

Freedom to Ride

Bicycle Skills Curriculum

Lesson 7

Hazard Avoidance



Acknowledgements

MOVE Santa Barbara County incorporated in 1995, and has taught bicycle education to youth and adults for over two decades. This curriculum is based on national guidance, our experience, and the suggestions and recommendations of educators, parents, community members and students. Our goal is to provide simple visually-driven guidance that provides the flexibility to tailor the program to work for a variety of schools and other educational programs. Bicycling is fun, good for the planet, good for your health and cost efficient. We want students to love to ride and to learn to do so safely, ensuring a lifetime of freedom to explore their worlds.

This curriculum would not be possible without the decades of support, guidance and dedication of individuals and organizations too numerous to mention.



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LESSON #7

HAZARD AVOIDANCE

INTRODUCTION

We designed this lesson to teach students how to avoid both small and large obstacles that they might encounter on the road. Unlike the other infrastructure that they have been learning about, these obstacles might pop up with little warning as they pedal around their neighborhoods. Learning how to recognize and react to these hazards safely will give students the confidence to get around under their own power, no matter what the road throws at them.

Objectives

After completing this lesson, your students will have mastered the following new skills:



Rock Dodge

How to avoid small obstacles in the road, like a rock or broken glass.



Hazard Dodge

How to avoid larger obstacles in the road, like a tree branch or improperly parked car, which may require maneuvering into traffic.



Quick Stop

Executing a rapid stop to avoid an obstacle without going over the bars or skidding.

PREPARATION

Materials

For this lesson, you will need the following materials:

- A bicycle for every student
- A helmet for every student or
 - Hair nets for every student if sharing helmets
 - Trash can for hair nets
- 4 stop signs
- 7 big cones
- 123 small cones
- 16 tennis ball halves
- 4 racquetball halves (“rocks”)
- 4 large sandbags (“hazards”)
- Directional arrows
- Sidewalk chalk
- Bicycle floor pump
- Chain lube and rags
- Large adjustable wrench
- Allen wrench multi-tool

small cone



big cone



Logistics

To teach the lesson you will also need the following:

- A secure paved space on your school campus. This could be a blacktop playground or parking lot.
- At least 3 volunteer assistants: 2 for the Learner’s Course, and 1 for the Group Ride. More assistants will allow a better student to adult ratio. See [Campus Support Guide](#) guide for tips on how to find assistants. See Page 9 for how to adjust the lesson with fewer assistants.



Classroom Prep

In the days leading up to the lesson, work with the classroom teacher on the following preparations:

1. Send home [Parent Notification Flier](#) to remind students and parents to bring their bikes on the day of the lesson, and to request parent volunteers.
2. Have all students watch:
 - For 5-9 year olds: https://www.pedbikeinfo.org/bicyclesaferjourney/el_en.html
 - For 10-14 year olds: https://www.pedbikeinfo.org/bicyclesaferjourney/mi_en.html



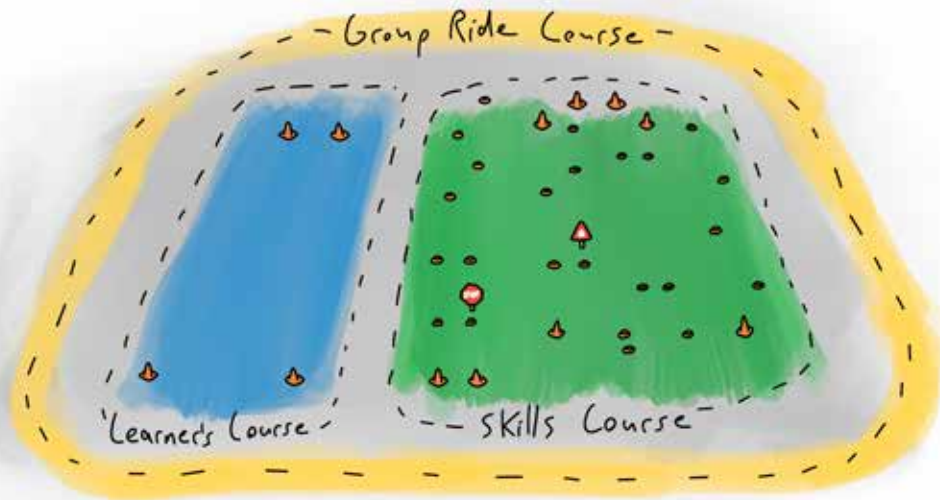
Duration

This lesson is designed around a 60-minute class period, though it can be modified based on your desired duration (see page 20).

- **Pre-Lesson Instruction** (10 min): Walk students through the bike and safety checks.
- **Course Assignment** (10 min): Divide students between courses based on skill level.
- **Lesson** (35 min): Instruct students on the core skills of the lesson, with those on the Skills and Group Ride Courses flip flopping halfway through.
- **Cleanup** (5 min): Gather bikes and helmets and discuss lessons learned.

Courses

During the Lesson period, students will ride one of these three courses:



Learner's Course

Here, the students who do not yet feel comfortable riding a bicycle can practice balance and pedaling with the help of your assistants.

Skills Course

This is the backbone of the lesson. Students will navigate obstacles, practicing skills from the Objectives as well as those from previous lessons.

Group Ride Course

As they wait for their turn on the skills course, students will go on an assistant-led loop ride, practicing skills from previous lessons.

Setup

On the day of the lesson, 30-40 minutes before the students arrive, work with your volunteer assistants to set up the three courses using cones, chalk, directional arrows, and traffic signs. You will also need to designate an area to stage bicycles and helmets. See the end of this lesson plan for a detailed diagram of the Skills Course, and page 14 for a detailed diagram of the Learner's Course.

