When man invented the bicycle he reached the peak of his attainments. Here was a machine of precision and balance for the convenience of man. And (unlike subsequent inventions for man’s convenience) the more he used it, the fitter his body became. Here, for once, was a product of man’s brain that was entirely beneficial to those who used it, and of no harm or irritation to others. Progress should have stopped when man invented the bicycle.

Mountain biking is a lifetime activity enjoyed by people of all ages. Though mountain biking competitions do exist, the majority of people who mountain bike do not do so to compete in races. Rather, many people mountain bike for fitness training, for the pure enjoyment of exercising in nature, and for social reasons.

Ideally, adequate resources would allow outdoor leaders to incorporate mountain biking in a way that individualizes instruction for all participants, regardless of experience. Mountain biking is a perfect activity to introduce to young people because it is a lifetime activity that welcomes all ages and experience levels. By implementing this unit in a safe and upbeat environment, outdoor leaders will open the eyes of many young people to how the outdoors can serve their recreational needs throughout life.

Participants can benefit from a solid mountain biking unit in many ways, both immediately and years down the road. Once basic skills are acquired, participants might be more inclined to join or form a community mountain bike club. This allows participants to extend their active involvement beyond the program. In addition, through mountain biking, participants will improve their cardiorespiratory fitness, leg strength, balance, and eye–hand coordination. Mountain biking is the perfect activity to maximize time spent outdoors and to just enjoy nature.

Where is mountain biking best taught? Anywhere! Glorious trails are not required to teach basic to advanced skills and tricks. Consider purchasing bike sets that rotate among community partners, allowing other people the opportunity to learn mountain biking techniques. The final evaluation should be led by the outdoor leader and could be a group bike ride on a beginner trail.

“It’s just like riding a bike!” Some participants will not have ridden a bike in many years, and this is a great quote to get them comfortable with biking. By carefully planning lessons, offering challenges on each skill, and setting a mastery motivational climate (rather than competition among the group), participants will learn new skills and experience great success.

**Equipment**

**Group Equipment**

- 1 helmet per participant
- 1 mountain bike with a water-bottle cage mounted to the bike frame for each participant
- Several bikes with cages on the pedals for intermediate participants so they can gain strength on the upstroke of their pedal rotation
- Several bikes with clipless pedals for more advanced participants
- Several pairs of bike shoes in a variety of sizes so participants who are more advanced can begin practicing clipping into the pedal
- First aid kit properly stocked for the activity
- An instructional route card (optional; but due to the potential distances that can be covered, it’s encouraged)

**Personal Equipment**

- Shorts or pants that will not get caught on spokes or obstacles
- Layered clothing for easy temperature regulation
- Padded shorts and other advanced clothing for long rides (optional)
- Sunglasses (to keep unwanted dust away from eyes)
- Sunscreen and lip balm as needed
- Backpack hydration system or water bottle for each participant with participant’s name clearly marked
- Bike gloves to aid with gripping and for protection from falls
- Identification so that participants get used to riding with an ID that includes name, address, phone numbers, allergies, and emergency contact person

**Equipment Care and Maintenance**

- Participants will learn about bike maintenance and should be required to clean and dry their bike at the end of each lesson. Necessary items for cleaning and maintenance include
  - cleaning fluid for washing the bike,
  - degreaser,
  - hand cleaner,
  - chain lubricant, and
  - grease.
- At least one complete set of bike tools is required:
  - Allen wrenches, including a long-handled (20-centimeter) Allen wrench
  - Screwdrivers (flathead and #2 Phillips)
  - Bike-specific wire cutters
  - Chain tool
  - Chain-wear measuring tool
  - Pair of pliers
  - Rubber mallet

- Puncture kit (for standard tires)
- Track pump (to help participants repair a tube on the ride without losing valuable class time)
- Tire levers
- Several floor bike pumps

• Include a spare-parts box that contains the following:
  - Extra tire tubes that will fit the bikes (correct valve size)
  - Tube patches and repair kit
  - Zip ties (electrical ties)
  - Brake pads
  - Chain-joining pins

• Storage for the bikes (e.g., baby barn and approved bike trailer if equipment is to rotate through various community programs)

**Site Selection**

Participants should first bike around the grounds of the program site so that they can become familiar with their bike and their skill level before moving to the actual location of the program. Trails in this unit should be at a beginner level. Beginner trails are wide, not too steep, and free of major obstacles. In other words, avoid taking participants on advanced rides that are rooted out or have a narrow, single track. Advanced trails are not necessary for incorporating mountain biking into a program. Setting up obstacle courses on the program site is often enough for participants to practice necessary skills that they can transfer to trails:

- Very small logs or blocks of wood provide developmentally appropriate obstacles for practicing stump-hopping techniques.
- Trees or any large pieces of equipment allow for sharp turns, simulating the skills required to steer properly and to gain confidence in steering, balance, and coordination.

Access to mountain bike trails, gravel roads, and so on provide the best conditions for mountain biking. Additionally, hills afford the opportunity to learn proper pedaling and balance technique while ascending and descending.

**Social Skills and Etiquette**

Participants need to become familiar with hand signals. Mountain bikers often are required to bike through towns in order to reach trails from their homes. Thus, proper knowledge of bike etiquette both in traffic and on trails is necessary for participants to be adequately prepared for a safe and enjoyable mountain biking experience.

