

TOOLS STATION – GRADE LEVEL LESSON PLANS

Pixie	K-1	2	3	5	Boys (see 3 rd grade) Learn/review 6 tools Use a block and tackle to lift something too heavy to pick up
Learn to assemble nuts and bolts Hammer in preset nails	Learn to identify 6 tools: hammer, screwdriver, saw, block & tackle, lever/crowbar, pliers/wrench & their uses	Identify 6 tools and their uses. Demonstrate use of lever to move something heavy	Learn/review 6 tools Use a block and tackle to lift something too heavy to pick up	Learn/Review 6 tools, lever, block & tackle	

Pixie- 30 minutes

materials: Nuts and bolts, hammer, wood with preset nails and screws, screwdriver

Let them play with the nuts and bolts. Show them how to put the nuts on the bolts and take them back off. Show them the hammer and screw driver and let them tell you what they are used for. Then show them how to use them. Let them hammer on preset nails and screw in the pre-started screws.

Kindergarten/1st grade- 30 minutes

materials: hammer, screwdriver, saw, block & tackle, crowbar, pliers/wrench, nuts and bolts, preset nails and screws.

Explain the 6 simple machines and where they might see those in their daily life. Ask which of the simple machines each of the tools is. 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)

Let them play with the nuts and bolts. Show them how to put the nuts on the bolts and take them back off. Show them the hammer and screw driver and let them tell you what they are used for. Then show them how to use them. Let them hammer on preset nails and screw in the pre-started screws.

2nd grade- 60 minutes

materials: hammer, screwdriver, saw, block & tackle, crowbar, pliers/wrench, masonry block

Ask questions to have them identify the 6 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. Set the long board on the pier block and show them how they can lift the masonry block with the longer lever teeter totter by standing on the other end. Explain fulcrum and show them that moving the board on the fulcrum makes this task easier or harder.

Girl Scouts Woodinville Day Camp, 2010 By Linda Gorordo, Laura Koch, 2016, 2018 by Angie Hancock.

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3rd grade-60 minutes

materials: hammer, screwdriver, saw, block & tackle, crowbar, pliers/wrench, masonry block

review: go over the 6 tools and have campers identify them

new skills: identify use and advantage of block and tackle in outdoor setting.

Ask questions to have them identify the 6 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. May also have a swing the girls can use to try to lift each other using the block and tackle. They love this! Give each girl a chance to “ride” in the swing or “lift” the other girl.

5th grade-30 minutes

materials: hammer, screwdriver, saw, block & tackle, crowbar, pliers/wrench, masonry block

review: go over the 6 tools and have campers identify them, review block and tackle.

new skills: learn about simple machines and how common things we use every day are simple machines.

Ask questions to have them identify all the tools and their uses. Pass around the hammer, screwdrivers, saw, crowbar. Explain block and tackle

Explain the 6 simple machines (inclined plane, wheel and axle, pulley, screw, wedge and lever). Have campers identify which of the tools is which of the simple machines. (block and tackle is a pulley, screw is screw, saw is a wedge, crowbar and hammer are levers, board on the pier block is an inclined plane, garden cart has wheel and axle)

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. May also have a swing the girls can use to try to lift each other using the block and tackle. They love this! Give each girl a chance to “ride” in the swing or “lift” the other girl.

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How to teach Tools

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 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.