



MOUNTAIN BIKING CURRICULUM GUIDE



TABLE OF CONTENTS

I.	Introduction	Pg. 3
II.	Sport Specific Challenges & Considerations	Pg. 3.
III.	Equipment	Pg. 5
IV.	Participant Preparedness	Pg. 8
V.	Environment & Terrain	Pg. 9
VI.	Safety & Liability	Pg. 11
VII.	Functional Destinations	Pg. 12
VIII.	Mountain Biking Skills	Pg. 13
IX.	Incorporating Nature	Pg. 53
X.	Games & Activities	Pg. 54
XI.	Lesson Plans	Pg. 59
XII.	Resources & References	Pg. 71

I. INTRODUCTION

Nothing compares to the simple pleasure of a bike ride. ~John F. Kennedy

Despite our best efforts, the inherent joy of outdoor recreation can sometimes be lost on beginners. This typically isn't the case when it comes to riding a bike. Balancing on two wheels, coasting along, feeling the breeze on your face – these are the simple pleasures of cycling that do not have to be explained. Combine these elements with the experience of being on a wooded trail, in and amongst nature, and you have a sport with instant appeal and immediate reward: mountain biking.

As a sport, mountain biking continues to grow in popularity across the globe. Well-run youth programs can provide a powerful entry-point to this life-long activity. This curriculum guide is designed to be a resource for leaders of introductory mountain bike programs. Within these pages you will find information that will be applicable to both school-based and extra curricular settings.

The following information will be most helpful when supplemented with an Outdoor Sport Institute (OSI) educational workshop. To find out where and when these workshops are happening, visit us online at outdoorsportinstitute.org Here you can also learn more about using OSI equipment, including mountain bikes, canoes, kayaks, skis, and more. This curriculum guide is also available free for download from our website.

II. SPORT SPECIFIC CHALLENGES & CONSIDERATIONS

As with any sport, there are specific elements to consider when planning a program. The most obvious barrier to the sport of mountain biking is proper equipment. Participants need a bike and a helmet, and in some cases these things can be hard to come by. In programs that rely on participants to provide their own equipment, instructors need to be ready for kids to show up with anything and recognize that some bikes will simply not work for the intended activity. This may mean having alternative bikes available, or working with participants to equip themselves with better bikes. It's worth taking the time prior to the start of a program to have participants show up with their bikes and helmets to make sure they will work.

In programs where a fleet of bikes are being provided, it falls on the instructors to maintain and service equipment regularly to ensure function and longevity. This can add significantly to the time commitment of the program, and should be factored into planning. In either case it's important to recognize that without adequate and properly functioning equipment it can be very difficult to run a safe and effective mountain bike program.

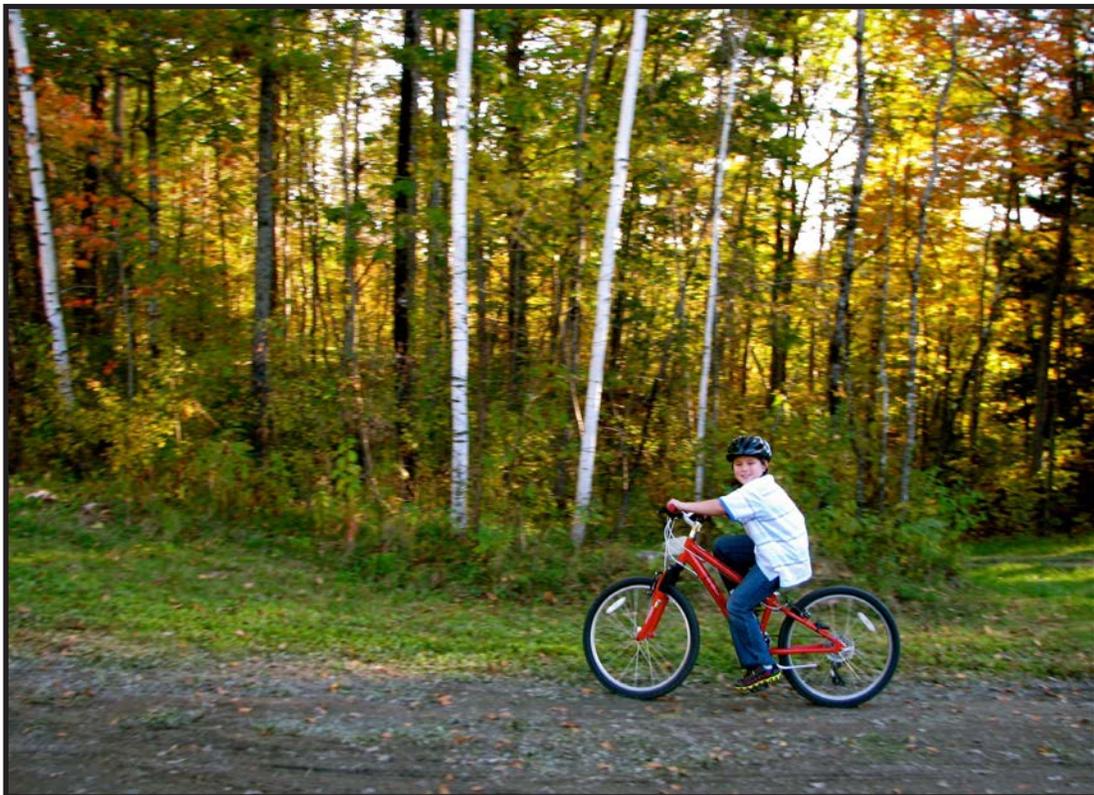
Another consideration for mountain bike programming is terrain. The sport of mountain biking has evolved dramatically over the years to the point where “purpose-built” trails are now a mainstay of the sport. It is important to recognize that there is a different experience to be had from simply biking off-road vs. riding on actual mountain bike trails. While OSI would love to see all Maine communities have quality trails developed, we recognize that a variety of factors can make this difficult and mountain bike programs often need to make due with limited terrain.

Whenever possible it's recommended to develop at least a small amount of biking-specific singletrack trail. When

designed and built correctly these trails serve to maximize the fun had while riding, and at the same time can dramatically increase the learning curve. When singletrack trails are not available, look for a variety of terrain, especially that which brings riders into the woods. Dynamic changes in landscape, riding surface, trail width, and topography will do a lot to keep riders entertained and excited.

Regardless of what's available for trail, all programs should find an open area with dirt or grass surface to use for creating obstacle courses, teaching new skills, playing games and allowing riders the space to generally gain comfort. Consider gaining permission to use a local ball field, as grassy surfaces can provide a greater sense of comfort (and a softer landing).

Finally, when it comes to running mountain bike programs, it's important to consider group management. Even in a small group of similar aged riders it's not uncommon to have a wide spectrum of skill and comfort. Trying to manage four or five young riders on a trail for 30 minutes can be quite a challenge. Having reliable volunteers, excited to work with different ability levels, will go along way towards improving everyone's experience.



III. EQUIPMENT

A casual glance online or in your local bike shop is all it takes for the immense variety of bicycles to become clear. Mountain, road, hybrid, commuter, full suspension...the list goes on and on. The following is a short explanation of key differences and features as they apply to introductory mountain biking.

Bike Type

The obvious difference between a mountain bike and other bikes is in the width and type of the tire. Generally, those unfamiliar with bikes will look at any bike with knobby-treaded, wide tires and assume it's a mountain bike. However, the differences go beyond this:

- Mountain bikes are typically designed so that the gears have higher clearance above the ground.
- Mountain bikes are designed to put the rider in a more upright position. This position puts greater traction over the rear wheel while allowing for ease of maneuvering with the front wheel.
- Modern mountain bikes often come equipped with some amount of suspension, either in the front fork (which holds the front wheel), or in both the front and rear of the bike. Bikes with only front suspension are referred to as "Hard Tails," while bikes with front and rear suspension are called "Full Suspension." Bikes with no suspension are called "Rigid" or "Fully Rigid."



Hard Tail Mountain Bike



Full Suspension XC Mountain Bike



Full Suspension Downhill Mountain Bike

Bike Quality

Those looking to purchase bikes are often sticker shocked after a trip to the bike shop. Bikes can range from as little as \$50 to upwards of \$10,000. The difference in price comes down to materials, weight, and durability. Bikes typically found at department stores are built using inexpensive parts that generally do not hold up to wear and tear. They are heavy, corrode easily, and are often not put together well. It's hard, however, to pass up the price tag when compared to better quality bikes typically found at a bike shop. Even entry level bikes here typically cost upwards of \$300. For the purposes of introductory programs, almost any mountain bike will suffice, but it's important as a leader to recognize the difference between bikes of different price-points and realize that often brakes, shifting, and general function of lower quality bikes may need more frequent maintenance.

Bike Sizes

When it comes to bikes, understanding size can be a little complicated. Youth bikes are sized based on wheel diam-

eter, whereas adult bikes are sized based on frame dimensions. To complicate things further, adult bikes can come in a variety of wheel diameters. To help simplify, here's a listing of common sizes you will see:

Youth

12" wheel diameter – Absolute smallest bikes, not something you'd see in an intro mountain bike program.

16" / 18" wheel diameter – These bikes typically fit children in the 4 to 7 year old age range, and again not typical sizes seen in a intro mountain bike program. Commonly come only with one gear and coaster brakes.

20" wheel diameter – This size is typical for 7 to 10 year olds. These bikes often come equipped as single-speeds or with minimal gearing and hand brakes. Once bikes hit this size range they are often more practical for trail use.

24" wheel diameter – This is the largest youth size bike available, as the next step up from here is a small adult bike. These bikes typically have all the attributes of larger bikes: front and rear derailleurs (gears), hand brakes, and front suspension.

Adult

Once you step up to adult bikes there are a few different options for wheel diameters. There are pros and cons to different sizes, and it often comes down to personal preference.

26" wheel diameter – This has been the standard for decades and continues to be widely accepted as the norm.

29" wheel diameter – These larger wheels have been around for years now and are commonly seen on the trail. The concept behind a larger wheel is that it provides greater ease in rolling over obstacles.

27" wheel diameter (650B) – This is a relatively new offering in mountain bike wheel size. The intention is to have the quickness of a 26" wheel and the roll-over ease of a 29" wheel.

Fat Bikes – This is a fast growing, highly popular trend in off-road biking. Fat bikes have over-sized and typically low-inflated tires that make them ideal for riding in snow and other soft surfaces. But many riders enjoy using them for all terrain and types of trails

Unlike with youth bikes, sizing the rider on an adult bike does not have anything to do with the wheel diameter. Instead riders need to select the proper sized frame. Mountain bike frames are measured from the center of the bottom bracket to the top of the seat tube. This measurement is expressed in inches (unlike road bikes which are generally expressed in centimeters).



Common frame sizes are as follows (note – sizes often change from one manufacturer to another):

Small: 13”, 14” or 15”

Medium: 16”, 17” or 18”

Large: 18”, 19” or 20”

X-Large: 21” or 22”

Making sure riders have properly sized bikes will go a long way towards their enjoyment of the sport. A properly fitted bike provides the rider adequate clearance over the top tube of the frame, and a comfortable distance from seat to handlebar. For a more detailed explanation see the Mountain Biking Skills section.

Single Speed vs. Geared Bikes

A quick glance at the drive train of a bike will tell you if it is equipped with more than one gear. Bikes with multiple gears have shifter levers on the handlebar and derailleurs that move the chain through the different gears. While much of our curriculum deals with learning to use multiple gears while riding, it is not necessary to the sport of mountain biking. It is possible to introduce individuals to off-road riding with a “single speed” bike. It is important to recognize, however, that it takes more strength to pedal a bike with one gear over varying terrain, and this might prove challenging for young riders.

Brakes

Typically kids’ bikes, especially those under 20,” come equipped with coaster brakes. These brakes work by pedaling backwards gently. While not ideal for trail riding, they can work on gentle terrain. The issue is that coaster brakes function by essentially locking the rear wheel, which can often lead to skidding. This is bad for the trail surface, as it causes ruts that lead to erosion, and potentially bad for the rider, as it’s not an effective way to stop or control speed. Coaster brakes also prevent the rider from being able to ratchet their pedals backwards, which is critical to some maneuvering. Pay special attention to what sort of terrain is available to young riders on these types of bikes.

Bikes with hand brakes leave the rider free to spin the pedals backwards because the braking action is applied to the rim of the wheels (with a V-brake) or to a disc rotor (with a disc brake). Handbrakes take slightly more education and practice on the part of the rider because it’s possible to apply too much or too little pressure to one or both of the brakes. This skill is covered in detail in the Mountain Bike Skills section of this curriculum guide.



Helmets

Any helmet used for bicycle riding, not including downhill-specific riding, BMX, or dirt jumping, is required by U.S. law to meet the the Consumer Product Safety Commission (CPSC) bike helmet standard. These helmets are typically high density foam and are designed to be light, breathable, and comfortable. However, they are also designed to sustain only one serious impact. Because a helmet can incur damage not visible to the user, if a rider has been in an accident where the helmet strikes an object it should be replaced immediately. Likewise helmets should be replaced after a period of around 5 years, as damage from general wear and tear and UV light can degrade the helmet's protective qualities.

Maine State Law requires bicycle riders aged 16 and under to wear helmets. Riders of all ages should always wear a helmet. Maintain a 100% policy in your program: 100% of participants and leaders wear a properly fitting helmet 100% of the time when riding.



IV. PARTICIPANT PREPAREDNESS

Luck is a matter of preparation meeting opportunity. ~Unknown

It is important to be aware that the material presented in this curriculum guide assumes that participants already have the basic skills needed to competently ride a bicycle. The intent of this material is to introduce the concepts of mountain biking, not to teach how to ride a bike.

This section covers some of the things to consider when discussing preparation with your participants. First, mountain biking can be a dirty activity. It is a good idea for participants to bring an extra set of clothes to change into after a ride. As discussed later in the Bicycle and Pedestrian Safety Education curriculum, when choosing garments for riding, always think “tight and bright.” Due to the aerobic nature of mountain biking, appropriate layering is an important consideration. In cool and/or breezy conditions layering lightweight protective layers such as windbreakers over breathable synthetic base layers will help keep a participant comfortable. Only closed toe shoes should be worn when mountain biking.

Sufficient hydration and energy consumption should also be discussed with participants. For programs lasting longer than 30 minutes, riders should have some type of hydration system (bladder, bottle) capable of carrying at least 20 fluid ounces. A small snack such as a granola bar can provide a good energy boost and fits easily into a pocket or pack. Encourage participants to come to each session hydrated, energized, and ready to go to allow more time for riding.

As the leader it is always smart to bring extra items such as tubes, a pump, extra snacks, and cuff retainers with you for those “just in case” moments. Leaders should also carry a first-aid kit and extra water, snacks, and clothing layers. Further information about preparation is discussed in the Safety and Liability section.



