



Simple Tools

Science & Technology Branch – Step 3

Purpose

The ‘Simple Tools and Machines’ Step provides a basic knowledge of what simple tools are and how they provide functionality in our everyday lives. Upon completion of this step, Trailmen should understand the names and functions of the simple tools and have a few hands-on activities of each.

1. What is a lever and how is it used?
2. What is a wheel and axle and how is it used?
3. What is a pulley and how is it used?
4. What is an inclined plane and how is it used?
5. What is a wedge and how is it used?
6. What is a screw and how is it used?

Notes to the Trail Guide //////////////////////////////////////

1. The goal is not for the boys to be experts on these topics but to gain an increased knowledge and awareness of the Step.
2. Make it relative to your patrol.
3. Remember, these lessons should build from Fox to Hawk and from Hawk to Mountain Lion.
4. See the Leaders Guide for more information on Steps.

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Skill Progression

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|  | <ol style="list-style-type: none">1. Picture matching2. Identification Game3. Nomenclature |
|  | <ol style="list-style-type: none">1. Build a simple machine (classroom) |
|  | <ol style="list-style-type: none">1. Build a simple machine outside to do work |

Helps

1. What is a lever and how is it used?
 - a. **Goal:** To understand the purpose of the lever and how it works.
 - b. **Lesson:** Recognize a lever and see how one really works.
 - c. **Examples:**
 - i. See-Saw
 - ii. Wheelbarrow
2. What is a wheel and axle and how is it used?
 - a. **Goal:** To understand the purpose of the wheel and axle and how it works
 - b. **Lesson:** Recognize a wheel and axle and see how one really works.
 - c. **Examples**
 - i. Bicycle wheel
 - ii. Wagon
3. What is a pulley and how is it used?
 - a. **Goal:** To understand the purpose of the pulley and how it works.
 - b. **Lesson:** Recognize a pulley and see how one really works.
 - c. **Examples:**
 - i. Rope & Pulley (block & tackle)
 - ii. Bicycle sprocket
4. What is an inclined plane and how is it used?
 - a. **Goal:** To understand the purpose of the inclined plane and how it works.
 - b. **Lesson:** Recognize an inclined plane and see how one really works.
 - c. **Examples:**
 - i. Stairs
 - ii. Ramp
5. What is a wedge and how is it used?
 - a. **Goal:** To understand the purpose of the wedge and how it works.
 - b. **Lesson:** Recognize a wedge and see how one really works.
 - c. **Examples:**
 - i. Axe
 - ii. Knife
6. What is a screw and how is it used?
 - a. **Goal:** To understand the purpose of the screw and how it works.
 - b. **Lesson:** Recognize a screw and see how one really works.
 - c. **Examples:**
 - i. Clamp
 - ii. Crescent Wrench

Scripture Ideas

Ephesians 6:13-17

- Fox – The Lord provides for a way to protect us from evil because he loves us.
- Hawk – Truth, morals, peace, and faith are taught in the Bible and through other Godly people. Look to those who are good examples and try to learn and apply those values to your life.
- Mt Lion - These tools consist of the word of God (the Bible), truth, the gospels, and salvation are all to be used together. Are you utilizing all of these? On a daily basis?

Activity Ideas

- See the relevant patrol and branch section of the activities
- Or, create your own activity relevant to your troop and region

Game Ideas

- Check the games section online for game ideas
- Or, create a game that works for your patrol
- A couple of ideas are listed below

Name of Group Activity: Lever Stomp

Time: 5-10 minutes

Summary: Stomp lever, boys get prize

Goal: Who can get the most prizes

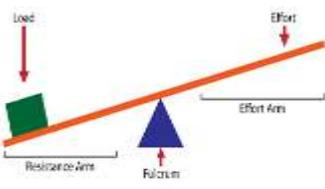
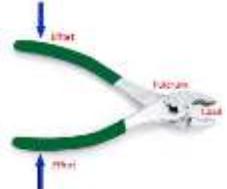
Preparation:

- Build lever from a small board like a 1x3x36 (inches) and a fulcrum about 2 inches high. One end of the lever should have a small bowl attached.
- **Supply "prize."** This could be candy or a ball (tennis ball).

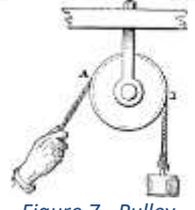
How to Play:

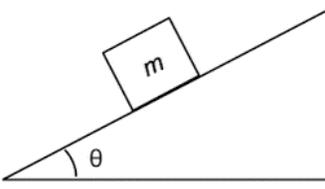
1. Trail Guide places prize in the bowl then stomps the other end of the lever. The prize flies through the air and is caught by a Trailman.

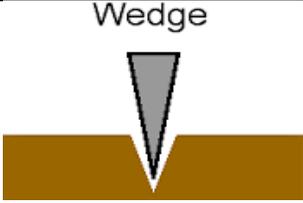
Simple Machines

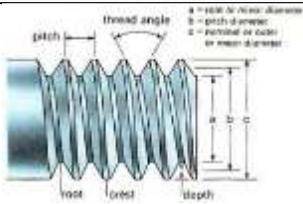
| Levers | | |
|---|---|--|
|  <p>Figure 1 - Lever</p> |  <p>Figure 2 - Wheelbarrow</p> |  <p>Figure 3 - Pliers</p> |

| Wheel & Axle | | |
|--|--|---|
|  <p>Figure 4 - Wheel & Axle</p> |  <p>Figure 5 - Steering Wheel</p> |  <p>Figure 6 - Bicycle Wheel</p> |

| Pulley | | |
|--|---|--|
|  <p>Figure 7 - Pulley</p> |  <p>Figure 8 - Crane</p> |  <p>Figure 9 - Bicycle Sprocket</p> |

| Inclined Plane | | |
|---|--|--|
|  <p>Figure 10 - Inclined Plane</p> |  <p>Figure 11 - Slide</p> |  <p>Figure 12 - Steps</p> |

| Wedge | | |
|--|---|---|
|  <p style="text-align: center;">Wedge</p> <p style="text-align: center;"><i>Figure 13 - Wedge</i></p> |  <p style="text-align: center;"><i>Figure 14 - Axe</i></p> |  <p style="text-align: center;"><i>Figure 15 - Knife</i></p> |

| Screw | | |
|---|---|---|
|  <p style="text-align: center;"><i>Figure 16 - Screw</i></p> |  <p style="text-align: center;"><i>Figure 17 - Screw</i></p> |  <p style="text-align: center;"><i>Figure 18 – Crescent Wrench</i></p> |

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