



Lesson developed by North Carolina Dept of Transportation and adapted for use in CA by the Sonoma County Bicycle Coalition Safe Routes to School program



**Time:** 30-40 minutes

## Bicycling Basics

*Studies have demonstrated that skill-building activities are the most effective way to promote student retention of bicycling safety skills. Lesson objectives set the stage for building safety skills, which are emphasized through students' participation in class activities. This curriculum does not cover every possible scenario that a child may encounter as a bicyclist but instead addresses the basic skills needed to be a safe bicyclist. Teachers should use their discretion to break up material to accommodate their daily schedules. The Skill-Building Activity is an essential component to this curriculum, and all lessons should be complemented with the reinforcement of safe bicycling behavior. More time can be spent on practicing skills if children are already familiar with the core material.*

### Lesson Objectives

The objective of this lesson focuses on identifying risky behaviors and hazardous situations and learning how to avoid them. Children will learn how to signal their intentions and react to communications from pedestrians and other vehicle operators.

The children will be able to:

- Use proper hand signals,
- Identify and avoid risky behaviors,
- Identify and avoid hazards when riding, and
- Respond appropriately to others.

### Why This Lesson is Important

Children need to learn where to bike and how to ride on the street safely, once they have their parent's or guardian's permission. Because bicycles are vehicles, children need to understand and obey all traffic laws, including signaling their intention. Learning to identify and avoid risky behaviors and road hazards will also help them bicycle safely.

## Applicable Standards of Learning

The Essential and Guidance Standards listed below were prepared for the state of North Carolina. Correlations to California State Content Standards are not available at this time, with the exception of Common Core as listed below.



### Essential Standards

4.PCH.4.2: Identify personal protection equipment needed for sports or recreational activities.	5:MS.1: Apply competent motor skills and movement patterns needed to perform a variety of physical activities.
4.MS.1: Apply competent motor skills and movement patterns needed to perform a variety of physical activities.	5.C.1.1: Use a variety of postures, gaits, and mannerisms to express a variety of characters in the presentations of stories.
4.C.1.1: Use a variety of postures, gaits, and mannerisms to express character in the presentation of stories.	5.C.1.3: Construct original scripts using dialogue that communicates ideas and feelings.
4.C.2.1: Use improvisation to tell stories and express ideas.	5.C.2.1: Use improvisation to create characters and solve problems.

### Common Core

CCSS.Math.Content.4.MD.C.5: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.	
CCSS.Math.Content.4.MD.C.6: Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	
CCSS.Math.Content.4.MD.C.7: Recognize angle measure as additive. [...] Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems.	

### Guidance

RED.C.2.1: Identify situations from your daily life in terms of problems and solution strategies.
EEE.SE.1.2: Illustrate personal responsibility in a variety of settings and situations.
P.SE.1.2: Use self determination to build independence.
I.SE.1.2: Integrate personal responsibility into the way you live your life on a daily basis.

# Bicycling Basics

Grades

**4-5**

Lesson 2

## Materials

- Computer and projector to view “*Bicycling Basics*”
- “*Bicycling Basics*” video download
- Parts of the Bicycle Diagram
- Sample child sized bicycle(s) for Skill Building Activity
- Bicycle Inspection Form (Homework)
- Parent/Caregiver Tip Sheet
- Parent Notification Letter and Consent Form (Instructor’s Guide, Appendix B)

## Preparation

Review the ***Let’s Go Biking!*** lesson video “***Bicycling Basics***” to understand how the video will supplement the classroom discussion and see a demonstration of how the skills taught in this set of lessons are performed by children in realistic settings. Reviewing this material will assist you in leading on-bicycle skill drills if you choose to conduct them.

Set up AV equipment in advance and be prepared to ask children the questions indicated during the video pauses. Use the explanations in the lesson plans, as needed, to help children understand the key concepts.

Confirm that volunteers are ready to assist you with setting up and conducting on-bicycle skill drills if you choose to conduct them.

