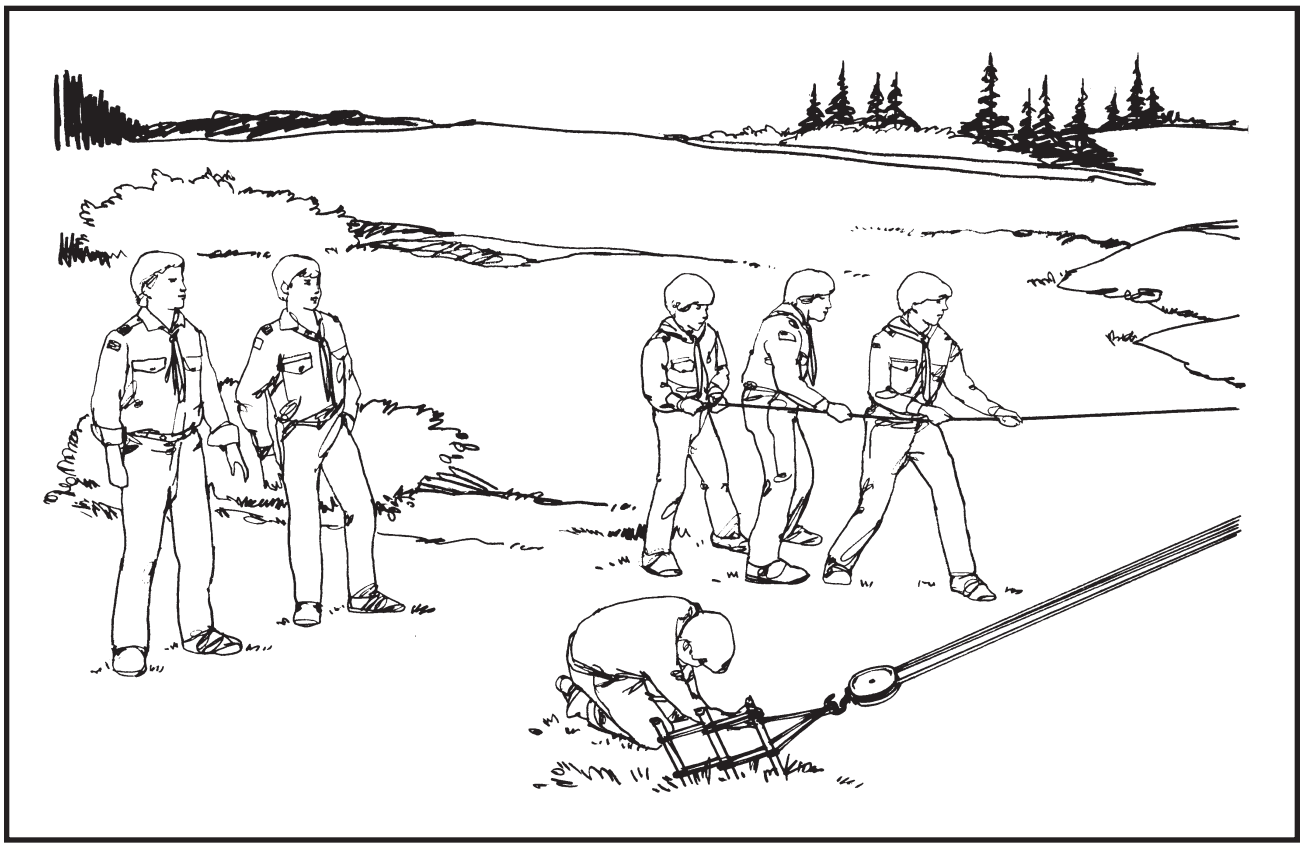
MECHANICS



Show a young man a piece of machinery, and he is sure to ask, "How does it work?" This month we will tap the inborn curiosity about mechanical operations for a program feature that is both fun and educational.

Virtually every object we use is a product of a machine. There is a tremendous variety of machines, but they all operate on the same principles. Your Scouts will have a chance to get some insight into those principles.

Arrange for the Scouts to meet mechanics who can explain how machines work and how they are maintained. If possible, have them work on such machines as lawn mowers, auto engines, and bicycles. Have them also put their mechanical knowledge into action with some pioneering projects during the campout this month.

