



Elisse M., Citrus Heights, California

California Pedestrian and Bicycle Safety Curriculum for Grades 4 and 5

California Safe Routes to School Technical Assistance Resource Center, a program of California Active Communities, a joint Unit of the University of California, San Francisco and the California Department of Public Health, and funded by the Federal Highway Administration through a Safe Routes to School Non-infrastructure award from the California Department of Transportation (Caltrans), in collaboration with the California Department of Education's California Healthy Kids and After School Resource Center.



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For more information visit:

<http://www.casaferoutestoschool.org/>

Introduction to the Pedestrian and Bicycle Safety Curriculum

Safe Routes to School programs make walking and bicycling to school safer and more accessible for children, including those with disabilities, and increase the number of children who choose to walk and bicycle. Safe Routes to School programs can benefit communities by enhancing children’s health and safety, well-being, and academic performance; easing traffic congestion and air quality near schools; and improving community members’ overall quality of life.

Through this series of nine lessons, based on Safe Routes to School program elements, fourth and fifth grade students will learn how to be safe pedestrians and bicyclists and understand the positive impacts that walking and bicycling have on their health and the environment. The curriculum emphasizes the importance of physical activity and pedestrian and bicycle safety skills while encouraging students to develop healthy habits that benefit both their physical and academic development. By participating in these lessons, students will gain real-life safety skills. They will evaluate how safe their neighborhoods are for pedestrians and bicyclists and be empowered to take action to make their neighborhoods safer. Students will learn how to make decisions that keep themselves, their community, and the earth, safe and healthy.

The lessons in this curriculum are designed as a supplemental resource, so teachers and after-school providers can easily integrate key Safe Routes to School components into their existing lesson plans. The lessons can be taught consecutively as a unit or can be done as stand-alone activities. Suggested times are noted for all of the lesson components to allow teachers the flexibility to pick and choose the most appropriate activities.

The curriculum is aligned with the Common Core State Standards (CCSS), the National Health Education Standards, and the California Health Education Standards. The lessons are integrated with English Language Arts (ELA), Mathematics, Science, and Physical Education. The alignment with CCSS and integration with core subject areas allow the important messages of the Safe Routes to School program to be introduced along with grade-level requirements.

LESSON 1: Time to Get Moving!

LESSON OVERVIEW

This is a two-part lesson that encourages students to make a physical activity goal and track their progress towards attaining that goal. In Part A, students will learn about the benefits of physical activity and the recommended amount of daily physical activity (60 minutes). Students will make a plan for fitting in 60 minutes of physical activity every day and track their progress towards that plan.

In Part B, students will share how they did or did not follow their physical activity plan and compare data about the effects of physical activity. Part A should be done at the beginning of this lesson series; Part B can be done after one week or at the end of the entire lesson series. If you wait until the end of the unit, have students fill out the *Let's Get Moving* worksheet every week.

OBJECTIVES

- Plan how to fit in 60 minutes of physical activity per day.
- Understand the mental and physical benefits of physical activity.
- Make a physical activity goal and track progress towards that goal.

TOPIC

Health Benefits of Walking and Bicycling to School
(Physical Education Focus)

STANDARDS SUPPORTED IN THIS LESSON

Common Core State Standards for Mathematics

Grade Four

- **4.NBT.B.4** (CCSS.Math.Content.4.NBT.B.4): Fluently add and subtract multi-digit whole numbers using the standard algorithm.
- **4.MD.A.2** (CCSS.Math.Content.4.MD.A.2): Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Grade Five

- **5.NBT.B.5** (CCSS.Math.Content.5.NBT.B.5): Fluently multiply multi-digit whole numbers using the standard algorithm.

California Health Education Content Standards

Nutrition and Physical Activity – Grade Five

Standard 1: Essential Concepts

- **1.10N**: Describe how physical activity, rest, and sleep are related.
- **1.11N**: Identify physical, academic, mental, and social benefits of regular physical activity.

California Physical Education Content Standards

Grade Four

- **5.1**: Set a personal goal to improve an area of health-related physical fitness and work toward that goal in nonschool time.
- **5.2**: Collect data and record progress toward attainment of a personal fitness goal.

Grade Five

- **5.2**: Work toward a long-term physical activity goal and record data on one's progress.

LESSON 1: Time to Get Moving!

National Health Education Standards for Grades Three to Five

Standard 1: Essential Health Concepts

- 1.5.1: Describe the relationship between healthy behaviors and personal health.
- 1.5.2: Identify examples of emotional, intellectual, physical, and social health.

PART A

MATERIALS NEEDED

- *Walk Around the Block!* worksheet (1 per student)
- *Make a Physical Activity Plan* worksheet (1 per student)
- *Let's Get Moving!* worksheet (1 per student)
- Timer or stopwatch (1)
- Sticky notes (5 per student)
- Chart paper (2 pieces)

PREPARATION ACTIVITIES

- Make copies of *Walk Around the Block!*, *Make a Physical Activity Plan*, and *Let's Get Moving!* worksheets.
- On the top of one piece of chart paper, write “**Why People Are Physically Active.**” On the other write “**Why People Aren't Physically Active.**”
- You may want to solicit parent volunteers to supervise students as they walk around the block.

Optional:

- * Read more about the Physical Activity Guidelines for Americans:
<http://www.health.gov/paguidelines>
- * Read more about the health benefits of exercise:
<http://mayoclinic.com/health/exercise/HQ01676>
- * Read more about the Physical Activity Guidelines in California:
http://www.californiaafterschool.org/articles/CASPA_Guidelines.pdf

STEPS FOR CLASSROOM ACTIVITY

Why Should We Be Physically Active? (15 minutes)

- Ask the class what they think physical activity is. Call on students to share their ideas about what constitutes physical activity. Tell students that there are three kinds of physical activity: endurance, strength, and flexibility. Endurance is developed when people do activities that make their hearts beat faster, such as running. Strength is developed by activities such as weight lifting and crossing the monkey bars. Flexibility means that muscles move easily. Flexibility is developed through activities such as stretching.
- Ask the class what kinds of physical activity they like to do. Briefly talk about different kinds of physical activity. Mention how walking and bicycling are great ways to be physically active while moving from one place to another. Ask students to share ways that they develop endurance, strength, and flexibility through physical activity.

PREPARATION TIME

10 minutes

ACTIVITY TIME

60 minutes

VOCABULARY

Endurance—The ability to keep going; developed through activity that gets the heart pumping.

Flexibility—The ability of muscles to move easily.

Strength—Physical power.

LESSON 1: Time to Get Moving!

- Hand out five sticky notes to each student. Ask students to think about reasons why people are physically active and reasons why people are not physically active. Have students write one reason on each sticky note. Ask students to come up and post their sticky notes on either the “**Why People Are Physically Active**” chart paper or the “**Why People Aren’t Physically Active**” chart paper.
- Review and discuss the factors that cause people to be physically active or not to be physically active.

Benefits of Physical Activity (10 minutes)

- Look at the sticky notes that the students put on the chart paper. Pick out the sticky notes that mention benefits of physical activity (for example, people may exercise because it helps them get stronger). Lead a discussion on the benefits of physical activity. Be sure to mention the following benefits:
 1. Improves concentration and performance in school.
 2. Reduces the risk of health problems (heart disease, diabetes, stroke, some types of cancer, overweight, or obesity).
 3. Improves sleep.
 4. Improves mood.
 5. Increases energy.

Walk Around the Block (25 minutes)

- Tell the class that children and teens should do at least 60 minutes (1 hour) of moderate-to-vigorous physical activity every day. Explain that moderate-to-vigorous physical activity gets your heart pumping. A slow stroll is not moderate-to-vigorous activity, but a brisk walk is. In order to understand how much walking that would be, tell students they are going to time how long it takes them to quickly walk around the block.
- Take the class outside. Tell students that you will time how long it takes them to quickly walk around the block. If you have parent volunteers, ask them to accompany students as they walk around the block. If you do not have parent volunteers, walk around the block with your class.



Olivia M., Citrus Heights, California

Note: You may alternatively have students walk around the track, field, or blacktop instead of the block.

- Determine a starting and ending point, perhaps at the front of the school. Tell the students that this is not a race and that they should try to walk at about the same speed (a brisk walk). Start the timer as the class leaves the starting point. As students come back to the starting/ending point, tell them their time. Remind them to remember their time and/or write it down. If you are walking with your class, have the class walk together and report how long it takes for the group to return to the starting point.
- After coming back to the classroom, have students share how long it took them to walk around the block. Ask students if they were surprised by their times or not. Have students fill out the *Walk Around the Block!* worksheet.

LESSON 1: Time to Get Moving!

Make a Physical Activity Plan (10 minutes)

- Remind students of the recommendation for children and teens to get at least 60 minutes of moderate-to-vigorous physical activity per day. Explain that these 60 minutes do not have to be done all at once. For example, a student could walk 20 minutes in the morning, play 20 minutes of soccer at lunch, and bicycle 20 minutes in the afternoon.
- Tell students that they are going to make a plan for fitting in at least 60 minutes of physical activity per day. The plan does not have to be followed exactly, but students should use the planning process as an opportunity to identify times of day when they might be physically active and the kinds of physical activity they might do. Advise students to pick activities that are realistic. For example, before planning on swimming for an hour, think about whether it's possible to get to the pool. Remind students of any recess times they might have at school and suggest that they plan to be physically active then. Ask students how they might be physically active by playing games at recess. Encourage students to plan on walking or bicycling to school.
- Have students fill out the *Make a Physical Activity Plan* worksheet. Explain how to fill out the *Let's Get Moving!* worksheet for homework. Throughout the week, be sure to check in with the class to make sure students are filling out their homework. Stress that the important thing is getting 60 minutes of physical activity per day, not necessarily sticking exactly to the plan. If students stray from their plans, they should note how and why on the *Let's Get Moving!* worksheet.

PART B

MATERIALS NEEDED

- Chart paper (1 piece)
- Sticky notes (1 per student; 1 per week if more than one week of physical activity was recorded)
- Blank white paper (1 per student)
- *The Benefits of Physical Activity* worksheets (1 per student)

PREPARATION ACTIVITIES

- Make copies of *The Benefits of Physical Activity* worksheets.
- On the top of one piece of chart paper, write "How Much Physical Activity Did We Do Per Week?" Draw the following on the bottom of the chart paper.

0-60 61-120 121-180 181-240 241-300 301-360 360-420 421-460 461+

STEPS FOR CLASSROOM ACTIVITY

How Much Were We Physically Active? (15 minutes)

- Have students take out their *Let's Get Moving!* worksheet. Give each student one sticky note for each week that you had them record their physical activity. On the sticky note, have students write how many minutes of physical activity they did in one week. Have students place their sticky notes on the bar graph that you set up on chart paper.
- After all the students have added their sticky notes to the bar graph, circle the number 420 on the bottom of the graph. Remind students that the goal was to get 420 minutes of physical activity per week (60 minutes per day).

PREPARATION TIME

10 minutes

ACTIVITY TIME

60 minutes

VOCABULARY

Endurance—The ability to keep going; developed through activity that gets the heart pumping.

Flexibility—The ability of muscles to move easily.

Strength—Physical power.

LESSON 1: Time to Get Moving!

- Ask the class how much physical activity most students did. By looking at the actual numbers reported on the sticky notes, ask the class to consider how many students met the goal of 420 minutes of physical activity per week.
- Discuss obstacles that prevented students from meeting their physical activity goals. How could students overcome these obstacles in the future?

Benefits of Physical Activity (20 minutes)

- Have students fill out *The Benefits of Physical Activity* worksheets.
- As a class, talk about the students' findings. Ask the class to consider the data they collected and determine whether or not there were consistent correlations between amount of physical activity and sleep, mood, energy level, and concentration.

Wrap-up (10 minutes)

- Ask students to reflect on what they've learned about physical activity and the importance of walking and bicycling.
- Pass out one piece of blank paper to each student. On the paper, have students fill in the sentence frame "I used to think _____. Now I think _____."
- Post the reflections around the room and have students circulate around the room reading each other's reflections.

Ideas for Extending the Lesson

- Encourage students to poll family members about their physical activity habits and ask them to record data about the impact of physical activity on their sleep, mood, energy level, and concentration.
- Have students make posters advertising the benefits of physical activity and encouraging people to walk or ride a bicycle. Hang the posters around the school or in the community.
- Celebrate Walk to School Day and Bike to School Day (<http://www.walkbiketoschool.org>).



Ella O., Davis, California

Name: _____ Date: _____

As a class, our goal is to each get at least 60 minutes of physical activity per day. How are you going to meet this goal? Remember that you do not have to do all 60 minutes of physical activity at one time.

What's Your Plan?

	Specify the type of moderate-to-vigorous activity and the number of minutes planned for each activity.				Total # of Minutes
Monday	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	
Tuesday	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	
Wednesday	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	
Thursday	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	
Friday	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	
Saturday	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	
Sunday	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	Activity: # of Minutes:	

Student Worksheet

Let's Get Moving!

Name: _____ Date: _____

Record how much physical activity you do every day for a week. At the end of the week, add up how many minutes of physical activity you did during the week (goal: 60 minutes x 7 days = 420 minutes).

	What kind of physical activity did you do? Did you follow your plan?	In total, how many minutes did you spend being physically active?	Circle the effects that you noticed.
Monday			Sleep: Good or Bad Mood: Happy or Sad Energy: High or Low Concentration: High or Low
Tuesday			Sleep: Good or Bad Mood: Happy or Sad Energy: High or Low Concentration: High or Low
Wednesday			Sleep: Good or Bad Mood: Happy or Sad Energy: High or Low Concentration: High or Low
Thursday			Sleep: Good or Bad Mood: Happy or Sad Energy: High or Low Concentration: High or Low
Friday			Sleep: Good or Bad Mood: Happy or Sad Energy: High or Low Concentration: High or Low
Saturday			Sleep: Good or Bad Mood: Happy or Sad Energy: High or Low Concentration: High or Low
Sunday			Sleep: Good or Bad Mood: Happy or Sad Energy: High or Low Concentration: High or Low

1. How many minutes did you spend being physically active this week?
2. On days when you were physically active for 60 minutes, what did you notice about your sleep habits, mood, energy level, and concentration?

Name: _____ Date: _____

Use your *Let's Get Moving!* worksheet to help you answer these questions.

Hint: Fraction = (amount of days you noticed the effect of physical activity)/(total days of physical activity)

1. How many total days did you spend being physically active for 60 minutes or more?
2. On the days when you were physically active for 60 minutes or more, how many of those days did you report sleeping well? On what fraction of the days that you were physically active for 60 minutes or more did you sleep well?
3. On the days when you were physically active for less than 60 minutes, how many of those days did you report sleeping well? On what fraction of the days that you were physically active for less than 60 minutes did you sleep well?
4. On the days when you were physically active for 60 minutes or more, how many of those days did you report feeling happy? On what fraction of the days that you were physically active for 60 minutes or more did you feel happy?
5. On the days when you were physically active for less than 60 minutes, how many of those days did you report feeling happy? On what fraction of the days that you were physically active for less than 60 minutes did you feel happy?
6. On the days when you were physically active for 60 minutes or more, how many of those days did you report having high energy? On what fraction of the days that you were physically active for 60 minutes or more did you have high energy?
7. On the days when you were physically active for less than 60 minutes, how many of those days did you report having high energy? On what fraction of the days that you were physically active for less than 60 minutes did you have high energy?
8. On the days when you were physically active for 60 minutes or more, how many of those days did you report having high concentration? On what fraction of the days that you were physically active for 60 minutes or more did you have high concentration?
9. On the days when you were physically active for less than 60 minutes, how many of those days did you report having high concentration? On what fraction of the days that you were physically active for less than 60 minutes did you have high concentration?
10. What did you notice about the effect of physical activity on your sleep, mood, energy level, and concentration?

LESSON 2: Exercise Your Superpower!

LESSON OVERVIEW

This lesson begins with a brainstorm about the positive effects of physical activity. Students will participate in a “popcorn share” of what they know about the health benefits of physical activity. The class will review information about the circulatory and respiratory systems and students will read a short informational passage about how physical activity prevents illness, contributes to better sleep, has mood-boosting effects, increases energy, and improves concentration. Students will consider the benefits of physical activity and identify which benefits they personally find to be the most motivating. Finally, students will create comic strips showing the “superpowers” of physical activity. The comic strips will be shared and then collected together to make a comic book about the benefits of physical activity.

OBJECTIVES

- Learn the health benefits of physical activity.
- Identify the impact physical activity has on the circulatory and respiratory systems.

TOPIC

Health Benefits of Walking and Bicycling to School (Science Focus)

STANDARDS SUPPORTED IN THIS LESSON

Common Core State Standards for English Language Arts

Reading Standards for Informational Text

Grade Four

- **CCSS.ELA-Literacy.RI.4.2:** Determine the main idea of a text and explain how it is supported by key details; summarize the text.

Grade Five

- **CCSS.ELA-Literacy.RI.5.2:** Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.

California Health Education Content Standards

Nutrition and Physical Activity – Grade Five

Standard 1: Essential Concepts

- **1.10N:** Describe how physical activity, rest, and sleep are related.
- **1.11N:** Identify physical, academic, mental, and social benefits of regular physical activity.

California Science Content Standards

Life Sciences – Grade Five

- **2.b:** *Students know* how blood circulates through the heart chambers, lungs, and body and how carbon dioxide (CO₂) and oxygen (O₂) are exchanged in the lungs and tissues.

