

ADDITIONAL RESOURCES



Digital copies of this curriculum and many additional resources can be found at www.saferouteswa.org/schools/safety-education/

SECTION CONTENTS:

- Introductory Guide to Bicycle Safety
- Left Turn as Vehicle
- Left Turn as Pedestrian
- Lesson Plan: Walk Around the World - Optional Pedestrian Safety Lesson Plan
- Lesson Plan: Oral History and Walking to School - Optional Pedestrian Safety Lesson Plan

PEDESTRIAN ORIENTED ORGANIZATIONS/AGENCIES/PROGRAMS

- www.FeetFirst.org (Feet First)
- www.Saferouteswa.org (Safe Routes to School of Washington)
- www.Saferoutesinfo.org (National Center for Safe Routes to School)
- www.iwalktoschool.org (International Walk to School organization)

BICYCLE ORIENTED ORGANIZATIONS/AGENCIES/PROGRAMS

- www.bicyclealliance.org (Bicycle Alliance of Washington)
- www.bikeleague.org (League of American Bicyclists)
- www.bta4bikes.org (Safe Routes for Kids –Bicycle Safety Program Curriculum, Bicycle Transportation Alliance, Portland, OR)

ADDITIONAL RESOURCES

Federal funding for this curriculum is provided from the Washington State Department of Transportation to the Office of Superintendent of Public Instruction. The full curriculum and program information are available at www.saferouteswa.org.

INTRODUCTORY GUIDE TO BICYCLE SAFETY

INTRODUCTION

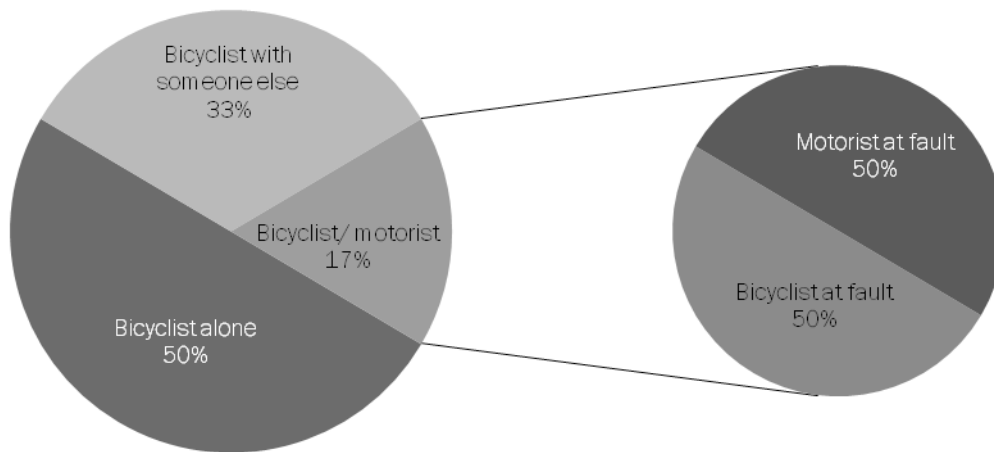
To teach bicycle safety, it is important to be a safe, legal, and comfortable bicycle user. This guide discusses safe riding concepts and provides several practice skills to on-bike handling skills.

It is important to know what it means to be a safe bicycle user. Although most bicycle users fear being hit by a car, particularly from behind, 50% of all bicycle crashes are falls involving the bicycle user alone hitting a stationary object, having a mechanical failure, or mishandling the bicycle and falling.

Another 33% of crashes involve the bicycle user and another object – a squirrel, a dog, another bicycle user, a pedestrian, etc. Many crashes involve bicycle users hitting each other.

Motor vehicle-bicycle collisions comprise a mere 17% of all bicycle crashes, and of those, half are the bicycle user's fault, usually due to the bicycle user not obeying a traffic law. Only 3% of bicycle crashes involve a motorist who didn't see a bicycle user.

Bicycle Crash Statistics



Thus, an educated bicycle user can prevent the vast majority of bicycle crashes by following traffic laws, taking some basic precautions, and by mastering a few bicycle handling skills.

The remainder of this guide discusses specific topics and skills that can help reduce bicycle crashes.