- Communication and courtesy: Cyclists must ride on the same side of the road as traffic and adhere to all traffic signals. While riding in a group on roads shared with vehicles, those riding at the front of the pack should shout “Car up” and those riding at the back should shout “Car back” to alert fellow riders of surrounding vehicles. While riding on trails, be aware that the following people have the right of way in the following order: (1) the rider heading uphill, (2) a group of children, and (3) the largest group.

- Environment: Following LNT principles, participants should not leave anything (i.e., food, bike parts) on the trails.

- Trail maintenance: Avoid taking participants on wet trails because this will cause further damage to the trails.

- Tailgating: Never tailgate! Participants should stay far enough behind that if a rider in front crashes or slows down suddenly, they have time to stop. A good rule of thumb is to stay back three bike lengths from the biker ahead.

- Pass with care: Announce yourself well in advance and let the rider ahead of you know that you are coming. Specially, use commands such as “On your left” or “On your right” so that hikers, joggers, and fellow bikers are not startled.

- If open fields are required for skills, outdoor leaders must ensure they have the proper permission to use the space for training.

**Risk Management**

Several risk management topics must be covered before participants ever sit on a bicycle. The level of risk will vary depending on how outdoor leaders provide practice for participants. For example, learning to steer a mountain bike on an advanced trail would pose great risk for beginner mountain bikers. However, learning how to control a mountain bike on a field or patch of grass at school or community center would not. In addition, it is important that outdoor leaders keep in mind the following:

- Participants cannot mount bikes unless they are wearing properly fitted helmets.
- Helmets that have been involved in an accident should never be used again.
• Participants must know and adhere to proper start and stop signals given by the outdoor leader.
• Participants must know how a bike should fit them and learn how to adjust the bike so that they are able to ride it safely.
• Extra care should be taken to guard bikers from descending rapidly down any rocky or rooted surface.

Unit Organization
Lessons in this unit begin with sizing your bike and move on to actual mountain biking activities on and off the program site. In this unit, participants will learn about mountain bikes and maintenance, steering mountain bikes through obstacles, hopping logs, and proper etiquette on trails. Each lesson provides modifications so that participants of beginner, intermediate, and advanced levels all have the opportunity to learn new skills and improve on previous skills. Outdoor leaders should plan for individualized instruction for participants of all skill levels—beginner, intermediate, and advanced.

Lesson Plans
Lesson 1: Bike Safety and Sizing Your Bike. Certain safety issues should be covered before participants ride the bikes, and this lesson covers these concerns. Participants will learn how to properly fit their helmets and bikes to ensure both safety and comfort.

Lesson 2: Identifying Bike Parts and Bike Maintenance. Because bike shops may not be easy accessible and paying others to maintain bikes becomes costly, it is important that participants learn how to clean and lubricate bikes. In this lesson, participants learn the names of bike parts along with their functions and how to clean and maintain bikes.

Lesson 3: ABC Quick Check, Gear Changing, and Pedaling Technique. In mountain biking, terrain often varies greatly, and riders need the skills to adjust from a rapid descent to a steep climb. In this lesson, participants will learn how to optimize both gear-changing and pedaling technique so they will have confidence when approaching varying terrain.

Lesson 4: Ascending and Descending Hills Without Obstacles. This lesson builds on the previous one whereby the focus is on technique in order to prepare for trails. Key skills taught in this lesson include balancing during ascending and descending, braking, and pedaling on hills.

Lesson 5: Environmental Awareness and Maneuvering Around Obstacles. Teaching riders to respect the trails and environment as well as preparing them to ride on the trails and safely avoid obstacles (e.g., trees, other riders, hikers) are the primary focus of this session.

Lesson 6: Ascending and Descending Hills With Obstacles. In this session, participants first learn safety concerns and technique for riding up and down hills with obstacles. The majority of the session will afford participants time to practice these skills in an authentic environment. It does not matter whether these obstacles are natural (e.g., trees, shrubs) or unnatural (e.g., large cones, any other equipment available to serve as obstacles).

Lesson 7: Hopping Logs and Other Obstacles. Participants learn proper hopping technique and are given time to practice this technique through an obstacle course.

Lesson 8: Small-Group Ride and Etiquette. The larger group will be placed into smaller groups of five to six riders. It is recommended that group members have similar bike control and speed so that all members of the group are comfortable and at ease. Once skill cues and routes are given to riders, they ride the trail while following all proper etiquette.

Terminology
• cassette—Consists of different-sized sprockets that are bolted together. Smaller cassette sprockets give the rider a higher and more difficult gear, resulting in maximum speed. The opposite is true for larger cassettes.
• chain—The chain allows the back wheel to rotate when the rider is pedaling by attaching the chainset to the cassette.
• chain ring—Three of these rings combine to form the chainset. Larger chain rings give the rider a higher and more resistant gear but allow the rider to move faster than the lower chain ring.
• derailleur (front and rear)—This component allows the chain to shift from gear to gear.
• fork—Connects the front wheel to the bike and controls the front wheel suspension. The more rigid the fork, the less suspension the rider will have.
• frame—This is the main part of the bike. The seat, handlebars, wheels, and all other components are added to the frame.
• **gears**—Gears allow the rider to pedal at varying rates of difficulty in order to achieve varying rates of power and speed. The higher the gear, the more difficult it is to pedal. Conversely, the lower the gear, the easier it is to pedal, but less power exists to propel the rider forward.

