Transportation Route Problems in My Local Community

Learning Segment 5

Driving Questions:

- Primary: Is my route to school safe enough to walk and roll to school?
- Secondary: How does the weather affect my route to and from school? What types of pollution are found along my route to and from school?

Purpose and Learning Objectives: Students analyze a number of key factors that determine the extension to which it is safe to walk or roll to and from school, for example:

- Infrastructure: Quantity and quality of routes for walking and rolling (i.e. sidewalks, bike lanes, etc.)
- Traffic Congestion and Accident Data
- Weather Factors
- Pollution Issues

Ultimately, students will make a decision if they can walk or roll to school given these conditions.

Connections to Other Learning Segments: Phase 3 focuses on the driving question, “Is it safe to walk or roll to and from school?” Learning Segment 5 is the final focus on this question, and calls on students to respond based on the conditions in their local context. Students will then design and implement solutions for these problems in subsequent learning segments.

Standards:

Science	ELA/ELD	Math	History/Social Sciences	Health	EP&Cs
K-ESS2-1; K-ESS3-2, K-PS3-1; K-PS3-2; Instructional segment 3: Weather Patterns 3-ESS2-1		MP.2; MP.4; MP.5		Four-Step Decision Making Process for Pre-K through Grade Two Five-Step Decision Making Process for Grades 3-5	Principles 2,3,5

Vocabulary:

- Infrastructure
- Traffic Congestion
- Accident
- Weather and Symbols: sunny, cloudy, icy, foggy, windy, rainy, thunderstorms
- Symbol
- Pollution: Air pollution, litter

Materials:

- San Mateo County Neighborhood Collision Data Near Schools
- Video: Weather Report
- Video: Learn about Pollution

Agenda: *Engage, Explore, Explain, Extend/Elaborate, Evaluate*

5Es	Activity	Students Will...	Teachers Will...	Timing
Engage	Scratch Game	Prepare students to activate their scratch game and recognize that the players get hit by cars as there are not enough safety precautions along the route.	Prepare students to activate their scratch game and recognize that the players get hit by cars as there are not enough safety precautions along the route.	20 min
Explain and Explore 1	Infrastructure	Utilizing the Transportation Route Problem and Analysis Chart refer back to the neighborhood map (either on paper or on scratch), analyze the number of sidewalks, bike lanes, safe crosswalks, etc. along their typical routes to school.	Provide students with the Transportation Route Problem and Analysis Chart. 1. Define the concept of walking and rolling infrastructure 2. Facilitate students' data analysis and discussion of their neighborhood map (either on paper or on scratch).	20 min

Explain and Explore 2	Traffic and Accidents	Students will analyze concerns related to traffic congestion and accident data.	1. Define the concept of traffic congestion and accidents* 2. Facilitate students data analysis and discussion of traffic and accident issues in San Mateo County (see report here) and discussion. **Teachers should consider the extent to which accident data is appropriate for the K-3 audience.*	30 min
Explain and Explore 3	How does weather affect walking or rolling to school?	1. Watch a video of a TV weather report. 2. Describe the types of things they observed while watching the video. 3. Respond to: "What are the different types of weather we have in our neighborhood?" Chart these on the t-chart. 4. Utilize the decision making process to respond to different scenarios and determine in column three whether or not they would walk or roll to school.	1. Play video for students. 2. Ask students what they observed during the video (e.g. map, colors, symbols, moving arrows, etc.). Ask students, "What types of symbols did you see the weather person use on the screen behind her?" and replay the video (without sound). 3. Ask students, "What are the different types of weather we have in our neighborhood?" Chart students' answers on first column of t-chart (Column One = Type of weather; Column Two = Symbol; Column Three = Walk/Roll?). 4. Introduce students to four-step decision making process for pre-K through grade two (see Health Framework). While pointing to different symbols, ask students how their commute to and from school would be affected by these different weather conditions and list responses into column three.	45 min
Explain and Explore 4	What types of pollution might be along our routes to school?	1. Brainstorm ideas and words related to pollution. 2. Respond to "How many of you saw pollution when coming to school today?" 3. Draw a picture of their environment with (and without) pollution. Observe other	1. Ask, "What ideas or words come to mind when thinking about *pollution*?" 2. Ask, "How many of you saw pollution when coming to school today?" 3. Provide drawing materials for students, and facilitate students drawing images related to a	5 min

		students' images related to pollution. Examples of pollution along a route would be exhaust from cars, litter, oil/grease spills, etc. 4. Watch video and respond to "What are the types of pollution we saw in the video?"	neighborhood with (and without) pollution. Have students observe each other's drawings. (gallery walk) 4. Watch video to reinforce learning: Learn about Pollution	
	Pollution makes the Earth unhealthy	1. Watch video: Learn about Pollution 2. Respond to, "What are the types of pollution we saw in the video?"	1. Play video: Learn about Pollution (this can be played without sound and with teacher's voiceover. Focus should be on imagery, with a stronger focus on air and soil pollution) 2. Ask, "What are the types of pollution we saw in the video?"	10 min
Evaluate	Making Decisions	1. Describe the types of problems that the students collectively experience along their routes to school. 2. Describe which problems they care about the most and would like to address.	Utilizing the problems analysis chart, facilitate a classroom conversation about the issues students' reported about their routes to school and which problems students prioritize for the purpose of designing solutions.	20 min

Agenda Connection	**Grade Level Recommendations**
Explore and Explain 3	During Instructional Segment 3 (Weather Patterns), Kindergarten students record data about the weather, such as temperature, rain and cloudiness, to determine patterns. Students in grade three focus on weather patterns in more depth during Instructional Segment 3 (Weather Impacts), and can use different symbols to represent a wider variety of weather. There are many weather-focused activities students in grades 3-5 can engage with, such as More in depth weather forecasting, to help students better understand forecasting and predicting weather.

Other Example Extension Lessons:

- Car Pollution
- Stranger Safety
- Crash Safety - Engineering Design Challenges