Welcome 4-H Leaders!

Research shows that learning is often best achieved when it is fun, active, interesting and easy to understand. Participating in fun activities creates a sense of togetherness within a group and help members relate to one another, as well as allowing the group to relax, to feel safe and at ease.

A leader can help 4-H members and groups learn, by leading activities with meaning. These lessons can then be applied to other areas of the members’ lives, helping them to transfer the meaning from the activity to the real world and everyday life.

The Discover level, Connecting Your Corners manual will discuss and explore the meaning behind the activities and transfer these insights, through the help of the 4-H leader, into their everyday lives whether it be in sports teams, school groups, community groups or at home with family.

The 3D’s of Learning - Each Skill Builder has three sections of learning called “Dream it!”, “Do it!” and “Dig it!” Below is a description of each.

Dream it! Plan for Success - this gives members a chance to help plan their activities. A skills checklist, background information, important words, and activating questions are included in the Member Manual so they will be able to think about the topic and activity and decide how they will approach it. The Leader Guide contains in depth background information on the topics, material lists, suggestions, time requirements for activities, and activating, acquiring, and applying questions to engage member’s thinking through each step of the learning process.

Do it! Hands on learning - this is where members are engaged in the activity planned / discussed in the Dream it! Section. Here members are doing the activities and leaders are observing, recording, and providing feedback on how well they are doing. Allow as much individual practice as required; you are assessing the progress and understanding of individual members.

Dig it! What did you learn? - this simply means that members and leaders need to ‘dig into their learning’. For the learning cycle to be completed, both need to reflect on how things went and how well they did. For members, this involves self-assessment, giving feedback, creating meaning from their experiences, and thinking about what they would do differently next time. Once this is done they will be in a good position to apply what they have learned to the next experience.

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What Skills Will You Learn?

Each section or ‘Builder’ in this project has activities that will help your project group learn to do by doing while learning new skills and having fun!

To complete this project, you must
- Complete the activities in each ‘Builder’ OR a similar activity that focuses on the same skills, as you and your leader may plan other activities
- Plan and complete the Showcase Challenge
- Complete the Portfolio Page
- Participate in your club’s Achievement. (See the inside back cover for more information about 4-H Achievements.

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<td></td>
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</tbody>
</table>

When you successfully complete your builders, you will showcase what you have learned.

Showcase & Portfolio
- Explain success in using the skills listed above
- Showcase Challenge
- My Portfolio Page
- 4-H Achievement

Page numbers: 15, 17, 19
Showcase Challenge and My Portfolio Page

At the end of the members’ section are the “Showcase Challenge” and “My Portfolio Page”. The Showcase Challenge page gets members to think about their accomplishments and explain or demonstrate how they were successful. There are a number of suggestions along with planning information to help them decide how they will best “showcase” their learning to friends, family, community members and/or fellow 4-H members.

Record keeping is an important part of every 4-H project. “My Portfolio Page” is a graphic organizer used to keep track of members’ 4-H experiences. As each member learns skills, the evidence of learning (through participation and completion of the various activities) is recorded on the page. When the Portfolio Page has been completed and confirmed by the leader, then it becomes a record of the member’s completion of the project and participation in other 4-H activities beyond the project.

4-H leader assessment of members will happen throughout the project as you assess the progress and understanding of individual members. You need to observe the members doing the skill and record what you see and hear. Your feedback should be positive and descriptive (not just “well done”). Share that feedback with members frequently so they can put your suggestions into action. How you choose to observe and record is up to you. Some methods are to create checklists, videos and notes while encouraging discussions, peer observations and questions. Recognize that members may improve over the course of a builder and that records should be updated to reflect when they demonstrated their best learning. You are discussing how well members are meeting the skills checklists that are at the beginning of each of the project books, in each Builder and on the Portfolio Page.

Projects promote technical, communication, meeting management, and leadership skills, as well as community involvement and real-world experiences. In addition to the specific skills members are to learn in each builder, the following general learning goals for members are important: Following instructions - Working with others - Using supplies safely - Using the key words - Improving with practice - Respecting timelines.

4-H Project Series Skill Development Levels

Each project topic series contains three levels of skill development: explore, discover, and master.

**Explore** - each project series has one project outlining the fundamentals. All members will be expected to complete the Explore level project before moving into the Discover level of projects. It introduces the basic skills and terms needed by members for subsequent projects in that series.

**Discover** - each project series has several project options and members are encouraged to take as many as they would like. At this level, members practice topic specific techniques and gain theme related skills through specialized builders.

**Master** - multiple project options encourage members to specialize in a topic. They may branch out and take advantage of community options such as cooking for a canteen or participating in a food drive. The Leader’s role is look for opportunities for their members to have more authentic experiences by: working with other mentors, partnering with outside agencies, participating in exchanges, entering competitions, etc. Projects at this level may include the “Partner-a-Project” whereby pre-approved courses will allow members to advance their skills, while applying their learning to the 4-H program.
4-H LEADER TIPS FOR SUCCESS!