• **pedal (platform, cage, and clipless)**—Pedals allow the rider to push the cranks around and in turn move the bike chain. Typically, beginner riders use platform pedals (foot sits on top of pedal), intermediate riders use cages (foot sits on top of pedal but toes are in a cage), and advanced riders opt for clipless pedals (cleats clip into a mechanism on top of the pedal). Cages and clipless pedals allow riders to gain power on the upstroke as well as the downstroke.

• **tubes**— Tubes are located in the tire of the bike and are pumped up to varying pressure levels depending on the terrain. Mountain bike tubes are pumped up much less than road bike tubes, although exact ranges depend on the tire. Kilopascals (kPa) or pounds per square inch (psi) ranges are often printed on the tube itself.

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**LESSON 1**

**Bike Safety and Sizing Your Bike**

**Overview**

Do not allow participants access to the bikes until they understand all components of bike safety. The intention of this lesson is to build awareness so that participants will have a positive and safe experience. Knowledge is a key aspect in acquiring any skill.

**Learning Objectives**

• To learn safety cues and guidelines to be followed throughout this unit
• To learn how to properly fit a bike helmet
• To learn how to properly size a bike

**Activity 1: Bike Safety—Warm-Up and Introduction**

Is it necessary to teach traffic signals and riding safely in traffic during a mountain bike unit? Absolutely! Participants will almost always come across motor vehicles or traffic signs at some point during a mountain bike ride.

**Skill Cues**

• Always ride on the same side of the road as vehicular traffic (i.e., right side of the road in North America) and use bike paths whenever available.
• Obey all traffic signs and lights just as drivers of vehicles must do.
• Wear a bicycle mirror on your helmet or handlebars when riding on any roads or streets (i.e., anytime you are not on trails).
• Regardless of the location, always look over your shoulder before making a turn and use proper hand signals.
• When riding with others, make your own decision in terms of following or waiting while crossing a street and so on.

**Teaching Cues**

• Inform participants of the skill cues for this activity and check their understanding by asking questions.
• Remind participants that they will receive an exit slip at the end of the class to measure their understanding of these rules and safety procedures and that they will not be able to ride until they have demonstrated mastery of these topics.

Activity 2: Helmet Sizing

When cyclists wear helmets that fit, they are more likely to avoid serious injury during a crash. Head injuries are the leading reason for serious injuries to children using wheeled equipment. Since the human skull is just 1 centimeter (.4 inch) thick, it can be shattered if a properly fitted helmet is not used.

Skill Cues

• Size: Be sure the helmet sits on the head (should not move around when shaking the head) and that all straps are snug yet comfortable.
• Fit the width of two fingers between the eyebrows and front of the helmet (wearing helmets high on the head is a common mistake).
• Adjust buckles or slides on the side strap so they are right under the ear.
• Tighten the chinstrap until you can fit just one finger between the strap and the chin.
• Have a buddy double-check the fit (figure 6.1).
• Participants present the helmet fit to the outdoor leader.

Teaching Cues

• Style: A single-impact crash helmet is designed to protect the head against a single hard fall. Never use a helmet that has been involved in a previous accident.
• Standards: Make sure that the helmet has a label stating that it meets safety standards of an organization such as CSA (Canadian Standards Association), CPSC (Consumer Product Safety Commission), or Snell.

Activity 3: Bike Sizing

When cyclists ride bikes that fit them well, they are more likely to ride with greater ease and more power (figure 6.2). Thus, it is important that all participants understand how to properly fit a mountain bike so that they can do so after they leave class.

Skill Cues

• Straddle the top tube.
• Both feet should be flat on the ground while wearing shoes.
• When riding a hard tail, about 8 to 10 centimeters (3-4 inches) should be between the tire and the ground when lifting the bike by the handlebars. When riding a full suspension, this distance should be less (2.5-5 centimeters [1-2 inches]).
- Seat height: With the ball of the foot on the pedal, participants should demonstrate a slight bend at the knee when the pedal is at the bottom of the stroke.
- Seat angle: The nose of the saddle should be level with the rear of the saddle.

**Teaching Cues**

- Have two participants mount bikes (one bike will fit while the other will be slightly big). Ask the rest of the participants to choose which bike fits and explain why this is the case.
- Ask participants to state the steps of properly fitting a bike.
- Remind participants without disabilities to offer peer assistance in bike sizing to those participants who need help. Choose the peer helpers strategically and ensure that peers take turns partnering up with participants with disabilities.

**Risk Management**

- Participants are not allowed on the bike unless they are wearing a properly fitted helmet.
- Participants are not to ride unless they are instructed to do so.
- Do not use helmets used in a previous crash.
- Check each bike before issuing to a participant—make sure the bike is functioning properly.

