METROPOLIS

A *green* CITY OF YOUR OWN!

Cover Art by Sir Gershom

**Text and Photos by
JOHN MARTONI**

Preface

Surprised that my students' vision of an "ideal city of the future" consisted of mini-malls, parking lots and big-box stores; I decided to create a curriculum that would expose children to a variety of urban forms from around the world. The city elements presented in the lessons are edges, districts, public spaces, landmarks and transportation--taken from Kevin Lynch's *Image of the City*. These elements provide an organizing mechanism for children to design their own ideal cities. The lessons increase students' awareness of planning issues such as sustainability and sprawl, while giving them an opportunity to express their heritage, interests and ideas using a creative design process. In addition, *Metropolis* is a multidisciplinary curriculum that embeds language arts, mathematics, health, art, science, and social studies throughout the unit. It can be a stand-alone unit or used prior to building a "box city" or teaching a neighborhood improvement curriculum. It would also be a great way for kids to stimulate their creativity before participating in community charrette activities such as those in *Youth Planning Charrettes by* Bruce Race & Carolyn Torma (1998 Planner's Press, Chicago).

Acknowledgments

Contents

INTRODUCTION

WE NEED YOUR HELP TO DESIGN A CITY THAT IS

KID-FRIENDLY
and
GREEN*!

*A GREEN city is a city that protects the environment.

> # People who plan cities are called *urban planners*.

What do *urban planners* do?

Urban planners try to make cities safe, healthy, and enjoyable places to live. They are especially concerned with public spaces that all citizens share, such as streets and parks.

Sometimes they design new cities, but most of the time they plan for existing cities to make them better or to figure out how they can grow bigger.

GETTING STARTED

Before you begin designing your own city it is helpful to think about places you already know about. What are places you like and don't like in your hometown (or another city you are familiar with)?

My Favorite Urban Space

What is your favorite urban space in your city (or another city you know about)? Draw a picture, map, or plan of this space that shows what makes it special.

Least Favorite Urban Space (Existing)

What is your least favorite urban space? Draw a picture, map, or plan that shows what makes this place undesirable:

Least Favorite Urban Space (Proposed)

How could your least favorite place be changed to make it better? Draw your ideas to make it safer, healthier, or more enjoyable:

CONGRATULATIONS! You just finished your first urban planning project!

IN DEPTH: THINK GLOBAL, ACT LOCAL!

Sprawling cities around the world are threatening our health and damaging our environment.

The more spread out our cities become, the more **natural habitat** and countryside they consume. This means less wildlife, plants, and farms. And the more people have to drive cars to get around because distances are too far to walk or bike. This means less **mobility** for those who cannot drive (such as kids!), less exercise, and more **fossil fuel consumption**.

The use of fossil fuels such as oil, coal, and natural gas is causing major problems around the world. Although these fuels power our cars, homes, and factories, they also pollute our air and cause acid rain. We have known for a long time that air pollution is a major health threat, resulting in **respiratory illnesses** and heart disease. Only recently, however, has it become widely known that burning fossil fuels is also causing temperatures to rise in a process known as **global warming**.

An Inupiaq Eskimo village in Alaska is already suffering the consequences of global warming. Residents of *Shishmaref* are being evacuated because their homes are literally falling into the ocean as the ice beneath their village melts and the sea levels rise. It is predicted that the entire village of 600 people will completely disappear within 10 years. Many other communities are also threatened by melting polar ice caps, rising sea levels, and flooding of coastal lowlands caused by climate change.

In addition, scientists warn us that global warming could result in stronger and more frequent hurricanes, as well as an increase in **malaria**. Warmer temperatures would enable mosquitoes that carry malaria to thrive in more areas of the world. At the same time, plants and animals that live in colder climates could disappear as temperatures rise. There has already been a significant decrease in the number of polar bears. There could also be an increase in **malnutrition** because crops would not be able to grow in some places.

Go to Chapter 1 to start designing your own ideal city that is KID-FRIENDLY *AND* GREEN!

Chapter 1

EDGES

EDGES

COMBATTING URBAN SPRAWL!

Design Challenge:

Urban sprawl causes lots of problems. We need your help to design a *compact* city with edges!

The ocean and mountains form spectacular natural edges for Vancouver, British Columbia (Canada).

DESIGN CHALLENGE ASSIGNMENT

DESIGN THE EDGES OF A NEW CITY!

1. DECIDE WHERE YOUR CITY WILL BE LOCATED.
(On an island, peninsula or hilltop? In a valley or canyon? Near a river, lake or ocean? Or somewhere else?)

2. DECIDE IF YOUR CITY WILL HAVE *NATURAL EDGES* (such as a river or hills), *MAN-MADE EDGES* (such as a greenbelt or walls), OR A COMBINATION OF BOTH.

3. MAKE A MAP OF YOUR CITY'S EDGES *LIGHTLY IN PENCIL* (so that you can easily erase any parts you decide to change). You can show details of what is around your city, but you should leave the inside blank for future urban design projects. Leave a one-inch margin on all sides of the paper so that the design is not cut off when it is photocopied.

4. *WHEN YOU ARE SATISFIED WITH YOUR DESIGN,* GO OVER YOUR LINES AND WORDS IN BLACK MARKER (so that you can make three photocopies of your map for future urban design challenges). Although you must leave the inside blank, you can color the details outside the edges of your city (using markers or colored pencils).
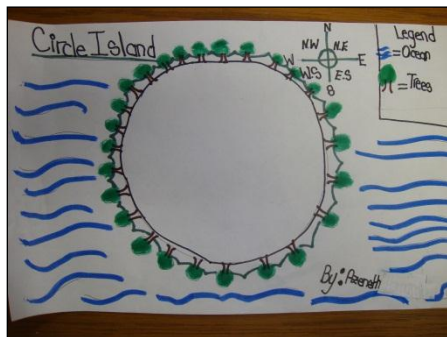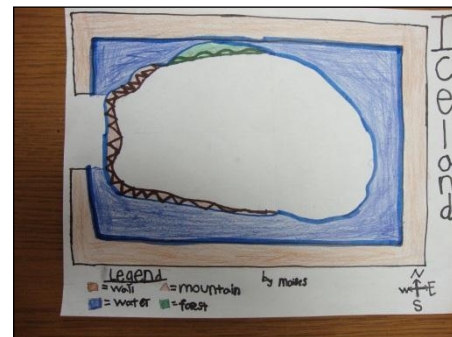
by Azeneth   by Tristan   by Moises

***Teacher's Note:** Make three photocopies of each student's map to use for future assignments.

EXTRA CHALLENGE

Explain how your city will accommodate future population growth. Will you extend patterns such as *grids** or *concentric circles** beyond your city's edges? Or will you increase *density** with taller buildings and *infill development*? Will you develop *satellite cities** or *linear cities** connected with special transportation systems*? Or do you have another idea?

*Use the Internet to find out what these terms mean

WHAT ARE EDGES?

EDGES ARE WHERE CITIES END.

Edges are boundaries between the city and its surroundings.

Edges can be natural features such as rivers and hills.

Or they can be man-made such as medieval walls and greenbelts.

The contrast between a city and its surroundings is especially dramatic when the city suddenly ends at a strong edge such as a shoreline or a wall.

Artwork by Emilio Lopez Marchena

The edges of Avila, Spain, include medieval walls and a river.

WHERE WILL YOUR CITY BE LOCATED?

Photo of exhibit at the Caja Granada Museum in Granada, Spain

On an island or a peninsula?
Near a river, lake, or ocean?
On a plateau, plain, hillside, or cliff?
In a valley or a canyon?

OR DO YOU HAVE ANOTHER IDEA?

***Teacher's Note:** You can find more pictures of geographic features to go with this lesson (and subsequent lessons) on the Internet using *Google Images*, in travel guides, and in *National Geographic magazine.*

NATURAL EDGES

Landforms/Topography: Mountains, hills, valleys, canyons, cliffs, plateaus...

Frigiliana, Spain

Ronda, Spain
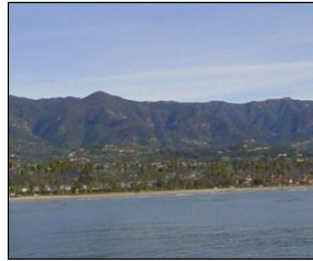
Santa Barbara, California (USA)

Anatolia, Turkey
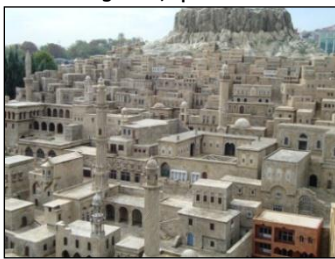
Mardin, Turkey

Exhibit at *Miniaturk* in Istanbul, Turkey

South San Francisco, California (USA)

Bodies of water and landforms defined by bodies of water:

Rivers, lakes, marshes, oceans, islands, peninsulas...

Amsterdam, Netherlands

Dublin, Ireland

Istanbul, Turkey

Istanbul, Turkey

Beirut, Lebanon

Shanghai, China

Vegetation: Countryside or wilderness such as forests, deserts, grasslands...
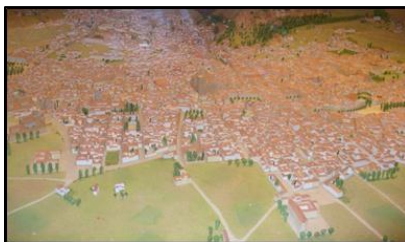
Model of Granada, Caja Granada Museum (Spain)

Istanbul, Turkey
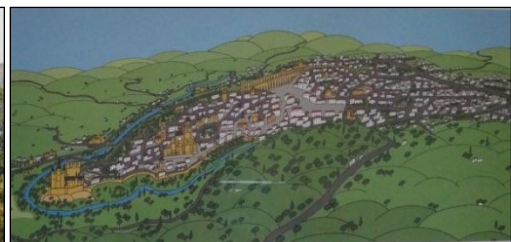
Segovia, Spain (artwork by Emilio Lopez Marchena)

13

MAN-MADE EDGES

Even though man-made edges are built or designed by people, they often coincide with natural features such as shorelines and changes in elevation.

Examples of man-made edges include: *Walls & moats,* *farmland & pastures,* greenbelts, gardens, parks & landscaping, *Signs & lighting*, *an abrupt end to the built-up area,* and transportation corridors such as canals.

Walls of Segovia, Spain

Exhibit at Topkapi Palace in Istanbul, Turkey

Greenbelt in New Orleans, Louisiana (USA)
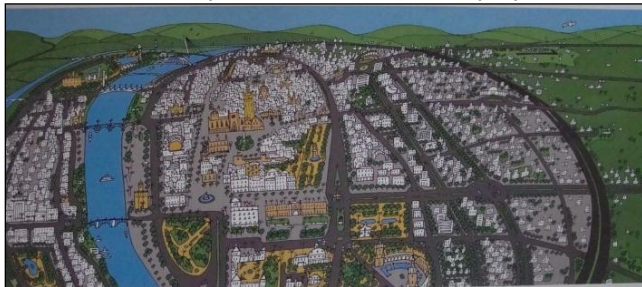
Agricultural areas around Sevilla, Spain (Artwork by Emilio LopezMarchena)

New Orleans map at Cabildo Museum (Louisiana, USA)

Exhibit at *Miniaturk* in Istanbul, Turkey
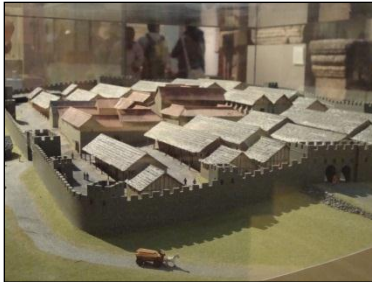
Exhibit at British Museum in London, UK

Greenbelt and walls of Segovia, Spain

Canal in Beijing, China   Exhibit at *Miniaturk* in Istanbul, Turkey   Exhibit at *Miniaturk* in Istanbul, Turkey

KEY POINTS

1. City edges can be:

- Bodies of water (such as an ocean, river, or lake)
- Landforms (such as mountains and hills)
- Manmade structures (such as buildings, railroad tracks, walls, or highways)
- Arbitrary lines that people make up

2. Not all cities have clear edges. Urban sprawl erases edges as it continues to expand and reshape the city edges.

Discussion Questions

1. What kinds of edges does your city have?

2. What kinds of edges do other cities you know about have?

SOCIAL STUDIES EXTENSION

MAP TIPS

- Use *map symbols* to show features such as mountains or bodies of water.

- Include a *legend* to explain the symbols (also called a *map key*).

- Use a *compass rose* to show north, south, east, and west.

- Don't forget to add a *map title*. The map title should be the name of your city (the name should be meaningful and creative!).
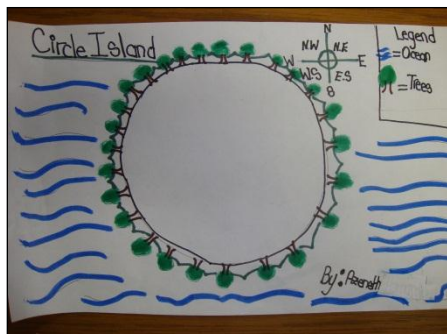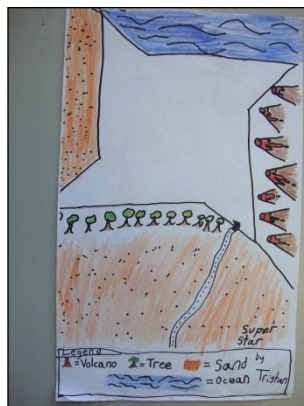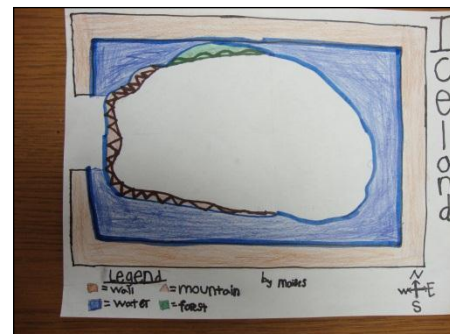
| by Azeneth | by Tristan | by Moises |

LANGUAGE ARTS EXTENSIONS

WRITING

WRITE A PARAGRAPH ABOUT YOUR DESIGN

- TOPIC SENTENCE: Explain what "edges" are.
- DETAILS: Describe your city's edges and tell what makes them interesting, unique, surprising, or important.
- CONCLUDING SENTENCE: Explain how the edges you designed will make your city *kid-friendly* and *green*.