Topics covered in this guide include:

- Principles of Traffic Law:
 - o Being predictable and visible
 - o Speed and destination positioning
 - o Yielding duties – first come, first served
- Bicycles and Equipment:
 - o Bike parts
 - o Bike fit
 - o ABC Quick Check
 - o Other equipment
- Handling Skills:
 - o Starting and stopping
 - o Scanning and straight-line riding
 - o Other handling skills and on-bicycle communication
 - o Real road practice

PRINCIPLES OF TRAFFIC LAW

BEING PREDICTABLE AND VISIBLE

Riding predictably and legally on the road is integral to reducing crashes. Bicycles are legal vehicles, and bicycle users have the same rights and responsibilities as motorists. Bicycle users fare best when they act and are treated as drivers of vehicles. This means that, as a bicycle user, you are responsible for obeying all the same traffic laws you follow when driving a car.

In order for other users to predict your movements, it is important for bicycle users to be visible on the road. Some of this is accomplished by equipment: wear visible clothing and use lights at night. Bicycles are required to have a white headlight and a red rear reflector. Another important way to be visible is to ride where other users look for vehicles. Riding on the right side of the road and positioning yourself to communicate where you are going helps other users see you.

SPEED AND DESTINATION POSITIONING

Two major differences between driving a car and driving a bicycle are that bicycles are slower and narrower than cars. This means that bicycle users use speed positioning rules to determine which lane to use. Also, bicycle users can divide lanes into thirds and position themselves in the lane based a variety of factors, including desired destination, speed of traffic, road conditions, and width of road.

Speed positioning means that a vehicle positions itself on a road based on how fast it is traveling relative to other road users. Slower vehicles travel on the right and faster vehicles travel on the left. As a bicycle user, ride as far right in the lane as is safe, generally about 3 feet from the edge of moving traffic. Avoid hugging the curb. When a bicycle user is too far to the right, several problems arise:

1. The bicycle user is no longer in the travel lane where motorists look for traffic. Drivers turning from driveways won't necessarily look for or see a bicycle user riding close to the curb.
2. The bicycle user can encounter problems from doors opening from parallel parked cars (called being "doored").
3. Right-turning traffic can cut off a straight-going bicycle user.

On sidewalks and multi-use paths, follow speed positioning rules: Bicycles (faster users) to the left and walkers (slower users) to the right. In these places, use audible warning whenever passing. Sidewalks are designed for speeds of less than 5 mph, so ride at a speed appropriate for the infrastructure and amount of traffic. Watch out at road crossings and driveways, as most collisions occur at those points. Generally, bicycle users and pedestrians are safer if bicycle users ride in the street according to traffic laws.

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Destination positioning means that bicycle users approaching an intersection use their position within a lane to communicate intended destination. Generally, bicycle users use the rightmost lane that serves their destination. Within the lane, a bicycle user positions according to the Rule of Thirds: the right 1/3 of the lane is used when turning right; the middle 1/3 of the lane is used when going straight; the left 1/3 of the lane is used when turning left. This rule varies a bit with with turn lanes and multiple destination lanes.

When changing lanes, use SASS:

- Scan behind and beside if vehicles are around.
- Assess if it is safe.
- Signal where you are going.
- Scan again before changing road position.

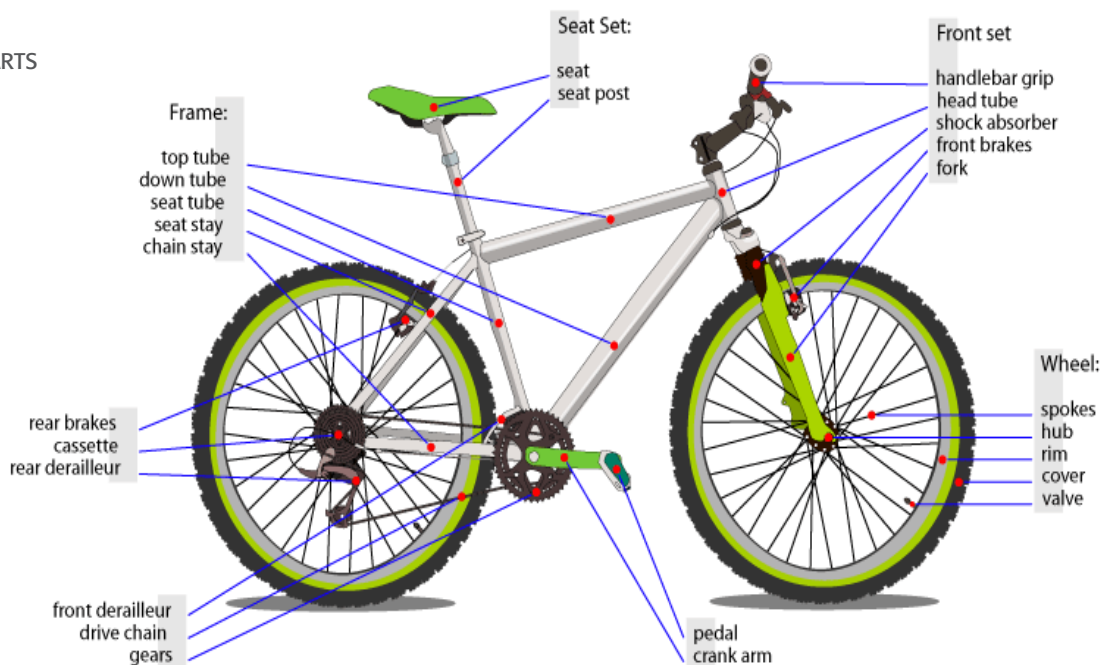
YIELDING DUTIES – FIRST COME, FIRST SERVED