♦ To complete, members must complete all the activities referred to on the “Project Completion Requirements” page OR alternate idea for an activity that would teach the same skill or an age appropriate variation. If activity substitutions are used, be sure to have the member make note in their manuals.

♦ Dependent on time available at each meeting, group size and abilities of group members, you may wish to break the Builders into more than one project meeting.

♦ The internet has lots of interesting websites and educational activities. You may choose to use a search engine to explore the options available. We do not endorse any website or the safety or functionality of any products they may sell. Information/products will be used at your own discretion.

♦ Safety is a number one priority. Care has been taken to create safe, age appropriate activities throughout this manual. As leaders, it is important for you to emphasize safety rules and manage or adapt activities in a manner that will safely match your members abilities. Ensure members have a good understanding of safe working and handling practices when using tools, that they use the appropriate safety equipment when necessary, and that appropriate supervision is provided. A quality experience needs to be a safe experience.

♦ The multiple intelligences theory teaches us that people learn in at least 8 different ways. All individuals will be stronger in some ways of “intelligences” and weaker in others. It follows that the more ways we teach, the more members we will reach. Throughout this project, you will find a mix of writing, reading, hands-on work, artwork, self-evaluation, group discussion and performance. Teaching projects using a broad blend will help increase the learning potential of all members.

♦ Projects are designed to teach many skills, such as the basics of how to care for and train cattle. However, the 4-H member is always more important than the subject matter. Stress cooperation in the activities where possible to develop teamwork and cooperation skills. These are valuable skills that will assist them in a number of settings. Ensure the work is completed in a manner that members feel good about themselves and their efforts. This can be done by assigning appropriate tasks or roles based on member’s individual abilities. Modelling and expecting supportive behaviour (i.e. no “put-downs”) amongst members, or by other adults, also contributes to a positive experience.

♦ There will be opportunity for experimentation and applying skills that members have learned throughout this project. Experimenting can be frustrating, but learning through trial and error is an important life skill. Explain to members that it is alright to either go onto the next builder or do the builder again if they need the practice. Help the members work through their challenges until they are satisfied with the quality of their work. Creating inventive 4-H members will be very rewarding.

♦ Celebrating success is an important but sometimes overlooked part of our lives. We encourage you to use the final section to empower the members by celebrating all they have learned in a fun manner. Anything that you do to add to the spirit of fun and the sense of accomplishment of each member will likely be remembered as the high-light of their 4-H year.

Have fun and thanks for your belief in young people!
Skill Builder 1: Beginning With The Rear

Skills Checklist:
- Making an inventory list
- Creating a butt joint

Dream It!

Background For Leaders

Equipment Inventory List

<table>
<thead>
<tr>
<th>Description Of Item</th>
<th>Cost</th>
<th>Date Acquired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example: Tape Measure</td>
<td>6.00</td>
<td>Sept. 14, 2010</td>
</tr>
</tbody>
</table>

A larger version of this table which will help them lot their inventory of tools appears in the member’s manual. It is designed to help them develop business management skills, recognize the importance of money and keeping track of supplies.

Age Considerations
- Ages 10 and up.

Thinking Ahead
- Discuss the importance of business and money management with your members. In every 4-H project, we incorporate these skills so that they may be used on resume’s, applications, and in interviews for future employment opportunities. 4-H is a very beneficial program in these areas, so members should recognize this early on.

Preparing for Success
- Good records can help members determine future needs and can also aid in verifying what they had in the case of theft, fire, or other misfortune

Activating Strategies
- Go over the Exploring Woodworking manual with your members to refresh their memories on woodworking terms. This first joint will be the simplest concept, but make sure to warn them that it will become more difficult as the manual progresses.

Safety Considerations
- This is the first project, so members may need to be reminded of safety rules learned in Explore Woodworking.
Butt What?

**Butt Joint:** This joint is the easiest and also the weakest. It is usually the first joint most of us make. You might use this kind of joint in a birdhouse or feeder because those items do not need to have extremely strong joints. Sometimes the butt joint is reinforced by dowels or corner braces.

Do It!

**Square Cut Box**

This box looks and works like a mitre box but is designed for square cuts only. It helps when cutting dowels or small bits of wood for projects. It would be nice to have one of your own, or to make one for a friend.

**Equipment/Supplies**

**Materials:**
- 1 1x4, at least 40” (1 m) long
- 8 No. 10 x 1 2" flathead wood screws
- 4d finishing nails
- wood glue
- sandpaper, 100 grit
- duct tape

**Tools:**
- marking tools
- c-clamp
- handsaw
- hammer
- protective eye wear
- twist drill and 5/32” bit
- Screwdriver

**Instructions**

1. Check the end of the 1x4 to see if it is square. If not, use your marking tools to square it.
2. Clamp the board to the work surface. Use your marking tools to measure a square line across the board at 12” from the square end. This is your first cut line.
3. Use your handsaw to cut on this line. This piece will become the bottom of your mitre box.
4. Repeat steps two and three, to make the sides of your mitre box. Lay the unglued pieces against each other, as they will appear in the finished mitre box.