WORD WORK *SOURCES: Merriam-Webster Children's Dictionary* and *The Clear and Simple Thesaurus Dictionary* by Harriet Wittels and Joan Greisman

EDGES: Plural of **edge**

Pronunciation: \'ej\
Part of Speech: *noun*
Definition: *a line or a place where something ends*
Synonyms: *boundary, city limit, perimeter, border, periphery, side*

Teacher's Note: You can adapt this page to meet your grade level standards and classroom needs. Ideas include putting the words in alphabetical order, synonyms/antonyms, definitions, sentences, singular/plural, parts of speech, using words in prepositional phrases/similes/sentences with conjunctions, syllables, prefixes/suffixes/word origins/word families.

VOCABULARY

edge

boundary

border

city limits

urban

suburban

rural

sprawl

natural

periphery

perimeter

IN DEPTH: WHY ARE EDGES IMPORTANT?

S P R A W L

Urban sprawl is when cities spread out so far that they do not have clear   edges.   Sprawl   has   become   a   major   prob-

lem since the invention of the automobile. People with cars can live and work very far from the center of the city.

ABOVE: Shanghai, China **BELOW:** Freeways in Los Angeles, California (USA)

PROBLEMS RELATED TO URBAN SPRAWL

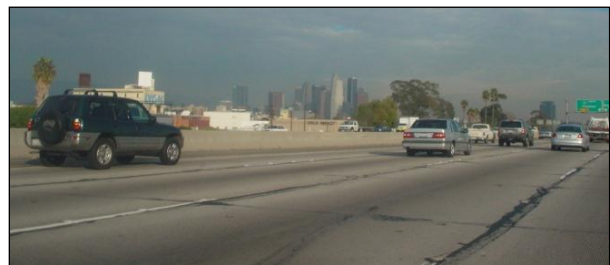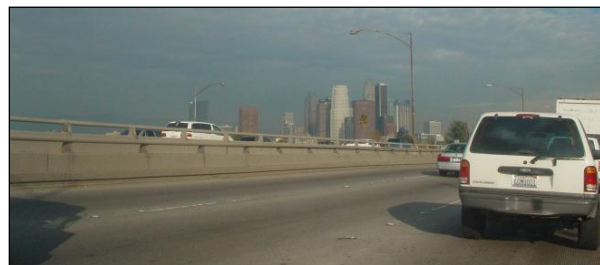**FOSSIL FUELS, POLLUTION, AND GLOBAL WARMING:** Cars use *fossil fuels,* which create air pollution and contribute to global warming. Furthermore, fossil fuels are finite. That means we will run out of them in the future.

LAND CONSUMPTION: The more that a city spreads out, the more farmland and wilderness it destroys. This results in the loss of habitat for plants and animals.

HEALTH AND SAFETY:

-Air pollution exacerbates health problems related to the respiratory system (such as asthma).

-In the United States alone, more than 40,000 people per year are killed each year in car crashes.

-People who travel by car usually don't get as much exercise as people who travel by bicycle or on foot. Lack of exercise and obesity are major health problems in modern societies around the world.

COSTS: When cities sprawl, they need more *infrastructure* such as roads, utility lines (electricity, gas, telephone, and water), transit services, and sewers—all of which are very costly to build.

OTHER PROBLEMS: Other problems related to sprawl include traffic jams (*congestion*) and difficulty getting around for people without cars (such as kids, the handicapped, those who can't afford a car, those who don't want a car, and the elderly).

HOW URBAN PLANNERS ARE ADDRESSING SPRAWL

Urban planners are working hard to keep cities from sprawling. One idea is to preserve farmlands and wilderness at the edges of cities by creating zones where building is prohibited.

Another idea is to increase *density*. Basically, this means to increase the number of people that can fit into the areas of the city that are already built so that there is no need to spread out.

One way to increase density is called *infill development*. If you look around a city there is a lot of unused space (such as empty lots or parking lots that are too big) where new houses could be constructed.

Density could also be increased by building UP, NOT OUT. We could fit more people *in the city* by building taller buildings.

Chapter 2

DISTRICTS

DISTRICTS

SUSTAINABILITY AND LOCAL HERITAGE ALL IN ONE!

Design Challenge:

In many cities you need to drive a few miles just to buy groceries or to go to school. We need your help to design *mixed use districts* that reduce car dependence and sprawl by providing places to live, shop, work, and play in close proximity.

Many cities have ethnic districts such as *Chinatown* in San Francisco, California.

DESIGN CHALLENGE ASSIGNMENT

DESIGN DISTRICTS FOR YOUR CITY!

1. Divide your city into districts. You must have at least three districts in your city—and probably no more than five (otherwise the future assignments will be very time-consuming).   Think of a name for each district and be able to explain each district's special identity.

Each district should have mixed uses (places for the activities of day-to-day life such as housing, grocery stores, a doctor's office, a post office, a school, etc.).

However, each district should also have something special that sets it apart from the other districts of the city.

2. Use fine-tipped markers to trace over the boundaries of each district. Use colored pencils to color each district a different color. The best way to color large areas is to imagine that the area is divided into rows. Shade each imaginary row with diagonal strokes.

Do not draw anything in the district at this time. We will do that in later assignments. Just color each one a different color and be ready to explain its special identity.
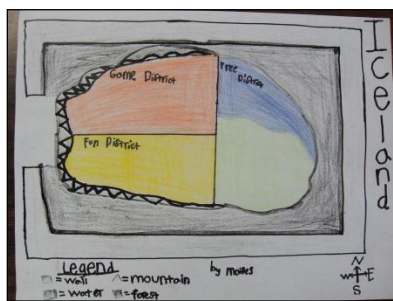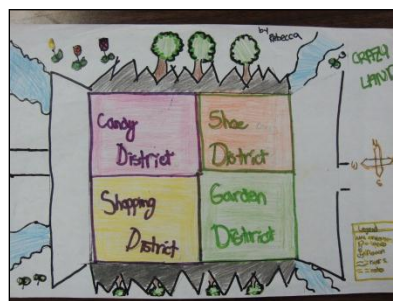
| by Moises | by Rebecca | by Tristan |

***Teacher's Notes:**

1. Use one of the photocopies made in the last lesson for this assignment.

2. It is generally best to use fine-tipped markers for lines and lettering, and to use colored pencils for coloring and filling in large areas.

WHAT IS A DISTRICT?

DISTRICTS ARE SMALL PARTS OF A CITY THAT HAVE A SPECIAL IDENTITY.

The *Alamo Square* neighborhood in San Francisco, California, is famous for its Victorian architecture and views of the city.

SOME TYPES OF DISTRICTS INCLUDE:

Ethnic neighborhoods such as Mexican, Italian, or Japanese
Historic districts   DOWNTOWN   AREAS WITH CERTAIN TYPES OF ARCHITECTURE SUCH AS SPANISH OR VICTORIAN   Places with a unique location or distinguishing feature such as along the beach or on a hillside   Specialty districts (such as an "antique row" shopping district, an artists zone, or a theater district)

KEY POINTS

1.   Districts are opportunities to create sustainable neighborhoods.   Districts should be compact and have mixed uses to minimize sprawl and car dependence.   This means that there should be places to live, shop, work, and play within walking distance in each district.   In addition, housing should be located near public transportation stops so that residents can travel to other parts of the city without a car.

The Bayswater District in London, England.

2.   Although many uses are "compatible" (such as housing and a grocery store), some uses are "incompatible" and should be separated.   Airports, landfills, and prisons, for example, should not be placed next to housing because they produce pollution, noise, or other types of adverse effects.

An industrial center in South San Francisco, California.

3. Districts are great opportunities to reflect a unique heritage, location or style of architecture.

ABOVE: *The French Quarter* in New Orleans, Louisiana. **BELOW:** *The Fillmore District* in San Francisco, California, is a historic African American neighborhood famous for its jazz nightclubs.

DISCUSSION QUESTIONS

-What types of districts does your city have?

-Are they mixed use?

-Do they reflect local heritage?

-What are some districts in another city you know about?

DESIGNING DISTRICTS FOR YOUR CITY

What types of districts would reflect the heritage of my city?

Districts often celebrate an area's history, culture, people, location, or architecture.

Signs, flags, and businesses in San Francisco's *North Beach* reflect the area's Italian roots.

What are the boundaries of each district?

Just like cities, districts can have natural edges (such as creeks or hillsides) or man-made edges (such as boulevards or parks). Some districts mark their boundaries with signs or gates.

A gate marks the entrance to San Francisco's *Chinatown*.

How will each district be sustainable?

Think of ways to avoid auto dependence in your districts. Brainstorm elements of day-to-day life (such as shopping, entertainment, services, employment, etc.) that could be included in a mixed use district within walking distance of residents' homes.

North Beach is a mixed use neighborhood in San Francisco, California.

How will each district be distinct, yet harmonious?

Memorable districts are unique in their appearance, location and uses (for example, Little Tokyo or the Theater District). Think of ways to make each district unique in your city.

Memorable districts are also harmonious. They have characteristics that unify the district (such as certain colors, building styles, signs, building heights...).
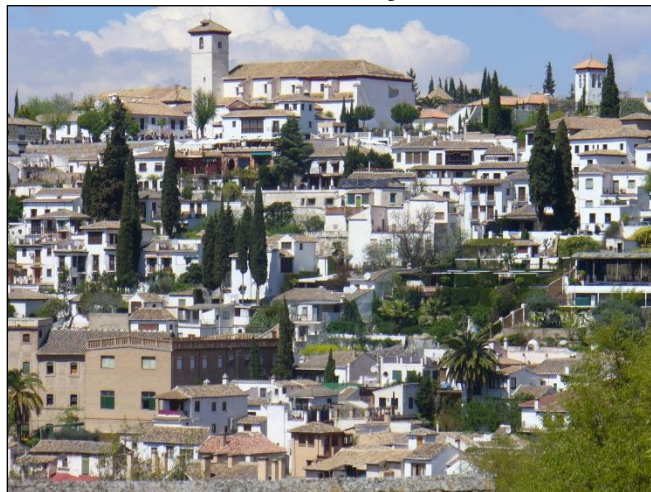
The hillside district of *The Albaicin* in Granada, Spain is unique because of its steep streets and Moorish history. It is also quite harmonious due to its whitewashed houses, small plazas, and interior courtyards.

How will my city's downtown be different from other districts?

In addition to neighborhood districts, cities typically have a *central business district* shared by residents from every neighborhood in the city. Downtowns are centers of government, transportation, and commerce.   Usually a city only needs one city hall, one train station, or one large department store for everyone.

Downtown should be easily accessible for residents from all parts of the city. Although it would probably be impossible for all residents to live within walking distance of downtown, it should be accessible by public transportation to keep it green.

Downtown San Francisco, California.

LANGUAGE ARTS EXTENSIONS

WRITING

WRITE A PARAGRAPH ABOUT YOUR CITY'S DISTRICTS:

- TOPIC SENTENCE: Define "*mixed use district.*"
- SUPPORTING DETAILS: Name and describe each district in your city. Explain how each district is unique, yet harmonious.
- CONCLUDING SENTENCE: Explain how each district is sustainable and kid-friendly.

WORD WORK

Sources: Merriam-Webster Children's Dictionary and The Clear & Simple Thesaurus Dictionary by Harriet Wittels & Joan Greisman

> ## DISTRICTS: Plural of *district*
>
> **Pronunciation:** \'dis trikt\
> **Part of Speech:** *noun*
> **Definition:** *a section of a city with a special feature or purpose*
> **Synonyms:** *neighborhood, zone, quarter, section, locality, place, region, territory*

VOCABULARY

neighborhood

quarter

zoning

commercial

industrial

residential

institutional

open space

heritage

mixed uses

sustainable

harmonious

Teacher's Note: You can adapt this page to meet your grade level standards and classroom needs. Ideas include putting the words in alphabetical order, synonyms/antonyms, definitions, sentences, singular/plural, parts of speech, using words in prepositional phrases/similes/sentences with conjunctions, syllables, prefixes/suffixes/word origins/word families.

IN DEPTH: TRADITIONAL ZONING VS. MIXED USE DISTRICTS

TRADITIONAL ZONING

Many cities have separate zones for shopping, working, living, and playing. This is called *zoning.* In some cases zoning is wise because it protects us. We are safer if we build homes away from places such as airports, landfills, and factories. In other cases, however, safety is not an issue. For example, it is not dangerous to live near a grocery store. In fact, neighborhood shopping and housing are *compatible* uses. They complement each other because it is convenient for both the store and the resident to be near each other. Yet in many cities it is illegal to build a grocery store near places where people live due to traditional zoning laws. This results in sprawl and car dependence. People who do not drive (such as kids) can't go to the store unless someone drives them because their houses are too far away to walk or bike.

Some common zones in American cities include:

-Residential* (Places to live)
Single-family homes, apartment buildings, town houses, condominiums, mobile homes, houseboats and retirement homes.

-Commercial* (Places to buy things)
Stores, banks, gas stations, office buildings, shopping malls, arcades, movie theaters, and restaurants.

-Industrial* (Places where things are made, disposed of, or processed. These places often noisy or polluted) Factories, power plants, water plants, trash transfer stations, recycling centers, landfills, warehouses, airports, and train stations.

-Open/Public Space and Parks* (Places to play, relax, exercise, or enjoy nature)
Plazas, town squares, parks, hiking trails, bike paths, basketball courts, playgrounds, recreation centers, tennis courts, soccer fields, and monuments.

-Institutional* (Places to get help, learn, or receive government services)
Police stations, libraries, courthouses, city halls, post offices, fire stations, museums, community centers, schools, hospitals and places of worship (such as churches, synagogues, temples, and mosques).

