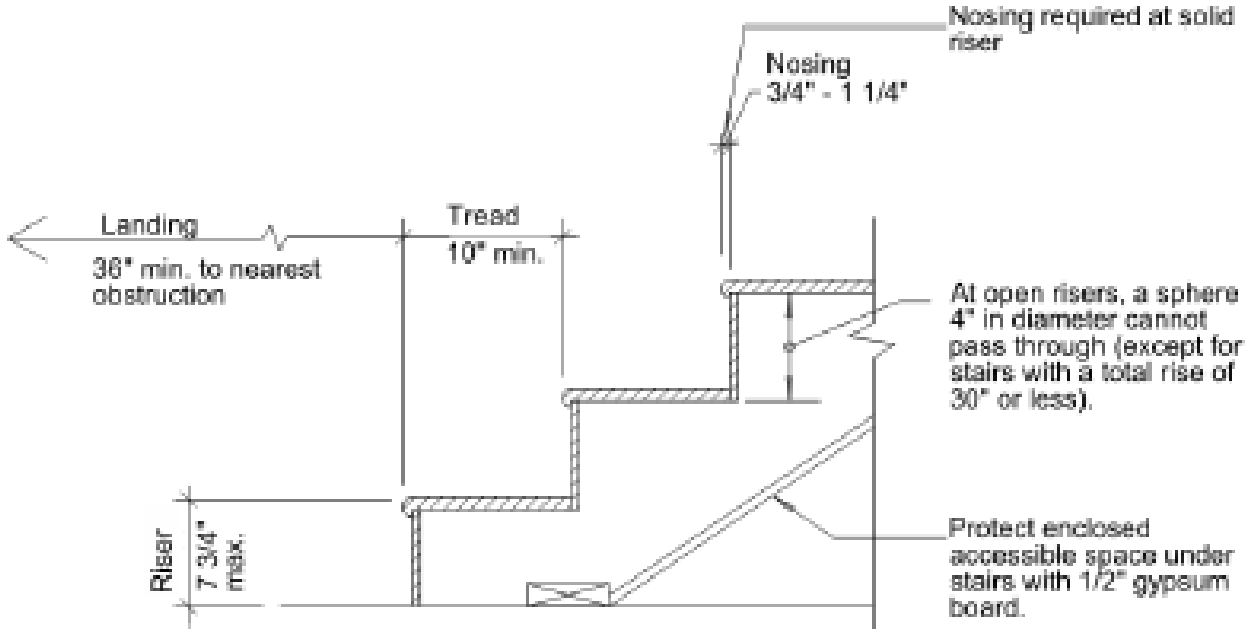
CONSTRUCTION TIP SHEET 1

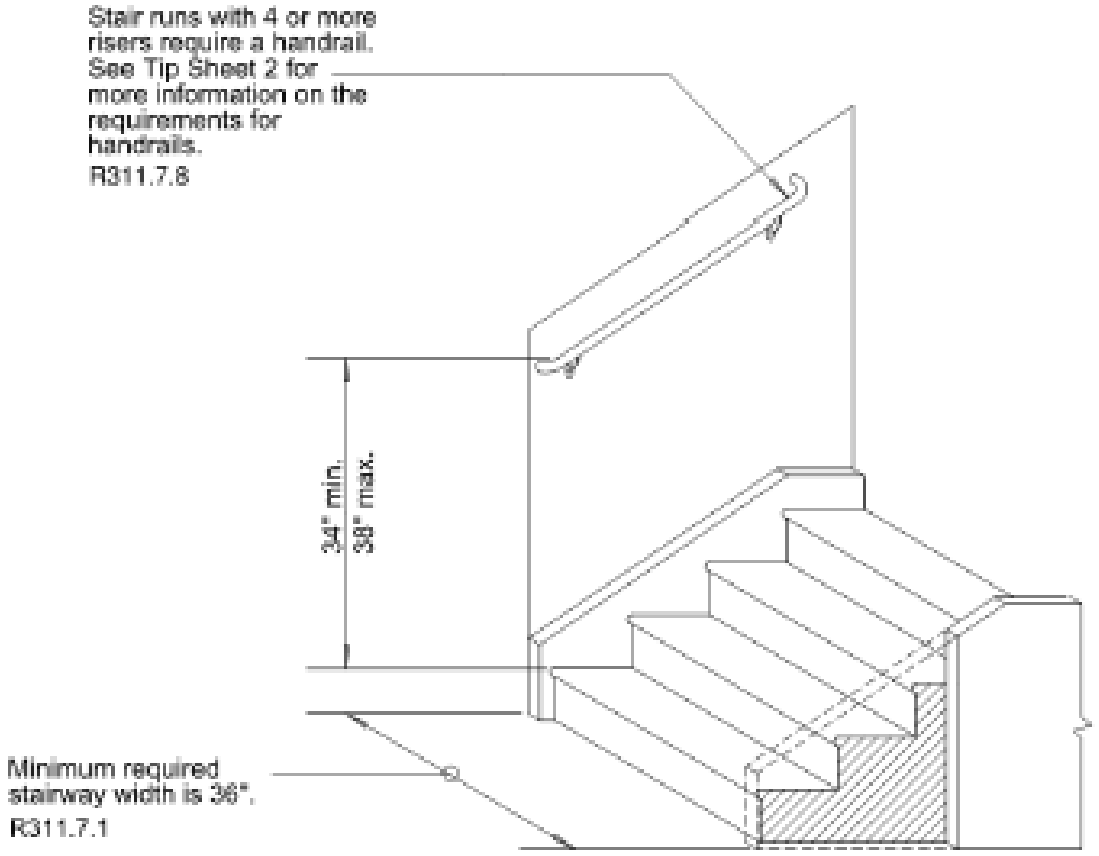
Basic Stairs

July 1, 2016

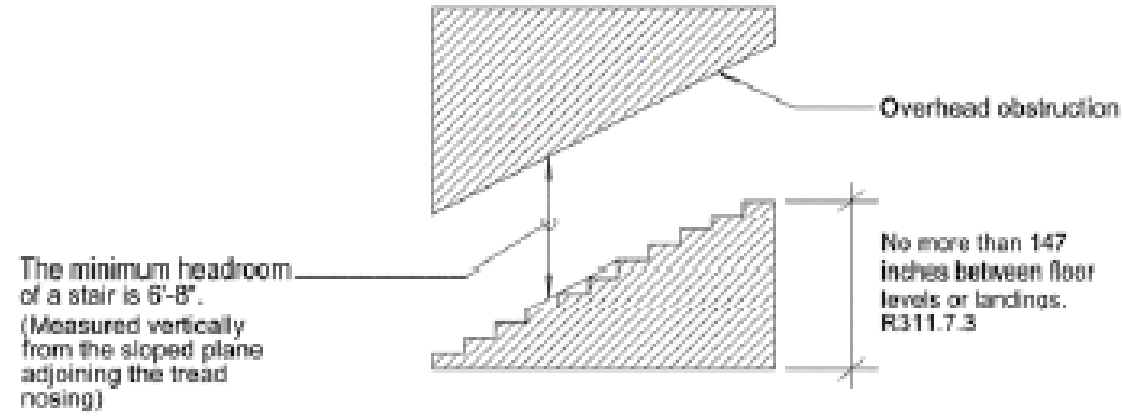
This Tip Sheet reflects code requirements of the 2015 International Residential Code (IRC) with Washington State Amendments.



- **Stair treads and risers:** The largest tread or riser within any flight of stairs is not to exceed the smallest by more than 3/8". (R311.7.5)
- **Illumination:**
  - Interior stairways shall be provided with an artificial light source to illuminate landings and treads. There shall be a wall switch at each floor level to control the light source where the stairway has 6 or more risers. (R303.7)
  - Exterior stairways shall be provided with an artificial light source located at the top landing of the stairway, and located at the bottom landing where accessing a basement. (R303.8)
- **Handrails:** Handrails are required on at least one side for stairways with four or more risers. See Tip Sheet 2 for additional information regarding handrails. (R311.7.8)
- **Landings required:** Landings are required at the top and the bottom of stairways. A floor landing is not required at the top of an interior flight of stairs, provided a door does not swing over the stairs. (R311.7.6)
