

TOOLS STATION – GRADE LEVEL LESSON PLANS

Pixie Assemble paper knives and learn to open and close, Learn to assemble nuts and bolts Hammer in preset nails	K-1 Learn about a safety circle Discuss knife safety & learn to pass kitchen knives (butter & chef's knife) Learn to identify 6 tools: hammer, screwdriver, saw, block & tackle, lever/crowbar, pliers/wrench & their uses	2 Review/Learn Safety circle and how to handle, use and pass kitchen knives Learn how to open, handle, close, and pass a jackknife Identify 6 tools and their uses. Demonstrate use of lever to move something heavy	3 Previous knowledge, plus: Learn how to open, handle, close, and pass a jackknife Make wood shavings Learn/review 6 tools Use a block and tackle to lift something too heavy to pick up	4 Previous knowledge, plus: Learn how to sharpen a jackknife. Make wood shavings to use as tinder for a fire.	5 Previous knowledge, plus: Learn/Review 6 tools, lever, block & tackle Make wood shavings to use as tinder for a fire. Learn what a bow saw is, and what it is used for	6 Previous knowledge, plus: Learn to use, sharpen, pass, carry and store a hatchet
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Kindergarten/1st grade- 30 minutes

materials: butter knife, chef's knife, hammer, screwdriver, saw, block & tackle, crowbar, pliers/wrench

Safety first. Most girls have been told they are too little to handle knives, and they have some legitimate fears. So start by assuring them that they can be safe, and that you can help them to learn to be safe, but that they should only use a knife with adult supervision.

Discuss knife safety, safety circle (or blood circle-they LOVE calling it this!), making sure to always keep an arms length plus the length of your knife away from anyone else. Once they are comfortable with this and have moved themselves into a large circle with appropriate distance between kids, introduce the tips about passing a knife: pinch the blade with the sharp edge up, present the handle to the person you are passing it to, make eye contact, signal verbally and verbal acknowledge (“here's the knife”, receiver acknowledges with “thank you”) as you pass. Practice passing a butter knife. If they are comfortable with this, then practice passing a chef's knife. Note: some girls this age will get a little scared when they see the chef's knife. Reassure that you trust they can learn to be safe. Reinforce they are NOT to use a knife without adult permission, and encourage them to try it. ***Don't force anyone, ie, “challenge by choice”...they can choose not to participate, but encourage them to try it.***

Once you are done with the knives, then (depending upon time) bring out the other tools, ask questions about what the tools are and what they are used for. Have them brainstorm uses for the tools on a camping trip. (hammer for tent stakes, etc)

Girl Scouts Woodinville Day Camp, 2010 By Linda Gorordo, Laura Koch, 2016 by Angie Hancock.

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2nd grade- 30 minutes

materials: chef's knife, jackknives, hammer, screwdriver, saw, block & tackle, crowbar, pliers/wrench, masonry block

Safety first. Most girls have been told they are too little to handle knives, and they have some legitimate fears. So start by assuring them that they can be safe, and that you can help them to learn to be safe, but that they should only use a knife with adult supervision.

Discuss knife safety, safety circle (or blood circle-they LOVE calling it this!), making sure to always keep an arms length plus the length of your knife away from anyone else. Once they are comfortable with this and have moved themselves into a large circle with appropriate distance between kids, introduce the tips about passing a knife: pinch the blade with the sharp edge up, present the handle to the person you are passing it to, make eye contact, signal verbally and verbal acknowledge (“here's the knife”, receiver acknowledges with “thank you”) as you pass. Practice passing a chef's knife. Note: some girls this age will get a little scared when they see the chef's knife. Reassure that you trust they can learn to be safe. Reinforce they are NOT to use a knife without adult permission, and encourage them to try it. **Don't force anyone, ie, “challenge by choice”**...they can choose not to participate, but encourage them to try it.

Once you are done with the chef's knife, bring out the jackknife and teach about how to hold, open, etc. Note: *very few girls this age have the hand strength to open and close jackknives*. Because of this, at second grade, open one for them, and let them practice passing it around the circle.

Once you are done with the knives, and depending on time, bring out the other tools, ask questions to have them identify they tools and their uses. Using the crowbar, have them try to lift, or pry the masonry block. An idea for doing this is to ask them if they can lift it themselves (don't let them hurt themselves!) and then show how they can lift it with the crowbar. (note: this piece may change slightly if I can come up with a teeter totter of some sort to use for the lever demonstration)

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3rd grade-30 minutes

materials: chef's knife, jackknives, hammer, screwdriver, saw, block & tackle, crowbar, pliers/wrench, masonry block, cedar shingle, paper bags

review: passing and handling a chef's knife and jackknife using proper safety guidelines;

new skills: proper technique for making wood shavings with a jackknife; identify use and advantage of block and tackle in outdoor setting.