Remind children to bring their Consent Form back to school before beginning on-bicycle skill drills if you choose to conduct them.

## Part 1 – Discussion and Demonstration

► **Time:** 25-35 minutes

1. **Signal Your Intentions**
2. **Avoid Risky Behaviors**
3. **Stay Out of Trouble**
4. **Identify and Avoid Hazards**
5. **Safely React to Others**

## Introduction

*Today we’ll learn how to signal to others on the road, how to avoid risky behaviors and how to identify and avoid potential road hazards. Before you ride your bike, always ask your parent or guardian for permission.*

Show “***Bicycling Basics***” video that coordinates with Lesson 2. Pause where indicated by the video and discuss the points raised. The main points and explanations are given below.

Review the Rules of the Road from Lesson 1:

- Ride with traffic.
- Stop at driveways.
- Yield to pedestrians.
- Heed sirens.
- Obey traffic signs and signals.
- Remember that bicycles are vehicles.

### 1. Signal Your Intentions

When cars were first introduced, drivers were required to use their left arm to signal turns and stops. Bicyclists today are still required to use hand signals to communicate with other road users and prevent crashes.

- **Right Turn:** In California, to signal a right turn, put your left arm out with your forearm up at a 90-degree angle. Alternative signal: put right arm out straight.
- **Left Turn:** Take a quick look back for traffic and put your left arm out straight. Moving to the left to avoid an obstacle or turning left both require a quick scan behind for traffic before changing position.
- **Slow or Stop:** Put your left arm out with your forearm down at a 90-degree angle.

**Note:** in the corresponding North Carolina produced "Bicycling Basics" video, the narrator only refers to the "left-arm right hand" turn signal and not the alternative "right arm out straight" right hand turn signal that is legal and acceptable in California. Be sure to pause the video and let students know that both right hand turn signals are legal in California.

### Discussion Opportunity Hand Signals

Which hand signals should the bicyclists use?

Ask children to demonstrate the maneuvers indicated in the video using a hand signal with their left arm (or right arm if using alternative right turn signal):

- Right Turn
- Move Left for obstacle
- Stop
- Left Turn



Right Turn



Slow or Stop



Left Turn



Alternative  
Right Turn

## 2. Avoid Risky Behaviors

*Bicycling involves your full attention. You should take extra care to prepare each and every time you ride. There are many things that you can do to minimize problems that you will encounter by conducting yourself responsibly when you ride.*

- **Put Items in a Backpack:** Carrying things in one hand or looped over the handlebars reduces the bicyclist's control of the bike and makes it difficult to use hand signals.
- **Don't Carry Other People:** Riding double changes the way a bicycle handles, puts weight where it doesn't belong, and makes it harder to steer and use the brakes.
- **Never Ride Against Traffic:** This puts bicyclists where motorists don't look for traffic and causes many turning and crossing collisions. It also makes it very difficult for the bicyclist to see and obey traffic signs and endangers other bicyclists riding with traffic.
- **Obey All Traffic Signs or Signals:** Ignoring traffic lights and stop signs leads to many car-bike crashes. Bicyclists should stop when the traffic light turns yellow as there isn't enough time to cross the intersection before the other traffic gets the green light to go.
- **Take Ear buds Out:** Listening to music while riding your bike is risky because you are unable to use the sense of hearing to help you detect a dangerous situation. Distractions will reduce your ability to make good decisions.
- **Call for a Ride Home:** Children shouldn't ride at night or in the rain. It can be dangerous even with head and taillights, especially because motorists may be sleepy or their vision may be reduced. Rain can also make the road slick and reduce the effectiveness of hand brakes. This makes it harder to turn and stop. In these situations, call for a ride home or walk your bike.