- **Landing dimensions:** A landing extending the width of the stair and measuring a minimum of 36" in the direction of travel is required at the top and bottom of every stairway. (R311.7.6)
- **Circular, winding or spiral stairways:** For exceptions related to the construction of circular, winding, or spiral stairways. (R311.7.5.2.1 & R311.7.10)



Typical Stair Elevation



Stair Permits

Yes or no answerers also need explanations.

What type of construction are these codes written for? (1) _____

What is the minimum and maximum height of a stair riser? (2) _____

_____

What is the minimum and maximum height of a stair tread? (2) _____

_____

What does it mean “nosing required at a solid riser”? (2) _____

_____

If I put a 7/8” radius nosing on the front of a stair tread, would that meet the code requirements? (1) _____

What are the requirements for stair landings? (4) _____

_____

_____

_____

_____

What are the requirements for handrails? (4) _____

_____

_____

_____

_____

Can I build a 33” wide stairway? (1) _____

Can the distance between the nosing and the sloped planed overhead be 84” (1) _____

_____

Score _____ / 18Pts.

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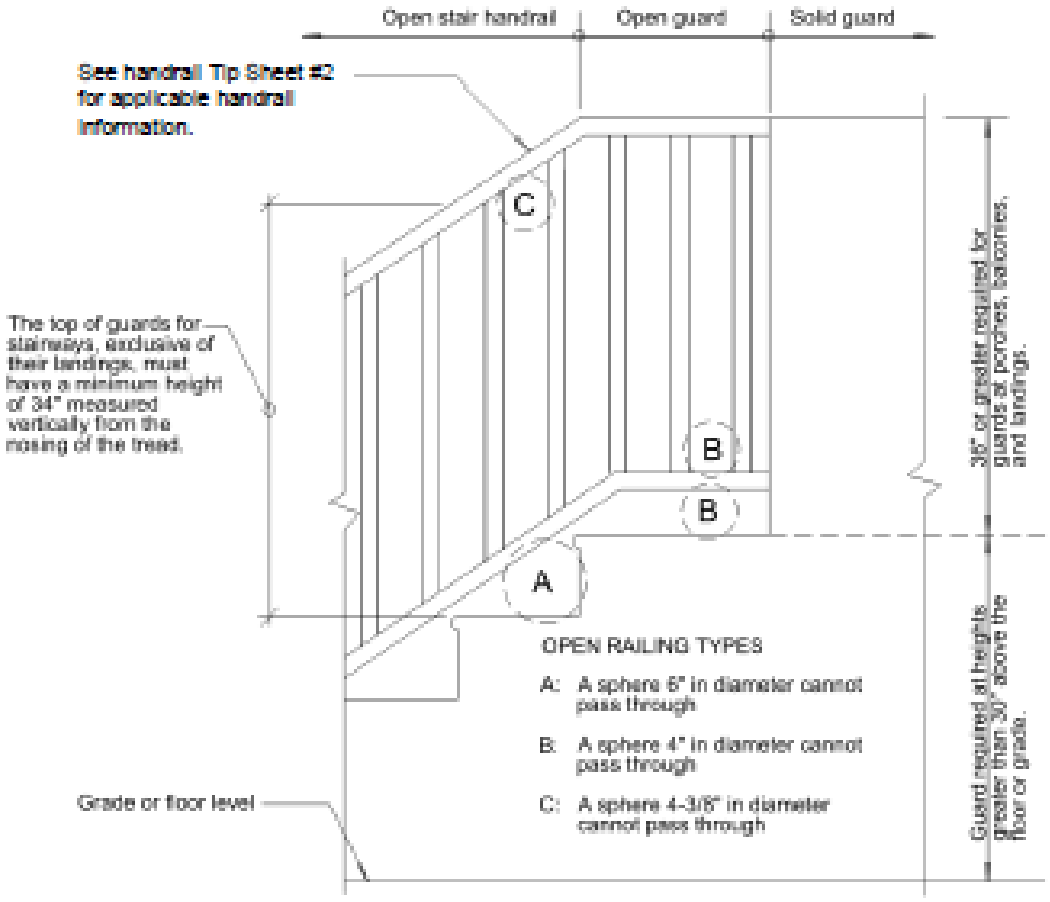
CONSTRUCTION TIP SHEET 3
Residential Guards
July 1, 2016

