Knowledge domain: **Mechanical**
Unit: Casing
Skill: Hinges

Tools and Parts Required:

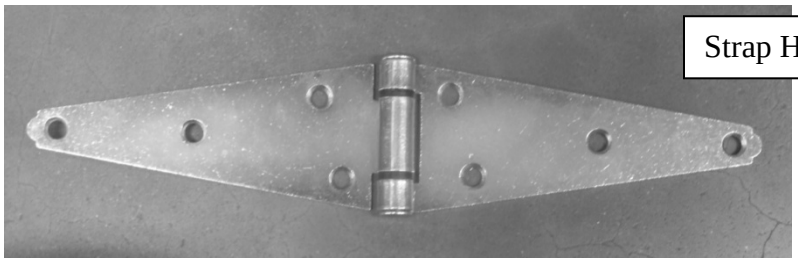
1) **2 Strap hinges**
2) **2 Pieces of wood**
3) **Hand drill**
4) **6 Flat-head wood screws (that fit with the strip hinges)**
5) **Pencil**
6) **Tape measure or Ruler**

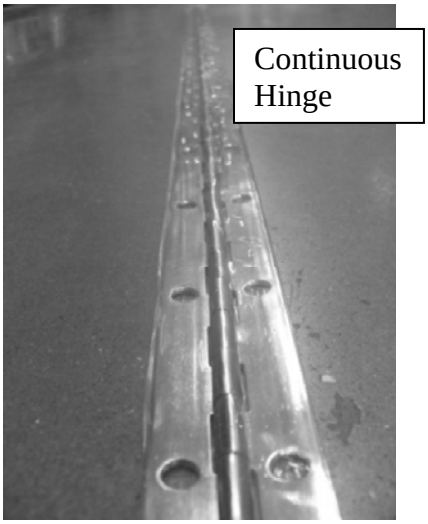
Introduction

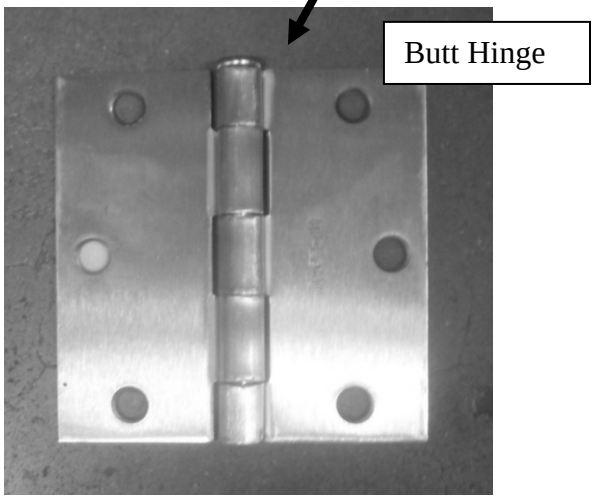
A hinge connects two solid objects. A hinge allows rotation between two solid objects. Hinges connect doors to walls. Hinges also connect the doors on cabinets. A hinge has two flaps that rotate around a barrel. The barrel is a cylinder-shaped section. A pin is located inside the barrel. A pin is a cylindrical piece of metal. The pin is sometimes removable. There are many different types of hinges.

Example

Below are pictures of different types of hinges.







Identification and Diagnosis
Use hinges to connect doors to a frame. Use hinges to connect cabinet doors to cabinets. Use hinges to connect two solid objects and allow rotation between the two solid objects. There are many types of hinges:

- *Strap hinges* are used on many kinds of interior and exterior cabinets. Strap hinges are also used on interior and exterior doors.

- *Butt hinges* are used to mount regular doors and cabinet doors. There are two varieties of butt hinges: rigid pin (pin cannot be removed) and loose pin (pin can easily be removed if you tap the pin with a screwdriver). The length of a butt hinge is usually between 13 mm and 150 mm.

- *Butterfly hinges* are usually used to mount light-weight doors. Butterfly hinges are available in a variety of shapes and patterns.

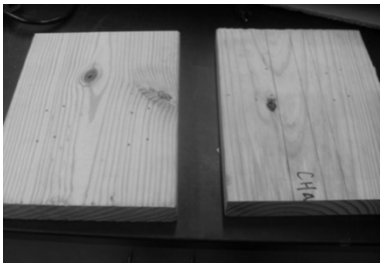
- *Flush hinges* are usually used to mount cabinets. Flush hinges are also used on light doors. Use a flush hinge when you want to conceal the entire hinge except the barrel. Flush hinges are weaker than butt hinges.

- *Continuous hinges* (also called *Piano hinges*) run the entire length of the door. There are many different lengths of continuous hinges. Continuous hinges are ideal when a long hinge is required, such as a cupboard door. Small countersink screws secure continuous hinges into the correct location.

Procedure
Strap hinges are very common in cabinets and small devices. The method to install a strap hinge on wood will be described here. Other types of hinges are installed using very similar methods.