## 3. Stay Out of Trouble

*No matter what mode of transportation you take, there is always an element of unpredictability. A storm could wash tree branches into the roadway or a dog could run into the street. There's little control you have over these situations, but if you consistently **scan for dangers** as you bike, **plan your move** around the trouble spot and **do it** you can stay safe while you ride.*

These are the steps to "staying out of trouble":

1. Scan for Dangers
2. Plan Your Move
3. Do it!

### Discussion Opportunity

#### Avoid Risky Behaviors

Talk about what can go wrong and what children can do to avoid risky behaviors during the pauses in the video:

- Where should you carry things?
- What should you do if you have two people and one bike?
- Where should you ride your bike on the road?
- What should you do at a traffic light or stop sign?
- What should you do if it gets dark?
- What should you do if it starts to rain?

### Discussion Opportunity

#### Avoid Hazards Stay Out of Trouble

Talk with children about what kind of hazards they might encounter while riding a bicycle.

Discuss with children how to react to the situations shown in the video using the step to Stay Out of Trouble:

- Tall bushes at the corner
- Broken glass in the road
- A loose dog on the side of the road
- Railroad crossing

Why is each step important?

1. Scan for Dangers
2. Plan Your Move
3. Do it!



#### 4. Identify and Avoid Hazards

##### Visual Barriers

- **Bushes Block Motorist's View:** Plants and trees can block the view of the road. A motorist driving down the road may not see a bicyclist leaving the driveway and the bicyclist may not see the motorist.
- **Parked Cars:** These parked cars can also keep motorists and bicyclists from seeing each other, particularly if one of them is entering the roadway.

##### Problems in the Roadway

- **Hazards:** Potholes, fallen branches and broken glass can cause a fall, damage the bicycle's wheel or give you a flat.
- **Dogs:** Pets running loose can cause bicyclists to crash or swerve into the opposite lane in front of traffic.
- **Railroad Tracks:** Bicycle tires can get caught in the space between the road and the track, and the rider could be thrown from the bike. Briefly scan behind for traffic and then ride over the tracks at a 45 to 90 degree angle.

#### 5. Safely React to Others

*You may get cues from other vehicles lights, signals, or situation context that helps you decide what you should do. Pay attention for the following:*

- **Left Turn Signal From Front of Vehicle with Lane Position Cues:** Left-turning motor vehicles may not see an oncoming bicyclist. Cars will generally position themselves in the lane to indicate which direction they are turning. Take notice of left turn signals or cars positioning themselves to make a left turn. You should make eye contact with the driver or stop to allow the driver to turn ahead of you.
- **Right Turn Signals from the Rear of a Vehicle:** A right-turning motorist may suddenly slow down and cross in front of a bicyclist to make the turn. Be on the lookout for right turn signals. Be ready to stop and allow the car to turn ahead of you.
- **Brake Lights:** Watching for these can help predict that the motorist is slowing down or stopping.
- **Back-Up Lights:** These white lights indicate a motorist is backing up and may not see the bicyclist.
- **Parked Car with Person Inside:** A vehicle door may be opened in the bicyclist's path, the motor vehicle may pull out into the street, or it may be about to back up.

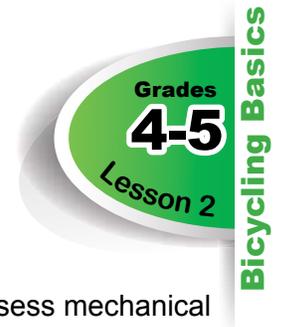
#### Discussion Opportunity

##### Safely React to Others

Discuss the cues to look for from other vehicles and what they mean. What cues does a driver give for you to react to? How should you react?

- A vehicle in front of you is about to make a right turn
- A vehicle in front of you is about to make a left turn
- A vehicle that is approaching is about to make a left turn
- A vehicle is braking and slowing down
- A vehicle is backing up
- A person is sitting in a parked car

## Part 2 – Activity



► **Time:** 10 minutes

The Bike Equipment Activity will make it much easier for you and your volunteers to assist kids with getting ready at the beginning of each on-bicycle portion of the course in Lessons 3-5. Go through these examples to give kids a better understanding how to assess mechanical problems with their bicycles.

