

## WILLIAM TELL SHOOTING GALLERY

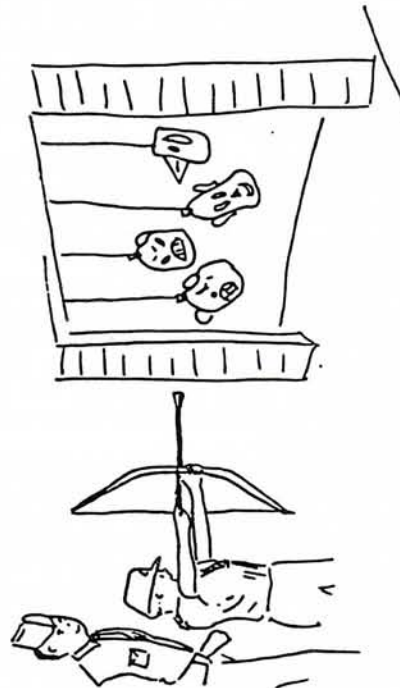
Here is a bow and arrow adventure that is easy to construct and operate and can be set up safely. It will provide fun and practice in basic archery skills. It has built-in appeal that keeps a person working to do better.

**THE GALLERY:** Suspend a large tarp or old canvas between two supports such as volley-ball standards, posts, trees, or even in the entranceway to a garage. For targets, prepare some plastic detergent or bleach bottles by painting faces or designs on them and suspending them from various heights in front of the tarp.

**EQUIPMENT:** (This may be borrowed.) Straight bows with a 25-pound pull are about right for Webelos Scouts. Arm guards will protect shooters' forearms. These can be made from old canvas, scrap leather, or plastic. The arrows must have a blunt rubber tip.

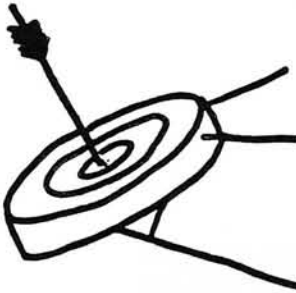
**PROCEDURE:** Divide den into groups according to number of bows. To reduce the waiting in line, give each boy two or three arrows. Establish a shooting line about 20-25 feet from the targets. Remember, boys need success to sustain interest, and the distance can be increased later. A long table or bench could establish a shooting line. After some fundamental instruction and coaching, allow boys to shoot. After a boy has shot all his arrows, be sure he retrieves them before another boy begins.

**SCORING:** Scorecards can increase the desire and extra concentration the boy needs to push him to do his best. Start out with 100 points. Shoot 10 arrows; add 10 points for each hit; subtract 5 points for each miss.



## For Archery

**Targets**  
**Bows**  
**Arrows**  
 - Bales of Straw or Hay/Target  
 20' Pole  
 Red Flag  
 Rope & Pulley  
 Arm Guards  
 Finger Tabs  
 Rope to mark off area  
 Arrow Holders  
 Material to make Target Holder  
 Rain Protection for Targets



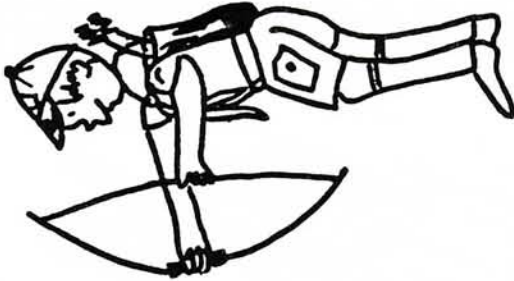
## GAME ARCHERY

**Objectives:**

1. Archery Safety
2. Use and care of Bows and Arrows
3. How to string a Bow
4. How to aim a Bow and Arrow
5. How to remove an arrow from target or ground

**Procedures:**

1. Boys line up single file. 4 Cub Scouts will shoot 5 Arrows each. Continue through period.
2. All lines will load, draw, and release at the same time
3. Never aim an arrow in direction of anyone.
4. Never put an arrow in bow until ready to shoot.
5. Shoot only when everyone is behind the line.
6. Remain behind line until instructed to advance.
7. Follow instructors directions carefully.
8. Starting point 15 ft. from target; back up 5 ft. each round.
9. Shoot only at targets.



## ATHLETE ACTIVITY BADGE

The Athlete Activity Badge requirements are natural ones for most boys of the Webelos age group. It works well to mix this activity in den programs with an activity badge which requires only mental activity, such as the Citizen Activity Badge. Most boys are able to do the skills required of them in the Webelos book, but they should be encouraged to increase those skills over a period of time. There should be a significant increase in their abilities. This activity can be used to help the boys earn the physical fitness skill award.

### Den Activities:

1. Use the following plan to complete the activity badge in den:

1. Prepare a den Athlete Activity Badge chart. Let the boys assist.
  2. Hold competitions within the den for each of the athletic activities listed in the requirements.
  3. Have boys do deep breathing and light loosening-up exercises at the beginning of each meeting.
  4. Have each boy maintain his own progress chart.
2. Visit a local athletic gym.
  3. Invite a fitness expert talk about appropriate exercises for Webelos age boys.
  4. Visit a local high school or college baseball or football department. Try to schedule your trip to coincide with a practice session.
  5. Go to a local sporting event.
  6. Set up an obstacle course and time it for each boy.
  7. Go to a local indoor pool once a month for practice in swimming skills.

### Related Boy Scout Merit Badge Books:

Athletics - Training, long jump

Personal Fitness - Techniques for push-ups, bent-knee sit-ups, pull-ups.

Swimming - Floating techniques, swimming strokes with drawings.

Boy Scout Physical Fitness Skill Book

Boy Scout Swimming Skill Book

### FITNESS PROGRESS CHART

Name \_\_\_\_\_

Pack \_\_\_\_\_ Den \_\_\_\_\_ Medical Check-up \_\_\_\_\_ (date)

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Week	No.1	No.2	No.3	No.4
Date	_____			
Pull-Ups	_____			
Sit-Ups	_____			
Push-Ups	_____			
50 Yard Dash	_____			
600 Yard Run/Walk	_____			
Standing Long Jump	_____			
Vertical Jump	_____			

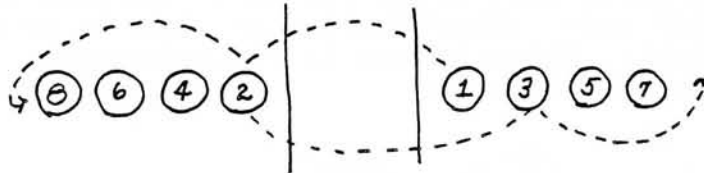
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### RELAYS AND RACES

Four types of relays are used in playing Webelos games. In FILE RELAYS, Webelos on each team line up one behind the other. Webelos No.1 goes forward to the goal line and returns to his team, tagging Webelos No.2. This continues until all have had a turn. The team finishing first is the winner.

In PARTNER RELAYS, each Webelos has a partner. Teams consists of an equal number of partners. The partners stand side-by-side in file formation. In the relay the first set of partners in each team goes forward to the goal line in whatever manner prescribed by the game, returns to its team, and tags off the next set of partners.

In SHUTTLE RELAYS, each team is numbered off. The even numbers line up in file formation with Webelos No.2 in front. The odd-numbered Webelos do likewise, with Webelos No.1 in front. Files are facing each other at opposite ends of the relay course. On the signal to begin, Webelos No.1 runs and hands off the ball or beanbag or whatever game equipment is necessary to Webelos No.2, then takes his place at the end of No.2's line. Webelos No.2 runs and gives No.3 the ball or whatever and takes his place at the end of No.3's line. This continues until all Webelos are back at their original places.



TAGGING OFF is a variation of the file relay. Instead of tagging the next team-mate in line a returning runner goes to the end of the line and "passes the tag" by touching the shoulder of the person in front of him, who in turn taps the next person, When the Webelos at the front of the line receives his tap on the shoulder, then he heads for the goal line.

#### HOMEMADE EXERCISE EQUIPMENT

Newspaper Gym - Take a large double sheet of newspaper and hold it by one edge. Using only the fingers of the hand that is holding the paper and without allowing the paper to touch any other part of your body, work it up into your palm with your fingers and hand until it is a ball. For a double workout, try it with a sheet in each hand. Have the boys note how hard this makes their fingers work and how their forearms ripple when they try to get the newspaper into a ball.

Take two double sections of newspaper and fold them in halves until you have a flat section with one edge that is a foot wide. Roll that piece up to form a baton. Try to pull the baton apart as you hold it behind your back. Then, see if you can break it by twisting it, clockwise with the right hand and counter-clockwise with the left hand. See if you can jump over the baton without letting it go. Then try jumping back through it.

Inner Tube Muscle Builder - Use discarded inner tubes. Cut an inner tube in half and loop it behind your hips, gripping the loose ends with both hands. Keep your elbows at your sides and stretch the tube forward as far as you can. Do this 8 or 10 times.

If you have tow bike inner tubes, loop both of them around an upright pole, then lie face down and slip each foot through the loops of rubber. Pull against the tube, one leg at a time, with the tubes resting at just about your heels. Try this for six times with each leg to start.

Barbell - Use a three foot dowel rod or broomstick with 3/4" pipe caps on each end. Imbed these pipe caps in 46 oz. cans filled with cement. Allow cement to dry overnight. Use for standing press or prone press.



Cardboard Boxes - Lay two rows of large and shallow cardboard boxes about a pace apart on a carpeted floor or on the ground. Start out walking through them with each step in a box. Gradually increase speed until u can run through the course and not miss any boxes. This course can also be set up outside using old tires laid on the ground.

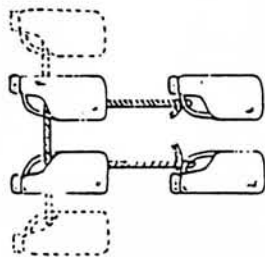


SKY-HOOK GYM

With this sky-hook gym you can set up your own physical-fitness program. The apparatus can be interchanged just as fast as you can unstrap one piece of equipment and snap-fasten another of your choice in its place. The gym is designed for use indoors or outdoors.

For outdoor use, all you need is a suitable tree limb from which you can hang a large pulley and suspend the sky-hook line. For indoor use, you can use a garage doorway which has an 8-foot clearance. All equipment is designed to be hung from a heavy-duty overhead hook or screw eye 8 feet above the ground. Remember to use a mattress or pad underneath the line if there is concrete or hard paving underneath.

Braided polypropylene rope is used because it is 40 percent stronger than manila and it is so easy to splice. Two sizes of rope are used - 3/8" and 1/4". A swivel-eye hook is used.



CHEST PULL

Materials: 4 quart size plastic bottles with handles

Stones  
Cord

Put stone weights in two of the four plastic bottles. Have the caps on all the bottles. Take a piece of cord about 5 feet long; tie one end of the cord to one end of the handle of one of the weighted bottles; pass the cord through the handles of the two unweighted bottles. Tie the other end of the cord to the handle of the last bottle. To operate the chest pull, hold the handle of an unweighted bottle in each hand, weighted bottles dangling. Spread the hands to raise the weighted bottles; bring the hands back together to let the bottles dangle.