SCOUTING OUTCOMES

This month's patrol and troop activities should give your Scouts

- Improved skills in rope work
- Some knowledge of mechanical operation
- A better understanding of engineering
- Increased self-confidence

ADVANCEMENT OPPORTUNITIES

Depending on the activities, Scouts may complete all or part of the following rank requirements:

Tenderfoot

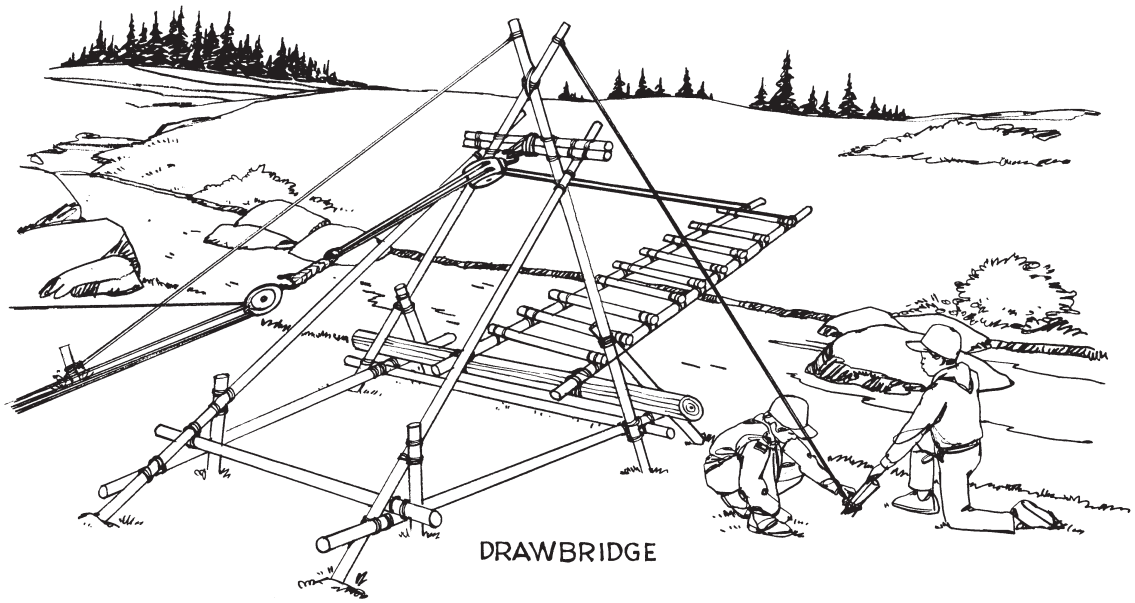
- Outdoor—cooking, hiking, camping, nature
- Citizenship—flag ceremonies
- Patrol/troop participation—patrol identification
- Personal development—Scout Oath and Law

Second Class

- Outdoor—cooking, camping, hiking
- Citizenship—flag ceremonies
- Patrol/troop participation
- Personal development—Scout Oath and Law

First Class

- Outdoor—cooking, camping, nature, hiking
- Citizenship—flag ceremonies
- Patrol/troop participation
- Personal development—Scout Oath and Law



Merit Badges. Older Scouts can concentrate on the Camping and Pioneering merit badges this month. Depending on activities during the campout, they may also cover requirements in Cooking, Hiking, and Wilderness Survival.

PARENT/GUARDIAN PARTICIPATION

The patrol leaders' council can involve parents in the program feature this month by

- Asking qualified people to assist with instruction for camping, pioneering, and mechanical skills
- Inviting them to the campout
- Asking them to provide transportation to the campsite

PATROL LEADERS' COUNCIL

The patrol leaders' council should meet during the early part of the previous month to plan troop activities for this program feature. If you don't complete all items on the following agenda, continue planning at patrol leaders' council meetings after each troop meeting.