National Health Education Standards for Grades Three to Five

Standard 1: Essential Health Concepts

- **1.5.1:** Describe the relationship between healthy behaviors and personal health.
- **1.5.2:** Identify examples of emotional, intellectual, physical, and social health.

LESSON 2: Exercise Your Superpower!

MATERIALS NEEDED

- *Physical Activity: Why Do It?* handout (1 per student)
- Comic book templates (2 kinds; at least 1 per student)
- Sticky notes (1 per student)
- Chart paper (1 piece)
- Markers (1 per group of 4 students)

PREPARATION ACTIVITIES

- Make copies of *Physical Activity: Why Do It?* handout and comic book templates.
- On the top of the piece of chart paper write “**We Are Physically Active Because...**”
- Consider locating visuals of the circulatory and respiratory system to show as support materials during this lesson. More information and examples of visuals are available at <http://kidshealth.org/kid/htbw/lungs.html#> and http://kidshealth.org/parent/general/body_basics/heart.html.

STEPS FOR CLASSROOM ACTIVITY

Popcorn Share (5 minutes)

- Ask students to think about the benefits of physical activity. Explain that physical activity is any bodily movement produced by contracting your muscles and results in burning energy in your body. Tell students that exercise is a kind of physical activity that is planned, structured, and repetitive. Give students a minute of think time and then ask them to popcorn share, each sharing their idea of a benefit of physical activity with the class.
- When using the popcorn share strategy, students can share their ideas when ready, in no particular order and without raising their hands, so long as only one person talks at a time.

Physical Activity: Why Do It? (20 minutes)

- Review the circulatory and respiratory systems. Begin by asking students to share what they know about the circulatory system. Ask students to think about the effects of physical activity on the circulatory system. Try to touch on the following key points:
 1. The circulatory system helps blood move through your heart and around your body.
 2. Blood delivers oxygen to your body’s cells, which is necessary to keep your body alive.
 3. Physical activity strengthens your heart and helps improve circulation.
- Have students share what they know about the respiratory system. Ask students to think about the effects of physical activity on the respiratory system. Try to touch on the following key points:
 1. The respiratory system brings oxygen into your body and removes carbon dioxide from your body.
 2. The main organs in the respiratory system are the lungs. As you breathe in, your lungs fill with air. In the walls of your lungs, your heart pumps blood that absorbs the oxygen from the air. While in your lungs, the air picks up carbon dioxide. When you exhale the air, the carbon dioxide leaves your body.
 3. Physical activity helps strengthen the lungs and breathing muscles. The more physical activity you do, the more efficient your lungs and heart get at delivering oxygen. If you start being really physically active, you may notice that you get less out of breath than you are used to. This is because your lungs and heart have gotten stronger!

PREPARATION TIME

5 minutes

ACTIVITY TIME

60 minutes

VOCABULARY

Circulatory System—The system that moves blood through your heart and around your body.

Respiratory System—The system that brings oxygen into your body and removes carbon dioxide from your body.

LESSON 2: Exercise Your Superpower!

- Pass out the *Physical Activity: Why Do It?* handout and give students time to read independently. When everyone is done reading, call the class back together.
- Ask students to identify the main idea and supporting details of the *Physical Activity: Why Do It?* handout.
- After thinking about what they have read, ask students to consider why they are physically active. Ask students to share which benefits of physical activity they find the most appealing.
- Pass out a sticky note to each student. On the sticky note, have students write one reason why they are physically active. Have students stick their notes on the “**We Are Physically Active Because...**” chart paper.
- After all the notes have been stuck on the chart paper, ask students to reflect on what they see. What are the most common reasons why students are physically active? What are the least common? Lead a discussion on motivation, talking about the influences that impact people’s decisions to be physically active or not be physically active.



Jill N., San Leandro, California

Comic Strip (20 minutes)

Note: If students need more time to complete this activity, consider sending their comic strips home for homework or finding another time in class when students can finish their comic strips.

- Tell students that physical activity is kind of like a superpower. Superpowers allow superheroes to do amazing things. So does physical activity!
- Using what they learned from the *Physical Activity: Why Do It?* handout, have students pick one superpower of physical activity that they would like to focus on. Possible superpowers could be the ability to improve sleep, the ability to strengthen the heart, the ability to improve moods, the ability to improve academic scores, etc.
- Tell students that they will be making comic strips to illustrate the superpowers of physical activity. To illustrate their chosen superpower, they should create a short scene to show how physical activity creates their superpower. For example, the “*Exerciser*” superhero could take people through a series of exercises, causing their moods to immediately change from grumpy to happy.
- Show students the two comic book templates and model how to use both. Tell students that they will just be sketching their comics and should not spend too much time adding details to their drawings. The important component of this activity is for students to show what they learned about the benefits of physical activity.
- Give students a few minutes to think about their superhero. Have students turn to a partner and share what their superhero’s superpower is.

Gallery Walk (5 minutes)

- As students finish, have them lay their comic strips face-up on their tables. When everyone is finished, give students time to walk around the classroom and look at each other’s comic strips.
- After class, collect all the comic strips to make a larger comic book about the benefits of physical activity.

LESSON 2: Exercise Your Superpower!

Ideas for Extending the Lesson

- Have students create comic strips that include “health villains” (high blood pressure, obesity, etc.). Talk about barriers to being healthy and have students include interactions between physical activity superheroes and health villains.
- Arrange to have your students share their comic strips with another class. Consider having your students use their comics to teach younger students about the benefits of physical activity.
- For homework, have students survey family members about why they are or are not physically active. Analyze the positive and negative influences on people’s decisions to be physically active.
- Put students into small groups and ask them to come up with a skit. The skit should involve all of the students’ superheroes. Have the groups perform their skits for each other.



Mariana C., Palm Springs, California

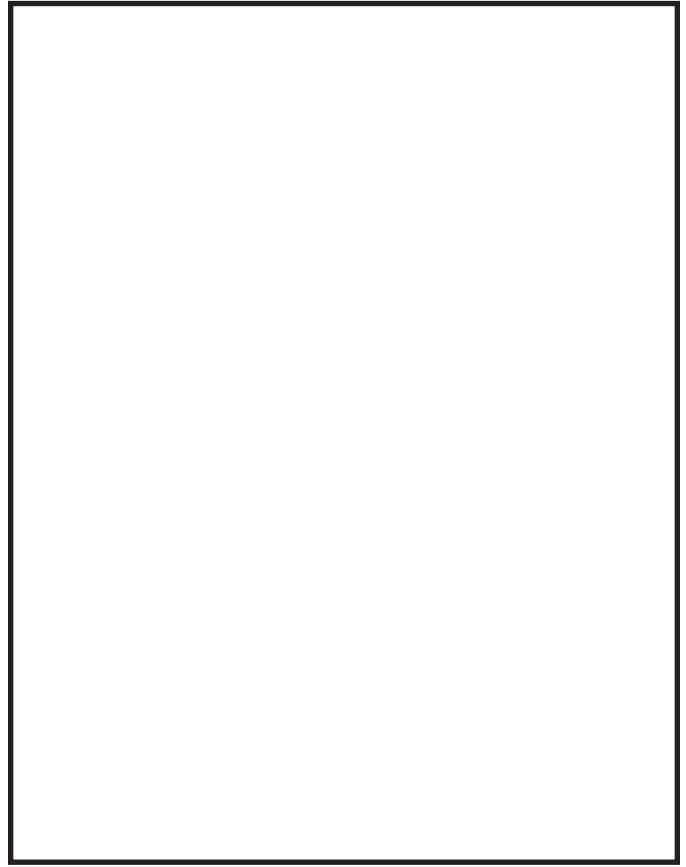
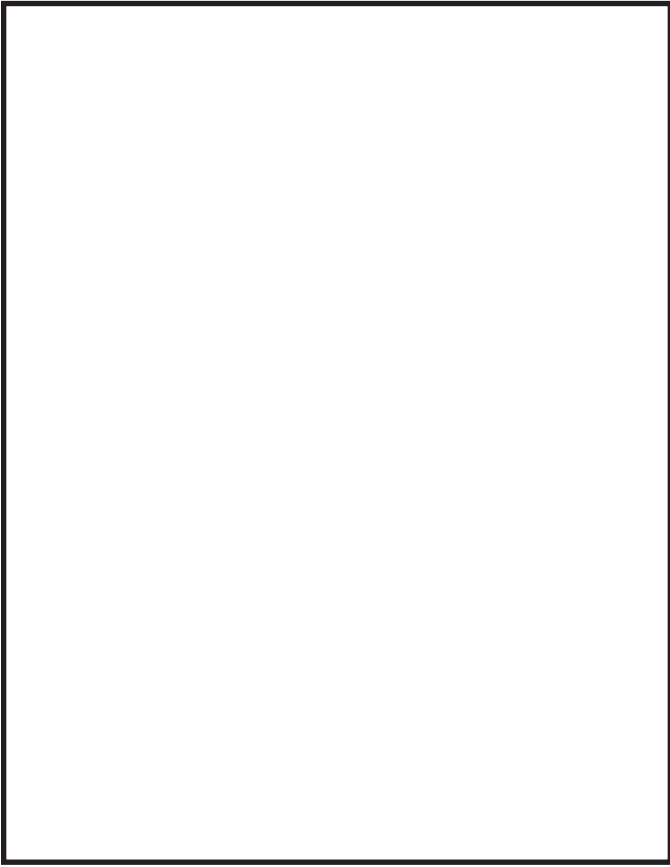
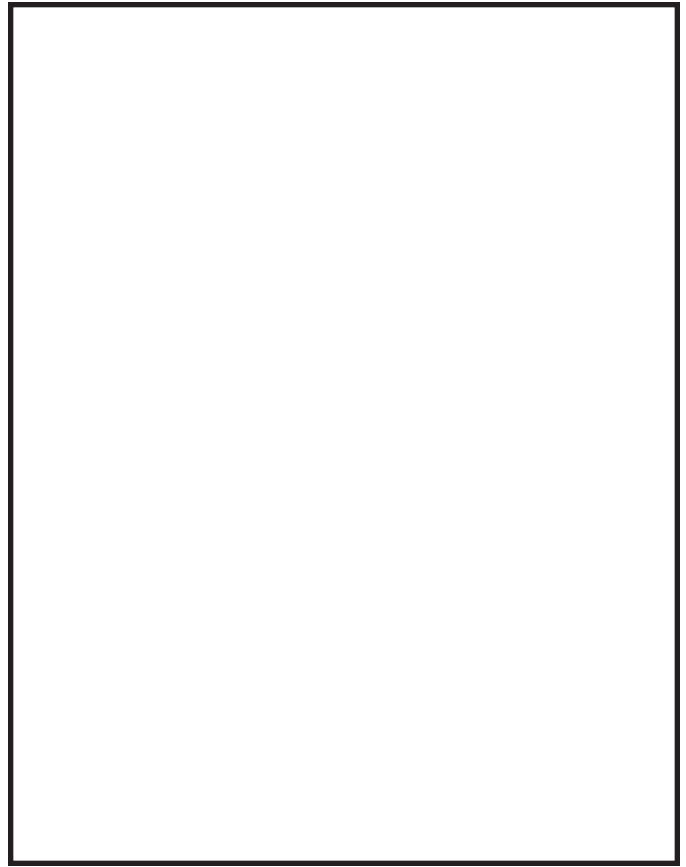
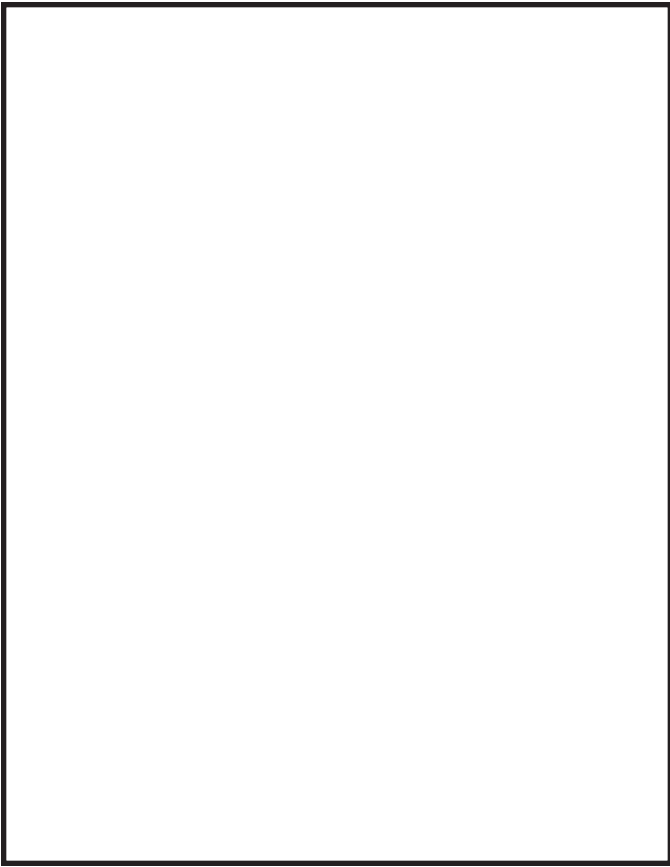


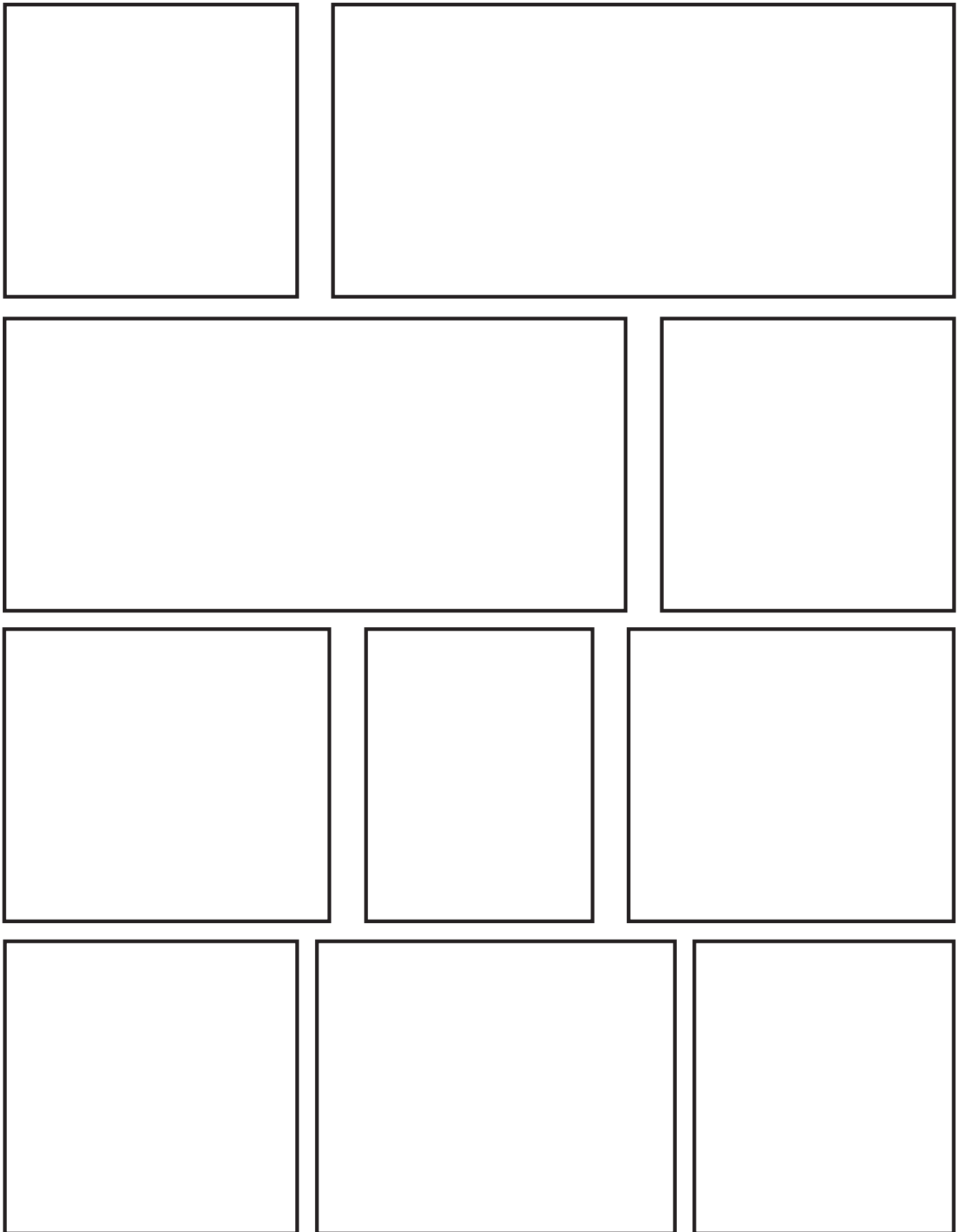
How did you get to school today? Maybe you walked, bicycled, were driven in a car, or rode the bus. If you walked or bicycled you not only made it to school, but you also were physically active while you were at it!

You've probably heard people talk about how important it is to be physically active. You might wonder, why is physical activity important? There are many reasons. First of all, physical activity keeps your body healthy. Physical activity helps the circulatory system by strengthening the heart and improving circulation. Physical activity helps the respiratory system by strengthening the lungs and breathing muscles. By helping your circulatory and respiratory systems work smoothly, physical activity prevents disease and illness. Healthy systems mean healthy people!