At intersections, when changing lanes, and when turning, bicycles follow the principle of first come, first served exactly as in a motor vehicle: The vehicle that arrives second yields to the vehicle that goes first, whether at an intersection or merging into a new lane. Similarly, a bicycle user turning from a minor street or driveway yields to vehicles on the larger street.

THE BICYCLE AND EQUIPMENT

Many bicycle crashes can be prevented by ensuring that the bicycle fits the rider and is in good working order. The following section covers basic bicycle terms, how to make sure a bicycle fits correctly, a maintenance check to perform before every ride, and other equipment to ensure safe, comfortable riding.

BICYCLE PARTS



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BICYCLE FIT

When you sit down in a car, you adjust the mirrors and seat. Similarly, it's important to ensure that the bicycle is adjusted before going for a ride.

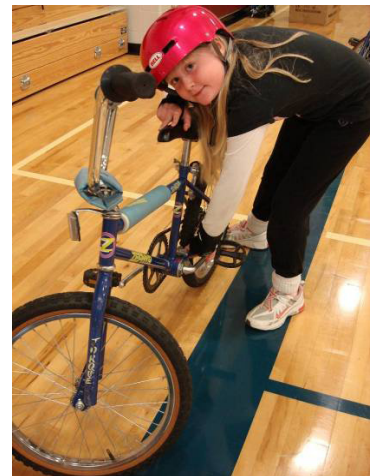
It shouldn't hurt to ride a bicycle. Muscles will be sore if you aren't accustomed to bicycling, but joints should not hurt while riding. Bicycle fit can be adjusted many ways, but there are a few important aspects of fit that all bicycle users should check before riding.

- The frame should be sized so that you have 1" to 2" between the tire and the ground when you straddle the bicycle, grab it at the stem and seat post, and lift it all the way up. Mountain bicycles should have 3" to 4".
- Legs: The seat (also called a saddle) should be high enough to let you have a slight bend in your knee – it should feel somewhat like normal walking when riding, not like walking on tiptoes or walking squatted down.
- Arms: Your arms shouldn't be stretched all the way out or be scrunched up close to your body. Instead, aim for a relaxed, comfortable bend in the elbow. Move the seat forward or backward to get a comfortable elbow bend.

ABC QUICK CHECK

Entropy affects bicycles the same as everything else. Even if a bicycle just sits unused in a garage, it will require maintenance over time. Err on the side of caution and perform the following check before every ride.

- Air: Check the tire pressure using a gauge or pump. Pump tires up to the pressure recommended on the sidewall. Avoid using a compression pump, as they tend to be inaccurate and can over-fill tires quickly.
- Brakes: Squeeze the brake levers. You should be able to fit your thumb between the brake lever and the handlebars. Lift the bicycle and spin the wheels to make sure the brake pads aren't rubbing.
- Chain, cassette, chainrings, cranks: The chain should be metal-colored, clean, and lubed, not rusty or black. The cassette and chainrings should be clean, not rusty or black. Check the cranks by aligning them with the chainstays and squeezing the crank to the chainstay. The crank shouldn't move.
- Quick: Check the quick releases on wheels and seat post to be sure they're secured. Tighten by twisting the nut, not the handle. Close so that the pressure on the handle briefly leaves a white imprint on your palm.
- Check: Lift the bicycle about 4" and drop it, listening for unexpected rattles or noise. Take it for a short ride around, shifting through the gears and using the brakes to be sure they all operate correctly.



Checking cranks.

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OTHER EQUIPMENT

The goal for using any bicycling gear is to improve comfort or safety. Not only can appropriate gear choice can help protect bicycle users from avoidable solo falls, but bicycle users can reduce collisions by choosing equipment that increases their visibility to other road users.