MIXED USE DISTRICTS

Green cities mix residential, commercial, institutional, and open space uses as much as possible to remain compact and walkable. There are several ways to mix uses:

-In a building* that has apartments on the upper floors above shops at street level

-On a street* that has both commercial and residential buildings

-In a neighborhood* that includes a variety of residential buildings, commercial buildings, institutional uses, and open spaces in close proximity

*SOURCE: City by Design by the National Building Museum

Chapter 3

PUBLIC SPACES

PUBLIC SPACES

Promoting Diversity and Democracy

Design Challenge:

We need places to hang out in our cities where EVERYONE is welcome. Help us design public spaces for everyday life that are entertaining, interesting, attractive, unique, inviting, fun, and unusual.
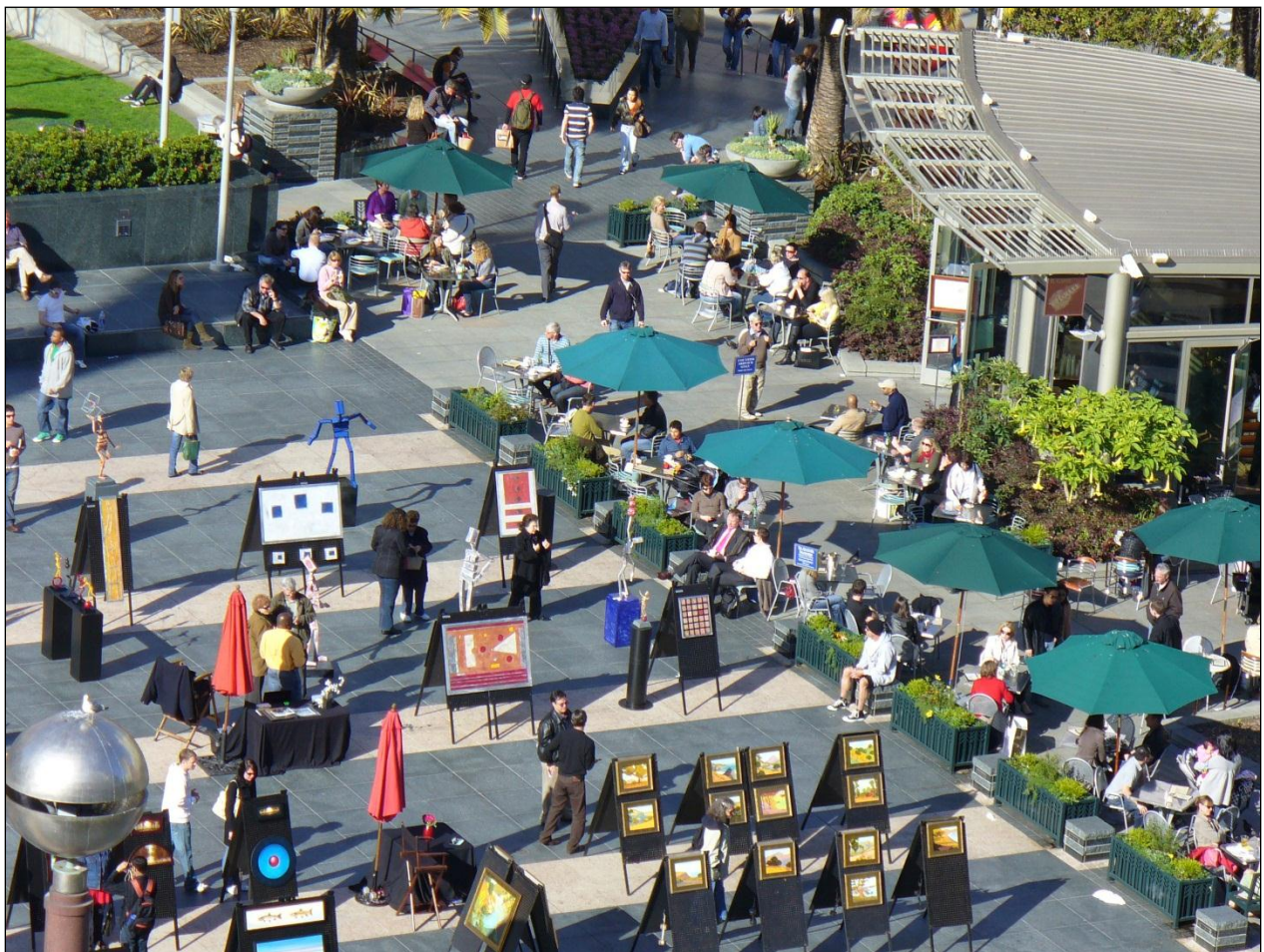
Union Square in San Francisco, California.

DESIGN CHALLENGE ASSIGNMENT

CREATE A PUBLIC SPACE IN EACH OF YOUR CITY'S DISTRICTS

1. On either graph paper or a blank sheet of paper, sketch a "bird's-eye view"*** of your public spaces with as many details as possible. If you can't draw certain details, describe them with words. Draw *lightly in pencil* (so that you can easily erase parts you change your mind about without having to start all over again). Don't forget to give each public space a name.

by Fausto	by Lesly	by Mario

*****A "bird's-eye view" is what it looks like from above—like a floor plan.*

2. Sketch each public space exactly where it should be located on a copy of your city map (*lightly in pencil* so that you can easily erase parts you change your mind about without having to start all over again).
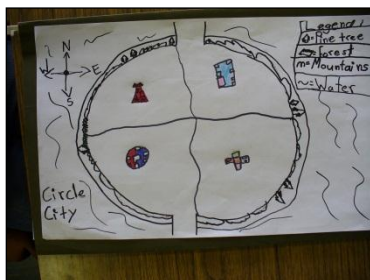
by Jacqueline	by Sofia	by Salma

3. Add the boundaries and names of the districts you created in the last assignment.

4. Use fine-tipped markers and/or colored pencils to finish your designs.

***Teacher's Notes: The *Project for Public Spaces* is a great resource for ideas. The website has lots of pictures and information related to public spaces. www.pps.org

EXTRA CHALLENGE

Draw the "bird's-eye view" plan of your public space *to scale*.*

If you don't know what "scale" means, look it up!!!

WHAT IS THE DIFFERENCE BETWEEN A SHOPPING MALL AND A PUBLIC SPACE?

A shopping mall is privately owned. Its main purpose is to sell merchandise to make money.

Public spaces **are not** businesses.   The main purpose of a public space is to provide a place to hang out for **EVERYONE,** *free of charge.*

Boston, Massachusetts (USA).

KEY POINTS TO REMEMBER ABOUT PUBLIC SPACES

EVERYONE IS WELCOME

The cultural identity and social diversity of residents is reflected in the space's users and design.

NO MONEY NEEDS TO BE SPENT TO ENJOY IT

There is no admission charge. You do not have to buy anything.

OUTDOOR SPACES ARE FOR EVERYDAY LIFE

Sitting, eating, reading, socializing, playing, resting, people-watching, entertainment, education, special events (such as shows, community celebrations, farmers markets, and public speeches), etc...

***Although public spaces can be indoors, urban designers are mostly interested in the outdoor spaces of a city—between the buildings.

PUBLIC SPACES CAN BE *GREEN*

-Public spaces should integrate greenery and nature into their designs.
-Public spaces should be central focal points of districts. They should be accessible to everyone by foot, bicycle and public transit.

Piazza del Campo in Siena, Italy

Plaza at *John Hancock Center* Chicago, Illinois

Millennium Park in Chicago, Illinois

Washington Square in San Francisco, California

TYPES OF PUBLIC SPACES

Plazas, squares, and *parks* are the most common types of public spaces. They are often located at a major crossroads (the intersection of two busy streets), at the end of a main street, or adjacent to a special natural feature like a beach or river.

Some public spaces are very unique. *Millennium Park* in Chicago has unusual fountains and artwork. Outdoor stairs are popular places to hang out with friends in Rome, Italy (*Spanish Steps),* and Vancouver, Canada (at the *Vancouver Art Gallery).* In Ottawa, Canada, the Rideau Canal becomes an outdoor ice rink each winter, while in Paris a riverfront street is covered with sand and converted into a beach each summer.

Millennium Park in Chicago, Illinois.

BRYANT PARK (NEW YORK CITY)

Park Map

Children's Painting Area

Chess and Backgammon Corner

Magic Show Advertisement

Outdoor Movie Screen

Reading Area

MORE PUBLIC SPACES...

Exhibit at Museum of Madrid (Spain)

Empty lot converted into a park in Long Beach, California (USA). The back of the car is lined with benches!

Jackson Square in New Orleans, Louisiana (USA)

Union Square San Francisco, California (USA)

DISCUSSION QUESTIONS

1. Think of as many activities as you can that can take place in a public plaza.

2. What are some public spaces you like in your city or another city you know about? What do you like about these spaces?

3. What are some public spaces you don't like? What makes these spaces undesirable?

LANGUAGE ARTS EXTENSIONS

WRITING

Write a paragraph about your city's public spaces.

TOPIC SENTENCE
> Define *public space*.

DETAILS
> Describe the public spaces you designed. Make each one sound attractive, exciting, unusual, interesting, and fun.

CONCLUDING SENTENCE
> Explain how your city's public spaces will be *kid-friendly* and *green*.

WORD WORK

PUBLIC SPACES: *Places used by the public for recreation in everyday life, especially to socialize or hang out. Places to stage public events and community celebrations.*

VOCABULARY

public

private

democracy

multiculturalism

diversity

space

plaza

square

park

recreation

socialize

Teacher's Note: You can adapt this page to meet your grade level standards and classroom needs. Ideas include putting the words in alphabetical order, synonyms/antonyms, definitions, sentences, singular/plural, parts of speech, using words in prepositional phrases/similes/sentences with conjunctions, syllables, prefixes/suffixes/word origins/word families.

Chapter 4

LANDMARKS

LANDMARKS
REFLECTIONS OF LOCAL HERITAGE

Design Challenge:

Many communities look almost exactly alike! We need your help to design a unique landmark that distinguishes our city from all others.

Torre del Mangia in Siena, Italy.

DESIGN CHALLENGE ASSIGNMENT

Create a landmark for each public space in your city

1.   On either graph paper or a blank sheet of paper, sketch an "elevation plan"*** of the front of one of your landmarks with as many details as possible. If you can't draw certain details, describe them with words. Draw *lightly in pencil* (so that you can easily erase parts you change your mind about without having to start all over again).

*****An "elevation plan" is what it looks like from directly in front at street level.*

2.   Sketch the location of your landmark on your city plan *lightly in pencil* (so that you can easily erase parts you change your mind about without having to start all over again).

3.   Give the landmark a name.

4.   When you are satisfied with your sketch, use fine-tipped markers or colored pencils to finish your design.

by Mario
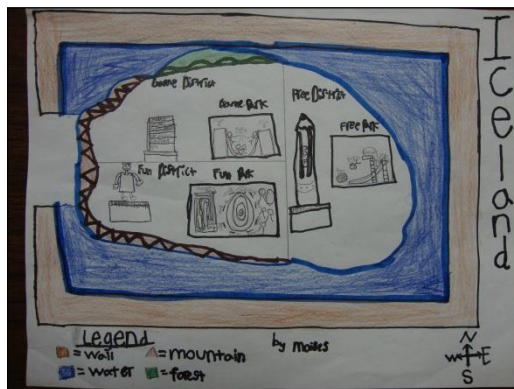
by Moises

***Teacher's Notes: *Amazing Buildings* by Kate Hayden (DK Readers) and *Draw 50 Buildings and Other Structures* by Lee J. Ames (Broadway Books) are great resources for ideas and drawing tips.

EXTRA CHALLENGE

Draw the elevation plan of your landmark *to scale.*

WHAT IS A LANDMARK?

A landmark is something that is easy to see and can help people know where they are. Examples include prominent buildings, statues, fountains, historic structures, and unique natural features.

San Francisco (California, USA) City Hall.

KEY POINTS TO REMEMBER ABOUT LANDMARKS

1. Landmarks should be CONSPICUOUS.

Landmarks are often next to public spaces or in the center of public spaces, but they do not have to be.   They can also be found at the end of a street, on top of a hill, or at a major intersection.

2.   Landmarks are opportunities to celebrate the unique heritage (history and culture) of a city. They

should reflect what is interesting, important, exciting, or unusual about the city and its residents. Landmarks often become symbols of a city. Examples include the *Eiffel Tower* in Paris and the *Golden Gate Bridge* in San Francisco.

When designing a landmark it is important to think about *how the landmark will reflect the unique personality of the city.* Landmarks may be inspired by historical events, special sites, famous residents, and ethnic origins of residents.
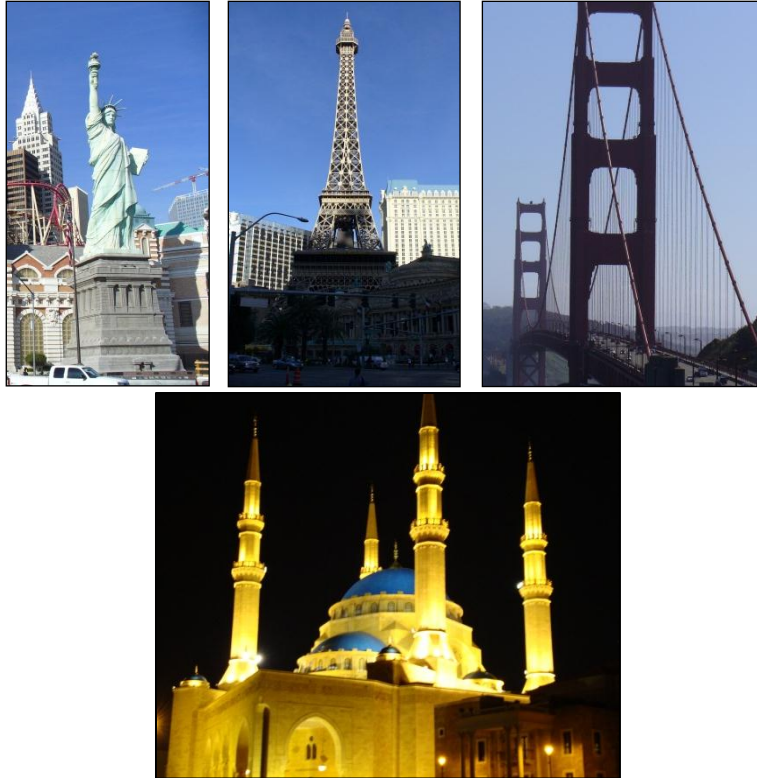
FROM LEFT TO RIGHT:

Replicas of the Statue of Liberty and Eiffel Tower in Las Vegas, Nevada; the Golden Gate Bridge in San Francisco, California; Al Omari Mosque in Beirut, Lebanon.