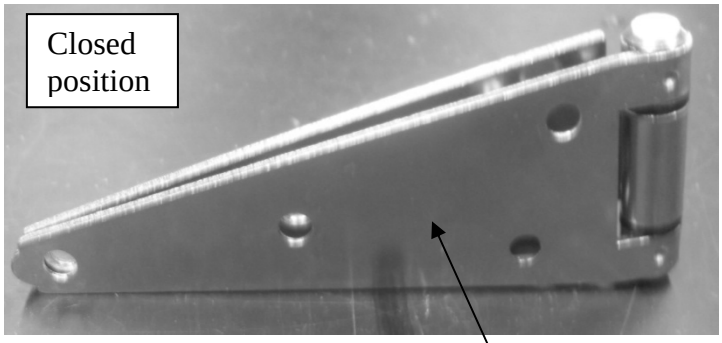
General Warnings:

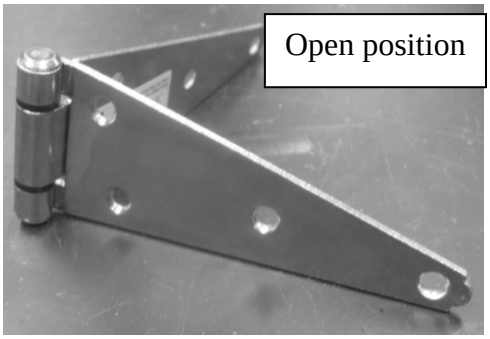
- Do not use nails to secure any type of hinge. The nails can easily be pulled out. This causes the door or cabinet door to fall off.
- For security, install the hinge on the inside of the room, cabinet, or building. If the hinge is installed on the outside, it can be dismantled.
- Verify that the edges of the wood where the hinge will be installed are straight. This is very important! Use a saw to make the edges straight if necessary. Lay the two pieces of wood on a flat surface. Lay the pieces of wood side by side.



Lay pieces of wood on a flat surface
Lay pieces of wood side by side

The flaps of hinges can touch in one direction. This is called the closed position. If the flaps are rotated the opposite direction, they do not close completely. The angle of rotation is restricted. This is the open position.

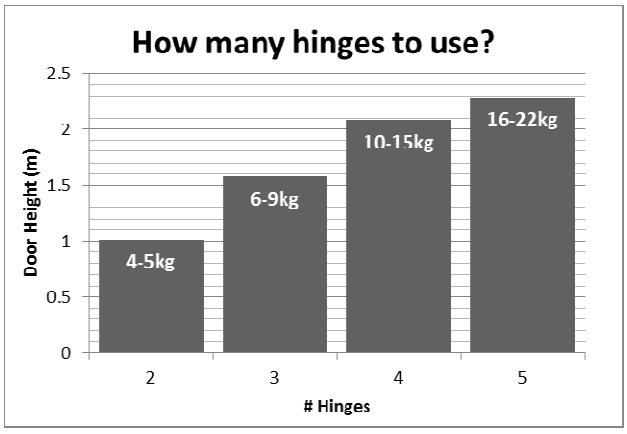




1. Lay the strap hinge across the pieces of wood. Lay the hinge in a flat position.

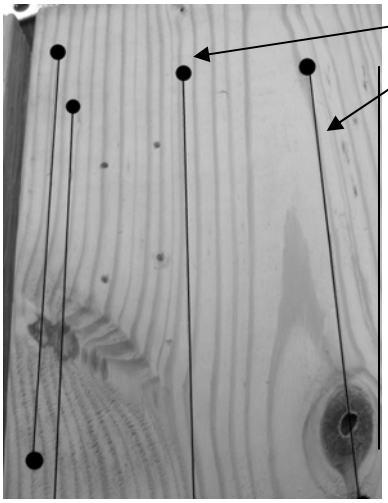
    - For a door, the strap hinges should be approximately 0.3 m from either end of the door. Position one strap hinge 0.3 m from the top of the door. Position the second strap hinge 0.3 m from the bottom of the door. Use a tape measure. For heavier doors, consult the graph below for how many hinges to use.

    - For other applications, the hinges should be closer to the top and the bottom than they are to the middle. This spacing helps prevent the lid from twisting the hinge (binding).



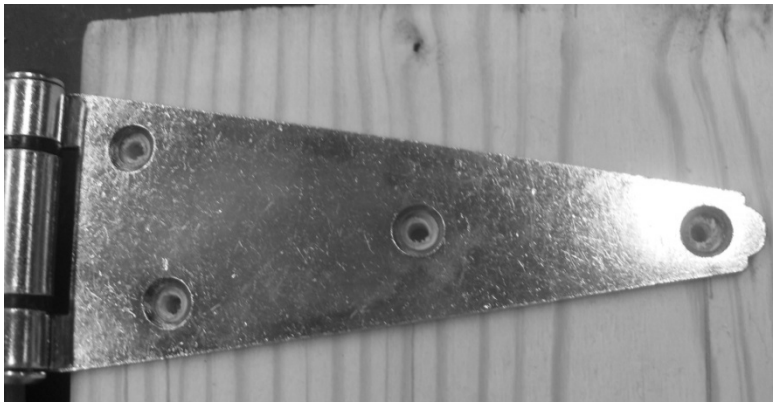
2. Center the hinge horizontally. Flip the hinge over. Place the center of the hinge pin on the edge of the door. It is very important to put the pin on the edge of the door. The two hinges must be perfectly aligned to properly function. Use a pencil to mark the location of the hinge's holes on the door.

