

Unlocking Your Future:

Transportation Lessons for Middle School



ACTIVE TRANSPORTATION
ALLIANCE

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Visit www.activetrans.org/education for more information.

Introduction



Overview of Unlocking Your Future: Transportation Lessons for Middle School

Active Transportation Alliance is committed in teaching students how to safely and regularly use active transportation. To fulfill this commitment, we have created a curriculum for middle school students that connect physical activity and career exploration with active transportation learning. This curriculum was designed to be flexible and easily adaptable for any number of settings and schedules.

Using Unlocking Your Future: Transportation Lessons for Middle School

This four-unit curriculum will allow adolescents to use problem solving, team building and physical activities to learn valuable information on sustainability, and will introduce them to jobs promoting active transportation. The 20 lessons provide participants the opportunity to explore individual and group activities which stem from the sustainable careers of city planner, bike specialist, geographer and environmental lawyer.

Teachers and out-of-school providers can implement one or more units in order to give students a comprehensive understanding of the lesson content. These short, easy-to-follow lessons are an excellent supplement to any curricula already in use, and promote students' self-directed learning. Using themes such as advocacy and health, lessons are created to be self-explanatory and easy to read. Encompassing subjects such as English language arts, math, science and physical education, each lesson includes objectives and learning standards, and provides options to account for students of all abilities. We encourage teachers to read through this guide and use the lessons that best fit their own teaching styles and the learning styles of their students.

“The mission of Active Transportation Alliance is to make bicycling, walking and public transit so safe, convenient and fun that we will achieve a significant shift from environmentally harmful, sedentary travel to clean, active travel.”

Beyond the Lessons

Included in this introduction is additional information on making your school a beacon for safe and active modes of transportation, as well as a place where families can learn about developing a healthy, active lifestyle.

Education and Advocacy

As an educator, you have the unique opportunity to have a positive impact on the children you teach and advocate for change in the communities you serve. Additional resources can be used to promote physical health and protect the environment through sustainable transportation.

Our free and low-cost programs, advocacy tools and lesson plans all align with the Illinois Learning Standards, the Common Core State Standards and are available online or upon request. For more information about other education programs, please visit www.activetrans.org/education.

Walk & Bike to School Days

Energize your school by celebrating Walk to School Day. Each October, millions of children, parents, teachers and community leaders across the globe walk, bicycle, skate, scooter or roll to school. This exciting event, held on the first Wednesday in October, reminds parents and children of the simple joy of walking or biking to school. It also serves as a great opportunity to focus on the importance of physical activity, safety,

air quality and walkable communities.

Bike to School Day builds on the popularity of Walk to School Day, which is celebrated across the country and the world. Bike to School Day, held on the second Wednesday in May, provides an opportunity for schools across the country to join together to celebrate and build energy from National Bike Month.

Walk and bike to school events are about changing community culture. In the process, they build awareness so that the environment is more inviting for every walker and bicyclist, young and old. For more information about these events, including resources on how to promote biking and walking in your community, visit www.walkbiketoschool.org.

Safe Routes to School

Safe Routes to School programs encourage and enable walking and bicycling to school throughout the year. The Safe Routes to Schools program operates on the Five Es: engineering, education, encouragement, enforcement and evaluation. The program supports infrastructure and non-infrastructure improvements to the pedestrian/bicycle environments around local schools.

For general information about Safe Routes to School, visit www.saferoutesinfo.org.

Unlocking Your Future: Transportation Lessons for Middle School

This lesson book would not exist without the efforts and support of numerous individuals and organizations. Thank you to all of our partners.

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A very special thank you to the students and teachers using these lessons!!