- Decide on the campsite. Remember that you will need a supply of poles and small limbs for pioneering projects. These materials are cut and readily available at some Scout camps. If your council's camp does not have them, make sure you can get permission to obtain suitable materials elsewhere. Do not plan to cut trees without the owner's permission.
- Plan the special activities for the campout. See the ideas in the next section. If special gear or tools will be needed, assign someone to obtain them; seek help from the troop committee, if necessary.
- Inventory the troop's camping equipment if you have not done this recently.
- Plan details of troop meetings for the month. Assign patrol demonstrations, covering skills that will be needed for campout activities.
- Practice knots and lashings, if equipment is available.

FEATURE EVENT

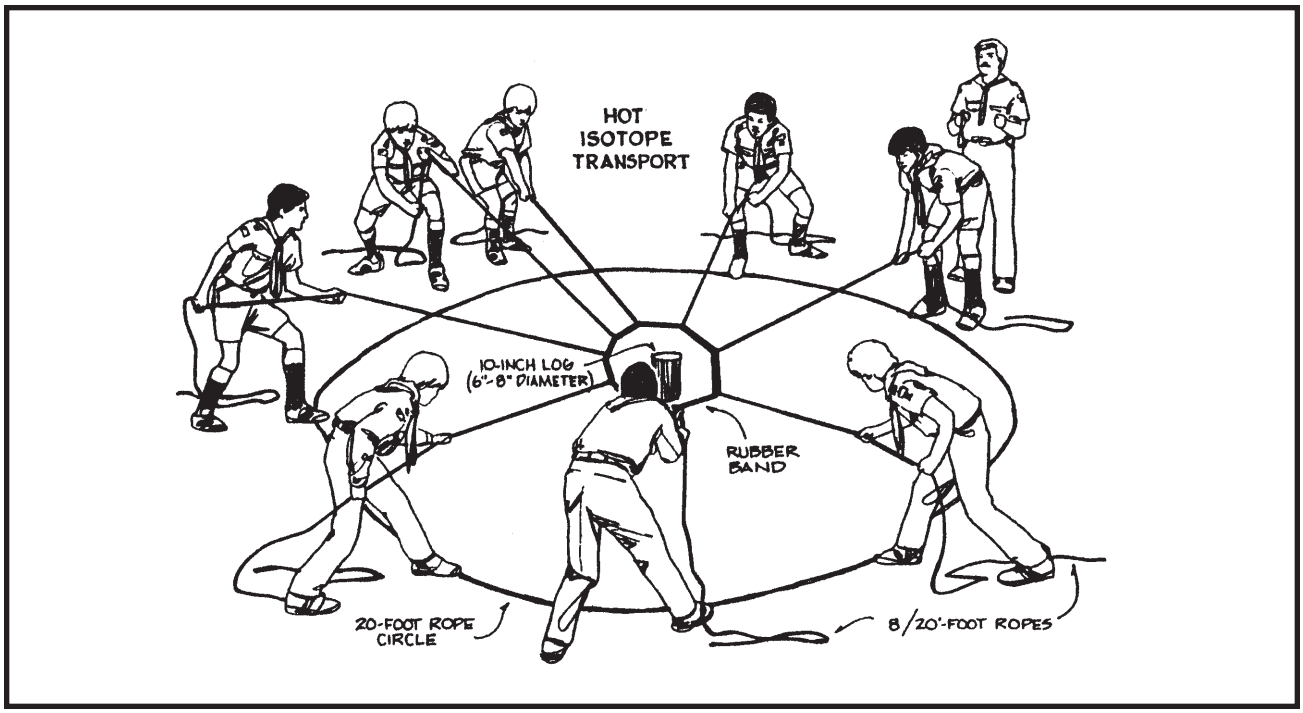
Mechanics Outing

Mechanics can be done with metal, plastic, wood, or other substances. In Scouting, mechanics is sometimes required for pioneering projects. Mechanics can also be done with bicycles, lawn mowers, auto engines, and other items. If the more experienced Scouts can get hold of a lawn mower engine and rebuild it, they could invent something that might prove useful to the troop, either on a campout or at some other function.

Younger Scouts can work on the mechanics of building pioneering projects that are fun and useful. Some examples are listed below.

The Rocker Bridge

This is a simple, single-lock trestle bridge with the footway in constant imbalance so that when weight is removed it returns automatically to the takeoff side. If necessary, the takeoff end can be weighted with an extra log.