**Lesson Closure**

Spread bike safety exit slips (see figure 6.3) on the ground. Ask participants to move to an exit slip and to complete the slip. Once exit slips are collected, verbally quiz participants on the following so that you can revisit items that need reinforcement before the next session:

- What are the steps of helmet fitting?
- How many fingers should fit between the eyebrows and the top of the helmet?
- What side of the road should a cyclist travel on?
1. What side of the road do cyclists always ride on?

________________________________________________________________________

2. True or false: Traffic signs do not always apply to cyclists.

________________________________________________________________________

3. True or false: Cyclists should always look over the shoulder before turning any direction.

________________________________________________________________________

4. True or false: Leaders are responsible for all cyclists behind them.

________________________________________________________________________

5. True or false: It is OK to ride without a helmet if you are just going down the road for a few minutes.

________________________________________________________________________

6. True or false: Helmet and handlebar mirrors keep cyclists from being startled by traffic or other riders.

________________________________________________________________________

7. True or false: Cues such as “Car back” or “Animal up” are helpful for alerting peers of surroundings.

________________________________________________________________________

On my honor as a participant at _________________________________, I promise to always follow bike safety rules throughout this unit so I do not put myself or my peers in any unnecessary danger.

____________________________________________________
(Participant signature)

Figure 6.3  Bike safety exit slip.
Overview
Participants must be able to identify bike parts; wash, adjust, lubricate, and repair bikes; and check for problems before riding. This lesson makes a great rainy-day activity. The bike maintenance part of this lesson should be taught indoors so that small parts do not get lost.

Learning Objectives
• To identify parts of a bicycle
• To be able to wash, adjust, and lubricate a bicycle

Activity 1: Identifying Bike Parts
In order to ride safely, participants should inspect the bike before riding. To do this well, they must be able to identify bike parts. After familiarizing themselves with the diagram provided, participants can demonstrate their understanding of bike parts through an active game.

Skill Cues
• Participants receive a labeled diagram of a mountain bike (figure 6.4) and follow along as the purpose of each part is explained.
• Parts covered include handlebars, gearshifts, suspension forks, tires, pedals, front and rear derailleurs, chains, chain rings, cassettes, brakes, saddles, and frames.

Teaching Cues
• Put participants into groups of two or three on one side of the area with bikes on the other side.
• Call out “Rear derailleur,” and the first rider (1) writes down the part on a sticky note, (2) sprints up to the bike (slowing down at a clearly marked boundary before approaching the bike), (3) places the sticky note on the appropriate part on the bike, and (4) returns to the group. Once finished, call out another bike part and the next person will go, and so on (see figure 6.4 for a list of bike parts for this activity).
• When the activity ends, give the groups time to self-evaluate their performance.
• Take a few minutes to discuss each part by having participants explain the purpose of the part.

Risk Management
• Participants should be well spaced so they do not run into one another during this activity.
• Having extra shoes with appropriate soles will help ensure that all participants are equipped with proper footwear for this activity.
Activity 2: Bike Maintenance

It is crucial to keep bikes clean so that they stay in good working order. Participants must understand that a mountain ride is not completed until a bike is cleaned at some level—from hosed off to full bike cleaning.

Skill Cues

Participants clean the drivetrain (chain, sprockets, chainset, and derailleur) in small groups:

- If the chain is dirty, place a little degreaser in a small pot. Dip a cleaning brush into the degreaser and scrub the chain clean (do not remove the chain).
- Degrease sprockets and chainsets next.
- After everything dries, relubricate the chain with drip oil or spray.
- Clean wheels and rims.
- Brakes need to be cleaned depending on the type (rim or disc).
- Clean and oil parts of cables normally in casing.
- Pull the front derailleur over to the largest chain ring, click the shifter as if to change into the smallest sprocket, and release the casing in the same way.

Teaching Cues

- Remind participants to rinse bikes thoroughly to remove all traces of degreaser.
- Demonstrate the cleaning process with a very dirty bike.
- Discuss procedures before and after cleaning.
Lesson 3  

ABC Quick Check, Gear Changing, and Pedaling Technique

Overview
Changing gears and understanding how to pedal effectively will enable riders to bike faster, longer, and on varied terrain. Everyone can benefit from a deeper knowledge of how to change gears in order to use energy efficiently.

Learning Objectives
• To be able to perform an ABC quick check
• To be able to pedal using an efficient technique
• To know how to switch gears
• To understand what pedaling in a high or low gear means

Activity 1: ABC Quick Check
Riders will have a safer and more enjoyable ride if they perform an ABC quick check before riding. Many bike groups across North America take time to teach beginners the ABC quick check, and though they may differ a bit from one another, the following cues will help riders perform this check.

Skill Cues
• A—Air; check that there is air in the tires.
• B—Brakes; check front and rear brakes.
• C—Chain and cranks; check to see if the chain and cranks are set properly.
• Quick—The quick release is up.
• Check—Do a short ride to make sure the bike is running properly.
Teaching Cues

- Ask riders what ABC stands for.
- Ask why it is necessary to perform an ABC quick check before riding.

Risk Management

- A nonnegotiable rule is that all participants must have a properly fitted helmet before riding (reinforce this with a buddy check and a final check by the outdoor leader).
- Before riding, an ABC quick check must be conducted (leaving out the check, or short ride, this first time).

