

IDIN Skill Builder: Wooden Spoon Instructor Guide

Time Needed:

6 hours total, or 2 x 3 hour sessions.

Number of People Needed to Run the Session:

1-2 instructors per 8 participants.

Space Set-Up:

This activity should be done in a room with sufficient table space. The tables should be ones which can withstand use of a mallet. If available, a workshop with vices for wood working would be ideal.

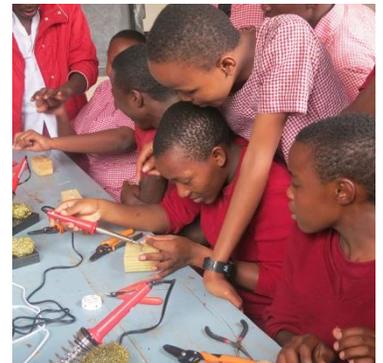


1. Introduction

PHILOSOPHY

Many people around the world go through their lives rarely using their inherent creative instincts to make a useful object with their own hands. However, a belief in one's individual ability to create technology can lead to a sense of agency and a belief that one can create positive change in the world. This idea embodies the purpose of a Skill Builder.

Those who participate in a Builder leave believing they can be creative, work with technology, and build tools to solve problems present in their own lives or in the lives of others. The experience provided is transformative; if they can successfully build this device, then by extension, they can build another. For example, creating light is a magical experience, endowing a person with the ability to replicate the power of the sun. As a person said in Zambia following a Builder, "I was a dull knife and you sharpened me."



This kind of transformation is only achieved by having participants build on their own terms, exploring the use of tools with guidance from an instructor. It is important that their devices work so they are successful and feel a sense of accomplishment; but even more important is that they felt they did it themselves and believe they could do it again.

Skill Builders are the building of a piece of technology as a means to acquiring fabrication skills, working with materials, and learning physical principles. This can range from using wire strippers and a soldering iron to create an LED light to using a hammer and chisel to shape wood into a spoon. The key to inspiring change in participants does not lie within the device created; it lies in the skills gained and the newfound sense of ability felt by participants.

For those who have never used the tools before, the initial stages of the Builder will feel awkward. Participants may "fail" at steps in the process. They should be guided out of these stumbles, not have the stumbles solved for them. Struggling with the process and resolving issues on one's own are important in building the feeling of agency that is necessary to use these skills to address problems in the world.



Skill Builders are also a powerful experience for the instructors. When the participants have successful devices, the pride they have will be reflected in the pride instructors feel. The instructors are the first link in passing along the philosophy and skills transmitted. If the instructors are steeped in these principles, the participants will carry the philosophy and skills forward in their lives and will share with those around them.

GUIDELINES

To be an effective instructor and create a valuable experience for the participants, keep the following ideas in mind while delivering the Skill Builder.

- Allow participants to work through the steps at their own pace. It is important that everyone gets to practice using each of the tools. Since this is the first time most people have used them, it will take longer than you might expect. The length or number of sessions should account for this. If you find you still go over, arrange for more time.
- Encourage participants to form pairs and help each other through the activity. Ensure there is not a dominant person in each pair who does all of the tooling and machining.
- If a participant is having trouble, encourage those around him or her to provide help so the participants can learn from each other. When a participant has solved a problem, have them demonstrate the solution to the group so they can take credit.
- If a participant makes a mistake, help them to diagnose the problem and fix it. This should be done by encouraging them to share their thoughts on the problem and the solution, before offering your own diagnosis and solution. Avoid correcting the mistake for the participant except in extreme situations.
- It is important to practice showing, instead of telling. A visual demonstration goes much farther than an oral description of the task. During the Skill Builder, be vigilant to ensure there is more showing than speaking.
- Encourage participants to use spare materials to practice the skills before using the tools to make the final product.
- Observe and advise the participants on their technique in using the tools so they have the opportunity to improve.
- Complement the participants as they successfully complete steps in the construction process, emphasizing that they are responsible for accomplishing the task.
- Promote a sense of camaraderie in the group. Ways to do this can include a group picture, having each person sign each other's device, or taking time for each person to demonstrate their functional device. Place emphasis on each participant's success in creating a working device to increase their confidence.
- Keep the guiding principles described in the philosophy section in mind as you deliver the curriculum.