For obvious reasons, handrails are essential. The problem here is to keep the posts rigid. One idea might be to use Scout staves as posts, with overhead crossbars between them and guy lines from the top corners. The extension of the treads on each side of the footway would still be necessary, but at the moment we see no easy way to avoid this. Do you?

The Drawbridge

This bridge will present few difficulties to any patrol that has already successfully tackled a monkey bridge. But as shown in the illustration, it would entail an inordinate number of square lashings, all of which must be guaranteed to hold. We must try to devise a method of fitting the cross timbers to the footway that would avoid all that repetitive rope work.

The intention, of course, is that the butt-end of the footway should be lashed to a pivot log that will turn freely in the A-frames at the foot of the shears. (Incidentally, saddles of burlap or something similar would obviously facilitate the turning process by reducing the friction of wood on wood.) The draw ropes come up from the far end of the footway and pass over the sheaves of a double block before being brought together and hitched to the tackle with a cat's-paw. The theory is that this would ensure a straight haul, but if there is any taper on the heavy hinge bar, you may discover that it has a tendency to slide in one direction or another until the butt-end of the footway grinds against the leg of the shears. (Adventurous pioneering is fraught with these incidental problems.)

It might help to drive restraining pickets into the ground at either end of the hinge bar, allowing it just a couple inches of clearance. Alternately, you could replace the double block with two single blocks at either end of the transom for a wider spread.

As for all those irritating square lashings along the footway, how would it be to use marlinespike hitches, as for a rope ladder? The idea would be to lash the top and bottom treads in position, and then make a ladder, using the other treads as rungs, and stretch it along the top of the bearers. The ropes could be shear-lashed at intervals to the outsides of the bearers. The labor savings would be enormous.

Hot Isotope Transport

The objective of this game is to pick up the "radioactive isotope" container with the transporter, lift it out of the circle, and place it on the ground outside the circle.

The isotope container is a 10-inch log, 6 to 8 inches in diameter. The transporter is a 2- to 3-inch-wide rubber band cut from an inner tube and tied to several lengths of rope. The circle is marked by a 20-foot piece of rope.

To play, set the radioactive isotope container in the center of the rope circle. Have each patrol, in turn, line up around the circle. Each Scout grasps a rope. Under the patrol leader's guidance, the Scouts pull the rope to stretch the rubber band, then bring the expanded band

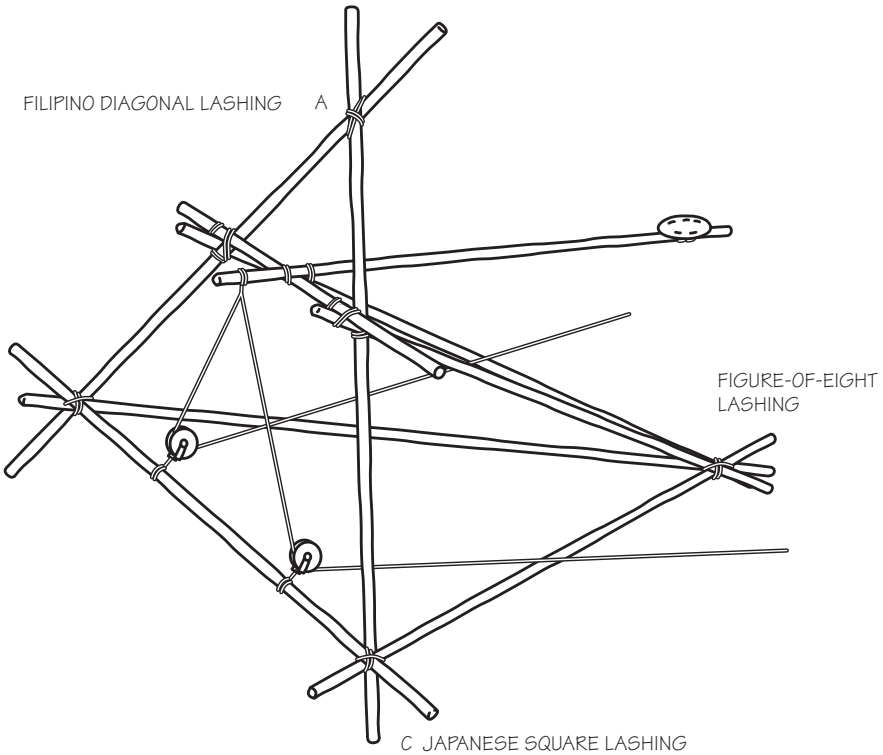
down over the container, relax the band to fit tightly around the container, then lift and deposit the container upright outside of the circle. The patrol that completes the task in the shortest time wins.