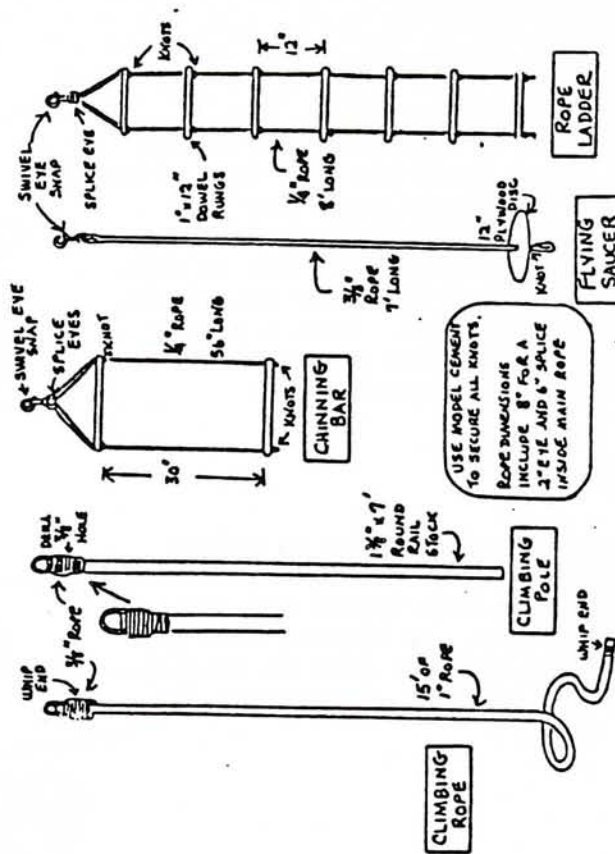
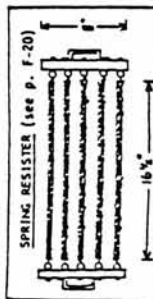
TENSION HANDGRIPS

Place the closed ends of five clip clothespins together, side-by-side, and glue to a popsicle stick, as shown. Allow to dry thoroughly. Glue an additional popsicle stick to each side on the other end of the handgrip. To work the handgrip, place the open end between the palm and fingers, bending the tops of the fingers over one side of the handgrip, squeeze to open the closed end of the handgrip.

SPRING RESISTER

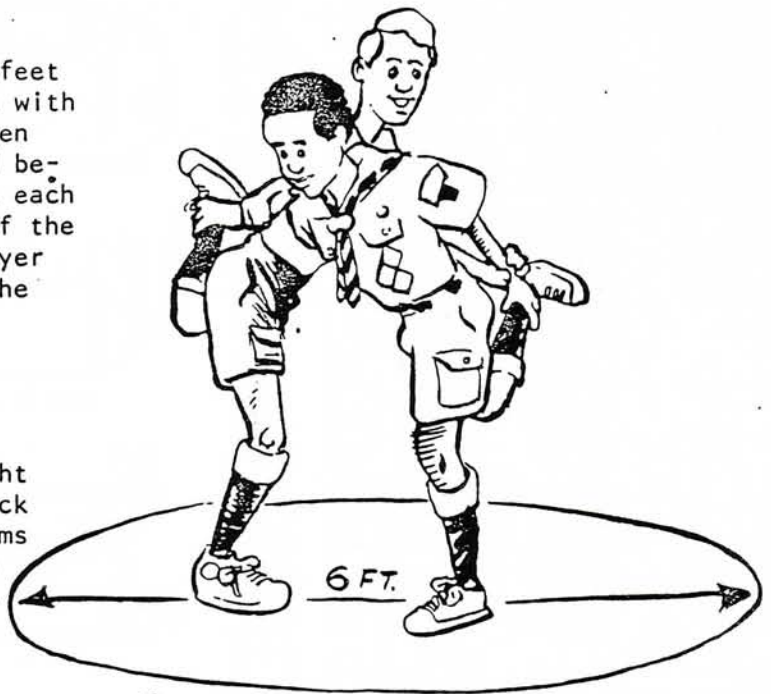
Materials: 2 pieces of wood (8 x 1 x 1"), 10 eye screws, nuts for eye screws, 5 springs, 2 drawer pulls

Fasten 5 eye screws to each piece of wood. Attach the springs to the eye screws. Fasten the drawer pulls to each piece of wood.



## GAME ROOSTERS

Two Webelos stand in a circle about 6 feet in diameter. Each holds his left foot with his right hand behind his back, and then grips his right arm with his left hand behind his back. On signal, they hop at each other, trying to force the other out of the circle or out of position. When a player lets go of his foot or arm or leaves the circle, he loses the contest.

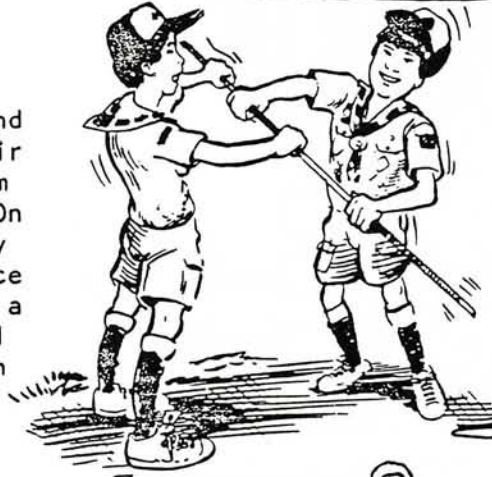


## ARM LOCK WRESTLE

Pair off the Webelos according to height and weight. They sit on the floor, back to back, with their legs spread and arms locked at the elbows. On signal, each tries to pull his opponent over to the side so that his left arm or shoulder touches the floor.

## COCKFIGHT

Two Webelos hold their left ankle behind them with their left hand and keep their right arm close to their side. The arm must not be used to strike or shove. On signal, they try to upset each other by charging or shouldering, or try to force the other to drop his left foot. With a large number of players, a free-for-all may be held. The last player to remain standing wins.



## BROOMSTICK TWIST

Two Webelos of equal height and weight grasp a broomstick (held horizontally) with both hands. Each tries to touch the stick to the floor on his right.

## BROOMSTICK WRESTLE

Two Webelos face each other, grasping a broomstick with their hands about 18 inches apart. On signal, each tries to cause the other to move his feet. The defeated player is the one who first takes a step or releases the stick.



Two Webelos, on their hands and knees and facing in opposite directions, are the "tractors." Other players straddle each tractor and, holding on with their legs, reach both hands back to grip the hands of their opponent. On signal, a tug-of-war begins.



## SCHOLAR ACTIVITY BADGE

Let's face it, a majority of Webelos age boys may not like school. There may be one or a dozen reasons. Probably the main reason is that 9 and 10 year boys are ..or would like to be.. free spirits, doing whatever he feels like when he feels like it. School is often seen as a place of confinement rather than learning.

A Webelos Scout has a very high quotient of curiosity and a thirst for knowledge. There is at least one boy in your den who can ask seven straight questions about a subject that interests him. The problem is that for many boys mathematics, English, history and geography are not very high on their current list of interests.

Through the Scholar Activity Badge, we hope to encourage boys to do well in their school work, to understand why schools are necessary and what they offer, and to learn how schools are run in this country. If a boy is at least a fair student, he should have no trouble earning this badge.

### Den Activities:

1. Discuss the history of education and how schools developed in America.
2. Invite a member of the school board or a professional educator to talk to the boys on the value of education and what school has to offer.
3. Plant flowers or shrubs on the school grounds to improve the school's appearance.
4. Raise the flag at school for a period of several weeks.
5. Invite an educator to visit the den and discuss careers which are available in the field of education.
6. Encourage the boys to talk about what is going on at school: the people who work at the school, how each boy is progressing in school. Get them to talk about the jobs they are doing at school (such as Safety Patrol) and why they are important.
7. As a good turn, help set up the meeting room for PTA meeting.
8. Visit a library and learn about the various services that are available.

### Related Boy Scout Merit Badge Books:

- Personal Management - Planning your time.
- Public Speaking - Speech and talk preparation, parliamentary procedure.
- Reading - Book list, library procedure.
- Scholarship - Study habits, planning your time, extracurricular activities, why education is valuable.



## BRIEF HISTORY OF EDUCATION

When prehistoric man learned to communicate with words he was able to pass his limited knowledge on to his children. Each generation added new ideas gained from its experience. As contact between individuals, tribes, and nations increased, so did the exchange of knowledge. But this word-of-mouth education was slow and limited.

It wasn't until writing was discovered, about 5000 years ago, that formal education began. In Asia and Egypt, temple priests taught selected boys the mysteries of their religions. These young men studied to become priests, government officials, scribes, or astronomers.



About his same time, the system of apprenticeship was established. Boys from poorer families were bound by agreements to work for a master without pay. In return, he taught them a trade or an industrial craft. The master also had to feed, clothe and house his apprentice. This system of apprenticeship was still in effect in colonial America.

When Greece became the cultural center of the western world, education took a new turn. No longer was education a religious rite or a mystery. All citizens could attend school. The teachings of men like Plato, Socrates and Aristotle still influence modern academic studies.

The Renaissance brought a great rebirth of culture to Europe. After the Reformation in the 1500's, church-financed public schools were started. Education was available to all but the very poorest.

The education system of America included:

- \* Apprenticeship training
- \* Elementary schools - many of which were supported by churches or other groups
- \* Secondary and higher institutions where emphasis was to prepare boys for college
- \* Prevocation schools which taught technical subjects

America today has a greater percentage of youth to age 18 attending school than any other country of the world.

### TIPS ON HOW TO TALK TO YOUR TEACHER

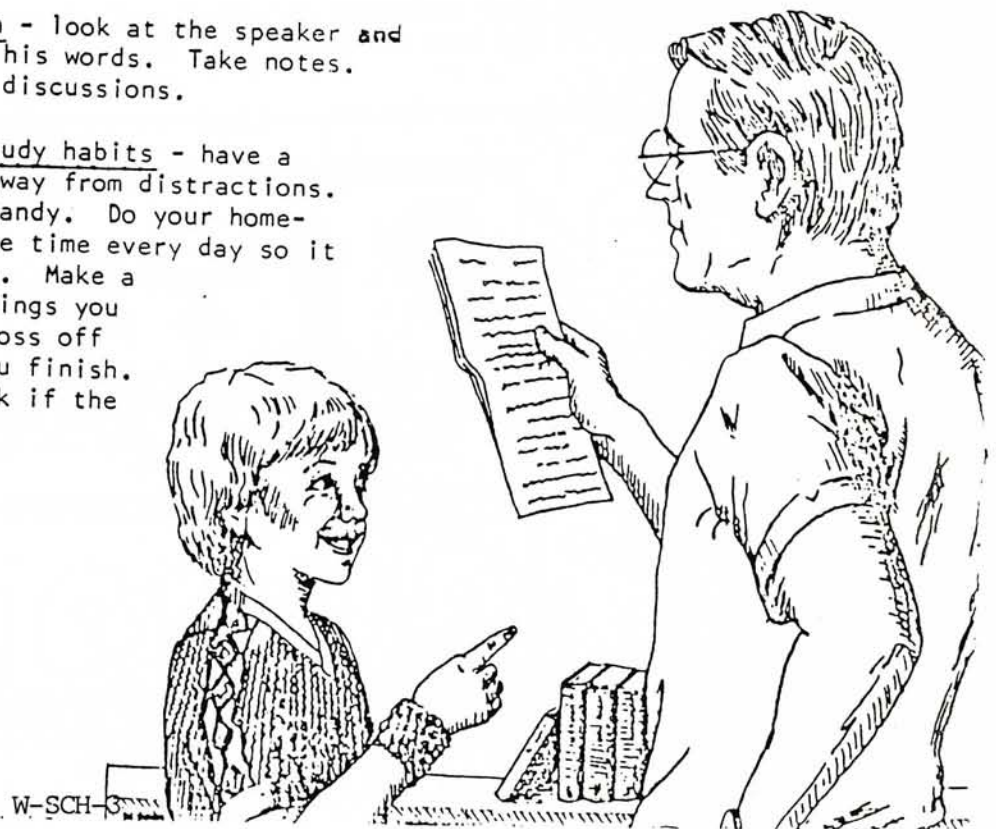
A good conversation with your teacher can increase your chances of making better grades, participating in clubs, working on new projects or earning school awards.