PREPARATION

To set the Skill Builder up for success, do the following ahead of time:

- Make the device yourself to discover what steps participants might find difficult and to ensure all tooling and machinery is functional.
- Set aside one set of Skill Builder parts for yourself and subassemblies to show key steps. As you lead the participants through the Skill Builder, you can demonstrate steps using your own set of parts.
- Set up at least one completed device that participants can reference as they complete the activity.
- Prepare extra material that the participants can use to practice skills.
- Print one 'Participant Skill Builder Photo Guide' per participant.
- Print one 'Skill Builder Module User Evaluation Sheet' per participant.
- Prepare supplies and tools at the work stations.
- Ensure a first aid kit is available.
- Ensure there are enough safety glasses for you and all participants to each have a pair throughout the activity. Ensure other personal protective equipment is available where necessary.

SAFETY

Below is a list of safety concerns relevant to this Skill Builder.

Chisel and gouge:

- A good chisel and gouge are sharp. As such, when using the tools, it is important to always point them away from one's body.
- It is important to be conscientious of where one's hands are placed. More often the case with the chisel than the gouge, if one is removing large chunks of wood at a time, the chisel can jump significantly and one's hand might get jammed against the wood or the vice.

Wood saw and coping saw:

- When cutting wood, the saw can jump around or slide on the wood until enough of a groove is made. It is important to keep body parts out of the direction of the blade to ensure the blade doesn't hit one's hand.
- For both the wood saw and coping saw, a sharper blade is safer than a dull one. Using force to do the work as oppose to relying on the tool creates a higher risk situation.

2. Overview

LEARNING OBJECTIVES

- Participants will learn what types of wood are better suited to carving.
- Participants will learn good techniques for sketching.
- Participants will learn how to shape wood with a chisel.
- Participants will learn how to shape wood with a gouge.
- Participants will learn how to properly cut wood.
- Participants will learn how to properly finish a wood carving.
- Participants will have made a wooden spoon.

LESSON PLAN

1. Review what a wooden spoon is and the tools needed to make one by hand. *10 min*
2. Complete pre-questions in the 'Skill Builder User Evaluation Sheet'. *5 min*.
3. Trace the spoon. *15 min*.
4. Gouge out the bowl. *30 min*.
5. Cut out the spoon's handle. *1 hour, 10 min*.
6. Cut out the spoon's head. *1 hour*.
7. Finish the spoon. *1 hour, 10 min*.
8. Reflection and feedback. *25 min*
9. Complete the post-questions in the 'Skill Builder User Evaluation Sheet'. *15 min*

3. Materials

TOOLS

	Item	Quantity Per # Participants
	Wood saw	2-4
	Coping saw	4
	Chisel (1", 2.54cm)	4
	Gouge (1", 2.54cm)	4
	Sand paper (60, 150, 220 grit)	8 sheets of each type
	Square	4
	Scissors	4
	Pencil	8
	Mallet (if available)	8
	Hardwood block (alternative to mallet)	8
	Wood vice (if available)	8
	C-clamp (alternative to wood vice)	8

SUPPLIES

	Item	Amount	Cost
	Wood block (12" x 4" x 2", 30 cm x 10cm x 5cm)	1	\$5-10
	Cardstock	1 piece	minimal
		Total Cost	\$5-10

4. Teaching Notes

INTRODUCTION TO THE SESSION

Wooden spoons are ubiquitous in cooking and can be found in the kitchens of homes in all parts of the world. However, few people know the amount of work involved in creating a spoon by hand.



PROPERTIES OF WOOD

There are several properties which should be considered when selecting a wood for use in carving. First, wood varies by its hardness. Soft woods such as butternut or basswood are easiest for those who are new to carving and are preferential when one is using hand tools rather than power tools. Second, wood will vary according to how dry it is. Wet wood is harder and will deform as it dries. As such, carving is best done on the driest wood available. Third, the grain in wood varies. It is best to look for woods which have a straight grain. Carving on straight grained wood minimizes the risk for crack propagation.