A variation on the game is to have several containers instead of one. The patrol to transport out the most containers in a given time wins.

Ballista

This is a great summertime event, as the main objective is to get the other patrol members as wet as possible. Each patrol is instructed to build a catapult using all three lashings and fill water balloons as quickly as possible. Each patrol is assigned a designated area and must stay within the boundaries as marked. Patrols should be separated by at least 25 feet.

Each patrol is provided with nine poles, two small pulleys, binder twine, 25 balloons, a bucket of water, and the bottom of a 2-liter plastic bottle. Each patrol receives a diagram of the catapult along with diagrams of figure-of-eight lashing, Japanese square lashing, and Filipino diagonal lashing.



Filipino Diagonal Lashing

Step 1—Start with the middle of the rope, tucking the running ends through the middle loop after going around both spars. Use the loop to pull the spars together.

Step 2—Proceed as for a diagonal lashing, taking the running end around both spars, keeping both ends together.

Step 3—Separate the ends and take frapping turns *between* the spars, pulling the rope tightly.

Step 4—Finish with a square knot. The Filipino lashing is a good alternative for the diagonal lashing.

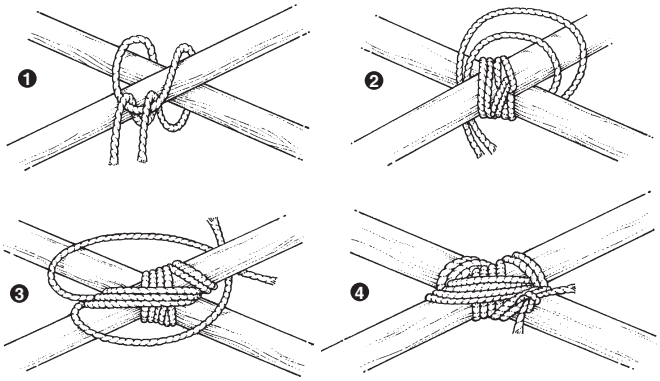


Figure-of-Eight Lashing

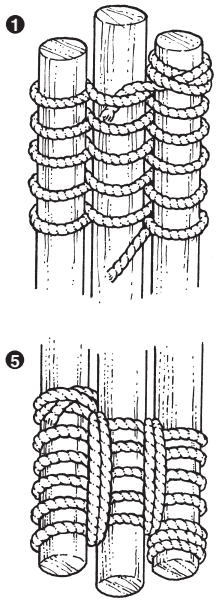
Step 1—Lay three spars alongside each other, butt to butt, tip-to tip.

Step 2—Tie a clove hitch around the outside spars, and twist the end around the rope.

Step 3—Alternate the rope over and under. Use six or more loose-turns.

Step 4—Finish with a clove-hitch.

Step 5—Make frapping turns between each pair of spars.



Step 6—Open the three legs to form an equilateral triangle at the base, with spars an equal distance from each other.

Step 7—To complete the tripod, square-lash three extra spars across the butts a foot or so from the base. For greater security, heel the butts into the turf.