Dig it!

**Important Words**

- Butt Joint
- Fasten
- Corner
In The Member Manual

Skill Builder 1: Beginning With The Rear

Pip Says....
Boxes: Butt joints are the weakest type of joint this project will cover, but they are also the simplest. They are good for making table tops or the corners of a box.

Skills Checklist:
- Making an inventory list
- Creating a butt joint

Dream It!
Below is a chart for you to log your inventory of tools. Not only will this help you track your costs for the level, but an equipment inventory list is a valuable business tool. Good records can help you determine your future needs and can also aid in verifying what you had in the case of theft, fire, or other misfortune.

Equipment Inventory List

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Important Words
Watch for these words in this builder:
- Butt Joint
- Fasten
- Corner

Do It!
Square Cut Box
This box looks and works like a mitre box but is designed for square cuts only. It helps when cutting dowels or small bits of wood for projects. It would be nice to have one of your own, or to make one for a friend.

Materials:
- 1 1x4, at least 40” (1 m) long
- 8 No. 10 x 1 1/2” flathead wood screws
- 4d finishing nails
- wood glue
- sandpaper, 100 grit
- duct tape

Tools:
- marking tools
- c-clamp
- handsaw
- hammer
- protective eye wear
- twist drill and 5/32” bit
- Screwdriver

Cut List:
- 3 1x4x12”

Instructions
1. Check the end of the 1x4 to see if it is square. If not, use your marking tools to square it.
2. Clamp the board to the work surface. Use your marking tools to measure a square line across the board at 12” from the square end. This is your first cut line.
3. Use your handsaw to cut on this line. This piece will become the bottom of your mitre box.
4. Repeat steps two and three, to make the sides of your mitre box. Lay the unglued pieces against each other, as they will appear in the finished mitre box.

Dig It!
Can you tell by looking at your box that it’s a butt joint?
Was this project easy to construct? Explain

What did you learn about butt joints?

What’s Next?
In the next skill builder, you will be learning about dado and rabbet joints, and the differences between the two. You will be instructed on how to build a tray.

Butt What?

Butt Joint
This joint is the easiest and also the weakest. It is usually the first joint most of us make. You might use this kind of joint in a birdhouse or sandbox because those items do not need to have extremely strong joints. Sometimes the butt joint is reinforced by dowels or corner braces.
Skills Builder 2: Just Dado It

Skills Checklist:
- Use a Dado Joint to connect two pieces of wood
- Use a Rabbet Joint to connect two pieces of wood

Dream It!

Background For Leaders:

Dado Joint - A dado joint is like a rabbet joint, except that the joint is made in the middle part of the board, not the end. This is a strong joint, because there is a lot of surface contact. Dado joints are used to make slots for shelves and other spots needing good support.

Rabbet Joint - This type of joint is often used for drawer fronts in cabinetwork. A cut is made at the end of a board so it will fit into another one.

Age Considerations
- Ages 10 and up
- All projects require adult supervision.

Thinking Ahead
- Ask members what uses they will have for the tray.
- What other types of projects may members want to use this joint for?

Activating Strategies
- Term to remember: In woodworking, the term kerf will refer to the groove in the wood where the rabbet or dado joint will be inserted. It does not only refer to joinery, it can be used for instance when describing the building of log homes. “The logs are locked together by the kerfs.”
Do It!

Make a Tray

Make this as a practical item or decorate it to add colour to your home! This tray features rabbeted corners and a dadoed bottom for strength and appearance. Select a washable finish. The dimensions are for a standard tray. Adjust them for your needs. Optional hand holes can be cut to size.

The next time you make this tray, you could try another type of joint. A simpler version of this tray can be made with butt joints, gluing and using fine screws to secure.

Equipment/Supplies

Cut List:
- 1 1/4” x 20” by 13” of plywood (tray bottom)
- 2 2” x 2” x 20” sides (Wood of your choice)
- 2 2” x 3” x 12” ends (Wood of your choice)

Instructions:

As with all projects, it is suggested that you sketch or make a cardboard model of this project first, before making it in wood.

1. Measure, mark and cut the pieces of wood.
2. Test assemble the pieces to check for fit.
3. Insert a 1/4” dado blade in the table saw. Set it to cut a groove 1/4” deep. Test a scrap of the wood you are using for the tray bottom in this groove. When this fits smoothly, dado the ends and sides of the tray bottom.
4. Test assemble the tray.
5. If you want to have hand holes in the ends of the tray, sketch and cut them now. Sand them smoothly.
6. Sand all the parts of the tray.
7. Glue, assemble and clamp.
8. Finish as desired.

Important Words

- Dado
- Rabbet
- Kerf
- Holes

Dig it!

What Do You Have To Say?