LEARNING OBJECTIVES ACCOMPLISHED:

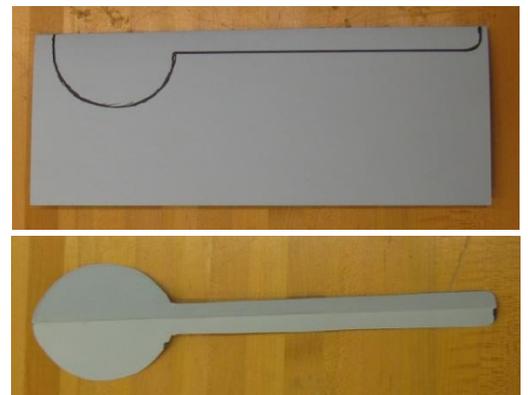
- Participants will learn what types of wood are better suited to carving.

TRACE THE SPOON

Skills	Tools	Supplies
sketching		

1. Fold the cardstock in half and sketch the desired profile of the spoon. Use the ruler to make sure the lines are straight. Cut out the drawing.

Teaching note: Explain that folding the cardstock in half ensures the spoon is symmetric.

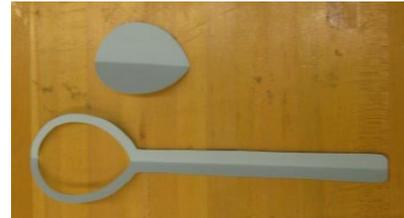


2. Mark the center of the wooden block. Place the cutout so that the center of the spoon aligns with the center of the block and the top of the spoon aligns with the top of the block. Trace the outline of the spoon onto the block.

Teaching note: Explain that aligning the top of the spoon with the top of the block gives a frame of reference for sketching the spoon's side profile. It also reduces the amount of cutting needed.



3. The rim of the spoon should be of an even thickness. Sketch a line for the inner edge of the rim and cut out the shape.



4. Trace the inner edge of the rim onto the wooden block. Use the machinist's square to mark the center of the bowl.



LEARNING OBJECTIVES ACCOMPLISHED:

- Participants will learn good techniques for sketching.

GOUGE OUT THE BOWL

Skills	Tools	Supplies
gouging		

5. Place the wooden block in a table vice or secure it to the table using a c-clamp, if a vice is not available.

Teaching note, if there is an appropriate one for this step



6. Gouge out the bowl.

Teaching note: Explain that participants should not use too much force. It is possible to propagate a crack across the wood that would ruin the rim of the spoon. Also, if the wood is very soft, explain that participants may use the gouge without a mallet.

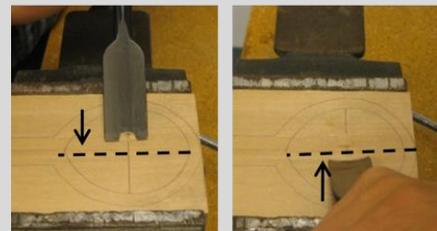
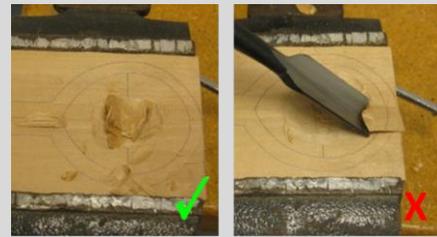


TEACHING NOTE: DEMONSTRATE PROPER USAGE OF A GOUGE

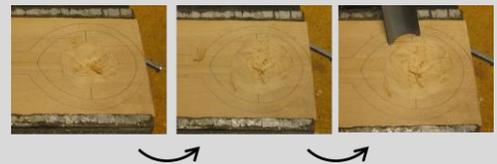
Sketch the area. Before removing any material from the block, it is important to sketch guidelines for the desired shape onto the wood. When gouging out an area, mark both the perimeter and center of the region in pencil. When the wood containing the sketched guidelines is removed, consider redrawing them on the remaining wood.