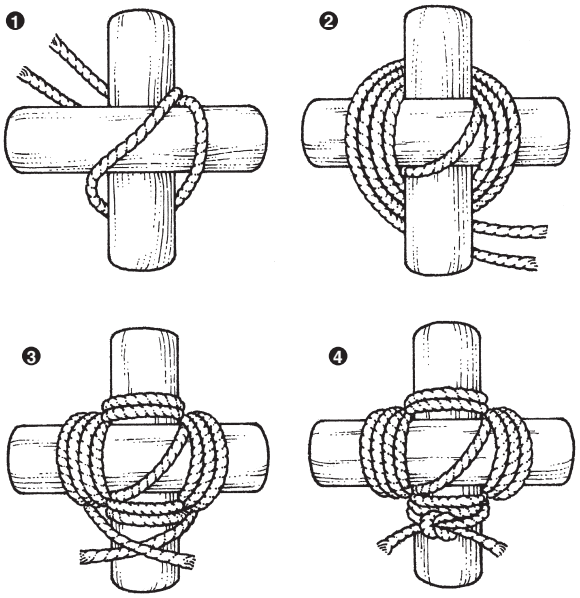
Japanese Square Lashing

Step 1—Start as if for a square lashing, but with about 30 percent more rope. Double the rope and pass the bight to the lower spar.

Step 2—With the two parts of the rope side by side, and never overriding, take two complete turns around both spars, the same as for the traditional square lashing.

Step 3—Take the two parts of the double rope and make frapping turns by taking two ropes between the spars in opposite directions. (One advantage is that it is easier to pull these turns very tight.) Two or three turns are sufficient.

Step 4—Finish the lashing by joining the two running ends together with a square knot and tucking in the ends.



Balloon Launch

Another summertime event is the balloon launch, in which the objective is to get the other patrol members wet. Each patrol is given a launch site separated from the others by at least 50 feet and is instructed to stay within the boundaries.

Each patrol receives 10 feet of surgical rubber tubing, a 4-by-6 piece of leather, 25 balloons, and a bucket of-water.

Two Scouts hold the ends of the tubing, and a third Scout pulls back the balloon in the leather pouch and attempts to aim it at the other patrols.

MECHANICS

TROOP MEETING PLAN

Date _____ Week 1

ACTIVITY	DESCRIPTION	RUN BY	TIME
Preopening _____ minutes	Have Scouts demonstrate rope whipping or fusing synthetic rope and splicing rope.		
Opening Ceremony _____ minutes	• Form the troop into a horseshoe. • Hold a uniform inspection. • Repeat the Scout Oath. • Repeat the American's Creed *(Boy Scout Handbook)*.		
Skills Instruction _____ minutes	• New Scouts practice tying clove hitch, square knot, and bowline. Do Rescue Race. (See the Games section of the *Troop Program Resources.**) • Experienced Scouts can see a presentation by a mechanic or go to an auto repair center or school to see how engines work and are maintained. • Older Scouts work on the Venture program or practice knots and study ropes needed for rappelling *(Fieldbook)*.		
Patrol Meetings _____ minutes	Discuss plans for the outing this month. Make sure everyone knows his assignments. If it is to be an overnighter, begin planning meals, the patrol duty roster, equipment distribution, and tent needs. Any Scouts who have not been camping will need extra help. All other patrols work on plans for activities toward rank advancement.		
Interpatrol Activity _____ minutes	Play Hot Isotope Transport. (See the Games section of the *Troop Program Resources.**)		
Closing _____ minutes Total 90 minutes of meeting	• Scoutmaster's Minute. • Retire colors. • Sing "Scout Vespers" *(Boy Scout Songbook)*	SM	
After the Meeting	Patrol leaders' council reviews the next meeting and plans for the outing. Begin work on next month's program feature.		

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MECHANICS

TROOP MEETING PLAN

Date _____ Week 2

ACTIVITY	DESCRIPTION	RUN BY	TIME
Preopening _____ minutes			
Opening Ceremony _____ minutes			
Skills Instruction _____ minutes	• New Scouts learn basic lashings—square, diagonal, and shear. Make a simple camp gadget. • Experienced Scouts continue to work with engines, return to the auto center, or visit a different machine maintenance area. • Older Scouts work on the Venture program or make plans for a fishing expedition at the troop outing; plan to prepare the fish for a meal.		
Patrol Meetings _____ minutes	Review assignments for the campout. First-time campers continue working on procedures for hiking and camping. All other patrols continue work on activities for advancement for the outing. Practice interpatrol activities.		
Interpatrol Activity _____ minutes	Do Roman Chariot Race. (See the Games section of the *Troop Program Resources.**)		
Closing _____ minutes Total 90 minutes of meeting	• Scoutmaster's Minute. • Retire colors.	SM	
After the Meeting	Patrol leaders council reviews the next meeting and plans for the campout. Continue work on next month's program feature.		