Discuss with members the difficulties they found constructing the dado joint and when/why one would use it. Also, ask members what ‘kerfs are’ to see if they can remember.
**Skill Builder 2: Just Dado It**

**Pip Says...**
A Dado joint and a Rabbet joint are very similar! The only difference is that a dado joint is made in the middle part of the wood, not the end.

**Important Words**
Watch for these words in this builder:
- Dado
- Rabbet
- Kerf
- Holes

**Skills Checklist:**
- Use a Dado Joint to connect two pieces of wood
- Use a Rabbet Joint to connect two pieces of wood

**Dream It**

A Rabbet joint is a cut or groove made in the edge or end of the board to receive another end. This type of joint is often used for drawer fronts in cabinetwork.

A Dado is a square or rectangular groove in a board. It is used to receive the end or edge of another board to make a dado joint. A dado cut is usually made somewhere in the board other than on the ends.

**Term to remember:** In woodworking, the term kerf will refer to the groove in the wood where the rabbet or dado joint will be inserted. It does not only refer to joinery, it can be used for instance when describing the building of log homes. Eg. “The logs are locked together by the kerf.”

**Do It!**

**Make a Tray**

Make this as a practical item or decorate it to add colour to your home! This tray features rabbeted corners and a Dadoed bottom for strength and appearance. Select a washable finish. The dimensions are for a standard tray. Adjust them for your needs. Optional hand holes can be cut to size.

The next time you make this tray, you could try another type of joint. A simpler version of this tray can be made with butt joints, gluing and using fine screws to secure.

**Cut List:**
- 1 1¼” x 20” by 13” of plywood (tray bottom)
- 2 2” x 2” x 20” sides (Wood of your choice)
- 2 2” x 3’ x 12” ends (Wood of your choice)

**Important Words**

**Instructions:**
As with all projects, it is suggested that you sketch or make a cardboard model of this project first, before making it in wood.

1. Measure, mark and cut the pieces of wood.
2. Test assemble the pieces to check for fit.
3. Insert a 1¼” dado blade in the table saw. Set it to cut a groove 1¼” deep. Test a scrap of the wood you are using for the tray bottom in this groove. When this fits smoothly, dado the ends and sides of the tray bottom.
4. Test assemble the tray.
5. If you want to have hand holes in the ends of the tray, sketch and cut them now. Sand them smoothly.
6. Sand all the parts of the tray.
7. Glue, assemble and clamp.
8. Finish as desired.

**Dig It!**

**What Do You Have To Say?**

What is difficult about making a dado joint?

What are kerfs?

When do you use a dado joint? Why?

**What's Next?**

In the next skill builder, you will be learning about dowel joints, the different types of dowels there are, and how to choose which one would be the best option depending on what you’re building.
Dream It!

Background For Leaders:

Let's do the Dowel

Dowels are used to fasten pieces of wood together and to strengthen joints. They can be cut from dowel rods or purchased by the piece. There are three different types of dowels: plain, spiral and grooved.

Dowel holes are cut with a drill press or with a hand drill, guided by a doweling jig.

How to determine a dowel's diameter:
You should be able to insert the dry dowel into the dowel hole easily by hand. If it is too tight, the glue will be rubbed off as the dowel is inserted.

How to determine the length of the dowel:
Dowels are usually cut 1/4 inch shorter than the combined length of the two dowel holes. When you press the two pieces of wood together on the dowel, you do not want the dowel holding them apart!

How to decide which dowel to use:
Choose between a plain dowel, a dowel with a longitudinal groove or a spiral-grooved dowel. The grooves help the air trapped in the hole to escape and can help the glue to spread inside the hole, making it stronger.

Do a dry run with the dowels in your project before applying glue!

Age Considerations

- Ages 10 and up.

Thinking Ahead

- Not only is learning about dowels necessary in order to understand joinery techniques, but also it will provide increased awareness regarding the strength of a product (tables, chairs, dressers, etc.).

Activating Strategies

- There are three different types of dowel – plain, grooved or spiral. Before inserting the dowel, one needs to decide on the proper diameter, length and type of dowel.
- Utilize your free resources by seeking help from people like hardware store employees, high school shops teachers, local woodworkers/carpenters, family members, and other 4-H clubs and leaders.
**Do It!**

**Equipment/Supplies**

*Materials:*
- 19mm (3/4") x 102mm (4") x 179mm (7") cedar, spruce or pine wood stock
- 10mm (3/8") x 1218mm (48”)
- Eye hook
- Carpenter’s glue

*Tools:*
- Pencil
- Square
- Crosscut saw
- Hand drill, 10mm (3/8") drill bit
- Bar clamp (or pipe clamp)
- Sandpaper 80 grit and 220 grit

**Safety Considerations**
- Review safety rules with the members before beginning any activity

**Important Words**
- Dovetail/Box Joint
- Pins
- Glue
- Interlocking

**Dig It!**

**What Wood You Say?**

Discuss with members what may make certain joints stronger than others. If you wish, gather samples of each type of joint and arrange them from strongest to weakest. Have them list reasons why some are weaker than others.