1. Set your goal and decide exactly what you want.
2. Prepare what you will say with a parent or friend. Make notes on information you might need or questions you need to ask.
3. Select a time when your teacher isn't busy. Make an appointment. Be polite, act natural and be honest. Ask for a chance to earn what you want and for suggestions on ways to improve your skills or behavior. Be sure to thank your teacher.
4. Check your attitude. Are you willing to work to improve?
5. After your talk, write down what you and your teachers agreed on. Follow through on the suggestions and fulfill your commitment. Keep trying even if it's hard. If you need help, ask for it.

Teachers are people too; they respond to genuine interest and enthusiasm. They want you to be a success.

### TIPS ON WAYS TO IMPROVE YOU GRADES

1. Learn to listen - look at the speaker and concentrate on his words. Take notes. Participate in discussions.
2. Develop good study habits - have a place at home away from distractions. Have supplies handy. Do your homework at the same time every day so it becomes a habit. Make a list; do the things you hate first. Cross off each item as you finish. Schedule a break if the list is long.

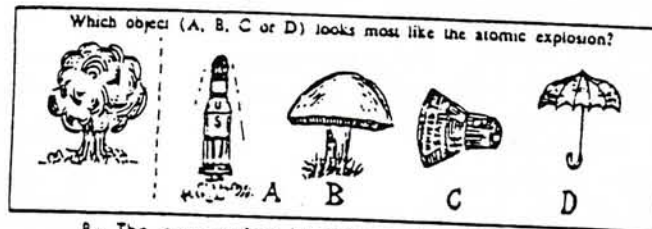


TIPS ON HOW TO IMPROVE YOUR GRADES

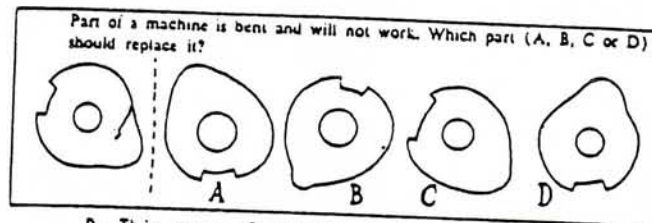
3. Use the right reading technique - learn how to skim by glancing through whole paragraphs at a time. You can find specific information this way. Slower, more careful reading is necessary when you must understand and remember.
4. Improve your vocabulary - look up a word you don't know. Write it down. Note spelling, pronunciation and meaning.
5. Sharpen your writing skills - organize your thoughts. Keep your sentences short. Don't start every sentence with the or I. Make sure your handwriting is neat. Double check spelling and punctuation. Go over your work.
6. Learn how to take tests - study for a test well ahead of time, carefully and calmly; do not 'cram'. Then relax, and face it. First, slowly read all the directions. Make sure you understand exactly what is required. Next, answer the questions you know for sure. Pace yourself. If there is an answer you don't know, skip it and go on. You can always go back and fill it in. Work steadily. Double-check your work for careless errors before you hand it in.
7. Develop a positive attitude - this is most important. You are what you think you are. Think you are going to pass and you probably will.

When you really want something at school and you are willing to work for it, your teacher is the best person to help you.

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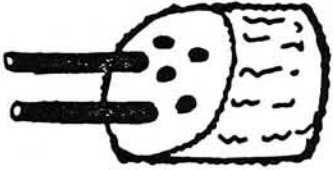
B. The expression 'atomic mushroom' is very appropriate. This type of exercise helps you see how things are alike, though they may be quite different in most ways.



D. This type of exercise helps you perceive the parts of physical objects, whether it is machinery, buildings or continents.

### PENCIL HOLDER

Cut a piece of round limb from a tree flat for the bottom. The top can be slanted or straight. Using a bit a little larger than the diameter of a pencil, drill holes straight down on the top. Sand the top and bottom if necessary. Blue felt on the bottom to avoid scratching the desk.



### PENCIL OR STUDY SUPPLY BOX

Use a cigar box or one of similar size depending on what you want to store in the box. Paint the box inside and out.

Cut a piece of felt to fit inside the box. Blue the felt in place.

On a piece of paper, draw a design for the lid of the box. Choose something simple. Place a piece of carbon paper, carbon side down, on the lid. Place the paper, with your design, on top of the carbon paper. Trace over the design with a pencil.

Choose different kinds of beans or seeds that you like to fill in the design. To fill in the design, outline with a thin layer of glue and fill in with beans or seeds one area at a time. Press the beans or seeds in place carefully.

Wait for the glue to dry thoroughly before using the box. If you like you may glue a border around the lid or box with the beans or seeds.

### MERIT BADGE BOOKS

Following is a list of merit badge books that might help a Webelos work on his Scholar badge:

- Personal Management - Planning your time.
- Public Speaking - Speech and talk preparation, parliamentary procedure
- Reading - Book list, library procedure
- Scholarship - Study habits, planning your time, extracurricular activities, why education is valuable.

### MAGAZINE BINDER

Use to bind a year's supply of favorite magazines for quick reference.

- Materials:
- Hammer
  - 1/4" leather punch
  - Sack needle
  - Hardwood block
  - 12 x 20" imitation leather
  - Upholstery material
  - 6 ft plastic lacing
  - Cardboard gauge

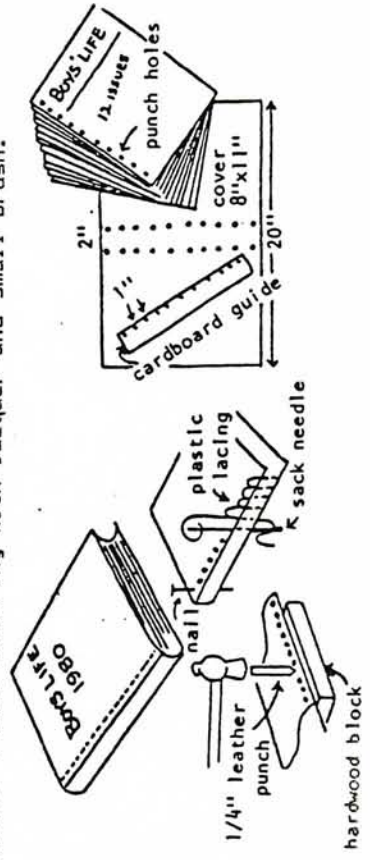
Punch a row of 10 holes along the back edge of each magazine, one inch apart and 1/4" from edge. Use hardwood block under magazine while driving the punch through. A cardboard gauge will help mark the holes evenly.

The piece of imitation leather will be a little large, but will be trimmed down later. Punch two rows of holes down the center of the cover, spaced two inches apart center to center. Use the same cardboard gauge to mark these holes.

Use plastic lacing to lace magazines and cover together. Run half the length of the lacing through the bottom hole. Using the sack needle, run both ends through the next hole (one from the top, one from the bottom) so that each end comes out on the opposite side of the book. A nail run through the top hole will keep everything lined up straight. Keep the lacing pulled tight and continue to the top hole.

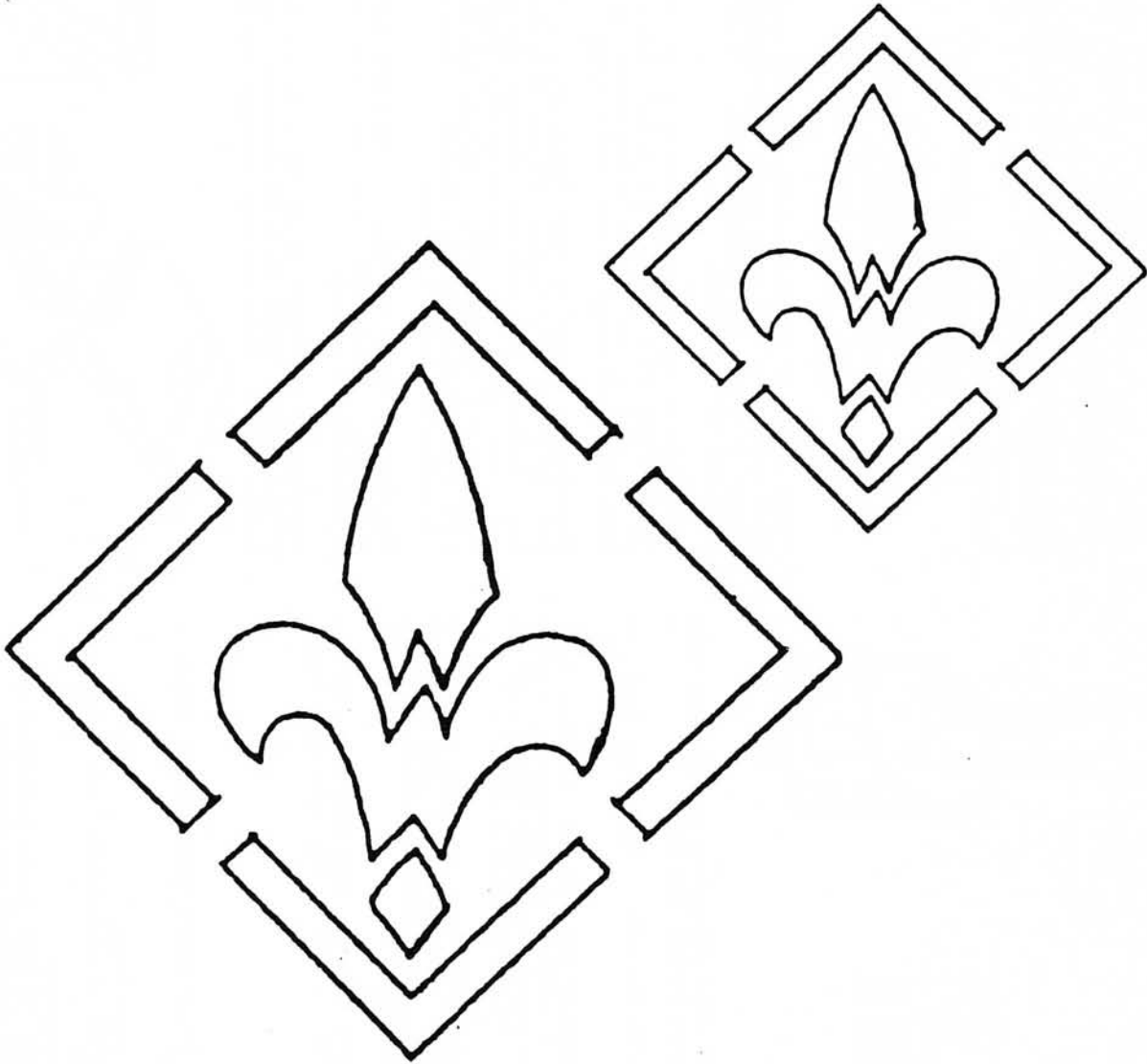
Tie the lacing at the back of the book with a square knot. Snip off ends. Trim the cover to fit, leaving a quarter-inch projecting all around.