3. Landmarks can be all sizes:

- **Towering landmarks** such as the *Space Needle* in Seattle can be seen from far away; giving their cities a unique skyline.

- Smaller landmarks such as fountains and statues are best seen close-up.

- Large or small, landmarks make cities unique and give them personalities.

Left: *Millennium Park* (Chicago, Illinois) **Center:** *Oriental Pearl Tower* (Shanghai, China)
Right: *Neptune Statue* (Bologna, Italy)

DISCUSSION QUESTIONS

Describe a landmark you know about.

- What type of landmark is it?
- How is it unique?
- What makes it prominent?

Teacher's Note:

Display pictures of all different types of landmarks (from home, books, or periodicals) to help students with discussion questions.

ART EXTENSION *FUN BOX*

MAKE A LANDMARK COLLAGE USING PICTURES OF LANDMARKS YOU FIND IN MAGAZINES

Teacher's Note: *National Geographic* and travel magazines have lots of pictures of landmarks.

LANGUAGE ARTS EXTENSIONS

WRITING

Describe your landmark(s) in a paragraph:

- TOPIC SENTENCE: Define *landmark*.
- SUPPORTING DETAILS: Describe the landmark(s) you designed for your city. How is it unique? Where is it located?
- CONCLUDING SENTENCE: How are your landmarks *kid-friendly* and *green*?

WORD WORK

> **Land·mark**
> *Part of speech:* Noun, singular
> *Compound word*: (land=part of the earth's surface) + (mark=something that shows a location)
> *Definition:* Something that is easy to see and can help people know where they are. Examples include prominent buildings, statues, fountains historic structures, and unique natural features.

VOCABULARY:

visible

prominent

monument

statue

fountain

memorial

tower

Teacher's Note: You can adapt this page to meet your grade level standards and classroom needs. Ideas include putting the words in alphabetical order, synonyms/antonyms, definitions, sentences, singular/plural, parts of speech, using words in prepositional phrases/similes/sentences with conjunctions, syllables, prefixes/suffixes/word origins/word families.

MATHEMATICS EXTENSION

MEASUREMENT AND GEOMETRY

BUILD A MODEL OF YOUR LANDMARK
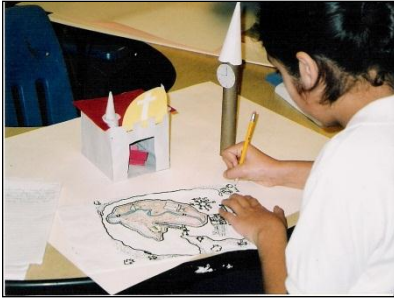
by Silvia   Models of Landmarks at Museum of Madrid (Spain)

Make a model of your landmark from geometric solids that you create from patterns. Sounds hard, but with a little bit of background information you will be a pro!

1. First you need to learn some geometric terms. Make an illustrated glossary of the following vocabulary words:

- Lines: Parallel and Perpendicular
- Circles: Radius and Diameter
- Congruent and Similar Figures
- Symmetry: Bilateral Symmetry and Rotational Symmetry
- Angles: Right, Acute, and Obtuse
- Triangles: Equilateral, Isosceles, and Scalene
- Quadrilaterals: Rhombus, Square, Rectangle, Parallelogram, Trapezoid
- Edges, Faces, and Vertices

2. Incorporate at least five of the geometric concepts listed in #1 into your landmark's design.

3. Draw a rectangle around your landmark's design. Find the *area* and the *perimeter* of the rectangle using both the U.S. and metric measurement systems.

4. Make a model of your landmark using geometric solids. Start by drawing patterns of faces that, when cut and folded, will make a solid. Describe the number and shapes of faces, edges, and vertices in your finished geometric solids.

Teacher's Note: This was developed for California 4th grade math standards. You can adapt this page by substituting vocabulary and concepts for your grade level standards and classroom needs in the areas of measurement and geometry. Other options for model building (recyclable box models and pop-up paper models) are included in Chapter 6. These methods are not math-intensive.

Chapter 5

TRANSPORTATION

TRANSPORTATION

FOR HEALTHIER PEOPLE & A HEALTHIER PLANET

Design Challenge:

You need a car to get around in most American cities. Automobiles pollute our air and many people—including kids—do not or cannot drive. We need your help to design a transportation system that is ECO-FRIENDLY *and* KID-FRIENDLY!

Mural at the London Transport Museum (UK)

How many modes of transportation can you find?

DESIGN CHALLENGE ASSIGNMENT

Design a transportation system for your city that is ECO-FRIENDLY *and* KID-FRIENDLY.

1. Choose which modes of transportation you want in your city.

2. Plan a network of transportation paths to connect the districts, public spaces, and landmarks you designed in previous assignments.

Draw your paths lightly in pencil so that you can easily erase them if you change your mind about the design.

If you use any special symbols, colors, or lines, be sure to explain them in your map key.

When you are satisfied with your plan, you should use markers or colored pencils to finish your design.

by SirGershom

by Salma

by Janneth

by Mario

51
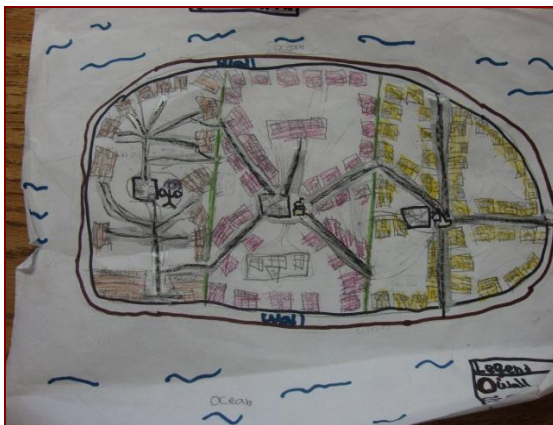
KEY POINTS TO REMEMBER ABOUT TRANSPORTATION

TRANSPORTATION SYSTEMS CONNECT DIFFERENT PARTS OF CITIES.

TRANSPORTATION IS A MEANS OF TRAVELING OR OF CARRYING SOMEBODY OR SOMETHING FROM ONE PLACE TO ANOTHER. EXAMPLES INCLUDE WALKING, BIKING, CARS, BUSES, SUBWAYS, FERRIES AND TRAINS.

Transportation has changed over time as new technologies have been developed. In the future we may have modes of transportation that do not exist right now.

TRANSPORTATION PATHS ARE THE ROUTES AND INFRASTRUCTURE FOR A TRANSPORTATION SYSTEM. EACH MODE OF TRANSPORTATION NEEDS A CERTAIN TYPE OF PATH. FOR EXAMPLE, PEDESTRIANS NEED SIDEWALKS, CARS TRAVEL ON STREETS, AND TRAINS USE TRACKS.

DISCUSSION QUESTIONS

1. What types of transportation does your city have?

2. What types of transportation have you seen in other cities?

DESIGNING TRANSPORTATION PATHS

Paths can be many shapes and patterns.

Paths can be made from many types of materials. Paths can be above ground (elevated), at ground level or underground (subterranean).

Drawing by John Martoni
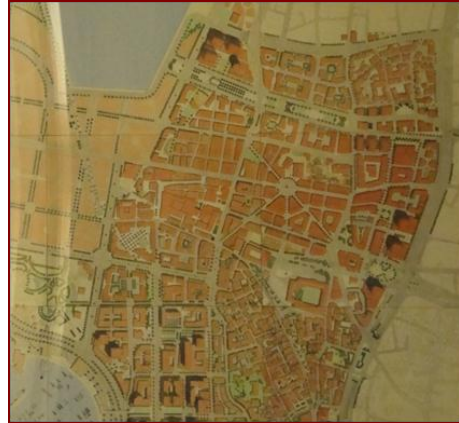
Map on display in downtown Beirut, Lebanon

Museum of Madrid exhibit (Spain)

Historical map on display in Boston's North End district(USA)

Museum of Madrid exhibit (Spain)

Exhibit at Caja Granada Museum, Granada, Spain

Teacher Note: The book *49 Cities* (by WORKac) has an extensive collection of ideal city plans from throughout history. The plans include a fascinating array of path patterns.

Information map posted on a Damascus street (Syria)
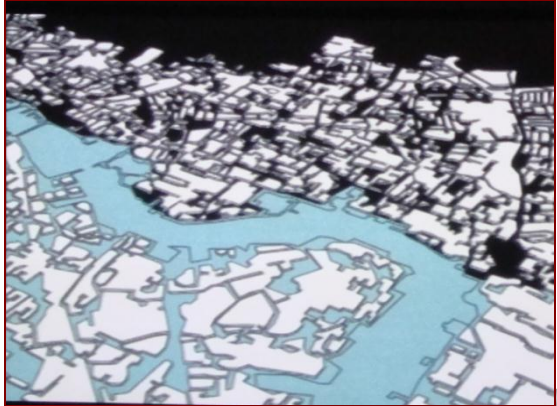
London Transport Museum exhibit (UK)

Museum of Madrid exhibit (Spain)

Information map posted on a London street (UK)

Model displayed at the Building Centre (London, UK)

Museum of London exhibit (UK)

WALKING AND BIKING

Advantages:
-Eco-friendly
-Kid-friendly
-Healthy
-Cheap
-Works well in compact cities that build UP (not OUT)

Disadvantages:
-Not protected from bad weather
-Can't carry very much
-Difficult to travel very far (especially difficult in sprawling cities)

Dublin, Ireland

Long Beach, California (USA)

Streets and parking spaces converted into areas for pedestrians and bicyclists

Vancouver, British Columbia (Canada)

New York City (USA)

Shanghai, China

Separate lanes for cars, pedestrians, and bicycles

*Concept of transportation advantages/disadvantages is from the National Building Museum's *City by Design* curriculum

PUBLIC TRANSPORTATION

Buses, Ferries, Subways, Streetcars, Trains...

Advantages:

-Reduces traffic by transporting many passengers
-Some new buses use natural gas (which emits less exhaust fumes)
-Electric subways/streetcars/trains do not emit harmful exhaust fumes
-Cheaper than buying/maintaining a car
-Passengers can relax while riding

Disadvantages:

-Buses pollute the air
-Can be crowded at rush hour
-Expensive to build tracks/tunnels
-Stops and schedules may not be convenient for everyone

How to Make Public Transportation More Convenient:

-Build mixed use districts with housing, shopping and places to work near transit stops
-Allow bikes on trains and buses so people can get to stops without a car
-Offer free or low cost passes for children and the elderly

London Transport Museum (UK)

San Francisco, California (USA)

San Francisco, California (USA)
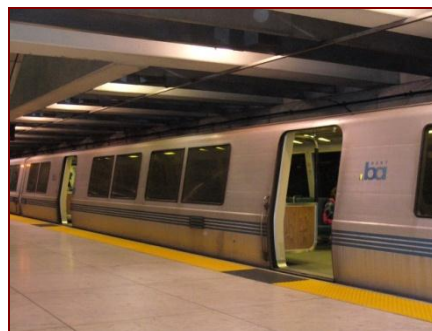
San Francisco, California (USA)

*Concept of transportation advantages/disadvantages is from the National Building Museum's *City by Design* curriculum

UNUSUAL MODES OF TRANSPORTATION

Credit: John Reinhardt   Credit: Carolyn Torma   Credit: Carolyn Torma

Buses in Curitiba, Brazil travel in special lanes so they don't get stuck in traffic. They also have special boarding stations for passengers to pay their fare BEFORE the bus comes. It saves time because nobody has to wait in line to pay the driver and there are lots of doors to get on and off the extra-long buses.

Credits: Carolyn Wargelin

Aerial gondolas are great for climbing steep mountains.

Credit: Carolyn Wargelin   Credit: Alossix Credit: Carolyn Wargelin

Funiculars and elevators are also effective ways to climb steep hills. The *Santa Justa Elevator* in Lisbon, Portugal takes people up to a bridge to reach the hilltop neighborhood of Bairro Alto. The elevator was designed by Gustave Eiffel (He also designed the *Eiffel Tower* in Paris, France).

Credit: Carolyn Wargelin Credit: Carolyn Torma Credit: Carolyn Torma

Shanghai, China is connected to its airport with a maglev train that travels up to 268 miles per hour. Maglev, or *magnetic levitation*, uses magnets to lift and propel the trains much quicker and quieter than wheeled trains. Some unique taxi systems include tricycles in Beijing, China and gondolas in Venice, Italy.

TRANSPORTATION OF THE FUTURE

Scientists and inventors are studying lots of ideas for the future...

Alternative Fuels: Biofuels, wind, solar, tidal...