Gouge toward the center, alternating sides. The gouge should always be pointed toward the center of the area being gouged, the center of the spoon's bowl in this case. It is also good practice to alternate sides following each gouge. This will ensure there aren't any cracks propagated across the rim of the spoon. For the same reason, it is important to use minimal force when gouging, especially if the wood is soft.



Start near the center and work toward the outside gradually. Again, to prevent cracks from extending outside the spoon's bowl, begin gouging near the marked center. Then, slowly work the gouge toward the outside until the sketch for the rim is reached.



LEARNING OBJECTIVES ACCOMPLISHED:

- Participants will learn how to shape wood with a gouge.

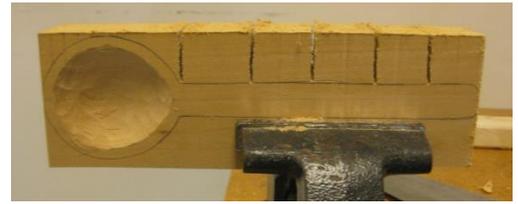
CUT OUT THE SPOON'S HANDLE

Skills	Tools	Supplies
sawing chiseling		

- If the spoon is shorter than the wooden block, cut off the excess using the wood saw.



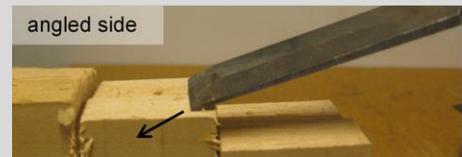
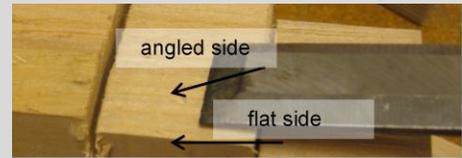
- Use the wood saw to make cuts every one 1.5 inches, from the edge of the wood block to the start of the spoon's bowl.



TEACHING NOTE: DEMONSTRATE PROPER USAGE OF A CHISEL

The chisel's blade is directional. One side of the chisel's blade is flat while the other side is cut at an angle. Before chiseling, consider which side of the chisel should be used. If the flat side is opposite the wood, the crack the chisel propagates in the wood will move upward slightly. However, if the angled side is opposite the wood, the crack the chisel propagates will move downward slightly.

Create chiseling "end points". Without an "end point," the crack created by the chisel will propagate through the length of the wood block being carved. To better control the amount of material removed at a given time, cut the wood perpendicular to the chiseling direction every 4 to 5 cm using a coping saw or wood saw. Then, use the chisel to remove these blocks one at a time.



- Using the chisel, remove the wood one segment at a time.

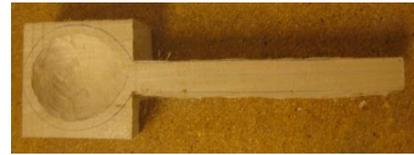


- Repeat the previous two steps on the other side of the handle.



11. Turning the spoon on its side, sketch the side profile of the handle.

12. Repeat steps 8 and 9 to remove the excess wood from the handle.



LEARNING OBJECTIVES ACCOMPLISHED:

- Participants will learn how to shape wood with a chisel.
- Participants will learn how to properly cut wood.

CUT OUT THE SPOON'S HEAD

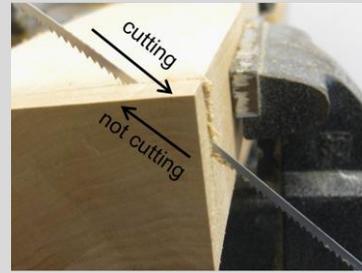
Skills	Tools	Supplies
sawing chiseling sketching		