This Tip Sheet reflects code requirements of the 2015 International Residential Code (IRC) with Washington State Amendments.

This guard diagram illustrates both open and solid guards.



Guard Elevation
R312

Note: Guards shall be structurally designed to comply with IRC Table R301.5.

GENERAL INFORMATION:
- The intent of this Tip Sheet is to provide a general understanding of the code requirements and does not address the subject in great detail.
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Guard rails

Explain how high a guard rail needs to be (3) _____

_____

_____

_____

Explain the distance apart the railing pickets (the vertical pieces) need to be to follow code (2)

_____

_____

Explain how high the bottom portion of the railing needs to be from the top of a landing, and from the top of a stair tread (3) _____

_____

What are the minimum requirements if you have a solid guard on a balcony? (2) _____

_____

Score _____ 10 Pts.

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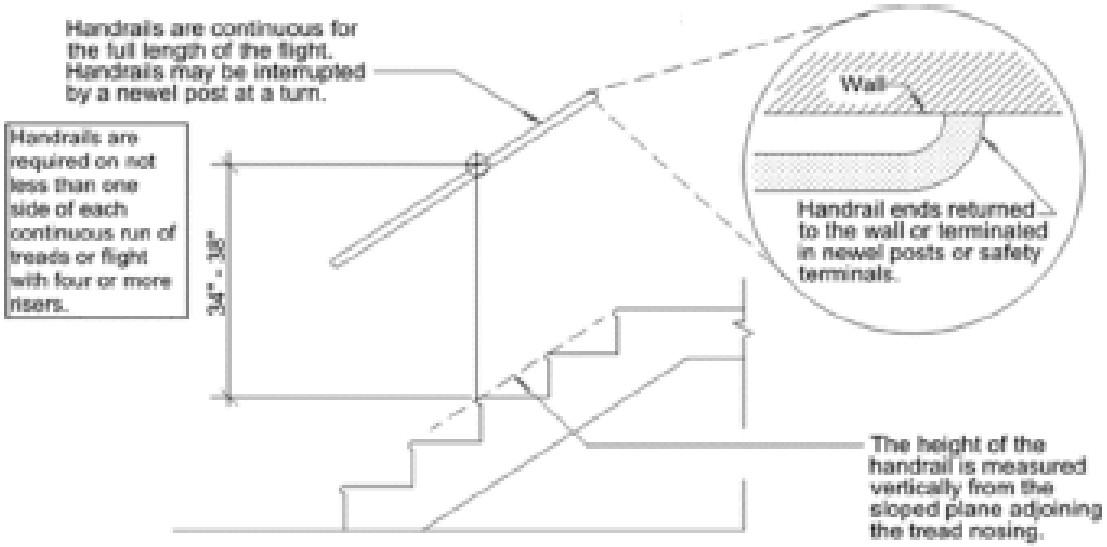
CONSTRUCTION TIP SHEET 2

Residential Handrails

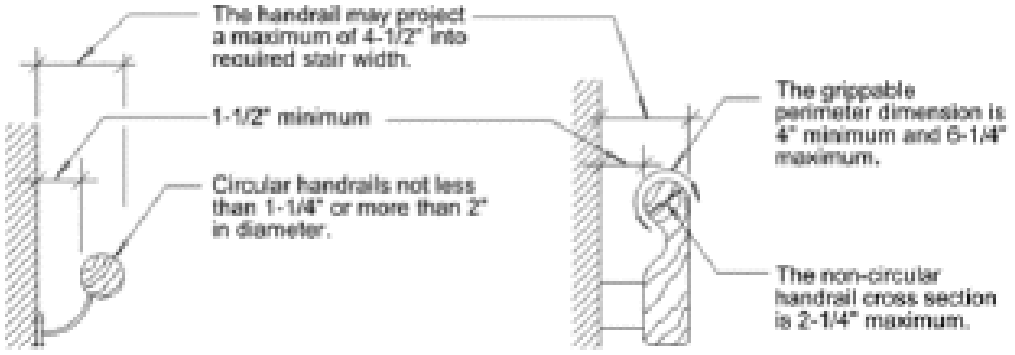
July 1, 2016

This Tip Sheet reflects code requirements of the 2015 International Residential Code (IRC) with Washington State Amendments.