PRE-RIDE INSTRUCTION

1. Set Expectations

Once the students arrive, they will likely head straight for the bikes and want to get riding as soon as possible. However, there are several key points to cover with them before they start pedaling so that everyone has a safe and fun day.

Each of the elements below is described in the second person so that you can use them as a script if needed. Emphasize that these are not about punishment, but making sure that everyone has a good time:



Listen to the instructor and assistants. If you don't, your ride could be over for the day.



Make sure to always wear a properly adjusted helmet when riding out on course.



Skidding, wheelies, and racing are not allowed. These can damage bikes and cause crashes.



Be kind and patient with your classmates. Help each other so that you can all ride together.

2. Distribute Bicycles and Helmets

Distribute plastic liners for the students to wear under helmets if they will be sharing.

If the students have brought their own bicycles, ask them to go stand next to theirs. If students are using provided bicycles, have your assistants assign them to bicycles that fit them best based on the illustration to the right. You will fine-tune fit and seat height later on in the lesson.

There should be at least 1-2" of clearance between the student and the bike when they are standing over it.



3. Toe to Head Check

Before students start riding, have them do a quick assessment of their clothing to make sure that they are visible to cars, and don't have loose items that might get caught in a wheel or chain.



Shoes

Tie your laces and tuck them into the side of your shoe, or under the top laces.



Pants

Roll up your right pant leg up to just below your knee and make sure to cuff it.



Loose Clothing

If you are wearing a sweatshirt around your waist, roll it into a tight noodle and tie it.



Colors

Wear bright colors so that drivers can see you and give you the space you deserve.

4. “2-2-2” Helmet Check

California law requires that youth 17 years and younger wear a properly fitted helmet while riding. Remind your students that they shouldn't just wear a helmet because it is the law: it protects your head and brain too! They can use two fingers to check all three of the adjustment points on the helmet. Have your assistants move around the group to help as you walk students through the following steps:



Forehead

You should only be able to fit *two fingers* between your eyebrows and the helmet. If the helmet tilts further back, it won't protect your brain.



Ears

Make the letter “V” with *two fingers*, and put them right under your ears. That is where the buckle or seam of your helmet straps should sit.



Chin

You should only be able to fit *two fingers* between your chin and the strap. If you can fit any more, your helmet could slip back in a crash.

Have your students shake their heads to ensure that the helmet is comfortable but doesn't move around on its own. Your assistants should double check each student's helmet to make sure they got the fit right.

5. Bicycle Check

Now that your students are ready to ride, it's time for them to give their bikes a quick once-over. We do this using a simple Safety Check, which students should do every time they go for a ride. Walk them through each of these steps, using your bike as an example. If any student's bike doesn't pass one of these steps, tell them to raise their hand and an assistant will help them fix it.

1. Air

It's pretty hard to ride on a flat tire. Check that yours are inflated by squeezing both your front and rear tires with your fingers. They should feel hard, not squishy.



2. Brakes

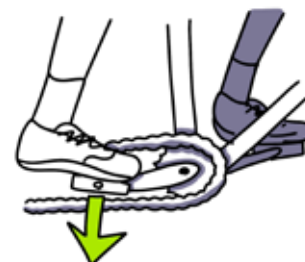
How would you come to a stop if your brakes were not working? There are different ways that you can check to make sure that they are functioning depending on the type of brakes you have:

- **Hand (Rim) Brakes:** If your bike has levers on the handlebar, it has hand brakes. These stop the bike when you pull them. To test them, stand over your bike, pull the left lever to activate your front brake, and rock your bike backwards and forwards. Then do the same with your right lever to activate your rear brake. Your bike shouldn't be able to move when a lever is pulled.

It is important to use both brakes at the same time. If you just grab the rear brake this can lead to an uncontrolled skid. If you just grab the front brake the bike can flip forward and send you over the handlebars.



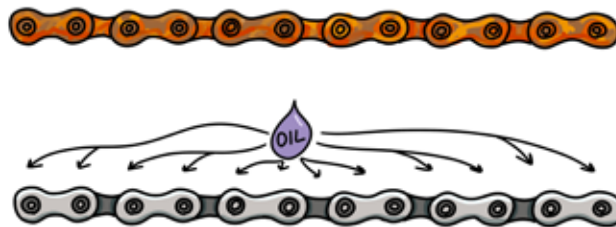
- **Coaster Brakes:** If your bike does not have brake levers on the handlebar, it has a coaster brake. This stops the bike when you pedal backwards. To test this, sit on the seat, put one foot on a pedal, and push backwards. While doing this, rock the bike backwards and forwards. It shouldn't be able to roll.



3. Chain

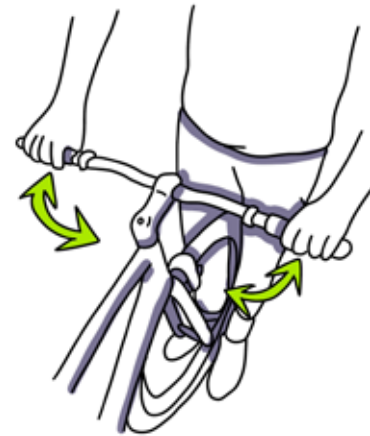
Your chain is one of the most important parts of your bicycle. It is what allows your pedaling to move the rear wheel. Without it you wouldn't be able to get anywhere fast! There are several things to check on your chain before riding:

- Is the chain dry or rusty and orange? If so, it might need some oil to function properly.
- For older students with geared bikes, have a classmate pick up your seat so the rear wheel of your bike is off the ground. Then rotate one of the pedals forward (clockwise) with your hand. This will make sure that the chain is properly seated on your gears before you start riding. If it is stuck between gears, it can break when you start pedaling.