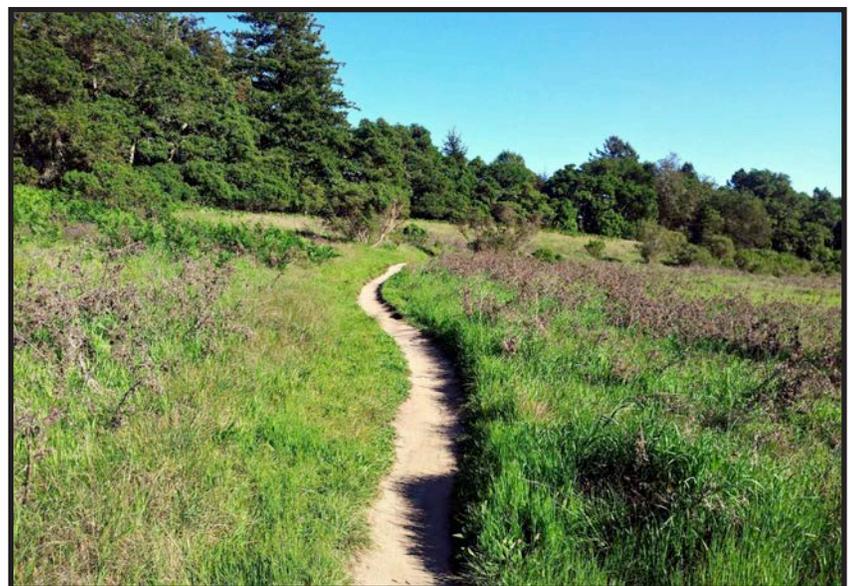
V. ENVIRONMENT & TERRAIN

*The rapid rush through the air gives me a delicious sense of strength and buoyancy,
and the exercise makes my pulse dance and my heart sing. ~Helen Keller*

Mountain biking is a great form of recreation that allows people to travel in a variety of different places. Biking in Maine provides many unique challenges for riders to consider. Conditions such as wind, rain, snow, poison ivy, and incessant blood sucking insects are just a few of the things bikers encounter when riding in Maine. Paying attention to weather reports and posted trail conditions is very helpful when planning session outings and activities. Whenever possible, take time beforehand to visit a session location to identify potential hazards and possible teaching areas. Be aware that trails and terrain can change. Just because it was okay to ride last week does not

mean it is good to ride this week.

When selecting trails and terrain to use for this course, remember that you are working with beginners. Something as simple as a dirt road winding through the woods can provide novice riders with thrills and challenge. Start small and work up to the harder terrain. Set a positive example for participants and always be mindful of trail closures and other trail users. Bikers should always yield, meaning stop and move to the side, for pedestrians and animals on trails.



VI. SAFETY & LIABILITY

As with all outdoor sports, some risk is inherent and mountain bike programs should take safety into consideration when planning and preparing. The previous two sections covered a number of safety-related topics, including environmental concerns and participant preparation. This section will discuss other areas of mountain bike safety.

Equipment Safety and Rules of the Road

OCI bike safety recommendations follow the Bicycle and Pedestrian Safety Education (BPSE) program curriculum established by the Bicycle Coalition of Maine and the Maine Department of Transportation. The BPSE curriculum is comprehensive and easy to understand, making it an ideal introduction to bike safety for riders of all ages. Because the BPSE program reaches thousands of Maine children every year through safety talks at schools, the consistency of the message helps reinforce the principles. More information can be found at bikemaine.org. Though this curriculum guide focuses on off-road biking skills, it is sometimes necessary to use roads to get to the trails and using your program as a mechanism for enhancing safe road-riding skills is an important bonus.

Have a Plan

Your detailed ride plan – where you are going and when you plan to return – should be shared with someone before hitting the trail. Carry a trail map and have a plan about where to go and what to do in the event of an emergency.

Be Prepared

At least one person in each group needs to carry supplies to fix minor problems on the trail. This kit should include a spare tube or patch kit, pump or CO2 cartridge, tire levers, and multi-tool. Know how to fix a flat and practice this all-important skill before it happens in the woods.

First Aid Training

OSI recommends that at least one leader per group have a minimum of Wilderness First Aid (WFA), as well as CPR, certification. WFA courses are two full days and cover topics important to those that may need to provide first aid care in a backcountry setting. OSI typically hosts a WFA course every spring, but many organizations and companies provide course opportunities around the state. Group leaders should carry a basic first aid kit on the trail. Know what is in your kit and how to use it.

Liability

Be sure that your organization or school has insurance that covers the activities you take part in. Many organizations will require participants to sign a specific waiver for the activity, and some will require leaders to have first-aid training. Your greatest asset in this regard is your common sense. Be vigilant about participant safety, plan ahead, and be knowledgeable about the activity and your location.

VII. FUNCTIONAL DESTINATIONS AROUND THE STATE

It is by riding a bicycle that you learn the contours of a country best, since you have to sweat up the hills and coast down them. Thus you remember them as they actually are, while in a motor car only a high hill impresses you, and you have no such accurate remembrance of the country you have driven through as you gain by riding a bicycle. ~Ernest Hemingway

There are dozens of places to ride around Maine and more trails are being built all the time, primarily by volunteers. Your local bike shop or closest advocacy group or club will be the best sources of information. The New England Mountain Bike Association (NEMBA) has links to Maine chapters and local trails. The following is a list of some riding locations in Maine, running roughly north-to-south, with dedicated mountain bike trails. It is just a sampling and by no means exhaustive. Search locally, get to know other riders, and explore!

- Fort Kent Outdoor Center, Fort Kent: 10thmtnskiclub.org
- Four Seasons Trails, Madawaska: fourseasonstrail.org
- Nordic Heritage Center, Presque Isle: nordicheritagecenter.org
- University of Maine Trail System, Orono and Old Town: umaine.edu
- Quarry Road Recreation Area, Waterville: quarryroad.org
- Bond Brook Trails, Augusta: augustatrails.org
- Camden Snow Bowl, Camden: camdensnowbowl.com
- Sugarloaf Outdoor Center, Carrabassett: sugarloaf.com/outdoorcenter
- Titcomb Mountain, Farmington: titcombmountain.com
- Sunday River, Newry: sundayriver.com
- Bradbury Mountain State Park, Pownal: bradburymountain.com
- Pineland Farms, New Gloucester: pinelandfarms.org/recreation

Other Destination Resources

Maine Trail Finder: mainetrailfinder.com

Maine Bureau of Parks and Lands: maine.gov/doc/parks

New England Mountain Bike Association (NEMBA): nemba.org

Maine NEMBA Chapters:

- Bethel Area
- Carrabassett Region
- Central Maine
- Greater Portland
- Midcoast Maine
- Penobscot Region

VIII. MOUNTAIN BIKING SKILLS

Life is like riding a bicycle - in order to keep your balance, you must keep moving. ~Albert Einstein

1. GETTING STARTED

- A. Bike and Pedestrian Safety Education
- B. Learning Parts of a Bike
- C. Bike Fit
- D. Body Position
- E. Riding Awareness & Vision

2. BRAKING & STOPPING

- A. Dismounting
- B. Dynamic Braking/Stopping

3. BALANCE & BODY POSITION

- A. Ready Position
- B. Body and Bike Separation
- C. Slow Ride Balance
- D. Low Obstacle Balance
- E. No Hands Riding

4. SHIFTING & CADENCE

- A. Front Ring/Rear Cassette Shifting
- B. Gear Selection
- C. Cadence

5. TERRAIN

- A. Uphill
- B. Downhill
- C. Transitions
- D. Cornering

6. OBSTACLES

- A. Ratcheting
- B. Pedal Stab
- C. Wheel Up
- D. Roll Over
- E. Wheelie Drop
- F. Bunny Hop

7. BIKE REPAIR & MAINTENANCE

- A. Basic Cleaning
- B. Front and Rear Wheel Removal
- C. Tire Pressure Check and Inflation
- D. Changing a Flat

8. FITNESS FOR RIDING

- A. Warm Ups
- B. Cool Down
- C. Perceived Rate of Exertion

9. TRAIL STEWARDSHIP

- A. LNT Outdoor Ethics
- B. IMBA Rules of the Trail
- C. Sustainable Trail Design
- D. Trail Stewardship & Responsible Riding

1. Getting Started

Goals / Objectives

There are a number of important safety skills to consider before getting started with riding. Establishing common language around and knowledge of equipment will allow for easier communication during the rest of the lessons. Perhaps most importantly, this is an opportunity to establish good habits around safety checks and equipment fit.

Terrain

An open, flat area, preferably with a soft tread surface such as grass.

Progression of Skills

- A. Bike and Pedestrian Safety Education
- B. Learning Parts of a Bike
- C. Bike Fit
- D. Body Position
- E. Riding Awareness & Vision

A. Bike and Pedestrian Safety Education

Purpose

OSI considers the Bicycle and Pedestrian Safety Education Program (BPSE), run jointly by the Bicycle Coalition of Maine and the Maine Department of Transportation, to be an essential curriculum for all participants learning about bicycling. The BPSE curriculum covers topics such as proper helmet fit, bike safety checks, rules of the road, and other important information. It is highly recommended that participants are introduced to the BPSE curriculum before moving on to other topics in this document. The skills and lessons outlined in this curriculum guide assume a level of knowledge through exposure to the BPSE curriculum. This skills section simply reviews the basics of BPSE bike safety content.

Mechanics

1. Wear a properly fitting helmet. Use the Eyes-Ears-Mouth test.
 - Eyes: Helmet should sit level on head, with 1-2 finger-widths between eyebrows and edge of helmet.
 - Ears: Straps should be adjusted so they make a “Y” shape around the ear, with the adjustment buckle directly below the ear.
 - Mouth: The chin strap should be adjusted so that when the rider opens their mouth the chin pulls down on the strap.
2. Dress “Bright and Tight.”
 - Wear clothing that is bright and visible.
 - Avoid loose clothing or shoelaces that can get caught in gears or pedals. Tuck in or roll up pant legs.
 - Maine State Law requires a headlight, rear reflector, and reflectors on pedals or feet when riding after dark. Go a few steps beyond and have both front and rear lights, as well as reflective clothing.
3. Do an “ABC Quick Check” on your bike before riding.
 - A = Air. Check that your tires are properly inflated.
 - B = Brakes. Check that your brakes are working.
 - C = Chain. Check that your chain isn’t rusty, is well lubed, and clear of any debris.
 - Quick = Quick Release. Check that your wheels are properly secured. If they have a quick release tab, make sure the tab is closed securely.
4. Follow the Rules of the Road.

- Ride on the right side of the road, with traffic.
- Be predictable. Ride in a straight line while on roads and never swerve or turn without first looking around you.
- Obey traffic signs and signals. Bikes must follow the same laws as cars. Always stop at stop signs and lights.
- Use hand signals to communicate. Point in the direction you will be turning. A flat palm pointed down means “stopping.”
- Yield to pedestrians.

Teaching Methodology

Pitch-Demo-Describe-Do:

- Are you excited to learn how to drive a car? Think of this as your first driving lesson!
- Explain the 4 main steps of Bike Safety.
- Describe the rules as you go, using interactive props and examples.
- Have participants practice walking around the area, using biking hand signals when they want to turn or stop.
- Have participants practice adjusting their helmets to fit properly. In groups of two they can check each other using the “Eyes-Ears-Mouth” test.

Games & Activities

Bike Rodeo

Further Practice

Bike safety is always important, but it is especially so if a program will be using parking lots or roads during a session. Reinforce these topics when preparing to encounter any situation that will involve riding near motor vehicles.

B. Parts of the Bike

Purpose

Learning the proper names of bike parts will allow for clearer communication during skills and mechanical lessons.

Mechanics

You do not need to be an expert bike mechanic to lead an introductory bike program, but it’s important to have some basic knowledge. Essential parts to know include:

- Brake levers
- Pedals
- Tire
- Seat
- Top tube
- Handle bars
- Front derailleur
- Rear derailleur
- Crank
- Hub
- Bottom Bracket

Teaching Methodology

Pitch-Demo-Describe-Do:

- Learning the parts of a bike is essential for learning to ride well and understand instructions.
- With a bike on a stand or visible to all, point and name parts of a bike
- Describe and demonstrate the function of the parts. I.e. “Watch here when I pull the brake lever.”

Active Experimentation and Discovery:

- Can anyone name a bike part? Okay, now point to it on this bike.
- Do you know what it does? Is there one of those, or two?
- Could this part look different on another bike (i.e. brake pads vs. disc brakes)?

Games & Activities

Bike Part Labeling

C. Bike Fit

Purpose

A properly fitting bike is necessary for comfort and ease of bike handling.

Mechanics

Bike fit can be as simple as two quick adjustments or as complicated as a computer-and-video-assisted professional fitting. For our purposes, we will be concentrating on three aspects of bike fit.

1. **Standover Height:** Stand over the top tube of the bike with feet flat on the ground. There should be at least a couple inches of clearance between bike and body.
2. **Seat Height:** With pedals in a 12 and 6 o'clock position, there should be just a slight bend in the knee at the 6 position. Riders should not be able to touch the ground while sitting on the seat, however, some younger or less experienced riders may wish to be able to touch the ground.
3. **Reach:** Riders reach the handlebars with a slight bend at the elbows while sitting on the seat. If handlebars are too far away or too close, consider switching to a smaller or larger bike. 1-3 fingers should be able to easily reach the brake levers.

Teaching Methodology

Pitch-Demo-Describe-Do:

- Having a properly fitted bike makes riding more fun, less scary, and helps avoid injuries.
- Demonstrate a properly fitting bike with emphasis on: Seat height (the slight bend in the extended leg); Standover height (the space between top tube and body); and Rreach (comfortably reaching handlebars)
- Demonstrate how to make adjustments, particularly the quick release on the seat.
- Have participants fit their own bikes.

Active Experimentation and Discovery:

- Have each participant try to make the personal adjustments on their bike, asking questions as needed.
- Have them try raising and lowering the seat just to feel how different it is.

Games & Activities

Bike Fit Musical Chairs

D. Body Position

Purpose

Once equipment is ready, body position is the most important fundamental mountain bike skill.

Mechanics

Neutral Position:

- Upper body is upright and arms are straight.
- Weight is distributed evenly over the hands and feet.
- Pedals are level and 1-2 fingers are covering brake levers.
- Riders are, ideally, up and out of the seat.

Ready Position:

- Body is forward, with more weight over arms.
- Elbows are bent and out. Knees are bent.
- Pedals are level and 1-2 fingers are covering brake levers.
- Riders are up and out of the seat.

Teaching Methodology

Pitch-Demo-Describe-Do

- Harder and fancier mountain bike skills all come out of these two basic body positions.
- Holding a participants' bike, have them demonstrate the two positions.
- In a small area, have participants ride loops in a neutral position. Have them try both sitting and standing.
- Repeat loop several times in a ready position.

Active Experimentation and Discovery:

Have a volunteer demonstrate holding a push-up position with straight elbows. Try to knock them over. Repeat again but this time have the volunteer hold the position with elbows bent and pointing out to the sides. Again, try to knock them over. Which position is harder to hold? How does that apply to the neutral and ready positions?



E. Riding Awareness & Vision

Purpose

Riding with an awareness of surroundings is necessary for safety and learning more difficult skills.

Mechanics

- Be alert to surroundings by constantly looking well ahead of your front tire and to either side.
- Use other senses, especially hearing, to learn more about the environment.
- Be aware of other riders and maintain a safe distance - keep at least two bike-lengths between riders.

Teaching Methodology

Pitch-Demo-Describe-Do:

- Why do we think using all of our senses, especially sight and hearing, while riding is important? Explain how it's important to remember to "Look where you want to go, not at what you want to avoid."
- Model riding with awareness by describing what is seen and where you are looking. (i.e. "I see that big rock to the left, I'm looking ahead to those roots...").
- Describe how this type of riding feels relaxed, especially in the shoulders and neck.
- Demonstrate again with a group of riders in a line, modeling keeping proper distance between the bikes.