Activity 2: Pedaling

Once helmets have been fitted and ABC quick checks are complete, participants are ready to mount their bikes and begin learning efficient pedaling technique. It is important that participants have an opportunity to hear a bit about pedaling technique. Never assume that riders know how to properly pedal a bicycle.

Skill Cues

- Toes on the foot pushing downward on the pedal stroke should be slanted up slightly.
- Pedal smoothly and consistently.
- Look ahead at a point well out in front of the front wheel so that you can see if your pedal stroke needs to be modified (increased or decreased) depending on the obstacles.

If using cages or clipless pedals, do these additional skill cues:

- When the pedal stroke is at the bottom of the downstroke, be sure to use a movement similar to wiping dirt off the bottom of your shoe on carpet or grass.
- Lift the heel and drag the foot upward, generating power while the opposite foot is pushing downward.
- Simply move heels outward to clip out of clipless pedals.

Teaching Cues

- Point the toes upward more as they approach the end of the downstroke.
- Demonstrate the motion of cleaning dirt off your shoe.
- A hard burn in the muscles does not mean accurate pedaling, although it can be good depending on the purpose of the workout.

Risk Management

Clear boundaries in an empty parking lot or field should be marked, and participants should understand that they are to ride within the marked boundary lines.

Activity 3: Gear Changing

Set up a bike route that has clearly marked lines along the perimeter of an area at the program site. This bike path should have cones on either side with room for approximately four cyclists to ride next to each other (i.e., very wide; this is the first time some participants have been on a bike in several years).
Skill Cues

- The right-hand lever on the handlebar operates the rear gear (moving the chain across the sprockets).
- The left-hand lever on the handlebar operates the front mechanism (shifts the chain from one chainwheel to another).
- The big chainwheel is for riding along flats or downhill.
- The smaller chainwheels are for riding uphill, into a strong headwind, or with lots of stopping and starting.
- The biggest sprocket is the lowest gear and is for hill climbing and starting.
- Keep pedaling while changing gears.
- Shift the gear one to three notches at a time rather than directly from smallest to biggest.

Teaching Cues

- Remind participants they will have the opportunity to pedal at their own pace while changing gears. This way, instruction is individualized and everyone benefits from the session.
- Have participants practice shifting gears by isolating the proper levers and timing the change for efficient pedaling speed to match the terrain.
- Participants need to be praised for their mastery of the tasks at hand and not the speed at which they travel.
- Ask participants to
  - bike at a pace where they are in control at all times,
  - get into the heaviest gear ratio (big ring with smallest sprocket),
  - get into the lightest gear ratio (small ring with biggest sprocket),
  - shift the gear one to three notches up, and
  - shift the gear two notches down.
- An easy way to avoid participants’ confusion when shifting gears is to call out, “Big three, little six,” “Big one, little one,” and so on.
- Remind participants to look over their left shoulder when making turns.
- Remind participants to announce forward moves to pass someone.
- Remind participants to maintain a safe riding speed—stress comfort and learning proper technique rather than going fast.
- While practicing pedaling strokes, it is best if participants have the opportunity to use platform pedals, cages, or clipless pedals.

Risk Management

Clear boundaries in an empty parking lot or field should be marked, and participants should understand that they are to ride within the marked boundary lines.

Lesson Closure

Figure 6.5 could be used while participants are biking along the perimeter after instruction on proper pedal technique and gear shifting has been given and riders are practicing in a group. You can use this assessment to rate performance so that you can easily identify skill-specific feedback and relay it to the participants. Check the appropriate box when a rider masters the required task (see key).

To close this session, it is helpful to know the success rate of the participants so that you can identify topics that should be revisited next session. Figure 6.6 allows you to examine how well participants have learned the objectives of this lesson.
### Key

<table>
<thead>
<tr>
<th>Pedaling</th>
<th>Gear shifting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Toes are slanted up on the downstroke.</td>
<td><strong>1.</strong> Able to shift on command.</td>
</tr>
<tr>
<td><strong>2.</strong> Pedaling is smooth and consistent.</td>
<td><strong>2.</strong> Shifts 1-3 notches at a time.</td>
</tr>
<tr>
<td><strong>3.</strong> Looks ahead while pedaling.</td>
<td><strong>3.</strong> Right hand changes rear gear.</td>
</tr>
<tr>
<td><strong>4.</strong> Announces presence when passing.</td>
<td><strong>4.</strong> Left hand changes front gear.</td>
</tr>
<tr>
<td><strong>5.</strong> Looks over left shoulder when turning.</td>
<td><strong>5.</strong> Shifts to speed up to pass.</td>
</tr>
</tbody>
</table>

**Figure 6.5** Pedaling and gear-shifting assessment.

---

| Name: ___________________________________________  Date: ____________________ |

1. Name two advantages of using clipless pedals.
   a. ______________________________________________________________________
   b. ______________________________________________________________________

2. On a scale of 1 (inexperienced) to 5 (experienced), rate your competence with gear shifting and pedaling. _________

3. State two things you could do to improve or maintain this self-rating.
   a. ______________________________________________________________________
   b. ______________________________________________________________________

4. Why should you shift gears only one to three notches at a time?
   ______________________________________________________________________

**Figure 6.6** Pedaling and gear-shifting exit slip.
LESSON 4

Ascending and Descending Hills Without Obstacles

Overview

Because mountain bike trails consist of many hills, it is time for participants to be exposed to balance and pedaling techniques in order to ascend and descend hills efficiently. These activities require participants to be on the bikes for a large portion of the session, and they will be participating in several spurts of rigorous activity.