Planning and Health

Unit 1 Lesson 1

40–60 minutes



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LEARNING OBJECTIVES

- Students will understand the connection between heart rate and physical activity
- Students will be able to explain some facets of what a city planner does
- Students will be able to express the ways transportation planning impacts human health

STATE LEARNING STANDARDS

- Common Core (CC) 6.R.I.2 Key Ideas and Details: Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- CC 7.R.I.1 Key Ideas and Details: Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CC 7.R.I.2 Key Ideas and Details: Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.
- CC 8.R.I.3 Key Ideas and Details: Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).
- Illinois Physical Development & Health 20.B.3a Monitor intensity of exercise through a variety of methods (e.g., perceived exertion, pulse monitors, target heart rate), with and without the use of technology.

REQUIRED MATERIALS

- Stopwatches, wristwatches or clocks that display seconds
- Paper and pen for students to note heart rates
- Calculators
- Chart paper (2) and marker

- Copies of “What is a City Planner,” one per student
- Copies of “Communities Learn the Good Life Can Be a Killer,” one per student

SET UP

- Prepare clocks or watches for physical activity
- Prepare copies of necessary articles for students to read
- Hang up blank chart paper in the classroom

PHYSICAL ACTIVITY WARM UP

Heart Rate Monitoring (20 minutes)

Take students to a gym or open area. Each student should have a piece of paper, pen/pencil, and access to a clock or watch. Demonstrate to students how to check their pulse using their index and middle fingers on the opposite wrist. Once all students have found their pulse, have them count the number of heartbeats in 30 seconds, then multiply that number by 2 to get their pulse rate (per minute). Students should write this down on their papers as their *resting heart rate*.

Have students jog around the gym/open area for 5 minutes. This will simulate taking a 5-minute bike ride to a grocery store, to school, or to meet a friend. After the 5 minutes elapse, have the students once again take their heart rate. This should be listed as their *active heart rate*. (Alternatively, some students could walk for 5-minutes.)

On a piece of chart paper, create a table that includes Active Heart Rate in one line and Resting Heart Rate on the other, with each student’s data in the columns. (If some students walked and some ran, create two different tables.)

A chart may look like this:

Active Heart Rate	122	140	130	128	134	120	120	128	150	148
Resting Heart Rate	72	72	62	60	72	68	60	70	76	70

Then, compute or have students compute the percentage increase of heart rate after activity. This is done by taking *active heart rate/resting heart rate* and subtracting 1. Using the data from column 1 for example, $122/72=1.6944$ means a 69.44% increase. Compute percentage increases for each person and ask students to see if they recognize any patterns or similarities.

Note to students that even 5 minutes of physical activity can significantly increase heart rate and be an important portion of one's daily exercise needs. Students should begin exploring how opportunities for exercise improve when their lifestyles allow them to walk, bike or use other physically active transportation modes.

LESSON ACTIVITY

What's a Planner? (15 minutes)

Give students 3–5 minutes to read the “What is a city planner?” page (if they finish early, they also can read the biographies on the back). After they have completed reading, have a short discussion with students about the role of a planner, and field questions the reading may prompt.

Some questions to consider:

- What is a city planner? What do they do? Why are they needed?
- What challenges might a city planner face in trying to do their job?
- The article implies city planners maintain a high degree of power. However, he/she certainly needs partners to make things happen, and likely encounters people who could prevent projects from moving forward. Who might these people be? (Business owners may not want to build/open in certain areas; politicians and city staff may not agree with a planner's ideas; residents may not want change in their communities.)

- What are some of the items missing in your community you think a planner could help fix? (Examples include: parks, sidewalks, bike paths, grocery stores, other stores, companies for jobs, affordable housing)

Share with students that this unit will look at how they might improve some aspects of their community through planning.

Personal Transportation Impacts (10 minutes)

One aspect of planning is transportation and the ability to commute with ease. This will be the focus of the next lesson in the unit. Today, however, students will apply critical thinking to their personal connection to transportation. Instruct students to get in small groups of 2 or 3 and brainstorm on the prompt “How Transportation Affects My Life” for 3–4 minutes. Tell students they should mention at least 3 different ways transportation affects their lives, with at least one item that is positive and one that is negative. They don't have to write in complete sentences; this is just a brainstorm.