Also, you may want to discuss with members any negative aspects to using a dowel joint, and what the different types of dowels are. Ask them which types of dowels should be used in certain situations.

Then next skill builder will be looking at the Mitre joint. Explain to the members the similarities between the miter joint and the butt joint.
In The Member Manual

Skill Builder 3: Throwing In The Dowel

Pip Says...

Pioneers used to make their own dowels to avoid having to buy nails. Dowels are hardwood pins that come in a variety of sizes.

Skills Checklist:

- Connect two pieces of wood with a dowel joint
- Identifying other uses for dowels

Important Words

Watch for these words in this builder:

Dowel, Edge, Groove

Dream It?

Let's do the Dowel

How to determine a dowel’s diameter:
You should be able to insert the dry dowel into the dowel hole easily by hand. If it is too tight, the glue will be rubbed off as the dowel is inserted.

How to determine the length of the dowel:
Dowels are usually cut 1/4 inch shorter than the combined length of the two dowel holes. When you press the two pieces of wood together on the dowel, you do not want the dowel holding them apart!

Do It!

Suet Feeder

Materials:

- 19mm (3/4") x 102mm (4") x 179mm (7") cedar, spruce or pine wood stock
- 10mm (3/8") x 1218mm (48")
- Eye hook
- Carpenter’s glue

Tools:

- Pencil
- Square
- Crosscut saw
- Hand drill, 10mm (3/8") drill bit
- Bar clamp (or pipe clamp)
- Sandpaper 80 grit and 220 grit

Instructions:

1. Measure 2 pieces 179mm (7") long from the wood stock. Use the square to draw a straight line across the board.
2. Sand all the sides of the 2 pieces until smooth.
3. Use diagram 1 to mark where the holes are to be drilled for the dowels.
4. Drill the holes 10mm (3/8") deep on the baseboard.
5. When drilling the holes for the dowel on the top piece, drill the 4 side holes and the one on the back 10mm (3/8") deep. Drill the front hole of the feeder all the way through. (Note: This is so that the dowel can be removed to put in a new suet cake.)
6. Cut 5 dowels 191mm (7 1/2") long and the sixth one 24mm (9 1/2") long.
7. Glue in the 5 dowels with carpenters glue and clamp together until the glue is dry.
8. Apply finish or leave natural.

Dig It?

What Wood You Say?

What is it about a dowel joint that makes it be strong?

Are there any negative aspects to using a dowel joint?

What are the different types of dowels?

What’s Next!

The next skill builder will look at the miter joint. This joint is very common and somewhat like the butt joint, except that it uses angles.
Skill Builder 4: The Mighty Mitre

Skills Checklist:
- Construct a mitre joint into a picture frame or mirror.
- Fill out a project cost record.

Dream It!

The mitre is a type of butt joint. The wood is cut at a precise angle using a mitre saw or mitre box. It looks better than a butt joint and is a bit stronger though it can be tricky to clamp.

Picture frames and doorframes often use this type of joint because it is a good way to join ornamental wood. You will notice that picture frames are pinned or reinforced at the corners for extra support.

Background For Leaders:

- This builder is shorter, and follows essentially the same principals as the butt joint in that it is also one of the weaker joints that are studied. Members will be asked to construct a picture or mirror frame, then record the costs of all materials purchased to complete the project. It is presumed that members will not have the proper sized glass or mirror needed to fill the frame, and will likely need to go and have a piece cut to the frame’s dimensions. This builder includes the business management aspect to help prepare them for future endeavors.

Age Considerations

- Ages 10 and up.

Thinking Ahead

- Make sure that members recognize the difference between a butt joint and a mitre joint as the two can be confused.

Activating Strategies

- Discuss with members the importance of keeping track of expenditures for individual projects. Even though it may not seem like a lot at a time, things can add up.

Important Words

- Mitre
- Angle
- Clamp
Do It!

Equipment/Supplies

Materials:
- wood of your choice
- glue
- thin panel pins (optional)
- glass or mirror cut to fit (have this cut after you have made the frame!)
- matting for picture (optional, but recommended)
- small screws and wire for hanging
- small scraps of felt

Tools:
- mitre box and saw
- router
- sander
- Saw

Cut List:
- 2 1 3/4” x 1 3/4” x 18” (sides)
- 2 1 3/4” x 1 3/4” x 16” (top and bottom)
- 1 piece of thin board to fit within the finished back (measure and cut to fit finished frame)

Instructions to make a 18” by 16” frame:

1. Cut wood, using a mitre saw and box. Cut at a 45 degree angle. Take great care to avoid splinters.
2. Test assemble the pieces, to make sure everything will fit together snugly.
3. On the back side of each piece, rout out a groove on the inside of each piece. This will form a ledge that the picture or mirror will rest on.
4. If you are routing hard wood, it may take more than one pass to make the depth of ledge you want. Do not force your router.
5. Glue and clamp the four pieces together. Lay on a flat surface. Let dry overnight. It might be a good idea to put a clean piece of paper or cardboard over top, with a bit of weight, to hold things flat as they dry.
6. If you want extra reinforcement, use very thin panel pins to nail the pieces together.
7. Have the glass or mirror cut now to fit the finished product. Insert the glass or mirror into the frame. Secure it with fine panel pins.
8. Attach picture wire frame between small screws.
9. Glue small pieces of felt to bottom corner of frame so it will not mark the wall.

