



Grades 6 - 8

Safe Routes to School Lesson Guide

Walking/Bicycling Traffic Safety Education

Aligned with Ohio Academic Content Standards

5 Ready-Made Lessons

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Trek Bicycle Stores
Columbus, OH



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Lesson 1

Mapping My Safe Route to School

Grades 6 – 8

Safety Focus



Students create a map of their route to school while analyzing the safety features, costs, and comparisons of different safe routes to their school.

Visit everymove.ohio.gov for electronic versions of this and the other Safe Routes to School Lesson Guides published by the Ohio Department of Transportation (ODOT).



- Grades K – 2
- Grades 3 – 5



Curricular Connections: Grades 6–8

Grade 6	Grade 7	Grade 8
Reading Standard for Literacy in History/Social Studies – Common Core State Standards	Reading Standard for Literacy in History/Social Studies – Common Core State Standards	Reading Standard for Literacy in History/Social Studies – Common Core State Standards
Integration of Knowledge and Ideas	Integration of Knowledge and Ideas	Integration of Knowledge and Ideas
7. Integrate visual information (in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.	7. Integrate visual information (in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.	7. Integrate visual information (in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
Social Studies Standard	Social Studies Standard	
Geography-Spatial Thinking & Skills	Economics-Economic Decision Making and Skills	
3. Globes and other geographic tools can be used to gather, process and report information about people, places, and environments. Cartographers decide which information to include and how it is displayed.	19. Individuals, governments and businesses must analyze costs and benefits when making economic decisions. A cost-benefit analysis consists of determining the potential costs and benefits of an action and then balancing the costs against the benefits.	

Related Vocabulary

- **Cartographer** – A person engaged in the production of maps.
- **Cost-Benefit Analysis** – An analysis of the cost effectiveness of different alternatives to see whether the benefits outweigh the costs.
- **Location** – A place where something is or could be located; a site.
- **Route** – A road, course, or way for travel from one place to another.

Student Worksheets

These are designed to copy and use in class.

Attachments
A – Mapping My Route
B – Informational Display Rubric

Procedure

➡ Day 1: (45 minutes)

- 1. Enlarge a section of a local map, with the school at the center, including the neighborhoods around the school for about a two-mile radius.** You can access maps that have already been created for several schools at the following site: <http://www.dot.state.oh.us/Divisions/Planning/SPPM/SystemsPlanning/Pages/SRTSRadiiMaps.aspx>
The map can be given as a handout to student groups, projected as an overhead, or shown on an interactive whiteboard.
- 2. Have students use the map from above, or a street view map to trace their route to school using a highlighter.** Students should also determine and record the distance of the route on **Attachment A – Mapping My Route**.
- 3. As a class, discuss and identify safety features and hazards along the routes.** For example: crosswalks, stop signs, crossing guards, sidewalks, no sidewalks, dogs, etc. Students will mark at least 5 of these additional features on their map as they continue using **Attachment A**. Encourage them to be creative in how these are identified on their maps. Students should also create a key for their map as they add information. Have them add the safety features to the key.



Materials Needed

- ☒ Copies of street view map
- ☒ Different colors of highlighters for each student
- ☒ Copies of Attachment A for each student
- ☒ Poster board or larger paper to create an informational display



Teacher Tip

If most students ride the bus, you might want to assign a specific location for each group. This could be a house within walking/bicycling distance, or another location that would allow students to map potential safe routes. You could also have them calculate the savings and determine the benefits of riding a bus or organizing a car pool.

Procedure

➡ Day 2 – 3: (45 minutes)

4. **Using the street map, have students determine 1-2 additional routes to school from home using Attachment A.** Again, students should identify safety features or potential hazards along these routes.
5. **Ask students to compare the possible routes** as indicated on their map and select one route to designate as the safest. They should justify their decision based on the information collected.
6. **Have students access the following website:**
<http://mobikefed.org/SavingsCalculator>
7. **Explain to students that they are going to do a cost analysis using the website. Have them determine potential savings** by calculating how much someone could save if he or she, using the route selected, walked or bicycled to school using the information on this site. Students should be creative in the information they include. They could calculate how much someone would save if he or she bicycled/walked to school every day, once a month, etc. The site has some fun and creative ideas that students can use.

➡ Day 4 – 5: (45 minutes)

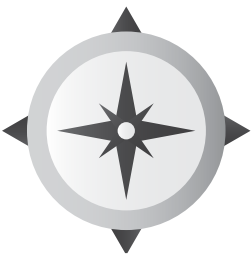
8. **Explain that students will create an informational display** using all the information they have gathered. They can use poster board or larger sized paper. This display will include their map, a key, and a written summary. The Informational Display Checklist from **Mapping My Route (Attachment A)** and the **Informational Display Rubric (Attachment B)** will be used to score their project.

Teacher Tip

Step 6 is important in order to meet the seventh grade standard. Students should discuss economic decisions that have been made by weighing the costs against the benefits. In many districts, students must walk to school within a 1 or 2-mile radius. Discuss this decision, how it was made, and what might happen if it changed to a larger or smaller radius.

Teacher Tip

Students can also use the Map My Route program at the following site: <http://maps.walkbiketoschool.org/>. This online tool allows students to enter travel features such as crossing guards, traffic signals, etc.