Handrails are required on at least one side of each continuous run of treads or flight with four or more risers.



Typical Handrail Elevation
R311.7.8



Type I Handrails
R311.7.8.3

GENERAL INFORMATION:

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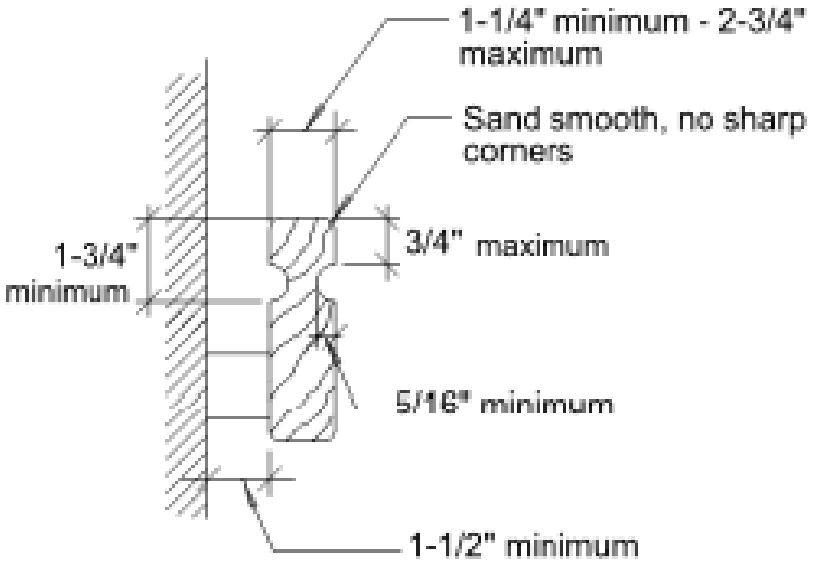
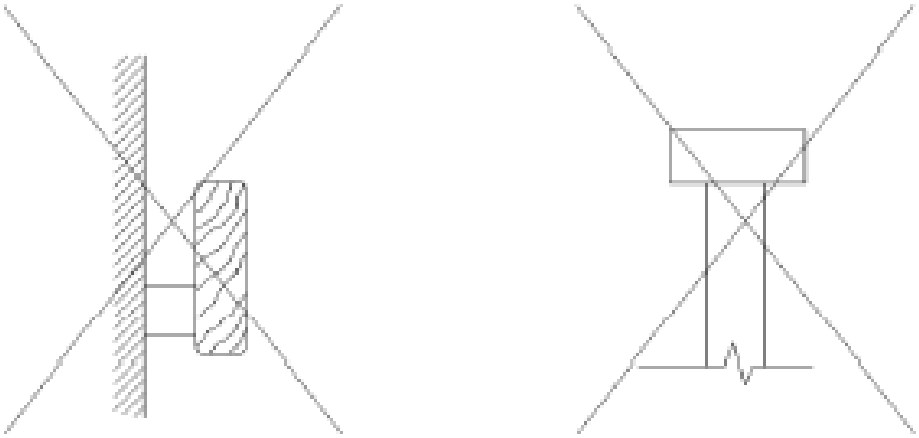


Type II Handrails
R311.7.8.3
(At handrails with a perimeter greater than 6-1/4")



Unacceptable Handrails

Hand rails

Yes and no questions require explanations

What are the requirements as to when you need a handrail? (2) _____

_____

What are the height requirements of handrails, and where do you measure from? (3) _____

_____

_____

_____

Can I have a handrail 1 ¼" from the wall? (1) _____

_____

What is the furthest a handrail can project away from a wall? (1) _____

What is the minimum and maximum width a handrail can be? (2) _____

_____

Can I just screw a 2" X 4" away from the wall 1 ½" and call it good? Why or why not? (3)

_____

_____

_____

Score _____ /12 Pts.

What is a Construction Manager? They plan construction projects and oversee their progress along the way in a timely and cost-effective manner. They are responsible for budgeting, organization, implementation and scheduling of the projects.

Responsibilities include:

- Oversee and direct construction projects from conception to completion
- Review the project in-depth to schedule deliverables and estimate costs
- Oversee all onsite and offsite constructions to monitor compliance with building and safety regulations
- Coordinate and direct construction workers and subcontractors
- Select tools, materials and equipment and track inventory
- Meet contractual conditions of performance
- Review the work progress on daily basis
- Plan ahead to prevent problems and resolve any emerging ones
- Negotiate terms of agreements, draft contracts and obtain permits and licenses
- Analyze, manage and mitigate risks
- Ensure quality construction standards and the use of proper construction techniques

Requirements are:

- Proven working experience in construction management
- Expert knowledge of building products, construction details and relevant rules, regulations and quality standards
- Understanding of all facets of the construction process
- Ability to plan and see the “big picture”
- Competent in conflict and crisis management
- Leadership and human resources management skills
- Excellent time and project management skills
- BS degree in construction management, architecture, engineering or related field

Now go to: http://www.bls.gov/ooh/management/construction-managers.htm

From this page, describe what the work environment is: (3 pt.) _____

_____

_____

_____

_____

How do you become a construction manager? (3 pt.) _____

_____

_____

_____

_____

What other building specialists do construction managers work with? (look under what they do) (2 pt.) _____

_____

_____

What is the annual pay for the average construction manager? (1 pt.) _____

_____

Is this a career you could see yourself pursuing? Why or why not? (2 pt.) _____

_____

_____

What are colleges in Washington that have degrees in construction Management? (1 pt.)

