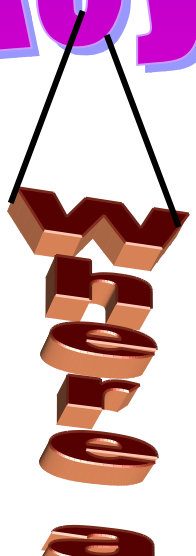
Key Holder Project



Where are Those Keys?

Western Technical-Commercial School

School:

Integrated Technologies, TTI1O

Course:

Grade 9 juniors

Grade:

Mr. Franzen

Teacher:

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Web Address:

Key Holder

Project:

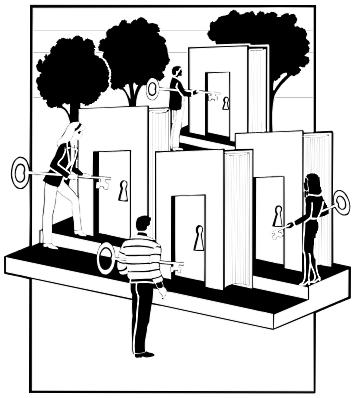
17

Pages:

Table of Contents

Key Holder Needed

Making a Key Holder



Situation:

You come home every day and keys seem to get thrown on the coffee table or the floor. You decide that something has to be done so that keys are organized.

Requirements:

The challenge is to build a custom key holder that will hold between 4 and 6 key sets. The key holder itself must have the following characteristics in its design:

1. Minimum of at least 5 wide round cut corners
2. Minimum of at least 5 sharp inside or outside corners at any angle
3. At least one big non-circular hole, hint you will need to drill two holes close
4. A length of 20 to 26 cm,
5. A minimum thickness 9mm and minimum width of 2 cm everywhere (keep in mind on placement of hole and shape features,
6. Installed 4-6 key holder hooks with some method of mounting to wall
7. A smooth finish with no real sharp edges and corners
8. Coated with a brush finish to seal in wood on front and sides
9. Your name permanently on the back, 20 mm Gothic
10. Report including all rough work, title page, table of contents, SPICE process and conclusion/reflection (see check list at back)

Thumbnails, final rough, isometric, full size front view, and scaled orthographic of key holder shape must be neatly completed either by computer (preferred) or by hand.

Resources, Time and Materials

- You will receive one piece of wood measuring 10 cm * 25 cm * 1.3 cm
- 4-6 hooks to hang keys with 1 or 2 mounting eyelets if required
- Shop hand tools, equipment: band saw, combination sander, and drill press
- Do not apply too much paint, as this will cause runs and slow drying time waist.

Due Dates:

Thumbnails_____, Rough____, Isometric_____, Orthographic, _____, Full size____, Key cut out and smooth____, 2 coats of finish, Report_____

Information and Planning

Each task or activity is going to follow the SPICE pattern, but different products will follow different processes. Keep in mind that you should put your name permanently into wood once you get it on the back and keep in your box. The following is a 3 step outline:

Initial Design stage with full pages for the following (See Page 5 for more info):

1. 5 Detailed thumbnails, with legend
2. Final idea showing a full page rough drawing with more details
3. Isometric –computer or hand
4. Full size drawing–computer or hand, showing full size of wood, and overall dimensions
5. Orthographic at a reduced scale of 1:2–computer or hand

Construction and wood working stage (see page 6 to 12 for related info)

1. Practice with a scrap piece of wood to get the feel of the machine you are using
2. Practice with all three machines prior to cutting your good piece. New pieces are going to cost you marks
3. Transfer your design to your wood and remember once you cut too much
4. Drill your hole first if possible; as there is more wood to hold onto, also a rasp or file might come in handy at this point
5. Cut out around the outline of your design leaving at least **3 mm** clearance.
6. Use the disk sander to take it down to about **1 mm** to your design, then go to sand paper
7. Use a course grade of sand paper first such as 40 or 60 then move up to a 90 or 100 for fine