Extend

- Have students continue to use the maps to investigate whether the shortest route to school is the safest route.
- If students find specific routes are missing safety features, have them identify what could be changed to improve safety and write to the proper authorities to request possible changes.
- Have students research Ohio's law banning texting while driving. Give students ample time to be sure they look at both sides of the issue, choose a side, and support their side with facts.

Assessment

Students will work collaboratively to gather, process and report information about specific routes to school. **Use the Informational Display Rubric (Attachment B) to assess student work**, which focuses on important data to include and how it is displayed.

Additional Resources



Technology Connections

Have students use **Google Earth** to create a tour with placemarks for locations to and from school. This can be used to highlight features along the route that are safe, as well as interesting. Students can save their tour and share it with the class.

For information on creating a tour with placemarks, watch the informational video on YouTube: <http://www.youtube.com/watch?v=3l4y0xfiA3Y&feature=related>

Related Careers

Invite your students to brainstorm all the potential careers related to this lesson.

- Cartographer
- City Planner
- Traffic Engineer



Attachment A – Mapping My Route (Part A)

Name: _____

<p>1. Use the street view map and highlight how you would walk or bicycle to school from home. If you have different routes, use different colors of highlighters. Remember to record the distance of each route.</p>	Start recording information for a key that will be part of your map
<p>2. Prepare for a Class Discussion: List safety features or hazards along the route(s) you highlighted.</p>	
<p>3. From the list above, record <u>at least</u> five safety features/potential hazards on your map where they are actually located. For example, indicate the location of a crosswalk. Do not make up a location for a feature. Record it only if it is really there. Remember to include symbols in your key for these features.</p>	
<p>4. Using your map, find at least two different routes from home to school that you think are “safe routes.”</p> <p>Ask Yourself:</p> <ul style="list-style-type: none">• What are the distances of these additional routes?• What makes one route better than the other?• What makes them safe routes?	
<p>5. Be sure to record these additional “safe routes” and safety features on your map.</p>	

Attachment A – Mapping My Route (Part B)

Name: _____

6. Compare the routes you identified and select the route you think is the safest route. Remember to justify your decision based on the information you have collected.

7. On your informational display, be sure to include a written response **and** visual information that provides evidence why you consider the route you selected to be the safest.

8. Access this website:
<http://mobikefed.org/SavingsCalculator>

9. Using the route you selected, determine potential savings by calculating how much someone could save if he or she walked or bicycled to school from home instead of riding in a bus or car.

Use your math skills and think about:

- What if someone biked/walked to school every day of the year? Once a week? Once a month?
- What if the whole class biked/walked from this location? The whole school?

**Have fun with this savings calculator and be creative in your thinking.
Information from this site must be included in your informational display!**

Informational Display Checklist

Did I include...

- ☐ The street view map with highlighted routes
- ☐ At least five safety/hazard features
- ☐ A key identifying the safety features
- ☐ The distances of each route shown on the map
- ☐ At least two different “safe routes” from my home to school
- ☐ A written response **and** visual information that provides evidence for why I consider this route to be safe
- ☐ Information on savings from the savings calculator website

Attachment B – Informational Display Rubric

Use this rubric to score student project with 3 being the highest score in each category.

Name: _____

Criteria	3	2	1	Enter Score
Safety Features/ Hazards	Five features are listed and labeled on the map; easy to read and locate.	Several features are listed and labeled on the map; easy to read and locate.	Features are not listed or are hard to locate and read.	
Written Explanation and Visuals	Quality details give the reader important information, and provide evidence to support claim of safest route.	Supporting details and information are relevant, but one key issue or portion of the claim is not supported.	Supporting details and information are typically unclear or not related to the claim.	
Routes to and from Location	Provides thorough and accurate information on the selected routes and provides the distances traveled.	Provides partial, yet accurate, information on the selected routes and provides the distances traveled.	Provides partial, yet accurate, information on the selected routes but does not provide information on the distances traveled.	
Savings Calculator	Information adds meaning to the project.	Information gives some support to the project, but limited.	Information does not support the project.	

Project Notes:

Total Score: _____



Text-astrophe!

Grades 6 – 8

Safety Focus



Students explore how distractions and visibility can have an impact on walking and bicycling to school safely. This exploration will allow students to be more aware of these safety concerns so they can make safe choices while traveling to and from school.

Visit everymove.ohio.gov for electronic versions of this and the other Safe Routes to School Lesson Guides published by the Ohio Department of Transportation (ODOT).



- Grades K – 2
- Grades 3 – 5



Curricular Connections: Grades 6–8

Grades 6 – 8

Science Standards

Science Inquiry and Application

- Design and conduct a scientific investigation
- Use appropriate mathematics, tools and techniques to gather data and information
- Analyze and interpret data
- Develop descriptions, models, explanations and predictions
- Think critically and logically to connect evidence and explanations
- Recognize and analyze alternative explanations and predictions
- Communicate scientific procedures and explanations

Related Vocabulary

- ▶ **Distance** – Space between two objects or places.
- ▶ **Speed** – A change in position over time.
- ▶ **Visibility** – The greatest distance under given weather conditions that it is possible to see without instrumental assistance.

Student Worksheets

These are designed to copy and use in class.

Attachments

A – Text-astrophe Student Data Sheet

B – Group Planning Sheet

Procedure

➡ Day 1: (25 minutes)

1. Show the following video to students:

(Video is approximately 3 minutes long.)