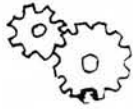
The name of the magazine can be traced directly from the magazine to the leather cover with carbon paper. Also put the year on the cover. Paint lettering with lacquer and small brush.



## DESK ACCESSORIES

Use the design as is or reduced to decorate a set of desk accessories. Use on the ends of a pair of plain bookends. A 6-oz juice can covered and stenciled with the design makes a nice pencil cup. Notebook covers can be stenciled with the design. Use your imagination.





## ENGINEER ACTIVITY BADGE

An engineer applies the basic laws of physics and chemistry to solve problems in construction, industry and other areas. Frequently, he uses a combination of one or more of the 6 types of machines which have been known for thousands of years. These are the lever, wheel and axle, pulley, wedge, inclined plane, and screw.

The Engineer Activity Badge is designed to give the Webelos Scout an introduction to the basic concepts of engineering. The projects require only an understanding of basic engineering principles. With careful planning, a den meeting can change a boy's whole concept of the myriad of man-made objects from one of boredom or apathetic acceptance to one of excitement and wonder at the engineering skill required. If you, as a leader, feel that you do not have adequate technical knowledge, consider asking someone with an engineering or allied background come to the den meeting and give the boys a demonstration or talk on these principles.

### Den Activities:

1. Demonstrate the mechanical advantage of the use of block and tackle in lifting weights.
2. Visit a water treatment plant and ask the person in charge to describe the applications of engineering to this facility.
3. Discuss property lines. Have a surveyor or other knowledgeable person show how property lines are determined and measured.
4. Survey an area near the den meeting site.
5. Make catapults and have demonstrations and game competitions at the den meeting.
6. Demonstrate bridge stresses with stiff poster paper and Matchbox cars.
7. Visit a construction site and have the construction foreman explain the basic aspects of the work.
8. Visit the engineering department of a plant or college and have the supervisor or professor demonstrate the use of drafting machines and other related equipment. Discuss possible careers in engineering fields.

### Related Boy Scout Merit Badge Books:

Architecture - Floor plans.

Drafting - How to draw floor plans with examples.

Engineering - What engineers do, types of engineers, bridge design.

Machinery - Block and tackle design.

Metals Engineering - Metal engineering description and examples.

Surveying - How property lines are determined, measuring lines with a substitute instrument kit and directions.

## BRIDGE BUILDING

Ever since man found roads that would let him travel from one place to another easier and faster, he has been faced with the problem of crossing streams, rivers, gullies and canyons. So he invented bridges - structures to leap from these obstructions and make the way smoother. At first, he used two basic geometric forms to build these structures - the arch and the triangle - and built his bridges of stone and wood. Today, highway and railroad bridges are made from steel plates, wire cable, angles, I-beams, H-beams and concrete to build the bridges we see crossing interstate highways, rivers and canyons.

The design of a bridge and the type of construction depend upon the kind and width of the obstruction, the load it is expected to carry, the kind of ground or rock found at the site and the cost.

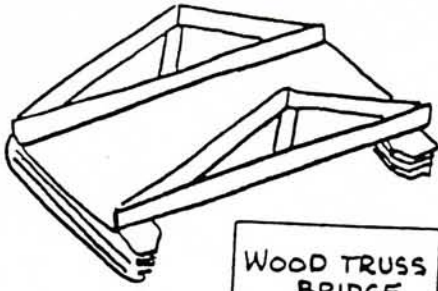
To learn about bridges and their construction, here are four different types you can make from cardboard. They can be used to display matchbox size or HO cars.

Wood Truss Bridge - This bridge is 2" wide, 4" long with sides 1" high. Lay out the sides and bridge floor as one piece, then cut halfway through the cardboard where the parts join and fold up the sides. Each side on a full-sized bridge would be built up with four timbers and iron rods, so draw the joints of the timbers with a pencil. Glue up six layers of cardboard 1/2" X 2 3/4" for abutments at each end of the bridge. This type of bridge was used in colonial days for single-lane roads. Some still exist today.

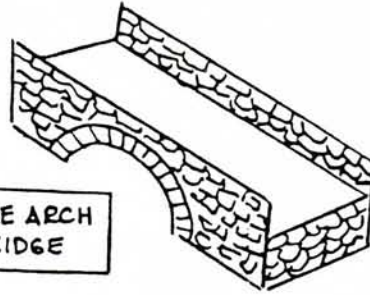
Stone Arch Bridge. - This bridge is made from three pieces of cardboard. Sides are 1" high and 4" long. The arch is 1/2" X 1 3/4". The floor and ends are made as one piece, then scored and bent. The floor is 3 7/8" long. Each end is 1/2" long and 1 1/2" wide. Draw the outlines of stones with a pencil.

Through Plate-Girder Bridge - This is typical of the reinforced steel-plate bridges we see used for both roads and railroads today. It is 3" wide and 9" long. The bridge floor and sides are laid out as one piece - the floor is 3" wide and 9" long - the sides are 1" high. Vertical lines are spaced on one-inch centers. The steel angles used to reinforce the steel plates are simulated by pencil lines. Abutments are made from six layers of cardboard 5/8" X 4" glued together. Pencil dots for rivets and pencil shading along the sides give the bridge a 3-dimensional effect.

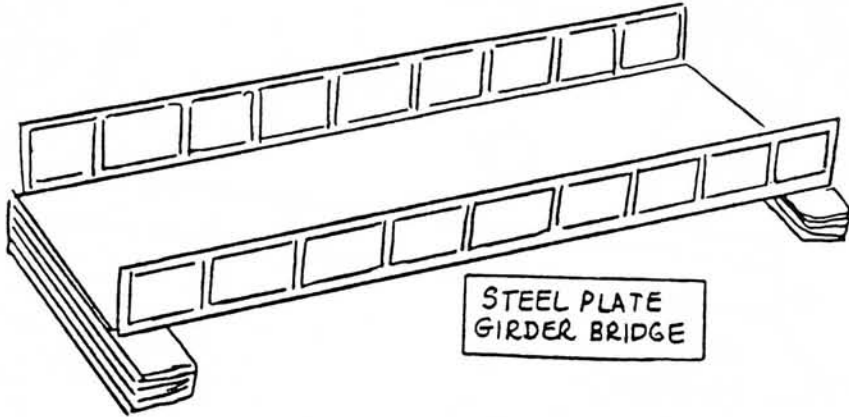
Modern Steel Arch Bridge - Made from three pieces of cardboard. The deck is 3" wide and 20" long. Sides (or railings) are 1/2" high. Make the sides and deck as one piece, then score and bend. Lay out one side and one end for the bottom unit as one piece on a 20" X 4" piece of cardboard. Sides are 4" X 18", ends are 2" X 4". Arch opening is 11" long by 3" high. Lay out vertical steel beams on 1" centers and mark them with a black felt tip pen. Steel arch bridges are used by railways and highways to span deep canyons. If the canyon is rock, no concrete abutments are needed.