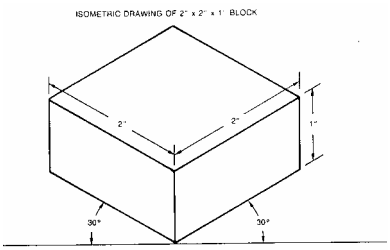
Painting/finishing stage (see page 13 for more info)

1. Once everything is smooth and accurate you are ready to paint.
2. Pick your paint colour (requires a primer coat) or stain and/or just a clear coat (varathane)
3. When painting make sure to not put too much paint on in one coat, as it will run afterward, take a very long time to dry and leave a poor finish
4. After it has dried overnight, if you have time, you can sand down with fine sand paper and put a second coat to improve finish

Key Points on Drawings

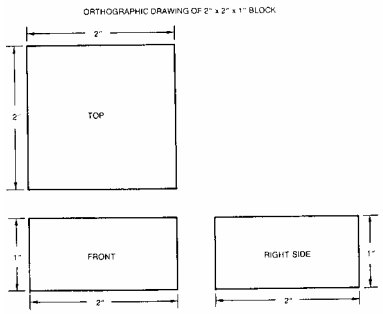
Creating an isometric by hand

1. Start with a rectangle box in an isometric format (30 degree from base line)
2. Draw your object on the face
3. Extend thickness line straight down at major features
4. Close bottom of object



Creating an isometric by computer

1. Create your orthographic first, and then copy the front view
2. Rotate the object by 30 degrees
3. Duplicate the object directly above original at a height of the thickness of key holder
4. Connect similar object features on the front view with straight lines



Orthographic by hand

Quick instructions below:

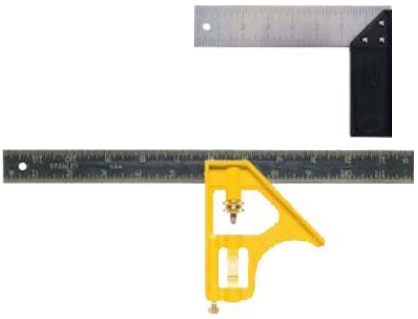
1. Figure out which scale to use. For example if you want a 1:2 scale, divide all of your measurements by 2 to use on sizing up you drawing
2. Choose the front view
3. Centre your "Envelope" within the boarders
4. Use light construction lines to start building your object on paper (2h lead weight)
5. Darken object lines and fill in notes and labels in gothic font
6. Make and Fill in the information block in gothic font

Remember:

X-axis and Y-axis spacing between objects must be the same for all three views
H= horizontal, V= vertical

Hand Tools in the IT Shop

There are a number of tools that you may need during your key holder construction. The following is just a few that you need to be familiar with.

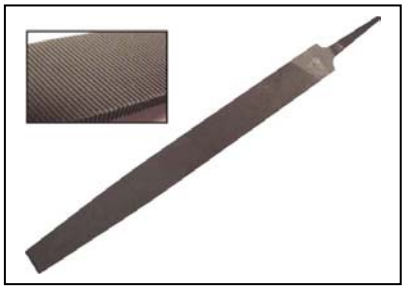


Layout tools:

Use only a **pencil** to mark wood appropriately.
The **combination square** and **standard square** is used to line up and layout your designs and design features, such as your key holder hooks.

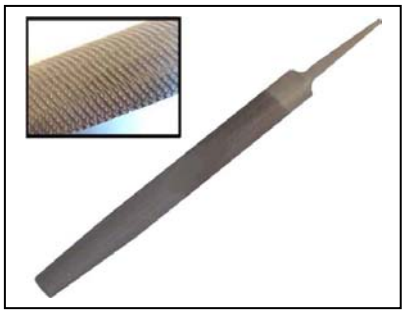
Sanding tools:

Rasp: are used to take a lot of wood material off quickly, leaving a very rough surface which comes usually in the half round shape.