New technologies: Driverless cars and vehicles that can travel on land, in water, and in the air...
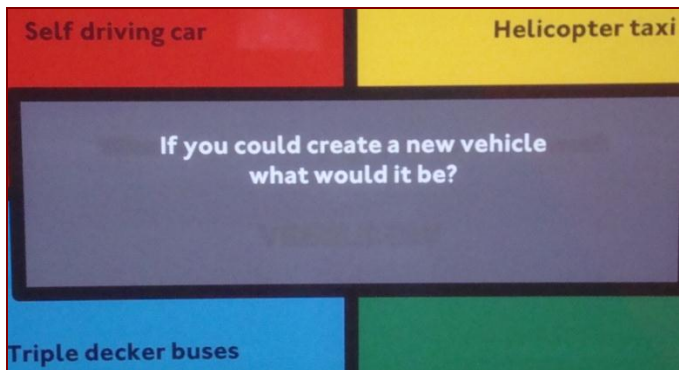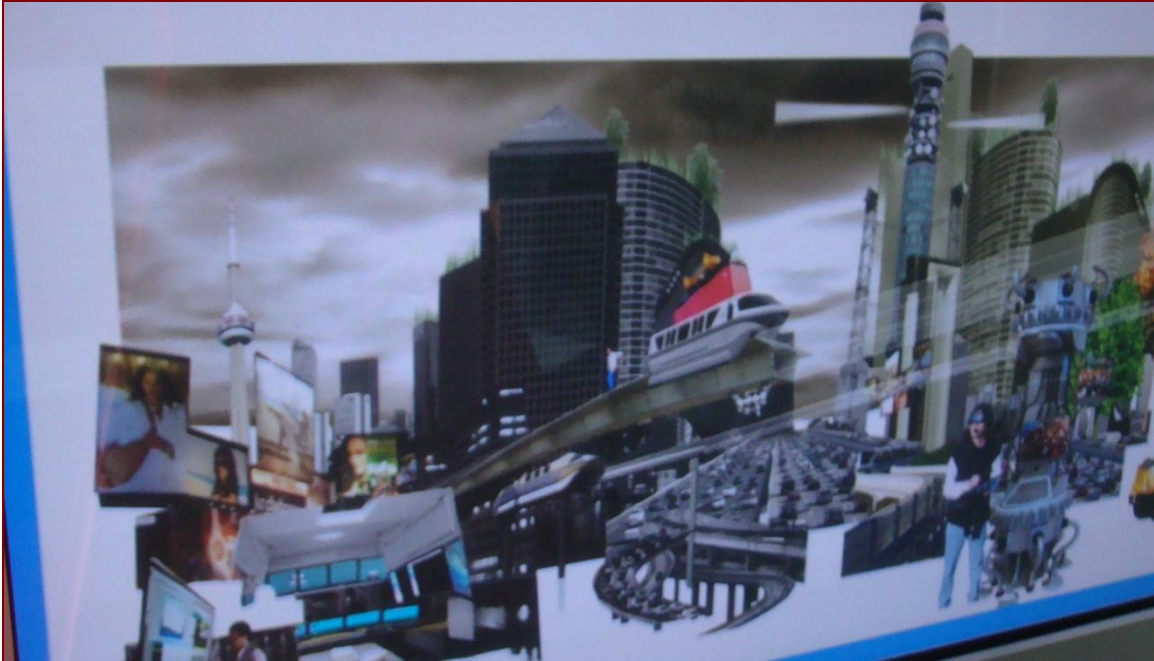
Exhibits at London Transport Museum (UK)

Do you have another idea?

LANGUAGE ARTS EXTENSIONS

WRITING

Describe your transportation system in a paragraph:

- TOPIC SENTENCE: Define *transportation system*.
- SUPPORTING DETAILS: Describe the modes of transportation and path system you designed for your city.
- CONCLUDING SENTENCE: How is your transportation system *kid-friendly* and *green*?

WORD WORK

trans•por•ta•tion
Part of speech: Noun
Definition: Means of carrying people and/or goods from one place to another.

VOCABULARY:

transportation

mode

mobility

route

system

pedestrian

access

connection

ferry

path

Teacher Note: You can adapt this page to meet your grade level standards and classroom needs. Ideas include putting the words in alphabetical order, synonyms/antonyms, definitions, sentences, singular/plural, parts of speech, using words in prepositional phrases/similes/sentences with conjunctions, syllables, prefixes/suffixes/word origins/word families.

IN DEPTH: CAR-ORIENTED CITIES

PROS:

Cars are very convenient because drivers can go *anywhere* they want, *anytime* they feel like it. They can also travel long distances and carry heavy items. Although the vast majority of cars still use gasoline, we are starting to see eco-friendly innovations such as electric cars, hybrid cars (electric and gas), biofuels (from plants), wind power, solar power and tidal power.

CONS:

Lack of mobility for those who do not drive
Car-oriented cities are spread out over large areas. In fact, distances are usually too far to walk or bike, and it is not possible for public transit to cover such large areas effectively. This makes life difficult for the many people who do not drive cars. The elderly, physically disabled, children, and low-income residents are all at a disadvantage in car-oriented cities.

Health and Safety
Lack of exercise: Obesity is at its highest level ever. Driving robs us of opportunities to incorporate exercise into our daily routines by walking or biking to our destinations.
Car accidents: Car accidents result in incredibly high numbers of deaths and injuries.

Congestion
Traffic jams waste time and fray nerves.

Infrastructure Costs
It is very expensive to build and maintain roads, freeways, bridges, parking structures, and tunnels.

Land Consumption
Consuming land for roads, freeways, and parking lots destroys natural habitats, countryside, and farms.

Air Pollution/Fossil Fuels/Global Warming/Oil Spills
You already know that the vast majority of cars use *fossil fuels*, which create pollution and contribute to global warming. Did you also know that pavement (of roads and parking lots) also raises temperatures in urban areas? In addition, pavement prevents the ground from absorbing precipitation. And to top it all off there have been devastating oil spills in our oceans (including the 1989 Exxon Valdez spill in Alaska and the 2010 British Petroleum leak along the Gulf Coast of the United States.

*Concept of transportation advantages/disadvantages is from the National Building Museum's *City by Design* curriculum

Chapter 6

PUTTING IT ALL TOGETHER

1. BUILD A MODEL!

First, paint the edges, districts, public spaces, and transportation network. Then you can build your landmarks and the buildings you will need to fill in each district (schools, houses, stores...). The next few pages explain different ways to build models.

Option A: BOX CITY: A MODEL MADE FROM RECYCLABLES

This method is great if you have a lot of space or want to build a model city as a group project. Use recyclables such as cereal boxes and paper towel tubes to construct a model of your city. Many food boxes have a wax coating that cannot be painted (the paint peels), so it is best to cover the surfaces with colored construction paper facades.

Church models by Alejandra

Option B: **MAKE YOUR OWN SOLID SHAPES!**

Another option is to make your own solid shapes from cardstock. You can easily make your own rectangular solids, cubes, cones, pyramids, and cylinders.

Red Tower by Mario
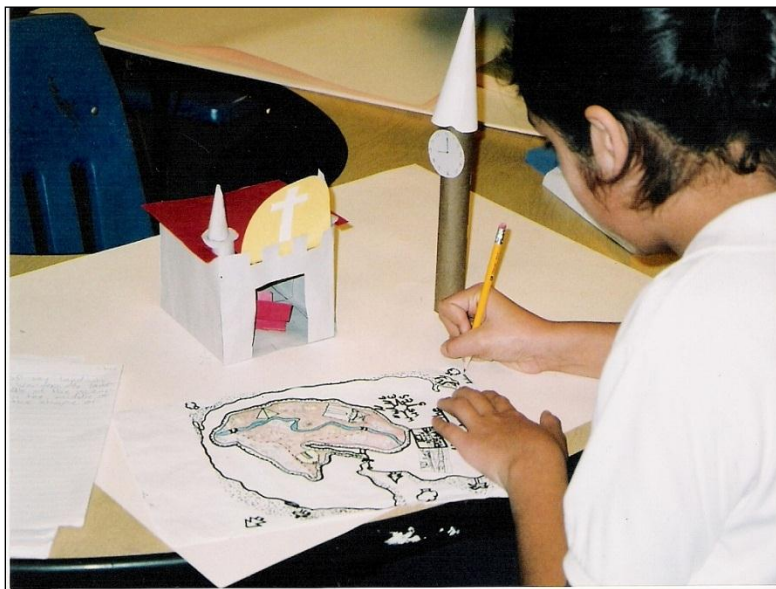
By Silvia
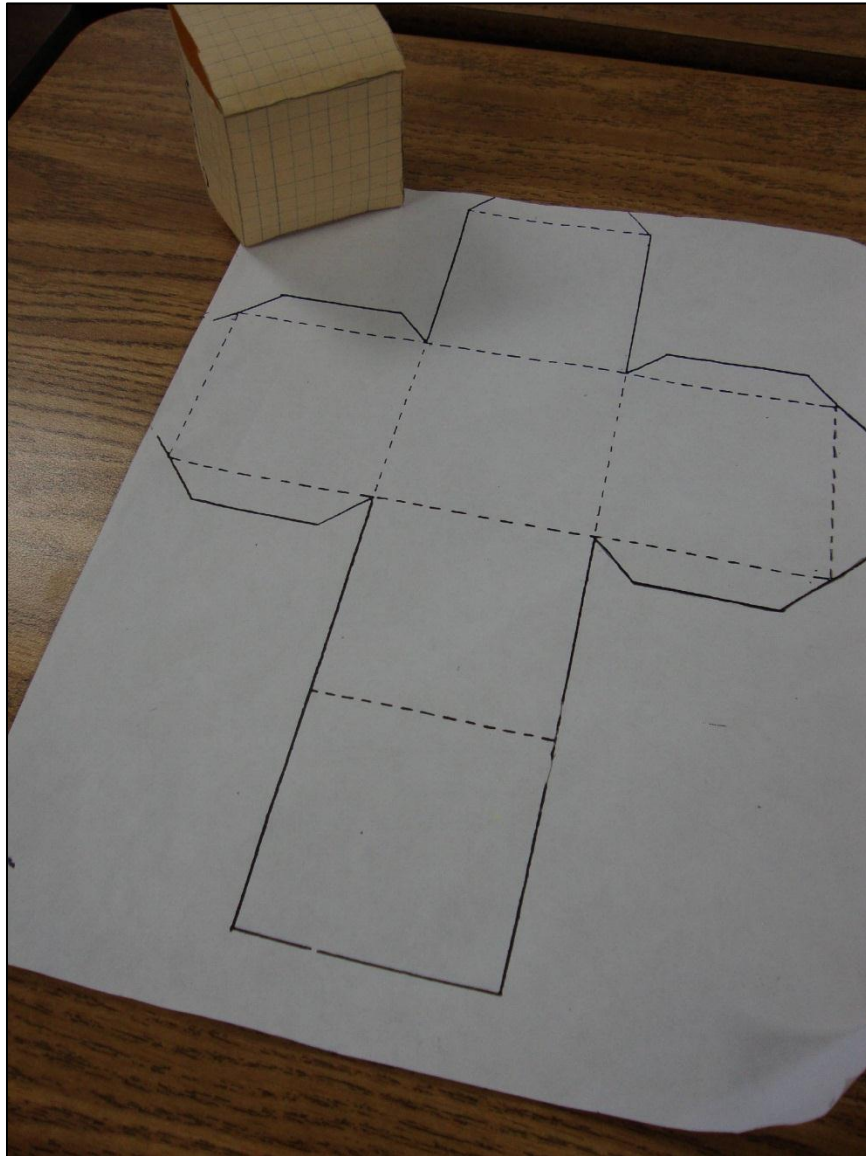
Pattern to make a cube: When you fold the lines this pattern forms a cube. You can find patterns ("nets") in the geometry section of your math book or on the Internet to make other solid shapes such as rectangular prisms, pyramids, cylinders, and cones.

Option C: **POP-UP CITY: A MODEL MADE OF PAPER**

This method is great for small models and is easy to do on your own without any help. All you need is a piece of cardboard for a base and card stock for your buildings.

1. Draw or paint your edges, districts, public spaces, and transportation network on the cardboard base.

2. Draw your landmarks and other buildings on the card stock. Be sure to leave a tab at the bottom to fold and glue to the cardboard base.

Pop up model by Mario

2. WRITE ABOUT IT!

TOURIST BROCHURE

Fold a piece of paper into three sections. Try to convince tourists to come to your city. Describe its attributes in words, illustrations, and maps.

LETTER TO COMMUNITY LEADERS

Write a letter to local leaders (such as the mayor, city council members, and planning commissioners) describing your ideas for green cities that are kid-friendly. Enclose a copy of the city plan you developed.

INFORMATIVE REPORT

You already have most of the report finished if you did the language arts extensions for edges, districts, public spaces, landmarks, and transportation.

Add an introductory paragraph that gives an overview of the project (our sprawling cities are causing problems that you attempted to solve by designing a green, kid-friendly city).

Add a concluding paragraph that convinces the reader that your ideas are worthwhile (sum up important ideas using strong adjectives).

3. PLAN AN EXHIBITION!

Hold a community event. Invite other classes, your parents, and local leaders to see your model and hear you present your report!
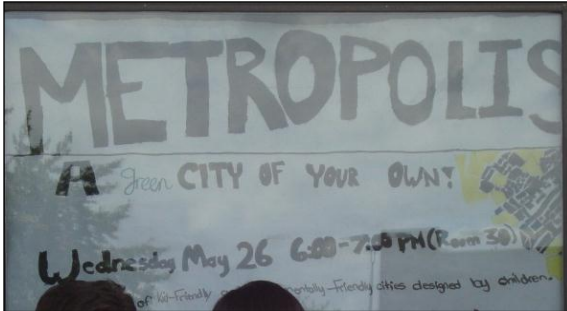
Chapter 7

APPLYING WHAT YOU KNOW

YOU CAN HAVE A POSITIVE IMPACT ON YOUR COMMUNITY BY MAKING IT MORE KID-FRIENDLY AND GREEN!

1. IDENTIFY COMMUNITY PROBLEMS:

-Walk around your neighborhood and make a list of places that are not kid-friendly or green. Write a neighborhood report to present to your class that identifies these places and explains why they are problematic. Take pictures of these places to show your class.

-Develop a survey to give to your classmates, neighbors, and family about their favorite and least favorite places in the neighborhood. Tally your results and display your findings in a graph.

2. PROPOSE SOLUTIONS:

Choose one of the problem places you have identified and propose a solution. Create a model, map, video, song, collage, play, or report that communicates your recommendations. Present your ideas to other students, parents, community members, and school staff. Write a letter to convince a local decision maker that your ideas and recommendations for change are crucial to improve the quality of life. Use a confident tone and powerful vocabulary to convince them that your recommendations are valid. Enclose a proposal map and an invitation to your community presentation.

APPENDICES

Appendix 1

TEACHER'S GUIDE

Overview

Metropolis challenges students to address current global problems as they design an ideal city. It provides glimpses of great cities around the world, sustainability and urban design principles.

Lessons

After the introductory lesson, there is a five-lesson sequence where students design an ideal city that is *kid friendly* and *environmentally friendly*. The lessons are hands-on and designed primarily for grades 4-6 (though they can easily be adapted for other grade levels). The only materials required are paper, pencil, and creativity. Additional sections include "Putting it All Together" (creating an exhibition) and "Applying What You Know" (proposing solutions to real neighborhood problems).