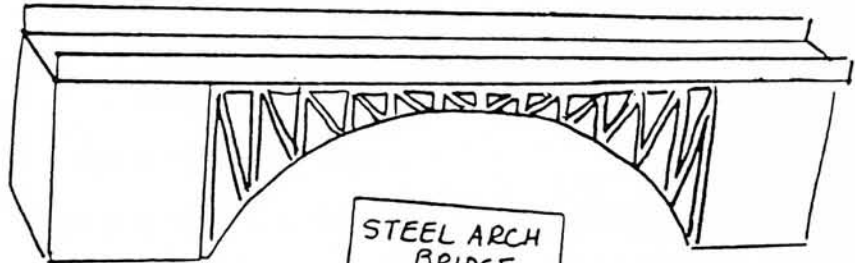
WOOD TRUSS BRIDGE



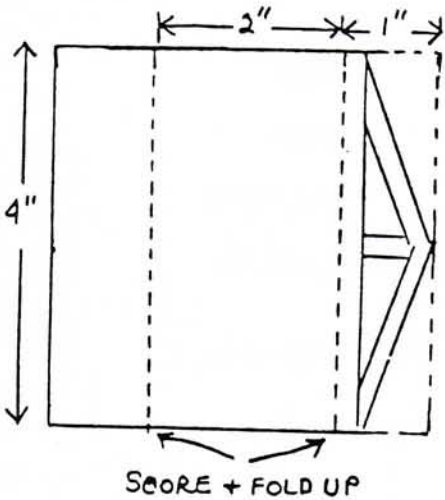
STONE ARCH BRIDGE



STEEL PLATE GIRDER BRIDGE



STEEL ARCH BRIDGE

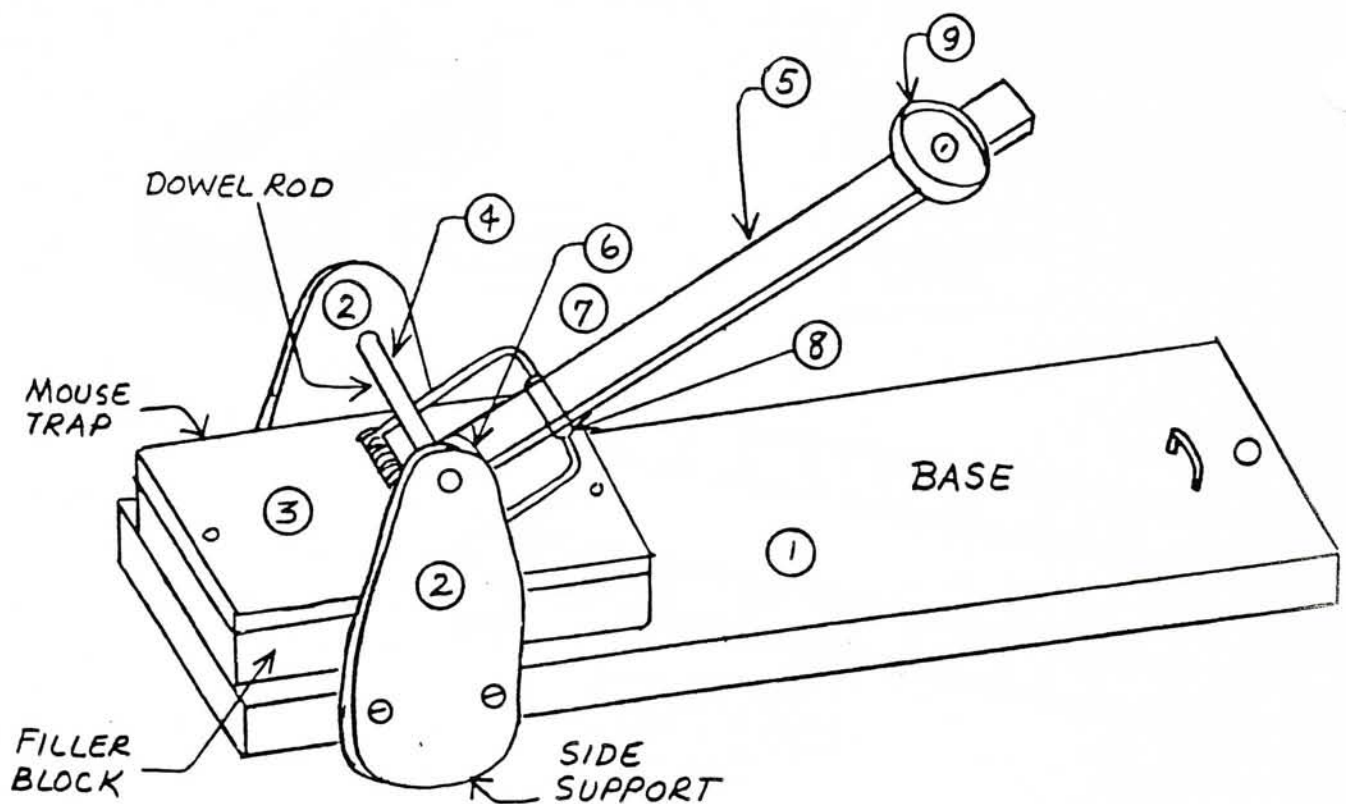


PATTERN WOOD TRUSS BRIDGE

Cut from Cardboard.  
 See measurements on previous page.  
 Decorate as indicated.  
 Use to display model cars.

- Boys' Life Magazine





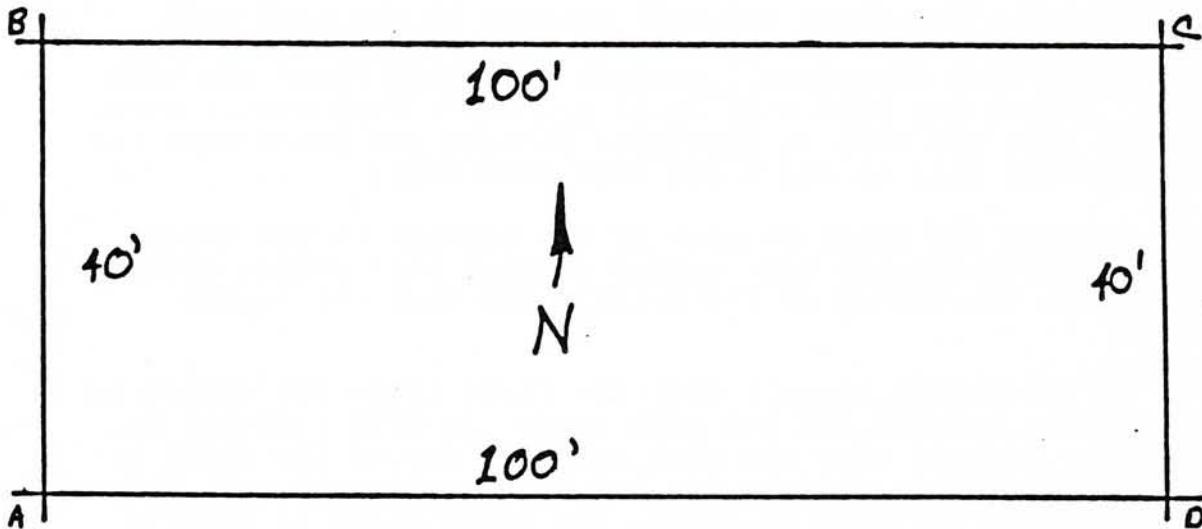
CATAPULT  
PARTS LIST

1. Base	3/4" X 2 1/2" X 15"	Wood
2. Side Support	1/4" X 2 3/8" X 5 3/4"	Plywood
3. Mouse Trap		
4. Dowel Rod	1/4" diameter	Wood
5. Swing Arm	1/4" X 1/4" X 10 1/4"	Wood
6. Swing Arm Retainer	1/4" X 2 1/2"	Tin Strip
7. Nut & Bolt	(use with tin strip to secure swing arm to mouse trap spring)	
8. String	(use to secure swing arm to mouse trap wire)	
9. Nut Cup		
6 Screws		

## SURVEYING LAND

Surveying land - yours or just stake out a section in the school yard or park using a fixed point such as a nail pushed through a rag.

To do this you will need a compass and a 100-foot tape. Put the compass on top of a 2 x 4 approximately 3-foot long. Start at one corner of your area to be surveyed. Take a reading of your compass and measure the distance to the next point. Do this all around your area that you have chosen to survey - marking down your distance and degree.



360 degrees	North	40'	Points A to B
90 degrees	East	100'	Points B to C
180 degrees	South	40'	Points C to D
270 degrees	West	100'	Points D to E

A surveyor's transit works much the same way. It gives him degrees in elevation as well as the degrees horizontally.

## ELECTRIC BUZZER

Materials: Magnet wire turned around a No. 8 nail  
No. 16 nail bent to touch top of metal strip  
6" x 1" metal strip cut from tin can  
6 volt lantern battery  
6" x 3" wooden block

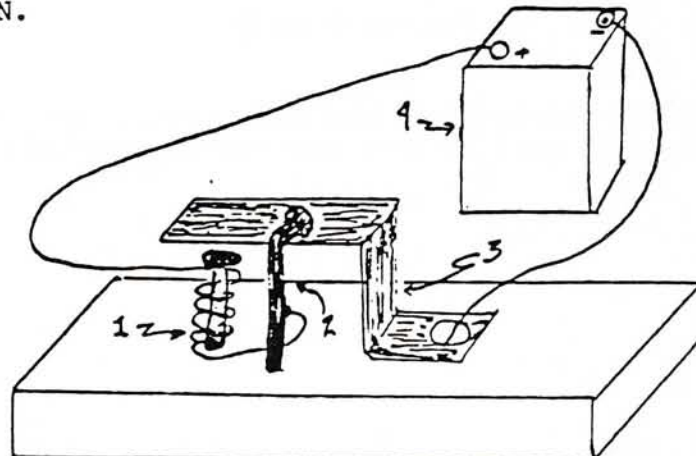
The two nails are driven into the wooden block as shown. Be sure the head of the larger nail is bent over so it will connect with the top of the metal strip.

Wind 100 turns of magnet wire around the straight nail. One end of the wire will connect with the positive post on the battery. The other end will connect to the bent nail. (It's best to solder the wire to the nail if possible, but, BE CAREFUL WHEN SOLDERING...BECAUSE SOLDERING IRONS ARE VERY HOT!) Almost any wire will do if you can't find magnet wire; just be sure the wire is insulated because you don't want the turns of the coil to short out with each other.

Connect the negative post of the battery to the metal strip by wrapping the wire around a small nail before driving it through the bottom of the metal strip into the wooden block.

If the buzzer doesn't work the first time, try adjusting the spacing between the two nail heads. It will probably be necessary to bend over the bent nail one way or the other to adjust the spacing between the top of the straight nail and the bottom of the bent nailhead. The metal strip is located between these two nails and will start vibrating with a loud buzzing sound when the spacing is just right. (ITS A GOOD IDEA TO DISCONNECT THE BATTERY WHEN ADJUSTING THE SPACING BETWEEN THE NAILS BECAUSE THE COIL MIGHT INCREASE THE VOLTAGE ENOUGH TO CAUSE A MILD SHOCK. THE SHOCK WILL BE HARMLESS BUT STARTLING!)

DO NOT LET THE METAL STRIP REST AGAINST THE TOP NAIL WHEN THE BATTERY IS HOOKED UP BECAUSE IT WILL QUICKLY RUN THE BATTERY DOWN.



## BLOCK AND TACKLE POWER

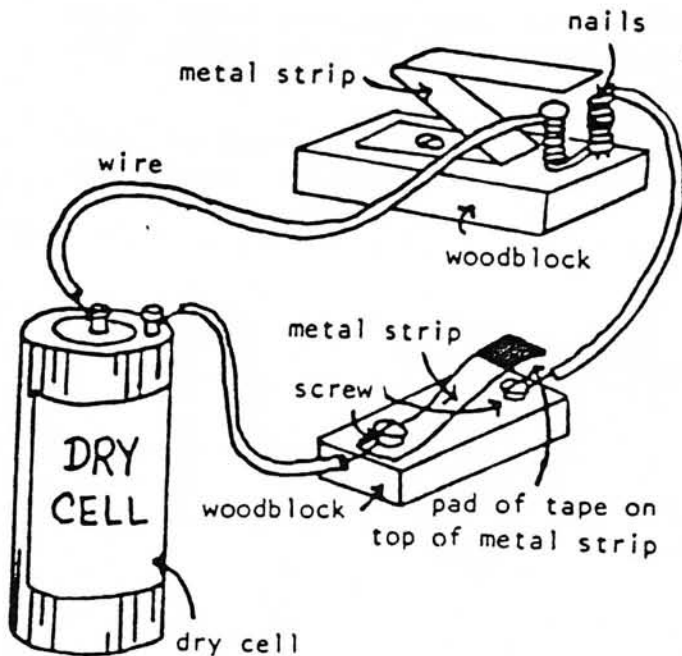
Two dowels of broomstick diameter and a length of clothesline can be used to demonstrate the increase in pulling power gained by the use of block and tackle. Tie the line to one of the sticks. Wrap it around both sticks 2 or 3 times. Have 2 of your larger Webelos Scouts grasp the sticks. Have the smallest boy pull on the line. He should be able to pull the two sticks together no matter how hard the larger boys try to hold back.

## OLD-FASHIONED TELEGRAPH SET

Materials: 2 wood blocks                                  2 metal strips cut from  
             2 nails    tin can  
             3 screws     1 dry cell battery  
             Electrical tape                                        2 wires

Assemble as illustrated. Bend the metal "Z" (sounder) so that it attaches itself to the nails when the key pressed down.

After the boys have completed their telegraph set, have them send messages to each other.