Files: take off small amounts of wood in a consistent format according to their shape. The common shapes are:

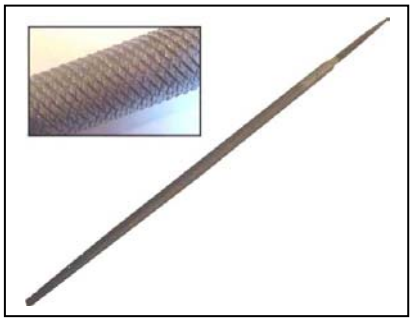
- Round
- Half round
- Flat



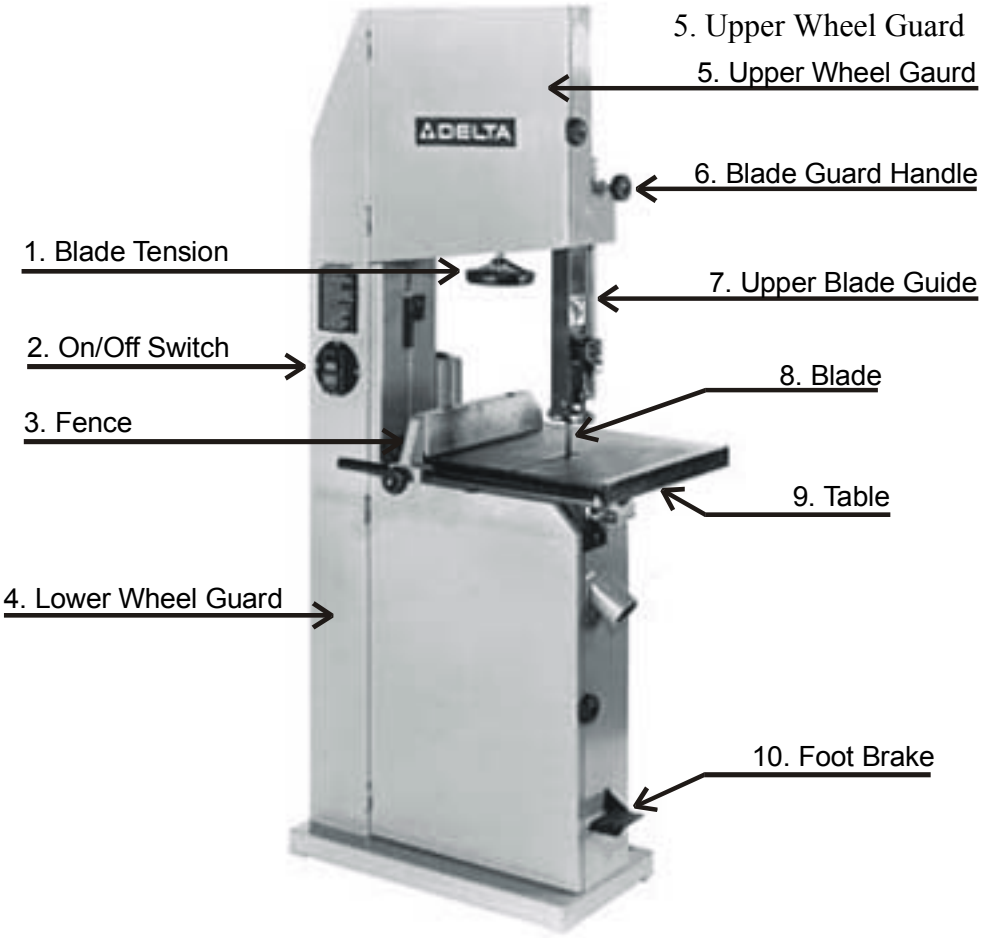
Sand paper is used to finish-off and customize specific areas of wood object. A sanding block may be used to keep sanding straight and consistent

When Filing your work it is important to keep the following in mind:

- Clamp your work when hand shaping it, preferably to a table vice.
- Using a table vice, you may need to put some scrap wood or cardboard to protect your wood surface from being damaged from vice teeth.
- Proper filing requires you to stand (not sit) while filing, and use two hands moving both your arms and shoulders in a smooth horizontal movement.



Information on the Band Saw



Description:

The band saw is a powerful motor-driven cutting tool. The saw's blade is a continuous, flexible band of steel with rip-cut teeth filed on one edge. It has a tilting table for cutting on an angle. The size of a band saw is determined by the diameter of the wheels that drive and guide the blade. The distance between the table and the blade guard limits the depth of cut.