<http://www.nytimes.com/2012/01/09/opinion/texting-while-walking.html>

2. Give each student a half-sheet of paper and have each student use the formative assessment strategy Commit & Toss. They should not put their names on the paper. Each student should “commit” to his/her opinion about whether it is dangerous to text while walking or bicycling and write the response on the paper.

3. Once students have completed the written response, have them crumple up the paper into a snowball shape and gently “toss” the paper around the room. Each student should find a snowball to read.

4. Have students pair up and discuss the responses on the snowball papers they found.

5. Ask all students to create a class human graph using the results recorded on the snowball papers. How many thought walking/bicycling was dangerous while texting and how many did not? Discuss results as a class.

6. Have students share incidents they can think of where texting caused a problem or accident.



Teacher Tip

Be sure to load and test the video prior to watching it with students. Depending on Internet speeds, it may load slowly the first time.



Materials Needed

For Lesson

- ☒ Area with both sidewalk and grass
- ☒ Toy Truck (anything that can be used as an obstacle)
- ☒ Sand or Gravel (create a different surface)
- ☒ Grass Surface
- ☒ Paved Surface
- ☒ Stop Sign (can be made and held by a student)
- ☒ Basketball (to be rolled or used as an obstacle)
- ☒ Skateboard, Scooter, or Bike (optional)
- ☒ Red Paper/Cardboard (used as a stoplight)
- ☒ Yellow Paper/Cardboard (used as a stoplight)
- ☒ Green Paper/Cardboard (used as a stoplight)
- ☒ Safety Cones or Soccer Cones (obstacle or boundaries)

continued on next page...

Procedure

➡ Day 2: (45 minutes)

7. **Before conducting this activity, set up an obstacle course that students will use.** Incorporate several different obstacles that students must walk around to simulate things that could be encountered on the way to school. (Cracks in the sidewalk, potholes, dogs, cars, other bicyclists/walkers, etc.).
8. **Divide students into groups. Have each group complete the obstacle course.** Record each student's time on the **Text-astrophe Student Data Sheet (Attachment A)**.
9. **Have students complete the course a second time. This time however, they will be texting a statement while walking.** Provide each with a statement so everyone is texting the same thing. You can simulate this with cell phones, tablets, an iPod Touch or another handheld device. While texting, students should keep track of his/her individual time and record the information on the data sheet. It should be more difficult and take students longer to complete the same course with this added distraction.
10. **Have each student complete the additional questions on the data sheet,** including creating a graph to represent the data and drawing conclusions based on the findings.
11. **Discuss with the class other factors** that have an impact on walking or bicycling safely to school. Create a class list. (Examples may include construction, traffic, etc.).
12. **Ask students how weather plays a role** in getting to school safely. Discuss how rain and fog can affect their route to school. Point out the idea of visibility. Have students focus on key factors that can have an impact on visibility.



Materials Needed

...continued

- ☒ Cell Phone or something similar that can be used to text sentences
- ☒ Timer
- ☒ Clip Board to record times
- ☒ Student Observation Sheet
- For Extension Activity**
- ☒ Wax Paper
- ☒ Sunglasses
- ☒ Vaseline
- ☒ Water Sprayer
- ☒ Other Materials as generated by students
- ☒ Copies of Attachments

Procedure

➤ Day 3 – 4: (45 minutes each day)

Teacher Tip

Students can rate other design ideas and write a paragraph explaining what course they felt was the easiest and which course was the most difficult.

13. Have student groups design a way to simulate how visibility can impact getting there safely when bicycling or walking to school.

Students will use the **Group Planning Sheet (Attachment B)**. Explain that students will use the same obstacle course, but this time they will need to design how to simulate heavy fog, rain, or other factor that can affect visibility. (Examples may include: wearing dark sunglasses, putting cellophane on glasses, spraying glasses with water, or smearing shaving cream on glasses but warn students not to get anything unsafe in their eyes. You can use safety glasses, swimming goggles, sunglasses, clear glasses or any other idea you may have.)

14. Give students time to plan and then test their ideas on the obstacle course. They should collect data to represent their findings.

Extend

- There are several free apps available from the iTunes App Store that utilize the camera while texting. You can download these onto your iPhone, smartphone, iPad or tablet. The app can be used on a course and compared to the data generated by students during the lesson. Some examples include:

- Walk & Type HD Lite
- Transparent Screen
- WalkNText

Assessment

Students work collaboratively to show the effects of texting and how changes in visibility can affect walking and bicycling to school. Use this lesson to assess students' understanding of collecting data and comparing results as well as drawing conclusions based on their experiences. Teachers may evaluate students through observation, discussion and the students' use of the **Text-astrophe Student Data Sheet (Attachment A)** and **Group Planning Sheet (Attachment B)**.



Additional Resources



Technology Connections

An article and video from ABC News talks about the dangers of texting and walking, along with a new law in one town that fines people for texting while walking. Use it to prompt a class discussion.

<http://abcnews.go.com/blogs/headlines/2012/05/texting-while-walking-banned-in-new-jersey-town/>

Related Careers

Invite your students to brainstorm all the potential careers related to this lesson.