There are many more benefits of physical activity in addition to helping your body stay strong. Being physically active helps you sleep better at night, and it gives you more energy during the day. Physical activity also improves your mood and concentration. If you are feeling cranky, moving your body can help cheer you up. Next time you are in a bad mood, take a brisk walk! And guess what? There is more! Being physically active also can help you do better in school because it can improve your concentration.

Physical activity helps people to be happy, healthy, energetic, and well rested. How will you be physically active today?





LESSON 3: Prescribe a Pollution Diet

LESSON OVERVIEW

“Pollutey Judy” drives everywhere and never carpools. She drives her vehicle that runs on gas out of convenience and does not realize the impact her choices have on the environment. In this lesson, students will use the calculation 1 mile = 0.97 pounds of air pollution* to determine how much air pollution Judy is creating each day. Each student will work to put Judy on a pollution reduction plan, suggesting ways she can spare the air. Students will calculate how much air pollution is saved per day when Judy is on her pollution reduction plan and will write opinion pieces convincing Judy of the importance of making safe and eco-friendly transportation decisions.

OBJECTIVES

- Learn how transportation choices impact air pollution.
- Identify the pros and cons of different modes of transportation.

TOPIC

Environmental Impact of Walking and Bicycling

STANDARDS SUPPORTED IN THIS LESSON

Common Core State Standards for English Language Arts

Writing Standards

Grade Four

- **CCSS.ELA-Literacy.W.4.1:** Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Grade Five

- **CCSS.ELA-Literacy.W.5.1:** Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Common Core State Standards for Mathematics

Grade Four

- **4.NBT.B.4** (CCSS.Math.Content.4.NBT.B.4): Fluently add and subtract multi-digit whole numbers using the standard algorithm.
(Note: 4th graders who have not learned about decimals can use the calculation 1 mile = 1 pound of air pollution.*)
- **4.NBT.B.5:** (CCSS.Math.Content.4.NBT.B.5): Multiply a whole number of up to four digits by a one-digit whole number, and multiply two, two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Grade Five

- **5.NBT.B.7:** (CCSS.Math.Content.5.NBT.B.7): Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

*<http://www.youcanbikethere.com/content/environmental-benefits-0>

LESSON 3: Prescribe a Pollution Diet

California Health Education Content Standards

Nutrition and Physical Activity – Grade Four

Standard 1: Essential Concepts

- 1.8.N: Identify ways to increase and monitor physical activity.

Nutrition and Physical Activity – Grade Five

Standard 8: Health Promotion

- 8.1.N: Encourage and promote healthy eating and increased physical activity opportunities at school and in the community.

National Health Education Standards for Grades Three to Five

Standard 1: Essential Health Concepts

- 1.5.1: Describe the relationship between healthy behaviors and personal health.
- 1.5.2: Identify examples of emotional, intellectual, physical, and social health.
- 1.5.3: Describe ways in which safe and healthy school and community environments can promote personal health.

Standard 8: Health Promotion

- 8.5.2: Encourage others to make positive health choices.

MATERIALS NEEDED

- *A Day with Pollutey Judy* worksheet (1 per student)
- *Go on a Pollution Diet!* worksheet (1 per student)
- Chart paper (1 piece)
- Lined white paper (2 per student)
- Index cards (1 per student)

PREPARATION ACTIVITIES

- Make copies of *A Day with Pollutey Judy* and *Go on a Pollution Diet!* worksheets.
- Read Teacher Supplemental Information.
- On the piece of chart paper make a chart similar to the one in the Teacher Supplemental Information. Make sure you have a place to write the pros and cons of walking, riding a bicycle, being driven in a car, and taking public transportation.

STEPS FOR CLASSROOM ACTIVITY

Pros and Cons of Different Modes of Transportation (10 minutes)

- Ask students to consider the pros and cons of different modes of transportation. Use the Teacher Supplemental Information to guide your discussion and record student responses on the chart paper.
- Ask students to consider the safety of each mode of transportation. How can each mode of transportation be made safer?
- Ask students to consider which pros and cons are most important to them. Is convenience more important than pollution? Why or why not? To what extent?

PREPARATION TIME

10 minutes

ACTIVITY TIME

60 minutes

VOCABULARY

Carpool—An arrangement between people to travel together in a single vehicle.

Con—The negative side of an issue.

Emissions—The production and discharge of something.

Inefficient—Failing to make the best use of time or resources.

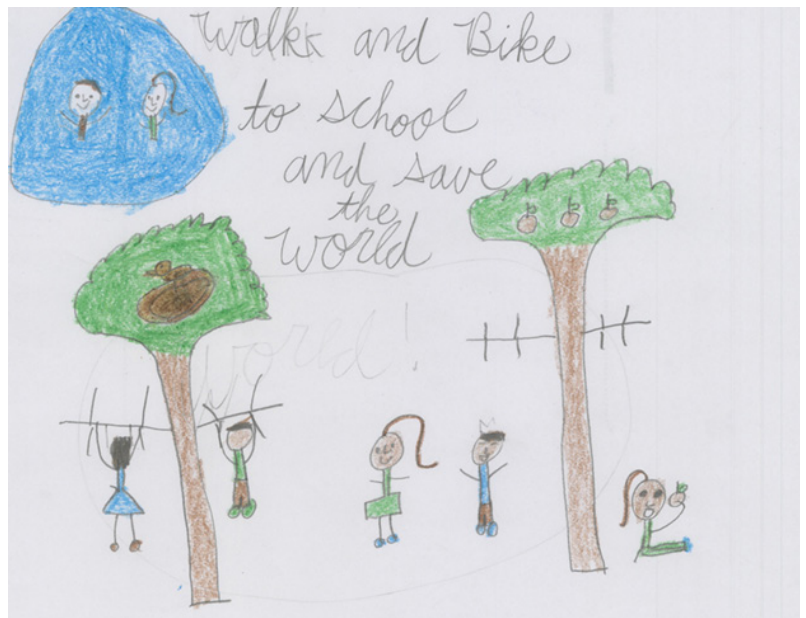
Mode—A way in which something is done.

Pro—The positive side of an issue.

LESSON 3: Prescribe a Pollution Diet

A Day with Pollutey Judy (15 minutes)

- Pass out the *A Day with Pollutey Judy* worksheet. Tell students that Pollutey Judy loves to drive. She drives everywhere, even places that are close enough to walk. Pollutey Judy never rides her bicycle, never carools, and never takes public transportation. She thinks driving is so convenient!
- Ask students what air pollution is. Tell them that cars, trucks, factories, power plants, trains, and planes create harmful gases that make the air dirty. When gases make the air dirty this is called air pollution. We can measure air pollution in pounds, with 0.97 pounds of air pollution = 1 mile of driving* (round this to 1 pound = 1 mile of air pollution if your students have yet to learn about decimals).
- Have students complete the *A Day with Pollutey Judy* worksheet to calculate how much air pollution Pollutey Judy produces per day. If students have not yet learned how to compute with decimals, have them use the modified conversion of 1 mile = 1 pound of air pollution.*
- After students have completed the worksheet, call the class back together. Ask students to share how much air pollution Pollutey Judy's driving produces on a daily basis. Work together to calculate how much air pollution Pollutey Judy's driving produces per week, per month, and per year.



Pollution Diet (15 minutes)

- Ask for suggestions on how Pollutey Judy can reduce the amount of air pollution her driving creates. Joanna R., Citrus Heights, California
- Hand out *Go on a Pollution Diet!* worksheet. Tell students that Judy has other transportation options: she can walk, bicycle, carpool, or take public transportation. Review the chart at the top of the *Go on a Pollution Diet!* worksheet. Briefly review the pros and cons of each transportation option.
- Have students complete the *Go on a Pollution Diet!* worksheet. After they have finished, call the class back together. Ask students to share how they reduced the amount of air pollution that Judy produced. Pick one student's pollution diet and work together to calculate how much air pollution Pollutey Judy will produce when she stays on that diet for one week, one month, and one year. Compare these computations to the amount of pollution Judy's driving currently produces per week, month, and year.

Writing (15 minutes)

- Praise the class for their hard work creating pollution diets for Judy. Tell them that, unfortunately, Judy is not sold on their diets. She loves to drive and does not understand why she should try to reduce the amount of air pollution her driving creates.

*<http://www.youcanbikethere.com/content/environmental-benefits-0>

LESSON 3: Prescribe a Pollution Diet

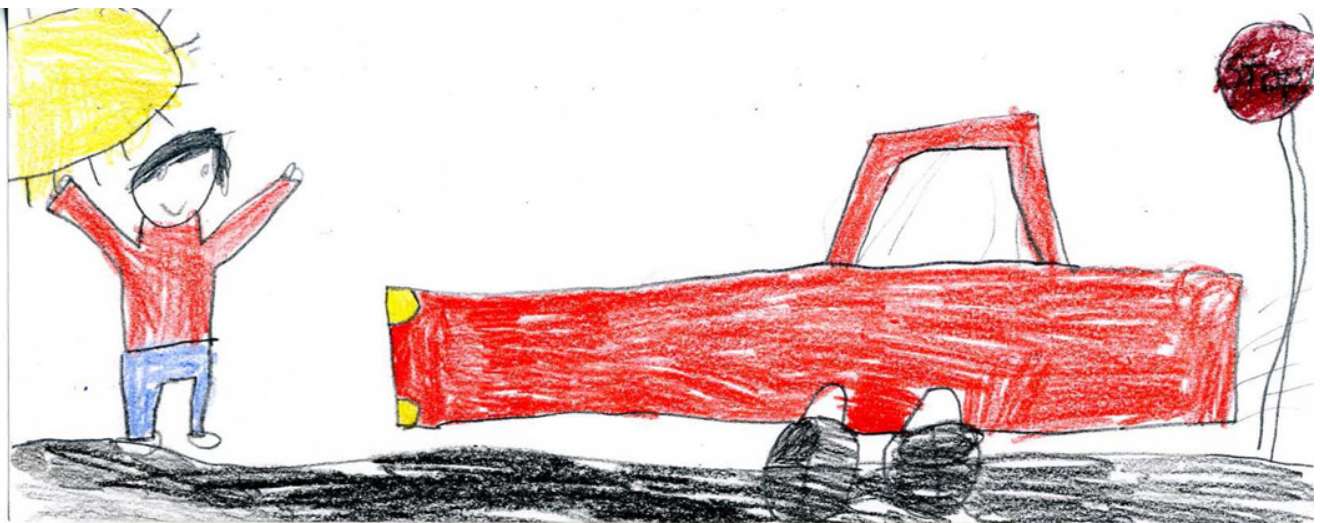
- Tell students that they will each write Pollutey Judy a letter trying to convince her to go on a pollution diet. Tell students to try to appeal to Judy by stating their opinions on air pollution, physical activity, and convenience. Remind students to support their opinions with reasoning and examples. Tell students to try and convince Judy of the importance of making both safe and eco-friendly transportation decisions.
- Hand out lined paper to each student. Have each student write a letter to Pollutey Judy. If students finish early they can share their letters with each other or design an advertisement about their pollution diet.

Exit Tickets (5 minutes)

- Ask students to think about the relationship between their transportation choices and air pollution. Pass out an index card to each student; these will be their “exit tickets” to hand in before class is over. On the front of the index card, have students write down one way that they could reduce the amount of air pollution that their transportation choices create. On the back of the index card, have students write down one thing they learned during today’s lesson.
- Have students hand in their exit tickets. Use these tickets as a quick way to assess what students learned during this lesson.

Ideas for Extending the Lesson

- Have students record their modes of transportation and approximate distances traveled for one week. Ask students to compute the amount of air pollution that their transportation choices produced and then put themselves on a pollution diet, identifying ways to reduce air pollution.
- Have students create a play or picture book about Pollutey Judy to perform for younger students. Ask students to identify the big ideas from this lesson and think about how the big ideas could be communicated to younger students.
- Read aloud Wump World by Bill Peet and discuss the book’s message about pollution. Have students write book reports on Wump World trying to convince Pollutey Judy to read the book.



Jake S., Long Beach, California

Teacher Supplemental Information

Pros and Cons of Different Modes of Transportation

Walking	
PROS	CONS
Travel is free.	Travel is inefficient for long distances.
Travel is also physical activity.	Limited by carrying capacity.
Does not create pollution.	Can be difficult or unsafe to walk on roads with no sidewalks or crosswalks.
Riding a Bicycle	
PROS	CONS
Travel is free.	Travel can be inefficient for long distances.
Travel is also physical activity.	Can be difficult or unsafe to ride alongside cars, especially when there is a lack of bicycle lanes.
Does not create pollution.	Have to park/lock bicycle at destination.
Driven in a Car	
PROS	CONS
Can travel both short and long distances.	Cost of gas.
Can travel with more than one person (often at least four people).	May have to pay for parking at places.
Do not have to worry about weather.	Have to factor cost of insurance and vehicle maintenance.
Convenient.	May have traffic congestion during peak hours (e.g., school hours).
	No physical activity.
	Gas emissions create smog/air pollution from car.
	Can be unsafe because of the potential of a motor vehicle accident.
Taking Public Transportation	
PROS	CONS
Do not have to worry about the weather (except when waiting for bus/train).	Physical activity is only gained in the short distance to and from the transit location.
Carries more passengers than a personal vehicle.	Gas emissions create smog/air pollution from bus.
Can be less expensive than driving in a personal vehicle.	People generally have to pay for it.
Creates fewer gas emissions per traveler than personal vehicle trips.	Restricted by transit schedule and routes.

Student Worksheet

A Day with Pollutey Judy

Pollutey Judy drives by herself every day. The chart below shows a typical day in Pollutey Judy's life. Calculate how much daily air pollution Pollutey Judy's driving produces. Round answers to the hundredths place. Use the calculation 1 mile = 0.97 pounds of air pollution.*

Destination	Distance (Round trip)	Mode of Transportation	Air Pollution
Work	4.3 miles	Driving	
Coffee Shop	1.2 miles	Driving	
Friend's House	5.8 miles	Driving	
Home	0.6 miles	Driving	

Total _____

*<http://www.youcanbikethere.com/content/environmental-benefits-0>

Pollutey Judy drives by herself every day. The chart below shows a typical day in Pollutey Judy's life. Calculate how much daily air pollution Pollutey Judy's driving produces. Round answers to the hundredths place. Use the calculation 1 mile = 0.97 pounds of air pollution.*

Destination	Distance (Round trip)	Mode of Transportation	Air Pollution
Work	4.3 miles	Driving	4.17 pounds
Coffee Shop	1.2 miles	Driving	1.16 pounds
Friend's House	5.8 miles	Driving	5.63 pounds
Home	0.6 miles	Driving	0.58 pounds

Total 11.54 pounds

*<http://www.youcanbikethere.com/content/environmental-benefits-0>

Other than driving, Judy has the following options for transportation:

Transportation	Air Pollution	Comfortable Distance
Walking	0 pounds/mile	2 miles or less
Bicycling	0 pounds/mile	8 miles or less
Carpooling with one other person	0.49 pounds/mile	Any

Put Pollutey Judy on a pollution diet! Instead of driving by herself, help Pollutey Judy find other transportation options. Fill in the chart below to calculate how much air pollution Pollutey Judy will create on her pollution diet. Then calculate how much less air pollution she is creating. Round answers to the hundredths place.

Destination	Distance (Round trip)	Mode of Transportation	Air Pollution
Work	4.3 miles		
Coffee Shop	1.2 miles		
Friend's House	5.8 miles		
Home	0.6 miles		

Total _____

Total Air Pollution Before the Pollution Diet (from *A Day with Pollutey Judy* worksheet): _____

Total Air Pollution on the Pollution Diet: _____

Total Decrease in Air Pollution: _____

Other than driving, Judy has the following options for transportation:

Transportation	Air Pollution	Comfortable Distance
Walking	0 pounds/mile	2 miles or less
Bicycling	0 pounds/mile	8 miles or less
Carpooling with one other person	0.49 pounds/mile	Any

Put Pollutey Judy on a pollution diet! Instead of driving by herself, help Pollutey Judy find other transportation options. Fill in the chart below to calculate how much air pollution Pollutey Judy will create on her pollution diet. Then calculate how much less air pollution she is creating. Round answers to the hundredths place.

Destination	Distance (Round trip)	Mode of Transportation	Air Pollution
Work	4.3 miles	Walking or Bicycling Carpooling	0 pounds 2.1 pounds
Coffee Shop	1.2 miles	Walking or Bicycling Carpooling	0 pounds 0.59 pounds
Friend's House	5.8 miles	Walking or Bicycling Carpooling	0 pounds 2.84 pounds
Home	0.6 miles	Walking or Bicycling Carpooling	0 pounds 0.29 pounds

Total _____

Total Air Pollution Before the Pollution Diet (from *A Day with Pollutey Judy* worksheet): 11.54 pounds

Total Air Pollution on the Pollution Diet: 0-5.82 pounds (answers will vary)

Total Decrease in Air Pollution: 5.72-11.53 pounds (answers will vary)

LESSON 4: Rules of the Road

LESSON OVERVIEW

In this two-part lesson, students will learn about pedestrian and bicycle safety laws and consider real-life scenarios where these laws apply. Students will begin by reading information about pedestrian and bicycle safety laws and examining whom the laws are meant to protect. When working with the scenarios, students will consider hypothetical traffic situations and determine who was at fault. Finally, students will write short opinion pieces to justify their decisions and will participate in a classroom discussion.

OBJECTIVE

- Learn and apply pedestrian and bicycle laws.