3. Use a tape measure or ruler to draw a straight line between the holes. This line must be parallel to the edge of the wood.



4. Drill holes for the mounting screws which will hold the hinge in place. Use a specialized self-centering bit to center the holes precisely. The guide sleeve on the outside of the bit ensures that the hole is centered. Select a drill bit is that is slightly smaller than the body of the screw.

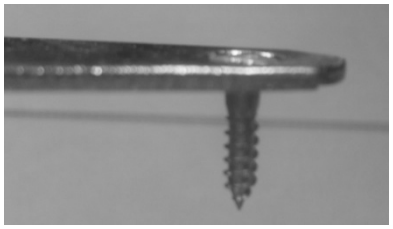
   If you do not have a self-centering bit, then make an indentation with a small nail first, then use a standard bit.



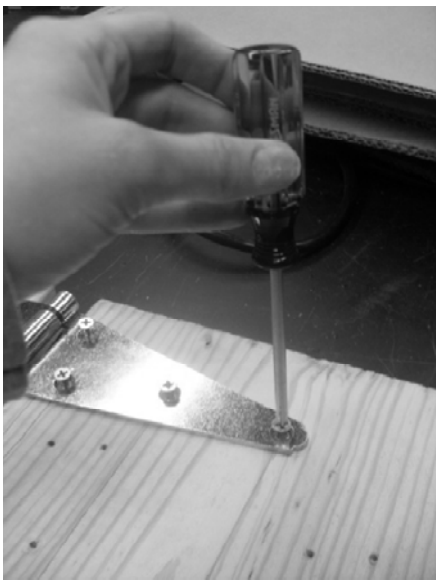
5. Lay the hinge so the hinge pin faces upward again. With the hinge in place, set the bit over the hole in the hinge. Drill the first hole. Do not change the alignment of the hinge when you drill. Repeat this method for the other holes. After each hole is drilled, verify that the alignment is straight.

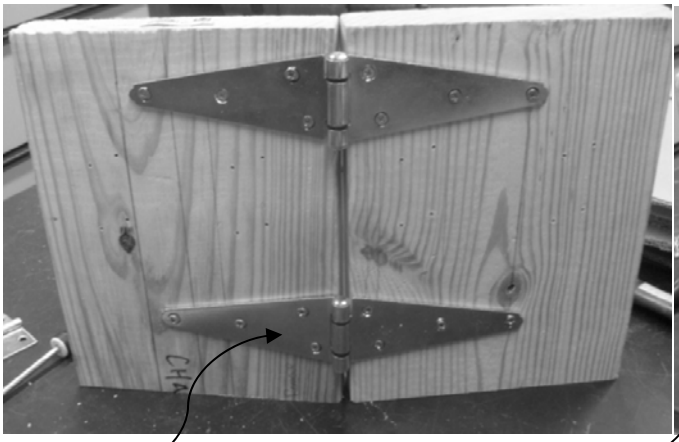
6. Install the hinge using flat-head wood-screws. If the lid is metal, bolts can be used to secure the hinges.

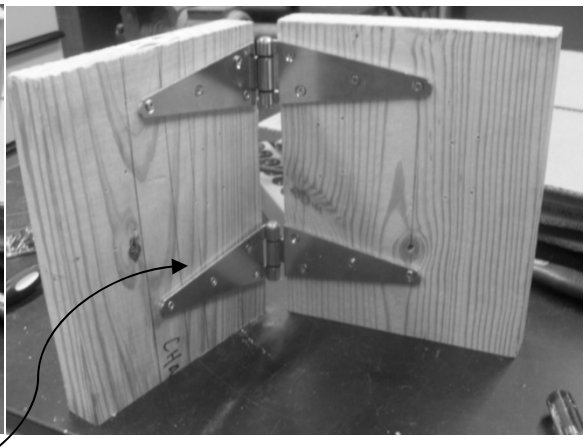
Flat head screws are flush with hinge



Put the screws inside the predrilled holes. Drive the screws into the wood using a screwdriver. Insure all screws are tightened

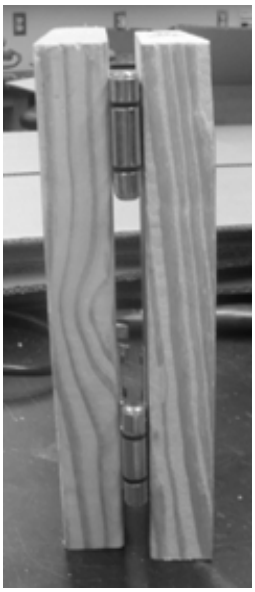






Finished product will be in an open position.

Hinge can be closed



Hinges in closed position from front & back

Exercise

Your instructor will give you two strap hinges and two pieces of wood. Use the procedure to hang the strap hinges.

Your instructor must verify your work before you continue.

Preventative Maintenance and Calibration

Always calibrate every medical device before returning it to use.