- Go over bicycle vocabulary using the **Parts of the Bicycle Diagram**.
- Point to a part on the bike and have kids respond with the appropriate term.
- Using the sample bike you have in the classroom, ask children to demonstrate various parts of the ABC Quick Check. You may wish to intentionally “adjust” the bike so there are three things wrong with it and challenge the children to find them.

### Review (optional)

► **Time:** 5 minutes

The instructor will review the lesson with these questions/actions:

- Ask children to name the rules of the road.
- Have children demonstrate the hand signals for turning and stopping.
- Ask several children to each name a different hazard to watch out for.
- Quickly show a few signs and signals (railroad crossing, yield, flashing yellow light), and ask children what cyclists should do when they see this sign or signal.

### Homework

Using the **Bicycle Inspection Form** at the end of this lesson, evaluate your bike and helmet with a parent/caregiver. Assess whether it is safe to ride. Use the form to have them help you make adjustments to your bike so it is ready to ride.



## Suggestions for a Balanced Curriculum

Grades  
**4-5**  
Lesson 2

*These optional activities are included to extend the lesson into other areas of learning. Most activities presented may be completed within a 20-minute time period, or may be assigned as homework opportunities.*

### Arts Education

Create a skit about bicycle hazards. Divide the class into groups of 6-8 children. Each group is tasked with writing a skit about bicycle safety, and each person in the group must be a character in the story. In the story, a bicyclist or several bicyclists must react to hazards they encounter along the way to a destination. The skit should include dialogue between characters. Allow children to make simple props and use creativity to represent characters and actions in the story.

Below are some examples of hazards that could be included in the skit:

- Cyclist is riding past a driveway where cars may be entering or exiting.
- A cyclist is exiting a driveway where shrubs block the view of the driver on the street.
- A driver in a parked car opens the door as a cyclist is approaching on the same side.
- A cyclist is riding through a parking lot where a car's back-up tail lights show a car may be backing out of a parking spot.
- Three cyclists are riding in the street and see unleashed dogs that may not be friendly.
- A cyclist is approaching an intersection at the same time as a motorist talking on a cell phone.
- A cyclist is approaching an intersection going straight, and one car plans to turn right in front of the cyclist while a motorist coming from the other direction plans to turn left across the path of the cyclist.
- A pedestrian is crossing in front of a cyclist even though the red pedestrian signal says it is not safe to cross.
- A cyclist is wearing headphones and doesn't hear an ambulance approaching from behind.

Have each group present the skit to the class.

### Mathematics

What role do circles play in your life? We could not make bicycles without circles. Show children a bicycle wheel. A circle is a very unique geometric shape. The circle allows the bicycle to roll smoothly on surfaces creating fewer bumps and less friction than an octagon with its sides and corners.

#### **Measuring Circumference**

Take a bicycle and draw a line with a sharpie on the front tire. Have a student roll a bicycle down the sidewalk a short, specific distance, using chalk lines or a marker (rock, tree, etc.) to show the student where to start and stop. Line up the line on the front tire with the line on the chalk for the starting point. Ask children to estimate how many times the wheel went around.

Measure the circumference around the wheel by wrapping a string around its perimeter. Hold the string tightly and have children cut the string exactly where the two ends meet. After measuring the string, have children report the circumference. Have children measure how far the bicycle wheel traveled.

With the measurement of the tire's circumference and the measurement of how far the bicycle wheel traveled, children can find out how many times the bicycle wheel went around. Have children set up the problem and find the answer.

### **Measuring Angles**

Draw a simple bicycle wheel on the board, dividing the wheel with spokes. It is best not to use a real bicycle wheel but to simplify it using a diagram.

Angles are geometric shapes that are formed where two rays share a common endpoint.

Should the angle of the spokes in the wheel be more or less than  $90^\circ$ ?