TOPIC

Rules of the Road/
Pedestrian and Bicycle Laws

STANDARDS SUPPORTED IN THIS LESSON

Common Core State Standards for English Language Arts

Reading Standards for Informational Text

Grade Four

CCSS.ELA-Literacy.RI.4.1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

Grade Five

CCSS.ELA-Literacy.RI.5.1: Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

Writing Standard

Grade Four

CCSS.ELA-Literacy.W.4.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Grade Five

CCSS.ELA-Literacy.W.5.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Speaking and Listening Standard

Grade Four

CCSS.ELA-Literacy.SL.4.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

Grade Five

CCSS.ELA-Literacy.SL.5.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

California Health Education Content Standards

Injury Prevention and Safety – Grade Four

Standard 7: Practicing Health-Enhancing Behaviors

- 7.4.S: Follow safety rules and laws at home, at school, and in the community.

LESSON 4: Rules of the Road

National Health Education Standards for Grades Three to Five

Standard 7: Practicing Health-Enhancing Behaviors

- 7.5.1: Identify responsible personal health behaviors.
- 7.5.2: Demonstrate a variety of healthy practices and behaviors to maintain or improve personal health.
- 7.5.3: Demonstrate a variety of behaviors to avoid or reduce health risks.

MATERIALS NEEDED

California Pedestrian Laws handout (1 per student)

California Bicycle Laws handout (1 per student)

Teacher Supplemental Information

Note: This supplemental information is taken directly from California law while the student handouts are written for grades four and five reading levels.

Example Scenarios pages

White board or chart paper

PREPARATION TIME

Day One: 10 minutes

Day Two: 5 minutes

ACTIVITY TIME

Day One: 50 minutes

Day Two: 50 minutes

PREPARATION ACTIVITIES

Day One:

- Make copies of *California Pedestrian Laws* and *California Bicycle Laws* handouts (may want to copy front-to-back).
- Make copies of the *Rules of the Road* worksheet.
- Assign each student a partner to work with on the *Rules of the Road* worksheet.

Day Two:

- Make copies of *Example Scenario #1*, *Example Scenario #2*, and *Example Scenario #3*.

STEPS FOR CLASSROOM ACTIVITY

Day One:

What's the Law? (10 minutes)

- Ask, "What are examples of pedestrian and/or bicycle laws?" Possible answers may include pedestrians having the right of way in crosswalks, and the requirement that children wear a bicycle helmet. Write answers on the white board or chart paper.
- Ask, "What are the consequences of breaking the law?" Possible answers may include fines, tickets, and incarceration.
- Tell students that there are many laws that apply to pedestrians and bicyclists. In this activity, students will examine some of those laws.

Rules of the Road (30 minutes)

- Pass out copies of *California Pedestrian Laws* and *California Bicycle Laws* handouts. Tell students that laws can sometimes be hard to make sense of. Explain that today students will try to understand several laws and determine whom the laws protect (e.g., pedestrians, bicyclists, or motorists).
- Pass out the *Rules of the Road* worksheet. Tell students that they will work in partners to complete the worksheet. Assign each pair a law to examine in more depth. Give students time to complete the worksheet.

VOCABULARY

Cul-de-sac—A street closed at one end and rounded at that end.

Hazard—A danger.

Illuminated—Lit up.

Incarceration—Being kept in jail or prison.

Intersection—A point at which two or more roads meet.

Violation—A disrespectful act or breaking of a law.

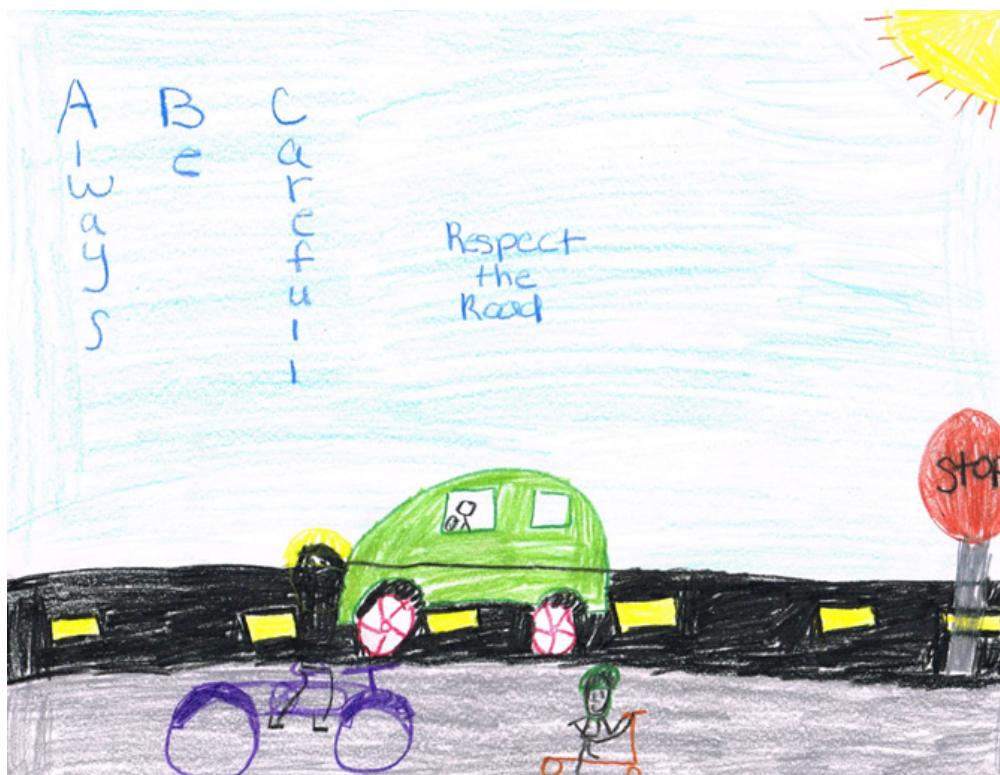
LESSON 4: Rules of the Road

Review the Rules (10 minutes)

- Go through the six sections on the *California Pedestrian Laws* and *California Bicycle Laws* handouts. Ask students to explain the meaning of each law and briefly discuss whom each law protects. Call on the students that studied each law to present their work.

Note: You may wish to only review a few of the laws instead of all six.

- Collect the *California Pedestrian Laws* and *California Bicycle Laws* handouts or ask students to keep them in a safe place. They will need them for part two of this lesson.



Emily S., Palm Springs, California

Day Two

Applying the Rules of the Road (30 minutes)

- Begin by asking students to share what they learned about pedestrian and bicycle laws during part one of this lesson.
- Tell students that today they will apply what they learned about pedestrian and bicycle laws to real-world situations. Each student will evaluate three situations. For each situation, students will read an example scenario and answer questions about who was at fault.
- Pass out the *California Pedestrian Laws* and *California Bicycle Laws* handouts that were used in Day One of this lesson. Remind students to use evidence from the laws to support their answers to the prompts. In their answers, students should both state their opinion about who is at fault and back up their opinion with evidence.

LESSON 4: Rules of the Road

Taking Sides: Rules of the Road (20 minutes)

- Bring the class back together. Review each example scenario and call on several volunteers to explain how and why they determined who was at fault. If students disagree, encourage a respectful debate.

Ideas for Extending the Lesson

- Using the *California Pedestrian Laws* and *California Bicycle Laws* handouts, have students write their own real-life scenarios. Have students share their scenarios and determine who was at fault in each situation.
- Have students make posters to teach about important pedestrian and bicycle laws. Hang the posters around the school or in the neighborhood.
- Using either the scenarios included in the lesson or scenarios that students write, have students participate in a mock courtroom. After considering a scenario, have students take “affirmative” or “negative” positions and present their case to a judge and a jury.
- Explore your city’s municipal code regarding riding bicycles on sidewalks. Try to find answers to the following questions: “Are there age minimums set by the city regarding bicyclists on the road?” “Is bicycling on the sidewalk allowed in both residential and commercial districts?” and “Are there any details about how bicyclists are expected to yield to pedestrians?” Discuss your findings with students and brainstorm ways in which the municipal code might affect their bicycling habits.
- Teach students about bike trains and elicit help from students and their families to start a bike train in your community. http://guide.saferoutesinfo.org/walking_school_bus/bicycle_trains.cfm
- Introduce the Bicycle Safety Training and Resources available at the Safe Routes to School Bike to School Page. <http://www.casaferoutestoschool.org/whats-happening-in-california/national-bike-to-school-day/>
- Invite a local bicycling club or bicycle shop representative to discuss bicycle-related issues, such as, equipment, maintenance, careers, or community events.



Sean K., San Leandro, California



Emily S., Palm Springs, California

Right of Way at a Crosswalk

- (a) The driver of a vehicle should yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection, except as explained in the rest of this section.
- (b) Pedestrians need to act safely. No pedestrian may suddenly leave a curb or other place of safety and walk or run into the path of a vehicle. No pedestrian may unnecessarily stop or delay traffic while in a marked or unmarked crosswalk.
- (c) The driver of a vehicle approaching a pedestrian within any marked or unmarked crosswalk should act carefully and reduce the speed of the vehicle or take any other action relating to the operation of the vehicle as necessary to keep the pedestrian safe.

Pedestrians Outside a Crosswalk

- (a) Every pedestrian on a roadway other than within a marked or unmarked crosswalk at an intersection should yield the right-of-way to all vehicles upon the roadway that are near enough to pose a hazard.
- (b) Drivers need to act safely. This section does not excuse drivers from taking responsible actions for the safety of any pedestrian upon a roadway.

Pedestrians on a Roadway

- (a) When walking upon any roadway outside of a business or residence district, pedestrians must walk as close to their left-hand edge of the roadway as possible.
- (b) Pedestrians may walk close to their right-hand edge of the roadway if a crosswalk or other means of safely crossing the roadway is not available or if existing traffic or other conditions would make it unsafe for the pedestrian to cross the road.

Youth Bicycle Helmets

Everyone under 18 years of age needs to wear a helmet at all times when riding a bicycle, scooter, or skateboard. Helmets also need to be worn when wearing in-line or roller skates. The helmet needs to be properly fitted and fastened.

Operation on a Roadway

- (a) Bicyclists may occupy the center of a lane when conditions such as a narrow lane or road hazard do not provide enough space for a motorist to pass at a safe distance within the same lane. If the lane widens so that there is enough room for safe passing within the lane, then the bicyclist should move to the right to allow that movement.
- (b) Bicyclists must make left and right turns in the same way drivers do, using the same turn lanes. If the bicyclist is traveling straight through an intersection, he or she should never pass on the right-hand side of vehicles that might turn right, but should stay far enough left to allow right-turning vehicles to pass on his or her right.

Equipment Requirements

- (a) Bicyclists will only ride a bicycle on a roadway if it has functioning brakes.
- (b) Bicyclists will only ride a bicycle that has handlebars that are at a level that is below their shoulders in order to grasp the handlebars at the normal steering grip area.
- (c) Bicyclists will only ride a bicycle that is of a size that they can stop the bicycle safely, supporting the bicycle in an upright position with at least one foot on the ground, and restarting it in a safe manner.
- (d) A bicycle that is ridden after dark must have the following equipment: a white light on the front of the bicycle; a red reflector on the rear of the bicycle; a white or yellow reflector on each pedal, shoe, or ankle; and a white or yellow reflector on each side forward of the center of the bicycle and a white or red reflector on each side to the rear of the center of the bicycle.

Teacher Supplemental Information

California Pedestrian Laws¹ (Excerpted from DMV handbook)

Right of Way at Crosswalk (§ 21950)

- (a) The driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection, except as otherwise provided in this chapter.
- (b) This section does not relieve a pedestrian from the duty of using due care for his or her safety. No pedestrian may suddenly leave a curb or other place of safety and walk or run into the path of a vehicle that is so close as to constitute an immediate hazard. No pedestrian may unnecessarily stop or delay traffic while in a marked or unmarked crosswalk.
- (c) The driver of a vehicle approaching a pedestrian within any marked or unmarked crosswalk shall exercise all due care and shall reduce the speed of the vehicle or take any other action relating to the operation of the vehicle as necessary to safeguard the safety of the pedestrian.

Pedestrians Outside Crosswalk (§ 21954)

- (a) Every pedestrian upon a roadway at any point other than within a marked crosswalk or within an unmarked crosswalk at an intersection shall yield the right-of-way to all vehicles upon the roadway so near as to constitute an immediate hazard.
- (b) The provisions of this section shall not relieve the driver of a vehicle from the duty to exercise due care for the safety of any pedestrian upon a roadway.

Pedestrians on Roadway (§ 21956)

- (a) No pedestrian may walk upon any roadway outside of a business or residence district otherwise than close to his or her left-hand edge of the roadway.
- (b) A pedestrian may walk close to his or her right-hand edge of the roadway if a crosswalk or other means of safely crossing the roadway is not available or if existing traffic or other conditions would compromise the safety of a pedestrian attempting to cross the road.

¹<https://www.dmv.ca.gov/portal/dmv/detail/pubs/vctop/vc/d11/c5>

Teacher Supplemental Information

California Bicycle Laws² (Excerpted from DMV handbook)

Youth Bicycle Helmets (§ 21212)

A person under 18 years of age shall not operate a bicycle, a nonmotorized scooter, or a skateboard, nor shall they wear in-line or roller skates, nor ride upon a bicycle, a nonmotorized scooter, or a skateboard as a passenger, upon a street, bikeway, or any other public bicycle path or trail unless that person is wearing a properly fitted and fastened bicycle helmet.

Operation on Roadway (§ 21202)

- (a) Any person operating a bicycle upon a roadway at a speed less than the normal speed of traffic moving in the same direction at that time shall ride as close as practicable to the right-hand curb or edge of the roadway except under any of the following situations:
 - (1) When overtaking and passing another bicycle or vehicle proceeding in the same direction.
 - (2) When preparing for a left turn at an intersection or into a private road or driveway.
 - (3) When reasonably necessary to avoid conditions (including, but not limited to, fixed or moving objects, vehicles, bicycles, pedestrians, animals, surface hazards, or substandard width lanes) that make it unsafe to continue along the right-hand curb or edge, subject to the provisions of Section 21656. For purposes of this section, a “substandard width lane” is a lane that is too narrow for a bicycle and a vehicle to travel safely side by side within the lane.
 - (4) When approaching a place where a right turn is authorized.
- (b) Any person operating a bicycle upon a roadway of a highway, which highway carries traffic in one direction only and has two or more marked traffic lanes, may ride as near the left-hand curb or edge of that roadway as practicable.

Equipment Requirements (§ 21201)

- (a) No person shall operate a bicycle on a roadway unless it is equipped with a brake which will enable the operator to make one braked wheel skid on dry, level, clean pavement.
- (b) No person shall operate on the highway a bicycle equipped with handlebars so raised that the operator must elevate his hands above the level of his shoulders in order to grasp the normal steering grip area.
- (c) No person shall operate upon a highway a bicycle that is of a size that prevents the operator from safely stopping the bicycle, supporting it in an upright position with at least one foot on the ground, and restarting it in a safe manner.
- (d) A bicycle operated during darkness upon a highway, a sidewalk where bicycle operation is not prohibited by the local jurisdiction, or a bikeway, as defined in Section 890.4 of the Streets and Highways Code, shall be equipped with all of the following:

²<https://www.dmv.ca.gov/portal/dmv/detail/pubs/vctop/vc/d11/c1/a4>

Teacher Supplemental Information

- (1) A lamp emitting a white light that, while the bicycle is in motion, illuminates the highway, sidewalk, or bikeway in front of the bicyclist and is visible from a distance of 300 feet in front and from the sides of the bicycle.
 - (2) A red reflector on the rear that shall be visible from a distance of 500 feet to the rear when directly in front of lawful upper beams of head lamps on a motor vehicle.
 - (3) A white or yellow reflector on each pedal, shoe, or ankle visible from the front and rear of the bicycle from a distance of 200 feet.
 - (4) A white or yellow reflector on each side forward of the center of the bicycle, and a white or red reflector on each side to the rear of the center of the bicycle, except that bicycles that are equipped with reflectorized tires on the front and the rear need not be equipped with these side reflectors.
- (e) A lamp or lamp combination, emitting a white light, attached to the operator and visible from a distance of 300 feet in front and from the sides of the bicycle, may be used in lieu of the lamp required by paragraph (1) of subdivision (d).

Reflectorized Equipment (§ 21201.5)

- (a) No person shall sell, or offer for sale, a reflex reflector or reflectorized tire of a type required on a bicycle unless it meets requirements established by the department. If there exists a federal Consumer Product Safety Commission regulation applicable to bicycle reflectors, the provisions of that regulation shall prevail over provisions of this code or requirements established by the department pursuant to this code relative to bicycle reflectors.
- (b) No person shall sell, or offer for sale, a new bicycle that is not equipped with a red reflector on the rear, a white or yellow reflector on each pedal visible from the front and rear of the bicycle, a white or yellow reflector on each side forward of the center of the bicycle, and a white or red reflector on each side to the rear of the center of the bicycle, except that bicycles which are equipped with reflectorized tires on the front and rear need not be equipped with these side reflectors.
- (c) Area reflectorizing material meeting the requirements of Section 25500 may be used on a bicycle.

²<https://www.dmv.ca.gov/portal/dmv/detail/pubs/vctop/vc/d11/c1/a4>

Student Worksheet

Rules of the Road

Name: _____ Date: _____

1. What road law are you studying?

2. Who does the law protect?

3. How does it protect them?

4. Do you have questions about the law?

Student Worksheet

Example Scenario #1

Name: _____ Date: _____

Tameka is playing kickball with Sara, Jaden, and Sam in her cul-de-sac. Sam kicks the ball and it lands in Ms. Hernandez' front yard. Tameka runs down the sidewalk to get the ball.