- Engineer
- Reporter
- Scientist

Attachment A – Text-astrophe Student Data Sheet

Names of Group Members: _____

1. Complete the chart below for each member of your group.

Student Name	Course Time Without Texting (minutes/seconds)	Course Time with Texting (minutes/seconds)

2. Create a graphical representation of your group data and include it with this data sheet.

3. Using the data from above, what conclusions can you make about texting while walking?
Be sure to use specific information from your findings.



Attachment B – Group Planning Sheet *(Part A)*

Names of Team Members: _____

Brainstorm with your group! What other factors can affect visibility when walking or bicycling to school?

Choose one of these factors to simulate on the obstacle course and record it below.

What materials might you need to simulate this on the obstacle course?

What is your plan? How will you use the materials?

Attachment B – Group Planning Sheet (Part B)

What data will you collect? How will you organize your thinking and present your findings?

Text-astrophe Checklist

Did you...

- ☐ Choose a factor that can impact visibility when walking or bicycling to school?
- ☐ Develop a plan for testing your idea and then test your idea?
- ☐ Make sure you have data from everyone in your group?
- ☐ Record data and information that will help you present your findings?
- ☐ Work safely as a team?

Teacher Notes

[illegible]



Designing a Safe School Parking Lot

Grades 6 – 8

Safety Focus



Students design a scale model of a school parking lot which includes several safe zones and safety features for pedestrian and school traffic.

Visit everymove.ohio.gov for electronic versions of this and the other Safe Routes to School Lesson Guides published by the Ohio Department of Transportation (ODOT).



- Grades K – 2
- Grades 3 – 5



Curricular Connections: Grades 6–8

Grade 6	Grade 7	Grade 8
Mathematics – Common Core State Standards Mathematical Practices <ol style="list-style-type: none"> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 6. Attend to precision. 	Mathematics – Common Core State Standards Mathematical Practices <ol style="list-style-type: none"> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 6. Attend to precision. 	Mathematics – Common Core State Standards Mathematical Practices <ol style="list-style-type: none"> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 6. Attend to precision.
Mathematics – Common Core State Standards Geometry <p>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</p> <ol style="list-style-type: none"> 1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. 	Mathematics – Common Core State Standards Geometry <p>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</p> <ol style="list-style-type: none"> 6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. 	
Mathematics – Common Core State Standards Ratios and Proportional Relationships <p>Understand ratio concepts and use ratio reasoning to solve problems.</p> <ol style="list-style-type: none"> 1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.” 2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.” 	Mathematics – Common Core State Standards Geometry <p>Draw, construct, and describe geometrical figures and describe the relationships between them.</p> <ol style="list-style-type: none"> 1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. 2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. 	

Related Vocabulary

- ▶ **Door Zone** – The space three feet or closer to parked cars to avoid as a door might unexpectedly open and cause injury.
- ▶ **Pedestrian** – A person who walks or travels on foot.
- ▶ **Proportion** – Comparative relation between magnitudes as to size, quantity, number, etc.; ratio.
- ▶ **Ratio** – The relationship between two quantities.
- ▶ **Scale** – The ratio of the size of a model/drawing to the actual size of the object represented.

Student Worksheets

These are designed to copy and use in class.

Attachments
A – Parking Lot Criteria
B – Scoring Rubric for Parking Lot Project

Procedure

➡ Day 1: (45 minutes)

1. Ask students what features in a parking lot help them feel safe.

Have them turn and talk to a partner to share ideas. Ask a few students to share and highlight features in a parking lot that contribute to their experiences. (Examples: designated walkways, space between parking spaces, good lighting, etc.) Discuss how students might feel if these features were not there.

2. Being more specific...have students brainstorm how they could make a parking lot safe for pedestrians and bike riders. This can include features discussed already in number one plus any new ideas.

3. Explain to students how to use what they know about ratio to design and create a scale drawing of a safe school parking lot.

4. Share a map and point out the scale in a map key. Discuss how the map is a smaller representation of an area because the real area is too large to represent on paper. Have students brainstorm other examples of where scales are found. Discuss how scale models can also show objects that are too small to represent on paper.

5. Demonstrate how to draw an object to scale. Draw a square on the board with each side measuring 10 inches. Ask students how can we create a square that is half of its size?

(Answer: We will scale down its measurements proportionally, maintaining its shape but reducing its size).

6. Draw the new square with dimensions of 5-inch sides. Show how to represent the relationship between the dimensions of the first and second square. The ratio of the small square to the larger is 5:10, 5 to 10, or 5/10 (also $\frac{1}{2}$).

Materials Needed

- ☒ Drawing Paper (11 x 17 or larger)
- ☒ Graph Paper
- ☒ Pencils
- ☒ Rulers, Measuring Tapes
- ☒ Map with a Scale
- ☒ Internet Access (if available)

Teacher Tip

A scale drawing shows a real object with accurate sizes except all measurements have been reduced or enlarged through the use of a ratio. The scale maintains the proportional relationship between all of the parts of the drawing and the actual object.

Day 1 continued on the next page...

Procedure

Day 1 continued...

- 7. Going deeper...discuss with students all of the different ways to represent a ratio relationship** with mathematical notation. Emphasize that using a scale allows us to represent large and small objects on paper. You can also explain that a scale drawing represents the view from above. For example, if we were to create a scale drawing of our classroom, we would need to know the measurements of the objects and furniture in our room. We would want to be able to represent their true dimensions on paper.