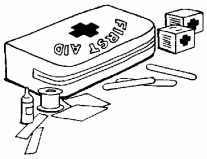
Operation:

The band saw blade travels in a clockwise direction forcing the stock that is being cut down against the table. Although the band saw is an excellent machine for cutting curves, it can also rip, crosscut, and re-saw stock. Because of its powerful motor and deep depth of cut the band saw can cut large pieces of wood and also odd pieces of wood. The blade must be under tension to maintain a straight cut.

Things to Remember:

+ Wait for the band saw to come up to full speed before staring to cut.
+ Do not cut curves that are too tight for the width of the band saw blade.
+ Do not force a cut, always use a smooth, slow feed into the blade.

Safety Contract for the Band Saw



Rules to remember

1. **Wear safety glasses!**
2. **Be sure** that all guards are in place.
3. The blade guard **must not be** more than 25 mm. above work.
4. Keep hands to the sides of the blade, **never** in front of the blade.
5. Keep work flat on the table.
6. Use a push stick to move scrap pieces of wood away from the blade.
7. Do not try to cut too small a radius, if necessary, make relief cuts first, ninety degrees to the line your must cut.
8. One person at a time operating the machine.
9. If the blade breaks, shut off the power and stand clear until the wheels have stopped turning.
10. When backing out of a cut, **do so with extreme caution** so as not to catch the blade and pull it off the wheels, otherwise **stop the machine first**.
11. When finished, turn machine off and use the brake to stop the blade.

+ Look at yourself; if you have **all** your body parts and you're not bleeding, then you can appreciate the benefits of safety in the shop.

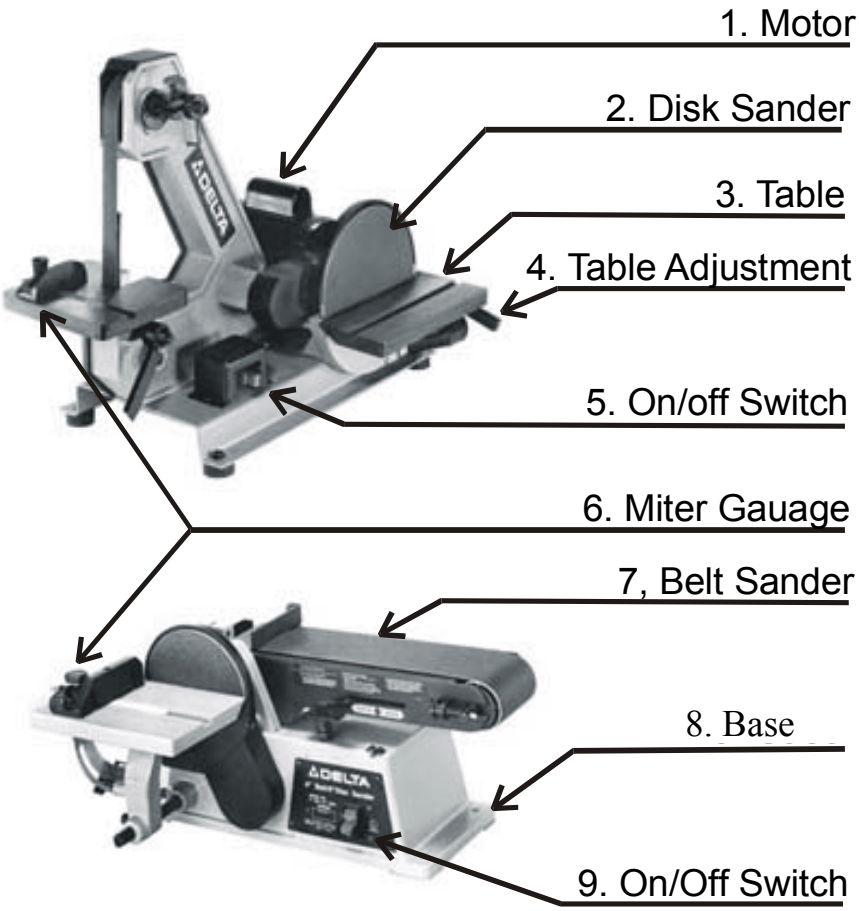
Date of lesson _____

I was **present** for the instruction on the safe use of the **Band Saw** and I understand its meaning and will operate this machine in a safe method as described. I feel comfortable in the operation of the Drill Press and if in any doubt will ask for help from an Instructor.