Meanwhile, Ms. Hernandez is in a hurry to pick up her daughter from daycare. Ms. Hernandez begins to pull out of her driveway and nearly hits Tameka.

Who is at fault? Who should have the right-of-way? Explain your reasoning using pedestrian law. How could Tameka have prevented this near-accident? How could Ms. Hernandez have prevented this near-accident?

Student Worksheet

Example Scenario #2

Name: _____ Date: _____

Roberto is late for school. He leaves his home in a hurry and begins to run to school. He runs to the intersection in front of the school. As he approaches the crosswalk he notices the pedestrian "Walk" signal is illuminated, so he continues to run across the street to school.

Meanwhile, the fifth grade math teacher, Mr. Sang, is on his way to work in his car. He signals to make a left hand turn and makes the turn through a crosswalk location in front of the school. Mr. Sang nearly hits Roberto.

In this situation, who had the right of way? Explain your reasoning using pedestrian law. How could Roberto have prevented this near-accident? How could Mr. Sang have prevented this near-accident?

Student Worksheet

Example Scenario #3

Name: _____ Date: _____

Marta is riding her bicycle to school. There is no one else on the road, so she decides to ride in the far left lane of the two-way street.

Carlos is driving his car to work. Carlos makes a left turn onto the street Marta is on. He does not see Marta and his car hits Marta's bicycle. Marta falls off of her bicycle, but luckily is not hurt.

Who is at fault in this situation? Explain your reasoning using bicycle law. How could Marta have prevented this accident? How could Carlos have prevented this accident?

Sample Student Answers

Scenario #1:

I think Tameka is at fault because the law states that “pedestrians need to act safely” and “no pedestrian may leave the curb or other place of safety and walk or run into the path of a vehicle.” Tameka should have looked carefully before running to get the ball. However, the law also states that, “drivers need to act safely.” Ms. Hernandez should have looked carefully before backing out of her driveway.

Scenario #2:

I think Mr. Sang is at fault because the law states that “the driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk.” Roberto was crossing safely in a crosswalk and Mr. Sang should have waited for him to cross before making the turn. Roberto could have looked carefully to make sure no cars were coming before he started walking.

Scenario #3:

I think Marta is at fault because she should have been on the right-hand side of the road. The law states, “Any person operating a bicycle... shall ride as close as practicable to the right-hand curb or edge of the roadway.” Marta could have prevented the accident by riding on the right-hand side of the road. Carlos could have prevented this accident by looking carefully before he made the turn.

LESSON 5: Design Your Own Traffic Sign Game

LESSON OVERVIEW

In this lesson students will learn to recognize and understand traffic signs. Students will look at pictures of traffic signs and note what they see, think, and wonder about each sign. After using this framework to guide discussion, the class will review the meanings of various traffic signs and discuss how signs help pedestrians, bicyclists, and motorists. The class will review pedestrian safety and identify which traffic signs affect pedestrians. Students will read an informational passage about traffic signs, paying particular attention to identifying and understanding new vocabulary words. In pairs, students will design and play traffic sign games. The games will provide students with an opportunity to demonstrate their knowledge of different traffic signs.

OBJECTIVES

- Identify the meaning and importance of traffic signs.
- Understand how traffic signs affect pedestrian and bicycle safety.
- Identify and define unknown vocabulary words.

TOPIC

Pedestrian and Bicycle Safety

STANDARDS SUPPORTED IN THIS LESSON

Common Core State Standards for English Language Arts

Reading Standards for Informational Text

Grade Four

- **CCSS.ELA-Literacy.RI.4.4:** Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

Grade Five

- **CCSS.ELA-Literacy.RI.5.4:** Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 5 topic or subject area.

Speaking and Listening Standards

Grade Four

- **CCSS.ELA-Literacy.SL.4.1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

Grade Five

- **CCSS.ELA-Literacy.SL.5.1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

Language Standards

Grade Four

- **CCSS.ELA-Literacy.L.4.4:** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

Grade Five

- **CCSS.ELA-Literacy.L.5.4:** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.

LESSON 5: Design Your Own Traffic Sign Game

California Health Education Content Standards

Injury Prevention and Safety – Grade Four

Standard 1: Essential Concepts

- 1.16.S: Identify ways to reduce risk of injuries from fires, around water, while riding a motor vehicle, as a pedestrian, on the playground, and from falls.

Standard 7: Practicing Health-Enhancing Behaviors

- 7.4.S: Follow safety rules and laws at home, at school, and in the community.

National Health Education Standards for Grades Three to Five

Standard 1: Essential Health Concepts

- 1.5.4: Describe ways to prevent common childhood injuries and health problems.

Standard 7: Practicing Health-Enhancing Behaviors

- 7.5.1: Identify responsible personal health behaviors.
- 7.5.2: Demonstrate a variety of healthy practices and behaviors to maintain or improve personal health.
- 7.5.3: Demonstrate a variety of behaviors to avoid or reduce health risks.

MATERIALS NEEDED

- Chart paper (3 pieces)
- *Traffic Signs* pages (1 per student)
- *Bicycle Safety Signs* page (1 per student)
- *What's the Big Deal About Traffic Signs* passage (1 per student)
- *Requirements for Traffic Sign Game* (1 per student)
- Blank white paper (available for use as needed)
- Scissors (available for use as needed)
- Index cards (available for use as needed)
- Assorted board game materials: dice, cardstock, spinners, etc. (optional)

PREPARATION ACTIVITIES

- Read over Teacher Supplemental Information (included at the end of this lesson).
- On the pieces of chart paper write “**See**,” “**Think**,” and “**Wonder**” (one word per chart paper).
- Make copies of *Traffic Signs* pages, *Bicycle Safety Signs* page, *What's the Big Deal About Traffic Signs* passage, and *Requirements for Traffic Sign Games* (1 per student).

STEPS FOR CLASSROOM ACTIVITY

See/Think/Wonder (15 minutes)

- Pass out the *Traffic Signs* and *Bicycle Safety Signs* pages. Give students a few minutes to look over the traffic signs on both pages. Tell students that they will be participating in a thinking routine called “See, Think, Wonder.”
- Ask students what they see. These should be straightforward observations without inferences. For example, students may share that they see some signs with words, some signs with symbols, and some signs with pictures. Write student responses on the chart paper labeled “**See**.”

PREPARATION TIME

10 minutes

ACTIVITY TIME

60 minutes

VOCABULARY

Crucial—Extremely important.

Merge—Come together.

Motorist—Someone who drives or travels in an automotive vehicle.

Pedestrian—A person traveling by foot on a roadway or sidewalk.

U-turn—A turn that completely reverses the direction of travel.

Yield—To slow an action for someone or something.

LESSON 5: Design Your Own Traffic Sign Game

- Now ask students what they think about the traffic signs. These responses should reflect students' thoughts and inferences about the traffic signs. For example, students may share that they think the "3 Tracks" sign refers to train tracks or that the "Emergency Parking Only" sign might appear in front of a hospital. Write student responses on the chart paper labeled "Think."
- Finally, ask students what they wonder about the traffic signs. These responses can include questions or information students would like to find out more about. For example, students may wonder what a "T intersection" is or what divided highways are. Write student responses on the chart paper labeled "Wonder."
- Briefly review the traffic signs that students had questions or misconceptions about. Use the *Teacher Supplemental Information* as necessary.

Pedestrian and Bicycle Safety (5 minutes)

- Ask students to think about how traffic signs help to keep pedestrians, bicyclists, and motorists safe. Ask, "How do traffic signs help pedestrians? How do traffic signs help bicyclists? How do traffic signs help motorists?" Explain that a bicyclist is considered a pedestrian when on sidewalks and considered a motorist when on roadways.
- Ask, "What if there were no stop signs? How would pedestrians, bicyclists, and motorists be affected?" Take several student responses.
- Have students circle the traffic signs that they think are the most helpful to pedestrians. Ask students to share several of their answers with the class.
- Ask students to share what they notice about the bicycle safety signs.
- Traffic signs help to keep pedestrians and bicyclists safe, but knowing the rules of the road is not the only way to stay safe. Ask, "What other ways can pedestrians and bicyclists stay safe?" Explain that bicyclists need proper training and supervision when learning to ride their bicycles. Pedestrians and bicyclists should be supervised when they are learning how to walk or bicycle on the road. As pedestrians and bicyclists learn about safely walking and bicycling, they should also learn about the rules of the road.

Traffic Signs: Text and Vocabulary (10 minutes)

- Pass out the *What's the Big Deal About Traffic Signs?* passage to each student. Tell students that they are going to read the passage independently. While they read, students should pay extra attention to challenging vocabulary words. Tell students to circle words when they're not sure of the word's meaning.
- When everyone has finished reading, have students share the words they circled. Make sure to review and discuss the definitions in the "Vocabulary" section of this lesson.

Traffic Sign Games (25 minutes)

- Pass out *Requirements for Traffic Sign Games*. Tell students that they will be working in pairs to design games about traffic signs.
- Introduce the materials that will be available to students. Tell them they can create a card game, a board game, or a sports game. Review the *Requirements for Traffic Sign Games*.
- Tell students that they will not have long to create their game, so they need to come up with and execute their ideas quickly. (Alternatively, you can make the game creation a multi-day activity).

LESSON 5: Design Your Own Traffic Sign Game

- Possible game ideas include traffic sign concentration, traffic sign go fish, traffic sign charades, etc. In order to encourage creativity, you may want to hold off on sharing specific ideas with the class.
- Assign partners and circulate around the room as the pairs work. When students finish, have them play their game. If there is enough time, have pairs get together with another pair. Instruct each pair to explain the rules of their game to each other and give the pairs time to play each other's games. If there is not enough time for students to play each other's games, designate another time when the game could be available to play.

Reflection: I Used to Think _____, Now I Think _____ (5 minutes)

- At the end of class, have students use the sentence frame "I used to think _____. Now I think _____" to share what they learned about traffic signs.
- Depending on time constraints, you can have students share their reflections in pairs, write down their reflections, or share their reflections with the whole class.

Ideas for Extending the Lesson

- Take the class on a walk around the neighborhood. Have them bring their *Traffic Signs* pages and take notes on which traffic signs they see. After the walk, have students make their own traffic signs to display around the school and neighborhood.
- As homework, have students assess the traffic signs they see in their neighborhood. Send home the *Traffic Signs* pages for students to take notes on. Ask students to write a short paragraph describing the traffic signs they saw in their neighborhood and assessing the effectiveness of the signs (e.g., Did they seem to be working? Were pedestrians, bicyclists, and motorists following the signs? Were more signs needed?).
- Have the class design a "Safetyville" at school, including streets, crosswalks, intersections, etc. Have students make traffic signs to display in Safetyville. As students walk through Safetyville, they can physically practice the correct behaviors that the traffic signs communicate.
- Share and access videos and resources about pedestrian safety:
<http://www.pedbikeinfo.org/pedsaferjourney>



Valeria R., Palm Springs, California

Pedestrian Signal Lights

Pedestrian signals show words or pictures similar to the following examples:



"Walk" or "Walking Person" signal light means it is legal to cross the street.



"Do not Walk" or "Raised Hand" signal light means you may not start crossing the street. Flashing "Do not Walk" or Flashing "Raised Hand" signal light means do not start crossing the street because the traffic signal is about to change. If the signal light starts flashing after you have already started to cross, finish crossing the street walking as quickly and carefully as possible.

Countdown signals indicate how many seconds remain for crossing. These signals allow pedestrians the flexibility to speed up if the crossing phase is about to expire.

Some signals may provide a beeping or chirping sound or a verbal message. These signals are designed to help visually impaired pedestrians cross the street.

At many traffic signals, you need to push the pedestrian push button to activate the "Walk" or "Walking Person" signal light. If there are no pedestrian signals, obey the traffic signal lights.

Traffic Signs

The shape and color of a sign gives you a clue about the information contained on the sign. Here are the common shapes used:



An eight-sided red STOP sign means you must make a full "STOP" whenever you see this sign. Stop at the white limit line (a wide white line painted on the street) or before entering the crosswalk. If a limit line or crosswalk is not painted on the street, stop before entering the intersection. Check traffic in all directions before proceeding.

A three-sided red YIELD sign means you must slow down and be ready to stop, if necessary, to let any pedestrians, bicyclists, or vehicles pass before you proceed.



A square red and white regulatory sign means you must follow the sign's instruction. For example, the DO NOT ENTER sign means do not enter a road or off ramp where the sign is posted, usually on a freeway off ramp. The WRONG WAY sign may or may not be posted with the DO NOT ENTER sign. If you see one or both of these signs, ride to the side of the road and stop. You are going against traffic. When safe, turn around and return to the road you were on. At night if you are going the wrong way, the road reflectors will shine red in your headlamp.



If a sign has a red circle with a red line through it, it always means "NO." The picture inside the circle shows what you can not do. The sign may be shown with or without words. This sign means drivers can not make a U-turn.



A yellow and black circular sign means you are approaching a railroad crossing.



X-shaped signs with a white background that state RAILROAD CROSSING indicate that you must look, listen, slow down, and prepare to stop, if necessary. Let any trains pass before you proceed.



Five-sided signs mean you are near a school. Stop if children and/or adults are in the crosswalk.



A four-sided diamond-shaped sign warns you of specific road conditions and dangers ahead. Many warning signs are diamond-shaped.



A white rectangular sign means you must obey important rules.



Some warning signs have a fluorescent yellow-green background. These signs warn of conditions related to pedestrians, bicyclists, schools, playgrounds, school buses, and school passenger loading zones. Obey all warning signs regardless of their shape.



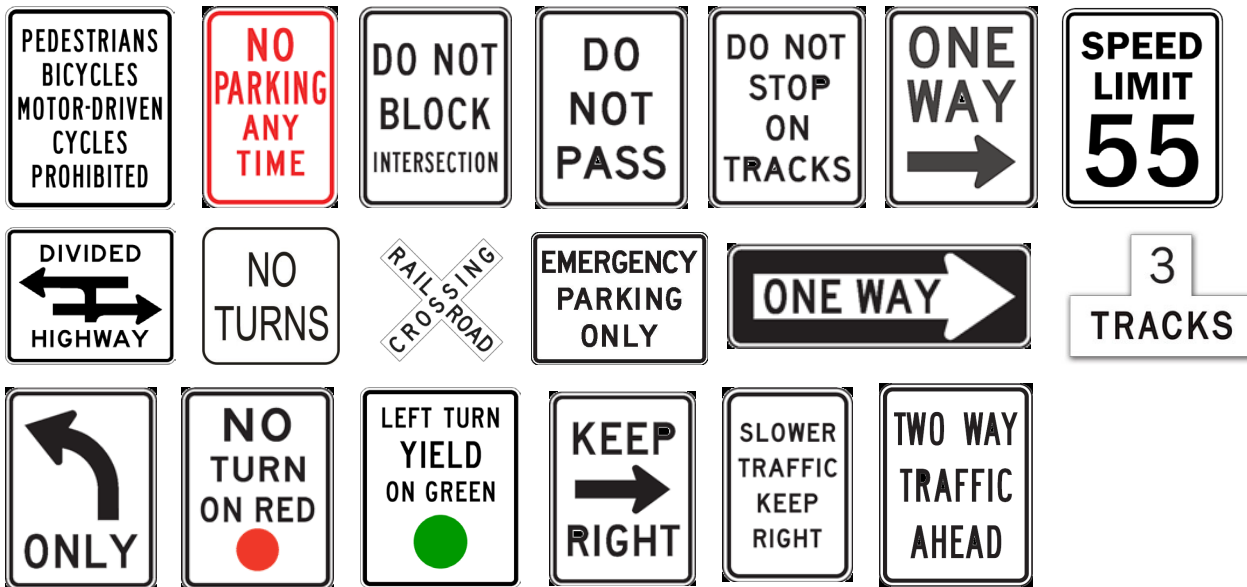
Sharrows are used to indicate lanes that bicyclists are lawfully allowed to occupy. They both remind bicyclists and alert motorists.

Red and White Regulatory Signs



No U-Turn No Left Turn No Right Turn

White Regulatory Signs



Highway Construction and Maintenance Signs



Guide Signs



Hazardous Loads Placards



Slow Moving Vehicle



Warning Signs



Slippery When Wet



Merging Traffic



Divided Highway



Directional Arrow



Sharp Turn



Two Way Traffic



Lane Ends



Reverse Turn



End Divided Highway



Traffic Signal Ahead



Pedestrian Crossing



Winding Road



Added Lane



Crossroad



Stop Ahead



"T" Intersection



Yield Ahead



Curve

Pedestrian Signal Lights





When walking, bicycling, or being driven around your neighborhood, you probably see all sorts of traffic signs. Maybe you do not even notice them because you pass by them so often. Next time you're out and about, pay extra attention to the traffic signs that you see. Traffic signs are important because they give crucial information to pedestrians, bicyclists, and motorists.

Traffic signs communicate important rules of the road to pedestrians, bicyclists, and motorists. As pedestrians walk, traffic signs tell them when and where it is safe to cross the street. By reading traffic signs pedestrians can learn how bicyclists and motorists are expected to drive and can learn what to expect as they walk.