Standards

Appropriate for all grade levels, *Metropolis* is interdisciplinary, addressing education standards in mathematics, language arts, fine arts, science, and social studies.

- **Language Arts**

-Writing: Students will describe the rationale for the design of their cities.
-Speaking & Listening: Students will present their plan to the class.
-Reading: Students will read handouts.
-Vocabulary Development: Each lesson includes a section titled "Word Work."

- **Mathematics**

-Scale/Fractions/Ratios
-Geometry/Shapes/Area/Perimeter
-Measurement
-Graphing

- **Social Studies**

-Maps
-Democracy/Government/Taxation
-Public vs. Private
-Heritage/Culture/History
-World Cities
-Adaptation to Natural Resources/Environment/Topography
-Communities
-City of the Future as a State or U.S. History Extension

- **Science**

-Ecosystems
-Pollution/Global Warming

- **Visual Arts**

-Color
-Symbolism
-Model-building
-Design Professions

- **Physical Education/Health**

Links between obesity, walking, and exercise

TEACHER'S GUIDE: INTRODUCTION

Theme
What is urban planning? Urban planners work to make cities safer, healthier, and more enjoyable. A current global challenge for urban planners is how to reverse the damage being caused by sprawling, automobile-oriented cities.

Activities
1. Read about urban planners.
2. Students draw their favorite and least favorite urban spaces.
3. Students draw a proposal to make their least favorite space better.
4. Read about the negative effects of sprawling cities.

Time Frame:
One hour

Materials:
-Photocopy of chapter
-Pencil
-Crayons or colored pencils

Teacher Prep
-Photocopy a class set of the introductory chapter as a handout
-Optional: Set up a display of photographs and books about the causes and effects of global warming (they can be your own photos, cut out from magazines, or printed from the Internet). *Google Images* is a good resource. A good book is Al Gore's *An Inconvenient Truth*.

TEACHER'S GUIDE: CHAPTER 1 (EDGES)

Theme
Cities do not have to sprawl. In fact, compact cities are better for the environment and better for people who do not drive cars (such as kids).

Activities
1. Class will read and discuss a handout about city edges.
2. Each student will design edges for his or her ideal city.

Timeframe
One hour

Materials
-*Edges* Handout for each student. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2
-Blank paper for students to design their edges. The paper should be a standard size that can be photocopied such as (8 ½" x 11") or (8 ½" x 14") or (11" x 17")
-Black fine-tipped markers to trace over finished design
-A folder for each student to keep his or her work in

***FOR ENGLISH LANGUAGE LEARNERS there is a fill-in-the-blank paragraph model in Appendix 3 (for the writing assignment given on the "*Language Arts Extensions*" page). The paragraph model is also appropriate for students who have difficulty writing the paragraph.

Teacher Prep
BEFORE LESSON:
-Photocopy a class set of the handout. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2.
-Optional: Set up a display of photographs of city edges (they can be your own photos, cut out from magazines, or printed from the Internet). *Google Images* is a good Internet resource for images. Travel magazines and travel guides are excellent sources for pictures and maps (especially *National Geographic, Knopff Travel Guides*, and *DK Eyewitness Travel Guides*).

AFTER LESSON:
Make three photocopies of each student's design (for future lessons and assignments). The photocopies work best if the students trace over all lines and lettering with a black fine-tipped marker. It is also a good idea to leave a one-inch margin on all sides so that no parts of the design are cut off by the photocopier. Have each student keep his/her own photocopies in a folder for the remaining lessons.
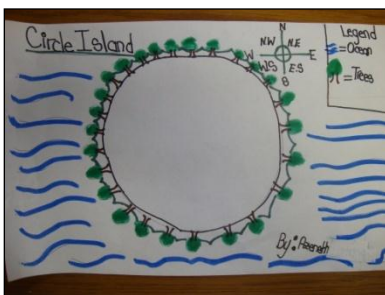
Extensions
Social Studies: Parts of a Map.
Language Arts: Writing assignment and vocabulary list.

These activities can be easily adapted to your grade level, state standards, and classroom needs.

Examples of Student Work
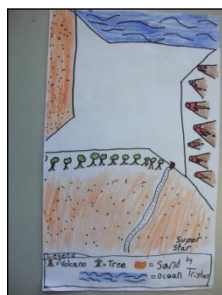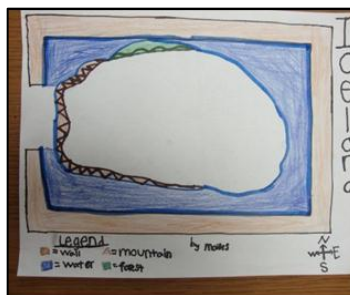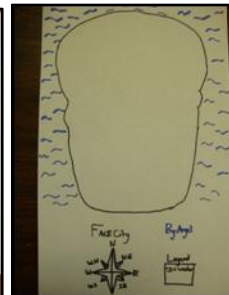
| by Azeneth | by Tristan | by Moises | by Angel |

TEACHER'S GUIDE: CHAPTER 2 (DISTRICTS)

Theme
Districts (neighborhoods) are small parts of the city with unique attributes. They provide opportunities to incorporate cultural identity and local heritage into daily life. Mixed use districts (housing, commerce, and recreation in close proximity) are environmentally friendly and kid friendly because they enable residents to conveniently meet their daily needs without a car.

Activities
1. Class will read and discuss a handout about districts.
2. Each student will envision three to five distinct districts for his/her ideal city. Tasks include marking boundaries, naming the districts, and coloring each district a different color. Subsequent assignments involve designing public spaces and landmarks for each district. More than five districts could make these future assignments overwhelming.

Time Frame
One hour

Materials
-Photocopy of "Districts" handout. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2
-Each child needs one of the photocopies of his/her plan for "edges" from Chapter 1
-Fine-tipped markers
-Colored Pencils

***FOR ENGLISH LANGUAGE LEARNERS there is a fill-in-the-blank paragraph model in Appendix 3 (for the writing assignment given on the "*Language Arts Extensions*" page). The paragraph model is also appropriate for students who have difficulty writing the paragraph.

Teacher Prep
-Photocopy a class set of the handout. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2.
-Optional: Set up a display of photographs of urban districts/neighborhoods (they can be your own photos, cut out from magazines, or printed from the Internet). *Google Images* is a good Internet resource for images.   Travel magazines and travel guides are excellent sources for pictures and maps (especially *National Geographic, Knopff Travel Guides*, and *DK Eyewitness Travel Guides*).

Extensions
Language Arts: Writing assignment and vocabulary list.

These activities can be easily adapted to your grade level, state standards and classroom needs.

Examples of Student Work

| by Moises | by Tristan | by Rebecca |

TEACHER'S GUIDE: CHAPTER 3 (PUBLIC SPACES)

Theme
City and neighborhood centers that are easy to get to discourage sprawl. Public spaces are outdoor spaces for everyday life—plazas, squares, parks, etc. They provide an opportunities for everyday activities (such as relaxing/eating/playing), as well as opportunities for community events such as celebrations and speeches. They are an expression of democracy and diversity because everyone is welcome, and no money needs to be spent to enjoy them.

Activities
1. Class will read and discuss a handout about public spaces.
2. Each student will design a public space for each district in his/her ideal city on a plain white sheet of paper or on graph paper.

***This does not have to be done to scale; though it certainly can be if you wish to teach your students about scale! If you have limited time, just have the students design one public space instead of one for each district.

3. On a photocopy made of their edges assignment: Students will copy the boundaries of their districts from the district plan they made in Chapter 2 (without coloring in the districts). Then they will add the public spaces they have designed for each district. Usually the public spaces will be in the center of the districts, UNLESS there is a special reason for locating them elsewhere (such as near a shoreline).

Time Frame
Two one-hour sessions:
- First hour: Read handout, discuss ideas, and begin sketching plans (bird's eye view/"floorplan") of public spaces.
- Second hour: Finish up bird's eye views and sketch the public spaces in their correct locations on city plan.

   ***If you are having your students work to scale you will need additional time to teach them about scale.

Materials
-Photocopy of handout. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2
-Each student needs a photocopy of his or her "edges" plan from Chapter.
-Fine-tipped markers
-Colored pencils
-Graph paper
-Rulers

***FOR ENGLISH LANGUAGE LEARNERS there is a fill-in-the-blank paragraph model in Appendix 3 (for the writing assignment given on the "*Language Arts Extensions*" page). The paragraph model is also appropriate for students who have difficulty writing the paragraph.

Teacher Prep
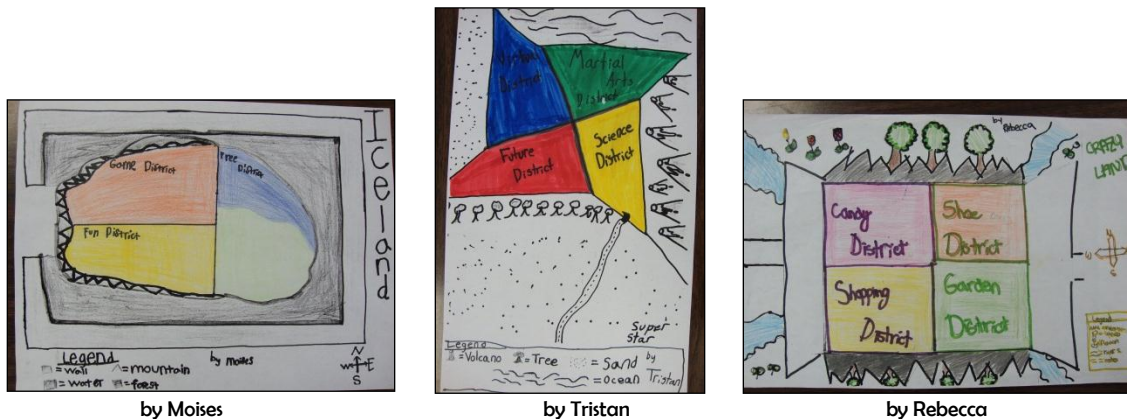
-Photocopy a class set of the handout. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2.

-Optional: Set up a display of photographs of public spaces and PLANS OF PUBLIC SPACES (they can be your own photos and plans, cut out from magazines, or printed from the Internet). *Google Images* is a good Internet resource for images.   Travel magazines and travel guides are excellent sources for pictures, plans and maps (especially *National Geographic*, *Knopff Travel Guides*, and *DK Eyewitness Travel Guides*).

Extensions

<u>Language Arts:</u> Writing assignment and vocabulary list.

These activities can be easily adapted to your grade level, state standards, and classroom needs.

Examples of Student Work

BIRD'S EYE VIEW OF PUBLIC SPACES:
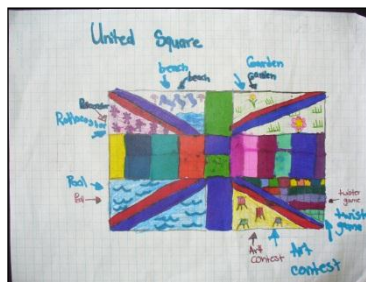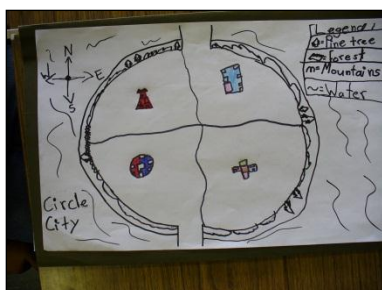

by Fausto

by Lesly

by Mario

by Sofia

by Rebecca

ADDING PUBLIC SPACES TO THE CITY PLAN:

by Jacqueline

by Sofia

by Salma

TEACHER'S GUIDE: CHAPTER 4 (LANDMARKS)

Theme

Like public spaces, landmarks are excellent anchors for city centers because they are focal points that draw our attention. Although landmarks can be any size (from a small statue to a soaring tower) they should be in conspicuous locations (on top of a hill, in or adjacent to a public space, or at the end of a street...).   Each landmark is unique and provides an opportunity to express a locality's distinctive heritage.

Activities

This lesson introduces students to landmarks throughout the world.

1. Class will read and discuss a hand-out about landmarks.

2. Each student will design a landmark for each district in his/her ideal city (creating an "elevation plan"/straight-on view of each landmark). The landmarks should be in or adjacent to the public spaces, UNLESS there is a special reason for locating them elsewhere. For example, someone may wish to have a special landmark on top of a hill overlooking the city instead of in a plaza down below.

***This does not have to be done to scale, though it certainly can be if you wish to teach your students about scale!

3. Students will draw the landmarks on their city plans.

Time Frame

Two one-hour sessions

-First hour: Read handout and begin designing straight-on views of landmarks (elevation plans).

-Second hour: Finish elevation plans and put landmarks on city plan.

***You will need two additional sessions if you do the math extension activity of building models.

Materials

-Photocopy of handout. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2.

-Fine-tipped markers

-Colored Pencils

-Graph Paper

-Ruler

-Scissors, glue, and construction paper (if you plan on doing the math extension activity of building a model of the landmarks)

-Recyclables (such as cereal boxes and toilet paper tubes) for an alternative model-making activity if the math extension is too advanced for your grade level

***FOR ENGLISH LANGUAGE LEARNERS there is a fill-in-the-blank paragraph model in Appendix 3 (for the writing assignment given on the "*Language Arts Extensions*" page). The paragraph model is also appropriate for students who have difficulty writing the paragraph.

Teacher Prep
-Photocopy a class set of the handout. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2.
-Optional: Set up a display of photographs of urban districts/neighborhoods (they can be your own photos, cut out from magazines, or printed from the Internet). *Google Images* is a good Internet resource for images.   Travel magazines and travel guides are excellent sources for pictures and maps (especially *National Geographic, Knopff Travel Guides,* and *DK Eyewitness Travel Guides*).

Extensions
Art: Make a "Landmark Collage."
Math (Geometry & Measurement): Students design and build a scale model of a landmark that reflects the heritage of their city.
Language Arts: Writing assignment and vocabulary list.

These activities can be easily adapted to your grade level, state standards, and classroom needs.