Tip: To avoid tilting pictures, hang frames from two, not single hooks on the wall.

Dig it!

Get The Picture?

Here, members must make a list of all the items they had to purchase to complete this project. They can estimate the cost of each item if they don’t know the actual cost.
Skill Builder 4: The Mighty Mitre

Pip Says....

Clean-up is a very important part of finishing – you want to tackle it immediately (even if it might be more tempting to sit and stare at the beautiful project that you just created).

Skills Checklist:
- Construct a mitre joint into a picture frame or mirror.
- Fill out a project cost record.

Important Words
Watch for these important words in the builder:
Mitre, Angle, Clamp

Dream It!

Degree

The mitre is a type of butt joint. The wood is cut at a precise angle using a mitre saw or mitre box. It looks better than a butt joint and is a bit stronger though it can be tricky to clamp.

Picture frames and door frames often use this type of joint because it is a good way to join ornamental wood. You will notice that picture frames are pinned or reinforced at the corners for extra support.

Do It!

Picture or Mirror Frame

You can make this to any dimensions, of course. Varnish the frame, if you wish to show off the grain. Paint it, if you want to emphasize what the frame will hold. Or leave it unfinished, if you are using a material such as old barn board! The choice is yours.

Materials:
- wood of your choice
- glue
- thin panel pins (optional)
- glass or mirror cut to fit (have this cut after you have made the frame!)
- matting for picture (optional, but recommended)
- small screws and wire for hanging
- small scraps of felt

Tools:
- mitre box and saw
- router
- sander
- saw

Cut List:
- 2 3/4" x 1 3/4" x 18" (sides)
- 2 3/4" x 1 3/4" x 16" (top and bottom)
- 1 piece of thin board to fit within the finished back (measure and cut to fit finished frame)

Instructions to make a 18" by 16" frame:
1. Cut wood, using a mitre saw and box. Cut at a 45 degree angle. Take great care to avoid splinters.
2. Test assemble the pieces, to make sure everything will fit together snugly.
3. On the back side of each piece, rout a groove on the inside of each piece. This will form a ledge that the picture or mirror will rest on.
4. If you are routing hard wood, it may take more than one pass to make the depth of ledge you want. Do not force your router.
5. Glue and clamp the four pieces together. Lay on a flat surface. Let dry overnight. It might be a good idea to put a clean piece of paper or cardboard over top, with a bit of weight, to hold things flat as they dry.
6. If you want extra reinforcement, use very thin panel pins to nail the pieces together.
7. Have the glass or mirror cut now to fit the finished product. Insert the glass or mirror into the frame. Secure it with fine panel pins.
8. Attach picture wire frame between small screws.
9. Glue small pieces of felt to bottom corner of frame so it will not mark the wall.

Tips: To avoid tilting pictures, hang frames from two, not single hooks on the wall.

Dig It!

Get the Picture?

Make a list of all the items you had to purchase to complete this project. Estimate the cost of each item if you don’t know the actual cost.

What was the total cost of your frame? Does it surprise you? If so, Why?

What’s Next?

The next skill builder is slightly different from the rest. It looks at two different joints: the Dovetail or Box joint, and the Mortise and Tenon.
Skill Builder 5: Making The Connection

Dream It!

Putting Two And Two Together

Throughout the manual you have been learning about different types of joinery, and constructing projects related to a specific joint. In this skill builder, you will be introduced to two types of joints that haven't been mentioned, but are still very important, and very similar to one another. Mortise and Tenon, and Dovetail or Box joints. These two types of joinery are the most difficult to construct, and are mainly used for furniture that requires extreme strength.

Dovetail joints have flaring pins and tails that interlock securely. This helps them resist being pulled apart which makes them ideal for parts of furniture that take a great deal of stress. Drawers are a good example. The joint is composed of pins on the piece that tails on the other. The spaces between the pins and tails on each piece are called sockets.

Mortise and Tenon is a sturdy interlocking joint. It was once used in all types of carpentry, but today it is mainly found in furniture. Typically two pieces are joined at right angles. The “Tenon” is the part that fits inside the “Mortise”. The joining of these two pieces is usually made permanent by gluing, or by using dowels, or wedges.

Background For Leaders:

- This builder is to give members and overview of the manual, as well as introduce them to two other joints that are not mentioned throughout, but are still important. The Dovetail/Box joint and Mortise and Tenon joint are very similar, and are more difficult to construct. These two are optional for the members to make projects for, but require them to research and learn what they are.