Some traffic signs tell bicyclists and motorists how to act on the road. They alert bicyclists and motorists to upcoming situations. For example, some signs might tell bicyclists and motorists to yield and let other bicyclists and motorists go first. Other signs might tell bicyclists and motorists that their lane may be merging with another lane. More signs might tell bicyclists and motorists that a street is a dead end, that it is okay to make a u-turn, or that a winding road is ahead. Traffic signs help to keep everyone safe!

As you construct your traffic sign game, keep in mind the following guidelines.

- Game must allow players to demonstrate their knowledge of traffic signs.
- Game must include at least ten different traffic signs.
- Traffic signs must be helpful to pedestrians, bicyclists, and motorists.
- Game must be able to be played by two to four people.

LESSON 6: Silent Safety Signals

LESSON OVERVIEW

In this lesson, students will learn about how pedestrians and bicyclists use silent signals and eye contact to communicate and stay safe. This lesson will begin with an exploration of nonverbal ways that we gain information from each other. Students will discuss how we silently communicate with each other and will consider how punctuation acts as a silent communicator (when we read, we read the words but punctuation gives us silent information about how to read the words). Students will learn about bicycle hand signals and will participate in a hand signals game outside. Students will also learn about eye contact and participate in an eye contact game involving a basketball. The end of the lesson will include an “I used to think____, Now I think____” reflection.

OBJECTIVES

- Learn how nonverbal communication helps us stay safe when walking and bicycling.

TOPIC

Pedestrian and Bicycle Safety
(Physical Education Focus)

STANDARDS SUPPORTED IN THIS LESSON

Common Core State Standards for English Language Arts

Language Standards

Grade Four

- **CCSS.ELA-Literacy.L.4.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Grade Five

- **CCSS.ELA-Literacy.L.5.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

California Physical Education Content Standards

Manipulative Skills

Grade Four

- **1.17:** Keep a hand dribbled ball away from a defensive partner.

Grade Five

- **1.14:** Dribble a ball (by hand or foot) while preventing another person from stealing the ball.

California Health Education Content Standards

Injury Prevention and Safety – Grade Four

Standard 1: Essential Concepts

- **1.16.S:** Identify ways to reduce risk of injuries from fires, around water, while riding a motor vehicle, as a pedestrian, on the playground, and from falls.

Standard 7: Practicing Health-Enhancing Behaviors

- **7.4.S:** Follow safety rules and laws at home, at school, and in the community.

LESSON 6: Silent Safety Signals

National Health Education Standards for Grades Three to Five

Standard 1: Essential Health Concepts

- 1.5.4: Describe ways to prevent common childhood injuries and health problems.

Standard 7: Practicing Health-Enhancing Behaviors

- 7.5.1: Identify responsible personal health behaviors.
- 7.5.2: Demonstrate a variety of healthy practices and behaviors to maintain or improve personal health.
- 7.5.3: Demonstrate a variety of behaviors to avoid or reduce health risks.

MATERIALS NEEDED

- *Bicycle Hand Signals* handout (1 per student)
- *Silent Safety Signals* worksheet (1 per student)
- Chart paper (1 piece)
- Sidewalk chalk, cones, or a basketball court
- Basketballs
- Jump ropes
- Index cards (1 per student)

Note: If you have difficulty locating the chalk, cones, basketballs, or jump ropes, consider asking your school's Physical Education teacher or requesting that your students bring these materials from home.

PREPARATION TIME

10 minutes

ACTIVITY TIME

60 minutes

VOCABULARY

Eye Contact—When two people are aware of looking directly in each other's eyes.

PREPARATION ACTIVITIES

- Make copies of *Bicycle Hand Signals* handout and *Silent Safety Signals* worksheet.
- If you do not have a basketball court, find a cement area to use for the outside activities. Draw boundaries with chalk or set up cones. Set up a space that will be large enough for your entire class to move around in at once.
- On the top of the piece of chart paper, write the following two sentences:
"Is it time for breakfast?" Jennifer asked. "Let's eat, Grandpa!"

STEPS FOR CLASSROOM ACTIVITY

Silent Communicators (10 minutes)

- Ask students how they communicate with each other. After students mention how they communicate (for example, talking, texting, social media), encourage them to think about other ways in which we communicate.
- Ask, "How can you communicate with someone without saying or writing down words?" Have students demonstrate how they might silently communicate with each other (for example, waving, raising eyebrows, bowing, etc.).
- Ask, "Why might you need to communicate with someone without saying a word?" Have students share several ideas. Remind them of the ways you silently communicate within the classroom.
- Tell students, "When we read, there is something that acts like a silent communicator." Take out the chart paper with the sentences written on it. Ask students to read the sentences out loud. Then ask, "What do you see written on the paper that we do not say out loud?" (Punctuation).

LESSON 6: Silent Safety Signals

- Ask, “What information does punctuation give us?” Tell students that punctuation acts as a silent communicator: when we read, we read the words but punctuation gives us silent information about how to read the words. In the sentences on the chart paper, punctuation silently tells us that someone is talking (quotation marks), that a question is asked (question mark), and to pause while reading (periods and commas). Point out how the last sentence would be much different without the comma (“Let’s eat, Grandpa!” vs. “Let’s eat Grandpa!”).

Silent Safety Signals (15 minutes)

- Say, “We use silent communicators all the time. Pedestrians and bicyclists use silent signals to communicate with motorists and each other.” Ask students to share a few ways that pedestrians and bicyclists use silent signals. Ask why pedestrians and bicyclists need silent safety signals (because they are often too far away from motorists and each other to talk).
- Tell students that they are going to learn about the silent signals that help to keep pedestrians and bicyclists safe. Tell students that eye contact is one silent way that pedestrians and bicyclists communicate. Eye contact ensures that motorists are aware of the presence of pedestrians and bicyclists.
- Ask students to think about the last time they crossed the street. Have students share any silent signals that they used to communicate with motorists. Explain that in addition to using eye contact to communicate with motorists, pedestrians also communicate through the placement of their bodies. If you see a pedestrian waiting on a corner while watching traffic, you can tell that they are waiting to cross the street.
- Say, “Sometimes bicyclists need to turn left or right. It’s important that they communicate how they will turn. When drivers want to turn left or right, they turn on a turn signal. How do bicyclists communicate how they will turn?” Tell students that bicyclists can communicate using hand signals. Pass out a *Bicycle Hand Signals* handout to each student.
- Show students the hand signals for making a left turn, making a right turn, and stopping on a bicycle:
 - » Left turn—Extend your left arm straight out, parallel to the road.
 - » Right turn—Extend your left upper-arm out to the left, bending your elbow up and pointing your fingertips up; or extend your right arm straight out to your right side, parallel to the road.
 - » Stop—Extend your left upper arm out to the left, parallel to the road and bend your elbow down and point your fingers to the ground.
- Using the *Bicycle Hand Signals* handout for reference, have students get out of their seats and practice each signal. Yell out a signal (“left turn”, “right turn”, etc.) and have students demonstrate the correct movements.

Outside Activity #1: Practicing Bicycle Hand Signals (10 minutes)

- Tell students that you will be going outside to do two outside activities. Remind students to act like they are in class, not recess, when participating in the activities. Tell students to pay extra close attention to directions while outside.
- Take students outside, either to a basketball court or to the yard. Make sure that you have space for students to walk freely and, if you are not using a basketball court, make clear boundaries drawn with chalk or set up with cones. Utilize the Group Activity Schematic #1.

LESSON 6: Silent Safety Signals

- Tell students that they will pretend to be riding bicycles. As they move, they will walk normally but will use bicycle hand signals to communicate. Have the students walk in different directions. Students will use hand signals to communicate what direction they will be going (left or right) or to show when they will be stopping.
- By using hand signals, students should try to avoid collisions. If students collide, all of the involved students need to get off of the court.
- If after a time there are only a few students left on the court, you may play again or move onto the next activity.

Outside Activity #2: Practicing Making Eye Contact (15 minutes)

- Utilize the teacher Group Activity Schematic #2 for the eye contact activity.
- Remind students that eye contact is when two people are aware of looking directly in each other's eyes. Tell students that they will practice making eye contact during this activity.
- Students will be divided into two groups. Group #2 is intended to be a smaller group, consisting of no more than five to ten students.
- Group #1 will practice dribbling a basketball across the basketball court. Students will simulate busy motorists traveling on the roadway.
- Meanwhile group #2 will simulate pedestrians trying to cross the street. Student pedestrians will have to stop, look LEFT, RIGHT, and LEFT again, then jump rope across the court.
- Instruct students in group #1 and group #2 to make eye contact with each other as they move around the court.
- To make the activity more challenging, teachers can send "motorist" students across the basketball court faster, using shorter wait periods.

Reflection (10 minutes)

- Bring the class back to the classroom. Ask, "What did you learn in the first activity? How could you use what you practiced when bicycling?" Discuss how students practiced using hand signals and silently communicating with each other.
- Ask, "What did you learn in the second activity? How could you use what you practiced when walking?" Discuss how students practiced looking left/right/left before crossing and silently communicating with each other.
- Hand out an index card to each student. Ask students to reflect on what they learned about silent safety signals. On the index cards, have students fill in the prompt "I used to think____, Now I think_____."
- Call on several students to share their reflections. Collect the index cards and post in the classroom.









LESSON 6: Silent Safety Signals

Ideas for Extending the Lesson

- As homework, have students observe the silent signals that pedestrians, bicyclists, and motorists use. Have students fill out the *Silent Safety Signals* worksheet.
- As a class, have students come up with a list of the top five silent safety signals. Break students into groups and have each group create a skit illustrating how pedestrians or bicyclists can use an important safety signal. Arrange for your class to perform their skits for younger students.
- Have students write informational essays about the importance of using silent safety signals on the road.
- As an extension of Lesson 5: Design Your Own Traffic Sign Game, students may have designed a "Safetyville." If so, have students use silent signals while traveling through Safetyville.



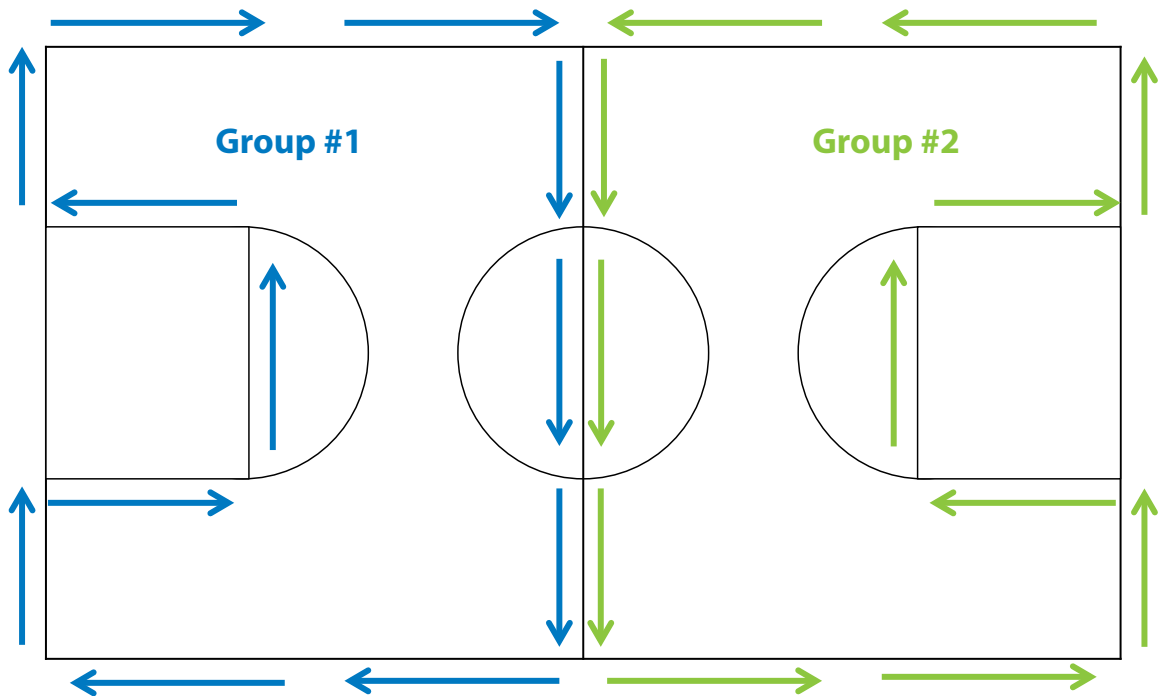
Ashley M., Palm Springs, California

Front View	Hand Signal	Back View
	Left Turn Extend your left arm out sideways.	
	Right Turn Extend your left arm out sideways bent at a ninety-degree angle at the elbow joint, hand pointing upwards and the palm of hand facing forward.	
	Alternative Right Turn Extend your right arm out straight.	
	Stopping or Slowing Extend your left arm out sideways bent at a ninety-degree angle at the elbow joint, hand pointing downwards and the palm of hand facing backwards.	

(Adapted handout from City of Virginia Beach)

Group Activity Schematic #1

On the Basketball Court

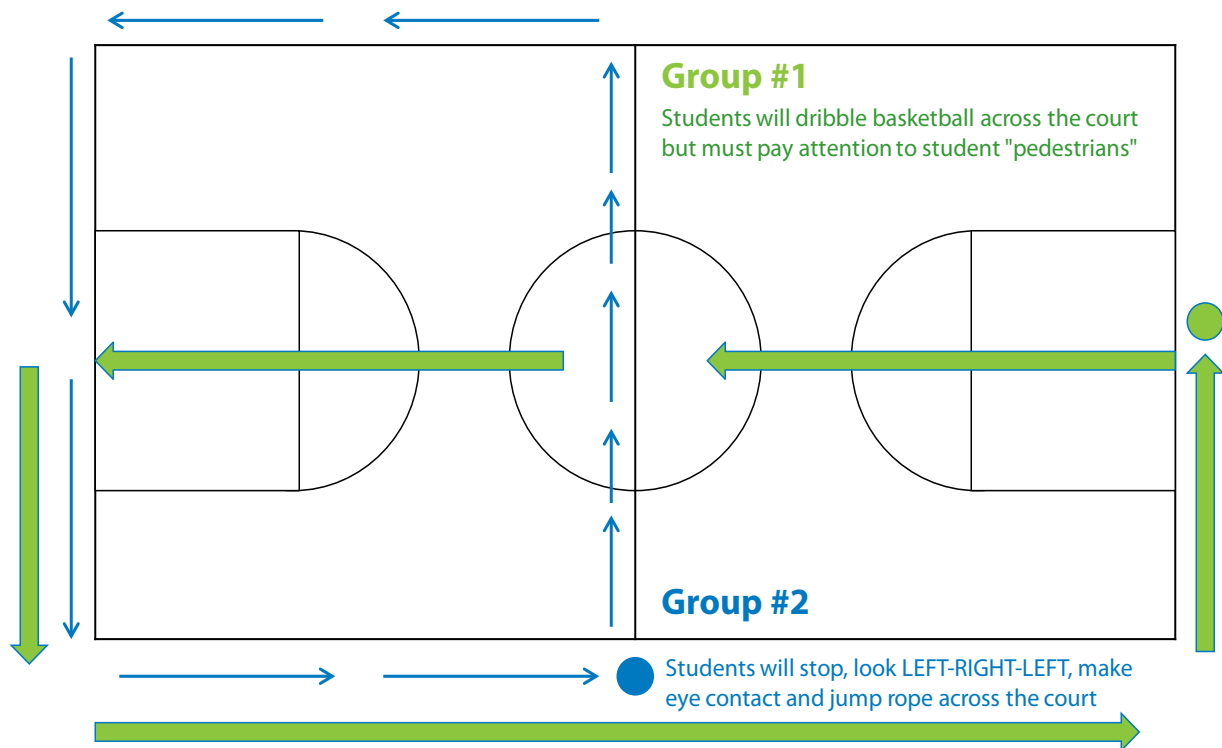


Safe Routes to School Technical Assistance Resource Center



Group Activity Schematic #2

On the Basketball Court



Safe Routes to School Technical Assistance Resource Center



Student Worksheet

Silent Safety Signals

Name: _____ Date: _____

Spend some time observing the types of silent safety signals that pedestrians, bicyclists, and motorists use. You can make observations while you walk, bicycle, or drive in a car.

Pedestrian, Bicyclist, or Motorist?	Type of Silent Safety Signal Used

LESSON 7: Get Your Helmet On!

LESSON OVERVIEW

In this lesson, students will learn and understand the importance of wearing a helmet while bicycling and participating in other modes of active transportation. They will examine the influences that contribute to people not wearing helmets and analyze data relating helmet use to bicyclist fatalities. Using their knowledge of helmet use and bicycle safety, students will create advertisements to persuade people to wear helmets. These advertisements will aim to overcome the obstacles that prevent people from wearing helmets. As extension activities, students will be encouraged to delve deeper into the data around helmet safety, write informational pieces about the importance of wearing helmets, and learn how to properly fit bicycle helmets.

OBJECTIVES

TOPIC

Bicycle Safety

- Learn the 3B's of bicycle safety (be responsible, be predictable, and be visible).
- Learn the importance of wearing a bicycle helmet.
- Analyze the influences that contribute to bicyclists not wearing helmets.
- Create persuasive advertisements that include bicycle safety messaging.

STANDARDS SUPPORTED IN THIS LESSON

Common Core State Standards for English Language Arts

Writing Standards

Grade Four

- **CCSS.ELA-Literacy.W.4.2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Grade Five

- **CCSS.ELA-Literacy.W.5.2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Speaking and Listening Standards

Grade Four

- **CCSS.ELA-Literacy.SL.4.1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

Grade Five

- **CCSS.ELA-Literacy.SL.5.1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

Common Core State Standards for Mathematics

Grade Four

- **4.NF.C.6:** (CCSS.Math.Content.4.NF.C.6): Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.