Learning Objectives

- To know how to ascend a hill safely and using proper technique while on a mountain bike
- To be able to descend a hill safely and in control while on a mountain bike

Activity 1: Ascending Hills

Because the heart rate skyrockets while ascending hills, have participants get into groups of two or three for some peer teaching. Once all the skill cues are established, participants break off into their groups and one rider attempts to ascend the hill at a time. When the first rider reaches the top, she waits for the next rider to join her. At this time, the two riders give each other feedback based on the skill cues.

Skill Cues

- Riders need to gain speed while approaching the base of the hill.
- Riders should be in a gear that allows for easy pedaling as they begin riding up the hill.
- Weight needs to be forward (figure 6.7).
- Keep elbows in close to the core of the body.
- Change gears only one notch at a time.
- Perform smooth pedal strokes (i.e., do not stop pedaling).
- Maintain a consistent breathing rate.

Figure 6.7 The rider keeps his weight forward while ascending this hill.

**Teaching Cues**

- Ask riders to explain the steps of ascending a hill (check for understanding).
- Remind riders to be in an easy gear as they begin ascending the hill.
- Point out to riders that, unlike biking on flats, it is important that they change gears only one notch at a time while going uphill.

**Risk Management**

- The ABC quick check should be done before riding the bike.
- Because riders will be in groups of two or three, participants should spread out so that groups have plenty of room.

**Activity 2: Descending Hills**

In this activity, teach participants the proper cues for descending and demonstrate proper technique as they wait at the bottom of the hill. Then, in the same groups as activity 1, participants ride to the top of a wide hill (not on a trail but on an open hill so that everyone can be monitored at the same time). Riders can then ride down the hill one at a time and should be given adequate time to practice. The peers and the outdoor leader should use the skill cues to give skill-specific feedback (both positive and corrective) to group members.

**Skill Cues**

- Fingers should cover the brake levers so the brakes are easily accessible.
- Riders should not pull the front lever too hard at once; this could cause them to tip over the handlebars.
- Balance weight according to the steepness of the descent (the steeper the descent, the more the rider will have to balance weight to the rear).

**Teaching Cues**

- Leaning too far forward could cause the rider to fly over the handlebars.
- Leaning too far backward could cause the front wheel to pull back and the rider to land on his back.
- Control speed and control the bike while descending. Encourage beginners to use the rear brakes first, supported with front brakes.
- Riders might want to lower their seat depending on the steepness of the hill.
- Consider using an area where the hill is steeper in some parts than others or only have beginners ride halfway up the hill (or as far as they can).
- Invite intermediate and advanced riders to attempt to ride farther up the hill.
- If desired, have participants perform a peer activity requiring riders to give feedback to one another on ascending and descending technique (see figure 6.8). This will help hold all riders accountable for the skills needed and also offers skill-specific feedback on what needs to be improved to reach mastery.

**Risk Management**

- The ABC quick check should be done before riding the bike.
- Extra attention should be paid to the brakes because riders will be descending.
- Because riders will be in groups of two or three, participants should spread out so that groups have plenty of room.
Lesson Closure

In the closure of this session, ask the participants the following questions:

- What steps are necessary to ascend a hill efficiently?
- What steps are necessary to descend a hill safely?
- How do you feel physically? Why do you think you feel that way?

### LESSON 5

**Environmental Awareness and Maneuvering Around Obstacles**

**Overview**

Teaching riders to respect trails and the environment as well as preparing them to ride on trails and safely avoid obstacles (e.g., trees, other riders, hikers) is critical in a mountain biking unit. Activities in this lesson will help participants understand rules that need to be followed so that mountain bikers continue to be welcomed on the trails. In addition, steering technique must to be taught and practiced so that riders can avoid biking into obstacles while on the trails.

**Learning Objectives**

- To understand how to be an environmentally friendly mountain biker
- To know the techniques for maneuvering the mountain bike around obstacles
- To be able to maneuver a mountain bike at a slow speed around obstacles
Activity 1: Environment
In this lesson, participants will be asked to come up with group trail guidelines, and these should be posted so that they are clearly visible to everyone. These guidelines should remain posted throughout the duration of the unit so that everyone is reminded to be environmentally friendly riders (figure 6.9).

Skill Cues
- Never leave anything behind.
- Ride on open trails only.
- Never spook animals.
- Help keep trails maintained.
- Stay off wet trails.
- Avoid hard braking that tears up the trail.

Teaching Cues
- Quiz participants on their knowledge of skill cues.
- Encourage participants to organize a trail awareness campaign in their school or community.

Activity 2: Steering Around Obstacles
Bike trails vary greatly in the obstacles that exist on them. Whereas beginner trails may have none, others may have several. It is necessary for riders to learn how to maneuver their mountain bikes around obstacles so that they are prepared to ride safely on trails.