- Head: Check helmet fit each time before a ride, as straps can become maladjusted quickly. To check helmet fit:
 - o Lean over: With helmet unbuckled, lean over. The helmet should not fall off. If it falls off, adjust the fit.
 - o Eyes: Look up and see the edge of the helmet. You should be able to fit no more than 2 fingers between eyebrows and helmet.
 - o Ears: The helmet straps form a V just beneath the earlobe.
 - o Mouth: You can feel the strap beneath your chin, but still be able to open your mouth comfortably. Aim for “chewing gum tight.”



CHECKING HELMET FIT.

- Eyes: To protect your eyes from insects or flying debris, wear eye protection like sunglasses or safety glasses. Make sure that the glasses don't block your peripheral vision.
- Clothing: The goal is for motorists to see and identify a bicycle user from far away. In the daylight, light-colored clothing stands out against the dark road and background, so choose a bright-colored sweatshirt or T-shirt for a daytime ride. At night, even light colored clothing isn't enough; bicycle users should wear reflective material on clothes and helmet.

For longer rides, choose wicking clothing that doesn't chafe or flap. Many bicycle users wear padded bicycle shorts and jerseys made of synthetic materials to stay comfortable on long bicycle rides.

- Hands: To protect your hands and provide cushioning, wear padded bicycling gloves. When you crash, gloves act as helmets for your hands, protecting them from “road rash.”

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- Feet: Many bicycle users choose to wear special bicycling shoes that have stiff soles and no shoelaces, but regular shoes work well on short bicycle rides. However, when wearing regular shoes and pants, always tie and tuck shoelaces and pant cuffs before riding.
- Carrying things: Plan ahead. Because loose sacks, clothing, or straps can cause serious crashes, bicycle users should use a backpack or special bicycle racks and bags to carry items.
- Lighting: Legally, bicycles being ridden at night must have a white front headlight visible from 500 feet away and a rear red reflector. Many bicycle users add a red blinking rear light because although reflective material is visible from farther away, it requires a light source to be useful. If riding in very dark conditions, consider using a front light bright enough to illuminate the road in addition to a front light that makes you visible to others.



KIDS TYING AND TUCKING BEFORE A RIDE.

BICYCLE HANDLING SKILLS

Riding predictably is a key component of preventing crashes. The following drills help improve bicycle handling skills so that bicycle users can ride predictably in traffic and respond correctly in an emergency.

STARTING AND STOPPING

Starting smoothly communicates to drivers that a bicycle user is competent, which can greatly improve a motorist's confidence in the bicycle user. A stable stop can save energy and prepare a bicycle user for a smooth start. Signaling before turning communicates with drivers, an integral piece to avoiding collisions.

1. Practice riding in a straight line and signaling before turning. If in a group, keep 1 to 2 bicycle lengths between riders.
 - o Signals: The same as in a car. Right turn can also be signaled by pointing with the right arm.

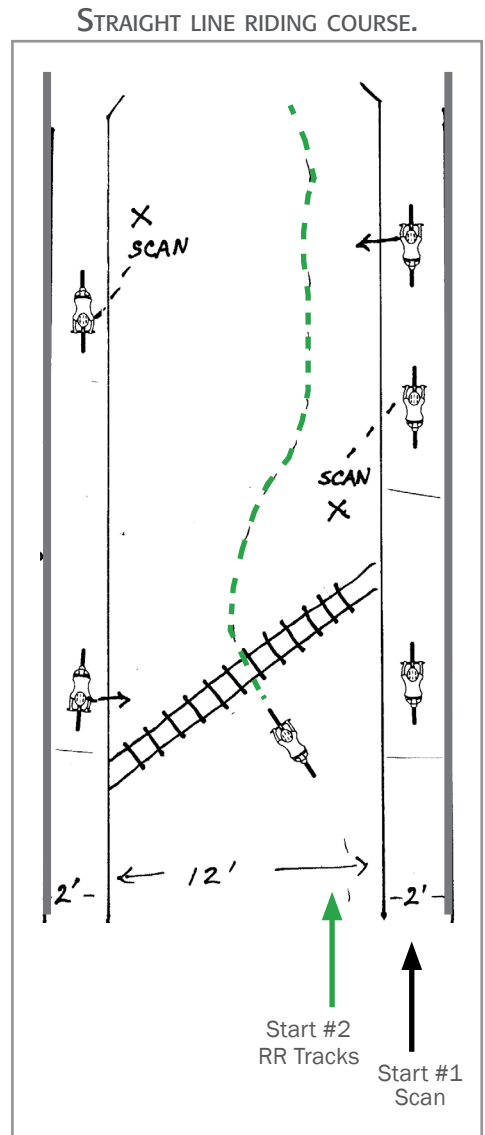


2. Practice the Whistle Stop. Stop as quickly as you can right where you are as if someone blew a whistle ordering you to freeze.
3. Quick Stop: Move your weight back over the rear wheel, keep pedals level, and squeeze the front brake up to 3 times as hard as the rear brake for more braking power. Let up on the front brake if you start to skid, as rolling over the handlebars can occur if you stop too quickly.