Grade Five

- **5.NF.B.3:** (CCSS.Math.Content.5.NF.B.3): Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions, mixed numbers, or decimal fractions, e.g., by using visual fraction models or equations to represent the problem.

LESSON 7: Get Your Helmet On!

California Health Education Content Standards

Injury Prevention and Safety – Grade Four

Standard 1: Essential Concepts

- 1.9.S: Explain the importance of wearing helmets, pads, mouth guards, water safety vests, and other safety equipment during athletic and outdoor activities.

Standard 6: Goal Setting

- 6.1.S: Make a personal commitment to use appropriate protective gear while engaging in activities.

Standard 8: Health Promotion

- 8.3.S: Encourage others' safety behaviors (e.g., wearing bicycle helmets and seat belts).

National Health Education Standards for Grades Three to Five

Standard 1: Essential Health Concepts

- 1.5.4: Describe ways to prevent common childhood injuries and health problems.

Standard 8: Health Promotion

- 8.5.2: Encourage others to make positive health choices.

MATERIALS NEEDED

- Chart paper (1 per table group)
- Pencils, crayons, and/or markers (1 set per group of 4 students)
- The 3 B's handout (1 per student)
- *What's the Connection Between Helmet Use and Bicyclist Fatalities?* chart (1 per student)
- Blank white paper (1 per student)
- *Bicycling Advertisements* handout (1 per group of 4 students)

PREPARATION ACTIVITIES

- Group tables (if not already set up in groups) so that one table group seats approximately four students. Put one piece of chart paper on each table group.
- Make copies of 3 B's handout and the *What's the Connection Between Helmet Use and Bicyclist Fatalities?* chart.
- Make copies of the *Bicycling Advertisements* handout included at the end of this lesson.

STEPS FOR CLASSROOM ACTIVITY

Chalk Talk (10 minutes)

- Ask the class how they stay safe while riding a bicycle.
- On the chart paper, students should write or draw everything they know about bicycle safety. Allow five minutes for this activity.
- When five minutes is up, call the class back together. Ask students to share what they wrote and drew about bicycle safety. Write student responses on the white board or chart paper. Correct any misperceptions and add information whenever possible.

PREPARATION TIME

10 minutes

ACTIVITY TIME

60 minutes

VOCABULARY

Brain Injury—Injury to the brain from an external force.

Percent—Amount per 100.

Predictable—To be expected.

Responsible—To be in charge of your behavior.

Visibility—The ability to be seen.

LESSON 7: Get Your Helmet On!

The 3 B's (10 minutes)

- Introduce the 3 B's of bicycle safety: be responsible, be predictable, be visible.
- Distribute the 3 B's handout to each student. Briefly read and discuss each section with the class.
- Go through each of the student responses from the chalk talk activity. As a class, have students decide if the responses fit under responsibility, predictability, or visibility. Label each response with a "R", "P", or "V."
- Consult the 3 B's handout and add any bicycle safety component that the class failed to mention. This does not need to be an in-depth discussion, but should give students a general overview of bicycle safety.



Nu Ri L., Davis, California

Why Are Helmets Important? (10 minutes)

- Ask students to articulate why wearing helmets is important (because they protect against brain injury, disability, and death). Share that helmet use has been estimated to reduce brain injury risk by 85 percent.
- Wearing a helmet is also important because it's the law. Share that the California Youth Helmet Law mandates that people under 18 years of age need to wear a helmet when riding a bicycle, scooter, skateboard, or wearing roller or in-line skates. The text of this law is included at the end of this lesson.

Analyzing Influences (5 minutes)

- Ask the class why they think people would not wear a helmet, after learning more about bicycle safety. Possible answers: people think that helmets are not cool, people think helmets are uncomfortable, people do not own helmets, people forget.
- Have students think about obstacles that prevent people from wearing helmets. Ask students to consider how these obstacles could be overcome. Introduce the idea of creating advertisements that aim to overcome obstacles to helmet wearing. For example, to change the perception that helmets are not cool, how could helmets be portrayed and talked about in advertisements?

Creating Advertisements (20 minutes)

- Present the four advertisements included at the end of this lesson. Ask students to consider how effective these advertisements are and who they might appeal to. Ask students if they think any of these advertisements change perceptions about helmet wearing and/or bicycling.
- Explain that students will be working in pairs to create an advertisement that promotes helmet wearing. The advertisements should address one of the obstacles to helmet wearing identified in the previous section.
- Advertisements should be encouraged to incorporate a statistic about helmet wearing (taken from the *What's the Connection Between Helmet Use and Bicyclist Fatalities?* chart).

LESSON 7: Get Your Helmet On!

Gallery Walk (5 minutes)

- Find a place in the classroom for students to display their advertisements. Allow students to silently walk around the room and look at the advertisements.
- After students walk around the classroom “gallery,” call the class back together to discuss what they noticed. Ask the following questions: What was effective? How did different advertisements use data? What could be done with these advertisements?

Ideas for Extending the Lesson

- *What’s the Connection Between Helmet Use and Bicyclist Fatalities?:* This worksheet takes students through a variety of math problems to better understand how helmets reduce disability and death from brain injury.
- Have students write persuasive fact sheets for younger students about the importance of wearing helmets and articulating the components of helmet safety. Share this writing with students in other classes.
- Assign students to small groups and ask the groups to script and perform skits about the importance of wearing helmets.
- Properly Fitting a Helmet: Bring in a bicycle helmet and discuss how to properly fit a bicycle helmet. Because of the possibility of lice, do not have students wear the helmet. You may demonstrate how to properly fit the helmet. Use guidelines on the 3 B’s handout. Show the following video found under Videos and Clips > Fitting a Bicycle Helmet at <http://www.nhtsa.gov/Bicycles>
- Collect student-made advertisements and create a calendar to be sold by the PTA so that safety messages will be delivered throughout the year.



Olivia L., San Francisco, California

Student Worksheet

What's the Connection Between Helmet Use and Bicyclist Fatalities?

In the graph below, the columns titled "Number" and "Percent" represent the number and percent of bicyclist fatalities in the United States within the given years.

Year	-----No Helmet-----		-----Helmet-----		-----Unknown-----		-----Total-----	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
2005	676	86	77	10	31	4	784	100
2006	730	95	37	5	2	0	769	100
2007	646	92	50	7	4	0	699	100
2008	654	91	59	8	3	0	716	100
2009	573	91	52	8	3	0	628	100
2010	429	70	94	15	93	15	616	100

1. In 2009, there were 628 bicyclist fatalities. What fraction of these fatalities involved bicyclists who were not wearing bicycle helmets?
2. In 2007, 92 percent of bicyclist fatalities involved bicyclists who were not wearing bicycle helmets. Write 92 percent as both a fraction and a decimal.
3. Which year had the most bicyclist fatalities? What percentage of those fatalities involved either no bicycle helmet or unknown bicycle helmet use?
4. What have you learned from examining this data?

Data from <http://www.helmets.org/stats.htm>.

In the graph below, the columns titled "Number" and "Percent" represent the number and percent of bicyclist fatalities in the United States within the given years.

Year	-----No Helmet-----		-----Helmet-----		-----Unknown-----		-----Total-----	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
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2010	429	70	94	15	93	15	616	100

- In 2009, there were 628 bicyclist fatalities. What fraction of these fatalities involved bicyclists who were not wearing bicycle helmets?
573/628
- In 2007, 92 percent of bicyclist fatalities involved bicyclists who were not wearing bicycle helmets. Write 92 percent as both a fraction and a decimal.
92/100, 0.92
- Which year had the most bicyclist fatalities? What percentage of those fatalities involved either no bicycle helmet or unknown bicycle helmet use?
2005, 90%
- What have you learned from examining this data?
Answers may vary. Answers may include observation that bicycle helmets greatly protect against bicyclist fatalities.

Data from <http://www.helmets.org/stats.htm>.

BE RESPONSIBLE:

Always wear a properly fitting bicycle helmet.

Eyes, Ears, and Mouth Check Test for proper helmet fit:

Eyes—Helmet should fit level on head and the rim should be one or two finger widths above the eyebrows.

Ears—Helmet side straps should create a tight “V” under ear lobes when buckled.

Mouth—Helmet chin strap should fit snug with a finger space between the strap and chin.

Quick Test—Shake head from side to side to make sure the helmet is secure.

Wear proper bicycle attire.

Make sure shoelaces are tied securely.

Avoid clothes that will get caught in the bicycle chain or wheel spoke.

Use a strap or band to secure loose pant legs.

Do not wear headphones or use hand-held devices while bicycling.

Wear bright colored clothing during the day and light colored clothing at night.

ABC Bicycle Quick Check.

A is for air pressure check.

B is for brake and bar (handlebar) check.

C is for checking cranks, chains, and cogs.

Quick is quick release, making sure quick releases on wheels are tight and closed properly.

Check is for checking bicycle to make sure it's ready to ride.



BE PREDICTABLE:

Understand the Rules of the Road- right of way, yielding, turning, traffic signs, scanning roads/crossings, etc.

Use hand signals when riding a bicycle.

Left turn—Extend the left arm straight out, parallel to the road.

Right turn—Extend the left arm out to the left, parallel to the road and bend the elbow up and point fingertips upward; or extend the right arm straight out to the right side, parallel to the road.

Stop—Extend the left arm out to the left, parallel to the road and bend the elbow down and point fingertips downward.

BE VISIBLE:

Avoid riding a bicycle when it is dark or in bad weather.

Use lights, bright clothing, and reflective materials to increase visibility when riding a bicycle.

California Bicycle Laws¹ (Excerpted from DMV handbook)

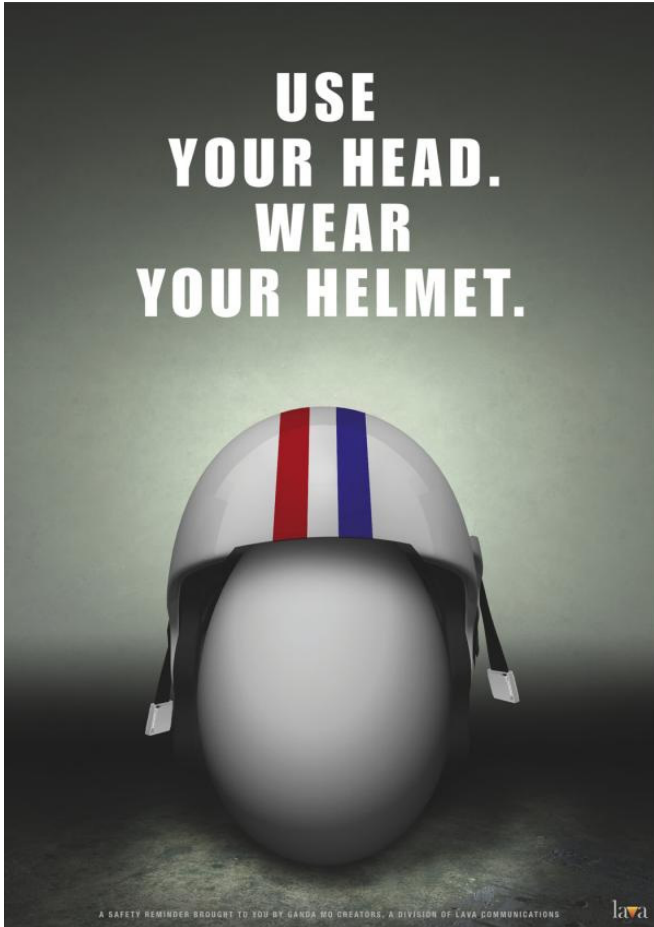
Youth Bicycle Helmets: Minors (§ 21212)

- (a) A person under 18 years of age shall not operate a bicycle, a nonmotorized scooter, or a skateboard, nor shall they wear in-line or roller skates, nor ride upon a bicycle, a nonmotorized scooter, or a skateboard as a passenger, upon a street, bikeway, as defined in Section 890.4 of the Streets and Highways Code, or any other public bicycle path or trail unless that person is wearing a properly fitted and fastened bicycle helmet that meets the standards of either the American Society for Testing and Materials (ASTM) or the United States Consumer Product Safety Commission (CPSC), or standards subsequently established by those entities. This requirement also applies to a person who rides upon a bicycle while in a restraining seat that is attached to the bicycle or in a trailer towed by the bicycle.

¹<https://www.dmv.ca.gov/portal/dmv/detail/pubs/vctop/vc/d11/c1/a4/21212>

Student Worksheet

Bicycle Advertisements



LESSON 8:

How Can We Be Safe on Our Routes to School?

LESSON OVERVIEW

This lesson begins by having students think about what makes a safe route for pedestrians and bicyclists. Students will consider how they can assess the safety of different routes. The class will discuss what makes routes safe or less safe and collaboratively come up with a rating system to use when assessing their routes. After coming up with a rating system, the class will test the system by assessing the pedestrian and bicycle safety of their school block. As homework, students will assess the pedestrian and bicycle safety of their routes to school.

OBJECTIVES

- Determine what factors affect pedestrian and bicycle safety.
- Determine the safety of different routes to school.

TOPIC

Safe Routes to School

STANDARDS SUPPORTED IN THIS LESSON

Common Core State Standards for Mathematics

Grade Four

- **4.NBT.B.4:** (CCSS.Math.Content.4.NBT.B.4): Fluently add and subtract multi-digit whole numbers using the standard algorithm.

California Health Education Content Standards

Injury Prevention and Safety – Grade Four

Standard 1: Essential Concepts

- **1.16.S:** Identify ways to reduce risk of injuries from fires, around water, while riding a motor vehicle, as a pedestrian, on the playground, and from falls.

Standard 8: Health Promotion

- **8.3.S:** Encourage others' safety behaviors (e.g., wearing bicycle helmets and seat belts).

California Science Content Standards

Investigation and Experimentation – Grade Five

- **6.b:** Develop a testable question.
- **6.c:** Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.

National Health Education Standards for Grades Three to Five

Standard 1: Essential Health Concepts

- **1.5.4:** Describe ways to prevent common childhood injuries and health problems.

Standard 8: Health Promotion

- **8.5.1:** Express opinions and give accurate information about health issues.
- **8.5.2:** Encourage others to make positive health choices.

LESSON 8:

How Can We Be Safe on Our Routes to School?

MATERIALS NEEDED

- Chart paper (6 pieces)
- Markers (5 sets)
- Clipboards (1 per student)
- Pencils (1 per student)
- *Let's Keep Score!* worksheet (1 per student)
- *How Safe is Your Route?* worksheet (2 per student)
- *Neighborhood Safety: The Big Five* sheet (1 for teacher reference)
- Neighborhood Pictures (1 per pair)

PREPARATION ACTIVITIES

- On five pieces of chart paper, write the following words (1 word on the top of each paper): sidewalks, intersections, motorists, bicyclists, environment. Under the word, draw a line down the middle of the paper. Write "**Safe**" on one side of the paper and "**Not Safe**" on the other.
- Divide the class into five groups. Give one piece of labeled chart paper and a set of markers to each group.
- Make copies of *Let's Keep Score!* and *How Safe is Your Route?* worksheets.
- This lesson includes a walk around the school block. You may want to solicit parent volunteers to help with supervision.

STEPS FOR CLASSROOM ACTIVITY

What's Safe? (15 minutes)

- Ask students to consider how safe their neighborhood is for walking and bicycling. Ask a few students to share ideas and experiences. Ask students to think about how they can determine the safety of their neighborhood.
- Pass out the neighborhood pictures. Ask students to share the safe and less safe features of the neighborhoods they see.
- Tell students that there are features that make some neighborhoods safer than others. Explain that the students will consider how sidewalks, intersections, motorists, bicyclists, and the neighborhood environment contribute to pedestrian and bicycle safety.
- Discuss how neighborhoods with less safe features can be made safer for pedestrians and bicyclists. Tell students that even if their neighborhood has less safe features, they can still find ways to safely walk or bicycle.
- On their piece of chart paper, each group should write and draw ways that sidewalks, intersections, motorists, bicyclists, or the neighborhood environment effect pedestrian and bicycle safety. Each group will think about one aspect of neighborhood safety.

Keeping Score (15 minutes)

- Call the students back together to share their thinking about how sidewalks, intersections, motorists, bicyclists, and the neighborhood environment contribute to pedestrian and bicycle safety.
- Explain that students will measure the safety of their school neighborhood by calculating a safety rating. In order to do so, students will be adding and subtracting safety points based on different safety features. Through this process, students will be able to develop safety ratings for different neighborhoods.

PREPARATION TIME

10 minutes

ACTIVITY TIME

60 minutes

VOCABULARY

Intersection—A place where two or more roads meet.

LESSON 8:

How Can We Be Safe on Our Routes to School?

- On a piece of chart paper, write students' ideas for important safety features to assess. For each feature, have students assign a number of points. For example, "Has clearly labeled intersections" could have a value of plus five points while "Has cracks in sidewalks" could have a value of minus two points. Use the *Neighborhood Safety: The Big Five* sheet to help guide your discussion.
- Pass out the *Let's Keep Score!* worksheet and have students write down the features and point values that they collectively determine. This information should also be written on the chart paper.