4. Handlebars

Your handlebars not only help you steer your bike, but are home to your shifters and your brake levers. Making sure that they are properly tightened onto your bike is crucial. Imagine trying to drive a car with a loose steering wheel! To check this, stand in front of your bike, and grip your front wheel between your legs. Grab your handlebars and twist them side to side. They should not move. If they do, there are two ways to fix this depending on what type of stem your bike has.



If there are no bolts on the side of the stem, tighten the bolt on the top until the handlebars no longer twist.

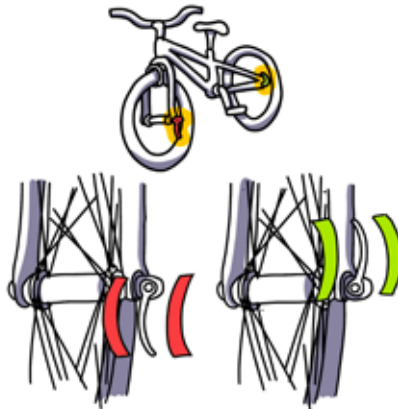


If there are bolts on the side of the stem, tighten them both equally until the handlebars no longer twist.

5. Wheels

Check to ensure that the wheels are secured tightly. Many bicycles have a quick release lever on the side of the wheel that holds it in tight. Flipping the lever into the tightened position should take a little bit of force. If it flips up too easily, or doesn't stay closed, tighten the nut on the other side of the hub.

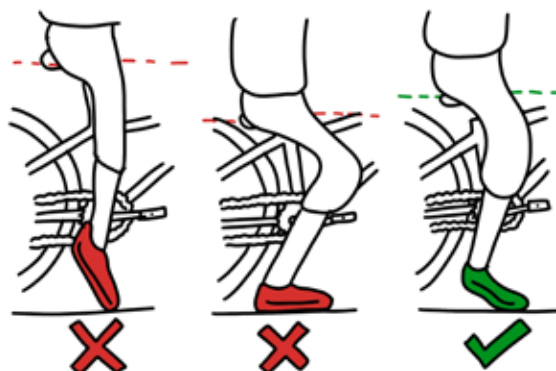
Some students may have bicycles where the wheels are held in place by bolts or a thru-axle instead of a quick release. Have an assistant with a large adjustable wrench and multi-tool with allen wrench circulate through the students as they do these checks to help tighten these as needed.



6. Seat

Proper seat height is key to enjoying your ride safely. When seated, the rider's feet should just be able to touch the ground. Note that for those just learning to ride, we will start with the seat slightly lower. This will be covered later on in the lesson.

On many bikes, proper height is controlled by a quick release lever located where the seatpost enters the frame. This lever functions the same way as the quick release on a wheel. When this lever is opened, it allows you to raise and lower the seatpost. Have your assistants work with each student to set proper seat height, and then close the lever in the same way that you did on the wheels.



LESSON

Course Assignment

After the safety checks, it is time to start the lesson. Divide your students into two groups:



Those who know how to ride



Those who are still learning to ride

Use the following steps to do this:

1. Tell the students, “If you know how to ride a bike, join us for quick lap around the lesson area.” Have any students who do not join this lap move to the Learner’s Course.
2. If any of the students who did join the lap are clearly still struggling to ride, have them also join the Learner’s Course.
3. If you have two or more assistants, split the remaining students who did complete the lap successfully into two groups. One will proceed to the Skills Course, while the other will continue riding laps with an assistant as part of the Group Ride. Halfway through the lesson, these two groups will switch areas.
4. If you only have one assistant, drop the Group Ride and have all the students who successfully completed the quick lap proceed to the Skills Course.

Starting The Lesson

Instruction will now begin simultaneously on all of the courses. We suggest having the PE teacher manage the Skills Course, the classroom teacher or an assistant manage the Learner’s Course, and a third assistant manage the Group Ride. Additional assistants can help on the Learner’s Course, or in specific places on the Skills Course as noted below.

Here is a breakdown of how to run all three of these courses:

1. Learner’s Course: pages 12-14
2. Skills Course: pages 15-18
3. Group Ride: page 19

Learner's Course Instruction

The Learner's Course is where the classroom teacher or an assistant, plus ideally 1 additional assistant (a 4:1 student to adult ratio is best) will help those students who are not yet comfortable riding a bicycle on their own. Share this portion of the Lesson with the adult who will be leading the instruction so that they are familiar with the skills progression.

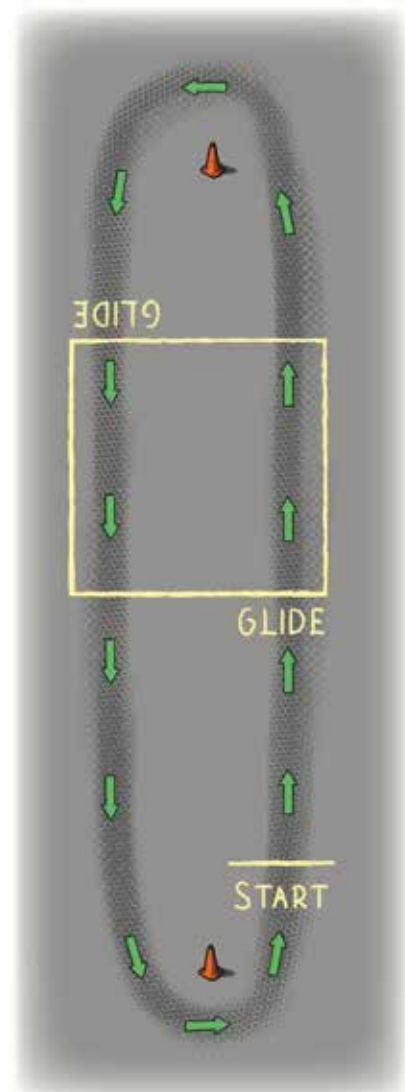
Teaching a kid how to ride a bicycle is one of the most fulfilling activities you can be involved in! Everyone learns at their own pace, so to take it slowly and let every student decide how quickly they are ready to move forward. Be supportive and maintain their trust. Make sure that all adults working on this course understand this, and have read their [Volunteer Guide](#).

