1. Woods I
   1. Goals:
      1. Introduce students to variety of tools
      2. Have fun
      3. Be creative (I feel like too many other classes, students creativity is stifled. I try to give them as many opportunities for customization to keep them excited and interested.)
      4. Get students back for woods II (since you asked for this stuff, I can tell you my first year at PLHS, there was 2 sections of woods I, 1 woods II and 1 woods III. This year, we have 6 woods I, 4 woods II and 2 woods III. There are a TON of factors that go into this but students wouldn’t sign up for advanced classes if we weren’t doing something right in woods I. I firmly believe in the course I have created. With that being said, I am constantly looking for ways to improve and update so feel free to make any changes you see fit!)
   2. Rational- I am not interested in producing future cabinet makers, welders, auto mechanics, etc. I understand most of these students are just trying our classes out. If they have a deep interest in the area, we offer multiple levels of every course but being realistic, most students aren’t going to use this stuff on a daily basis in their future. For the select few who do enter this a career field, AWESOME! I hope I did the occupation justice but for the rest of the students, I am very interested in transferable skills. I will try to highlight some of those areas below. Planning, Measurement, Quality of work are my big focuses in woods I. These are all things I think we can teach using wood as a medium. If they become a cabinet maker, bonus.
   3. Projects
      1. Cutting Board (All students complete this project)
         1. Pick design (I have 4 basic patterns to follow that all involve some type of re-saw operation. I would suggest building all of them ahead of time so you know where students will folly. When I started designing this course, I did just straight pieces of wood glued edge to edge. That is still an option for students but not very challenging. I would recommend starting here.)
         2. Sketch it out
         3. Pick “Colors” (For woods I, I am not that interested in students being able to ID wood. I tell them what the different species are but focus on the color. Students have access to Red Oak, Cherry, Maple, Black Walnut, Padauk and Purpleheart. PH, PD and BW are all limited to keep the cost of the course down. I have students shoot for under 1 board foot.)
         4. Pick dimensions (for these projects, I tell students that most cutting boards are roughly the size of a sheet of paper. Start there and make it bigger or smaller based on student preference. Add widths of each individual piece. Ask teacher for help with lengths…specifically when tackling more complex end grain or face grain patterns. Again, I taught this with just straight strips to start, then moved up to more complex boards as I become more confident planning the projects.)
      2. Project #2 (Each student picks one, shows three different assembly techniques. Nobody uses all three but at least the class can see all three ways.)
         1. Canoe paddle
            1. More glue up procedure
            2. Band saw work
            3. Shaping the paddle blade with hand tools
         2. Wood shelve
            1. Kreg jig assembly
            2. Customize for fishing rods, lipstick, gun rack…get creative.
            3. Dimensions should be set based on plan but alter/change orientation of pieces and bandsaw/drill press work to customize appearance
         3. Wood Box
            1. Dado joinery
            2. Custom top
            3. Plywood bottom
   4. Calendar/Units
      1. Safety (I go through each tool by reading the attached documents and ad-libbing. I demonstrate each tool. Students follow behind me and demonstrate they understand how to use the tool. I can then correct any mistakes they are making right there. Students take digital safety test…PLHS has 1:1 iPads for all students. This is super convenient for the digital safety tests. Students that get any questions wrong are notified, I call them up individually, we talk about the incorrect questions, I update the answer right on google and the student gets 100% on the quiz and can then use the tool)
      2. Measurement (See attached packet. I do a visual check for completion. Pretty straight forward here.)
      3. Planning
         1. Bill of Materials (I took this directly from Stout. I teach students how to calculate Board feet. Before they start any project, they are expected to complete the BOM. I provide the price/bd.ft. Based on the price I purchase from the lumber company. This incorporates very real math, if that is something your administration looks for. In addition, during woods II and III, I am able to teach the students how to use excel to speed the process up.)
         2. Work Instructions (Also taken from Stout. I show the students the steps to square a board and the steps for glue up. I have videos too. We use a service called Schoology at PLHS; if you are unfamiliar it is basically Facebook for education…maybe D2L like. I post everything there. Students are expected to write out step by step instructions detailing exactly what operation they are doing and what part of the board/dimension they are cutting. Again, if admin is looking for any writing, this is as real as it gets. I think of them as a recipe; once completed, anyone should be able to take them and re-create a project exactly. I am a stickler with these. I think it greatly helps students to plan the project before getting in the lab. It alleviates a lot of questions of “what's next?.)