- 8. Have students work in groups to measure an item in the classroom and determine the scaled representation.** Using these objects, students should demonstrate how to convert measurements using a common scale (0.5 inches = 1 foot). For example, have a group of students measure the length of a classroom "board." If a classroom table measures 5 feet in length, and the scale is $0.5'' = 1'$, the scaled representation of the table will be 2.5 inches on paper.



Teacher Tip

Depending on students' experiences with ratio or scales, you may want to introduce (or review) cross-multiplying to determine scaled equivalents.

Cross multiplication balances equations by multiplying both sides by the same amount.

➡ Day 2: (45 minutes)

- 9. Introduce the design project to the students** using the **Parking Lot Criteria (Attachment A)**. Students have been selected to design a safe school parking lot for an imaginary new elementary school. Students can work in small groups of 2-3 or individually. Explain to students that the parking lot must meet the design and safety criteria on **Attachment A**. Feel free to adjust the criteria with your class at this time.

- 10. As a class, brainstorm information students will need to know to create their parking lot.** Possible responses might include: the average dimensions for a car and bus, the average width for a sidewalk, the average dimensions of a parking spot (and a handicapped one). If students have access to the Internet, they can search for these dimensions independently. Information on required space size and number of spaces can be found online.
<http://www.ada.gov/restripe.htm>

Day 2 continued on the next page...

Procedure

Day 2 continued...

- 11. Before students begin working, discuss a possible scale that will allow students to draw the whole parking lot on one sheet of paper.**

For example, if the parking lot students choose to design has a length of 50 feet, what ratio or scale can they use to draw it? Allow students to provide suggestions, recording the ideas for all to discuss. Remind students that every student may choose to use his or her own scale, but all parking lots must fit on one sheet of drawing paper. You may also want to discuss using compatible numbers to create a scale in which the measurements are easily converted; i.e.; If the paper is 17 inches long, the length of the parking lot can be 34 feet ($0.5'' = 1'$). The additional length of the paper can be grassy area.

➡ Day 3 – 4: (45 minutes each day)

- 12. Provide time for students to complete the design project.**

- 13. Hold a “gallery walk” when students are finished with their projects, during which students walk around the classroom to view one another’s work.**

- 14. Discuss these questions as a class:**

- How did you choose the scale for your parking lot?
- How can you determine the area of your parking lot?
- How can you prove that your parking lot meets both the design and safety criteria?
- Compare your parking lot to others' parking lots.
How are they similar? Different?
- What modifications could you make to your project to enhance its design?
- What other safety criteria would you require if you were the school district?
- How do bicyclists or pedestrians get from the street to school through the parking lot?

Extend

- Research ways architects and engineers create blueprints, or discuss how technological advances have changed the design process.
- Modify existing design criteria to include maximizing the number of parking spots. For example, at what angle could you position each parking space to maximize the number of possible parking spots?
- Have students create scale drawings of the classroom, the playground, their bedrooms, etc.

Assessment

This lesson uses a real-world scenario to involve students in a design challenge. Students will be engaged in rich mathematical thinking while developing possible solutions. Score each parking lot design using the **Scoring Rubric for Parking Lot Project (Attachment B)**.

Additional Resources



Technology Connections

The first several pages of this site contain interesting information about designing parking lots.

http://www.apai.net/cmdocs/apai/designguide/Chapter_5B.pdf

Related Careers

Invite your students to brainstorm all the potential careers related to this lesson.

- Architect
- Cartographer
- City Planner
- Civil Engineer
- Construction Worker

Attachment A – Parking Lot Criteria

Congratulations Student Designer or Student Design Team!

You have been selected to design a safe school parking lot for an imaginary new local elementary school.

In accordance with our agreement, the parking lot must meet these design criteria:

- The parking lot design must be drawn to scale.
- The parking lot can be in the shape of any polygon and/or composed of several rectangles.
- The parking lot must have parking spaces for at least 30 cars for staff and visitors, in addition to three handicapped spaces.
- The parking lot must have some grassy areas around the perimeter and/or in the interior.

The parking lot must also meet these safety criteria:

- The parking lot must have a bus lane. The bus lane will also be used for parent pick up and drop off.
- The parking lot must have several walkways to provide pedestrians safe zones in which to walk.
- Appropriate signs that emphasize safety should be clearly labeled.
- Walkways must be located outside of the “door zone” of parked cars. The door zone is three feet around a car.

Your finished project should include a title, labels, and a scale. Additionally, the total area of the parking lot must be determined and labeled.

Attachment B – Scoring Rubric for Parking Lot Project

Name: _____

Criteria	Achieving the Standards 3	Progressing Toward the Standards 2	Limited Progress Toward the Standards 1	Enter Score
Elements of Scale	The parking lot design utilizes an appropriate scale to represent the parking lot. All elements of the parking lot are drawn to scale.	The parking lot design contains a few minor errors with use of scale.	The parking lot design shows little mathematical understanding of the task.	
Design	All elements of the design criteria are met.	Most elements of the design criteria are met.	Few of the design criteria are met.	
Safety	All elements of the safety criteria are met.	Most elements of the safety criteria are met.	Few of the safety criteria are met.	

Comments:

Total Score: _____



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Kids Report! Choosing a Safe Helmet

Grades 6 – 8

Safety Focus



Students analyze, develop criteria, and evaluate bicycle safety helmets, which will help them understand the safety importance of wearing a bicycle helmet to and from school.