13. Use the coping saw to cut out the bowl along the outer edge of the ridge.

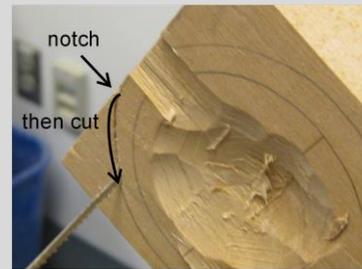


TEACHING NOTE: DEMONSTRATE PROPER USAGE OF A COPING SAW

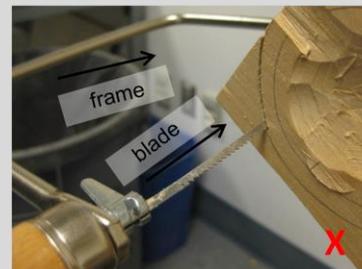
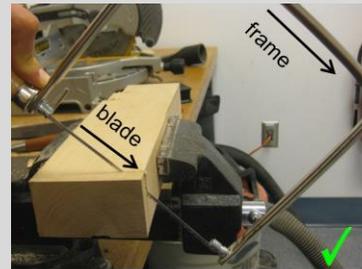
Apply force in the cutting direction. The saw should do most of the work. Putting too much force on to the saw will make the arm tired but the material will not cut more quickly. Coping saw blades only cut in a single direction, and should be oriented in the saw with the teeth pointing downward. Make the forward strokes with strength, but draw the blade back without using force.



Create a notch. If one is cutting a curved shape into a block of wood, it may be difficult to get the coping saw to cut into the wood at an angle. Instead, cut a small notch that is perpendicular to the face of the wood. Then, once the small notch has been made, turn the blade slowly within the notch to begin cutting along the curved outline drawn.



Keep the blade parallel to the frame. Coping saw blades are very thin and subject to easy breakage. This happens most frequently when the blade becomes misaligned with the plane of the saw's frame. Avoid using excessive force to get the blade to follow a curve, especially one that is particularly sharp.



14. Turning the spoon on its side, sketch the side profile for the spoon's bowl.



15. Using both the coping saw and chisel, where appropriate, remove the rest of the excess material around the bowl.



LEARNING OBJECTIVES ACCOMPLISHED:

- Participants will learn good techniques for sketching.
- Participants will learn how to shape wood with a chisel.
- Participants will learn how to properly cut wood.

FINISH THE SPOON

Skills	Tools	Supplies
gouging chiseling finishing		

16. It is expected that the cutout of the spoon is rough. To create a nice finish and a uniform spoon, first use the gouge and chisel to make larger adjustments to the shape of the spoon.



17. Once the spoon's general shape is as desired, use the 60 grit sand paper to continue making small adjustments to the shape. Move then to the 120 grit, followed by 220 grit sand paper, to finish the surfaces of the spoon.



TEACHING NOTE: DEMONSTRATE PROPER WOOD FINISHING TECHNIQUE

Use a table's edge to tear sand paper. Sand paper comes in large sheets that are difficult to manipulate. It is easiest to cut the paper into smaller pieces. Rather than using a pair of scissors, bend the sand paper in the desired location. Then, rip along that bend leveraging a table's edge. This will create a smooth cut in the sand paper.



Create sanding blocks. One can use more force in sanding by creating sanding blocks as oppose to holding the sand paper in one's hand. The simplest sanding block can be made by stapling a piece of sand paper to a scrap of wood. When stapling the sand paper, ensure the two ends have folded over each other. This will prevent the sand paper from easily ripping off the block. Keep a portion of the block uncovered so one's hand isn't directly gripping the sand paper.



Work through the grits sequentially. Sand paper comes in many different grits. When finishing a piece of wood, one should use three different grits, at a minimum. 60 grit sand paper is the coarsest and will remove large amounts of material. 220 grit paper is the finest and is used to create a smooth finish. One should move sequentially through the different grits to ensure a smooth, uniform finish throughout the spoon.



LEARNING OBJECTIVES ACCOMPLISHED:

- Participants will learn how to shape wood with a chisel.
- Participants will learn how to shape wood with a gouge.
- Participants will learn how to properly finish a wood carving.
- Participants will have made a wooden spoon.

REFLECTION AND FEEDBACK GROUP DISCUSSION QUESTIONS

- Besides another spoon, what would you make with the new skills you've acquired?
- How long did you think it would take you to make the spoon when you first started?
- What was the most interesting thing you learned while making the spoon?
- Which skill that you learned are you most excited about?
- Which skill that you learned would you like to have spent more time practicing?

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