Active Experimentation and Discovery:

- Individually practice riding while looking about 6 feet in front of your front wheel.
- Try saying out loud what you see ahead of you and to either side.
- Try doing the "wrong" thing: look intently at a small obstacle you want to avoid (i.e. a root) while also trying to navigate around it.

Further Practice

People with disabilities, including vision impairment, enjoy the sport of mountain biking. Consider sharing with participants a video or website about blind mountain bikers to demonstrate how the activity uses all senses.

Games & Activities

Over the Shoulder

Space for Leader's Notes

2. Braking and Stopping

Goals / Objectives

In this chapter participants will learn basic braking techniques to stop and effectively control speed.

Terrain

Appropriate spaces for teaching the skills in this chapter are open paved areas and/or mowed grassy area. There should be enough space to allow participants to attain moderate speeds. Open areas large enough for some type of circular course or track are good options. Examples include a no-traffic parking lot or recreation sports field. Specific terrain requirements will be included with each skill as necessary.

Progression of Skills

A. Mounting/Dismounting

B. Dynamic Braking/Stopping

A. Mounting & Dismounting

Purpose

The purpose of this lesson is to get participants comfortable with the basic movements associated with mounting/dismounting a bicycle.

Mechanics

Mounting the bike:

- Stand next to the bike (on either side), holding bike in upright position.
- Tilt bike towards body.
- Swing leg back and up over the seat.
- Finish facing forward standing over the top tube.
- Left or right pedal slightly higher than horizontal.
- Place foot on pedal, push on pedal to start moving. In the same motion, move butt onto or over the seat. This last part is called using the “Power Pedal.”

Dismounting the bike:

- Ride in the “ready position.” Pedal position is in 6 o’clock and 12 o’clock.
- Stand on 6 o’clock pedal to shift weight forward off of the seat.
- Place opposite foot on the ground.
- With both feet on the ground tilt bike over to left or right.
- Swing left or right leg behind and over seat.

Teaching Methodology

Pitch-Demo-Describe-Do:

- It’s hard to get riding if you can’t get on and off the bike successfully!
- Demonstrate mounting a bike, specifically pointing out the Power Pedal.
- Have participants practice, aiming for smooth movements.
- Repeat with dismounting.

Active Experimentation and Discovery:

- Have participants coast along in a neutral body position. Have them transition from seating to standing with a 6/12 o'clock pedal position.
- While slowly coasting in the neutral standing position, participants can try tilting the bike from side to side.
- Ask participants to try kick coasting where they stand with one foot on the 6 o'clock pedal and push off the ground with the other foot.
- Challenge participants to tap different objects/obstacles with their foot while coasting in the neutral and ready positions, except with pedals at 6/12 o'clock.
- Standing over the bike with two feet on the ground, ask participants to practice tipping the bike over and swinging their leg behind and over the seat.

Further Practice

As participants gain comfort with the dismount position and the leg swing motion, participants can practice rolling mounts/dismounts where the leg swing occurs before the bike has come to a complete stop. Discuss dismounting in an emergency (crash) situation. How would it work going over the handle bars? Not necessary to practice, but beneficial for participants to think about.

Games & Activities

Power Coast

Space Alien Invasion

Adaptations

For younger participants, it is sometimes easier to bring their leg up and over in front of the seat.

B. Dynamic Braking & Stopping

Purpose

In this lesson participants will gain familiarity with the braking system and practice braking techniques to make both gradual and rapid stops.

Supplies & Terrain

Cones or some other type of visual marker that can be used to lay out specific zones for stopping exercises. An appropriate supplement to the terrain outlined in the previous section is a short, moderately inclined dirt or grassy slope to allow participants to practice braking downhill.

Mechanics

- Left lever = front wheel brake
- Right lever = rear wheel brake
- Aim for 1-2 fingers on brake lever, but definitely no more than 3.
- Standing in ready position, press heels down.
- Smooth pull on levers, gently and evenly.
- Adjust body position back over bike to maintain equal weight on both wheels.
- Skidding should be avoided. It is not good for the tires or the trail.

Teaching Methodology

Pitch-Demo-Describe-Do:

- Tell me why it's important to know how to stop safely when biking.
- Standing next to your bike, show participants which lever goes to which brake.
- Have repeat, standing next to their bike. Try using both levers, and then just one and then the other.
- Demonstrate using brakes gently and evenly in a riding situation.
- Have participant practice braking, using both levers, while riding.

Active Experimentation and Discovery:

- Quick Stop Drill - Lay out a reference line or zone. Have participants achieve a moderate speed and ask them to stop in the zone.
- Practice using both brakes. If ability allows, ask participants to try (gently!) using the front and rear only.
- Vary the riding surface to challenge participants ability to stop without skidding (grass, loose or packed dirt, gravel).
- What method produces the quickest stop? The longest?
- How should body position change while braking?

Further Practice

Take a group ride with participants and focus on braking while riding different terrain. Set up a similar stopping zone at the base of a small hill. Participants can attempt to descend the hill and stop in the specific zone, without skidding.

Games & Activities

Slow Race on a Hill
Red Light, Green Light
Brake Challenge Course

Adaptations

Be aware that younger participants may have difficulty fully reaching the brake levers and that many younger participants may not be familiar with hand operated brakes.

Space for Leader's Notes

3. Balance and Body Position

Goals / Objectives

The first and most important thing about biking is learning how to balance on two wheels. Once that is accomplished, increased balance and body position variety allow a rider to tackle more challenging terrain.

Terrain

These skills are best learned in an open, relatively flat area. Once basic competency is acquired, more varied terrain can be introduced.

Progression of Skills

- A. Body and Bike Separation
- B. Slow Ride Balance
- C. Low Obstacle Balance
- D. No Hands Riding

A. Body & Bike Separation

Purpose

To advance to more difficult terrain and improve bike handling, a rider must be able to move their body in dynamic ways separately from the movement of their bike.

Terrain

Start with an open area with a slight hill. As participants gain comfort, transition to more technical terrain.

Mechanics

- Riders in ready position.
- Standing on the pedals, use legs and arms to shift body weight front-to-back over bike. Arm bend will become deeper with forward weight shift.
- Repeat, shifting weight side-to-side. It's more about moving and tilting the bike *under* the body, than moving the body over the bike.

Teaching Methodology

Pitch-Demo-Describe-Do:

- Learning how to separate your body from your bike will mean you can tackle more challenging hills and turns.
- Demo front-to-back body weight transfer while riding.
- Explain how pressure in feet and hands changes while doing this.
- Have participants try it themselves.
- Repeat demo and do again with side-to-side movement.

Games & Activities

Try adapting games such as Red Light, Green Light or Alien Invasion by requiring riders to maintain a certain body position.

B. Slow Ride Balance

Purpose

Balance and bike handling skills are increased when a rider can balance on two-wheels without the benefit of significant speed.

Mechanics

- Body awareness and bike/body separation are critical skills here.
- Slight shifts in body position can help riders maintain balance.
- Try shifting to a higher (harder) gear.
- Being able to stay on your bike in one place without moving is called a “trackstand.”

Teaching Methodology

Pitch-Demo-Describe-Do:

- Being able to ride slowly can help you navigate obstacles and tight turns. It’ll also help you win some of our games!
- Demonstrate riding as slowly as possible without putting your feet down. Using a harder gear helps.
- Describe the feelings of needing to react when the bike leans.
- Describe feeling pressure on your feet in the high gear.
- Have participants try riding as slowly as possible while maintaining balance.

Active Experimentation and Discovery

- Have participants try riding slowly, not trying to stay in a straight line.
- Then ask them to try it in different gears, and again while trying to maintain a straight path.
- Which gears make it easier? Is it easier to ride a straight line or more curvy?
- What does it feel like to ride really slowly?

Games & Activities

Slow Race

Circle Game

C. Low Obstacle Balance

Purpose

Increase bike-handling skills with greater balance.

Mechanics

- Some speed is needed to ride in a straight line.
- Focus on where you want the bike to go – not what you are trying to avoid.

Teaching Methodology

Review of Important Skills:

- Reminder about lessons learned while riding slowly.
- Vision / Riding Awareness

Pitch-Demo-Describe-Do:

- Being able to balance over narrow objects means you'll be able to ride over bridges without needing to get off your bike.
- Demo riding along a straight line. Emphasize vision.
- Explain how having some speed can assist with this skill.
- Have participants practice riding in a straight line with proper vision.
- Repeat with participants riding over a length of 2"x4" or 2"x6."

Active Experimentation and Discovery:

- Have a variety of lines available for riders to navigate: chalk, cones, field lines, board flat on ground, etc.
- What makes it easier to stay close to the line or on top of the board?

Games & Activities

Straight Line Ride

Board Balance

D. One-Hand and No-Hands Riding

Purpose

One hand riding is necessary for the use of hand signals. (See BPSE curriculum.) Hands-free riding tests body awareness and balancing skills. It is also a good way to experience the effects of leaning.

Terrain

Open clear area with gradual slope.

Mechanics

- Seated neutral position
- Lift one hand at a time off the handlebars.
- Lift both hands off the handlebars a couple inches so that you can quickly grab them again if you need to.
- Some speed and smooth pedaling is helpful. Using a slight downhill aids practice of this skill.

Teaching Methodology

Pitch-Demo-Describe-Do:

- Not only is one-handed riding a fun trick, it's actually an important safety skill.
- Demo riding with lifting one hand and then the other just a little bit.
- Have participants practice on their own, with lots of space between riders.

Active Experimentation and Discovery:

- Try one-handed riding for short periods of time on both a gentle uphill, flat, and gentle downhill.
- Does one type of terrain make it easier to do?
- If participants are comfortable, challenge them to try making small turns with one hand.
- Try skill while pedaling vs. coasting.

Further Practice

Participants that are comfortable with one-handed riding may want to try no-handed riding. Start small with short periods of time with both hands off the handlebars and gradually work up to longer periods of no-handed riding.

Games & Activities

Hand Signal Practice

One Hand Riding

Bike Polo

Space for Leader's Notes:

4. Shifting & Cadence

Goals / Objectives

In this section, participants will learn the dynamics of bicycle shifting. Participants will be able to comfortably shift through the range of gears on a bicycle and identify improper gear combinations. Participants will also develop an understanding of pedaling cadence and how to maintain steady pedaling with shifting while negotiating changing terrain.

Terrain

When introducing these skills, easy and open terrain such as a recreation field is ideal. This type of teaching area will allow participants to focus more on the skill being taught rather than terrain. When participants have achieved basic understanding of the skills you can begin slowly introducing more challenging terrain. This might include small sections of hills and different terrain surfaces. Varied terrain is essential to understanding the use and function of the shifting system.

Progression of Skills

A. Front & Rear Shifting

B. Cadence

A. Front & Rear Shifting

Purpose

A bike's shifting system works to control chain position on the front chain rings and rear cassette. Not every gear combination is appropriate and so participants should also learn how to avoid those that result in a cross-shifted drivetrain.

Mechanics

- The front derailleur shifter is on the left handlebar, the rear derailleur shifter is on the right.
- Rider must be pedaling forward to shift the bike.

- On the front chain rings: the bigger the ring = the harder the gear; makes big changes to power.
- On the rear cassette: the bigger the cog = the easier the gear; makes smaller changes to power.
- Avoid cross-shifting the drive train, which is when the chain is on the small ring and small cog, or the big ring and big cog.
- Make shifts incrementally one gear at a time when shifting up or down, and try to shift when tension on chain is minimal.

Teaching Methodology

Pitch-Demo-Describe-Do:

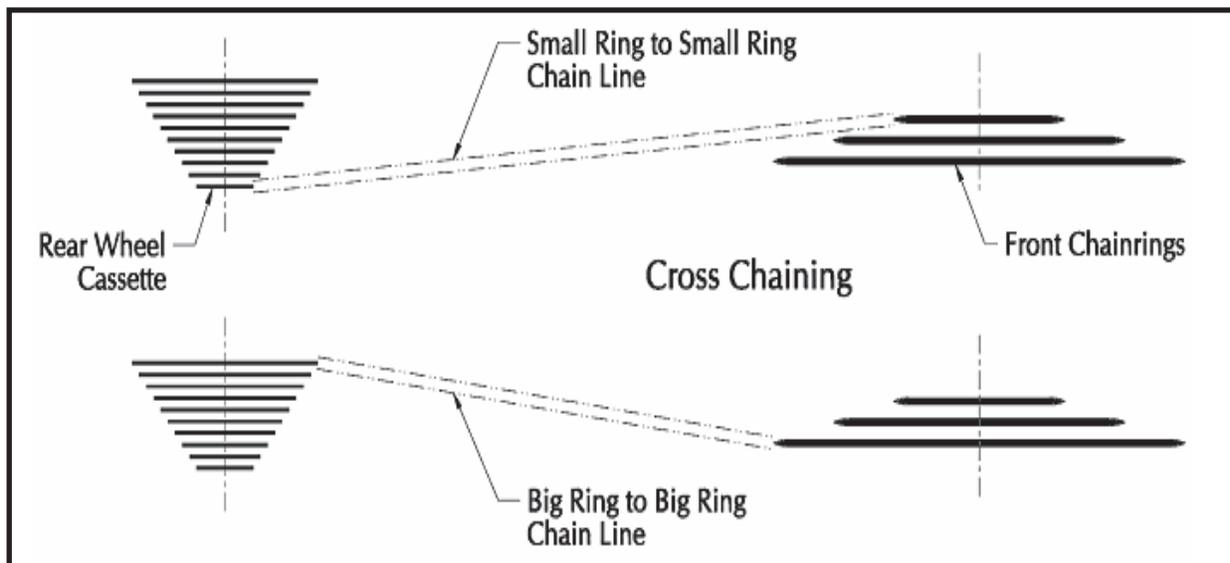
- Proper shifting makes riding a lot more fun and easier, and it saves your bike from damage caused by improper shifting.
- Use a bicycle mechanic's stand to hold a bike off the ground. Participants can watch as the bike is shifted through its gear range on the front and rear.
- Have participants try shifting the bike in the stand. They can begin to associate the motions of the shifters with the motions of the derailleur and feel how shifting effects the difficulty of pedaling.
- Avoid referring to the numbers associated with different gears, as those markings change from bike to bike. Instead, focus on participants learning what is actually happening to the chain as they shift.

Active Experimentation and Discovery:

- Lay out a circular course on a flat/nearly flat surface. Have participants ride around the course and experiment with shifting the bike. Practice shifting the front and rear derailleurs separately.
- What made the pedaling easier? What made the pedaling harder? As participants begin to develop familiarity you can call out different gear combinations for the participants to shift into.

Further Practice:

Go on a short ride with ups, downs, and different surfaces. Discuss gear selection for different terrain.



B. Cadence

Purpose

Cadence is a way to express how fast you are pedaling. Participants will learn how to apply gearing selection to maintain steady pedaling cadence.

Terrain

This skill requires more terrain variety than many of the previous skills. Any area with a mix of ups and downs will be adequate for this skill. An established trail with grade reversals would be an ideal setting. If no trails are available, an exploratory ride around a schoolyard or park would also be effective.