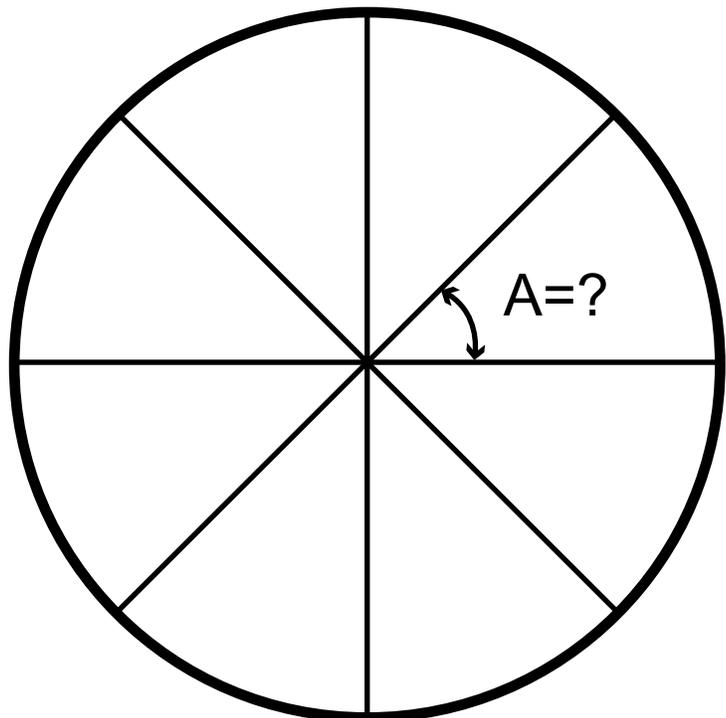
Have children measure the first ray of the angle. What is the measurement?

If all of the angles are equal size, what is the total number of degrees in the circle? (A)

Have children set up the problem and solve it. ( $A^\circ \times 8 = X$ )

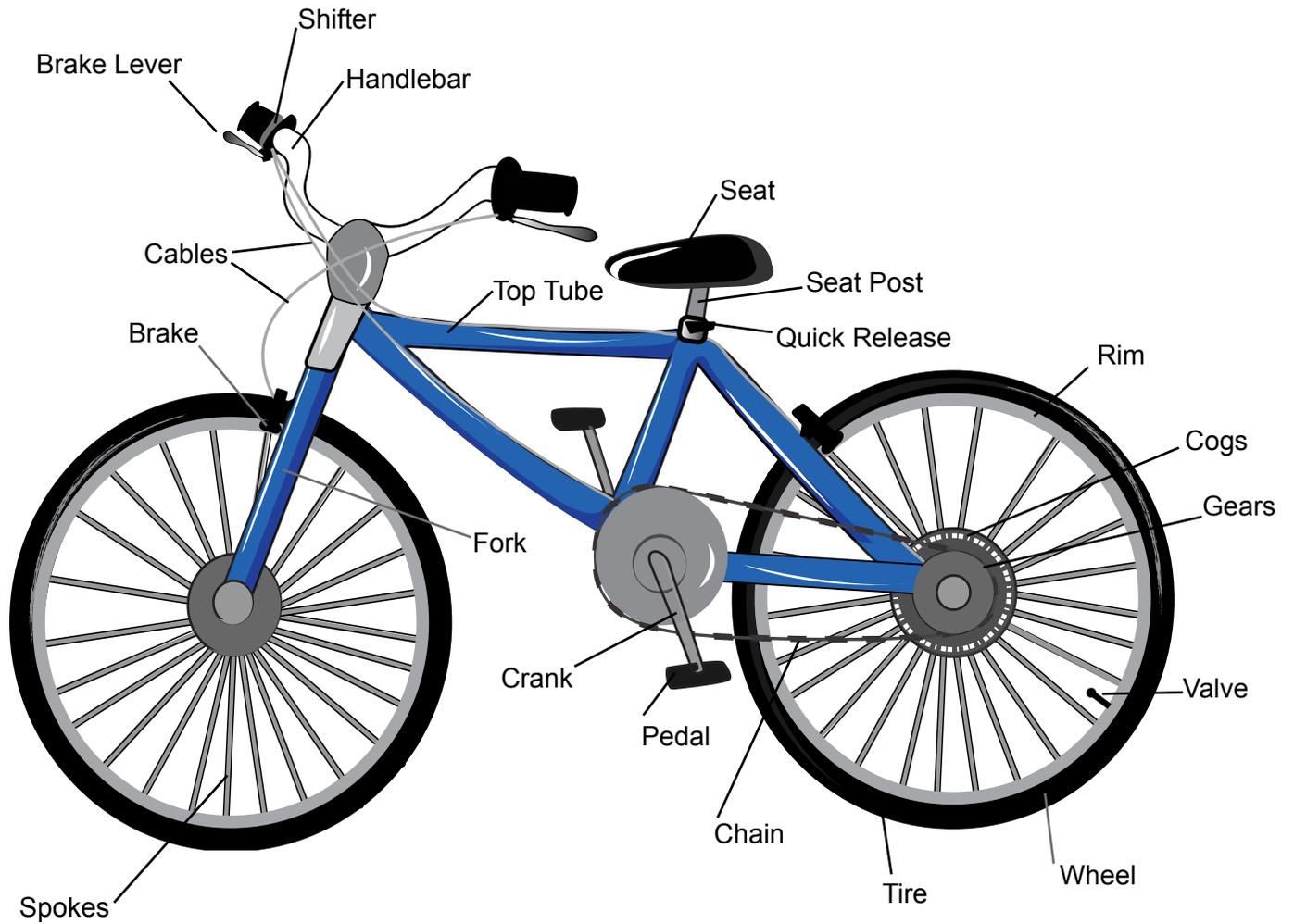
If the bicycle has 28 spokes, what is the measurement of each angle?