After the time is up, have students use their lists to do a full group brainstorm to create two class lists: one of the positive ways that transportation impacts their lives and one of the negative.

Possible items:

- Not old enough to drive, so they rely on others to get to many places
- They live in a spread-out area, so it's a challenge to get to places
- A bike/bus/train gives them freedom to go to places previously unavailable
- Don't feel safe walking and/or biking in certain locations (lack of sidewalks, cars moving too fast, threat of violence, etc.)
- Lack of reliable public transportation options

- Have to ride the bus to school
- It takes too much time to get places
- Lack of transportation options available
- The weather in their region makes walking/ biking challenging

Encourage students to keep their list (or you collect them) for the future, as the final project in the unit will involve them designing a neighborhood beneficial to everyone’s health and wellness promotion.

City Planning and Health (10 minutes)

Note whether there was mention of how transportation can connect with a person’s health. Review the findings from the heart rate activity that started the lesson. Walking or biking can be great ways to exercise, but when someone chooses riding in a car instead of walking, they don’t get those benefits.

Have students take out their “Communities Learn the Good Life Can Be a Killer” article. Read the article aloud as a class, stopping every few paragraphs to discuss unfamiliar words, questions or comments students have, and the point the author is trying to convey. (It is suggested you don’t read the full article, but instead stop prior to the “Can Our Suburbs Be Saved?” section.)

Some questions to consider:

- What does “built environment” mean to you?
- Why do you think the built environment was once a concern for those thinking about public health?
- What reasons would you suggest for the drop in number of children who walked to school (from 66% to 13% in 25 years)? What reasons do current students give for not walking or biking to school?
- Do you agree with the article’s theory that the changes of built environment have contributed to diseases like Type 2 diabetes, heart disease and fatty livers? Why or why not?

REFLECTION (5 minutes)

Review with students some of the main topics discussed during the lesson. (What is a Planner? Connection of physical health and built environment. How transportation affects the lives of everyone.) Encourage students to come up with questions they still have about any of the topics discussed. Write these on chart paper and return to them as points of clarification and discussion throughout the unit, adding or removing questions as desired.

EXTENDING THE LESSON

Have students ask the “How Transportation Affects My Life” questions to adults at home and see what similarities or differences they experience. Report back answers to the class to explore responses.

What is a city planner?

A city planner's job is to help citizens build a great community. City planners (or just "planners" for short) work with neighborhood groups, the mayor, the police, engineers, businesspeople, and many others to make the community the best place to live.

Think about all the buildings in your city or town. As the population goes up, there will need to be more houses, apartments, and workplaces for the new residents.

But what would happen if all these new buildings were built just anywhere? Who would make sure there are still enough parks and playgrounds for adults and kids to enjoy? Would the roads and sidewalks be able to fit all the cars people will drive, the bikes people will ride, and the walking people will do? Where could trees and plants grow if there were just buildings and roads?

You might not notice it at first, but the location of all the buildings around you took *planning*. Planners make sure cities are built in a *smart* way, so that the roads can fit all of the traffic the buildings create, that neighborhoods still have parks and playgrounds, that there are places for trees and wildlife, that there are enough stores to find the things we need, that residents can find good jobs, and that everyone has a chance to live in a nice house or apartment.

This is called *shaping a community's growth*. Planners think ahead. They help residents decide how to improve their community today, 5 years from now, and 20 years from now.

There are many different kinds of planners:

Community planners build *consensus* in the community on how it should grow, and how each piece of land around a city should be used. Some land is used for markets and stores, some for houses, some for factories, some for office buildings or skyscrapers, some for roads and trails, and some for parks and playgrounds.

Environmental planners make sure that important natural features of a community are protected. This includes protecting lakes, rivers, and *wetlands* from pollution.

Transportation planners plan a city's transportation system: roads and highways, railroads, bike paths, and sidewalks.