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MECHANICS

TROOP MEETING PLAN

Date _____ Week 3

ACTIVITY	DESCRIPTION	RUN BY	TIME
Preopening _____ minutes			
Opening Ceremony _____ minutes			
Skills Instruction _____ minutes	• New Scouts review basic hiking skills and what to do if they get lost. Learn how to pack a backpack. • Experienced Scouts continue to work with machines. If possible, work on a lawn mower motor or other small engine. • Older Scouts work on the Venture program or finish planning a fishing event for the campout.		
Patrol Meetings _____ minutes	Finalize menus for this month's campout and make sure everyone knows what he needs to bring. Review clothing and equipment needs and collect any necessary fees. Practice interpatrol activities.		
Interpatrol Activity _____ minutes	Play Reactor Transporter. (See the Games section of the *Troop Program Resources.**)		
Closing _____ minutes Total 90 minutes of meeting	• Scoutmaster's Minute. • Retire colors.	SM	
After the Meeting	Patrol leaders' council reviews the next meeting and plans for the troop outing. Continue work on next month's program feature.		

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MECHANICS

TROOP MEETING PLAN

Date _____ Week 4

ACTIVITY	DESCRIPTION	RUN BY	TIME
Preopening _____ minutes			
Opening Ceremony _____ minutes			
Skills Instruction _____ minutes	• New Scouts learn the basics of tent pitching. Review square lashing and practice diagonal lashing *(Boy Scout Handbook)*. • Experienced Scouts continue to work on engines. • Older Scouts work on the Venture program or assist younger Scouts with tent pitching.		
Patrol Meetings _____ minutes	Review plans and assignments for the hike-campout. Make sure everyone knows the travel plans and equipment needs. Go over the patrol duty roster. Practice interpatrol activities that will take place.		
Interpatrol Activity _____ minutes	Do Flagpole Raising. (See the Games section of the *Troop Program Resources.**)		
Closing _____ minutes Total 90 minutes of meeting	• Scoutmaster's Minute. • Retire colors.	SM	
After the Meeting	Patrol leaders' council reviews the next meeting and checks last-minute details for the outing. Finalize work on next month's program feature.		

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MECHANICS

TROOP OUTDOOR PROGRAM PLAN

Date _____

TIME	ACTIVITY	RUN BY
Friday evening	Load gear at meeting location and leave for camping area. Plan only a light meal en route.	SPL
	Arrive at campsite, off-load equipment. Set up patrol sites.	SPL/PL
Saturday 6:30 A.M.	Cooks and assistants up. Prepare breakfast. (Cooks should be working on First and Second Class requirements.)	Cooks, assistants
7:00 A.M.	Everyone else up. Take care of personal hygiene, air tents, hang out sleeping bags.	
7:30 A.M.	Breakfast	
8:00 A.M.	Clean up.	Cooks
	Patrols put up the gear for morning activities, clean up patrol site.	
8:30–11:30 A.M.	Work on pioneering project.	SPL
Noon	Lunch	
12:30 P.M.	Clean up.	Cooks
	Free time	
1:00 P.M.	Work on pioneering projects.	SPL
4:30 P.M.	Start dinner preparation.	Cooks
5:30 P.M.	Dinner	SPL
6:00 P.M.	Clean up.	Cooks
8:00 P.M.	Campfire	SPL
9:00 P.M.	Cracker barrel	
10:00 P.M.	Lights out	
Sunday 6:30 A.M.	Cooks and assistants up. Prepare breakfast. (Cooks should be working on First and Second Class requirements.)	Cooks, assistants
7:00 A.M.	Everyone else up. Take care of personal hygiene, air tents, hang out sleeping bags.	
7:30 A.M.	Breakfast	
8:00 A.M.	Clean up.	Cooks
	Patrols put up the gear for morning activities, clean up patrol site.	

TIME	ACTIVITY	RUN BY
8:30 A.M.	Worship service	
9:00–11:00 A.M.	Fishing	
11:00 A.M.	Break camp.	
Special equipment needed	Scout staves, rope, spars, troop camping equipment	