Setup

The Learner's Course should be set up as a long narrow rectangle, with the students riding in a big loop. This allows them to ride in a straight line while mastering a particular skill. If there is a downward slope anywhere on the blacktop, use it! Students will master these skills faster if they have some momentum.

Directions

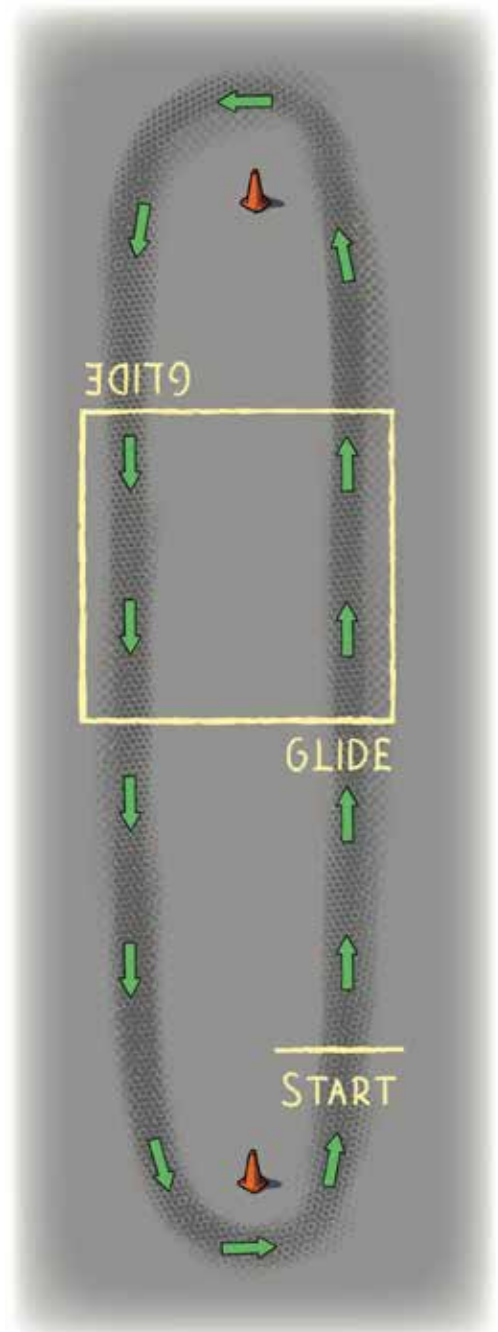
1. Have the students line up behind the designated start line.
2. Adjust each student's seat so that they can sit on the bike while also having their feet flat on the ground.
3. Adjust the seat on your own bike to the same height.
4. Demonstrate how to use your brakes:
 - Rocking forwards and backwards while standing over your bike, grabbing their brake levers (for hand brakes) or holding a pedal backwards (for coaster brakes).
 - For those with coaster brakes, explain how their bike will always stop when they pedal backwards.
5. While standing over your own bike, demonstrate how they can move forward by walking with their bike.
6. Then show them how they can push off the ground with one foot, then the other, and then lift their feet up to glide forward. We call this "Push Push Glide."



7. Have the students start walking around the course in a big loop while standing over their bikes as demonstrated, then progressing to Push Push Glide as they are comfortable. They should start with smaller steps for the Push Push portion, then proceed to larger steps as they are comfortable.
8. Mark off part of the area with chalk, and encourage them to glide when they are in this area.
9. As students master Push Push Glide, encourage them to try putting their feet onto the pedals during the Glide portion. You can say “Push Push Glide PEDALS!” to motivate them.
10. Once some of the students have gotten comfortable putting their feet on the pedals, have everyone pause wherever they are on the course and turn towards you.

11. Demonstrate with your own bike how to start from the Power Pedal Position:

- Rotate your dominant foot pedal at 2:00, or roughly parallel to the downtube of the bike frame.
- When ready, push down on hard the pedal, then hard on the ground with your other foot, and roll forward.
- Immediately bring your other foot onto the other pedal.
- Keep pedaling. The faster you go the easier it will be to balance.
- Hold your handlebars straight to avoid swerving.
- Don't look down, keep your head high and shoulders straight. Your bike will naturally want to go where you are looking.
- When ready to stop, use your brakes to slow down to a stop before taking your feet off the pedals.