With the 3rd graders, follow the knife safety guidelines above about passing a chef's knife and jackknife, etc. Then give each girl a jackknife, let them open it if they can, but make sure the leaders and P.A.s support them if they cannot. Hand strength is still an issue at this age, and pulling out that blade is difficult. Review closing the knife (keep fingers pinched on the side of the knife so they never get in the way of the blade) Ask them to make shavings.

Demonstrate how to hold a piece of shingle with one hand, firmly against the ground, in front of them, and to make strokes down the corner to shave off bits. Talk about having the knife "bite" into the wood, and finding the angle of the knife against the wood that will work the best.

Watch for safety elements—girls who are cutting at an unsafe angle or to the side of their body, or are not holding their wood firmly against the ground, etc. Some will get this right away, some will need help and practice. **Make sure leaders and P.A.s are supporting as well as you cannot help them all at once.**

Allow some time for them to work with this, and make sure each girl is successful in making a pile of shavings, then have them close the knives and collect them. Change for 2011 – 3rd graders will need to collect shavings in a paper bag for firebuilding.

Once you are done with the knives, and depending on time, bring out the other tools, ask questions to have them identify they tools and their uses. We will have a block and tackle rigged up for them to try to lift a heavy block. Demonstrate and let them all have a chance to see how heavy the block is without the block and tackle, and how easy it is to lift using the "proper tool" that helps with mechanical advantage.

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4th grade-60 minutes

materials: chef's knife, jackknives, sharpening stones, water, hammer, screwdriver, saw, block & tackle, crowbar, pliers/wrench, masonry block, cedar shingles, paper bags

Teach/Review: the elements of knife safety covered in the 3rd grade section.

New skills: how to handle the jackknives; how to sharpen them. See attached worksheet for instructions from the makers of our stones. Note: we will use water as our lubricant.

Ask them to make shavings. Demonstrate how to hold a piece of shingle with one hand, firmly against the ground, in front of them, and to make strokes down the corner to shave off bits. Talk about having the knife “bite” into the wood, and finding the angle of the knife against the wood that will work the best. Watch for safety elements—girls who are cutting at an unsafe angle or to the side of their body, or are not holding their wood firmly against the ground, etc. Some will get this right away, some will need help and practice. ***Make sure leaders and P.A.s are supporting as well as you cannot help them all at once.***

Allow some time for them to work with this, and make sure each girl is successful in making a pile of shavings, then have them close the knives and collect them. Note: 4th graders will be using their own shavings to make a fire, so give each girl a paper bag to collect them. They will take them when they leave tools. Remind leaders to take them to firebuilding.

Once you are done with the knives, and depending on time, bring out the other tools, ask questions to have them identify the tools and their uses. We will have a block and tackle rigged up for them to try to lift a heavy block. Demonstrate and let them all have a chance to see how heavy the block is without the block and tackle, and how easy it is to lift using the “proper tool” that helps with mechanical advantage.

5th grade-60 minutes

same as 4th grade, except for showing them a bow saw, which is used in camping for cutting branches and smaller wood that you wouldn't do with a hatchet or axe. Eventually, we'd like to add them learning to use the bow saw themselves, but time will not permit at this point.

6th grade-20 minute rotation as part of Survivor Challenge

materials: Shingles, hatchets, jackknives, lath

In the 20 minute morning rotation of the Survivor Challenge, the 6th graders should receive a review on safety with a jackknife and making shavings, and how to use a hatchet to split wood. We will provide shingles which are thick on one end and thin on the other which are very easy to split. Review safety, kneeling, using a lever/falling straight down action to the side of their bodies (not swinging it towards themselves), using another shingle or a piece of lath to hold the one they are splitting. Hold the piece to be split, drop the hatchet straight down onto the piece, once it bites, then lift the piece itself and hit it on the ground to force the hatchet down.

In the afternoon session, the girls will be supported as they use these skills, together with lashing and firebuilding, to create their own fire that is able to pop a balloon full of water.

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How to teach Tools that are not Knives

In the past, the station now known as tools was simply knife safety, and all that was covered was knives. Starting in 2009, we began to introduce a change to this, as we recognize that there are many more tools which are used in outdoor situations, and which would be helpful for girls to identify and learn to use.

The tools chosen are based on the normal tools used for everyday use, both in the outdoors and around the house. Since they will use some of them in the woodworking station also, we'd like the girls to identify and know the uses of 6 tools: **hammer, screwdriver, saw, block and tackle, lever/crowbar, wrench/pliers.**

All of these tools are based on scientific principles known as the simple machines. Simple machines are 6 mechanical devices which either independently (simple) or in concert (complex) do “work”, ie, give us some mechanical advantage that helps us to do a job easier than we can do it with our own bodies. The six simple machines are: lever, pulley, wheel & axle, screw, wedge and inclined plane.

Background info on the simple machines can be found at the following links:

<http://sln.fi.edu/qa97/spotlight3/spotlight3.html>

<http://www.mos.org/sln/Leonardo/InventorsToolbox.html>

The tools themselves are all versions of simple machines:

a hammer is a lever

a screwdriver helps us to use a screw which is an inclined plane

a saw is a wedge

a block and tackle is a pulley

wrench/pliers-depends on how they are used, lever, screw, wedge, etc.