SCANNING AND STRAIGHT-LINE RIDING

Signaling isn't the only way to communicate with drivers. Scanning over your left shoulder communicates to drivers that you're intending to make a position change. It's important to continue riding in a straight line even while scanning.

1. Practice scanning behind with SASS while riding straight on a course similar to the straight line riding course diagram below (this is the same course used in the kids' unit). Call out what you see after looking over your left shoulder.
2. Rock Dodge: While riding straight, you come upon an object in the road unexpectedly and can't swerve out of the way. On the straight-line riding course, practice flicking your front wheel around an obstacle in the road without steering wide around it.
3. Shifting: The goal of shifting is to allow a bicycle user to maintain the same cadence – number of pedal revolutions per minute – as terrain changes. The most efficient cadence is 75 to 95 revolutions per minute, which feels fast for most people. Practice shifting while riding on the straight line course.

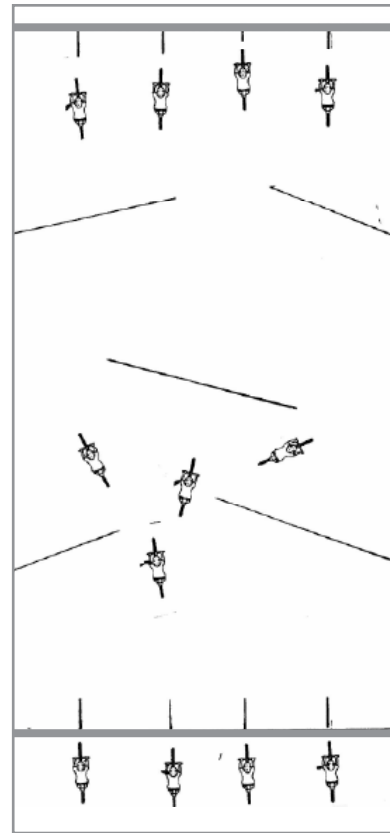


Other Handling and On-Bicycle Communication Practice

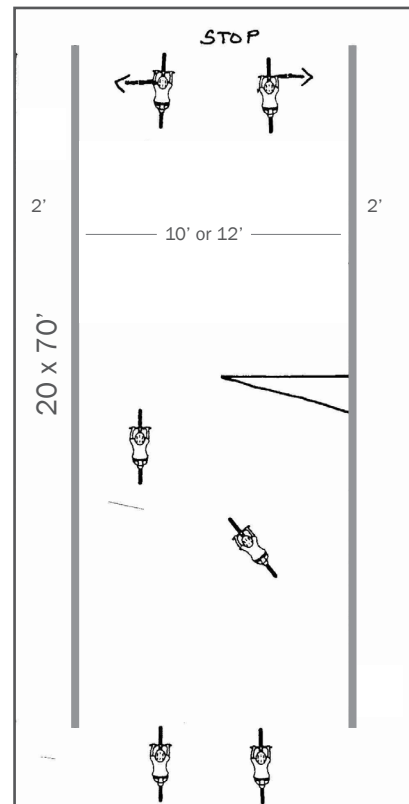
1. With other bicycle users, practice the Squeeze Box, which is like pinball with bicycle users, on a course similar to the one shown below (this is the same course used in the kids' unit). This reinforces the idea that all road users are working together to get to their destinations and builds on-bicycle communication and slow-speed handling skills.

2. Practice You Go First, which teaches nonverbal communication and cooperation. Lay out a course similar to the diagram below (this is the same course used in the kids' unit). Have a pair of bicycle riders stand next to each other and start together. Once started, the rider on the left indicates whether or not the rider on the right should go first around the obstacle. At the end of the course, both bicycle users come to a complete stop, look all ways, and signal either right or left, depending on position, before returning to the start.

3. **PRACTICE THE INSTANT TURN:** If a motorist turns unexpectedly in front of a bicycle user, the bicycle user can turn faster than he can stop. This maneuver allows the bicycle user to turn right at a 90° angle to go parallel to the turning car. Instigate a sharp right turn by flicking or "punching" the handlebars to the left, then follow through by turning the handlebars to the right. Complete the turn with the inside pedal up, looking up at where you're going. Avoid braking throughout the maneuver.



SQUEEZE BOX COURSE.