_____

_____

What is the difference between a construction manager and a foreman? (2 pt.) _____

_____

_____

Score _____ / 14

Practice Interviews

You have just landed an interview for a seemingly wonderful job! Now what? Successful interviewing will be essential in order for you to lock in an offer. Here's how to interview, including tips and strategies for effective interviewing from preparation through follow up.

Company Research

Research should always be your first step. Gathering background information on employers is a crucial element in successful interview preparation. You will need to be prepared to answer the questions "What do your know about our company"? and "Why do you want to work here?"

Practice Makes Perfect

Practice makes perfect (or at least leads to improvement). Practice with a friend and record or videotape your responses so you can replay the interview and see how well you did. Prepare answers to commonly asked interview questions. Before the interview review the company's web site.

Prepare For the Interview

It is very important to be on time for the interview. On time means ten to fifteen minutes early. If need be, take some time to drive to the office ahead of time so you know exactly where you are going. Know the interviewer's name and use it during the interview. Remember to bring an extra copy of your resume and a list of references. Emphasize what you can do to benefit the company rather than just what you are interested in. Also prepare a list of questions you want to ask the interviewer.

Stay Calm

During the interview try to remain as relaxed as possible. This will show the interviewer how you handle stressful situations. Ask for clarification if you're not sure what's been asked and remember that it is perfectly acceptable to take a moment or two to frame your responses so you can be sure to fully answer the question. End the interview with a thank you to the interviewer and reiterate your interest in the position. Then follow-up with a personal thank you note.

For this exercise, you will chose a company to research and be prepared to be interviewed for a job at that company. The companies I want you to choose from are **McClendon's Hardware, Boeing, BECU, or Hexcel Corporation**. You will prepare answers to the following questions, and be prepared to be interviewed by that company addressing these questions:

Tell me about yourself. (Tell me a bit of who you are so I get to know you, and then tell me specifically your background that would make you a good candidate for this job.) _____

_____

_____

_____

_____

_____

_____

Why do you want to work for us? _____

_____

_____

_____

Tell me what you know about our company, and how you see yourself being a part of it _____

_____

_____

_____

What kind of experience do you have that you can apply to this job? _____

_____

_____

_____

What is a personal strength you have? _____

_____

_____

_____

_____

What is a weakness you have? _____

_____

_____

_____

Tell me about a time when you have had difficulties, in work or school, and how you overcame them.

_____

_____

_____

_____

_____

_____

Tell me about a time you were under a lot of pressure. What was going on, and how did you get through it? _____

_____

_____

_____

What are your goals for the future? _____

_____

_____

_____

Why should I hire you? _____

_____

_____

_____

_____

Do you have any questions for me? _____

_____

_____

_____

_____

_____

Score _____ /22

STAR method of interviewing- Situation or Task, Action you Took, Results you Achieved.

Give me an example of a time you faced a conflict while working on a team. How did you handle that?

_____

Describe a time when you had to interact with a difficult fellow student/co-worker. What was the situation, and how did you handle it?

_____

Tell me about a time you were under a lot of pressure. What was going on, and how did you get through it?

_____

Tell me about a time you set a goal for yourself. How did you go about ensuring that you would meet your objective?

_____

Give me an example of a time when you were able to successfully persuade someone to see things your way at work.

_____

Describe a time when you saw some problem and took the initiative to correct it rather than waiting for someone else to do it.

_____

Ask questions-

Tell me what a typical day in this job would be?

How did you start here at Boeing?