It is not necessary to teach the simple machines unless you choose, but it is helpful to understand and explain the idea of “WORK” and how TOOLS help us to do WORK easier because they give us mechanical advantage. This is just throwing some science into the mix!

Most kids will know what a screwdriver and hammer are, but many will not know the concept of a lever or a pulley, and we'd like to plant the seeds at camp about using tools to do jobs, and how choosing the right tool can make it easier and more efficient to do a job.

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THREE TYPES OF WOOD

**The following comes from page 56 of Outdoor Education in Girl Scouting, 1996, by Girl Scouts of the United States of America.*

Comments in italics added by Laura Koch.

Tinder

“Tinder is any small piece of natural material that burns as soon as it is touched with a match. It can be dry wood, dried leaves, wood shavings, dried pine needles or cones, bark (*that’s fallen off*) from a dead tree, or paper twisted into spirals.” *Also: lichen*

Kindling

“Kindling is larger in diameter than tinder, but generally smaller than the diameter of an adult’s thumb. It must be thin enough to catch fire quickly before the tinder burns out, but large enough to ignite larger fuel. Twigs or splintered pieces of wood can be used for kindling. Both tinder and kindling should be as dry as possible to catch fire quickly. To test dryness, see if the wood snaps, rather than bends, when broken.”

Fuel

“Fuel is larger wood that keeps a fire going. Fuel might be charcoal or might be dry, seasoned wood found on the ground (*or provided by campground host, or packed in to your site*). At some sites it may be necessary to bring in wood for fuel or buy it.” *The last sentence is the preferred method, especially as Girl Scouts has been working to assimilate the ethic of Leave No Trace.*

Things to burn: There are three types of materials used in fires - tinder, kindling, and fuel.



Twigs



Bark



Fuzz Stick



Shavings

Tinder: That material which catches fire from a match. It should be no thicker than a match, but longer. Shavings or fuzz sticks, fine twigs (especially from evergreen trees), bundles of tops of bushes or weeds, pieces of fat pine, thin pieces of bark, and dried bracken fern all make good tinder. Paper works, too. Beware of light materials like grass or leaves. These flare up quickly, have little real substance and burn out too quickly to catch on anything heavier. Light materials also may blow away and become a fire hazard to the surroundings.

Kindling: Good dry sticks graduated in size from pieces just bigger than tinder, up to pieces as thick as a thumb, and from six to twelve inches long. Larger pieces may be split for kindling. On wet days, dead branches hanging in trees may be used for kindling. Do not use any branches that bend rather than break - they may be too wet to burn well. Do not break branches still attached to trees.



Fuel: The real fire material. Good firm pieces of wood, graduated in size from pieces just bigger than kindling to good sized logs, depending on use. Charcoal is often used as fuel too. Downed trees may be cut up and used for fuel, but avoid rotten logs. Rotten logs will burn, but give almost no heat. Pine and other evergreens burn quickly, with bright flames, but do not make good coals. Oak and other hardwoods will give good coals that burn for a long time, but with less flame.

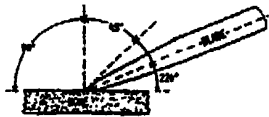
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GENERAL SHARPENING INSTRUCTIONS

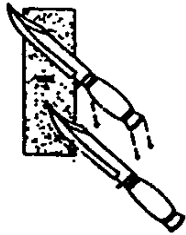
1. First you need to select the proper [sharpening stone](#) for your sharpening job.

1. **SILICON CARBIDE CARBO-ARK** tm. (coarse) for very dull or nicked blades.
2. **WASHITA OR SOFT ARKANSAS** (Medium) for preliminary honing.
3. **HARD ARKANSAS** (Fine) popular finishing hone.
4. **SURGICAL BLACK ARKANSAS** (Extra Fine) finest finishing hone.

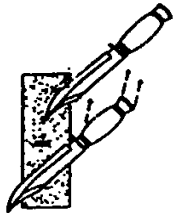
Put a small amount of Hall's Honing Oil (or any light mineral oil or water) on your stone. Using a **Natural Stone** without oil or water will damage and clog your stone.



2. Place your blade flat on the end of your stone. Raise the back of your knife to an approximate 22-degree angle as illustrated. This angle will ensure a perfect edge.



3. **PULL** the blade **TOWARDS** you, just like you are trying to carve a thin slice off the top of the stone. Don't be afraid to use pressure against the stone while sharpening since it will not damage the stone or your **knife**. Repeat this **PULLING** stroke 3 to 10 times. Remember, try to keep the same approximate sharpening angle all the time since this is the key to obtaining the sharpest edge



4. To **sharpen** the other side of your knife place your blade at the opposite end of your **stone** and repeat steps 2 and 3, but instead of pulling the knife towards you push it away from you. Repeat this stroke 3 to 10 times as well. Remember to take a full sweep as you pull or push the knife across the stone for a full effect of **sharpening your knife** properly.