Skills Checklist:
- Construct a dovetail/box joint
- Research a topic
- Recognize Mortise and Tenon joint
- Recognize Dovetail/box joint
**Do It!**

**Cut N’ Paste**

The members must look through magazines or take a picture themselves, then paste it in the spaces provided to them. Note: Do not allow members to search them on the internet and print them off. Our goal is for them to be able to recognize them on their own without simply typing the joint name into a search engine.

They will be required to write a short description beside each picture to demonstrate their knowledge of each joint.

**Age Considerations**
- Ages 10 and up.

**Equipment/Supplies**
- Magazines
- Scissors
- OR camera

**Important Words**
- Dovetail/Box Joint
- Pins
- Glue
- Interlocking

**Dig it!**

**The Final Finish**

Discuss with members what they will do with the skills they have learned throughout the manual. Have them jot it down in the space provided. Note: The members must now go back to skill builder one, and complete their inventory table.

**Test Your Memory: ANSWER KEY**

1) The weakest type of joint is the **butt joint**.
2) A rabbet joint would be used on a **corner**, a dado is used to receive the end or edge of another board.
3) You would use a **mitre saw** to most accurately cut the angle of a mitre joint.
4) **Yes**, some dowels have grooves. They help the air trapped in the hole to escape and can help the glue to spread inside the hole, making it stronger.

5) **Discussion**

<table>
<thead>
<tr>
<th>Description Of Item</th>
<th>Approximate Cost</th>
<th>Perceived Level Of Importance High/Medium/Low</th>
</tr>
</thead>
</table>

There is a larger version of this table in the members manual which they must fill in what tools would be beneficial to own, its approximate cost, then it’s level of importance.
In The Member Manual

Skill Builder 5: Making The Connection

Pip Says:....

Search the internet to find a helpful video that goes through step by step how to construct a dovetail joint.

Skills Checklist:
- Construct a dovetail/joint
- Research a topic
- Recognize mortise and tenon joint
- Recognize dovetail/joint

Dream It!

Putting Two And Two Together

Throughout the manual you have been learning about different types of joinery, and constructing projects related to a specific joint. In this skill builder, you will be introduced to two types of joints that haven't been mentioned, but are still very important, and very similar to one another, Mortise and Tenon, and Dovetail or Box joints. These two types of joinery are the most difficult to construct and are mainly used for furniture that requires extreme strength.

Dovetail joints have flaring pins and tails that interlock securely. This helps them resist being pulled apart, which makes them ideal for parts of furniture that take a great deal of stress. Drawers are a good example.

Mortise and Tenon is a sturdy interlocking joint. It was once used in all types of carpentry, but today it is mainly found in furniture. Typically two pieces are joined at right angles. The “Tenon” is the part that fits inside the “Mortise”. The joining of these two pieces is usually made permanent by gluing, or by using dowels, or wedges.

Important Words

Watch for these important words in this builder:
- Dovetail/Box joints, Pins, Glue, Interlocking

Do It!

Cut 'N' Paste

For this section you may wish to construct a Dovetail or Mortise and Tenon joint as personal project with your leader. In this Do It section though, you must research both of these joints, and find pictures to back up your research. (You can find these pictures from magazines, or take them yourself. You may not print one off the internet because it is too easy to just type in a joint name and click on a photo without needing to recognize it through your own knowledge.)

Beside each clipping or photo, state which joint it is and write a short description of the characteristics of each. This will help you to know if you can recognize how it looks as well as explain how it works.
Showcase Challenge

Have members use their Member Manual to help them in organizing what they have learned. The form of presentation can vary according to the wishes of the leaders and member’s ability. Information could be presented in many forms, some of which are: posters, pamphlets, written reports, speeches, computer presentations, displays, etc. Suggestions are listed on the Showcase Challenge page at the back of the Member Manual. The best results are almost always obtained when members are allowed to present their information in the style of their choice.

Showcase Challenge
Bringing it all together!

Now that you have finished this project, it is time to think about how you will share your experiences and knowledge with others. You may put your new skills to work by helping at a community event or at your club Achievement or teaching others about your topic. The goal of the Showcase Challenge is to help highlight your new skills and help you understand how you can use them. It can be an opportunity to receive feedback from others on your project. So go back through your manual and find some highlights of your learning (what you are proud of) and think about how you will “showcase” it.

Dream It!

Here are some Showcase Challenge Suggestions:

- Demonstrate something you made or learned about
- Make a poster or display
- Act out a play
- Make a video or slideshow
- Give a speech
- Write a report
- Use your new skills to help with the Club Achievement plans
- Or come up with your own idea. It is up to you and your leader!

My Showcase Challenge Plan

My showcase idea: __________________________________________________________

What materials and resources do I need? _______________________________________

Who do I need to help me? __________________________________________________

When do I need to have things done by? _______________________________________
**Do It!**

Insert or attach your finished product or a photo of you sharing your skills in your Showcase Challenge.