      4. Build (Get in the lab and get cracking! As soon as a student has their design/sketch, I check it off and try to help with any issues I see ahead of time. Students create a BOM and WI specific to their design. I encourage them to work in small groups. When they think they are done, they bring the measurement packet, BOM and WI to me. We go through their safety, I check off the WI by going through it in front of the students, I help them get material and then they are off and running. I put a lot of trust in the students because I end up sitting by my work desk to get all the planning and safety done. It does help break up how many students are on the tools and limits lines. Students are encourage to take things home and plan them outside of class but it is not required. Those students that do, obviously get into the lab sooner. As more and more students get into the lab, I try to stay one day ahead of the first student by adding in band saws, routers, sanding and finishing as needed. When a student completes their first project, they can immediately start looking at P#2.)
      5. Grading (Students should earn 100% through all their safety tests giving them a nice buffer. From there, I have two project grades that total ~100 points. Those grade sheets aren’t perfect but I think I am getting them fairly well refined that most of the items are very black and white. Students grade first, I grade second. ½ the points come from each assessment to equal a total score. Most of the time, I am within a couple points.)
2. Woods II
   1. Goals:
      1. Assembly/planning and Time management (build off P#2 from woods I with option to assemble anything together. Bigger projects mean more pieces and improved efficiency of work time. Hurray to more transferable skills)
      2. Be creative (students pick their projects)
      3. Get students for other CTE classes including but not limited to, Woods III. (They made it this far, how can skills be transferred to Construction, Engineering, Metals and/or other career related courses i.e. business, FACS, art, etc. We have access to some awesome digital technology at the school so how does these intermediate/advanced classes tie together? And how do we get students to explore their talents, passions and future?)
   2. Rationale- Same as above. In addition, this class is basically designed after Stout’s industrial enterprise practicum. So far, students have prototyped about 20 projects, of those, 8 have been refined and are pretty good projects. With this year, my goal is get 50 prototypes in the classroom. From there, each year I want some class groups to further refine those initial designs while others continue to add to our catalog. Eventually, I want to pair with the business department and literally run it the exact same as Stout’s IEP. The only difference, the prototypes are already made, the class will simply choose one or two designs and try to run it just like a business selling to teachers, students and the community. If all goes as planned, 5 years from now, students in woods II will be able to see how much money the previous classes made and will try to outdo their predecessors. I like competition. Last thing, the course is currently listed in the handbook as bending and lamination. I completely through that out the window when I came here. There was no tools or equipment to do what the course description said so again, I created my own class from the ground up.
   3. Projects
      1. P#1: Proposal
         1. What do YOU want to make?!
         2. Students create a written proposal of the project they want to create. I try to bill it as a “craigslist add.” Students should try to sell me on their idea. I introduce this on day one and it is due at the end of the week.
         3. Must be feasible, cannot be a cabinet or a project already in the classroom
      2. P#2: Prototype
         1. I put the students into groups based on the projects they are proposing (chair group, table group, etc.)
         2. I attached a PPT that has a bunch of students names and pictures of projects. I try to get super creative with the various “chairs” out there. Students then go to their groups and discuss exactly what they want to produce. As long as it fits the category they are assigned to, they should be able to scour the inter-webs to find something cool.
         3. Students create a BOM and WI for their project. I provide the lumber and they prototype it. They have about 3 weeks to work on this and at the end, they present their project to their peers.
         4. I save MOST of the prototypes. Some really suck or are totally unfeasible but its OK for students to fail at a prototype. In my opinion, that’s the whole point of trying something new…not all of them work out. Others need additional refinement and a select few are great projects for other students to replicate in P#3.
      3. P#3: Individual Project
         1. Students evaluate the projects in class…they can choose from any of the projects prototyped in their class or ANY previous class. I obviously recommend certain ones over others but as long as its been prototyped once, it can be replicated. I like this model because a student might come into woods II thinking they want to make a table. After they prototype their table, they may find that another group created a cool chair. They can now pick that chair to build and keep or they can stick with their prototype by recreating the same thing a second time.