Students Signature_____

Teachers Signature_____

Information on the Combination Disk/Belt Sander



Description:

The large disk sander is extremely useful for sanding end grain and outside curves of wooden projects. The disk sander is extremely heavy, powerful and when properly setup and used, accurate.

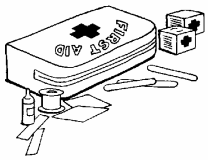
Operation:

Because the disk is heavy, the motor must have time to bring the disk to full speed before it is used. The table can be adjusted for angles or to have a larger gap between the table and disk to compensate for different shaped projects.

Things To Remember:

+ Be sure the machine has been turned off as the disk takes a long time to stop turning.
+ Always work on the downward turning side (right side) of the disk so that the stock is pushed down onto the table.

Extra Notes:



Safety Contract for the Combination Disk/Belt Sander

Rules to remember

1. Wear safety glasses!
2. Turn on the dust collector and open the blast gate to the collector pipe.
3. Do not touch the disk when it is turning.
4. Do not sand pieces of wood that are too small to hold safely.
5. Do not try to sand off large amounts of stock, remove excess with a cutting tool first.
6. Do not apply too much pressure on stock when sanding or else it will burn.
7. Replace sandpaper when ripped or wrinkled from heavy usage.
8. Before replacing paper, be sure that power is disconnected.
9. Turn machine off when finished

+ Look at yourself; if you have all your body parts and you're not bleeding, then you can appreciate the benefits of safety in the shop.