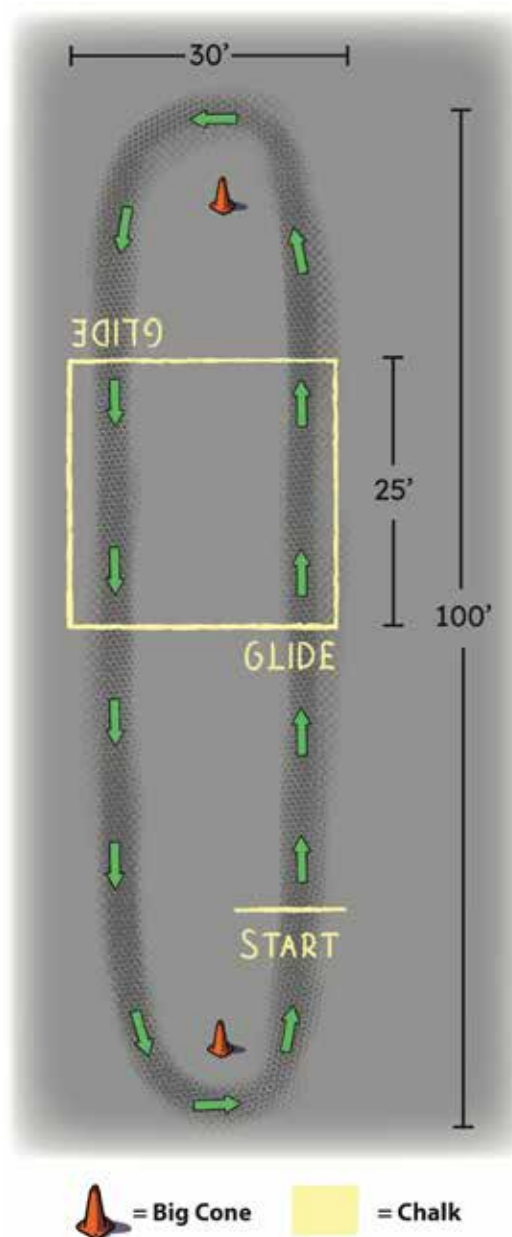
12. Have the students restart riding the course, with those who are ready to do use the Power Pedal Position doing so. The rest can continue to practice Push Push Glide.
13. If you have enough assistants, have one walk behind each student as they start from the Power Pedal Position to steady them if they lose their balance.

General Tips

- Whenever possible, avoid holding onto a student or their bike as they learn to balance. Kids learn to balance much better if they don't have an adult holding them up. If necessary, demonstrate the skills again on your own bike, then have them repeat it.
- If a student is working really hard and not getting it, take a water break and tell them they're doing a great job! You can also switch students with another assistant. Sometimes hearing the instructions in a different way will help the student progress.
- Students are dealing with learning a lot at once. Be patient and whenever you can, break down those components. This is a learning process for everyone!

Course Layout

Here is a diagram of the Learner's Course to help with setup. Feel free to modify as needed based on the space available at your school.



Skills Course Instruction

The Skills Course is where you will teach the primary skills of this lesson: dodging rocks, dodging larger obstacles, and quick stops. Using a course similar to that from Lesson #1, students will progress through the course in 3 phases, each with a different obstacle avoidance technique. Each phase should last 5-10 minutes, or until it is clear that students have mastered the new skill introduced in that phase.

Before students begin each phase, have them watch you ride the course once. Narrate what you are doing as you ride. Highlight where they should be practicing each skill. We have underlined these skills in the Directions. Once you finish, have the students ride through the course one at a time, counting to 10 after each student starts to space them out. Halfway through the class, have the students on the Skills Course switch places with those in the Group Ride.

Phase #1: Rock Dodge

Rock Dodge teaches students how to make a quick maneuver with the handlebars to avoid a small hazard in the road that can appear suddenly, like a rock or broken glass.

Objective

This phase will introduce the following new skill:

Rock Dodge

Maneuvering one's front wheel quickly around a small obstacle. The rear tire will then follow over the obstacle.

Describe to the students that in this course, the dodge involves a quick wiggle of the handlebars to the left then right, avoiding the racquetball "rock" while staying within the tennis ball markers. Explain that the wiggle works best if riders get a little bit of speed.

Explain that it is important to swerve left and then back to the right when avoiding obstacles because we want our final reaction to steer us away from potential traffic on the road. When we swerve left, we head toward the road and traffic, but our corresponding wiggle back to the right directs us away from the road and traffic.

Setup

Ensure that the rock dodge is set up properly, with a racquetball half in the middle of each lane, surrounded by four tennis ball halves. If the placement of the tennis balls is too wide, students may be inclined to ride straight through and alongside the center "rock" without wiggling. Make sure not to place the tennis balls too far apart (approximately 3-6") to force the students to execute that wiggle to avoid the racquetball.

