



Mountain Biking Merit

Note: Demonstrate safety and skill at all times as you complete this merit. A helmet and elbow guards are required.

1. Calculate your appropriate bike frame size (effective top tube length and center of bottom bracket to top tube measurement along the seat tube), bottom bracket to saddle extension length, stem length, handlebar width, crank length, and saddle placement (forward or back). Place your record of these measurements in your workbook.

2. Tune your front and/or rear suspension for preload according to your weight, and compression and rebound damping according to the type of trail and personal preference. Record these settings and place the record in your workbook. If your bike does not have suspension, research the products available and select a low-cost stem, headset, and fork that will fit your bike. Write a description of these products and the effect they may have on your riding.

3. Ride at least an hour each on the following types of trails:

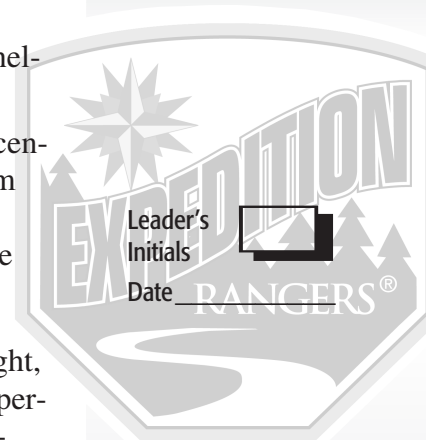
- a. Technical
- b. Fire road
- c. Single track

Write one paragraph for each trail you rode, describing the specific challenges it presented. If there was a “crux,” or a very difficult point, describe it in detail.

4. Explain the effects of suspension length (front and rear) on how a bike handles in rough and smooth terrain and how it responds to a rider’s input. Write a one-page description of the similarities and differences of these styles of full-suspension bicycles: downhill, free-ride, cross-country.

5. Assemble an off-road repair kit that includes the following:

- a. Multitool or 4, 5, and 6 millimeter Allen wrenches; standard and Phillips screwdrivers; and spoke wrench
- b. Reliable air pump
- c. Extra inner tube
- d. Patch kit with glue
- e. Two tire levers
- f. Small adjustable wrench (might be included with the multitool)
- g. Pocketknife



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- h. Sidewall patch (a dollar bill will also work)
- i. Extra derailleur cable
- j. Chain-breaker tool with extra chain pins or links
- k. Extra shoe cleat bolt (if needed)
- l. Any other tool or accessory specifically needed for your particular bike

6. Set up a mountain bike obstacle course. Demonstrate the following mountain-biking skills for your group and commander:
- a. Bunny-hop over a small obstacle
 - b. Ride off a drop-off at least twelve inches high
 - c. Ride up onto a twelve-inch-high ledge (can be the same obstacle as “b”)
 - d. Weave through a series of obstacles spaced no more than four feet apart
 - e. Ride at a high speed on a surface that will not be harmed. At a predetermined point, stop the bike as quickly as possible with little or no skidding, using primarily your front brake.
 - f. Set up a steeply inclined surface of at least three feet high and ride down it. Stretch your arms fully and place your abdomen on or close to the saddle and your bottom over the back tire for balance. (This part of the requirement may be completed by placing a wide board from the lowered tailgate of a pickup truck to the ground.)

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7. Explain the proper nutrition and hydration needed for both a 1½-hour ride and a 4-hour ride.

8. Participate in ONE of the following three types of rides. Make your selection based on your skill and fitness level. If you are an experienced rider, select either option “b” or “c.”

- a. Group ride sponsored by a local bike shop
- b. Mountain bike race
- c. As a team member in an endurance event (usually twelve hours of riding divided between four riders)

9. Plan a ride that utilizes various trails to form a large loop of at least twenty miles. Use a topographical map that shows trails through a wilderness area. Ride this loop with an experienced mountain biker. Write your plotted trip and insert it in your workbook.

10. Do all of the following:
- a. True (straighten) a wheel using just a spoke wrench and bike frame (use an old wheel or one you're not worried about damaging).
 - b. Clean your drivetrain (crankset, chain, and cassette [rear sprockets]) using

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an environmentally safe degreaser. Relubricate only the inside of the chain, placing a drop at every link pivot. Wipe off any excess.

- c. Fix a flat without patching by using emergency techniques: Tie a knot in the tire, twist a stick across the flat, use a shoelace to tie the two ends, etc.
- d. Use a chain-breaker tool to detach the chain from your bike. Reattach it for use as a single-speed bicycle, placing the chain across the front middle chain ring and one of the larger middle rear cogs. This simulates the repair you would use if your rear derailleur broke while riding. Now reattach the chain as normal.

11. Participate in a trail repair or maintenance event sponsored by a local bike shop or community service group. Write a one-page description of the techniques used to prevent trail erosion. If a local event is not available, volunteer for at least two hours of trail maintenance at a local park or wilderness area that permits mountain biking. Write a one-page report describing what you did.

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