Walk Around the Block (20 minutes)

- Make sure every student has a *Let's Keep Score!* worksheet, a *How Safe is Your Route?* worksheet, a pencil, and a clipboard.
- Tell students that they will be trying out their rating system by assessing the safety of the school block. They should consider how safe the block is for pedestrians and bicyclists.
- On the *How Safe is Your Route?* worksheet, have students note the features and points that they listed on the *Let's Keep Score!* worksheet.
- During the walk, keep the class together and discuss the safety features that are noticed as they arise.
- After the walk, have students compute the total safety score for the school block and answer the questions at the end of their worksheets.

Reflection and Homework (10 minutes)

- Have students think about how the school block could be made safer for pedestrians and bicyclists. Have students share ideas about what could be done to make the block safer. Ask students to consider whether there is anything they can do to make the block safer for pedestrians and bicyclists.
- Have students consider how their rating system worked. Ask students if they would like to make any changes to their rating system. If changes are suggested, try to find consensus as a class before implementing changes. If changes are implemented, have students note the changes on their *Let's Keep Score!* worksheet.



Courtney A., Long Beach, California

LESSON 8: How Can We Be Safe on Our Routes to School?

- Tell students that as homework they are going to assess the pedestrian and bicycle safety of their routes to school. Sometime this week, they should walk or bicycle to school and note the safety features of their neighborhoods. If students are unable to walk or bicycle to school, they should take their normal transportation to school but assess the safety of their route through the eyes of a pedestrian or bicyclist. Using another copy of the *Let's Keep Score!* worksheet, students will compute the safety score of their route to school.

Ideas for Extending the Lesson

- Print out Google Maps to show students' routes to school. If you have a computer lab, you can teach students how to show and print these maps themselves. Have students trace their routes and note safety features as they walk and bicycle to school.
- Have students write letters to the mayor or city council suggesting safety improvements to the neighborhood. Encourage students to share evidence from their neighborhood safety walks. To learn more about the safety of their neighborhoods, have students analyze the traffic injury data available at <http://www.casaferoutestoschool.org/test-news-1/>.
- Ask students to conduct brief interviews with safety professionals (e.g., public health professionals, local police officers, etc.) to find out about efforts to keep neighborhoods safe. Have students ask the following questions: What type of data or information do you use to measure safety near schools? Who is responsible for analyzing and interpreting that information? Are the data you collect available for our school?



Arami C., Davis, California

Student Worksheet

Let's Keep Score!

Name: _____ Date: _____

As a class, determine which features contribute to the safety of your route. Write down each feature and the number of safety points (positive or negative) assigned to each feature. You will use this scorecard to determine the safety of your route.

Feature	Safety Points

Student Worksheet

How Safe is Your Route?

Name: _____ Date: _____

As you walk or bicycle, use the *Let's Keep Score!* scorecard to help you determine the safety of your route. Write down the features that you notice and the number of points (positive or negative) assigned to each feature.

I walked / bicycled (circle one)

Feature	Notes	Points

How many total points did your route get?

What could make your route safer?

Neighborhood Safety: The Big Five

Consider the following aspects when creating your class' neighborhood scorecard.

1. Sidewalks

- Are there sidewalks in your neighborhood?
- Are they wide enough?
- Do they have cracks or gaps?
- Are parked cars, bushes, or other obstacles blocking the sidewalks?

2. Intersections

- Are there crosswalks? Are they clearly labeled?
- Are there traffic signals? Do they work properly and allow for enough time to cross the street?

3. Motorists

- Do motorists seem cautious? Are they aware? Are they speeding?
- Do motorists stop for pedestrians?
- Do motorists stop for traffic signals?

4. Bicyclists

- Are there other bicyclists on the road?
- Are there bicycle lanes?
- How do motorists interact with bicyclists?

5. Environment

- Is the neighborhood safe?
- Is the neighborhood clean?
- Is the neighborhood well lit at night?
- Are there unleashed or menacing dogs?



No sidewalk



Blocked sidewalk



Unleashed dog



Crossing guard



Bicycle lane



Clear and clean sidewalks

LESSON 9: Getting to School: What's the Cost?

LESSON OVERVIEW

In this lesson students will consider the monetary, environmental, safety, and practical costs of different modes of transportation. Partners will share how they get to school in the morning and why they use this mode of transportation. As a class, students will consider the reasons why students use different modes of transportation. Students will be asked to help Traveling Tony evaluate the monetary and environmental costs of walking, bicycling, and being driven to school. Students will also consider the “safety cost” of the different modes of transportation that Traveling Tony can take to school and identify ways to make Tony’s morning commute as safe as can be (bicycle helmets, seat belts, etc.). Finally, students will write letters to Traveling Tony explaining their recommendations for how he can get to school.

OBJECTIVE

- Evaluate the monetary, environmental, safety, and practical costs of different modes of transportation.

TOPIC

Impacts of Walking and Bicycling to School

STANDARDS SUPPORTED IN THIS LESSON

Common Core State Standards for English Language Arts

Writing Standards

Grade Four

- **CCSS.ELA-Literacy.W.4.1:** Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Grade Five

- **CCSS.ELA-Literacy.W.5.1:** Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Common Core State Standards for Mathematics

Grade Four

- **4.NBT.B.4** (CCSS.Math.Content.4.NBT.B.4): Fluently add and subtract multi-digit whole numbers using the standard algorithm.
(Note: 4th graders who have not learned about decimals can use the calculation 1 mile = 1 pound of air pollution.)*
- **4.NBT.B.5** (CCSS.Math.Content.4.NBT.B.5): Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Grade Five

- **5.NBT.B.7** (CCSS.Math.Content.5.NBT.B.7): Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

California Health Education Content Standards

Injury Prevention and Safety – Grade Four

Standard 7: Practicing Health-Enhancing Behaviors

- **7.3.S:** Use appropriate protective gear and equipment.
- **7.4.S:** Follow safety rules and laws at home, at school, and in the community.

LESSON 9: Getting to School: What's the Cost?

National Health Education Standards for Grades Three to Five

Standard 7: Practicing Health-Enhancing Behaviors

- 7.5.1: Identify responsible personal health behaviors.
- 7.5.2: Demonstrate a variety of healthy practices and behaviors to maintain or improve personal health.
- 7.5.3: Demonstrate a variety of behaviors to avoid or reduce health risks.

MATERIALS NEEDED

- *What's the Cost of Bicycling?* worksheet (1 per student)
- *What's the Cost of Driving?* worksheet (1 per student)
- *Getting to School: What's the Cost?* worksheet (1 per student)
- Lined paper (1 piece per student)

PREPARATION ACTIVITIES

- Make copies of *What's the Cost of Bicycling?*, *What's the Cost of Driving?*, and *Getting to School: What's the Cost?* worksheets.

STEPS FOR CLASSROOM ACTIVITY

How Did You Get to School? (5 minutes)

- Have students turn to a partner and share how they got to school this morning. Ask students to share why they used the mode of transportation that they did.
- Call on students to share how they got to school. Briefly discuss the reasons why students used certain modes of transportation.

What's the Cost of Bicycling and Driving? (20 minutes)

- Tell students that there are different options for getting to school and each option has pros and cons. There are different costs for each option—monetary (money), environmental (pollution), safety, and practical (convenience) costs.
- Explain that students are going to help Traveling Tony evaluate the costs of using different modes of transportation to get to school. Traveling Tony goes to college every day. His school is two miles away from his house, which means it takes him four miles round trip to get to and from school. There is no public transportation in Traveling Tony's neighborhood and he does not have anyone to carpool with. Traveling Tony has three options for getting to school—walking, bicycling, and driving.
- Tell students that they will begin by calculating the monetary costs of each mode of transportation. Ask students how much it costs to walk (\$0). Tell students that they will calculate the monetary costs of bicycling and driving. To do this, students will figure out how much it costs per mile to bicycle or drive.
- Pass out the *What's the Cost of Bicycling?* and *What's the Cost of Driving?* worksheets. Have students complete each worksheet. Review the calculations as a class, using the answer keys to check your students' work.

PREPARATION TIME

10 minutes

ACTIVITY TIME

60 minutes

VOCABULARY

Environmental—Relating to the natural world and humans' impact on the natural world.

Fuel Efficiency—A measure of how much energy is produced by an engine in relationship to the amount of fuel it uses.

Insurance—Protection against a possible event or occurrence.

Maintenance—Keeping something in good condition.

Monetary—Having to do with money.

Practical—Concerned with actually doing something rather than just ideas.

LESSON 9: Getting to School: What's the Cost?

Getting to School: What's the Cost? (20 minutes)

- Now that students have calculated the costs of bicycling and driving per mile, ask them to think about what other costs Traveling Tony should consider.
- Tell students that they are going to help Traveling Tony calculate the cost that each mode of transportation has on the environment. Ask students if walking, bicycling, and/or driving causes air pollution. For driving, students will use the conversion 1 mile = 0.97 pounds of air pollution* (round to 1 mile = 1 pound of air pollution if students need a modification).
- Tell students that they will also consider the safety cost of each mode of transportation. Traveling Tony can help to make each mode of transportation safer by following certain precautions (crossing in the crosswalk while walking, wearing his helmet while bicycling, etc.)
- Have students fill out the *Getting to School: What's the Cost?* worksheet.
- When all students have finished, review and compare students' responses.
- Ask students if there is any other information Traveling Tony should consider when choosing which mode of transportation to use. If students do not bring it up, point out that Traveling Tony will also want to consider the practical cost of using each mode of transportation. For example, if Tony does not have much time in the morning, walking may not be practical because it would take Tony more time to get to school. However, Tony may wish to walk or bicycle to school even though it takes longer than driving because he cares about the environment and does not want to create pollution by driving.

Reflection: Persuasive Letters (15 minutes)

- Ask students to make a recommendation for which mode of transportation Traveling Tony should use. Tell students that they will be writing a letter to Traveling Tony trying to convince him to use their recommended mode of transportation.
- In the persuasive letters, students should use information from their *What's the Cost?* worksheet to persuade Traveling Tony to change his mode of transportation. Remind students to use supporting details to convince Traveling Tony of their reasoning.

Ideas for Extending the Lesson

- After calculating the distances they travel to school, have students calculate the monetary and environmental costs of their trips to school.
- Have students make posters advertising the hidden costs of different modes of transportation. Encourage students to use the information they learned in this lesson to teach others about the impact of their transportation decisions.



Alexia Z., Rocklin, California

*<http://www.youcanbikethere.com/content/environmental-benefits-0>

Name: _____ Date: _____

It costs money to buy and maintain a bicycle. Help Traveling Tony calculate the cost of riding a bicycle per mile.

Starting Costs

Average cost of bicycle = \$150

Basic equipment (bicycle helmet, pump, spare tube, seat pack, front and rear lights, and water bottle) = \$100

1. How much money does it cost to buy a bicycle and basic equipment? Show your work.

Routine Maintenance Costs

Cost of routine maintenance = \$50/year

Replacement tires = \$30 for one set per year

Occasional upgrades (new bicycle helmet, seat, pedals, wheels) = \$60 per year

Average life of a bicycle = 10 years

2. Calculate how much money will be spent on maintenance over the life of a bicycle. Show your work.

Calculate Cost of Riding a Bicycle per Mile

Average miles ridden over the life of a bicycle = 10,000

3. Add the starting costs (question 1) and the maintenance costs (question 2).

Divide this answer by the total number of miles ridden over the life of a bicycle (10,000).

4. What is the cost of riding a bicycle per mile? (Round to the nearest hundredth) _____

Source: Maryland Pedestrian and Bicycle Safety Education Program,

<http://www.saferoutesinfo.org/program-tools/maryland-pedestrian-and-bicycle-safety-education-curriculum-k-5>

Name: _____ Date: _____

It costs money to buy and maintain a bicycle. Help Traveling Tony calculate the cost of riding a bicycle per mile.

Starting Costs

Average cost of bicycle = \$150

Basic equipment (bicycle helmet, pump, spare tube, seat pack, front and rear lights, and water bottle) = \$100

1. How much money does it cost to buy a bicycle and basic equipment? Show your work.

$$\mathbf{\$250 = (\$150 + \$100)}$$

Routine Maintenance Costs

Cost of routine maintenance = \$50/year

Replacement tires = \$30 for one set per year

Occasional upgrades (new bicycle helmet, seat, pedals, wheels) = \$60 per year

Average life of a bicycle = 10 years

2. Calculate how much money will be spent on maintenance over the life of a bicycle. Show your work.

$$\mathbf{\$1,400 = 10 \times (\$50 + \$30 + \$60)}$$

Calculate Cost of Riding a Bicycle per Mile

Average miles ridden over the life of a bicycle = 10,000

3. Add the starting costs (question 1) and the maintenance costs (question 2).

Divide this answer by the total number of miles ridden over the life of a bicycle (10,000). Show your work.

$$\mathbf{\$0.165 = (\$250 + \$1,400) \div 10,000 \text{ miles}}$$

4. What is the cost of riding a bicycle per mile? (Round to the nearest hundredth) _____

$$\mathbf{\$0.165/\text{mile}}$$

Name: _____ Date: _____

It costs money to buy, maintain, and drive a car. Help Traveling Tony calculate the cost of driving a car per mile.

Insurance

Average cost of Insurance = \$1,300 per year

Life of a Car = 15 years

1. How much money is spent on insurance over the life of a car? Show your work.

Cost of Gas

Average cost of gas in California = \$4.00 a gallon

Fuel Efficiency = 30 miles per gallon

2. Calculate how much it costs for gas per mile (round to nearest hundredth). Show your work.

The average number of miles driven over the life of a car = 150,000

3. Calculate how much money will be spent on gas over the life of a car. Show your work.

Maintenance Costs

Oil Change:	Tune-Ups	Tires
\$45 per oil change, performed twice per year	\$100 per tune-up, performed once per year	\$80 per tire, set of 4 tires replaced per year
Total yearly cost for oil changes: _____	Total yearly cost for tune-ups: _____	Total yearly cost for tires: _____

4. How much money is spent on maintenance (oil changes + tune-ups + tires) per year? Show your work.
5. How much money is spent on maintenance over the life of a car (15 years)? Show your work.
(Hint: Use your answer above to help)

Calculate Cost of Driving per Mile

Average cost of a midsize car = \$15,000

6. Add cost of a midsize car (\$15,000), amount of money spent on insurance (question 1), amount of money spent on gas (question 3), and amount of money spent on maintenance (question 5). Show your work.
Divide this answer by the total number of miles driven over the life of a car (150,000). Show your work.
7. What is the cost of driving per mile? (Round to the nearest hundredth) _____

Source: Maryland Pedestrian and Bicycle Safety Education Program,

<http://www.saferoutesinfo.org/program-tools/maryland-pedestrian-and-bicycle-safety-education-curriculum-k-5>

Name: _____ Date: _____

It costs money to buy, maintain, and drive a car. Help Traveling Tony calculate the cost of driving a car per mile.

Insurance

Average cost of Insurance = \$1,300 per year

Life of a Car = 15 years

- How much money is spent on insurance over the life of a car? Show your work.

$$\mathbf{\$19,500 = (\$1,300 \times 15 \text{ years})}$$

Cost of Gas

Average cost of gas in California = \$4.00 a gallon

Fuel Efficiency = 30 miles per gallon

- Calculate how much it costs for gas per mile (round to nearest hundredth). Show your work.

$$\mathbf{\$0.13 = (\$4.00 \div 30 \text{ miles})}$$

The average number of miles driven over the life of a car = 150,000

- Calculate how much money will be spent on gas over the life of a car. Show your work.

$$\mathbf{\$19,500 = (\$0.13 \times 150,000 \text{ miles})}$$

Maintenance Costs

Oil Change: \$45 per oil change, performed twice per year Total yearly cost for oil changes: \$90	Tune-Ups \$100 per tune-up, performed once per year Total yearly cost for tune-ups: \$100	Tires \$80 per tire, set of 4 tires replaced per year Total yearly cost for tires: \$320
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- How much money is spent on maintenance (oil changes + tune-ups + tires) per year? Show your work.

$$\mathbf{\$510 = (\$90 + \$100 + \$320)}$$

- How much money is spent on maintenance over the life of a car (15 years)? Show your work.

(Hint: Use your answer above to help)

$$\mathbf{\$7,650 = (\$510 \times 15 \text{ years})}$$

Calculate Cost of Driving per Mile

Average cost of a Midsize Car = \$15,000

- Add cost of a midsize car (\$15,000), amount of money spent on insurance (question 1), amount of money spent on gas (question 3), and amount of money spent on maintenance (question 5). Show your work.

$$\mathbf{\$61,650 = (\$15,000 + \$19,500 + \$19,500 + \$7,650)}$$

Divide this answer by the total number of miles driven over the life of a car (150,000). Show your work.

$$\mathbf{\$0.41 = (\$61,650 \div 150,000 \text{ miles})}$$

- What is the cost of driving per mile? (Round to the nearest hundredth) _____

$$\mathbf{\$0.41/\text{mile}}$$

Student Worksheet

Getting to School: What's the Cost?

Name: _____ Date: _____

Help Traveling Tony weigh the costs of different modes of transportation. Traveling Tony's trip to school is 4 miles round trip.

To calculate the monetary cost, use the costs per mile that you calculated for bicycling and driving.

To calculate the environmental cost, use 1 mile = 0.97 pounds of air pollution.*

Mode of Transportation	Monetary Cost	Environmental Cost
Walking		
Bicycling		
Driving		

What's the safety cost?

Mode of Transportation	How safe do you think this mode is? Use a scale of 1-3 with 1 the most safe and 3 the least safe	How could Traveling Tony increase the safety of this mode?
Walking		
Bicycling		
Driving		

*<http://www.youcanbikethere.com/content/environmental-benefits-0>