Visit everymove.ohio.gov for electronic versions of this and the other Safe Routes to School Lesson Guides published by the Ohio Department of Transportation (ODOT).



- Grades K – 2
- Grades 3 – 5



Curricular Connections: Grades 6–8

Grades 6–8

Reading Standard for Literacy in Science and Technical Subjects – Common Core State Standards

Integration of Knowledge and Ideas

9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with what is gained from reading a text on the same topic.

Related Vocabulary

- ▶ **Consumer** – A person who purchases goods and services for personal use.
- ▶ **Criteria** – A standard, rule, or test on which a judgment or decision can be based.
- ▶ **Marketing** – To advertise or promote something.

Student Worksheets

These are designed to copy and use in class.

Attachments
A – T-Chart
B – Criteria Reflection
C – Helmet Rating Sheet
D – Exit Ticket

Procedure

➡ Day 1: (45 minutes)

1. **Have students share what they think is the best candy bar on the market.** As students share, create a class list using a **T-Chart (Attachment A)**.
2. **Have students share what makes their candy bar choice the best.** As they share, complete the right side of the **T-Chart**.
3. **Discuss the concept of a consumer group.** Many times consumer groups are used to compare different brands of a product to find out which is best, or to help look for what consumers are interested in.
4. **Explain to students that they will be working in consumer research groups.** During this time, they will be comparing different types of bicycle helmets to develop a list of criteria by which to rate the helmets.
5. **Distribute four different types of bicycle helmets to each research group.** Ask groups to develop a list of criteria to evaluate or rate the helmets, being sure to include safety features as a key factor using the **Criteria Reflection (Attachment B)**.

Materials Needed

- ☒ 4 Different Types of Bicycle Helmets per group
- ☒ Pencils
- ☒ Rulers, Measuring Tapes
- ☒ Paper
- ☒ Attachment A can be made into an overhead or large class chart
- ☒ Copies of Attachments

➡ Day 2 – 3: (45 minutes each day)

6. **Have each group use the criteria to rate each helmet and complete the Helmet Rating Sheet (Attachment C).** Groups might also add to the criteria as they process and evaluate helmets.
7. **Have each group present and discuss the criteria and product ratings.** Once groups have shared, discuss how people in a group can give different ratings for the same items. Ask which bicycle helmets the class thinks most people would buy and why.

Teacher Tip

It's best to have a variety of helmets of different brands, styles, and sizes.

If you don't have access to several different types of helmets for each group, have students bring in one from home. If students bring in helmets, try to distribute them so they will not be rated by the owner.

Day 2 continued on the next page...

Procedure

Day 2 continued...

8. Handout the Exit Ticket (Attachment D) and have students complete the first question.

9. View this video news report on bicycle helmet testing.

(Video is approximately 3 minutes long.)

<http://www.cbsatlanta.com/story/18720637/consumer-reports-toughest-bike-helmets>

10. Have students access the Internet and look for *Consumer Report* information on bicycle helmets and helmet safety. Encourage students to search for more consumer information about safe bicycle helmets from different resources. Some links can be found in the Additional Resources section of this lesson.

11. Using the Exit Ticket (Attachment D) again, have students complete the second question. Students should compare the group findings to the information from consumer findings.

Extend

- **Explain to students that in many places wearing a helmet is a law.** Look up information on helmet laws for Ohio, and even your city. Read a few parts to the class, including penalties for not wearing a helmet.
- **Hold a class debate highlighting both the pros and cons of a helmet law.** Give students ample time to be sure they look at both sides of the issue, choose a side, and support their side with facts. As an alternative to a class debate, students could also write an opinion piece.

Assessment

Students work together to develop a set of criteria, and then use the criteria to evaluate bicycle helmets. Use the **Exit Ticket (Attachment D)** to evaluate how students compare and contrast the information from their investigation to that of a credible source.

Additional Resources



Technology Connections

Articles on Bicycle Helmet Safety:

http://kidshealth.org/kid/watch/out/bike_safety.html

<http://www.livestrong.com/article/82285-bicycle-helmet-safety-kids/>

<http://www.bhsi.org/guide.htm>

National Council for Teachers of Mathematics (NCTM) Illuminations Site –

Free Ride Applet: This applet allows you to vary the gear ratio of a bike. The distance traveled by a half-pedal is determined by the ratio of gears.

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=178>

Related Careers

Invite your students to brainstorm all the potential careers related to this lesson.

- Manufacturer
- Marketing/Sales/Promotional Representative
- Product Analyst
- Public Relations Specialist
- Research Engineer
- Scientist

What is the "BEST" candy bar on the market?

[illegible]

Attachment B – Criteria Reflection

Names of Group Members: _____

Brainstorm! What features are important to include as part of a bicycle helmet?

Choose at least five criteria from your list to rate the helmets. Using this table, explain why each of the five criteria are the most important to your group. At least two criteria **must** focus on safety features.

Criteria	Why It's Important
1.	
2.	
3.	
4.	
5.	

Rating System:

Think about how you will rate each criteria and possibly determine an overall score to help compare the helmets. Be creative! Record your final decision about ratings below. Use additional paper if needed.