### International Morse Code

#### Letters

A	di-dah	J	di-dah-dah-dah	S	di-di-dit
B	dah-di-di-dit	K	dah-di-dah	T	dah
C	dah-di-dah-dit	L	di-dah-di-dit	U	di-di-dah
D	dah-di-dit	M	dah-dah	V	di-di-di-dah
E	dit	N	dah-dit	W	di-dah-dah
F	di-di-dah-dit	O	dah-dah-dah	X	dah-di-di-dah
G	dah-dah-dit	P	di-dah-dah-dit	Y	dah-di-dah-dah
H	di-di-di-dit	Q	dah-dah-di-dah	Z	dah-dah-di-dit
I	di-dit	R	di-dah-dit		

#### Numerals

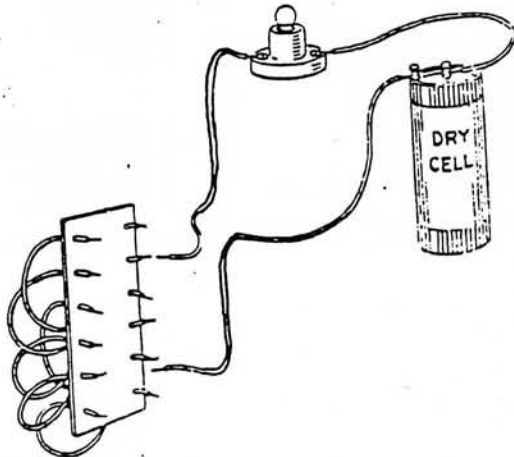
1	di-dah-dah-dah-dah	6	dah-di-di-di-dit
2	di-di-dah-dah-dah	7	dah-dah-di-di-dit
3	di-di-di-dah-dah	8	dah-dah-dah-di-dit
4	di-di-di-di-dah	9	dah-dah-dah-dah-dit
5	di-di-di-di-dit	0	dah-dah-dah-dah-dah

## BATTERY OPERATED QUIZ BOARD

Materials: Dry Cell  
Wire  
Flashlight bulb  
Minature socket  
Cardboard  
Nail

1. Use the nail to punch six holes down the left side of a piece of cardboard, and six holes down the right side.
2. Place the end of one wire in any hole at the left and the other end in any hole on the right.
3. Strip the insulation from the ends of the wire and secure it in place. Repeat with the other five wires.
4. Connect a wire between a dry cell terminal and a socket terminal.
5. Connect another wire to the remaining terminal of the dry cell.
6. Attach a third wire to the remaining terminal of the socket.
7. By touching the two free ends of the wires together briefly, the light will go on.
8. Put a question on the left side and the answer on the right side. Be sure that these are on opposite ends of the same wire.
9. Now try it out by asking a friend to take the two free ends of the wires from the cell and socket and try to touch the matching questions and answers.

This works because by touching the question with one end of the wire and the answer with the other, the circuit has been completed and the light goes on.





## HANDYMAN ACTIVITY BADGE

Handyman Activity Badge is a interesting badge for 4th and 5th grade boys. They are all looking at cars and dreaming for the day when they will own their own "wheels". What is more natural then for them to learn the proper care and maintenance that a car needs. For the time being they will have to make-do with their bikes. Bicycles require the same type maintenance and care as do automobiles. The principles of drive mechanisms and braking are similar for both, the complexity of the actual machine is just simpler for the bike.

Along with the care of their "wheels" this activity badge will be helping them learn to care for their homes. In many single parent homes where the adult is a woman, the Webelos Scout may have to perform many of the routine maintenance chores that are needed to keep the household functioning. Handyman Activity Badge will help prepare the boy for assuming some of these tasks around the house.

### Den Activities:

1. Visit a garage or auto maintenance facility. Talk about the care of cars.
2. Invite a mechanic to visit the den and demonstrate on one of the leaders' cars how to replace light bulbs and check the oil and other fluid levels.
3. Have a bike inspection and simple repair clinic for a den meeting. Consider asking a bike repair man to visit the den that meeting.
4. Discuss the proper care of hand tools. Demonstrate with a set of commonly used tools. Consider including tool storage, rust prevention and maintaining sharpness on tools such as chisels in the discussion.
5. Visit a bike shop and talk about the types of bikes and their uses. Learn about the different parts of the bikes.
6. Talk about safety procedures needed when operating power lawn mowers. Use a mower to demonstrate mower use and care. Demonstrate proper gas can closing before operating a mower nearby.

### Related Boy Scout Merit Badge Books:

- Cycling - Bike construction, care, and maintenance.
- Home Repairs - Common home repairs, electrical cord and plug repair, garden tool care.
- Machinery - Common tools and their use.
- Traffic Safety - Safe operating car check list, tire safety, bike safety.

## CHECKING AN AUTOMOBILE

All too quickly these boys will be new drivers. You can help them appreciate the proper care of a vehicle so that it can be safely operated. You might note that three things can go a long way toward safe motoring: (a) No drinking while driving. (b) Buckle up the safety belt, which is done by less than 20% of our USA population. And (c) regular attention to a vehicle to be sure it is ready to travel.

While the Webelos Handyman Activity Badge can be earned with far fewer items completed, it is possible to demonstrate the variety of things on a modern automobile that need to be checked, such as follows. This may form the basis of an entire den meeting, and you might encourage each dad-son team to check their own vehicle against this checklist.

-----  
Park vehicles upon arrival where there are no water or oil drippings. Let the engines cool down as much as possible.  
-----

### TIRES AND SHOCKS:

- \_\_\_(01) Show the boy the sticker within the door opening on the driver's side that identifies the recommended tire inflation pressures.
- \_\_\_(02) Then using the proper gauge, check the pressure in the tires. This check should not be done until the tires are COOL and have been just driven no more than three miles.
  - \_\_\_(03) If appropriate add or remove air from the tires.
- \_\_\_(04) Show the boy how you can run your hand slowly over the tire on a parked auto to see if the tread is still smooth. It is possible to find both cupping into the tires and uneven tire wear that need professional tire checking, balancing, and/or alignment.
- \_\_\_(05) Check the shocks. Go to each fender in turn and press down very hard. If all is well, the vehicle will bounce, but with only one major bounce quickly ending with minor rocking.
- \_\_\_(06) Also show on the sticker the recommended total load (including passengers) that may be safely carried in the vehicle.
  - \_\_\_(07) Each boy could roughly estimate the number of pounds that his family members weight, and by subtraction estimate how much other weight might be safely carried on a major vacation trip.

### LIGHTS AND ELECTRICAL:

- \_\_\_(08) Check that the parking lights are all lit.
- \_\_\_(09) Check to be sure the headlights turn on properly.

- \_\_\_ (10) Check to see if the dimmer switch changes the headlights from "high" to "low" beams.
- \_\_\_ (11) Press the service brake while someone checks that all brake lights do light.
- \_\_\_ (12) Operate the turn signal lever while someone checks operation of front and rear lights. Remember that many vehicles have more than one lamp on some corners. (Of course, on most cars you can normally tell that the most important turn signal bulb is out if there is no blinking when the lever is moved.)
- \_\_\_ (13) Check the horn for operation.
- \_\_\_ (14) Now check all other bulbs, such as:
  - \_\_\_ dash panel
  - \_\_\_ overhead/underdash courtesy lamps
  - \_\_\_ outside "cornering" lamps
  - \_\_\_ trunk lamps
  - \_\_\_ glovebox lamp
  - \_\_\_ \_\_\_\_\_
  - \_\_\_ \_\_\_\_\_
  - \_\_\_ \_\_\_\_\_
  - \_\_\_ \_\_\_\_\_

**FLUIDS AND ENGINE COMPARTMENT:**

Two words of caution: (a) Some vehicles with electrical cooling fans can come on when the engine is off. If this vehicle has such an arrangement (or if you cannot tell) do these tasks only when there is no danger from a very hot engine. And (b) do not let anyone work under the hood while someone has the keys near the ignition.

First, with engine OFF and VERY COOL: (NOTE: If the engine is too hot, skip #15 and #16 until another day.)

- \_\_\_ (15) Remove the radiator cap SLOWLY to see if the radiator is full or in need of a mixture of coolant/water or water alone.
- \_\_\_ (16) Then determine whether the radiator overflow reservoir needs to be filled with a similar mixture of coolant/water or water alone.

Second, with the engine OFF and SOMEWHAT COOL:

- \_\_\_ (17) After the engine has been OFF for at least three minutes (to let the oil drain back into the pan), check the oil level by removing the oil dipstick, wiping it clean, inserting to the full extent, then reading the level.
  - \_\_\_ (18) If necessary, add enough oil to bring the reading back to full. (CAUTION: Be sure to put oil in the proper filler opening. Switching oil and transmission fluid can easily occur.)
- \_\_\_ (19) Visually check that the two (typical) chambers for the service brakes are reasonably full of fluid.



- \_\_\_\_(20) Check that the power steering (if present) fluid level reaches the indicator mark.
- \_\_\_\_(21) Determine whether the windshield cleaning fluid tank needs fluid--either special fluid or water.
  - \_\_\_\_(22) If necessary add fluid to tank.
- \_\_\_\_(23) Look around the engine compartment for leaks, especially near hoses, which may soon become major problems.
- \_\_\_\_(24) Remove wingnut or bolt to expose the airfilter. Remove filter and see if it is excessively dirty.
  - \_\_\_\_(25) If appropriate it can be replaced at this time.
- \_\_\_\_(26) Check to see that all fanbelts are in place.
- \_\_\_\_(27) Check that fanbelts are tight, deflecting no more than 1/2" when you press down on the belt halfway between two pulleywheels.
- \_\_\_\_(28) Inspect the belt for "glaze" and cracking which occurs when the belts have aged.
- \_\_\_\_(29) Inspect the battery. Some have an "eye" that should show green. If the caps remove, see if water needs to be added.
  - \_\_\_\_(30) If there is a lot of white powdery material down the battery, this can be removed by wetting the battery with a quart of water, then sprinkling baking soda on it for 5-10 minutes, then flushing off with water.

----- SAFETY CHECK -----

- \_\_\_\_(31) Now check to be sure all caps are in their places, all tools and fluid bottles and rags are removed. This is a precaution before the engine is started and idles in PARK.

-----

The next few items can be checked while the vehicle is fully warming up (in PARK) for its transmission check.

PARKING ("EMERGENCY") BRAKE:

- \_\_\_\_(32) Check the adjustment on the parking brake. With everyone clear front and rear of the vehicle, set the parking brake, place the vehicle in DRIVE and see if it is able to hold the vehicle in place. (Recall that many vehicles can BACK UP while the correctly adjusted parking brake is fully engaged.)

VISIBILITY ITEMS:

- \_\_\_\_(33) Check that the windshield wipers are flexible, properly attached, and free from breaks or missing pieces.
- \_\_\_\_(34) Check that the windshield and other glass are clean enough that the driver can QUICKLY see in all directions.

- \_\_\_(35) Check that the inside and outside mirrors are clean enough and free of thumbprints that the driver can QUICKLY see reflections in them.
- \_\_\_(36) Check the inside of the windshield to be sure that it is clean enough that the driver can reasonably see when nighttime headlights shine into his eyes. This is especially important where smokers are in the vehicle frequently.
- \_\_\_(37) If water is squirted onto the windshield, the control for the wipers can be checked. (Recall that running of wipers on a dry windshield causes scratches.)

**TRANSMISSION:**

With engine RUNNING and WARMED to operating temperature:

- \_\_\_(38) Pull automatic transmission (if present) dipstick, wipe it clean, replace and immediately remove dipstick for reading. Remind the boys that this check is one of the most important since there is no "idiot light" or gauge for transmission fluid.