Examples of Student Work
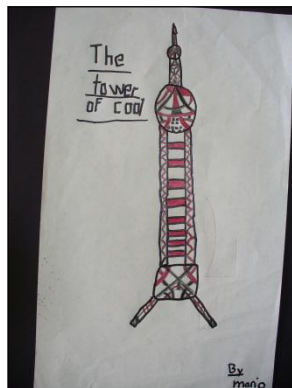
by Mario
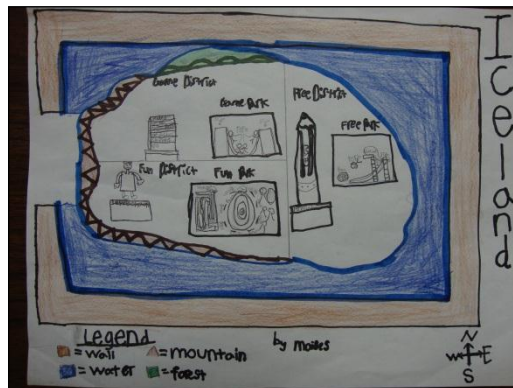
by Moises

TEACHER'S GUIDE: CHAPTER 5 (TRANSPORTATION)

Theme
The purpose of a transportation system is to connect different parts of cities.   Car dependence has resulted in environmental problems and limited mobility for those who cannot drive (such as kids).

Activities
1. Read a hand-out about transportation.
2. Connect districts, public spaces, and landmarks with a transportation system.

Time Frame
One hour

Materials
-Photocopy of handout. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2
-Fine-tipped markers
-Colored Pencils

***FOR ENGLISH LANGUAGE LEARNERS there is a fill-in-the-blank paragraph model in Appendix 3 (for the writing assignment given on the "*Language Arts Extensions*" page). The paragraph model is also appropriate for students who have difficulty writing the paragraph.

Teacher Prep
-Photocopy a class set of the handout. You can photocopy the entire chapter if you have time and want to go into detail. Or you can use the abbreviated version in Appendix 2.
-Optional: Set up a display of photographs of urban transportation systems (they can be your own photos, cut out from magazines, or printed from the Internet). *Google Images* is a good Internet resource for images.   Travel magazines and travel guides are excellent sources for pictures and maps (especially *National Geographic, Knopff Travel Guides*, and *DK Eyewitness Travel Guides*).

Extensions
Language Arts: Writing assignment and vocabulary list.

These activities can be easily adapted to your grade level, state standards, and classroom needs.

Examples of Student Work

by Mario   by SirGershom   by Salma

by Janneth

TEACHER'S GUIDE: CHAPTER 6 (PUTTING IT ALL TOGETHER)

The brief reading in this chapter explains how to prepare for an exhibition:

1. Decide if you want each student to make a small individual model of his or her city or if you want the whole class to work together to build a large model of just one city. Large models can be built on butcher paper on the floor or on a table. Chapter 6 outlines several model-building techniques.

2. There are several ideas for written descriptions of student projects that can be displayed next to the model(s).

3. Set a place, date, and time for a presentation. Invite students from other classes, school staff, families, community members, and local leaders to hear students describe the methodology and rationales of developing their cities.

TEACHER'S GUIDE: CHAPTER 7 (APPLYING WHAT YOU KNOW)

The lessons learned throughout this unit can be applied to existing cities and neighborhoods to make them better! City planners rarely plan entirely new cities. The bulk of planning work consists of improving existing cities and managing growth.

The brief reading in this chapter explains ways students can identify community problems and propose solutions using the background knowledge they have acquired.

Appendix 2

HANDOUTS

Lesson 1: EDGES

Boundaries, city limits, perimeter

General Information:

City edges keep cities from sprawling. Compact cities are *kid-friendly* and *environmentally friendly* because they are easier for pedestrians and bike riders to navigate. People who do drive cars won't have to drive long distances to work, play, and shop.

Edges can include:

- Bodies of water (such as an ocean, river, or lake)
- Landforms (such as mountains and hills)
- Man-made structures (such as buildings and walls)

Discussion Questions:

What kinds of edges does your city have? Do you know about the edges of another city?

Assignment:
DESIGN THE EDGES OF A NEW CITY!

1. DECIDE WHERE YOUR CITY WILL BE LOCATED.
On an island, peninsula, or hilltop? In a valley or canyon? Near a river, lake, or ocean? Or somewhere else?

2. DECIDE IF YOUR CITY WILL HAVE *NATURAL EDGES* (such as a river or hills), *MAN-MADE EDGES* (such as a greenbelt or walls), OR A COMBINATION OF BOTH.

3. MAKE A MAP OF YOUR CITY'S EDGES *LIGHTLY IN PENCIL* (so that you can easily erase any parts you decide to change). You can show details of what is around your city, but you should leave the inside blank for future urban design projects. Leave a one-inch margin on all sides of the paper so that the design is not cut off when it is photocopied. Include map symbols, a legend (map key), compass rose, and map title. The map title should be the name of your city.

4. *WHEN YOU ARE SATISFIED WITH YOUR DESIGN*, GO OVER YOUR LINES AND WORDS IN BLACK MARKER (so that you can make three photocopies of your map for future urban design challenges). Although you must leave the inside blank, you can color the details outside the edges of your city (using markers or colored pencils).

5. WRITE A PARAGRAPH ABOUT YOUR CITY'S EDGES.
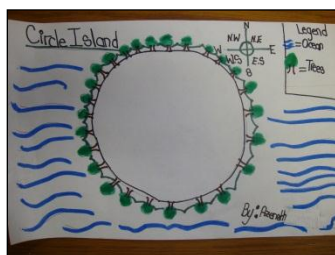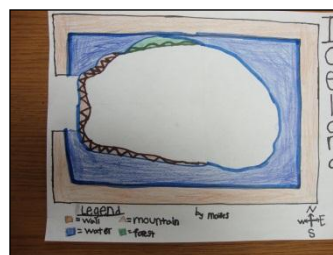
| by Azeneth | by Tristan | by Moises | Caja Granada Museum Exhibit (Spain) |

EDGES

Shanghai, China

Amsterdam, Netherlands

Vancouver, British Columbia (Canada)

Istanbul, Turkey
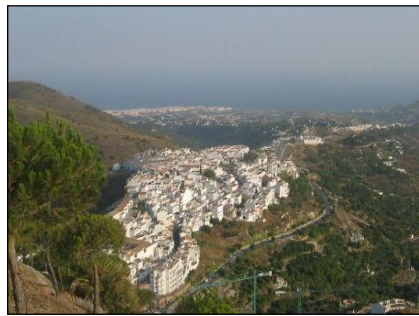
Frigiliana, Spain

Anatolia, Turkey

Ronda, Spain

South San Francisco, California (USA)

Map of New Orleans, Louisiana (USA) on display at Cabildo Museum

Exhibit at *Miniaturk* in Istanbul, Turkey
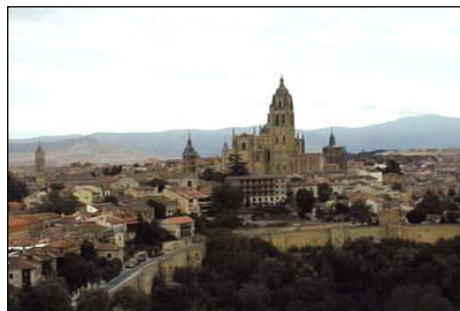
Segovia, Spain

Santa Barbara, California (USA)

Lesson 2: **DISTRICTS**

Neighborhoods, zones, special areas

General Information:
Districts are small parts of a city that have special identities. Some examples of districts include:
- Ethnic districts (such as Italian, Japanese, or Mexican)
- Residential neighborhoods (such as a main street for shopping surrounded by apartments and/or houses)
- Special uses (such as downtown, beach-oriented area, a museum district, antique shopping zon, or university area)
- Special style (such as a neighborhood with a certain style of architecture)

Discussion Questions:
What are some districts in your city? Do you know about any districts in another city?

Assignment:
DESIGN DISTRICTS FOR YOUR CITY!

1. Divide your city into districts. You must have at least three districts in your city—and probably no more than five (otherwise the future assignments will be very time-consuming).   Think of a name for each district and be able to explain each district's special identity.

*In order to be **kid-friendly** and **environmentally friendly** each district should have mixed uses (places for the activities of day-to-day life such as housing, grocery stores, a doctor's office, a post office, a school, etc., within walking distance).*

However, each district should also have something special that sets it apart from the other districts of the city.

2. Use fine-tipped markers to trace over the boundaries of each district. Use colored pencils to color each district a different color. The best way to color large areas is to imagine that the area is divided into rows. Shade each imaginary row with diagonal strokes.

Do not draw anything in the district at this time. We will do that in later assignments. Just color each one a different color and be ready to explain its special identity.

3. Write a paragraph about your city's districts.
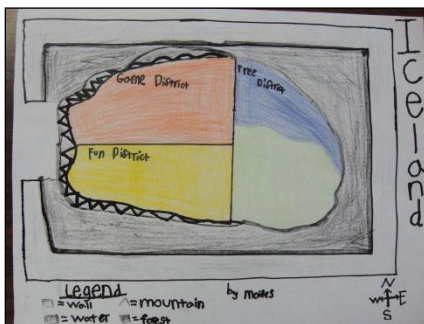
by Moises   by Tristan   by Rebecca

DISTRICTS
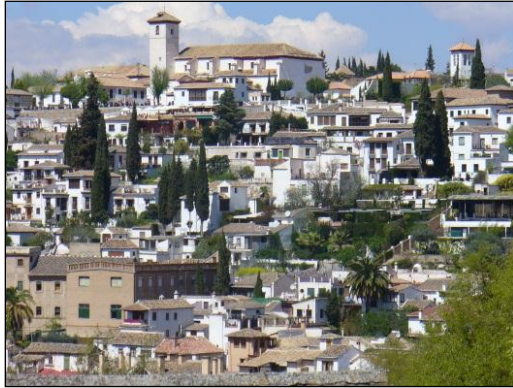
Albaicin Neighborhood in Granada, Spain

Alamo Square Neighborhood in San Francisco, California (USA)

Bayswater District in London, England (UK)

Shopping district in San Francisco, California (USA)

Chinatowns in London, England (UK) and San Francisco, California (USA)

Lesson 3: **PUBLIC SPACES**

Plazas, squares, parks

General Information:

Public spaces are ***outdoor*** places to hang out. Some types of public spaces include plazas, squares, and parks. *Kid-friendly* and *environmentally friendly* public spaces should be centrally located in each district so that they can be easily reached without a car. Good locations for public spaces are along busy streets or at the intersection of busy streets.

Discussion Questions:

What kinds of public spaces does your city have? Do you know about the public spaces of another city?

Assignment:

DESIGN A PUBLIC SPACE FOR EACH DISTRICT IN YOUR CITY!

1. On a photocopy of your edges draw the boundaries of the districts you planned in the last assignment (lightly in pencil).

2. Create a public space in each district. Sketch its location on your city map *lightly in pencil* (so that you can easily erase parts you change your mind about without having to start all over again).

3. Name each public space.

4. When you are satisfied with your sketch, use fine-tipped markers and/or colored pencils to finalize your design.

5. Write a paragraph about your city's public spaces.

By Jacqueline   by Sofia   by Salma

EXTRA CHALLENGE: *On a separate sheet of paper draw a "bird's-eye-view" plan of your public space with as many details as possible (what it would look like from above if you were a bird flying overhead). If you can't draw certain details, describe them with words.*

by Fausto   by Mario   by Lesly

SUPER CHALLENGE: *Draw your "bird's-eye views" to scale!*

PUBLIC SPACES

San Francisco, California (USA)

San Francisco, California (USA)
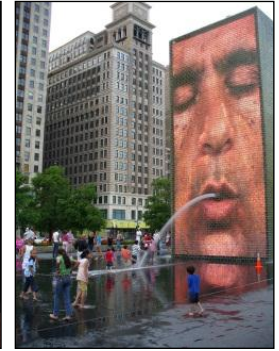
Chicago, Illinois (USA)

Siena, Italy

Chicago, Illinois (USA)
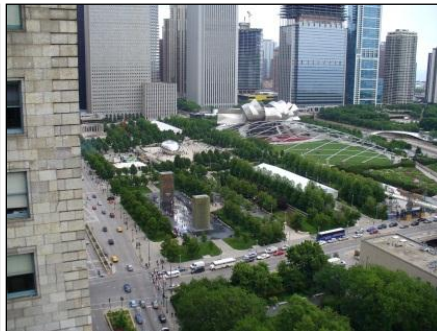
Public spaces in Chicago, Illinois (USA)

Public spaces in San Francisco, California (USA)
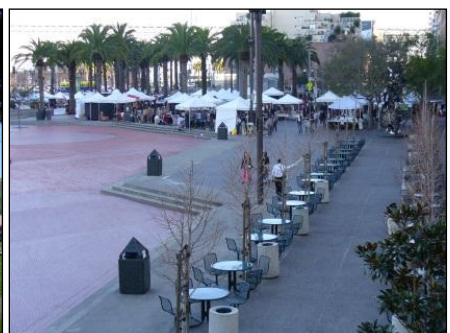
Lesson 4: **LANDMARKS**

Prominent structures, unique sights, conspicuous attractions

General Information:

Landmarks are structures that are easy to recognize. They help people to know where they are. They make cities unique and give cities some personality. They often become symbols of a city. Some examples include the Eiffel Tower in Paris, Big Ben in London, and the Hollywood Sign in Los Angeles. Landmarks can be buildings, statues, fountains, signs, bridges, or any other type of structure.

Discussion Questions:

What kinds of landmarks does your city have? Do you know about the landmarks of another city?

Assignment:
DESIGN LANDMARKS FOR YOUR CITY!

Create a landmark for each public space in your city:

1. On either graph paper or a blank sheet of paper, sketch an "elevation plan"*** of the front of one of your landmarks with as many details as possible. If you can't draw certain details, describe them with words. Draw *lightly in pencil* (so that you can easily erase parts you change your mind about without having to start all over again).

*** An "elevation plan" is what it looks like from directly in front at street level.

2. Sketch the location of your landmark on your city plan *lightly in pencil* (so that you can easily erase parts you change your mind about without having to start all over again).