         2. The planning should already be done so they select the project and just need to do a BOM. The BOM allows students to again customize wood choice or any variations to the project they want. I order material specific to what the students want to create so each student pays only for their project. This may range from 10 dollars up to 150… I had a student create an Adirondack chair last year using entirely padauk. It literally is a 70 dollar chair typically made from high end red cedar and he brought the cost up to 150$ so it is all up to the student how they want it to look and what they want to spend.
         3. WI should already be done as they are a recipe. I save the prototypes, BOM and WI from each project prototyped in woods II. I touch them up but the planning portion should be done already. If a student wants to customize something, they can but shouldn’t have too.
         4. Build it and take it home to enjoy.
         5. Included on the google drive is a bunch of projects I already have in the classroom with BOM and WI completed. Feel free to use these projects as a springboard for your own classes.
      4. Variations
         1. As stated earlier, I am hoping to have enough prototypes that one day students will skip this step. Instead, they will refine/improve/alter an existing prototype to make it better. I am starting to run out of space in the classroom but will address that issue another day.
         2. Eventually, I want to partner with the business department and have the whole class do some market research, pick a single project to mass manufacture and ultimately try to turn a profit. Admin here is slowly getting on board with collaboration and what better way to prepare students for the “real world” than to do “real world on demand manufacturing” in the classroom.
   4. Other
      1. Have fun and be creative
      2. Students build off their Woods I knowledge. We still do safety, review all the tools, review assembly techniques, practice for project planning but the size of projects goes from 3-5 pieces up to ~25. Time management becomes a big component.
      3. We do have lasers and a CNC wood router so students do have access to these. I don’t take class time with only a quarter to teach the students how to set them up or program them but I do give them the option to do custom work on either tool after school. I also offer this in woods I but most students don’t take advantage of it till now.
3. Woods III/IV
   1. Goals:
      1. Cabinetry and quality (less about customization here and more about post-secondary technical skill development. I remind students this can be an heirloom if well done. My parents still have the desk I made as a JR in HS and I don’t imagine I will ever get that back. Great example of the scale of project, financial and time investment required, and ultimately the quality of work.)
      2. Assembly/planning and Time management (build off woods II. These projects have about 50 pieces each. For us, that averages better than one piece completed per day. Time management is HUGE here. )
      3. Have fun…you don’t need me to tell you after 2 classes with these students, I know them pretty well. This is typically a smaller class size so I have a GREAT time with students.
      4. Science of wood…cutting, milling and harvesting trees. Wood ID.
   2. Rational- Biggest, most practical projects with a clear outlet to use skills developed in woods pathway as a cabinet maker.
   3. Overview
      1. Projects
         1. Gun cleaning station –OR- Brookes cabinet
         2. Dart Board Cabinet
         3. Night Stand
         4. Coffee Table
         5. Other??? I would like to have 8 cabinets to choose from. Still working on more ideas that can be built for under $50, completed in one quarter and students want to make.
         6. WOODS IV- students basically take this class as an independent study. Very few students make it this far in their high school career. I tell students that they can create whatever they want at this point. I have taught them everything they need to know to basically design, create and build whatever they want. They go through safety with everyone else in woods III but after that, they are on their own. Gun cabinets, home entertainment centers, desks...total freedom.
      2. Selection
         1. I designed and built all the cabinets so far. With only 45 days a quarter, I provide students the drawings with dimensions. Students still create a BOM and WI. Each of the projects has about 50 pieces. They all cost about the same amount to build and are roughly the same quantity of material.
         2. Wood choice- I buy all red oak ahead of time. This helps keep the cost down but students can chew up any scrap in the classroom. Woods III is the only woods course during 4th quarter so they can chew up a whole bunch of various wood species before the summer. I will not buy additional lumber so I encourage the students to use it in moderation and as accents. i.e. strips of the exotics included in draw fronts or making checker pattern in the top requires a small amount of material we probably have laying around. I do not charge extra for the use of these materials as lots of it ends up getting burned if not consumed. I am already buried under the previous teachers 35 years of accumulating junk. Students are expected to update BOM and WI accordingly.
         3. We use an online service for students to pay for anything related to school (i.e. lunch, activity fees, fines, etc.) As a result, woods II is the only class that students determine what they will pay for class. With woods I, it is $20. Woods III is $50. The use of the online service is being implemented by the district so I am “strongly encouraged” to have students use it. In addition, our district has a very strict policy on student course fees so I can only charge for the material being kept by students. None of the money I collect should go towards capital or equipment. If your district is more lenient, it may offer more options with project selection. Last, students are expected to purchase or make their own knobs and pulls. I do not purchase drawer guides to keep the cost down; we make them out of wood.