YOU GO FIRST.

SQUEEZE BOX IN ACTION:

1. Four riders start together as a team.



2. All cyclists ride around the obstacles, waiting for slower riders within the squeeze box, finishing together as a team.



3. Everyone comes to a complete stop, looks all ways, and signals either right or left, depending on position, and returns to the start along the outside of the box.



REAL ROAD PRACTICE

Real-world practice is the only true way to learn about bicycle skills and principles. Riding through a quiet three- or four-way stop intersection, practice the skills learned earlier:

1. Obeying all traffic principles.
2. Riding in a straight line to be predictable to others.
3. Lane positioning indicating where the bicycle user is going.
4. Obeying traffic signs and signals.
5. Changing lanes or moving out into the lane using SASS.
6. Use nonverbal communication: eye contact, nod, look behind.
7. Avoiding driveway ride outs.
8. Left and right turns with stop and signal, including yielding to oncoming traffic when necessary.



Avoid driveway ride-out. Practice leaving a driveway by stopping and looking left, right, left, as if there was an invisible stop sign at the end of the driveway.



Lane positioning for right and left turns. More to the left side of the lane for a left turn, and more to the right side of the lane for a right turn. Use SASS to move out into the lane well before the intersection.

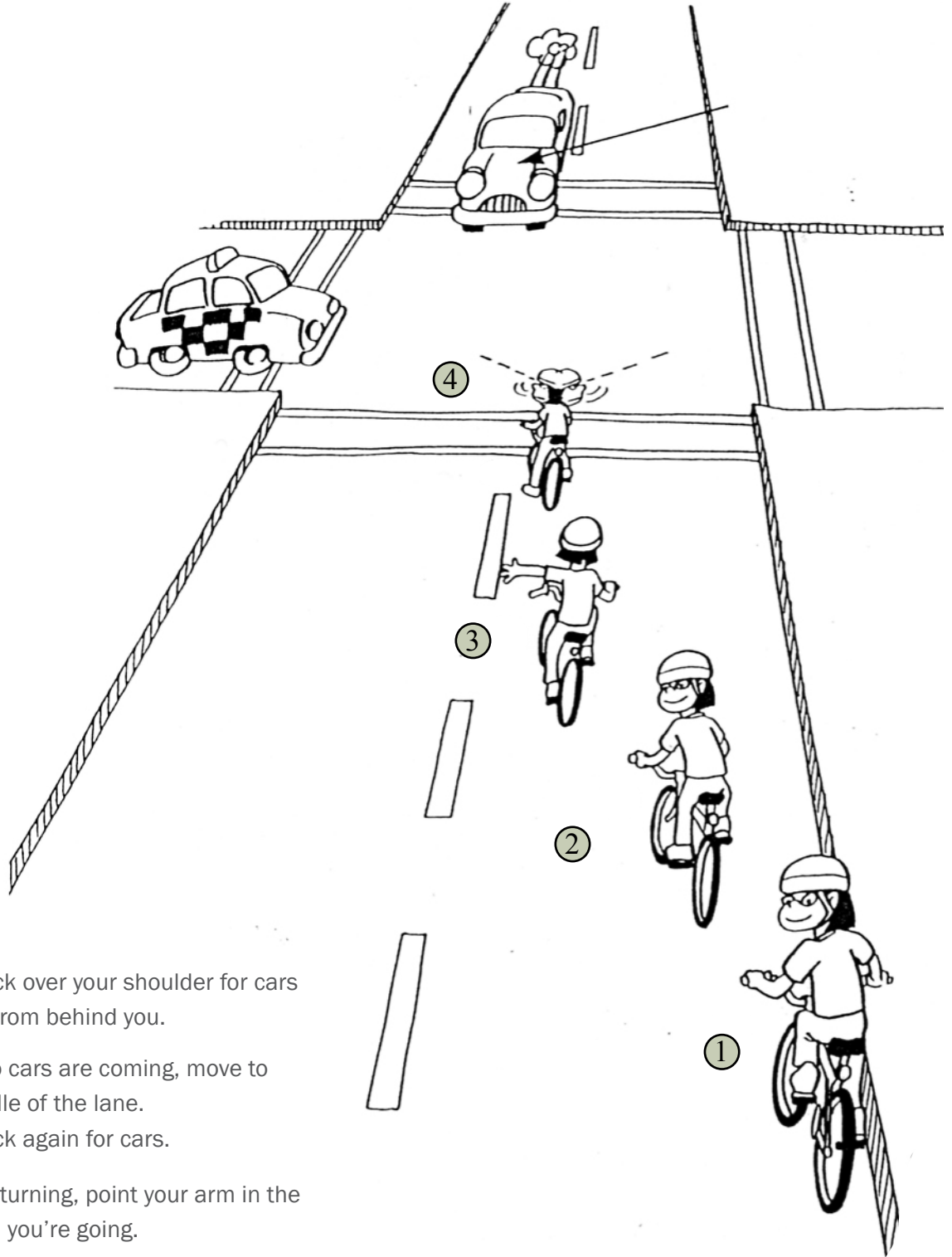


Left turn that includes a complete stop, including foot down, looking left, right, and left again, and a signal.