Mechanics

- Accomplished riders spend an immense amount of time working on their cadence and pedaling efficiency. For others, aiming for an average cadence of 70 to 90 rotations per minute is a good place to start.
- When approaching terrain changes, anticipate when to shift and do so early to maintain an ideal cadence
- Pedaling should feel smooth and steady throughout changing terrain.

Teaching Methodology

Review of Important Skills:

- Shifting

Pitch-Demo-Describe-Do:

- Pedaling is truly the most essential cycling skill.
- If possible, with the bicycle in a stand show participants what 70 rpm and 90 rpm looks like.
- Explain the definitions of cadence and rpm.
- Have participants ride a short course with different rpms on each lap. Do not worry what the exact number is, just challenge them to have a different cadence each time and to try to be consistent with that cadence for the entire loop.

Active Experimentation and Discovery:

- Lay out a circular course on a flat/nearly flat surface. Have participants select a gearing they are comfortable with. Have the participants ride around the course for 30 sec - 1 min and ask them to count the number of times they spin the pedals. Ask participants what their count is. Discuss what cadence is and why different gears effect rpm.
- Go on a short loop ride consisting of varied terrain. Ride the loop once in a very easy gear. Ride the loop again in a very hard gear. How does the cadence change? What was easy or difficult? Ride the loop a third time and challenge participants to use the shifting to maintain a consistent cadence. Emphasize shifting early when going uphill.
- Are bike speed and pedaling cadence related?

Further Practice

Becoming proficient with maintaining cadence is an ongoing task. Elite riders are constantly working on it and using sophisticated technology to assess their pedaling efficiency. Remind participants throughout a program to try to keep a steady pedaling cadence when riding, and encourage understanding of what cadence means. If appropriate for your group, ask a science or physics teacher to give a presentation on gear ratios.

5. Terrain

Goals / Objectives

This section covers skills necessary for riders to negotiate basic trails. At its core, this section is all about introducing participants to the thrill of trail riding.

Terrain

Easy rolling up and down terrain, beginning with more open space and progressively moving on to narrower trails.

Skills Progression

- A. Trail Vision
- B. Climbing
- C. Descending
- D. Transitions
- E. Cornering

A. Trail Vision

Purpose

Develop the participant's ability to look ahead and identify obstacles in terrain as they approach.

Mechanics

- The bike wants to travel where you are looking.
- Do not look at the trail directly in front of the tire. Instead, try to look ahead about 10 ft down the trail.
- Look at where you want to go. If you are staring at the big rock you don't want to hit, you're more likely to hit it.

Teaching Methodology

Review of Important Skills:

- Riding Awareness & Vision
- "Ready position"
- Braking

Active Experimentation & Discovery:

Lead participants on a short trail ride. Afterwards, ask them what they noticed in their surroundings while they were riding. Do the same loop again and this time give the participants an objective: "Look at the furthest point down the trail you can see." Ask them to compare experiences.

Further Practice

Using sidewalk chalk and cones set up a short course. Draw a series of letters, numbers or symbols on the ground. As the riders progress through the course ask them to shout out the letter / number as far ahead of them as they can see.

B. Climbing

Purpose

Introduce riders to riding uphill by learning to keep the rear wheel weighted for greater traction in both a seated and standing position.

Terrain

Areas with uphill and trails of varying steepness and technical difficulty.

Mechanics

- Look ahead and spot the best route up the climb.
- Anticipate the climb and shift into the appropriate gear before beginning the climb.
- Seated climbing conserves energy and requires a slightly easier gear. Better for long climbs.
- Standing climbing is more powerful and can be done in a harder gear, but is hard to sustain for long periods.
- Weight the rear wheel by sitting and keeping body low, or standing and keeping weight back. Try to find a “happy place” where the rear wheel won’t skid and the front wheel won’t lift off the ground.

Teaching Methodology

Review of Important Skills:

- Trail Vision
- Cadence
- Shifting

Pitch-Demo-Describe-Do:

- Remember, in outdoor sports sometimes, “It doesn’t have to be fun to be fun.” Climbing is hard work but it makes us stronger and it then allows us the fun of going downhill!
- Demo the seated climbing stance on a short uphill.
- Have participants try.
- Repeat again with the standing climbing stance.
- Discuss appropriate gear selection and the benefits/disadvantages of sitting vs. standing.

Active Experimentation & Discovery:

- At the foot of an uphill, ask participants to spot the route, or “line,” up the climb. Have them try riding that line, and then repeat the same hill again using a different line. Did one feel better than the other?
- Practice riding up a hill in different gears and ask participants to try shifting at different times.

Further Practice

Find a loop of trail with varying climbs that participants can ride several laps of, practicing different techniques for hill climbing.

Games & Activities

Mark the spot
Hill climb

Adaptations

Younger riders will need easier inclines to practice on, while older riders with more developed leg muscles can practice on steeper, more technical grades.

C. Descending

Purpose

Introduce participants to riding downhill confidently by learning to shift weight back and stay relaxed.

Terrain

Downhill terrain and trails of varying steepness and technical difficulty.

Mechanics

- Keep eyes on the “line,” or the route you want to take, and look well ahead of front tire.
- Stay loose and relaxed in a standing ready position.
- Shift weight back behind seat, with arms stretched out.
- Adjust weight shift as needed, depending on steepness of the descent.

Teaching Methodology

Review of Important Skills:

- Bike/Body Separation
- Braking
- Ready Position



Pitch-Demo-Describe-Do:

- Gaining confidence with descending means you can ride with more fun and less fear.
- Have a participant be your assistant to demonstrate descending technique:
- Place their rear wheel up on a solid object (like a bench), and have them mount the bike while you block their front tire and hold their front brake lever.
- Ask the participant to get into a ready position and try to find a body position that allows them to balance easily. How far back is their body?
- If desired, repeat this activity with all participants.
- Practice descending a hill moving into the correct body position, using brakes to control speed.

Further Practice

Ask participants to experiment with degrees of “back weighting” while riding different downhill grades. How does the steepness of the hill relate to how far back you position your body? As participants gain comfort, have them practice braking less during simple descents.

Games & Activities

Slow race

Adaptations

Smaller riders may have a harder time getting all the way behind their seat. Take this into account when choosing the steepness of the terrain. On longer descents, the seat can be lowered to make back weighting easier.

D. Transitions

Purpose

Mountain bike trails consist of constant terrain changes – ups, downs, twists and turns. This skill focuses on learning to dynamically move from ascending to descending and back again smoothly and confidently.

Terrain

For this skill you need rolling terrain with consecutive ups and downs. A simple and common example of a transition is a wheelchair access point on a sidewalk.

Mechanics

- Look ahead to prepare for the next up or down.
- Ready position, standing on pedals.
- Use legs to move weight forward and backward on the bike as needed to absorb the terrain change.

Teaching Methodology

Review of Important Skills:

- Bike/Body Separation
- Climbing
- Descending
- Shifting Gears

Pitch-Demo-Describe-Do:

- Learning to be more efficient with transitions makes you a more capable, faster rider, but it's also a lot of fun. Who has ever seen or heard of a “pump track?”
- Demonstrate riding a short section of trail while moving body weight during the terrain changes.
- Ask participants to remember and explain what the uphill and downhill body positions are.
- Have participants try the same section of trail.

Active Experimentation & Discovery:

If you have access to a pump track give participants plenty of time to play on the bumps and jumps. Encourage them to try it standing, sitting, and in different gears.

Adaptations

If riders are not comfortable on the selected terrain, they can first practice these skills by riding flat terrain and practicing moving their weight forward and back.

E. Cornering

Purpose

Cornering effectively and safely makes riding much more fun. It is also a very important factor in being good trail stewards; poor cornering leads to skidding and trail damage.

Mechanics

Set-up before the turn:

- Keep pedals level, with inside pedal back. (Some riders prefer to drop the outside pedal and lift the inside pedal.) Cease braking if possible.
- Bikes can turn and bikes can brake, but they can't effectively do both at the same time. Braking and turning at the same time almost always results in skidding, which is hard on the trail and can cause the rider to lose control.

Choosing a line:

- Generally, enter a turn at the outside (red in diagram) and go back towards the center upon exiting the turn.
- Try to ride the outside until the mid-point of the apex.
- Look through the turn, not down at the front wheel.

Leaning:

- Here is where bike/body separation really becomes important. When leaning through a turn, the bike is what leans while the rider remains as upright as possible.

Teaching Methodology

Review of Important Skills:

- Bike & body separation

Pitch-Demo-Describe-Do:

- Remember how we learned and practiced bike/body separation? Let's put it into use while riding trails!
- Explain there are three main components of cornering: set-up, line choice, and lean.
- Demo set-up position and have participants practice.
- Demo lean and have participants practice.
- Explain line choice - perhaps drawing in the dirt to illustrate your point.
- Have participants practice on the same corner multiple times.

Active Experimentation and Discovery:

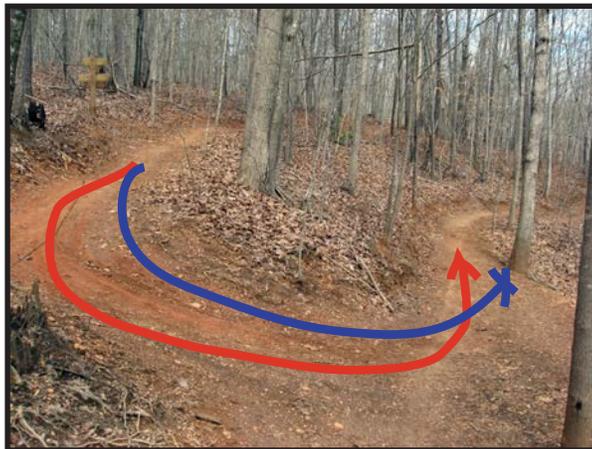
Have participants try riding the same corner but using different lines. What is faster? Easier? Harder to control? If possible, ride a trail with a bermed corner.

Games & Activities

Slalom with Cones

Watch a Pro

Physics Lesson



6. Obstacles

Goals / Objectives

Introduce participants to concepts that will allow them to move from riding on fairly smooth trail tread to terrain with obstacles of varying height and shape. This will also help increase overall comfort, balance, and “feel” on the bike.

Terrain

An open space, with a soft tread surface, such as a manicured lawn or sports field is ideal when learning these skills. Aim to create a progression of obstacles ranging from only a few inches in height to a maximum of 12” in height. These obstacles should be well secured on the ground and provide adequate clearance around the perimeter. Consider the distance someone may fall - this space should be clear for participants.

Pieces of natural or milled wood can create ideal obstacles. The smallest obstacle should be easily negotiable by anyone comfortable riding forward on a bike (i.e. a piece of plywood lying flat on the ground). As obstacles become larger, consider objects that would mimic natural features found on a trail (i.e. a small downed tree or log roughly 12” in diameter – something too large to simply pedal over).



As skill progressions build, consider finding easily negotiable stretches of singletrack with similar obstacles on which participants can practice. Obstacles should have alternate routes around them. The key is to use terrain that provides challenge, but only through measured progression. Participants should have the opportunity to both push themselves to the next step, or work on something easier until they’ve gained confidence.

Skills Progression

- A. Ratcheting
- B. Pedal Stab
- C. Wheel Up
- D. Roll Over
- E. Wheelie Drop
- F. Bunny Hop

A. Ratcheting

Purpose

This skill allows riders to pedal over obstacles when ground clearance doesn't allow for a complete revolution of the pedals. It is not only useful for expanding our ability to maintain momentum in a variety of situations, but also sets the groundwork for other skills that involve generating power with short, quick pedal motions.

Mechanics

- Ready position standing on pedals
- Relaxed grip on handlebar
- Vision focused forward
- Pedal starts at 12 o'clock, then moves forward to 3 o'clock, then reverses back up to 12.
- Repeat motion keeping pedal stroke from rotating below the 3 o'clock forward position.
- Use a gear with enough resistance to achieve relatively quick movements.

Teaching Methodology

Review of Important Skills:

- Ready Position
- Trail Vision
- Balance

Pitch-Demo-Describe-Do:

- Has anyone heard of ratcheting before?
- Slowly demo the pedal positions.
- Start with "power foot" at top of stroke, finish with foot forward, then reverse, and repeat.
- Have participants practice.
- Who can think of when this might come in handy?



Active Experimentation & Discovery:

- One of the best ways to "discover" this skill is by playing the Circle Game and/or doing a Slow Race.
- Challenge participants to try pedaling forward, on flat easy terrain, with one foot.
- Try ratcheting on both sides.
- If skill levels allow, use a small obstacle that makes pedaling with a full rotation impossible and ask students to try pedaling (not coasting) over it.

Further Practice

Have participants start in a gear that allows for a comfortable amount of resistance and practice moving forward ratcheting first on the drive side, then the opposite. Next try using a gear with significant resistance and practice ratcheting at a very slow pace. Finally, try ratcheting in a gear with very little resistance to compare the ease and / or difficulty. Create obstacles that require ratcheting to ride over or through.

Games & Activities

Slow Race

Follow the Leader

2 strokes back / 1 stroke forward

“No Coasting” game, pedals always have to be moving either in full rotation or ratchet.

Adaptations

Consider that younger riders might have an easier time doing this from a standing position, whereas older riders will often have more leg power available to generate short pedal strokes from a seated position. Also note: this skill can not be practiced on bikes with coaster brakes!

B. Pedal Stab

Purpose

The actual technique of pedal stabbing is identical to ratcheting, without the repetition. Learning to generate power through one short, quick partial pedal revolution is the foundation of learning to climb over and descend off of more complicated obstacles.

Mechanics

- Start from a seated position, weight over the pedals.
- Relaxed grip on handlebar and vision focused forward.
- Pedal starts at 1 o'clock, then moves forward to 3 o'clock, this time without the emphasis on reversing the pedal back to the 1 o'clock position.

Teaching Methodology

Review of Important Skills:

Ratcheting

Pitch-Demo-Describe-Do:

- Has anyone ever encountered an obstacle that seemed too big to ride over? This skill can help you ride over some of those.
- Demonstrate pedal movements.
- Explain what the pedals did and how it will help navigate larger obstacles.
- Have participants practice

Active Experimentation & Discovery:

- Ask participants to try doing one “stab” slowly, having them change the gear they are in if needed so that they feel tension through the whole motion.
- How might this be a useful technique? What happens to the bike as we do this?

Further Practice

Have participants start in a higher gear (that provides significant resistance) and practice moving forward trying a pedal stab on each side, doing complete revolution between each stroke. When do they begin to feel tension in the stroke and when do they lose tension?

Next try pedal stabbing in an lower (easier) gear to compare the ease and/or difficulty. Next try using a gear with what the rider perceives as a comfortable amount of resistance and practice. Try from a seated and standing position

C. Wheel Ups

Purpose

This takes the skill of pedal stabbing and adds a lifting of the front wheel. This allows the rider to begin clearing obstacles with the front tire that otherwise may impede forward momentum.

Mechanics

- Ready position, standing with level pedals.
- Relaxed grip on the handlebar and vision focused forward, over obstacle at where you want to end up.
- Bend elbows and lean upper body over handlebars to compress, or “load” the front shock.
- In a smooth motion, explode up with the upper body and straighten arms.
- Continuing that motion, bend the elbows and pull the handlebars towards your chest.
- When wheel lands, follow through with ratcheting or regular pedal revolutions.