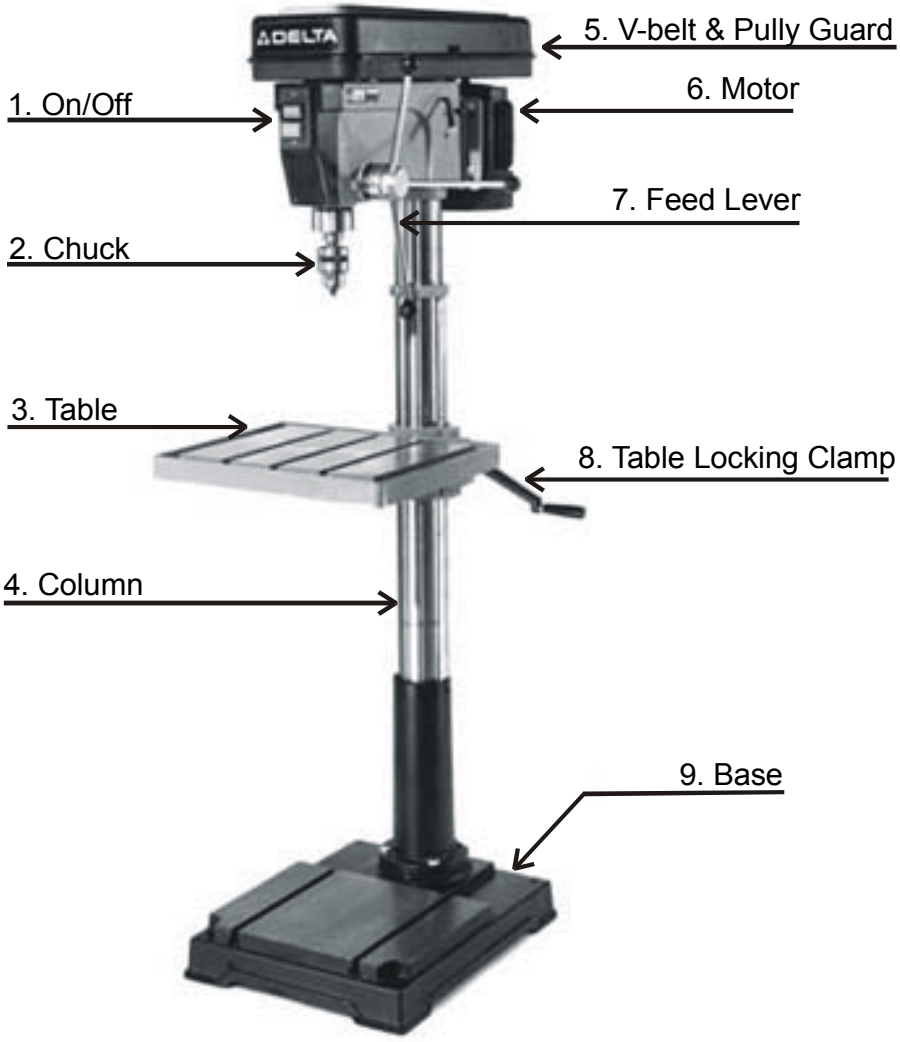
Date of lesson _____

I was **present** for the instruction on the safe use of the **Disk Sander** and I understand its meaning and will operate this machine in a safe method as described. I feel comfortable in the operation of the Drill Press and if in any doubt will ask for help from an Instructor.

Students' Signature_____

Teachers Signature_____

Information on the Drill Press



Description:

The drill press is an accurate, vertical boring or drilling machine. It is also capable of many other operations such as mortising, routing, sanding and shaping using a variety of attachments.

Operations:

Stock is held by hand, jig or Clamp on the Drill press table and the chuck is brought down to the work using the feed wheel. The speed can be adjusted for different woods and materials: faster for soft, slower for hard.

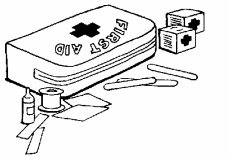
Things To Remember:

+ Do not force the bit into the work.
+ Use a slow, steady, even feed rate into the work.
+ The depth guide is used to make multiple, same depth holes.

Extra Notes:

Name:

Date:



Safety Contract for the Drill Press

Rules to remember

1. **Wear safety glasses!**
2. Long hair **must be enclosed** in a hair net or be tied up.
3. When boring small pieces **hold them securely** with a clamp.
4. **Be sure** to use a bottoming piece (scrap) under the work so that you will not drill into the table.
5. Operate the drill at the correct speed.
6. Make sure the drill bit is tight in the chuck
7. **Never** leave the chuck key in the chuck.
8. Be sure you have the right type of drill bit for the job.
9. One person operating the machine at a time.
10. Turn off drill press when finished.

+ Look at yourself, if you have all your body parts and you're not bleeding, then you can appreciate the benefits of safety in the shop.

Date of lesson _____

I was **present** for the instruction on the safe use of the **Drill Press** and I understand its meaning and will operate this machine in a safe method as described. I feel comfortable in the operation of the Drill Press and if in any doubt will ask for help from an Instructor.

Students Signature_____

Teachers Signature_____

Finishing Your Key Holder

When you have completed your key holder to your satisfaction… hint check with teacher to make sure you are on the right track… i.e. to make sure you are ready to paint, you should also have some paint colour ideas ready to show the teacher. One of those ideas you will have to choose in order finish the work.

It is important to finish your key holder to:

1. Protect and harden your surface
2. Make it look attractive
3. Seal, and preserve the wood

Surface Preparation and Finish Types

There are two major ways to go about finishing the surface of your wood:

- Stain and/or clear coat
- Primer and colour paint

Both are oil base and recommend that shop coats/smocks be worn just in case. Clean up of brushes, and paint area, requires the use of **paint thinner** to clean up and break-down paint. Paint brushes are to be returned to the paint bath tubs, once finished. All painting is to be done using newspaper under your work, under the exhaust fan area of the shop. This area is only for students that are completely ready to paint at that time.

Stain

Stains will darken and bring out the grain in the wood in an attractive manner by **highlighting the wood density areas**. Stain is just a cosmetic look, but still needs to be coated with a clear coat of varathane. After the stain, you must let dry, then put a **first coat of varathane on, which will soak into the wood** leaving a rough some-what flat appearance once dry. **A second coat is needed**, after a fine sanding with +100 grit sand paper in order complete the seal properly. If you wish to put more coats on, you may do so as to make it look glossier.