In this activity, participants should spread out along a perimeter that consists of two of the following (where possible): grass, gravel, or pavement. In doing so, riders will be exposed to steering around obstacles on varying terrain. All riders should start slowly through the obstacle course. Eventually you should invite those who are demonstrating confidence and success in the skill to speed up through the course. You may want to set up two obstacle courses, one with many obstacles and one with fewer obstacles. Then riders can choose which course they would like to attempt to ride through; typically beginner riders would choose the easier course.

Skill Cues
- Only turn handlebars at slow speeds.
- Lean your body to the side you want to steer (it’s instinctive).
- Look ahead so you are aware of what is coming (just as when driving a vehicle).
- Stay focused.

Teaching Cues
- After placing pylons (large and small), balls of various sizes, and large diagrams of animals, participants maneuver around the obstacles.
- Remind participants to focus on maneuvering (i.e., mastery) and not on speed.
- Ask participants how they were able to move around these obstacles successfully.

Risk Management
- All riders must wear a helmet during the biking sessions.
Lesson 6

Ascending and Descending Hills With Obstacles

Overview

Now that proper technique for ascending and descending has been taught, riders need the opportunity to improve their skills because most trails will have obstacles (e.g., trees, hikers, sharp turns). Once riders warm up, direct them to the area where they learned how to ascend and descend hills. Here, riders should be given time to review ascending and descending and practice riding up and down the hill without obstacles. This entire lesson should be devoted to a long warm-up and then lots of practice time for the skills of riding up and down a hill with obstacles.

Figure 6.9 The group has developed trail guidelines, and now they are ready to go on an environmentally friendly ride.

- Riders must perform the ABC quick check before riding.
- Encourage riders to focus on mastery of riding around obstacles rather than speed.
- A distance of at least four bike lengths must be maintained between each rider.

Lesson Closure

Upon completion of this session, ask participants the following:

- What was one aspect of steering that you improved on today?
- If a beginner cyclist asked you what are the most important aspects of steering to remember when steering around obstacles, what would you say? (Fill in any points that the group forgets to mention.)
Learning Objectives

- To state the steps for properly maneuvering, ascending, and descending a hill on a mountain bike
- To effectively maneuver and ascend a hill at the same time
- To effectively maneuver and descend a hill at the same time

Risk Management

- Begin with an ABC quick check as well as a peer check on helmet sizing.
- Give adequate time to warm up on flat ground before taking part in the activities.
- All safety commands (e.g., announce when passing, looking over left shoulder when turning) must be followed at all times.

Activity: Ascending and Descending Hills With Obstacles

Place obstacles (football [soccer] corner flagpoles are ideal, but large cones and other taller objects work well also) in a zigzag formation on the side of the hill where participants are not warming up. In groups of two or three, participants practice riding up the hill one at a time and then descending the hill one at a time.

Skill Cues

- Look ahead approximately 1 meter (3 feet) so there is time to react to obstacles.
- Keep pedaling while ascending.
- Keep elbows close to the core of the body.
- Keep weight forward while ascending.
- Keep weight backward while descending.
- Maintain control while ascending.
- Use handlebars more to steer rather than balance if going at a slow speed.
- Keep hands on brake levers while descending (start slow when first learning to descend with obstacles).
- Keep feet equal on pedal descent (i.e., neither foot should be high or low on the pedal stroke because the rider is not pedaling) to decrease the risk of hitting obstacles.

Teaching Cues

- Invite riders who are more experienced to ride higher on the hill. Riders who are less confident should only be requested to ride up a shorter section.
- Although many obstacles should be placed, riders should only attempt to maneuver around the obstacles as they feel confident to do so. As confidence increases, riders should be required to weave through all obstacles just as they would have to if a tree or other obstacle were on a trail.
- Check for understanding on skill cues before starting
- Reinforce proper balance (see skill cues).
- Remind participants to gain speed before ascending the hill.
- Ask peers to give feedback to their groups and partners.
- This would be a good time to assess the group or use the skill-specific feedback chart (figure 6.10) to offer specific feedback to the riders.
Lesson Closure

- Hold a group discussion at the end of the session and ask the following questions.
  - Why is it important to learn how to avoid obstacles on a trail?
  - What is the most important safety concern when descending a hill on a mountain bike?
  - What is one thing you feel you need to improve on while practicing these skills?
- The skill-specific feedback chart (figure 6.10) could be used while participants are practicing. You can use it to rate performance so that skill-specific feedback is easily identified and can be relayed to the participants. Check the appropriate box when a rider masters the required task.
LESSON 7

Hopping Logs and Other Obstacles

Overview
At this point in the unit, many group members will be excited about how much they have learned. To keep these participants from becoming bored, new skills need to be introduced. However, it is important to set up an alternative activity (i.e., an activity of your choice that some riders need more practice on) for those who might not want to attempt hopping obstacles. It is not necessary for participants to successfully hop a log upon completion of this lesson; rather, it is important that they know how to do it. If they do not feel comfortable, they should not try to hop the log.

Learning Objectives
• To state the steps of hopping a log successfully
• To understand the importance of timing in log hopping

Activity 1: Hopping Logs
Participants will learn proper hopping technique and practice the technique through an obstacle course. Participants are given an obstacle (fire logs are ideal) and asked to place it somewhere on the field where they have plenty of personal space. (The field should be dry so the bikes do not tear the ground.) Once skill cues are given, riders spread out and practice hopping the log.