Teaching Methodology

Pitch-Demo-Describe-Do:

- This is one of the first steps towards learning to “catch air” when mountain biking!
- Standing next to your bike and holding the handlebars, slowly go through the motions of “Load-Explode-Pull.”
- Have participants try it themselves, standing next to their bikes.
- Repeat demonstration while riding slowly, and have participants try.

Active Experimentation & Discovery:

Have an array of low-to-the-ground obstacles (pieces of flat wood, tennis balls cut in half, painted or chalk lines) for participants to try to wheel up onto and then ride over.

Further Practice

Progressing to an obstacle higher off the ground, roughly 4” to 6,” have participants try using a wheel up to practice lifting front wheel onto object and then step off the bike. This skill focuses the rider on good wheel up initiation. As participants gain comfort, ask them to try ratcheting or pedaling to continue riding over the obstacle. What happens when they try to do a pedal stab with a wheel up?

Find natural obstacles on a trail (i.e. rocks and roots) where riders can practice lifting their front wheel over while riding. For those not feeling sure about the technique, continue practicing wheel ups over flat objects just to work on timing.

Games & Activities

Wheel Up Tag

Wheelie Contest

D. Roll Over

Purpose

This skill involves using body weight and position to bring the bike over an object that you may or may not be able to pedal over. This technique is useful for negotiating a wide variety of uneven terrain using momentum to the rider's advantage. It also builds a rider's timing and ability to read lines on the trail.

Mechanics

- Ready position, standing with flat pedals.
- Vision focused forward and relaxed grip on the handlebar.
- Wheel up to initiate roll over.
- As bottom bracket crosses obstacle, use hips and legs to drive the bike forward without pedaling.

Teaching Methodology

Review of Important Skills:

- Ready Position
- Vision
- Wheel Ups

Pitch-Demo-Describe-Do:

- This is another skill in your “tool box” for navigating obstacles while riding.
- Demonstrate a roll over for your participants.
- Describe the two main body position changes.
- Have participants practice, with a variety of different sizes obstacles for them to choose from.

Active Experimentation & Discovery:

Challenge participants to try riding over small obstacles without pedaling. Then challenge participants to try riding over larger obstacles using only a pedal stab and wheel up. What made this possible? What position did you find your pedals in?

Further Practice

Consider starting by having riders practice doing a wheel up over a line drawn on the ground, then using body weight to “push” the rear wheel past the line. Next use small objects that do not impeded rider momentum.

Work up to objects (preferably rounded, like a log) that are just high enough that the chain rings on the front of the students' bikes don't hit. This will be different for different bikes, so having multiple options is important. As participants gain confidence, challenge them to approach with different speeds – very slow, a little faster, faster still. Find opportunities on the trail to practice this skill.

Games & Activities

Follow the Leader

E. Wheelie Drop

Purpose

The wheelie drop essentially takes previously learned skills and applies them in a new context. It is sometimes advantageous for a rider to come off a piece of terrain or obstacle with the front wheel up so it lands after or roughly at the same time as the rear wheel (as opposed to rolling off and landing first). This gives the rider greater control, and allows them to more quickly be able to negotiate what lies ahead.

Mechanics

- Vision focused forward and relaxed grip on the handlebar.
- As the front wheel approaches the ledge or “drop,” do a pedal stab and wheel up.
- Weight will need to be slightly back to ensure the rear wheel lands first.

Teaching Methodology

Review of Important Skills:

- Pedal Stabs
- Wheel Ups

Pitch-Demo-Describe-Do:

- Another tool for our tool kit!
- Demo a wheelie drop off of a small lip.
- Describe how it uses previously learned skills: pedal stab and wheel up.
- Have participants try.

Active Experimentation & Discovery:

Challenge participants to try doing a “wheelie” off a very small drop of no more than 6”, such as a sidewalk. Now see if they can wheelie off the drop but have both wheels land together. When might each be useful?

Further Practice

As with other skills, progression is key. The lead-in to an introductory drop should be long, providing riders plenty of time to work out their timing approaching the small “lip.” As riders build confidence, move to changes in height that are more challenging but can still be rolled. Ask participants to try rolling the drops before wheelie dropping – this way they see that it’s possible. On the trail, find grade reversals and small ledges to practice on.

F. Bunny Hop

Purpose

This skill involves bringing both wheels off the ground at the same time to clear an obstacle. Learning to control the bike off the ground is useful in riding more advanced terrain, though it requires greater comfort on the part of the rider and greater body awareness.

Mechanics

- Ready position with level pedals.

- Firm contact with both feet on the pedals.
- Front foot and pedal should be tilted slightly back, rear foot and pedal should be tilted slightly down.
- Pushing against the pedals and using a backwards “scuffing” motion of the feet, pull legs into lower stomach, while pulling handlebar towards chest.
- Easier with forward momentum, though possible from a static position.

Teaching Methodology

Pitch-Demo-Describe-Do:

- This is a classic bike skill. Who has tried one before?
- Demonstrate a bunny hop.
- Explain where rider will feel pressure on pedals.
- Have participants try.

Active Experimentation & Discovery:

On flat open terrain (preferably on lawn or other soft, forgiving tread surface), challenge participants to try and pick only the rear wheel up off the ground using the “scuffing” foot motion. Now see if they can alternate picking up the rear wheel and then the front wheel. Can they pick both wheels up off the ground together? When might this skill be useful?

Further Practice

Putting the entire maneuver together will be easier with a little bit of momentum to start. Practice building some speed and then bunny hopping. Draw a line on the ground and have riders try hopping over it. Try hopping over three-dimensional obstacles such as small sticks and planks. For those very comfortable with the skill, try bunny hopping sideways.

Space for Leader’s Notes:

7. Bike Maintenance & Repair

Goals / Objectives

This skill section will go over basic maintenance practices to help keep a bicycle functioning properly. Participants will also learn skills to perform basic on-trail repairs.

Terrain

Most of the skills in this chapter do not require outdoor riding space. The skills can be taught in a more formal classroom environment or they can also be integrated into other skill lessons.

Progression of Skills

- A. Basic Cleaning
- B. Front and Rear Wheel Removal
- C. Tire Pressure Check and Inflation
- D. Changing a Flat

A. Basic Cleaning

Purpose

In this lesson participants will learn how to perform a basic bicycle wipe-down and the importance of keeping a bicycle clean. Participants will gain familiarity with different parts of the bicycle and basic cleaning tools.

Supplies

- Cloth rags
- Large stiff-bristled brushes
- Medium sized brushes

Mechanics

- Cleaning a bicycle should ideally be done after every ride.
- Start big and work small. Begin with big parts such as the frame and wheels. Methodically work to smaller components.
- Develop a system/order that can be easily remembered and followed consistently.
- Exercise caution around moving parts such as headsets, bottom brackets, fork stanchions, and wheel hubs. Avoid forcing dirt/grime/moisture into those areas with high pressure air or water.
- If limited time is available for cleaning, the derailleurs, brakes, and chain should be priority because they are heavily used.
- Use large stiff-bristle brush first to remove dried mud and dirt from tires, rims, frame and fork.
- Use smaller brushes next to clean in and around shifting system (chain, chain rings, cassette, front and rear derailleur). Specialty tools are available that fit in between the cassette cogs.
- Use rags and/or fine bristled brushes to clean around the cockpit area (brake levers, shifters, handlebars, headset).

Teaching Methodology

Review of Important Skills:

- ABC quick check. Cleaning the bike is a great way to do a more in depth check of the various parts of the bike.
- Parts of the bike.

Pitch-Demo-Describe-Do:

- A clean bike is a happy bike.
- Cleaning the bicycle regularly helps keep all of the systems (brakes, shifting, pedaling, steering, suspension) functioning properly and prevents these systems from wearing out prematurely.
- Show participants the different tools (rags, brushes, cog cleaner) that are used for cleaning and when they are used.
- Show participants the various parts of the bike that should be cleaned after riding and how to clean them.
- Have participants clean their own bikes.

Active Experimentation and Discovery:

With a dirty bike in hand, ask participants if the bike is okay to put away until the next ride. Why or why not? Why would you want to clean the bike before putting it away?

Further Practice

Bike cleaning can be paired with learning/reviewing the different parts of the bike.

Games & Activities

Pit Stop

Structured Cleaning

Adaptations

With younger participants focus on cleaning the large parts: wheels, tires, and frame.

B. Tire Pressure & Inflation

Purpose

In this lesson participants will learn how to use a pump to inflate flat or low pressure tires. Participants will also develop an understanding of how tire pressure affects riding different terrain.

Terrain

A paved area is an excellent spot to illustrate the effects that tire pressure can have riding.

Mechanics

- Identify manufacturer's recommended inflation pressure on tire sidewall. Do not exceed recommended pressures.
- Identify valve type. There are two different styles of inflation valves: Presta and Schrader. Presta valves have an exposed core and look "pointy," Schrader valves have a recessed core and look "stubby." Modern pumps have attachments that can accommodate both styles.
- Secure pump head to the valve by pressing head down firmly onto valve.
- Lock head in place by flipping lock lever up and away from the valve. (Note: this mechanism varies from one pump to another.)

Teaching Methodology

Review of Important Skills:

- Bike cleaning: Bikes are much easier to work on when they are clean.

Pitch-Demo-Describe-Do:

- Riding on underinflated tires feels slow and sluggish, like riding through sand, due to increased rolling resistance. In addition, if the pressure is too low there is an increased risk of a pinch flat.
- On the other end of the spectrum, riding on overinflated tires feels easy to pedal due to decreased rolling resistance, but provides a less secure and rough, jarring ride over bumps.
- When determining tire pressure consider the rider's weight and terrain. Lower pressures are well suited to soft terrain like sand or mud because the tire will compress and have a larger footprint. Higher pressures work well for packed trail conditions or roads.
- Have participants locate tire pressure recommendations on their bike.
- Demonstrate different types of valve stems among the group's equipment.
- Demonstrate how to use the pump and read the pressure gauge.
- In groups of two, have participants deflate their front tire somewhat and then practice reinflating to the correct pressure.

Active Experimentation and Discovery

- Have participants inflate the tires to the minimum recommended pressure. Ask them to ride around on a paved surface. Do the same thing with the tires at the highest recommended pressure. Was there a difference?
- Lay out some small obstacles such as sticks or lumber to ride over with the tires at different pressures.

C. Front & Rear Wheel Removal and Installation

Purpose

In this lesson participants will learn how to remove and install the front and rear wheel of a bike that has quick release axles.

Mechanics

Front Wheel Removal:

- Identify brake type: disc or v brake.
- For disc brakes, do not squeeze brake lever when wheel is removed.
- If v-brake style, demonstrate how to disconnect noodle by squeezing brake arms together and disengaging noodle end from the metal connector.
- Locate quick release lever and flip to "open" position. Some resistance should be felt when opening the lever.
- Loosen the skewer on the non-lever side only. Loosen until wheel can be removed.

Rear Wheel Removal:

- Before starting the rear wheel removal process shift the rear derailleur to the smallest cog.
- Follow steps listed for front wheel removal.
- Exercise caution when removing the wheel. Avoid damaging the chain or derailleur by not pulling against tension.

Front Wheel Installation:

- Set the wheel evenly into fork dropouts. If disc brakes are present, use caution when sliding the disc into the caliper.
- With quick release lever in “closed” position, tighten non-lever side of skewer.
- When non-lever side is tight, open the quick release lever and tighten the non-lever side 1-2 more turns
- Flip the quick release lever to the “closed” position. The lever should sit parallel and flush next to the fork.
- There should be some resistance to push through in order to close the lever.
- If v-brakes, squeeze the brake arms together and connect the noodle to the metal connector.

Rear Wheel Installation:

- Set the wheel evenly into the fork dropouts. Place the chain on the smallest cog of the rear cassette. Make sure the cassette is in front of the rear derailleur. If disc brakes are present, use caution when sliding the disc into the caliper.
- Follow steps listed for front wheel installation.
- If v-brakes, squeeze the brake arms together and connect the noodle to the metal connector.

Teaching Methodology

Review of Important Skills:

- Parts of a bike
- ABC Quick Check

Pitch-Demo-Describe-Do:

- Know how to remove and put back on your wheel is essential to fixing a flat. And we all want to know that skills, so we don't get stuck out on the trail with a busted bike!
- Show participants the process of removing the front and rear wheels.
- Show how the quick release lever works. With v-brakes, releasing the noodle can sometimes be difficult for one person. Demonstrate how to use a buddy to help squeeze the brake arms together.
- Ask participants to try removing their front wheel, then replacing it. Remember that quick release levers should take a bit of strength to open and close, and they should be close to the frame/fork so they don't get caught and accidentally open.

Active Experimentation and Discovery:

- Ask participants in small groups to generate a step-by-step list for the process of removing a front wheel.

Further Practice

Divide participants into groups of two and have them practice removing and installing the front and rear wheel. Try doing a guided process the first time and then give participants a chance to try it without direct guidance.

Adaptations

The process of removing and installing a wheel is a very complex task that may be difficult for young participants to understand and perform. With younger participants, refine the scope of the lesson to focus only on one or two simple points such as the identification and operation of the quick release skewers.

D. Changing a Flat

Purpose

In this lesson participants will learn how to change a flat tube.

Mechanics

- Use tire levers to remove the tire from the rim: Work first lever under tire bead and fix opposite end to a spoke. Insert the other lever under the tire bead and slowly work it around the rim until one side of the tire is completely off the rim. Go slowly and don't force it.
- Remove the old tube. Some tubes have a threaded stem with nut that must be removed before the tube can be taken out.
- Remove the tire completely from the rim by pulling the bead over and off the rim.
- Do a visual check on the inside of the tire for foreign objects (i.e. thorns, nails) that may have caused the flat to occur.
- Do a visual check on the rim for any sharp edges or protrusions.
- Slightly inflate the new tube so that it has some form.
- Put one bead of the tire onto the rim. Be aware that many tires are designed to roll in a specific direction, usually displayed on the sidewall of the tire. This is more important when installing a rear tire as the rim has a fixed position.
- Insert valve stem into rim hole and gently push tube up into tire and onto rim.
- Slowly begin working the other tire bead onto the rim. Take care not to pinch the tube between the rim and tire. Tire levers may be needed to get the last bit of tire onto the rim.
- Once the tire is on the rim, squeeze once around the tire to make sure the tube is evenly distributed inside the tire.
- Inflate the tire partially and check to be sure the tube is not pinched between the tire and rim.
- Finally, inflate the tire to desired pressure

Teaching Methodology

Review of Important Skills:

- Wheel removal and installation

Pitch-Demo-Describe-Do:

- This skill is incredibly empowering. Once you can confidently change a flat, you feel like you can go off riding and not worry as much about possible mechanical issues.
- Demonstrate each step of the process, pausing after each step to allow participants to do the same to their own bike.
- For simplicity, start by practicing on front wheels.
- Once the "flats" have been "fixed," be sure to walk participants through checking their work to make sure it is satisfactory. (Remember that an improperly inserted tube can result in a pinch flat.)

Active Experimentation and Discovery:

- As a group, have participants generate a list of steps required to perform the task. What tools and supplies are required? How do flats occur? What can we do to prevent flats?

Further Practice

Ask participants how this skill would be different on the trail vs. in a warm/dry/not buggy classroom.