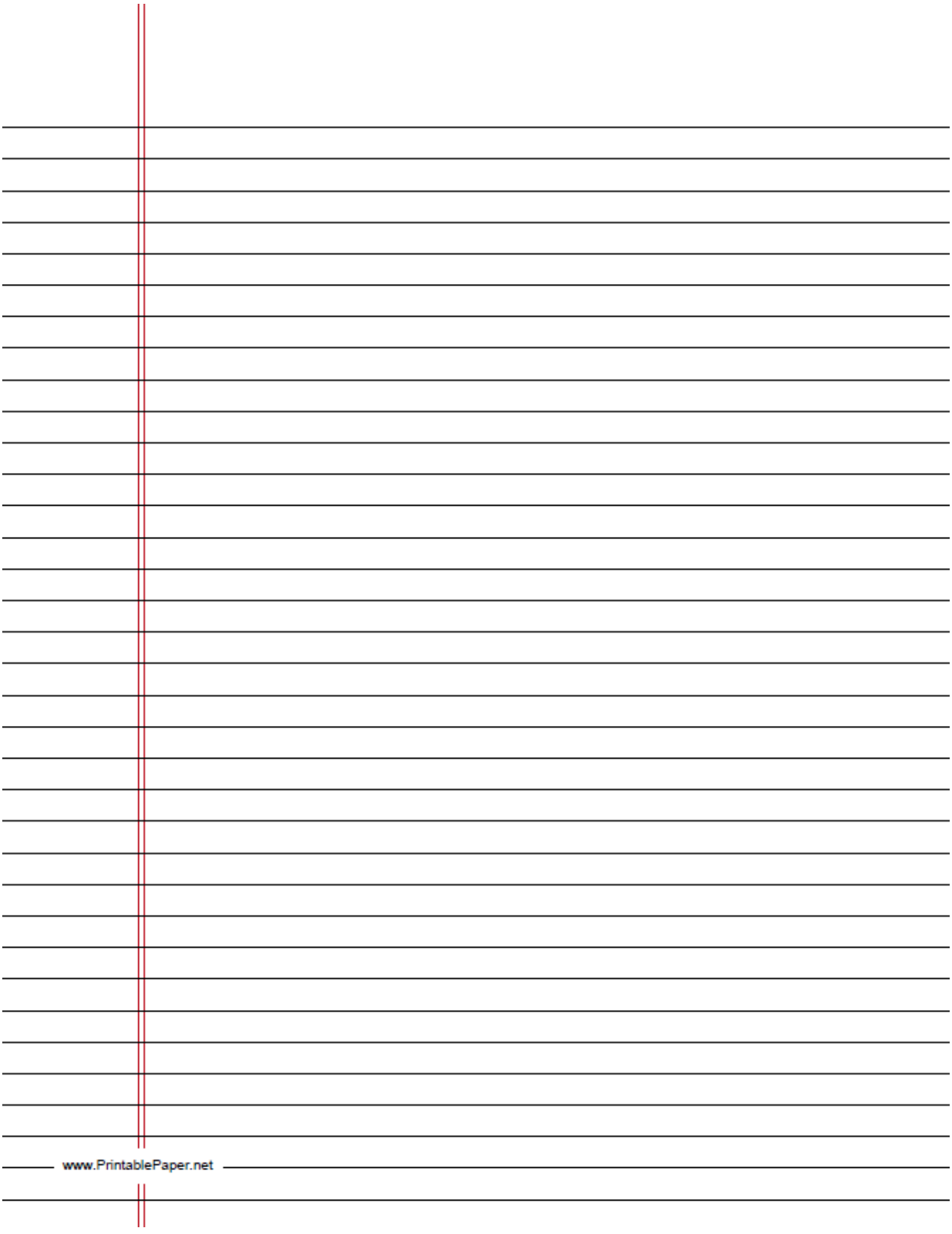
What does training for this job look like?

Ask questions that are specific to the job description.

Where can I be in 5 years with this company?

What type of growth is there with Boeing?

Do Now Worksheets


www.PrintablePaper.net

Construction math questions:

Rec 9/6/2022

AN

Whole Numbers

1.A contractor needs to install base molding around a room that is 12’ by 14’. How much base molding will the contractor need?

2. Dusty is making a bookcase that is 6’ tall. He wants 8 shelves evenly spaced. How far apart are the shelves?

3. Dusty is building an 8’ cabinet for his sister. The cabinet needs to be in three sections, and the middle section needs to be 40” to hold her TV. How big are the other cabinets?

4. A customer needs 46 pieces of 2” X 4” at 18” to hold signs. How many 8’ 2” X 4” does Dusty need to order?

5. Dusty needs to cut a 8’ 2” X 4” into 6 equal parts, How big are the parts?

6. Dusty needs to deliver 5,000 pounds of crushed rock to a customer for a driveway. His truck is rated to haul ¾ tons. How many trips will it take?

7. Dusty needs to install base molding in a 20’ X 14’ room. The molding comes in 12’ lengths, how many lengths will he need?

8. A construction crew of six carpenters (all working at the same rate) can build a house in 5 weeks. How long will it take 10 carpenters to build the same house?

9. If 3 Lbs of #7 1 ¼” drywall screws cost $2.70, how much is 8 Lbs?

10. You own an apartment, and you need new carpet. The carpet cost $4 per square foot, plus add on %10 for waste. How much will it cost for you to recarpet your apartment?
The room sizes are 10 X 12, 16 X 20, 16 X 12, 12 X 22.

11. Thanksgiving questions- If you cooked six turkeys, and each turkey could serve 11 people, how many servings would you have? If your brothers family of five came, and they can each eat three servings, how many servings would you have left?

12. Dusty is putting in doors into an apartment building. There are seven floors to the building, and six apartments on each floor. On the odd floors, the apartments need 6 doors, and on the even floors, the apartments need 5 doors. How many doors all together?

13. If we know the total run length of a roof, and the total rise of a roof, can we figure out the length of a rafter? The run is 11’ and the rise 5’ what is the rafter length?

14. You are putting in a 8’ by 12’ patio and are using 16” by 8” pavers. How many pavers will you need?

15. If you and a partner can install 5 floor joists in ½ hour, how long will it take to install 160 floor joists?

16. A carpenter cuts 27”, 34” and 26” from an 8’ roll of weather stripping. How much is left of the roll?

17. A contractor buys 850 board feet of pine and 1300 board feet of hemlock and 450 board feet of spruce. What is the price if the lumber is all priced at $3 a board foot?

18. A contractor needs to haul 5000 Lbs. of gravel for a driveway. His truck can haul ¾ of a ton. How many loads will he need to make?

19. A contractor in Florida needs to board up the windows of a house for hurricane season. Each of the windows is 2’ X 3’ and there are 32 of them. How many sheets of plywood will he need to buy?

20. If you cut 13 pieces lumber, each 40 inches long, from 5 boards each 120 inches long, how much lumber will you have left over?

21. If a cedar deck cost $4,000 for materials and $250 a year for maintenance, and a composite deck cost $5,000 to build but no maintenance cost, how long will it take the composite deck to pay for itself compared to the cedar deck.