Skill Cues
• Practice lifting the front wheel by riding forward. Just before lifting the front wheel, keep the pedals horizontal, knees slightly bent, and bottom out of the saddle and pull the bike upward in a popping motion. (Note: The log is not being used at all at this point.)
• Add the log.
• Ride to the log.
• Set the front tire on the front of the log by lifting the front wheel using the previous steps and then letting it fall back down on top of the log.
• Continue to pedal to move the front wheel on the log and to propel forward so the back wheel will move up and over the log.
• Try different speeds to determine what speed is best for hopping up on the log.

Teaching Cues
• Remind participants that lifting the front wheel too soon will cause it to hit the log but not allow them to hop onto the log.
• Participants should pedal immediately after setting the front wheel on the log so there is adequate momentum to move the back wheel up and over the log (especially when descending) (figure 6.11).
Risk Management

- ABC quick check and helmet fitting check must take place before riding.
- Introduce participants to hopping on dirt or dry grass so that if they do fall, they will have a softer landing than if they were on pavement.
- Riders should also be instructed to find personal space when necessary so that they avoid other riders.

Activity 2: Hopping Logs Throughout a Course

Participants who did not wish to learn how to hop a log during activity 1 were practicing all other skills through an obstacle course. At this point, all participants come together to the obstacle course, place their logs somewhere on the course, and practice all skills learned to date. The larger the perimeter of the course, the less boring it will be for the group, and it is best if there are some hills in the course so ascending and descending skills can be practiced. Additionally, this activity will afford participants a rigorous cardiorespiratory workout.

Skill Cues

- Reinforce skill cues for activity 1 of this lesson.
- Look over the left shoulder when making a turn.

Teaching Cues

- Set up two courses, one with more hills and many more obstacles than the other. Invite participants to ride through either course. To individualize instruction even more, color code some obstacles (e.g., blue cones are the most difficult) and challenge participants to ride along a particular color course.
- Check participants’ understanding of skill cues through guided discovery (i.e., use prompting questions so that students can formulate the correct responses).
- Reinforce all skill cues throughout this lesson, providing skill-specific feedback to participants.
- Remind participants to ride safely and with adequate distance between them and their peers (three bike lengths).

Risk Management

- ABC quick check and helmet fitting check must take place before riding.
- Announce yourself when you’re about to pass a peer.

Lesson Closure

Upon completion of this session, ask participants the following questions:

- Were you nervous before learning how to hop a log?
- Are you nervous now?

• What do you think you need to do to become more confident?
• Are you tired?
• On a scale of 1 to 10, how hard do you think you worked?

LESSON 8
Small-Group Ride and Etiquette

Overview
Understanding proper etiquette and being exposed to trails are a wonderful way to conclude a mountain biking unit. A group ride allows participants to demonstrate their respect for the environment and their ability to ride in a group.

Learning Objectives
• To practice skills in a group setting
• To know and practice proper group-ride etiquette

Activity: Group Ride
Throughout this session, the entire group will be placed into smaller groups of five or six riders based on experience. It is best if additional coleaders are available so that each group of riders has an experienced adult present. Once skill cues are given, riders are given time to ride and follow proper etiquette as a group (figure 6.12). Encourage riders to spend the last part of the session cleaning up any garbage that they find on the trail.

Skill Cues
Inform participants of the following information related to group rides so that they will be more confident joining such groups and so they will be positive members of the group.

• Be on time. Many people only have a little time to devote to group rides; respect their time!
• Research the group so that you do not end up with beginners if you are advanced or advanced riders when you are a beginner.
• Communicate in traffic (i.e., “Car back” or “Rider back” means a car or rider is approaching the group from the rear; “Car up” or “Rider up” means a car or rider is approaching from the front).
• “Walker up” means there is a pedestrian on the road or trail ahead; “On your left” means that a rider is about to pass.
• Stay alert at all times and focus on the rider ahead.
• Do not look back; this can cause swerving.
• Move to the back when tired.

Teaching Cues
• Before the ride, check for understanding of all the skill cues.

• Remind riders of the proper cues when approaching them on the trail and so on.
• It makes sense to place intermediate riders in the same group and so on. By placing participants in groups according to their experience and comfort, the pace of the ride will be comfortable and riders are less likely to become discouraged.

Risk Management

• The ABC quick check should be done once all helmets are properly fastened.
• You should be familiar with the trail system. Ideally the trail system would have various levels of trails (beginner and intermediate) and obstacles.
• Avoid rocky and rooted trails because most riders will likely be at the beginner level.
• If riders do come across rocks or roots that they do not feel confident passing through, encourage them to stop, pick up their bike over one shoulder, and walk around or over the obstacles. Once through, they can remount the bike and continue the ride.

Lesson Closure

Ask riders the following questions to make sure that they understand safety and etiquette commands.

• What should you say if you know a car is coming up behind you?
• What do you say if a hiker is walking toward you on a trail?
• Are you tired? Did you find it difficult to stay alert the entire time?
• Did you remember to give group members cues? If not, why? How did you feel as a group member if a command was not passed along to you?

References and Resources