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**Dig It!**

Now that you have showcased your project skills;
- How did your Showcase Challenge go?
- What would you do differently next time?
- How will you use your new skills in the future? *(in different situations?)*
Portfolio Page

Once members have completed all the builders they will have a lot of information recorded in their manuals. These are products of their learning. As a final project activity, members and leaders will pull together all this learning in completing the Portfolio Page in the Member Manual. There is a skills chart that lists the skills members are expected to complete by the end of the project. Members and leaders must indicate how they know the member was successful at a particular skill. Leaders will find evidence if they think about what they have observed members doing, what discussions they have had with members, and what members have produced. If leaders think that members need to go back and improve on any skill, this chart helps them clarify what needs to be done.

### My 4-H Portfolio Page

**Name:** __________________________  **Date:** _________________  **Year in 4-H:** ___

**Club:** ___________________________  **Hours Spent on 4-H:** ___ (Project and Other 4-H Activities)

### Discovering Presentations Project Skills Chart

To be completed by the leader and the member based on observations and conversations throughout the project.

<table>
<thead>
<tr>
<th>Skill Builder</th>
<th>Members will be able to…</th>
<th>We know this because…</th>
</tr>
</thead>
</table>
| 1             | Refresh memory on ways to connect wood  
Use a butt joint to connect two pieces of wood | Identify activities completed and record observations and information from discussions about activities. |
| 2             | Use a dado joint to connect two pieces of wood  
Use a rabbet joint to connect two pieces of wood |  |
| 3             | Connect two pieces of wood with a dowel joint  
Identify other uses for dowels |  |
| 4             | Construct a mitre joint  
Construct a mirror/picture frame |  |
| 5             | Construct a dovetail or box joint  
Research  
Implement a plan |  |

### Additional Comments/Activities:

**Leader Point of Praise!**

I am most impressed by…

I acknowledge that the member has completed the 4-H project requirements.

**Leader’s Signature:** ___________________________
In the Member Manual

Above and Beyond!
In addition to project skills, 4-H also increases skills in meeting management, communications, leadership, community involvement through participation in club, area, or provincial 4-H events or activities. List below any activities you participated in this year in 4-H.
(Some examples include Executive Positions Held, Workshops, Communication, Community Service, Rally, Bonspiels, Conferences, Judging, Camps, Trips, Awards, Representation to Area or Provincial Councils, etc)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

**Feel Free to add additional pages that include awards, certificates, new clippings, photos or other items that describe your 4-H involvement.

Member Point of Pride!

What I learned…

What I need to improve on…

What I want others to notice…

Member’s Signature: ________________________________

Point of Praise! Another’s perspective on your achievements in 4-H.
(community professionals, MAFRI staff, 4-H club head leaders, 4-H Ambassadors, friends of 4-H)

I am most impressed by...

I believe that you have learned…

In the future I encourage you to…

Signature: ________________________________
4-H Achievement

4-H Achievement is... a 4-H club celebration when members have completed their projects. Achievements are planned by the club to give recognition to members and leaders for their accomplishments in their 4-H projects and club activities.

A 4-H Achievement can take many different formats: from choosing a theme, to member project displays, to members using their new skills for the event (entertainment, food, decorating, photographer, etc.), to members presenting their project to the whole group, the options are endless and open to the creativity of the members and leaders in each club!

Clubs may also plan their Achievement to promote 4-H to the community or to recognize sponsors and others who have helped the club.

Members and leaders - be sure to check your project books for the project completion requirements, so you will be ready for your club’s Achievement celebration!

If you have any questions, comments or suggestions for this or other 4-H projects contact:

Manitoba 4-H Projects
Manitoba Agriculture Food and Rural Initiatives
1129 Queens Avenue
Brandon, MB R7A 1L9

Email: 4h@gov.mb.ca
Phone: 204-726-6613
Fax: 204-726-6260

This manual is for educational use only and is not intended as professional advice.

For more information about 4-H and the many 4-H opportunities available please visit

http://www.gov.mb.ca/agriculture/4-h/
What is 4-H?

4-H is an international youth organization involving more than 7 million members in 80 countries around the world.

In Canada, 4-H began in 1913 in Roland, Manitoba as a community-based organization dedicated to growth and development of rural youth. Today’s 4-H program reaches both farm and non-farm youth across Canada. The motto of “Learn to Do by Doing” is embodied in the program, as 4-H focuses on skill development as well as personal development of life skills such as communications, leadership and citizenship.

4-H Motto

“Learn To Do by Doing”

4-H Pledge

I pledge,
My HEAD to clearer thinking,
My HEART to greater loyalty,
My HANDS to greater service,
My HEALTH to better living,
For my club, my community, and my country.

4-H Quality Equation Principles

Quality People

- Promote responsibility, respect, trust, honesty, fairness, sportsmanship, citizenship, teamwork and caring.

Quality Experiences

- Provide members with personal development and skill development experiences.

Quality Projects

- Promote and value quality effort.
- Promote high quality, safe food production within industry standards.

Manitoba 4-H project material is developed by
Manitoba Agriculture, Food and Rural Initiatives (MAFRI)