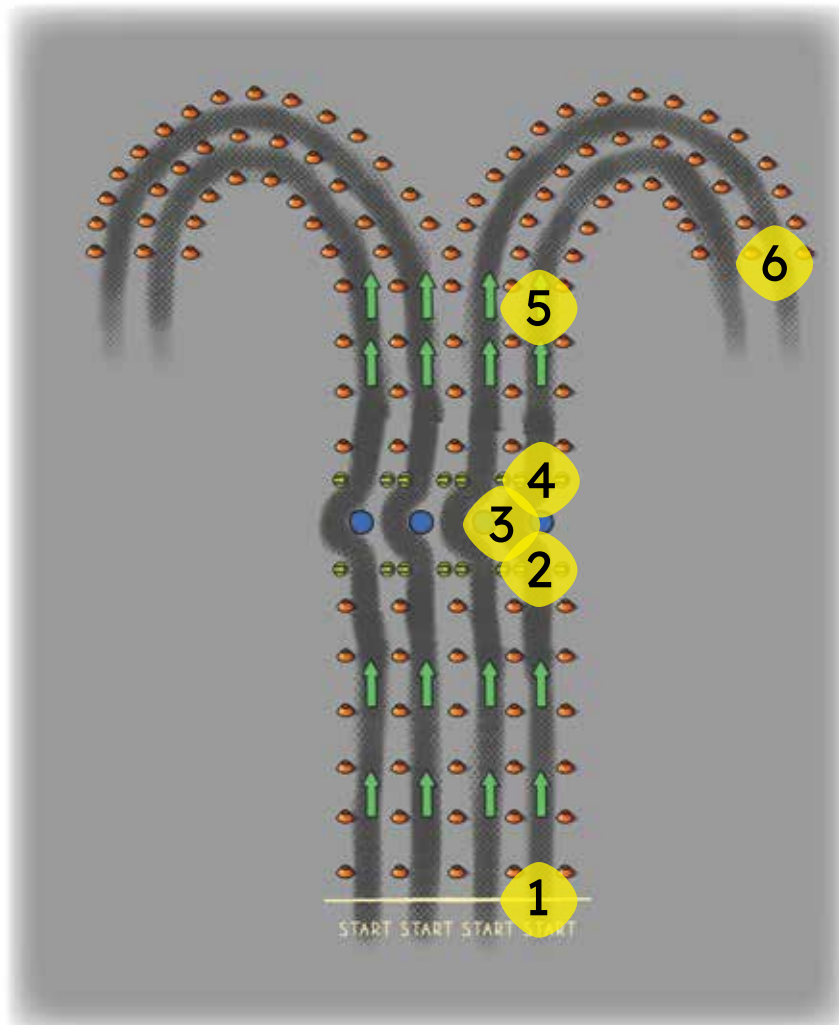
Divide the class into four equal groups, and have each group line up behind one of the four course lanes.

Phase #1: Rock Dodge (continued)

Directions

1. Pedal into the course, gathering speed before the “rock.”
2. Pass between the first set of tennis balls.
3. Dodge left around the “rock,” then wiggle back right to exit the obstacle through the second set of tennis balls.
4. Avoid hitting any of the tennis balls.
5. Once through the obstacle, ride the rest of the course.
6. Exit the course, returning to the start to try again.

Once the students have mastered this dodge, proceed to Phase #2.



Phase #2: Hazard Dodge

Hazard Dodge teaches students how to avoid large hazards like tree branches, large patches of gravel, or a vehicle parked in the bike lane. These obstacles are big enough that the rider must move further into the lane of vehicle traffic to avoid the hazard.

Objective

This phase will introduce the following new skill:

Hazard Dodge

Maneuvering around a larger obstacle that might require riding out into the street.

Explain to the students that this dodge requires three preparatory steps: see, scan and signal. This will prepare them for riding on the street, where they should regularly look at the roadway ahead to notice things they may need to respond to. While in line, have them practice scanning over their left shoulder and signaling left around the hazard.

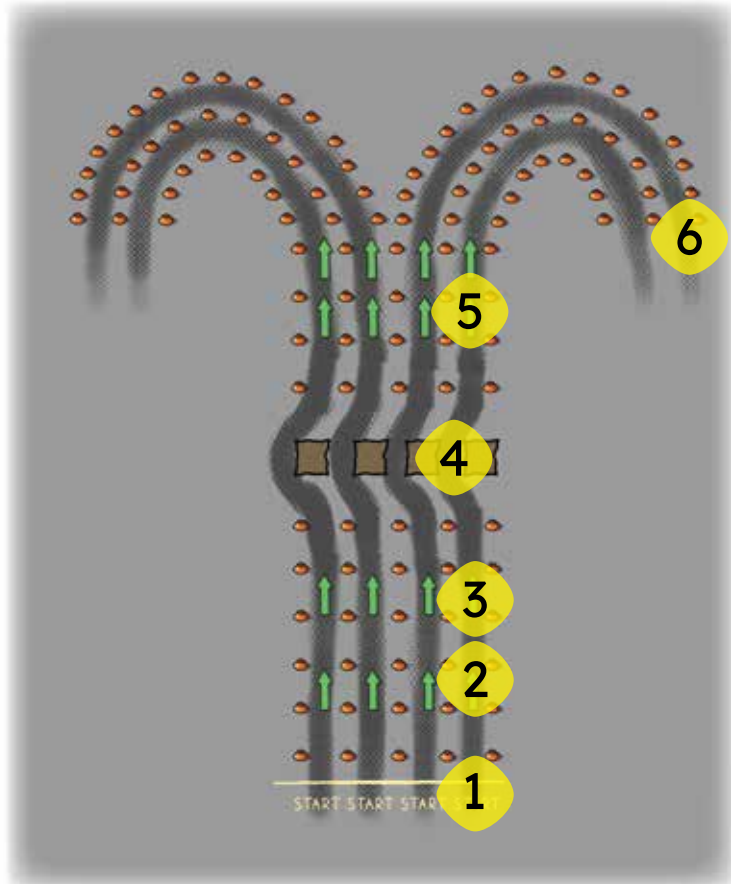
Setup

Remove the tennis balls and racquetballs from the course, and replace them with the four large sandbags as indicated in the course diagram below.

Divide the class into four equal groups, and have each group line up behind one of the lanes.

Directions

1. Pedal into the course, looking ahead at the “hazard.”
2. Before reaching the “hazard”, scan over your shoulder as if to look for vehicles coming from behind.
3. Signal left to show intent to move into the roadway while avoiding the “hazard.”
4. Put your hand back on the handlebars, and Dodge around the left side of the obstacle.
5. Once around the obstacle, return to the center of the lane and ride the rest of the course.
6. Exit the course, returning to the start to try again.