8. Fitness for Riding

Goals / Objectives

Gaining overall fitness is just one of the many benefits of taking part in mountain biking. Learning about different parts of a workout (the warm-up, cool-down, etc) can increase fitness gains and help prevent injuries.

Terrain

This material can be covered suitably in an indoor or outdoor setting.

Progression of Skills

- A. Warm-ups
- B. Cool-downs
- C. Understanding Intensity Levels

A. Warm-Ups

Purpose

Warming up before exercising is an important way to increase performance capabilities and reduce the risk of injuries.

Mechanics

- Warming up involves progressively becoming more active until the heart rate is slightly elevated, blood flow to extremities is increased, and muscles feel warm.
- Warming up becomes more important when the exertion level of the workout increases and/or the weather is colder. For example, a warm-up prior to a mountain bike race in November will look much different than a warm-up for an easy ride to the post office.
- In general, warm-ups should be a minimum of 10 minutes in length and should involve all the major muscle groups (legs, arms, and trunk). Exertion levels should rise to a place where conversation becomes short 2-3 word phrases.
- Warm-ups should involve motion and activity. Static stretches (holds) should not be used here.

Teaching Methodology

Pitch-Demo-Describe-Do:

- Warming up is important to help riders avoid injury and it's often an opportunity to play some fun games.
- Explain to participants that over the next 10 minutes they should feel their muscles warm up and their breathing and heart rates increase slightly.
- Do two rounds of a Slow Race.
- Play Alien Invasion for 5 minutes.
- Ask participants to ride a small, known loop for 5 minutes practicing bike/body separation and standing to pedal.

Active Experimentation and Discovery:

Challenge your group to come up with their own 10 minute warm-up routine that meets the requirements of using the whole body and getting the heart rate up.

Games & Activities

Almost all of them! Any activity or game that is slightly to moderately vigorous would be good for a warm-up.

B. Cool Downs

Purpose

Cooling down is, like warming up, important for injury prevention. Learning to appreciate both of these skills can assist participants in establishing good life-long habits of an active lifestyle.

Mechanics

- Cool downs should take a minimum of 10 minutes. They should be long enough to bring the heart rate down to a low level and should stay there for a little while. Cool downs are a great time for participants to be at an activity level where it is easy to chat and goof off.
- Start a cool down by decreasing the intensity of the activity through a change of terrain, a different game, or an entirely different activity.
- Finish a cool down with static stretching, where stretches are held for a length of time (often at least 30 seconds). Static stretches are best done at the end of a workout because they actually decrease muscle power but are important for recovery.

Teaching Methodology

Pitch-Demo-Describe-Do:

- Cool downs are important for injury prevention, promoting muscle recovery, and they help bring the group together for some end-of-session fun. This is an example of a cool down and it's called the "55-5."
- Explain to participants that they over the next 10 minutes they should feel their breathing and heart rates decrease and their bodies "settling down."
- As a group, do 10 minutes of easy riding on a simple, short loop with flat terrain. After 3 minutes of very easy pedaling, include 5 minutes where participants pedaling as fast as possible for 5 seconds and follow that with 55 seconds of riding easy. Participants should be in a high enough gear so that they aren't out of control with their cadence.
- Finish with 8-10 minutes of static stretching. (See below.)



9 Classic Static Stretches: (Hold for at least 30 seconds for each stretch, each side. Remember to breathe.)

- Tricep Stretch – Straight arm across chest, other arm gently pulls it in towards chest.
- Overhead Stretch – Bend arm and place behind head, other hand gently pulls down on bent elbow.
- Quad Stretch – Standing on one leg, other leg is bent and hand gently pulls ankle towards back. Keep knees

close together.

- Achilles Stretch – Hands on ground, legs out straight behind with body in upside-down “V” shape, slowly drop one heel towards the ground and hold.
- Front Lunge – Front leg bent, back leg straight, gently press hip of straight leg forward.
- Side Stretch – Sitting with legs apart, lean upper body towards one leg, reaching for foot with hands.
- Figure Four – Lying on back, bend knee and cross ankle over other thigh. Gently pull that thigh towards chest.
- Butterfly – Sitting with legs bent and soles of feet together, hold ankles and gently lean forward. Try to keep back straight.
- Toe Touch – Standing, stretch high up to the sky and then down to touch toes. Keep a slight bend in the knees.

Active Experimentation and Discovery:

Challenge participants to create their own group cool down routine. Be sure to include activities that become progressively less intense and a series of static stretches.

Games & Activities

Many games are great for use in cool downs. Get creative!

Adaptations

Even if time is tight, try to keep cool downs as part of your program’s riding routine. This is an important life-long habit we have the power to help participants establish.

C. Understanding Intensity Levels

Purpose

Having an understanding of the different intensity levels can help increase knowledge of exercise fundamentals, and basic physiology. This can be used as a segueway into learning about heart rates, lactic acid measurements, and VO₂ Max testing for older participants or those that are interested.

Mechanics

Monitoring heart rate is the simplest way to measure the intensity of exercise. This can be done by hand or by using a heart rate monitor.

- Measuring by hand involves taking a pulse for 10-20 seconds and then multiplying by the appropriate number to get beats per minute (BPM).
- A heart rate monitor usually consists of a strap that connects across the chest and a wristwatch that reads heart rate in beats-per-minute. Heart rate monitors are quite affordable for simple models or can be very fancy with lots of extra features.
- Another way to measure intensity is by using a rate of perceived exertion scale. The Training Levels chart below has both a percentage of maximum heart rate range and perceived exertion indicators.

Heart Rate Training Levels

Heart rate (HR) is measured in beats per minute (BPM). A simple way to estimate maximum heart rate is 220 minus age.

Level 1 – 55-72% of max HR. Easy to hold conversation. Feels light. This level trains aerobic base.

Level 2 – 70-82% of max HR. Breathing noticeable when talking. Feels slightly harder but is not painful. This level trains aerobic conditioning.

Level 3 – 80-90% of max HR. Only short sentences can be spoken. Feels like work. This level trains “lactate

threshold.”

Level 4 – 88-94% of max HR. Can only speak a couple words at a time. High intensity, feels like a race. This level trains VO2 Max.

Level 5 – 92-98% of max HR. Talking not possible. Very high intensity, sprinting as fast as possible. Completely anaerobic.

Teaching Methodology

Pitch-Demo-Describe-Do:

- Learning about intensity levels can help us become better athletes, but it is also fun to challenge yourself to go harder or faster.
- Explain why measuring our exercise intensity could be important.
- Explain Training Levels 1 through 5.
- Demonstrate how to measure heart rate.
- Have participants take their own heart rate.

Active Experimentation and Discovery:

- During different activities, ask participants questions to get them thinking about the level of intensity. Can they talk easily? Are they breathing hard? Do they feel burning in their muscles? Pair their answers with different “training levels” to encourage understanding of the system.
- Have participants take their heart rate at rest and again after different levels of exercise intensity.

Games & Activities

Recording Heart Rate

Hill Climbs

Intro to Intervals

Adaptations

This particular skill is very difficult for younger participants to grasp. Most elementary-aged kids (and even some middle and high school students) seem to have only two gears: not moving or going as fast as possible. That is okay. For these ages it may be more appropriate to focus on the varying intensity levels inherent to riding on different types of terrain (flat vs hill).

Space for Leader’s Notes

9. Trail Stewardship

Goals / Objectives

This topic introduces participants to the concepts associated with riding responsibly, sharing the trail with others, and caring for the land on which we ride. Although this information is not skill based, it is critical to developing the awareness of young riders as they explore the world of mountain biking.

Terrain

Much of the information can be covered in a classroom setting, but will be more powerful when conveyed on the trail with real-world examples, both positive and negative. Look for trails designed, built and maintained well, as well as terrain that has seen damage from erosion and misuse.

Skills Progression

- A. LNT Outdoor Ethics
- B. IMBA Rules of the Trail
- C. Sustainable Trail Design
- D. Trail Stewardship & Responsible Riding

- A. Leave No Trace Outdoor Ethics

Purpose

Introduce participants to the Leave No Trace organization and the 7 key principles of LNT.

Mechanics

Leave No Trace (LNT) is an mechanism for learning about and practicing minimum-impact wilderness travel and recreation. The seven principles are:

- Plan ahead and prepare.
- Travel and camp on durable surfaces.
- Dispose of waste properly.
- Leave what you find.
- Minimize campfire impacts.
- Respect wildlife.
- Be considerate of other visitors



Teaching Methodology

Active Experimentation and Discovery:

Ask participants to find examples of where the principles of LNT are being followed or not being followed in their own riding. Ask them to think of ways they can improve their practice of these skills.

Games & Activities

Go on a trail tour that incorporates short stops along the way where the different skills of LNT are presented.

Further Practice

The Leave No Trace organization has many resources on their website, and they offer training and workshops around the world. Find out more at: lnt.org

Adaptations

One way to engage older participants with the principles of LNT is to make them the teachers. Assign them to present one of the principles, or a certain skill, of LNT to the rest of the group. Encourage creativity in coming up with their mini-lesson.

B. IMBA Rules of the Trail

Purpose

Introduce participants to the International Mountain Bike Association (IMBA) and the rules of the trail.

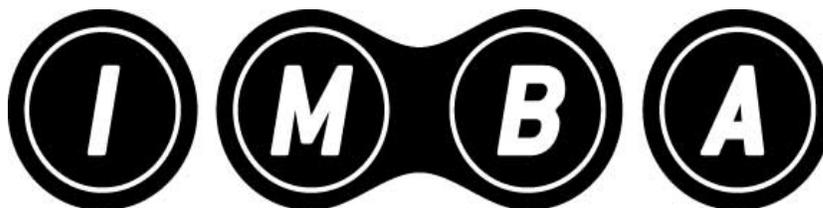
Mechanics

There are 6 parts to the IMBA rules of the trail:

1. **Ride Open Trails:** Respect trail and road closures. Ask a land manager for clarification if you are uncertain about the status of a trail. Do not trespass on private land. Obtain permits or other authorization as required. Be aware that bicycles are not permitted in areas protected as state or federal Wilderness.
2. **Leave No Trace:** Be sensitive to the dirt beneath you. Wet and muddy trails are more vulnerable to damage than dry ones. When the trail is soft, consider other riding options. This also means staying on existing trails and not creating new ones. Don't cut switchbacks. Be sure to pack out at least as much as you pack in. (See previous skill section!)
3. **Control Your Bicycle:** Inattention for even a moment could put yourself and others at risk. Obey all bicycle speed regulations and recommendations, and ride within your limits.
4. **Yield Appropriately:** Do your utmost to let your fellow trail users know you're coming; a friendly greeting or bell ring are good methods. Try to anticipate other trail users as you ride around corners. Bicyclists should yield to other non-motorized trail users, unless the trail is clearly signed for bike-only travel. Bicyclists traveling downhill should yield to ones headed uphill, unless the trail is clearly signed for one-way or downhill-only traffic. In general, strive to make each pass a safe and courteous one.
5. **Never Scare Animals:** Animals are easily startled by an unannounced approach, a sudden movement or a loud noise. Give animals enough room and time to adjust to you. When passing horses, use special care and follow directions from the horseback riders (ask if uncertain). Running cattle and disturbing wildlife are serious offenses.
6. **Plan Ahead:** Know your equipment, your ability and the area in which you are riding and prepare accordingly. Strive to be self-sufficient: keep your equipment in good repair and carry necessary supplies for changes in weather or other conditions. Always wear a helmet and appropriate safety gear.

Teaching Methodology

Review of Important Skills:
LNT Principles



INTERNATIONAL MOUNTAIN BICYCLING ASSOCIATION

Further Practice

Ask participants to find examples of where the rules of the trail are being followed or not being followed in their own riding. Ask them to think of ways they can improve their practice of these skills.

Games & Activities

Bike Rodeo

Go on a trail tour that incorporates short stops along the way where the different rules of the trail are presented.

Adaptations

One way to engage older participants with the Rules of the Trail is to make them the teachers. Assign them to present one of the “Rules” to the rest of the group. Encourage creativity in coming up with their mini-lesson.

C. Sustainable Trail Design & Construction

Purpose

Introduce participants to the concepts behind building trail that withstands user impact and changing environmental conditions.

Mechanics

Trail building and the principles of sustainable trail design are a huge topic. People plan and build trails as a career! This skill section is simply intended to introduce some of the basic concepts. Hopefully it whets your appetite for more information on trails.

Here are some contour trail building tips from IMBA:

- Do everything you can to keep the water off the tread, and users on it.
- Build on the contour and use frequent grade reversals. “Surf the hillside.”
- Follow the half-rule: A trail’s grade shouldn’t exceed half the grade of the sideslope.
- Maximum grade should be 15 percent (except for natural or built rock structures).
- Average grade should stay under 10 percent (with grade reversals).
- Route trails to positive control points (viewpoints, water, other attractions).
- Use bench-cut construction, and excavate soil from the hillside.
- For reroutes, reclaim old trail thoroughly, the visual corridor as well as the trail tread.
- For highly technical trails where grade will sometimes exceed 15 percent, use natural rock, rock armoring or other rock features to add challenge and improve sustainability.

Two Critical Trailbuilding Tips:

1. **Avoid the Fall-Line:** Fall-line trails usually follow the shortest route down a hill; the same path that water flows. The problem with fall-line trails is that they focus water down their length. The speeding water strips the trail of soil, exposing roots, creating gullies, and scarring the environment.
2. **Avoid Flat Areas:** Flat terrain lures many trailbuilders with the initial ease of trail construction. However, if a trail is not located on a slope, there is the potential for the trail to become a collection basin for water. The trail tread must always be slightly higher than the ground on at least one side of it so that water can drain properly.

Ideally, all trails incorporate the five sustainable trail principles:

1. The Half Rule
2. The 10-Percent Average Guideline
3. Maximum Sustainable Grade
4. Grade Reversals
5. Outslope

Teaching Methodology

Review of Important Skills:

LNT Principles

IMBA Rules of the Trail

Active Experimentation and Discovery:

Ask students to find examples of where the trail design principles are being followed or not being followed on their local trails. If possible, practice designing and building a small section of trail, or improving a section of existing trail.

Games & Activities

Go on a trail tour that incorporates short stops along the way where the different design principles are presented with examples on the trail.

Further Practice

Get older participants involved in an actual trail project. There are most likely many organizations in your area (land trusts, parks, recreation areas) that have ongoing trail projects.

D. Trail Stewardship & Responsible Riding

Purpose

Introduce participants to the role they play in providing a positive trail experience for themselves and others.

Mechanics

- Educate yourself and others about responsible riding practices.
- Be a role model.
- Get involved. Volunteer time to get involved with trail maintenance and stewardship.

Teaching Methodology

Review of Important Skills:

- LNT
- IMBA Rules of the trail
- Sustainable Trail design

Games & Activities

Follow the Leader – Use this traditional game as an introduction to discussing how our actions can impact those we ride with, both positive and negative.

Plan a volunteer day with participants, friends and family to clean up a section of trail.

Have participants create posters, signs, or even videos educating other riders about trail stewardship.

Have members of local cycling clubs / trail organizations / land managers come and share information about their organization and what they do.

Adaptations

With younger participants, focus on simple concepts: Staying on the trail, using proper equipment, not littering, and adhering to rules of the trail. Challenge older participants to get more involved with stewardship as part of your program.