-----  
 The engine may now be turned off.  
 -----

**MISCELLANEOUS:**

- \_\_\_(39) Rarely checked, but important (especially around smokers), be sure there is a gascap that is properly tightened.
- \_\_\_(40) Rarely checked, but important, be sure that all registrations are current:
  - \_\_\_ current license plate
  - \_\_\_ current decals on the license
  - \_\_\_ parking sticker expiration dates
  - \_\_\_ state inspection sticker (where required)
  - \_\_\_ number of miles since last major servicing
  - \_\_\_ expiration date on driver's license
  - \_\_\_ \_\_\_\_\_
  - \_\_\_ \_\_\_\_\_
- \_\_\_(41) Check that the seatbelts can be pulled and buckled by each of the occupants.

**EMERGENCY EQUIPMENT:**

Check all items which are carried for emergency purposes to be sure they are ready for an emergency. These may include:

- \_\_\_(42) Show the boys where the spare tire is located, and check its pressure--about 1/3 of the spares are too low in pressure to be of any use.
- \_\_\_(43) Jack and handle(s) for changing a tire.
- \_\_\_(44) First Aid items that may have been used but not replaced.

**DRIPPING FLUIDS:**

- \_\_\_(45) For the final check, look under the vehicle for evidence of drippings.

BICYCLE SAFETY AND MAINTENANCE CHECKLIST

OWNER'S NAME \_\_\_\_\_ DEN \_\_\_\_\_

MAKE \_\_\_\_\_ SERIAL NUMBER \_\_\_\_\_

BIKE O.K.      NEEDS SERVICE

BODY AND FRAME

- 1. Can driver straddle frame with both feet on ground?      ( )      ( )
- 2. Are handlebars tight and in line with front wheel?      ( )      ( )
- 3. Are grips tight and are ends in good condition?      ( )      ( )
- 4. Are the frame tubes in line and in good condition?      ( )      ( )
- 5. Are pedals intact, tight and not binding?      ( )      ( )

BRAKES

- 16. Does coaster brake operate within 20 degrees of horizontal?      ( )      ( )
- 17. Do hand brakes have tight grip and sufficient reserve when engaged?      ( )      ( )
- 18. Are brake pads centered with at least 3/16" rubber on shoes?      ( )      ( )
- 19. Do the gear shifters need adjustment?      ( )      ( )

TIRES AND WHEELS

- 7. Do wheels run true, both side-to-side and around?      ( )      ( )
- 8. Do spokes have good tension?      ( )      ( )
- 9. Are there no more than 2 spokes missing per wheel and not together?      ( )      ( )
- 10. Do tires have good tread with no sidewall damage?      ( )      ( )
- 11. Is valve straight and is tire properly inflated?      ( )      ( )

ROAD SAFETY

- 20. Does bike have front, rear, and wheel reflectors?      ( )      ( )
- 21. Is the night lighting system fully functional?      ( )      ( )

DRIVE MECHANISM

- 12. Are bearings neither loose nor binding?      ( )      ( )
- 13. Does chain have 1/2" play with no excessive looseness?      ( )      ( )
- 14. Is chainguard properly fitting and free from touching chain?      ( )      ( )
- 15. Is chain properly lubricated?      ( )      ( )



## BICYCLE INSPECTION AND MAINTENANCE

1. Record and save the bike's serial number to have for identification if the bike is stolen.

### BODY AND FRAME

2. Can the driver straddle the frame with both feet on the ground? Both feet should be flat on the ground, so that the boy can hopefully touch his toes to the ground when the ground is uneven.
3. Are the handlebars tight and in line with the front wheel? A slight misalignment with the front wheel can result in an accident if the boy must make emergency corrections.
4. Are the grips tight and are the ends in good condition? If the hands can't hold the handlebar properly, control is lost.
5. Are the frame tubes in line and in good condition? The tubes can be dented and even have rust so long as the overall condition is good enough to have straightness and strength.
6. Are the pedals intact, tight, not binding? Be sure the angle of the pedals is correct; the pedal must be flat.

### TIRES AND WHEELS

7. Do wheels run true, both side-to-side and around? If the wheel is out-of-round when seen from the side, the spokes are incorrectly set so that the wheel is "flat" somewhere.
8. Do the spokes have good tension? Loose spokes hold nothing, and are the equivalent of a missing spoke.
9. Are there no more than two spokes missing per wheel and they are not together? Every missing (and loose) spoke is a gap in the strength of the axle to the wheel.
10. Do the tires have good tread with no sidewall damage? Poor tires can't handle the stress of emergency direction changes and stopping.
11. Is the valve straight and is the tire properly inflated? An angled valve will be cut by the rim. Tires must have the correct inflation to support weight and to handle emergency stress.

## DRIVE MECHANISM

12. Are the bearings neither loose nor binding? Loose or binding bearings will soon fail.
13. Does the chain have 1/2" play with no excessive looseness? A little slack is necessary, but excessive slack will result in the chain jumping off the sprocket - no brakes on coaster-brake bike.
14. Is the chainguard properly fitting and free from touching chain? The chainguard must function to avoid catching the boy's pants.
15. Is the chain properly lubricated? All machinery needs proper lubrication.

## BRAKES

16. Does the coaster brake operate within 20 degrees of horizontal? The coaster brake must engage quickly for the bike to handle emergency stops, and a boy has a hard time if the pedal must be pushed forward as well as down, especially in flat-bottom shoes.
17. Do the hand brakes have tight grip and sufficient reserve when engaged? Hand brakes should not be at their maximum "squeezed" position as the brakes engage. There should be some cable reserve left for increased gripping of wheel.
18. Are brake pads centered with at least 3/16" rubber on shoes? Replace wornout pads. It beats medical bills.
19. Do the gear shifters need adjustment? This safety and maintenance program does not focus on the shifters, cables, and gears. These parts are important for the boy to enjoy his bike, but are not as directly related to his safe steering and stopping. It is important to remember that a boy may weave his bike from side to side on the road to make up for poor gears - a safety problem.

## ROAD SAFETY

20. Does bike have front, rear, and wheel reflectors? While people may argue that having all these reflectors may be unnecessary in the daytime, there is no boy who will not "stretch" the daylight hours too far every once in a while.
21. Is the night lighting system fully functional? If a bike does not have adequate lighting for night riding, the boy should be instructed not to ride after dusk. He will get a false sense of confidence if he feels his bike is safe for riding in low light conditions.

If you have any doubt about the maintenance or safety of a boy's bike, seek a professional repairperson to give you assistance. A boy's life is too precious not to protect.

## Bicycle Maintenance

For the activity period of your first or second den meeting, there should be instruction and practice in minor maintenance problems and the servicing of a bicycle. Here is where you refer to the activity resources previously listed.

If you are not very familiar with bicycles or handy with an adjustable wrench, you may turn this instruction over to your den chief, father of a Cub Scout, or a neighbor handyman. But remember, this is merely minor maintenance and servicing, not a full course in bicycle overhaul.

Begin by discussing with your Cub Scouts the importance of keeping a bicycle in good condition. Ask what can happen if-- Brakes fail? Handlebars are loose? A wheel is wobbly? A tire is cut or bruised? The pedals feel floppy?

Have the boys explain what they would do to correct these conditions. Their answers will tell you what they already know about maintenance. Let your discussion and maintenance exploration prepare boys to respond to the quiz to follow which you can make into a challenging game.

Then, using the maintenance materials you have, show and let the boys practice checking:

- .Saddle adjustment
- .Handlebar adjustment
- .Spoke tightness
- .Wheel trueness
- .Brake operation
- .Tire condition
- .Frame straightness
- .Chain tension
- .Bearing adjustment
- .Lights, reflectors, and bell or horn operation
- .Gear operation

If possible, have two or more types of bicycles (middleweight, lightweight, and hi-riser) for instruction and practice.

Give the date, time, and place for the bike clinic and explain what will be checked and how the clinic will be run. Urge the boys to make any necessary adjustments or have repairs made by a bicycle serviceman before the clinic, if they can. Show the illustration of the sticker that will be put on bicycles that pass the clinic safety tests.

To find out how much your Cub Scouts have learned from the instruction, you may want to give the following quiz. You can read the questions and have the boys write their answers, or you can make a copy for each boy.

## Maintenance Quiz

1. True or False: Your saddle should be low enough so that you can put both feet flat on the ground while in the saddle. (False. To check saddle adjustment, set the pedal crank so that one of the pedals is in its lowest position. With one foot on the ground, sit in the saddle and place the ball of the foot on the low pedal. The leg should be almost straight. It is true that you should be able to stand with both feet flat on the ground while straddling the bar--off the saddle. Have a Cub Scout show how to adjust a saddle to the proper height.)
2. True or False: Your bike chain should have about a half-inch of play and should be oiled to keep it from rusting. (True. Have a Cub Scout show how to adjust chain tension.)
3. True or False: Spokes help keep the bicycle wheel straight and true. (True. Ask a Cub Scout to show how to tell when a spoke is loose.)
4. True or False: On bicycles with hand brakes, the wheel rims must be kept clean. (True.)
5. True or False: Your handlebars can be a little loose without danger. (False. Handlebars should always be tight. Have a Cub Scout show how to tighten them.)
6. True or False: You can make brake repairs yourself. (False. An experienced bicyclist may be able to make some cable adjustments on hand brakes, but for safety's sake it's best to leave brake repairs in the hands of a bicycle serviceman.)
7. True or False: A bicycle must have a front light, reflectors, and a bell or horn. (May be either true or false. Check the police for local ordinances.)
8. True or False: As long as there is some air in your tires, it doesn't matter how much. (False. They should be inflated to the correct pressure for safety and longer wear. Ask a Cub Scout to show where to find what the correct tire pressure should be.)



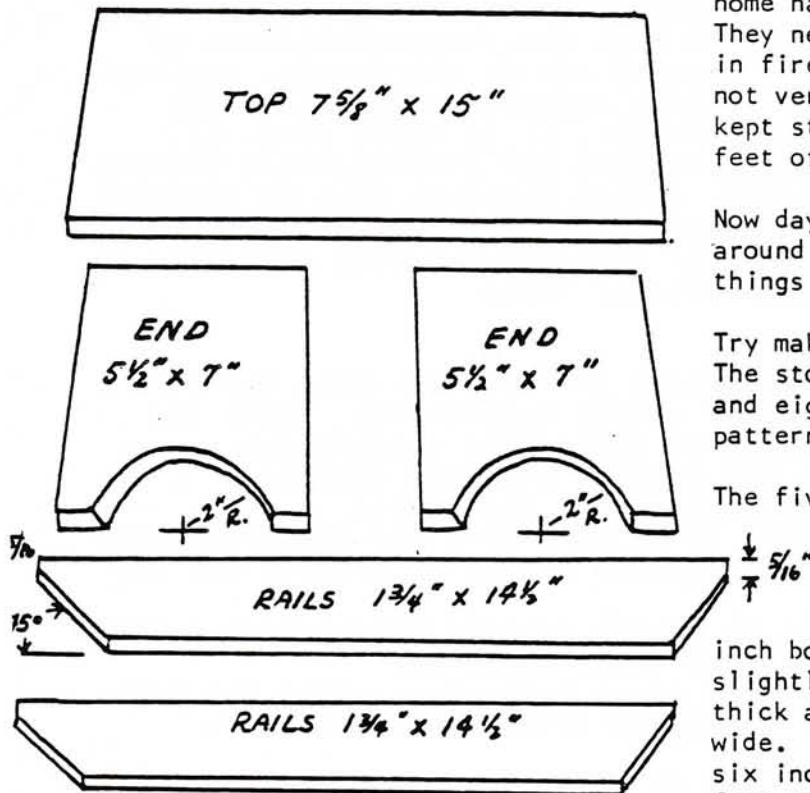
## LAWNMOWER CHECKLIST

- \* Check level of gasoline. Add any if needed, but be careful not to spill gas all over lawnmower.
- \* Be sure the gas can is properly capped before starting the mower. The fumes can cause an explosion if ignited.
- \* Check to make sure there is enough oil. Add any if needed.
- \* Make sure that the air filter is reasonably clean.
- \* Be sure the blade has free rotation. Clear any debris from under the mower body. If the rope won't pull, there may be something stuck between the blade and the body.