After students have mastered this skill, discuss with them what riders should do if they scan behind them and see traffic coming (answer: stop or slow down and wait for traffic to pass, then scan again and ride around the obstacle when safe). Proceed to Phase #3.

Phase #3: Quick Stop

The Quick Stop teaches students how to execute an emergency stop when they encounter an obstacle and have no time to think or respond, such as: a friend crashing in front of them, a dog jumping into the road, or a driver making a sudden right turn across the bike lane.

Objective

This phase will introduce the following new skill:

Quick Stop

Stopping rapidly to avoid an obstacle that one cannot dodge around. This requires picking up speed and using three actions to keep your bike in control:

- Using both brakes.
- Getting your pedals in the 'flat' position.
- Shifting your body weight back over the rear wheel.

Before starting this phase, take students on a quick lap around the lesson area to practice proper braking and flat pedal gliding. Explain that if we use only our brakes to stop, we could fly over the handlebars or skid uncontrollably. Show how standing up on the pedals and flat pedal gliding, while shifting our weight back, can prevent skidding.

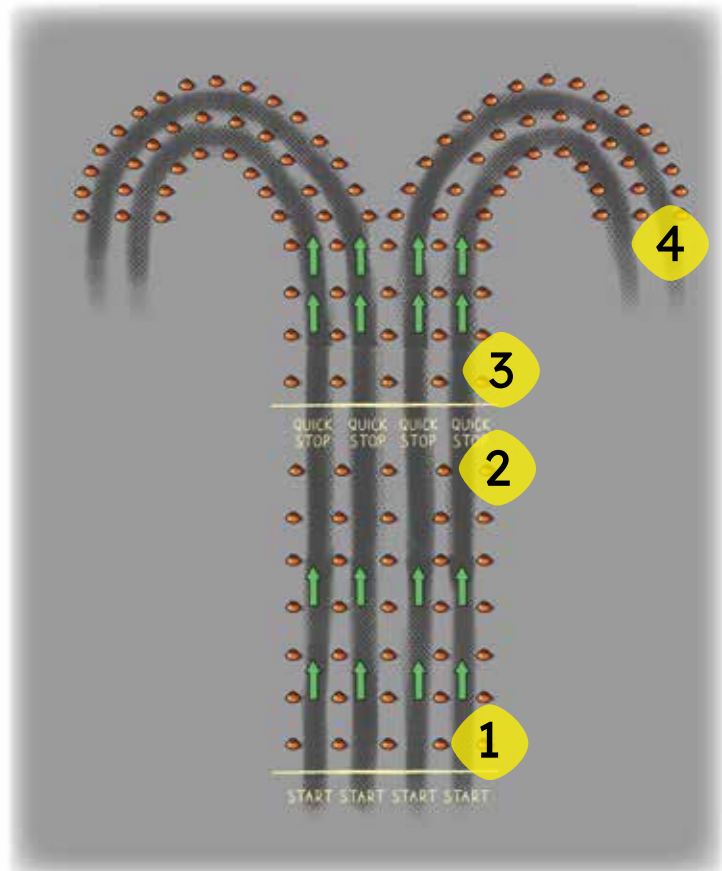
Setup

Remove the hazard dodge, and use chalk to draw the quick stop line in the course diagram below. Then, divide the class into four equal groups, and have each group line up behind one of the lanes.

Directions

1. Enter the course, picking up speed to approach the quick stop.
2. 6-8" from the line, simultaneously place pedals in flat pedal glide position, pull both brakes hard and move body weight as far over the rear tire as possible, executing a Quick Stop.
3. Restart, and finish the course, signaling as you pass the big cone.
4. Exit the course and return to the start line to try again.

Students are often timid doing this phase. To motivate them, consider sharing how moving one's weight further back while riding is used by many professional mountain bikers to avoid flipping over the bars when going down a steep hill.



Group Ride Instruction

The Group Ride Course is where an assistant takes the half of the class that is not participating in the Skills Course on follow-the-leader ride around the lesson area. Students should follow the assistant assigned to lead this ride, always maintaining 1-2 bike lengths between them and the rider in front. For this lesson, have the assistant call out the following skills as they ride around the lesson area:

- **Starting/Stopping:** The assistant can call out “stopping,” then slow to a stop. All riders behind them should pass the message on, and slowly come to a stop as the rider in front of them does.
- **Signaling:** Whenever the group is approaching a turn, call out “left turn” or “right turn,” and all riders should signal appropriately.
- **Scanning:** Call out “scanning,” and all students should practice looking over their left shoulder, while still riding in a straight line.
- **Slalom:** On a straight stretch of the ride, call out “slalom,” and the students should practice leaning right and left to gently weave their bikes left and right.
- **Flat Pedal Glide:** Call out “flat pedal glide,” and all the students should stop pedaling, keep their pedals level, and coast until you call out “pedal.”

If needed, you can also add in the following scenarios:

- **Big Circle Riding.** This activity gives the assistant a great view of the group, while making it fun to practice certain skills. The group rides in one big circle so everyone can see everyone else. This is a great time to practice one handed riding as a precursor to signaling. The instructor can shout out, “everyone put your left hand into the circle”, and then, “everyone put your right hand outside the circle”. If students can’t yet do this, they can practice just lifting their hand off the handlebar for one second.
- **Take It Wide:** Draw a 5’ long angled line with chalk on the pavement. Tell students to “take it wide” by maneuvering their bicycle in a wide turn that allows them to cross the line at a perpendicular angle. This activity teaches students to always cross railroad tracks and driveway lips with their bike perpendicular to the obstacle, as they do on the Skills Course in this lesson.