IX. INCORPORATING NATURE

Discovering a deep appreciation for the natural world is one reason we partake in outdoor sports. This section is simply a jumping off point to get started helping participants interact more closely with the world around them. There are many, many resources available to help you in this area.

Don't forget that you are already doing the most important thing – getting people outside. You do not need special skills, activities, or equipment for that. Share your own enthusiasm for and wonder of the natural world and it is sure to enhance the experience of your participants.

Sample Activities

More detailed descriptions of these activities are found in Joseph Cornell's book "Sharing Nature with Children" (see resources below). This book is a classic naturalist educator reference and is invaluable to adults wishing to enhance children's experience with the outdoors.

Nature Scavenger Hunt - Create a scavenger hunt list that includes items found in the natural world, but that are not rare (i.e. no "Lady Slipper" flowers). Different colored rocks, different types of leaves and flowers, pinecones, a feather, human-made litter, something soft, and different kinds of seeds are just some examples of items to include in a scavenger hunt. Leave time at the end of participants to share their finds and even look them up in field guide books.

Meet a Tree - In groups of two, blindfold one person. The non-blindfolded person then leads their partner gently and carefully to a tree. The blindfolded person then has a minute to "meet" their tree. They can touch the bark and leaves, hug it to feel its size, and smell it. They are then led back to the group and after removing the blindfold must try to guess which tree was "theirs."

Duplication - Before the group arrives, a leader collects ten natural objects and arranges them on a handkerchief, covering them up with another handkerchief. Gather the group around and tell them they will have about twenty seconds to memorize what is hidden underneath. Then give them 5 minutes to go find the objects themselves. Come back as a group and review the finds, introducing and telling stories about each object. Themes such as getting energy from the sun, leaves changing color, and how rocks are created can all be introduced during this activity.

Resources

Your Local Land Trust:

Land trusts often offer a variety of outdoor activities and events, such as bird watching or "mushroom hunting." Land trusts can provide information on local trails and may be able to connect you with volunteers to present naturalist curriculums. Find your local land trust at the Maine Land Trust Network website: mltn.org.



Project WILD:

Workshops for teachers and outdoor leaders around Maine. Search “Project Wild” at maine.gov.

Wild New England:

Created in part by the Maine Department of Inland Fisheries and Wildlife. wildnewengland.org

Geologic Site of the Month:

Maine Department of Conservation. Search “geologic site of the month” at maine.gov.

Maine Department of Environmental Protection:

Teacher and Leader Resources: Search “DEP” and “schools” at maine.gov.

Sharing Nature With Children, by Joseph Cornell

A classic book filled with activities to encourage understanding of and respect for the natural world.

Last Child in the Woods, by Richard Louv

A must-read for any adult concerned with getting kids outside.

X. GAMES & ACTIVITIES

If growing up means it will be beneath my dignity to climb a tree...I'll never grow up...not me! ~Peter Pan

Alien Invasion

Skills Addressed: Mounting and dismounting

Materials Needed: n/a

Location: Open area free of obstacles. Have defined playing area so “space ships” must navigate around each other.

How to Play: Bikers are individual space ships riding through space. When the leader yells “Alien Invasion!” riders must dismount their bikes, find a partner, and play “Rock, Paper, Scissors.” The person on the losing end gets one point. (Points are bad. Individuals keep track of their points.) Mount bikes and continue riding until another “Alien Invasion.” When a player gets three points they must dismount and remain in one position as a piece of “space dust.” Continue until one space ship is left.

Bicycle Red Light, Green Light

Skills Addressed: Braking

Materials Needed: n/a

Location: Open, gradual downhill.

How to Play: Adapt the classic playground game to be played on a bicycle. Who can make it to the person at the bottom of the hill the fastest without skidding?

Bike Fit Musical Chairs

Skills Addressed: Bike Fit

Materials Needed: n/a

Location: Open area free of obstacles.

How to Play: Starting on a properly fitted bike, at a pre-determined cue (example: music stops) participants get off their bike and run around to find a different bike that also fits.

Bike Limbo

Skills Addressed: Bike/body separation

Materials Needed: A length of light and breakable flagging tape.

Location: Open area free of obstacles.

How to Play: This game is played the same as typical limbo except participants must go under the limbo “stick” while on their bikes. For obvious safety reasons, the limbo device must be easily breakable and those holding it should be ready to let go as needed. The idea is to challenge riders to “get low” but not create a situation where they get clothes-lined by the tape.

Bike Part Labeling

Skills Addressed: Bike parts and basic bike mechanics.

Materials Needed: Bike part labels, enough for every group of 2.

Location: Anywhere, could be classroom/indoor setting.

How to Play: In groups of two, label different bike parts with labels provided.

Review parts and language as a group.

Bike Polo

Skills Addressed: One-handed riding and bike handling.

Materials Needed: Polo mallets and balls (plastic).

Location: Open, grassy area.

How to Play: If all participants feel comfortable with one-handed riding you may consider introducing the sport of bike polo. Bike polo involves hitting a ball with a plastic mallet while riding a bicycle. For more information visit the American Bicycle Polo Association website at www.bicyclepolo.org. Initially work with participants to develop basic skill such as holding the mallet and hitting the ball. Over a 6-8 week course participants may gain enough comfort to play simple matches. Find out if there are local polo-cyclist in your area that may be interested in helping out.

Bike Rodeo

Skills Addressed: Rules of the Road

Materials Needed: Materials for signs and marking lanes.

Location: Large open area with no traffic.

How to Play: Use cones, model street signs, chalk, and other markers to create a small “street” complete with lanes and intersections. Have participants navigate the “street” safely and by following the rules of the road.

Board Balance

Skills Addressed: Balance and bike handling

Materials Needed: Varying lengths of boards.

Location: Flat open area with adequate space.

How to Play: Lay a length of 2x4” and/or 2x6” on the ground. Participants can practice riding across the boards

length-wise, keeping both wheels on the whole time.

Brake Challenge Course

Skills Addressed: Braking

Materials Needed: Cones or other markers.

Location: Anywhere with adequate space.

How to Play: Set out a course with multiple stop zones. Vary the zone placement for difficulty. Incorporate balance practice by challenging participants to do a track stand for x seconds in a specified zone before continuing.

Circle Game

Skills Addressed: Balancing, slow riding, ratcheting, track stands

Materials Needed: Enough cones or rope to make a large circle that the whole group can fit into.

Location: Flat, open area free of obstacles.

How to Play: Create a small circle with cones or rope, where everyone and their bike can fit inside easily but there isn't a lot of extra space. Create a smaller "no ride" zone in the middle of the circle, so the end effect looks like a donut. Once everyone is inside and riding around, the leader says "go!" and from that point on participants can't put their foot down, take their hands off the handlebars, or ride out of the circle. If they put a foot down they must stop and stay where they are. The goal is to be the last person left on their bike. Participants can try to block others, but they can't ram or push.

Follow the Leader

Skills Addressed: Riding as a group, bike handling skills

Materials Needed: Obstacles, if wanted.

Location: Almost anywhere.

How to Play: Play Follow the Leader with different challenges along the way: being in different gears, varying body positions, using hand signals, etc.

Hand Signal Practice

Skills Addressed: Rules of the Road

Materials Needed: n/a

Location: Open area free of obstacles.

How to Play: Practice using hand signals learned through BPSE: stopping, left turn, and right turn. In small groups, ride in a line with the first person deciding what signal to use. Switch places so everyone has a chance to be first in line.

Hill Climb Challenges

Skills Addressed: Ascending, shifting gears

Materials Needed: n/a

Location: Area with up hills.

How to Play: After a good warm up, challenge participants to try riding to the top of a hill going at varying levels of intensity. Choose an appropriate distance and pitch depending on age and ability level of participants. Each time up the hill go at a different intensity until the last time they are going as fast as possible. Maintaining different paces can be very challenging, especially for younger kids. But encourage them to pay attention to their breathing and how much they are able to talk. See how far riders can get without stopping, and then encourage them to

beat their personal record. Try seated and standing, and in different gears.

Intro to Intervals

Skills Addressed: Fitness for Riding

Materials Needed: n/a

Location: Almost anywhere

How to Play: Intervals are repeated periods of higher exertion during training. Intervals can vary in intensity, length, and number of repetitions. Come up with a short interval session for the group to do and repeat it (in the same way) a number of times throughout the unit. Have the participants keep track of or simply acknowledge their improvement at the workout. If they feel slower or worse, challenge them to think of why that might be. Did they drink enough water? Eat a good breakfast? Get enough sleep?

Mark the Spot

Skills Addressed: Shifting and ascending

Materials Needed: Marker for everyone

Location: Area with at least one uphill.

How to Play: Ask participants to use a stick, rock, or other object to mark where they think they should shift before the climb. Have participants ride the hill. Did they shift at their marker? Earlier? Later?

Obstacle Course

Skills Addressed: Bike handling, hand signals, riding as a group, slow riding, stopping...almost anything!

Materials Needed: Cones, sidewalk chalk, rope, 2x4 or 2x6 board lengths, firewood pieces, etc.

Location: Open area without risk of vehicle traffic.

How to Play: The sky is limit when developing a bike obstacle course. Use cones, markers, or sidewalk chalk to lay out a path for participants to ride. Incorporate challenges such as board bridges, roll-over obstacles, or even a sidewalk drop. Add in off-bike activities like a basketball shoot or ball toss. See who can ride it the slowest and the fastest. Challenge participants to use hand signals when turning or stopping. There are infinite possibilities.

One Hand Riding

Skills Addressed: One-handed riding and bike handling.

Materials Needed: n/a

Location: Open area free of obstacles.

How to Play: Try riding through an obstacle course with one hand and then the other. Challenges can be added by having participants tap their helmet with one hand or reach down and pick up an object off the ground while riding.

Over the Shoulder

Skills Addressed: Straight line riding and rules of the road.

Materials Needed: Materials (cones/rope) to make lanes.

Location: Open area with lots of space.

How to Play: In groups of two, one person stands still (off the bike) while their partner rides away from them. The standing partner holds up a number of fingers while the person riding must look backwards and yell out how many fingers they see. (Caution: Make sure there is plenty of space between riders and that there are no hazards in the riding area.) Repeat while riding by either side of partner. To challenge, create narrow “lanes” with cones

or pin flags. Participants must try to stay inside the lanes while looking back to count fingers. The lanes provide feedback so that riders can see if they are staying straight.

Pit Stop

Skills Addressed: Bike care and maintenance

Materials Needed: Cleaning materials

Location: Open area

How to Play: Divide participants up into even teams with one bike. Each member of the team is responsible for cleaning one part of the bike. The team chooses one member to ride a loop and then come in for a pit stop. Time the cleaning portion and see how quickly the teams can complete a pit. This could be incorporated into a relay event where each member of the team rides the loop with pits in between.

Power Coast

Skills Addressed: Mounting

Materials Needed: n/a

Location: Open area.

How to Play: This game helps practice the mounting motion of getting moving and up on the seat. Begin with participants standing over the top tube. Challenge participants to see how far they can coast with a single mounting pedal stroke. This can also be incorporated into a “Red light, Green light” game or “Alien Invasion.”

Recording Heart Rate

Skills Addressed: Fitness for Riding

Materials Needed: Paper and pencils; stopwatch

Location: Anywhere

How to Play: Have participants find and record their resting HR prior to starting a session. Then, periodically and randomly throughout the session, stop activity and have participants find and record their HR. Have them also write down what they were doing for activity prior to each HR record. This may be used every so often throughout an entire program allowing participants to see changes in their HR. They may see their resting HR decrease, demonstrating greater fitness.

Slalom with Cones

Skills Addressed: Cornering and bike handling

Materials Needed: Cones or other markers

Location: Open area with adequate space

How to Play: Set up a “slalom course” using cones for riders to make turns through. Change the distance and angles as riders become more proficient. Focus on correct position before increasing speed or changing terrain. Then have participants try leaning their bikes into the turn. This will require that they have more speed and are already comfortable with some body/bike separation.

Slow Motion “Race”

Skills Addressed: Balance, slow riding, ratcheting, track stands

Materials Needed: Cones to make end zones.

Location: Open area with enough space for all participants to line up side-by-side.

How to Play: Set up two lines 20-30 feet apart in an open flat area. Have a “race” where everyone tries to be the

last person across the finish line. They must stay in a straight line and not touch their toes to the ground. For more challenge, do it on a downhill while emphasizing smooth braking and balance.

Straight Line Ride

Skills Addressed: Riding in a straight line, riding on roads.

Materials Needed: Rope or sidewalk chalk.

Location: Open area free of obstacles.

How to Play: Draw a straight line with chalk, or mark one with rope laid out in a straight line. Participants practice riding straight, staying as close as they can to the line.

Structured Cleaning

Skills Addressed: Bike care and maintenance

Materials Needed: Materials needed for cleaning

Location: Anywhere with adequate space

How to Play: Incorporate bike cleaning practices into the end of every lesson. Choose one participant (one with the dirtiest bike) to lead the group in the cleaning portion at the end of a lesson, similar to leading group stretching.

Wheelie Contest

Skills Addressed: Wheelies, wheel lifts

Materials Needed: n/a

Location: Open area free of obstacles.

How to Play: Have riders compete against themselves to see how far they can ride with the front wheel in the air. Go over wheelie safety (cover rear brake) first.

Wheel Up Tag

Skills Addressed: Front wheel lifts

Materials Needed: “Tag” stations, such as poly-spots, tennis ball halves, rounds of wood, etc.

Location: Anywhere with adequate space.

How to Play: Use the wheel up to touch your tire to the top of several designated objects of varying heights.

XI. LESSON PLANS

When I see an adult on a bicycle, I do not despair for the future of the human race. ~H.G. Wells

The lesson plans in this curriculum guide have been written to include appropriate skill progressions and are aligned with national standards and grade-level outcomes from the Society of Health and Physical Educators (SHAPE America). Always take into account your own school district’s policies for curriculum development. The lessons here refer to standards at both the elementary (E) and middle school (M) levels, though they could readily be aligned with high school standards. The SHAPE national standards referenced in this section can be found here:

Society of Health and Physical Educators. (2014). *National standards & grade-level outcomes for K-12 physical education*. Champaign, IL: Human Kinetics.



Lesson 1. Mountain Bike Basics

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson participants will learn basic bike handling skills, with an emphasis on rider awareness, vision, and safety. This lesson plan assumes BPSE curriculum has already been discussed.

Supplies/Venue

Cones. Optional: Bike parts labels. Open, flat area.

Procedures

1. Introduction

- a. Welcome and introduce plan for session.
- b. Equipment and Attire Prep: Bike and helmet fit, ABC Quick Check.
- c. Warm-up Game or Activity: Bike Fit Musical Chairs

2. Sport Experience

- a. Introduce Skill: Riding Awareness “Don’t space out when you should be spacing out.”
- b. Skill Practice: Simple obstacle course, focus on spacing between riders.
- c. Introduce Skill: Neutral and Ready Body Positions
- d. Skill Practice: Obstacle course repeated in both neutral and ready positions.
- e. Skill Practice: Hand signals for biking (turning and stopping).
- f. Group Ride: Focus on vision, spacing, and using hand signals.

3. Wrap-up

- a. Group stretch.
- b. Review skills covered.