Attachment C – Helmet Rating Sheet

Names of Group Members: _____

Using your criteria and rating system, evaluate each helmet. Be sure to include detailed notes, which can also include illustrations, descriptions, and questions you might have.

Helmet # _____	Helmet # _____
Helmet # _____	Helmet # _____



Attachment D – Exit Ticket

Name: _____

Date: _____

1. Based on your group criteria and rating system, which helmet would you say is the “best” helmet? Explain your thinking.

2. View the video and/or gather more information from a credible source. Based on this new information, would you change any of your criteria? Explain your thinking.



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Lesson 5

Getting There Safely: It's Your Responsibility Too! *Grades 6 – 8*

Safety Focus



Students take personal responsibility for being safe as they get to and from school. This includes knowing safety rules, following them, and encouraging others to be safety conscious while they are on the way to and from their school.

Visit everymove.ohio.gov for electronic versions of this and the other Safe Routes to School Lesson Guides published by the Ohio Department of Transportation (ODOT).



- Grades K – 2
- Grades 3 – 5



Curricular Connections: Grades 6–8

Grade 6	Grade 7	Grade 8
Writing – Common Core State Standard	Writing – Common Core State Standard	Writing – Common Core State Standard
Text Types and Purposes 3. Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.	Text Types and Purposes 3. Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.	Text Types and Purposes 3. Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
Speaking & Listening – Common Core State Standard	Speaking & Listening – Common Core State Standard	Speaking & Listening – Common Core State Standard
Presentation of Knowledge and Ideas 5. Include multimedia components (graphics, images, music, sound) and visual displays in presentations to clarify information.	Presentation of Knowledge and Ideas 5. Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.	Presentation of Knowledge and Ideas 5. Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

Related Vocabulary

- **PSA (Public Service Announcement)** – A type of message featured on television, radio, print or other media that is usually aired at no charge in order to raise awareness of a social issue.

Student Worksheets

These are designed to copy and use in class.

Attachments
A – Safety Message Tips
B – PSA Planning Page
C – PSA Storyboard
D – PSA Presentation Rubric

Procedure

➡ Day 1: (45 minutes)

1. **Watch the video "Safe Out the Door"** performed by the All-Ohio Show Choir. (Video is approximately 4 minutes long.)

<http://www.dot.state.oh.us/groups/EveryMove/SRTS/Pages/Safe-Out-The-Door-Video.aspx> **or**

<http://www.youtube.com/watch?v=qPMcEBIqVWo>

2. **Discuss the meaning of a PSA** (Public Service Announcement) with students. Have them share other PSAs that they might have seen on TV or heard on the radio. (Examples could include "Click It or Ticket" for seatbelt safety, "Arrive Alive" to promote safe driving, etc.)

3. **Ask students:**

- **What do PSAs have in common?** (Fun, entertaining, disturbing, informational, include attention grabbers, emotional connection to audience, fast paced)
- **How do they try to get the message across?** (Positive messages, or messages to inform people of hazards)
- **What is a typical length of a PSA?** (Short, like a 30 second TV or radio commercial)

4. **Lead a class discussion about how they get to and from school.** Do they walk, ride a bike, ride in a car, or are they a bus rider? Discuss any safety tips, messages, concerns, features, or safety experiences they have had or witnessed while on their way to and from school. If possible, make a list on the board or chart paper of any safety items they share. Encourage them to share a few items in all the categories (walkers, bicyclers, car riders, bus riders). (Example: Kids need to cross the streets in a crosswalk or some kids try to text while they are riding their bikes, etc.).

5. **Explain to students they will be creating a PSA.** These PSAs will focus on being safe while **walking or bike riding** to school. Have the students divide into small groups of 3-4. This will be their PSA group.



Materials Needed

- ✓ Online access to watch Safety Video
- ✓ Copies of Lesson Attachments
- ✓ Optional: access to video creation software (iMovie, Windows Movie Maker, video camera) and/or online access for comic strip design.

Day 1 continued on the next page...

Procedure

Day 1 continued...

6. **Distribute a list from Attachment A - Safety Message Tips to each group** and encourage student groups to talk about the importance of all of the tips on the list. (Teachers can choose or assign each group either walking safety or bicycling safety.)
7. **Distribute the PSA Planning Page (Attachment B). Have groups identify key messages** from the lists to include in their PSA. They should record them on their PSA Planning Page and turn it in.



Teacher Tip

Once you collect the pre-planning page, use it to get a sense of the group's direction.

Students may want to use additional resources to research their topic before they create a PSA. Provide feedback on their planning page to help groups think about key messages.

➡ Day 2 – 4: (40 minutes each day)

8. **Show or hand out a copy of the PSA Presentation Rubric (Attachment D)** to the students so they understand how they will be assessed.
9. **Distribute the Planning Pages back to the groups** and have them continue planning their PSA using the **Storyboard (Attachment C)**. During this time, they should gather more information about their message and begin to think about what to include in their PSA.
10. **Using Attachment C**, students should continue working on the storyboard for their PSA and practice timing. Each PSA should be no more than 30 seconds in length. During this time, encourage students to be creative and to focus on safety when getting their message across.



Teacher Tip

If you are having students create a PSA using iMovie or other video creation tool, you will need to add time in the lesson to complete that task. It's a great way to incorporate technology and allow students to be creative!