22. Express these measurements in inches: 9’ 8”, 4’ 6”, 3’ 11”.

23. You are laying out a line of bricks 96” long. Each brick is 4”, how many bricks will you need?

24. A new pressure washer costs $1200. If you charge $150 to clean a driveway and sidewalks, how many driveways will you need to clean before you start making some sweet money?

25. If a coil of nails will apply 5 sheets of plywood, and each sheet is 32 square feet, how may coils of nails will be needed to apply all the plywood on a 16’ X 40’ roof?

26. How many inches are in 8’?

27. Convert to inches- 3 ft. 6 in., 6 ft. 8 in.
Covert to feet and inches- 71 inches, 125 inches.

Fractions adding and subtracting

1. A framed takes a 8’ 2”X 4” and cuts off two sections of 21 ½” and 18 ¼”. How much of the 2 x 4 is left?

2. Dusty the cabinet maker made a cabinet too big! He built a cabinet 43 ½ “ wide, and the doorway into the customers house is 35 ¼”. How much does Dusty need to cut his cabinet down by?

3. Dusty glues together three boards, one is 3/4” thick, one is ½” thick and the last is 7/8” thick. How thick is the glued board?

4. Dusty is gluing together three boards, one is ¼”, one is 3/8” and the last is 11/16”. What is the thickness of the glued boards?

5. You need to cut ½” off a 5 1/2” board, where will you set the table saw fence?

6. You have an 8’ 2” X 4”. You cut off 27 ¾” and then you cut off 18 ½”. How much of the 2” X 4” is left?

7. From a 8’ 2” X 4”, you cut off 31 ¾”, 18 ½”, and 9 ¼”. How much of the 2” X 4” is left?

8.In looking over a blueprint of a job, you see that ¼” represents 1 foot. If the length of a garage is 28 feet and the width is 16 feet, what would the dimensions on the blueprint be in inches?

9. If you are reading a blueprint and ¼” represents 1 foot. If a bedroom measures 3 5/8” by 2 ¾” on the blueprint, how big will it be in feet on the jobsite?

10. When 1/8” represents 1’ on the drawing, how many feet are represented by 7 ¾”?

11. How many 1/16 of an inch are in ¼”? In 3/8”? In 7/8”

12. If you have a 10’ pipe, and cut 37 ½” and 14 5/8” off of it, how much of the pipe is left?

13. Three laborers work part time for 5 days. Laborer A works 2 ½ hour each day, laborer B works 3 ¾ hour each day, and laborer C works 3 1/3 hour each day. They are paid $18 per hour, what is the total pay?

14. The distance from a bathroom counter to the ceiling is 65 ¼”. A medicine cabinet measures 30 ½” tall and will be centered between the counter and the ceiling. What is the space above and below the cabinet.

15. A carpenter spent 2/3 of an hour installing drywall, 3 ½ hours installing kitchen cabinets, 1 ¼ an hour installing a light fixture, and ½ an hour cleaning up. What was the total amount of time on the job site?

16. A blueprint shows a total floor thickness as 1 1/8". If the laminate flooring is 3/8" of an inch thick, how thick is the sub-floor material?

17. The roof opening for a skylight was cut out at 40 ½" wide, but the actual skylight is 46 3/8". How much larger will the opening need to be to fit the new skylight?

Fractions multiplying and dividing

1. A carpenter needs to cut a 8 ½" board in half to get two equal pieces. Where does he need to set the table saw fence?

2. Dusty is looking at a set of plans for a house. The scale of the drawings is ¼" on the drawing is equal to 1' on the house. He measured a bedroom on the plans to be 3" X 4". How much carpet would he need to buy to carpet the bedroom?

3. There are 8 boards that are ¾" thick all stacked together. How thick is the total stack?

4. A customer has an opening for cabinets that is 79 ½", and she wants three equal sized cabinets. How big is each cabinet?

5. You have a board that is 7 ½" wide. If you cut it in half, how wide will the two boards be?

6. how thick are 7 ¾" stacked boards?

7. If 3 lbs of #7 1 5/8" screws cost $3.15, how much does 8 lbs cost?

8. A carpenter is building a ½ stairway. The total rise of the stairway is 50 ¾ inches and she wants to have 7 stairs. How much will each stair rise?

9.A mason orders 215 bricks to construct a patio and a barbeque. 3/5 of the bricks are used to build the patio. How many bricks are left to build the barbeque?

10. If a 96 ¾" pipe is cut to 1/3 its length, what is the new size of the pipe?

11. A carpenter installs 32 ½ feet of baseboard in ½ an hour. How long will it take to install 430 feet of baseboard?

12. A stairway is constructed using 13 risers. What is the total rise if each riser is 7 ¾"?

13. A stairway is 217 ½" tall, and it has 30 risers. How high is each riser?

14. If a painter uses 1/3 of a gallon of paint to paint the trim around five (5) windows, how much paint is used to paint one (1) window?

15. A finish carpenter installing crown molding needs 2 pieces at 48 5/8" long, and three pieces at 37 ¾" long. What is the total amount of crown molding needed, and how many 8' boards will she need to buy?

16. A contractor is planning the framing for a wall that is 149 ¾" wide, and wants to install a 32 ½" door in the center. How much space should she calculate on either side of the door?

17. A bookcase is constructed out of ¾" plywood, and it has a top and bottom and four shelfs, if everything is equally spaced apart, how much space will be between each shelf?

Decimals

1. A framer wants to buy Gatorade for his crew. The local grocery store sells it for $3.25 a six pack, and the big box store sells it for $11.75 a case of 24. Which is the better deal?