Adaptations

Bike Part Labeling Game and watching a video of visually impaired mountain bikers are good supplements to this lesson.

Evaluation

Participants will demonstrate ability to ride with awareness of surroundings and appropriate distance between riders.

SHAPE America / NASPE National Standards Alignment

Safety: S4.E6 S4.M7

Lesson 2: Starting and Stopping

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson participants will learn different ways to mount and dismount a bike and how to slow and stop with control. Participants will experience trail riding while learning the principles of the IMBA “Rules of the Trail.”

Supplies/Venue

Cones. Open area, with flat and some gradual incline.

Procedures

1. Introduction

- a. Welcome and introduce plan for session.
- b. Equipment and attire prep: Helmet fit, ABC Quick Check.
- c. Warm-up Game or Activity: Alien Invasion

2. Sport Experience

- a. Introduce Skill: Mounting and dismounting, “Power Pedal.”
- b. Skill Practice: Mounting and dismounting from various positions.
- c. Play: Alien Invasion again, with focus on using Power Pedal technique.
- d. Introduce Skill: Braking body position and feathering.
- e. Play: Red Light, Green Light (no skidding!)
- f. Group Ride: Focus on appropriate braking. Introduce IMBA Rules of the Trail.

3. Wrap-Up

- a. Group stretch. Discuss importance of cooling down after riding.
- b. Review skills covered.

Adaptations

Red Light, Green Light can be made more challenging by using non-dominant foot, playing on steeper terrain, or trying to stop in the shortest distance possible in order to be the last person to cross the line. Challenge older groups to create their own mountain biking “cool-down” routine.

Evaluation

Participants will demonstrate ability to stop safely, and will be able to explain reasons to avoid skidding. Participants will be able to explain the importance of warming up and cooling down for physical activities.

SHAPE America / NASPE National Standards Alignment

Fitness Knowledge Warm-up/Cool-down: S3.E4 S3.M12

Lesson 3: Using the Shifters

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson participants will learn how to shift into harder and easier gears.

Supplies/Venue

Cones or other objects for obstacle course. Terrain with hills.

Procedures

1. Introduction

- a. Welcome and introduce plan for session.
- b. Equipment/Attire prep: Helmet Fit, ABC Quick check.
- c. Warm-up Game or Activity: Obstacle Course (slalom, rotary, stop line, etc)

2. Sport Experience

- a. Introduce Skill: Shifting gears. Consider using bike stand for discussion and demonstration, and to have participants practice.
- b. Skill Practice: Ride flat ground while shifting through all gears one at a time, not crossing chain.
- c. Play: Slow Race
- d. Skill Practice: Shift through all gears while riding up slight incline.
- e. Group Ride: Focus on shifting into easier/harder gears depending on terrain. Reminder of IMBA Rules of the Trail.

3. Wrap-Up

- a. Play: The Circle Game
- b. Group stretch or “Group Original” cool-down
- c. Review skills covered.

Adaptations

It is especially important to choose appropriate terrain for ages and abilities. Younger participants will need gentler hills. Challenge older students to discuss the physiology of biking up hills. Which body systems are being worked? What creates the burn in your legs?

Evaluation

Participants will demonstrate ability to appropriately change gears in front and back.

SHAPE America / NASPE National Standards Alignment

Outdoor Pursuit Skills: S1.M22

Lesson 4: Cornering

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson, participants will learn techniques for riding through corners and transitions.

Supplies/Venue

Cones. Terrain with rolling hills and corners.

Procedures

1. Introduction

- a. Welcome and introduce plan for session.
- b. Equipment/Attire Prep: Helmet fit, ABC Quick Check.
- c. Warm-up Game or Activity: Circle Game or Alien Invasion, played on side hill.

2. Sport Experience

- a. Introduce Skill: Bike/body Separation, cornering body position.
- b. Skill Practice: Slalom around cones practicing cornering pedal position.
- c. Group Ride: Go to area with a few different corners to try.
- d. Introduce Skill: Choosing a Line
- e. Skill Practice: Using the same corner, try riding different lines, at different speeds, and with different body positions.

3. Wrap-Up

- a. Cool-down game: Participants' choice.
- b. Group original cool-down, stretching.
- c. Review skills covered.

Adaptations

Consider showing video of skilled riders navigating different turns.

Evaluation

Students will be able to explain what “choosing a line” means and will demonstrate ability to safely navigate corners without skidding.

SHAPE America / NASPE National Standards Alignment

Outdoor Pursuit Movement Concepts: S2.M13



Lesson 5: Climbing

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson, participants will learn effective shifting and body position for climbing.

Supplies/Venue

Cones. Terrain with variety of hills.

Procedures

1. Introduction
 - a. Welcome and introduce plan for session.
 - b. Equipment/Attire prep: Helmet fit, ABC Quick Check.
 - c. Warm-up Game or Activity: Follow the Leader, focus on different body positions and shifting.
2. Sport Experience
 - a. Introduce Skill: Timing of shifting.
 - b. Skill Practice: Experiment with when to shift for a climb.
 - c. Introduce Skill: Body position for climbing, keeping traction.
 - d. Skill Practice: Hill Climb Challenge
 - e. Group Ride: Focus on maintaining flow with good shifting and body position movement.
3. Wrap-Up
 - a. Cool-down Game: Circle Game
 - b. Group original cool-down, stretching.
 - c. Review of skills learned.

Adaptations

Again, terrain choice is important. Consider having two different hills for the climbing challenge to accommodate different abilities. Or create alternative routes up easier slopes to challenge fast learners.

Evaluation

Students will demonstrate ability to downshift before beginning a climb, and change body position as needed during ascent.

SHAPE America / NASPE National Standards Alignment

Outdoor Pursuit Movement Concepts: S2.M13

Lesson 6: Descending

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson, participants will learn how to descend steeper terrain.

Supplies/Venue

Cones. Terrain with hills, at least one hill with lots of open space.

Procedures

1. Introduction

- a. Welcome and introduce plan for session.
- b. Equipment/Attire Prep: Helmet Fit, ABC Quick Check.
- c. Warm-up Game or Activity: Red Light, Green Light

2. Sport Experience

- a. Introduce Skill: Dynamic Braking and the problems with skidding.
- b. Skill Practice: Braking with weight back.
- c. Skill Practice: “Quick Stop” Activity
- d. Skill Practice: Slalom
- e. Group Ride: Focus on dynamic braking, avoiding skids.

3. Wrap-Up

- a. Group original cool-down or group stretch.
- b. Review of skills learned and discussion. What is more challenging: Ascending or descending? Which one is more fun? Why? Can the challenging skill also be enjoyable?

Adaptations

Add challenge by having participants try to do a trackstand during descent. Ask them to beat their own personal record for time. Younger, smaller participants may be unfamiliar with hand-operated brakes and may even have difficulty reaching the brake levers. Rotating handlebars up slightly may help.

Evaluation

Students will demonstrate ability to brake using both hands and avoiding skids, and will be able to explain why skidding damages trails and equipment.

SHAPE America / NASPE National Standards Alignment

Rules and Etiquette: S4.E5 S4.M1

Lesson 7: Riding Over Small Obstacles

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson, participants will learn the basics skills needed to ride over and across low obstacles such as sticks, roots, and small rocks.

Supplies/Venue

Cones, length of 2 x 6” and/or 2 x 4,” length of rope or chalk line. Open, flat area (grass works well).

Procedures

1. Introduction

- a. Welcome and introduce plan for session.
- b. Equipment/Attire prep: Helmet fit, ABC Quick Check.
- c. Warm-up Game or Activity: Short group trail ride

2. Sport Experience

- a. Introduce Skill: Navigating obstacles. What obstacles might be encountered on trail?
- b. Skill Practice: Straight Line Ride
- c. Skill Practice: Board Balance
- d. Introduce Skill: Roll Over
- e. Skill Practice: Rolling Over Low Objects (boards, low ramp)
- f. Introduce Skill: Front wheel lift
- g. Play: Obstacle course, navigating over and around a variety of objects.

3. Wrap-Up

- a. Cool-down game: Over the Shoulder
- b. Group original or group stretch.
- c. Review the lesson: What was most challenging? What part was most enjoyable? What part of this unit has been most enjoyable so far? Most challenging? Can something that is challenging also be enjoyable?

Adaptations

Create an obstacle course that implements skills learned and that participants can continuously rotate through. This allows faster, more advanced riders to ride a lot and beginner riders to take their time. Consider introducing a rear wheel lift if time and ability levels allow.

Evaluation

Students will demonstrate ability to ride in a straight line and roll over low objects. Students will explain why they personally find mountain biking to be challenging (or not) and enjoyable (or not).

SHAPE America / NASPE National Standards Alignment

Self-Expression and Enjoyment: S5.E2 S5.E3 S5.M4

Lesson 8: Wheel-ups to Wheelies

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson, participants will learn how to pedal stab and lift the front wheel off the ground.

Supplies/Venue

Obstacles at different heights (wood, logs, curb). Open area.

Procedures

1. Introduction

- a. Welcome and introduce plan for session.
- b. Equipment/Attire Prep: Helmet fit, ABC Quick Check.
- c. Warm-up: Slow Race
- d. Introduce Skill: Ratcheting Did anyone ratchet during the slow race?

2. Sport Experience

- a. Introduce Skill: Pedal Stab
- b. Skill Practice: Pedal stab in different gears, and while both sitting and standing.
- c. Introduce Skill: Wheel-ups
- d. Skill Practice: Wheel-up progression from flat ground to higher obstacles.
- e. Play: Wheel-up Tag

3. Wrap-Up

- a. Group cool-down ride focusing on skills learned.
- b. Group stretch.
- c. Review of skills learned.

Adaptations

Some participants may not be comfortable doing pedal stabs or wheel ups on to objects. Continuing practice on flat ground still provides opportunities to feel the timing and initiation. Participants can also try to “wheel-up” and over a target on flat ground (i.e. length of rope). For more advanced participants, consider introducing wheelies and wheelie contests.

Evaluation

Students will demonstrate ability to lift front wheel off the ground, while standing or riding.

SHAPE America / NASPE National Standards Alignment

Outdoor Pursuit Movement Concepts: S2.M13



Lesson 9: Advanced Obstacles

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson, participants will learn skills to ride over and across more difficult obstacles.

Supplies/Venue

Pieces of firewood, lengths of 2x4” or 2x6,” other obstacles. Open, flat area and trail with natural and human-made obstacles (bridges).

Procedures

1. Introduction

- a. Welcome and introduce plan for session.
- b. Equipment/Attire prep: Helmet fit, ABC Quick Check.
- c. Warm-up Game or Activity: Circle Game or Alien Invasion
- d. Review of previous skills learned: Pedal Stab, Wheel-ups

2. Sport Experience

- a. Introduce Skills: Riding over and across bigger obstacles.
- b. Skill Practice: Obstacle Course (multiple and diverse ride over options)
- c. Introduce Skill: Riding over a see-saw.
- d. Skill Practice: Add see-saw to obstacle course
- e. Discuss: What sections of the obstacle course are participants finding challenging? What can they do to improve? Can the individuals help each other with challenges?
- f. Group Ride: Focus on terrain with lots of obstacles (roots, rocks, bridges). Repeat challenging sections.

3. Wrap-Up

- a. Group cool-down and stretch.
- b. Discuss: What was the most challenging part of the session? What was the most satisfying part?
- c. Review of skills learned.

Adaptations

Again, some participants may not feel comfortable riding over objects. Provide them plenty of opportunities to practice the skills and progressions in very incremental ways. More advanced riders may be introduced to the skill of “rolling over” objects that are higher than the bike’s clearance, or to wheelie drops and bunny hops.

Evaluation

Students will demonstrate attempts to work through personal challenges and make improvements.

SHAPE America / NASPE National Standards Alignment

Challenge: S5.E2 S5.M3

Lesson 10: Bike Cleaning and Maintenance

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson, participants will learn the basic skills to care for a bike and fix minor problems. This lesson may be inserted anywhere in the curriculum, especially if inclement weather keeps the group inside. Keep in mind that derailleurs and chain need to be cleaned more frequently than just during one lesson.

Supplies/Venue

Tire pump, tire levers, cloth rags, brushes, lube. Open area, can be inside.

Procedures

1. Introduction:
 - a. Welcome and introduce plan for session.
 - b. Equipment Prep
 - c. Warm-up Game or Activity: Bike Parts Labeling.
2. Sport Experience
 - a. Introduce Skill: Measuring and changing tire pressure. Demonstrate/test out different tire pressures (on flat, hard surface) to see how it affects riding.
 - b. Skill Practice: Tire Inflation
 - c. Introduce Skill: How-to clean bike
 - d. Skill Practice: Bike Cleaning
 - e. Play: Pit Stop
 - f. Introduce Idea: Fixing a Flat, discussion of pinch flats.
3. Wrap-Up
 - a. Clean up tools and materials used.
 - b. Discuss how maintenance such as fixing a flat would be different on trail.
 - c. Why is preventative bike maintenance important?

Adaptations

If time allows, have participants try changing a flat. Have participants let air out of front tire and then “change” the tube to fix the “flat.”

Evaluation

Students will demonstrate ability to clean a bike, lube a chain, and inflate tires to proper pressure.

SHAPE America / NASPE National Standards Alignment

Personal Responsibility: S4.E2 S4.M1



Lesson 11: Biking and Fitness

Target Ages

Grades 4-8, Adaptations for younger and older participants

Overview

In this lesson, participants will learn how biking can be used to increase and measure physical fitness.

Supplies/Venue

Short trail loop, approximately 2-5 minutes in length.

Procedures

1. Introduction

- a. Welcome and introduce plan for session.
- b. Equipment/Attire Prep: Helmet fit, ABC Quick Check.
- c. Warm-up Game or Activity: Group Ride

2. Sport Experience

- a. Introduce Skill: Rating of Perceived Exertion (RPE) Scale
- b. Skill Practice: Repeating short loop 3-5 times, increasing RPE level each lap. Instructor can record times for each lap and students can add the RPE level at which they were riding.
- c. Play: Obstacle course or trail loop relay race.
- d. Discuss: What did the different RPE levels feel like? What parts of the body are working harder as the exertion level increases?

3. Wrap-Up

- a. Cool-down game: Participants choose
- b. Group stretch.
- c. Discuss: Local mountain bike events or races that participants may wish to learn more about.

Adaptations

Relay races can be great experiences but care must be taken to accommodate those that are not comfortable competing or racing. One option would be to do two mini-races were participants are only “competing” against their own times. Repeat the “race” on a few different days throughout the unit so that participants can track their progress over time. Older participants can learn about which body systems are working at different intensity levels. Consider showing video of Olympic or World Cup mountain bike races.

Evaluation

Students will demonstrate ability to ride at different intensity levels and will attempt to match them with the RPE rating scale.

SHAPE America / NASPE National Standards Alignment

Fitness Knowledge: S3.M13

XII. RESOURCES & REFERENCES

State of Maine

Bicycle Coalition of Maine - bikemaine.org

Regional

New England Mountain Bike Association - nemba.org

Eastern Fat Tire Association - efta.com

Beyond

Canadian Sport for Life / Cycling Canada LTAD - canadiansportforlife.ca

International Mountain Bicycling Association - imba.com

Barnett's Bicycle Institute – www.bbainstitute.com

Bike's Belong - bikesbelong.org