Primer and colour paint

The object must have a minimum of one coat of primer for the following reasons:

1. Prepare surface for colour coat to stick to
2. Seal in small holes
3. Minimize surface absorption

Once this is done and primer is dry, it needs to be sanded lightly. Note: if wood was poorly prepared, you will most likely have to put another coat of primer on, as you do not want any wood showing through the primer.

Colour Mixing

Colours will have to be mixed from primaries provided namely:

- Cyan,
- Magenta
- Yellow
- White
- Black

By **using a mixing cup you use the cyan, magenta, and yellow to get your colour match**, then if you need **to darken or lighten, you can use a bit of the white or black**. Mix only what you need and base that on how much you used when you primed your key holder. This colour system is known as the **CYMK system where K stands for black**. If you were to mix equal amounts of cyan, magenta and yellow together, theoretically you would get black, but actually what you get is a murky dark brown. For this reason a separate black pigment colour is added to the system. Inkjet and laser printers generally use the same principle, with the assumption you are printing on white paper.

Name:

Date:

Check List for Project Module

All work where possible must have a complete header, computer generated using previous made related templates with your logo. When handing in everything, double check prior to handing in by checking off the following items in chronological order:

(If Required) Related Explanations Below↓

- ☐ Duatang or report cover
- ☐ Title page
- ☐ Table of contents
- ☐ Module information
- ☐ *5 detailed thumbnail ideas, full page with legend
- ☐ * Detailed final Rough including hook placement, full page
- ☐ *Isometric- computer or hand
- ☐ *Final full size key holder design- front view
- ☐ *Orthographic of key holder– computer or hand
- ☐ SPICE, steps you took, separate ½ a page typed
- ☐ Conclusion reflection, separate ½ a page typed
- ☐ This check list- with items handed in, checked off
- ☐ Final self and peer evaluation paper
- ☐ Diskette holder and good diskette with your all of your files on it

*All due date components handed in will have the teachers initial along with a plus #, OT, or minus # showing if they were completed on time. These positive and negatives will directly affect your mark

You will be responsible for handing in one of depending on your situation:

A) A full report with a finished key holder in project box **or** ,

B) A full report including everything above *except finished key holder* **and** theory questions.

Name:

Date:

Index of Key Terms and Phrases:

Find ten new key terms or phrases and include the page number in the table below:

	New Key Term or Phrase	Page #
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Key Holder is Done!

The Key Holder is Made! ….

Peer Marker: _____

Activity Process and Product Steps	Total Marks	Self Mark	Peer Mark	Earned Marks
Problems identified and Requirements Met: Was the problem identified and understood? Does the key holder have 5 round corners, 5 sharp corners, one odd hole, 20 to 26 cm long, min 2 cm width and 9 mm thick Smooth finish, coating, 4-6 hooks, showing mounting manner, Finished with paint or clear coat properly Does the report have all requirements complete (check list)?	5			
Research and Information: What ideas that were found and implemented into the design Does the report show/document this research and investigation process well?	5			
Rough Ideas, Designs and Possible Solutions: Completed thumbnail sketches on a full page with legend and details? Sketches show **meaningful** possibilities? Addition rough idea sources, notes, supporting or pointing towards final design ?	10			
Final Design showing Solution: Computer preferred or hand drawn? Isometric view drawn well? Full front view, full scale, dimensions, original wood size drawn? Orthographic 1:2 reduced scale drawn?	15			
Workmanship: Construction: Product: Right tools used? Key holder accurate to original plan? Quality present, smoothness observed, and finish surface completed? Report generally well put together and complete?	15			
Finished Product: Solution: Colour(s), look good, interesting, would I hang this on my wall? Is the report done well, templates used, good reflection, and learning achieved? *If you could have done this project again what would you do differently or how would you improve the product or time taken to make the product?* _____ _____	30			
Final mark: Based on % finished and completion and fulfillment of requirements of the problem. **Peer and Self evaluation marks must be added up in this row!** →	**80**			

Teacher Comments: _____

_____