Have children set up the problem and solve it. ( $A^\circ \times 28 = 360$ )



## Parts of the Bicycle Diagram

To make sure your bike is ready to ride, it's important to know the various components that make up a bicycle so you can check your bike to make sure it's safe before you ride.





## Parent/Caregiver Tip Sheet

### Cycling on Sidewalks or Separate Paths

The brain of a child less than 10 years old is not sufficiently developed to handle the bicycle AND make the decisions necessary to safely interact with traffic. It is recommended that they bicycle on sidewalks or paths when they ride. Understanding your child's development can help you to decide when they've mastered the skills to move from cycling on the sidewalk or paths to cycling in the roadway.

**Development of Motor Skills** - School-age children typically have fairly smooth and strong motor skills. However, they vary widely in coordination — especially eye-hand, endurance, balance and physical endurance. Practice cycling with your child to help them develop good coordination.

**Cognitive Development** - Since brain maturation is not complete until a child is older, the average 7-year-old may take twice as long as an adult to respond to a stimulus. Children are on average around 10 when they are able to combine the skills needed to handle the bicycle AND think about traffic and rules of the road. As children are developing these skills they need more supervision because they:

- Expect others to look out for them,
- Do not understand complicated traffic situations,
- Overestimate their knowledge and physical strength,
- Focus on one thought at a time,
- Assume that a driver can see them if they can see the car,
- Think cars can stop instantly.
- Have a field of vision that is one-third smaller than an adult's so they have minimal peripheral vision,
- Have difficulty determining from which direction sounds are coming,
- Have difficulty estimating the speed of a car, and
- Have difficulty recognizing dangerous situations.

#### Help your child bicycle safely by understanding these precautions:

- Check the law in your state or jurisdiction to make sure sidewalk riding is allowed.
- Watch for vehicles coming out of or turning into driveways.
- Stop at corners of sidewalks and streets to look for cars and to make sure the drivers see you before crossing.
- Enter a street at a corner and not between parked cars.
- Alert pedestrians that you are near by saying, "Excuse me," or, "Passing on your left," or use a bell or horn.