## LAWNMOWER SAFETY PROCEDURES

- \* Pick up any stones or sticks in the area to be mowed.
- \* Don't refuel a hot engine. This may cause a fire or explosion.
- \* Be sure to turn off the mower before removing the bag.
- \* DON'T PUT HANDS, FEET OR ANYTHING ELSE UNDER THE MOWER WHILE IT IS RUNNING. DON'T LOOK UNDER THE MOWER WHILE IT IS RUNNING.
- \* Be careful that the mower doesn't roll back on your feet.
- \* If you are not using a bag, consider where the debris will be blown and avoid any bystanders.
- \* Use of goggles or protective eye gear and long pants are recommended.
- \* Turn mower off if you are planning to leave it.
- \* Don't tape the "dead man" control in the "on" position. It has been built into the mower as a safety feature.
- \* Not a safety issue, but important: If you have a four-cycle engine, remember to alternate which side is downhill when mowing along a bank. Otherwise you will not get oil to one side of the engine. The two-cycle does not have this issue.

## FIVE BOARD STOOL



Back in colonial times, every home had a lot of footstools. They needed 'em. Fires built in fireplaces are cheery, but not very efficient, so colonists kept stools handy to keep cold feet off drafty floors.

Now days a footstool is useful around the home in reaching the things that are in high places.

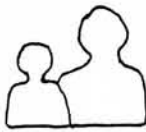
Try making a five board stool. The stool is fifteen inches long and eight inches high, and is patterned after a colonial one.

The five pieces of wood shown are standard size boards from the lumber yard. The top is cut from a one by eight inch board (which is actually slightly more than 3/4 inch thick and about 7 5/8 inches wide. The ends are cut from a six inch board and the rails from two inch stock.

The dimensions shown in the illustration are finished sizes. In cutting, allow a little extra material for trimming and finishing to size. When sawing, cut just outside the line in the waste area of the board. Use a cross-cut saw for the straight cuts, and a coping saw or jigsaw for the curves in the ends. Lay out the curved lines with a compass and the beveled ends on the rails with a combination square and pencil (or you can use a cardboard pattern). Use the square for marking the lines for cutting the pieces to length as well. And be sure to use a sharp pencil.

After the parts are cut, trim the ends with a wood file. Then sandpaper all surfaces to a stain finish to remove imperfections. Assemble the stool with two 2" finishing nails and white glue at each joint. To prevent splitting the wood, first drill 1/8 inch holes through the rails. Then drive the nails just through the rails and into the ends to locate their position. Next drill the same size holes for the nails in the ends, apply some glue and drive in the rails. Use a nail set to drive the heads of the nails slightly below the surface of the wood. Give your stool a final sanding and apply a coat of stain wax to finish.





## FAMILY MEMBER ACTIVITY BADGE

All Webelos Scouts are members of a family. The family unit may not be what we traditionally think of as a family, but rather consists of people caring for each other and being concerned about each other.

The Family Member Activity Badge is attempting to familiarize the Webelos Scout with the responsibilities of family members, functions carried out by the family, and how he fits into the family. Family enrichment is one of the goals of the Cub Scouting movement. It is hoped that, by developing increased communications and understanding between the boys and their families, future problems will be avoided. Your enthusiasm in leading this activity badge will be conveyed to the boys and their families and help make this an informative and enjoyable activity badge.

### Den Activities:

1. Talk about safety inspections in the home. Help the boys develop a checklist for home safety inspections. Have the boys report on the findings of their home inspections.
2. Visit a fire station and discuss handling emergency situations with the firefighters and paramedics.
3. Plan a family fun night to be held at a den meeting. Have each boy and his family contribute to the activities for the evening.
4. As a den, participate in a baby sitting course or a course designed to teach the care of small children.
5. In a den meeting, discuss money budgeting. Help the boys make a personal budget and try to follow it for a short period of time.
6. Invite a school counselor to visit den and talk about problems in communications with the boys.
7. In a den meeting, discuss energy conservation. Develop a plan to conserve electricity at home.
8. Invite a nutritionist or other knowledgeable person to discuss meal planning. Plan meals for 2 days.

### Related Boy Scout Merit Badge Books:

- Consumer Buying - Comparison shopping.
- Electricity - Home electric safety.
- Emergency Preparedness - Handling home emergencies.
- Energy - Energy production, energy conservation.
- Firemanship - Home fire safety, home fire escape plans.
- Home Repairs - Repairs for common home problems, replacing an electrical fuse.
- Personal Management - Money budgeting, family budgets, comparison shopping.
- Safety - Home safety checklist, accident awareness, preparedness for emergency situations

### Boy Scout Family Living Skill Book

## ENERGY CONSERVATION TIPS

Lighting: Turn off lights when you leave a room. Turning incandescent bulbs on and off will not shorten their lives. Use the proper size bulb for each fixture. A bulb with wattage too high for the fixture shortens the life of the bulb and may damage the fixture or wiring. Lamps in a corner reflect light from two wall surfaces giving you more usable light. Clean lighting fixtures regularly. Dust on lamps and reflectors impair lighting efficiency. Install fluorescent lights when remodeling. Fluorescent lighting produces up to five times as much light as incandescent using the same amount of electricity, yet it lasts up to 20 times longer than incandescent. Provide 'task lighting' (over desks, tool benches, sewing tables, etc.) so that work and leisure activities can be done without lighting the entire room. Check the ratings of all incandescent light bulbs in the house. In many cases, a lower wattage bulb can be used. So called 'long life bulbs' emit less light than a standard incandescent bulb of the same wattage. When purchasing light bulbs the wattage ratings tell you only the amount of power it takes to make the bulb work. The amount of brightness is measured in 'lumens'. Larger wattage bulbs usually are more efficient, producing more lumens per watt than smaller bulbs. Use photoelectric cells or automatic timers with security lights.



Heating and Cooling: A heating or cooling system works best with a clean filter. Dirty filters make systems work harder and use more energy. Choose an energy-saving temperature in the summer and winter. Select a medium range setting on window air conditioning units.

Refrigerators: Keep frost out of the freezer. Keep the refrigerator setting at 47 to 40 degrees. Level the refrigerator when installing it so the door seals tightly and closes easily. Avoid opening the refrigerator door frequently. Take as many items as possible out of the refrigerator each time the door is opened. Frozen foods which require thawing before cooking should be thawed in the refrigerator. This will help cool the refrigerator and reduce cooking time and energy. A side-by-side unit uses more energy than either the top-mounted or bottom-mounted freezer models. Vacuum the condenser coils (in back or at the bottom of the unit) every three months or so. Dust-covered coils impair efficiency of operation and increase energy usage. Before extended vacations, remove perishables from your refrigerator and turn the thermostat to a warmer setting.

Ranges: Select pots and pans with absolutely flat bottoms. Carefully measure water used for cooking to avoid heating more than is really needed. Develop the habit of 'lids-on' cooking. Tightly fitted lids help keep heat within the utensils, permitting the use of lower temperature settings and shorter cooking times. Turn unit off four or five minutes before cooking is over. Retained heat will finish cooking foods. Use a kitchen timer with a loud bell to avoid overcooking the foods. Make use of your pressure cooker. This will cut preparation time to 1/3 that required by conventional methods.

ENERGY CONSERVATION TIPS continued.....

Ovens: Do not pre-heat oven for broiling or roasting. Use a maximum temperature of 325 degrees for roasting meats. Cook several foods at one time. Do not use aluminum foil to line the oven. This blocks air circulation. Avoid peeking! Each time the oven is opened, the temperature drops 25-50 degrees, up to a 20% heat loss. Glass pans require 25 degrees less heat than metal pans for baking.

Microwave Ovens: These ovens draw only about half the power of their counterparts in standard electric ranges and cook food in a shorter time.

Small Appliances: Use small appliance when possible. They use fewer watts than the range.

Water Heating: Check the temperature on your water heater. Most water heaters are set at 140 degrees or higher, but you may not need water that hot unless you have a dishwasher. A setting of 120 degrees can provide adequate hot water for most families. If you reduce your temperature from 140 degrees to 120 degrees, you could save 18% on your energy usage for water heating. Letting the water run while shaving or when washing dishes by hand is needless waste. Repair leaky faucets promptly. Take showers rather than tub baths. The average person uses about half as much hot water in a shower as in a tub. Consider a relatively inexpensive water heater insulation kit if the unit is located in the garage or an unconditioned space.

Dishwashers: The average dishwasher uses 14 gallons of hot water per load. Be sure your dishwasher is full, but not overloaded, when you turn it on. Let the dishes air dry. If you don't have an automatic air-dry switch turn off the control knob after the final rinse. Do not use the rinse-hold on your machine. It uses 3 to 7 gallons of water every time you use it. Scrape dishes before loading them. If they need rinsing use cold water.

Washing Machines: Do not overload your machine. Pretreat for heavily soiled spots. Sort laundry articles and follow detergent instructions. Set the wash selector to cold or warm as often as possible. Dry full loads but do not overload. Do not over dry. Dry bulky items separately. Remove clothes from dryer as soon as it stops. Clean the lint trap after each load.



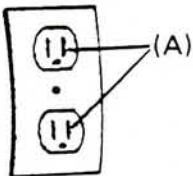
Addition of gaskets to wall receptacles and switch outlets will save energy and make the home more comfortable by reducing air drafts. Tests indicate that air movement through these electrical outlets can result in up to 20% of the air leakage in the average home.

Following are instructions for installation of one type gasket. Other gaskets are available with slight variation.

## Directions

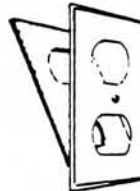
Place Gaskets on all Wall Receptacles and Switch Outlets.

1



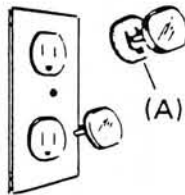
Punch out the 2 cap sealers (A) from Gaskets if not already removed. (Do not discard cap sealers.)

2



Remove Cover plate and place Gaskets behind cover plate. If Gasket is oversize, trim with scissors for a neat fit.

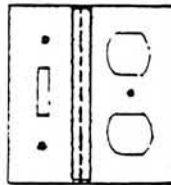
3



Push plastic cap through the cap sealers (A) removed from Gasket and insert into the receptacles when not in use. (Various manufacturers' caps work with slight variation.)



For Light Switch Outlets follow step No. 2 only.



For Combination Outlets, lay the 2 different Gaskets side by side and line up opening with the cover plate. Trim to fit flush with each other and then tape together.