➡ Day 5: (40 minutes)

11. **Share your PSAs!** Have students share their PSAs with the class or another class and use the **Rubric (Attachment D)** to assess them. They can do this "live," or if they have a recorded version, they can play it. You can extend this idea and have students create videos using iMovie or video cameras. These can be broadcast to the school as well.

Extend

- Have students rate each other's PSAs and vote for the most powerful. After this PSA has been selected, it could be recorded and used during school announcements, at a safety assembly, and shared with elementary students.
- **Xtranormal is a website that allows users to create animated videos.** Students could use this site to create their PSA. Videos are hosted on the Xtranormal website. <http://www.xtranormal.com>
- Develop a poster with coordinating slogans. Utilize technology and create a QR code using <http://qrcode.kaywa.com/>. This code, when scanned, would direct people to a website where the PSA video is hosted.



[kaywa.com](http://www.kaywa.com) and [xtranormal.com](http://www.xtranormal.com)

Assessment

This lesson is designed to provide the students with an opportunity to work with a group and create and present a real-world media project. Use the **Rubric (Attachment D)** to score the PSA presentations. If you are using video creation software, you may want to think about adding a "fair use" section to the rubric. Students should focus on getting the message across in their PSA.

Additional Resources



Technology Connections

Have students create a comic strip using the following website to promote their safety message. They can add characters, dialogue, and print their comic strip.

<http://www.readwritethink.org/files/resources/interactives/comic/index.html>

Related Careers

Invite your students to brainstorm all the potential careers related to this lesson.

- | | | |
|--------------------------|---------------------------|-------------------------------|
| • Advertising Copywriter | • Graphic Designer | • Public Relations Specialist |
| • Broadcast Producer | • Law Enforcement Officer | • Safety Inspector |
| • Commercial Director | • Lawyer | • Teacher |

Attachment A – Safety Message Tips

Walking Safety Tips	Bicycling Safety Tips
<ul style="list-style-type: none"> • Walk with a friend whenever possible. Plan your path carefully and stick to your plan. • Use sidewalks and paths. If you have to walk in the road, walk as far from motor vehicles as possible, facing oncoming traffic. • Be visible by wearing bright clothing in the daytime and reflective clothing at night. • Choose the route with the fewest streets to cross. Avoid crossing busy streets. • Before crossing, always look for motor vehicles. • When around stopped cars and buses, make sure the driver sees you before you start walking. • Pay attention to traffic lights, signs, signals, and sounds. • Text or talk on phone only when you stop walking. • Do not listen to loud music when walking. 	<ul style="list-style-type: none"> • Bicycle with a friend whenever possible. • Wear a helmet every time you ride a bike. • Tie your shoes, and secure long laces and loose pant legs so that they don't get caught. • Obey all traffic laws, signs, and signals in your community. • Plan your path carefully and stick to your plan. • Watch out for cars and buses at every driveway and intersection. • Stop, and walk your bike across busy intersections. • Wait until traffic is completely clear before you begin crossing. • Pay attention to your surroundings. Watch for other vehicles and hazards, such as potholes and parked cars. • Ride out of the "door zone" of parked cars. Ride three feet or more away from parked cars to avoid doors, which might open unexpectedly. • Look for drivers in parked cars. They may be getting ready to move. • When around stopped cars and buses, make sure the driver sees you before you start moving.

Attachment B – PSA Planning Page

Group Members

Three Key Messages to Include in Your PSA

Get Creative! BRAINSTORM some ideas for getting your message across in your PSA!
(jingle, song, rap, pictures/image)

Attachment C – PSA Storyboard *(Side A)*

Using your key messages for safety to and from school, plan your PSA. When using a storyboard, think about your message from beginning to end. Talk with your group about what will happen first, next, and last. Once you have a good idea, record it on the storyboard.

Title of PSA		
Characters in the PSA	Setting/Location of Scenes	Objects/Props Needed

Attachment C – PSA Storyboard *(Side B)*

<p>Remember to include a quick diagram or picture of what is happening in each scene plus dialogue for the characters.</p>	<p>1</p>	<p>2</p>
<p>3</p>	<p>4</p>	<p>5</p>
<p>6</p>	<p>7</p>	<p>8</p>
<p>9</p>	<p>10</p>	<p>Credits:</p>

Important Things to Remember:

Attachment D – PSA Presentation Rubric

Use this rubric to score student presentations with 4 being the highest score in each category.

Name: _____

	4	3	2	1	Enter Score
Storyboard	Demonstrates detailed planning and preparation. Process well-thought out. Includes diagrams and script.	Demonstrates good planning and preparation. Process thought out. Includes diagrams and script.	Demonstrates some planning and preparation. Includes limited diagrams and script.	Demonstrates little planning or preparation for project. Many elements missing or hard to understand.	
Content of PSA	Students create an original and interesting PSA. Focuses on the safety message and addresses the issue.	Students create a PSA that addresses the issue.	Students create an accurate PSA, but it does not fully address safety issues.	PSA not accurate or complete.	
Production	PSA presentation is clear and loud enough to be heard. Sound effects blend with the PSA's message.	PSA presentation is clear and loud enough to be heard. Sound effects usually blend with the PSA's message.	PSA presentation is clear and loud enough to be heard. Sound effects sometimes distract from the PSA's message.	PSA presentation is unclear and/or not loud enough to be heard. Sound effects distract from the PSA's message.	

Presentation Notes:

Total Score: _____