         4. On the google shared folder, the projects should be 90% ready to go. I did find that last year a couple of the pieces to complete the project were missing. I lost the sheet I had written down which projects and which parts needed to be re-drawn to complete the plans I had. Again, if you build before the students do, you will find any mistakes I made ahead of time and can correct this before distributing plans to students.
      3. Calendar
         1. Review- Check out the calendar. We still review each of the tools, even if a students took woods I and woods II in the same year. “Safety doesn’t take a vacation, either will we.”
         2. Plan
         3. Build- As soon as students have work instructions and BOM done, they can start pulling material. One project in 45 days may not seem like a squeeze for you or I but I am very liberal with my approach to digital devices. Personal aside, I believe that it has fallen on us to teach students the appropriate time to use a device for work and the appropriate time to use it for fun. If a student wants to play madden and check Pinterest during their work time, so be it. It is their work time and I can pretty well guarantee those students that play games before completing required work have lower quality and it is ultimately reflected in their final projects. I do not micromanage devices.

* I know I missed finishing in all this. Sanding and finishing is discussed in each class. Other items are also briefed over here but you may be able to piece it together by checking out the calendar and other resources.
* I am teaching all three of these for the first time with another teacher so we are already making changes to things. I would recommend doing the same. Let me know what you come up with too!!
* I would highly recommend building each of the projects before giving them off to students. It has really helped me understand where and when students will have issues. Especially with the cutting boards, as ironic as that is for an intro class.
* Be prepared for controlled chaos. Especially woods I, it is a challenge to write those WI and BOM for the first time. Students should struggle…this is the first time they have ever been expected to plan something and it’s a totally foreign environment being in a “shop” for most. More options for students with wood choice, project selection and customization within the project= more issues, stress and classroom management problems for us. I guess I out-way my own problems with getting students in the door and retaining them over 4 years.
* Project selection…I can struggle with selecting projects that students want to make. I try to leave them fairly open ended with lots of room for customization. This means more chaos in class as students are going to run into a greater number of issues but hopefully it keeps their interest to have invested themselves into their design. I also have difficulty knowing what 14-18 year olds want. In 5 years, I have only had 6 dart board cabinets made. I thought it was a great idea for a cabinet but apparently students don’t. Makes me wonder what’s wrong with kids; how can you not want to crush beers when you move out of your parents’ house while throwing darts against a cabinet you made?!?!
* Wood ID: I do cover this begging in woods I but do it specifically by color. That is all I expect students to do is tell the difference of species based on color so they can at least sort the scraps into their correct holding area (hence the wood selection, all the species I have for woods I are very different in color and easy to sort). In woods II, we go into more depth. I spend time describing the ways I ID wood from appearance to smell to feel. Can you tell I spend too much time in the woods lab?! I want students to also know what applications each species is typically used for. When students select the project they will build and keep, they can also select from a greater variety of materials. I get the prices from the lumber yard ahead of time and students can now choose from more exotics, cedar, mahogany, pine, ash, hickory or any of the materials they have already used in woods I. By woods III, I also include content on how trees are harvested, the internal parts of the tree, how trees grow and how they are milled for end user use. We watch videos take a more scientific look at the materials we are using. Again, including content from the core to appease Admin. Someday, they will realize that it is US that the common core should be supporting NOT the other way around as it is today. When they do, the connections students will be able to make will astound people. I hope I get a raise when that day comes. During all of this, I always have examples of other wood species on hand. In fact, I showed students in woods I today some of the stuff I have purchased and what it costs. They are baffled when I tell them that a board foot of some species exceeds $20 and super high end materials can exceed $50 for a single board foot. (Zebrawood, leopardwood, cocobolo and such are all great ones to wow students with the endless possibilities Mother Nature has to offer.)
* Woods II: Last note on this class. If you implement anything along this same format, please let me know. Also stealing from Stout and Brillion WI, I would be very interested in creating a project like the trains Brillion does. Each school builds a specific and different train car, cars are traded from building to building and trains are sold to the community. For each train sold, a second one is donated. Great PR opportunity!!