2. A carpenter needs to buy 7 eight foot 2X4's at $4.13 each, what is the total cost?

3. A mason uses a scale to measure the ingredients for a batch of concrete. The concrete is composed of 10.5 lbs of cement, 22.6 lbs of sand, 28.2 lbs of gravel and 5.1 lbs of water. What is the total weight of the batch?

4. A plumber makes $32.40 per hour. How much does the plumber earn for a 15.25 hour job?

5. A floorer purchases 110.5 sq yards of carpet for a living room. If the total cost of the carpet was $789.90, what is the cost per yard?

6. A developer purchases 7.8 acers of land to be subdivided into .6 acer lots. How many lots can fit on the land?

7. An electrical circuit has a load of 3.4 amps and 3 loads at 1.7 amps. What is the total load on this circuit?

8. A builder purchases 3.31 acers of land to build on. If an acer is $73,000, what is the total cost of the land?

Percentages

1.A framer estimates that 1850 board feet of lumber are needed for a project. How many board feet need to be ordered if 10% is added for waste?

2.A contractor gets a 5% discount from retail price at a supply company. If the retail price for her purchase was $8,420, what does she pay for the materials?

3.A framer grabs a pizza for lunch at Big Time Pizza which advertises that their pizzas cost 10% less than the competition. If pizzas down the street cost $9.50 each, what is the price of a Big Time Pizza?

4.A contractor needs 850 bricks for a patio. Allowing for 8% waste, how many bricks should the contactor order?

5. Dusty bids on a remodel job and comes up with a price of $45,000. He then adds on 5% for incidentals, and adds on 10% to the price and incidentals for profit. What is the final bid price?

6. A contractor gets a 7.5% discount on all plumbing and electrical supplies. If the retail price of his purchase is $8446.00, what is the amount of the discount?

7. Dusty takes his crew out for lunch, and the bill for food and beverage comes to $46.52, and the %8.6 sales tax is $4.00. How much should Dusty leave for a tip?

8. A contractor gets a 5% discount on all building materials. The contractor buys $6,840 worth of materials, how much is the discount?

9. If you take your roofing crew out to a pizza lunch and the bill comes to $56 before tax, how much do you leave for a tip at 15%?

Measurement

Students have a ruler in front of them and use a pencil to point where they are:
Start at 6 ½", -2 ¼", +6 3/8", -3 ¾"
Start at 10 ¾", -7 ¼", +5 3/8", -3 3/4"
Start at 6 3/8", + 4 ¼", - 7 ¾, + 2 11/16"
Start at 10 ¼",- 5 ¾", +7 1/8". - 4 5/16"
Start at 7 7/16", - 5 ½", + 4 3/16", + 3 9/16"

1. You want to install base molding around a 16' 6" by 11' 3" room and around a 7' tall by 30" door and a 8' by 3 ½' window. How much molding will you need?

2. You need to run 43’ 3” of electrical wiring. You need to run the wire through Electrical Metallic Tubing (EMT). The EMT comes in 10’ lengths. How many lengths will you need, and how much will you need to cut off the last length?

3. A furnace flue is made of 4 pieces of pipe. Each piece of pipe is 1 foot 10 ½ inches long. What is the total length of the flue in feet and inches?

4. The electrical code requires that no point on a wall can be more than 6 feet from an electrical outlet. How many outlets are required for the rooms. (draw rooms)

5. If a rope is 20 yards, 2 feet long, and you cut off 27’ 3”, how much rope is left?

Area

1. A contractor needs to install carpet in a room that is 12’ by 14’. How much carpet will the contractor need?

2. A painter has two cans of paint. One is 7/8 of a gallon, and the other is 3/8 of a gallon, how much paint does he have? If a gallon of paint covers 350sf, and he has to paint a wall 8’ by 35’, will he have enough paint?

3. A customer needs a room painted. The room is 10’ by 12’ and the walls are 8’ tall. Painter A gives a bid of $3 per sq. foot, and painter B gives a bid of $1075 for the job. Which bid is the lowest.

4. A painter has two cans of paint, one is ½ a gallon, the other is ¼ a gallon. One gallon covers 400 sf, and she needs to paint a wall that is 8’ by 20’ and put on 2 coats. Will she have enough paint?

5. You just had a new room added on to your house that measures 11’ X 19 1/2’. How much carpet and base board will you need to finish out the room?

6. You now need to paint the walls of your new room. If the walls are 10’ tall and the room size is 11’ X 19 ½’, how much area will you need to paint?

7. If you have a room that is 18’ X 15’ and need it to be carpeted, how much would it cost if the carpet is $21 per square yard?

8. How many bundles of shingles are needed to cover a two part roof if one part is 300 square feet and the other is 600 square feet, an it takes 3 bundles to cover 125 square feet?

Volume

1. If a yard of concrete is the amount of a slab measuring 3’ X 3’ X 3’. How much would a yard cover if it was 1’ thick?

2. How many cubic feet of concrete would you for a slab measuring 7’ X 8’ by 6”?

3. if a concrete slab is being poured and it is 8’X 7’ X 4”, and each bag of concrete holds .45 cubic feet of mix, how many bags would need to be ordered?

4. You are pouring a concrete foundation for a house, and the foundation will measure 22’ by 48’ by 6” thick. How many yards of concrete will you need?

5. What is the volume in cubic inches of an electrical box that measures 3” X 2” X 2 ½”?

6. What is the volume of a rectangle measuring 5 yards long, 6 yards wide and 4 feet tall?

7. How much concrete would be needed to fill a cylinder with a 3 foot diameter and 2 yards deep?