Left turn as pedestrians if the intersection is too busy to ride through. Right turn that includes a complete stop and signal.

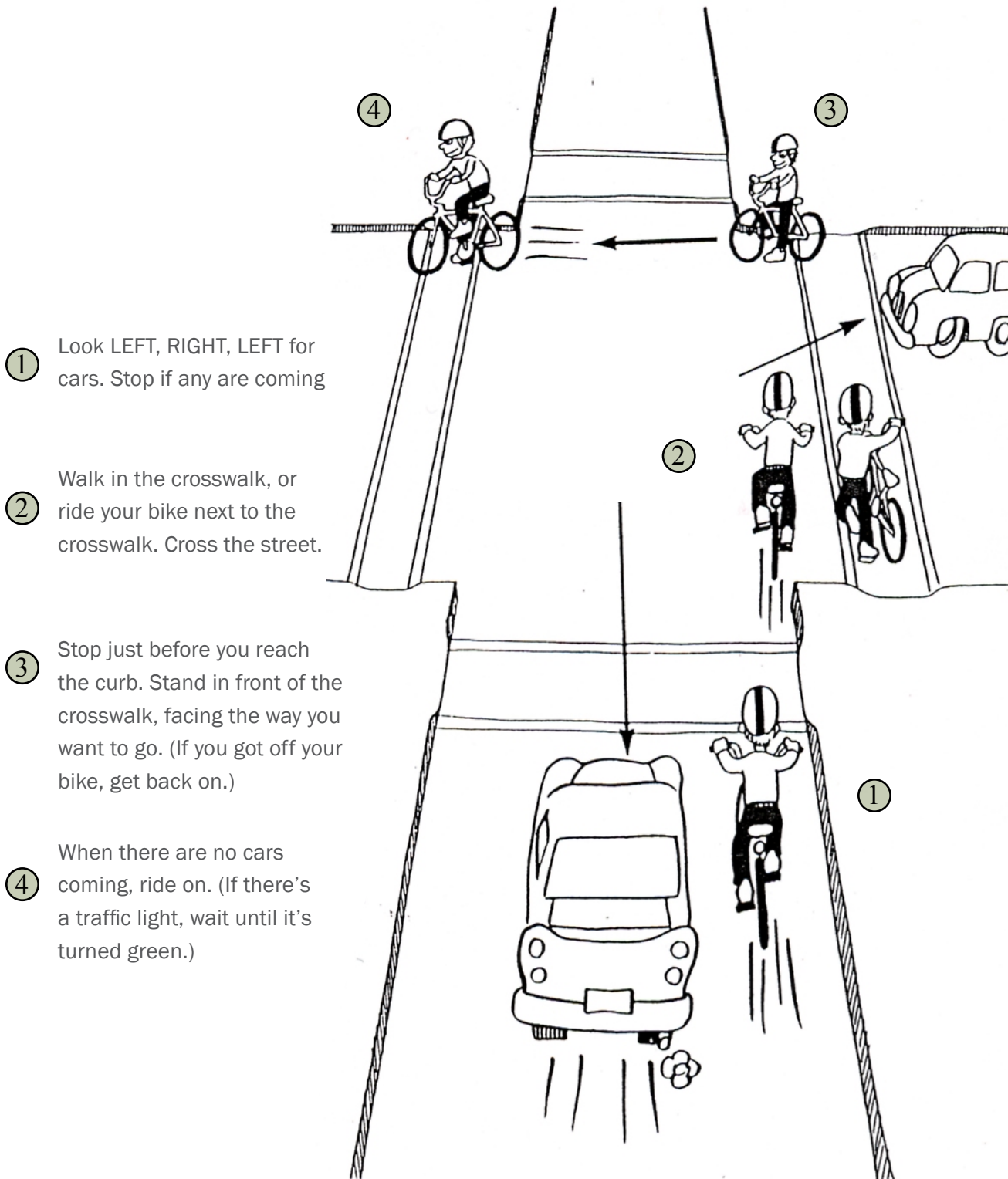
LEFT TURN AS VEHICLE



- ① Look back over your shoulder for cars coming from behind you.
- ② When no cars are coming, move to the middle of the lane. Look back again for cars.
- ③ If you're turning, point your arm in the direction you're going.
- ④ If you're turning onto another street, look LEFT, RIGHT, LEFT down that street. If cars are coming, let them pass. Then turn.