Other planners might focus on *affordable housing* (ensuring everyone in the community can buy or rent a place to live), *economic development* (promoting businesses and creating jobs), and *historic preservation* (protecting historic buildings from being destroyed).

My School's Neighborhood

Unit 3 Lesson 3

45–55 minutes



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LEARNING OBJECTIVES

- Students will draw a neighborhood map from memory.
- Students will create a scale and legend for a neighborhood map.

STATE LEARNING STANDARDS

- CC.7.RP.1 Compute unit rates associated with ratios or fractions, including ratios of lengths, areas and other quantities measured in like or different units.
- Illinois Social Science 17.A.3b Explain how to make and use geo-graphic representations to provide and enhance spatial information including maps, graphs, charts, models, aerial photographs, satellite images.

REQUIRED MATERIALS

- Long jump rope or string (one per student)
- Map of the United States (one per student)
- Paper
- Community map, centered approximately at the school's location with an empty box for a key (see end of lesson for instructions)
- Rulers
- Overhead projector
- Community map transparency

PHYSICAL ACTIVITY WARM UP

Walk the State Line (15 minutes)

In this activity, students will practice balance while learning the states. Have students spread out and have each student take a long jump rope and select a state to form with the rope. They must then walk along the rope shape without falling off. Once they have completed this task, have the students walk, skip or jump to each state, naming the state and balance on the outline of each shape as they go along. For an extra challenge, have students name the capital or the region of the country in

which the state is located. For an extra challenge, students can also walk on their ropes backwards or sideways.

LESSON ACTIVITY

Where am I? (5–10 minutes)

Introduce the lesson to students by explaining that one practical application of math and problem solving skills is navigation. Though technology like GPS and travel planning websites are useful tools, one can often save time and gain independence by knowing how to get around with little or no assistance from technology.

To get things started, ask students to draw from memory (on blank paper) an aerial-view map representing the streets and community surrounding their school, as much as they are able to recall. Depending on the community and students' knowledge, it may include details of street names and location or simply points of interest and their approximate locations. Encourage students to draw for about 5 minutes before distributing a map to each student with the community surrounding the school.

(If the area around the school is underdeveloped, select an alternate building/location.)

Your Area is "Legend"ary (20–25 minutes)

Project the community map using an overhead, and help students locate the placement of the school building on their map. Use the crossroads or address as a way to suggest the school's location. Draw the school building with them, approximately to scale. If there are other places of interest near the school, such as a park or government building, draw and label these locations as well.

After adding the location of the school, ask students in what other ways they could make this map more useful for those who might look at it. What things would they like to be able to know about when they look at the map? (These could include: how far it is from place to place; points of interest such as parks, stores, restaurants; bus and train stops; street names; north/south/east/west; neighborhood boundaries.)

Help students recall the name of the box often found in a map that can help the user know what various symbols on a map mean (Legend or Key). Ask students what the measurement tool often included on a map is called (a Scale). Tell students they will soon be creating their own legend and scale for the map. Still working as a class, suggest one type of point of interest and a symbol to include in the legend.

Note that in order for students to create an appropriate scale, they will need to know at least one distance on their map. To assist them, pick out a distance you know that is easily scalable (such as one mile), and tell students to use that information when they create their map's scale.

Have students work in partners to create both an appropriate scale and a legend that includes symbols for at least 3 different types of locations (these may include students' homes, restaurants, or stores) and to label these locations. Encourage them to pick points of interest that are found in many different locations and add more symbols as time permits. The scale should be labeled to include (at least) the equivalent of a quarter mile for use in future lessons. They should also include a compass rose.

Where Do We Go From Here? (5 minutes)

Call students back together to discuss what makes maps useful. Explain to them street and road names and numbers are often set up to help you know where you're going and distances between locations, even without a map. In rural areas, roads may be named with letters or numbers. In towns and cities, address numbers can often help you determine location and distance.

EXTENDING THE LESSON

Have students circulate around the room and ask other students where they live on the map and to label each location. See who can get the largest number of homes labeled in 5 minutes.