Lesson Modifications

These lessons are built around a 60-minute class period. If needed, you can modify the Skills Course portion to better fit the duration of your PE class. Here are a few suggestions:

Make it Shorter

- Consider dropping Phase #1 (rock dodge), and just focusing on Phase #2 (hazard dodge) and Phase #3 (quick stop).
- Combine all three obstacles into a single phase by putting one in each lane (repeating one obstacle twice). Have students alternate between lanes so that they can practice will all three obstacles.

Make it Longer

- Add additional phases with new skills introduced in each:
 - Simulate riding up a curb by placing a 4”x4”x12’ across the lane that students must pick up their front wheel to get over.
 - Add to this in the subsequent phase by turning that “curb” into a ramp, adding a 1’ wide and 6’ long board in each lane that students must ride up, then roll off the small drop. This simulates riding off of a curb.
 - Add 2”x4”s at an angle across all lanes, simulating railroad tracks like in Lesson #6.

Cleanup

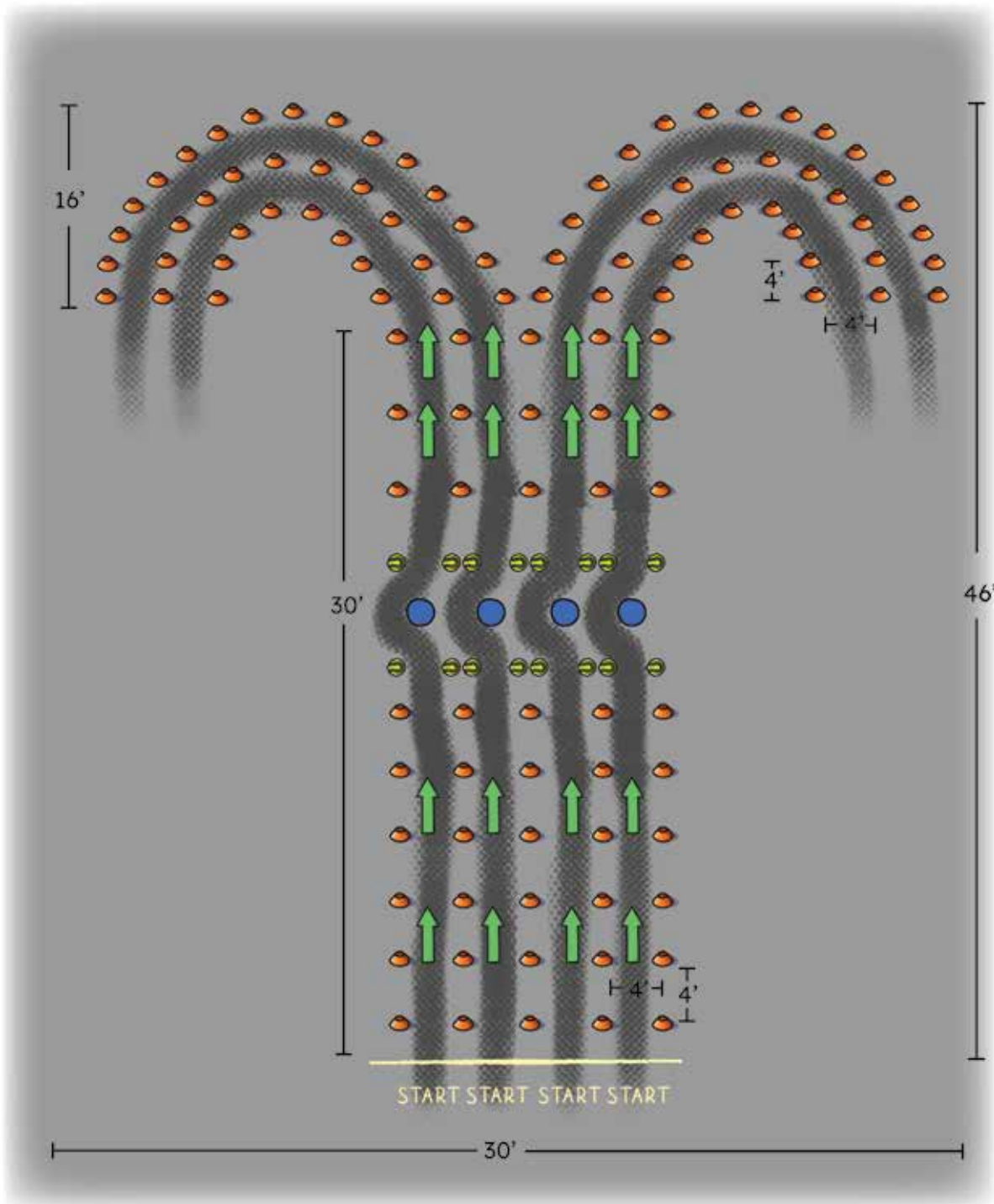
Once the lesson is finished, have the students help you pick up the cones, signs, etc. They should also return all their bicycles to the staging area, setting them up as they found them at the beginning of the lesson. If there is time, consider gathering everyone in a group and asking them the following questions:

1. What skills have you learned today? Can you describe them?
2. What was the hardest part of the lesson?
3. What was the most fun part of the lesson?

Finally, give them a brief description of the next lesson, and get them excited about the new skills that they will learn! Remind them that this whole series of lessons isn’t just a fun school activity: this will help them safely navigate their neighborhoods and give them the freedom to get where they want to go.

Skills Course Layout

Here is a diagram of the Skills Course for Phase #1 to help with setup. Feel free to modify as needed based on the space available at your school.



-  = Big Cone
-  = Small Cone
-  = Chalk
-  = Half raquetball
-  = Half tennis ball