## Hoja de Consejos para Padres/Tutores

### Andar en bici en las aceras o caminos separados

El cerebro de un niño menor de 10 años no se ha desarrollado lo suficientemente como para manejar la bicicleta y tomar las decisiones necesarias para interactuar de forma segura con el tráfico. Se recomienda que los niños circulen en las aceras/banquetas o caminos cuando andan en bici. Comprender el desarrollo de su hijo/a puede ayudarle a decidir cuándo haya dominado las habilidades necesarias para pasar de andar en la acera o caminos a circular en la calle pública.



**Desarrollo de habilidades motoras** – Los niños en edad escolar generalmente tienen las habilidades motoras fuertes y controladas. Sin embargo, varían mucho en cuanto a la coordinación - en especial la visiomotora, el equilibrio y la resistencia física. Practique el ciclismo con su hijo/a para ayudarle a desarrollar una buena coordinación.

**Desarrollo cognitivo** – Dado que la maduración del cerebro no está completa hasta que el niño sea mayor, el niño promedio de 7 años de edad puede tomar el doble de tiempo que un adulto para responder a un estímulo. En promedio los niños tienen alrededor de 10 años cuando son capaces de combinar las habilidades necesarias para manejar la bicicleta y pensar en el tráfico y las reglas de circulación. A medida que los niños van desarrollando estas habilidades, necesitan más supervisión debido a que:

- Confían en que los demás los van a cuidar,
- No entienden las situaciones de tráfico complicadas,
- Sobreestiman sus conocimientos y su fuerza física,
- Se centran en un pensamiento a la vez,
- Suponen que el conductor de un vehículo los pueda ver si ellos pueden ver el vehículo,
- Creen que los autos se pueden parar al instante,
- Tienen un campo de visión que es un tercio más pequeño que el de los adultos, por lo que tienen una visión periférica mínima,
- Tienen dificultad para determinar la dirección de donde llegan los sonidos,
- Tienen dificultad para estimar la velocidad de un automóvil, y
- Tienen dificultad para reconocer situaciones de peligro.

### Ayude a su hijo/a a andar en bicicleta de forma segura mediante la comprensión de estas precauciones:

- Revisar la ley en su estado o jurisdicción para asegurarse de que está permitido circular por la acera.
- Estar atento de los vehículos que salen o que entran en las entradas o vías de acceso.
- Hacer alto en las esquinas de las aceras y calles en busca de autos y para asegurarse de que los conductores lo vean antes de cruzar.
- Incorporarse a una calle por una esquina, y no entre dos autos estacionados.
- Alertar a los peatones sobre su cercanía, diciendo, "Con permiso" o "Rebasando por su izquierda", o utilizar una campana o bocina.

# Bicycle Inspection Form

Child Name \_\_\_\_\_

Go over the parts of the bicycle. Use this form and the Parts of the Bicycle Diagram given to you in class today to inspect your bike with an adult. Circle any issues on your bicycle that need to be addressed before you ride!

<b>Bike Size</b>	Too Small	Too Big		
<b>Seat</b>	Too Low	Too High		
<b>Handlebars</b>	Crooked	Loose		
<b>Wheels</b>	<u>Front</u> Low Pressure Wobbles Spokes Missing Tires Worn Tire Bulge	<u>Rear</u> Low Pressure Wobbles Spokes Missing Tires Worn Tire Bulge		
	<u>Left</u> Missing Doesn't Spin Bent	<u>Right</u> Missing Doesn't Spin Bent		
<b>Foot Brakes</b>	Not Working	Chain Too Loose		
<b>Hand Brakes</b>	<u>Front Brakes</u> Worn Pads Hits Rim Hits Tire	<u>Rear Brakes</u> Worn Pads Hits Rim Hits Tire		
	<b>Cables</b>	Housing Cracked	Missing Housing	
<b>Gears</b>	Don't Work	Broken Cables	Needs Adjustment	
<b>Chain</b>	Rusted	Gritty	Tight	Loose
<b>Helmet</b>	Purchase	Too Small	Too Big	Needs Adjustment



Inspection Notes: \_\_\_\_\_

\_\_\_\_\_

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