LEFT TURN AS VEHICLE

LEFT TURN AS PEDESTRIAN



① Look LEFT, RIGHT, LEFT for cars. Stop if any are coming

② Walk in the crosswalk, or ride your bike next to the crosswalk. Cross the street.

③ Stop just before you reach the curb. Stand in front of the crosswalk, facing the way you want to go. (If you got off your bike, get back on.)

④ When there are no cars coming, ride on. (If there's a traffic light, wait until it's turned green.)

LEFT TURN AS PEDESTRIAN

LESSON PLAN: WALK AROUND THE WORLD

GOAL: To help students appreciate walking and biking as way to travel; to enhance a geography or history by imagining a walk across a location of study

OBJECTIVES: STUDENTS WILL

- Track the number of miles they collectively bike or walk to school.
- Plot their collective progress on a map and use it as a starting point for further research

EQUIPMENT/MATERIALS:

- A map of a geographic area of interest to the class
- Travel diary form for each student
- String and scissors
- Internet or library research materials

INSTRUCTIONS:

- Choose a map of a location of interest to the class. Take into consideration the likely amount of travel your students will accumulate and scale your map choice accordingly. If you plan a short-term activity with a few students, for instance, a map of the entire US will not show a satisfying progress. A map of Mt. Rainier's Wonderland Trail, 100 miles long, may be a better choice.
- Display this map and explain to students that they will "travel" across this map as they tally the collective distance they walk or bike to school.
- Distribute a travel diary form for students to track the number of times they walk or bike to and from school.
- Once a week, the students will multiply the number of times they walked to school and from school by the number of miles from their home to school.
- Add all of the students' miles together and use the map scale to determine how many inches this represents on the map.
- Take a string and cut it to the length of the miles traveled.
- Pin one end of the string on the point of the map where the school is located.
- Stretch the string out and see where the students can go. Then decide as a class where they will go this week.
- Research that location. Using the internet, locate a school in that town and communicate via email with another class. Tell them what you are doing and survey them about how they travel to school.
- Decide as a class where their next destination will be and estimate how long it will take to get there.
- At the end of the month, see how far the class has gone. Discuss how long walking and biking can get you to where you want to go—even long distances.

LESSON PLAN: WALK AROUND THE WORLD

School Travel Diary

Name: _____ Grade or Class: _____

Distance from home to school : _____ Time period : _____

You can estimate the distance or measure it with a car odometer. If you have Internet access, you can plot the route and measure the exact distance by going to: [gmap pedometer.com](http://gmap.pedometer.com)

In the grid below:

1. Record the date you walked or biked to school
2. Put a checkmark (✓) in the correct column for that day
3. Multiply the number of times you walked or biked by the distance from your house to school.

Date	Walk or bike TO school	Walk or bike FROM school	Things I noticed along the way

Total times walked or biked: _____

Total number of miles traveled: _____

LESSON PLAN: WALK AROUND THE WORLD

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LESSON PLAN: ORAL HISTORY ABOUT WALKING TO SCHOOL

GOAL: Students will explore the issue of walking to school and examine how cultural norms have changed across generations.

OBJECTIVE:

- Students will interview grandparents or seniors about how they got to school as children and create and showcase an artistic display or story about the interview.

EQUIPMENT/MATERIALS:

- Any technology students wish to use for their interviews and displays, such as a voice recorder, camera, or pen and paper.
- Art materials depending on the kind of display the students would like to create (poster board, markers, tape, etc.)

PREPARATION:

INSTRUCTIONS:

- Partner with a neighborhood senior center or have students interview grandparents or other seniors from their own families.
- Introduce the subject of school transportation choice to the class by asking, “How did you get to school today?” Ask for a show of hands for people who were driven, took the bus, walked or biked.
- Explain that habits have changed in the past generation, and that the purpose of this assignment is to learn more by asking our elders about what it was like for them as children.
- Prepare for the interview by brainstorming a list of questions for students to ask.
- Students may conduct their interviews independently or as homework.

EXTENSION:

- If students interview their own family members, display the artwork at an open house or other school-wide event. If you partner with a neighborhood group, display the artwork in that lobby or communal space.

Safe Routes to School

Bike & Pedestrian Safety Education Program

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