3. Give the landmark a name.

4. When you are satisfied with your sketch, use fine-tipped markers and/or colored pencils to finish your design.

5. Write a paragraph about your city's landmarks.

***Teacher's Notes: *Amazing Buildings* by Kate Hayden (DK Readers) and *Draw 50 Buildings and Other Structures* by Lee J. Ames (Broadway Books) are great resources for ideas and drawing tips.

EXTRA CHALLENGE
Draw the elevation plan of your landmark *to scale.*

by Mario
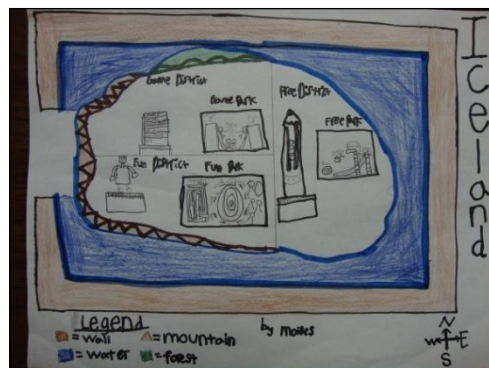
by Moises

by Silvia

LANDMARKS

Torre del Mangia Siena, Italy

Civic Center San Francisco, California (USA)
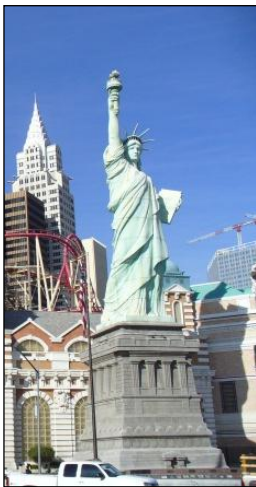
Replicas of the *Statue of Liberty* and *Eiffel Tower* in Las Vegas, Nevada (USA)

Golden Gate Bridge San Francisco, California (USA)

Millennium Park (Chicago, Illinois)

Oriental Pearl Tower (Shanghai, China)

Neptune Statue (Bologna, Italy)

Lesson 5: **TRANSPORTATION**

Travel routes & ways to get around

General Information:

Some types of transportation include: walking, car, bus, subway, train, boat, and bicycle. Each mode of transportation requires its own path or route (such as sidewalks, bicycle paths, canals, streets, and subway tunnels). Cars are neither kid-friendly nor environmentally friendly.

Discussion Questions:

What kinds of transportation does your city have? Is your city's transportation kid-friendly? Environmentally friendly?

Do you know about the transportation systems in other cities?

Assignment:

DESIGN A TRANSPORTATION SYSTEM FOR YOUR CITY!

1. LIGHTLY IN PENCIL: Plan a transportation system for your city. It should connect all of your districts, public spaces, and landmarks together. It should also be kid-friendly and environmentally friendly. If you use any special symbols, colors, or lines, be sure to explain them in your map key.

AFTER YOU ARE SATISFIED WITH YOUR DESIGN, you can go over your lines in ink/color.

2. Write a paragraph about your city's transportation system.

---

by SirGershom

by Salma

by Janneth

by Mario

TRANSPORTATION
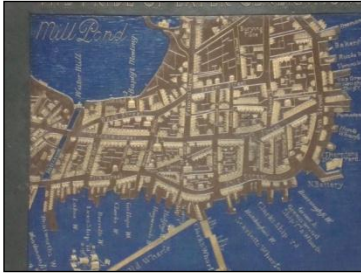
Map posted on a street in Boston, Massachusetts (USA)

Drawing by John Martoni

Exhibit at London Transport Museum (UK)

Map on display in Beirut, Lebanon

Pedestrian zone in Dublin, Ireland

Exhibit at Caja Granada Museum (Granada, Spain)

Exhibits at Museum of Madrid (Spain)

Separate lanes for cars, pedestrians, and bicycles in Vancouver, British Columbia (Canada), New York City (USA), and Shanghai, China

Cable cars, ferries, and commuter trains in San Francisco, California (USA)

Appendix 3

MODELS FOR PARAGRAPH WRITING

***These are especially useful for English language learners or students with difficulties writing a paragraph independently.

EDGES

An edge is _____.

(Write the definition of the word "edge")

The edges of my city consist of_____.

(List and describe the edges of your city here)

Edges are important because _____.

(Explain how edges make cities kid-friendly & green)

DISTRICTS

Districts are _____.

(Write the definition of "district" here)

My city has _____**districts.**

(Write how many districts are in your city here)

They are _____, _____, **and** _____.

(List the names of your city's districts in these spaces)

Each district has mixed uses such as _____, _____, **and** _____.

(List different uses that you would find in each district here)

Having mixed uses helps kids and the environment because _____

_____.

(Explain how mixed uses can reduce trips by car)

PUBLIC SPACES

A public space is _____.
                                          (Define public space here)

The public spaces in _____ **include**_____.
                          (Name of your city)   (List the public spaces you designed here)

_____.
(Describe how each space is attractive, exciting, unusual, unique, interesting and/or fun in as many
sentences as you need)

These public spaces are _____ **because**
                                          (Kid-friendly or green)

_____.
(Explain how your public spaces are kid-friendly or green)

LANDMARKS

A landmark is _____. **The landmarks in**
                          (Define "landmark" here)

_____ **include** _____.
(Name of your city)   (List the landmarks you designed here)

_____.
(Describe how each landmark is attractive, exciting, unusual, unique, interesting and/or fun in as
many sentences as you need)

These landmarks are _____ **because**
                                          (Kid-friendly or green)

_____.
(Explain how your landmarks are kid-friendly or green)

Transportation

Transportation means_____.

(Define transportation here)

The transportation system in_____

(Name of your city)

includes _____.

(List the modes of transportation here)

These modes of transportation are _____because

(Kid-friendly or green)

_____.

(Explain how your modes of transportation are kid-friendly or green)

Appendix 4

3RD GRADE STANDARDS
COVERED IN *METROPOLIS*

SUBJECT AREAS

Metropolis was designed as a standards-based, interdisciplinary unit of study for grades 3–6 (though it could be adapted for any grade level).

Standards in all states and at all grade levels are generally organized to cover the same subject areas and domains. *Metropolis* covers standards in the following subject areas and domains:

Language Arts:
Vocabulary, Reading Comprehension, Writing, Language Conventions (grammar), and Speaking and Listening

Mathematics:
Measurement and Geometry

Visual and Performing Arts:
Artistic Perception, Connections, Relationships, and Applications

Social Studies:
Social Science Foundational Skills (maps skills, geographical features, etc. . . .)

Health Education:
Personal and Community Health

On the following pages is an example of how *Metropolis* has been used to meet California's third grade standards in language arts, mathematics, visual and performing arts, social studies, and health education. You can easily look up specific standards for your grade level and state on the Internet.

CALIFORNIA 3RD GRADE CONTENT STANDARDS COVERED IN *METROPOLIS*

ENGLISH LANGUAGE ARTS

I. READING

1.0 Word Analysis, Fluency, and Systematic Vocabulary Development

Students understand the basic features of reading. They select letter patterns and know how to translate them into spoken language by using phonics, syllabication, and word parts. They apply this knowledge to achieve fluent oral and silent reading.

Decoding and Word Recognition
1.1 Know and use complex word families when reading [e.g., *-ight]* to decode unfamiliar words.
1.2 Decode regular multisyllabic words.
1.3 Read aloud narrative and expository text fluently and accurately and with appropriate pacing, intonation, and expression.

Vocabulary and Concept Development
1.4 Use knowledge of antonyms, synonyms, homophones, and homographs to determine the meanings of words.
1.5 Demonstrate knowledge of levels of specificity among grade-appropriate words and explain the importance of these relations [e.g., *dog/ mammal/ animal/ living things*].
1.6 Use sentence and word context to find the meaning of unknown words.
1.7 Use a dictionary to learn the meaning and other features of unknown words.
1.8 Use knowledge of prefixes [e.g., *un-, re-, pre-, bi-, mis-, dis-*] and suffixes [e.g., *-er, -est, -ful*] to determine the meaning of words.

2.0 Reading Comprehension

Students read and understand grade-level-appropriate material. They draw upon a variety of comprehension strategies as needed (e.g., generating and responding to essential questions, making predictions, comparing information from several sources). The selections in *Recommended Literature, Kindergarten through Grade Twelve* illustrate the quality and complexity of the materials to be read by students. In addition to their regular school reading, by grade four, students read one-half million words annually, including a good representation of grade-level-appropriate narrative and expository text (e.g., classic and contemporary literature, magazines, newspapers, online information). In grade three, students make substantial progress toward this goal.

Structural Features of Informational Materials
2.1 Use titles, tables of contents, chapter headings, glossaries, and indexes to locate information in text.

Comprehension and Analysis of Grade-Level-Appropriate Text
2.2 Ask questions and support answers by connecting prior knowledge with literal information found in, and inferred from, the text.
2.3 Demonstrate comprehension by identifying answers in the text.
2.4 Recall major points in the text and make and modify predictions about forthcoming information.
2.5 Distinguish the main idea and supporting details in expository text.

2.6 Extract appropriate and significant information from the text, including problems and solutions.

2.7 Follow simple, multiple-step written instructions (e.g., how to assemble a product or play a board game).

II. WRITING

1.0 Writing Strategies

Students write clear and coherent sentences and paragraphs that develop a central idea. Their writing shows they consider the audience and purpose. Students progress through the stages of the writing process (e.g., prewriting, drafting, revising, editing successive versions).

Organization and Focus
1.1 Create a single paragraph:

    a.   Develop a topic sentence.

    b.   Include simple supporting facts and details.

Penmanship
1.2 Write legibly in cursive or joined italic, allowing margins and correct spacing between letters in a word and words in a sentence.

Research
1.3 Understand the structure and organization of various reference materials (e.g., dictionary, thesaurus, atlas, encyclopedia).

Evaluation and Revision
1.4 Revise drafts to improve the coherence and logical progression of ideas by using an established rubric.

2.0 Writing Applications (Genres and Their Characteristics)

Students write compositions that describe and explain familiar objects, events, and experiences. Student writing demonstrates a command of standard American English and the drafting, research, and organizational strategies outlined in Writing Standard 1.0.

Using the writing strategies of grade three outlined in Writing Standard 1.0, students:

2.2   Write descriptions that use concrete sensory details to present and support unified impressions of people, places, things, or experiences.

2.3   Write personal and formal letters, thank-you notes, and invitations:

a.   Show awareness of the knowledge and interests of the audience and establish a purpose and context.

b.   Include the date, proper salutation, body, closing, and signature.

1.0 Written and Oral English Language Conventions

Students write and speak with a command of standard English conventions appropriate to this grade level.

Sentence Structure
1.1 Understand and be able to use complete and correct declarative, interrogative, imperative, and exclamatory sentences in writing and speaking.

Grammar
1.2 Identify subjects and verbs that are in agreement and identify and use pronouns, adjectives, compound words, and articles correctly in writing and speaking.
1.4 Identify and use subjects and verbs correctly in speaking and writing simple sentences.

Punctuation
1.5 Punctuate dates, city and state, and titles of books correctly.
1.6 Use commas in dates, locations, and addresses and for items in a series.

Capitalization
1.7 Capitalize geographical names, holidays, historical periods, and special events correctly.

Spelling
1.8 Spell correctly one-syllable words that have blends, contractions, compounds, orthographic patterns (e.g., [*qu*], consonant doubling, changing the ending of a word from [-y] to [-ies] when forming the plural), and common homophones [e.g., *hair-hare*].

1.9 Arrange words in alphabetic order.

III. LISTENING AND SPEAKING

1.0 Listening and Speaking Strategies

Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.

Comprehension
1.1 Retell, paraphrase, and explain what has been said by a speaker.
1.2 Connect and relate prior experiences, insights, and ideas to those of a speaker.
1.3 Respond to questions with appropriate elaboration.

Organization and Delivery of Oral Communication
1.6 Provide a beginning, a middle, and an end, including concrete details that develop a central idea.
1.7 Use clear and specific vocabulary to communicate ideas and establish the tone.
1.8 Clarify and enhance oral presentations through the use of appropriate props (e.g., objects, pictures, charts).

Analysis and Evaluation of Oral and Media Communications
1.10 Compare ideas and points of view expressed in broadcast and print media.
1.11 Distinguish between the speaker's opinions and verifiable facts.

2.0 Speaking Applications (Genres and Their Characteristics) Students deliver brief recitations and oral presentations about familiar experiences or interests that are organized around a coherent thesis statement. Student speaking demonstrates a command of standard American English and the organizational and delivery strategies outlined in Listening and Speaking Standard 1.0.

Using the speaking strategies of grade three outlined in Listening and Speaking Standard 1.0, students:

2.3   Make descriptive presentations that use concrete sensory details to set forth and support unified impressions of people, places, things, or experiences.

CALIFORNIA 3RD GRADE CONTENT STANDARDS COVERED IN *METROPOLIS*

MATHEMATICS

MEASUREMENT AND GEOMETRY

1.0 Students choose and use appropriate units and measurement tools to quantify the properties of objects:

1.1 Choose the appropriate tools and units (metric and U.S.) and estimate and measure the length, liquid volume, and weight/mass of given objects.

1.2 Estimate or determine the area and volume of solid figures by covering them with squares or by counting the number of cubes that would fill them.

1.3 Find the perimeter of a polygon with integer sides.

1.4 Carry out simple unit conversions within a system of measurement (e.g., centimeters and meters, hours and minutes).

2.0 Students describe and compare the attributes of plane and solid geometric figures and use their understanding to show relationships and solve problems:

2.1 Identify, describe, and classify polygons (including pentagons, hexagons, and octagons).

2.2 Identify attributes of triangles (e.g., two equal sides for the isosceles triangle, three equal sides for the equilateral triangle, right angle for the right triangle).

2.3 Identify attributes of quadrilaterals (e.g., parallel sides for the parallelogram, right angles for the rectangle, equal sides and right angles for the square).

2.4 Identify right angles in geometric figures or in appropriate objects and determine whether other angles are greater or less than a right angle.

2.5 Identify, describe, and classify common three-dimensional geometric objects (e.g., cube, rectangular solid, sphere, prism, pyramid, cone, and cylinder).

2.6 Identify common solid objects that are the components needed to make a more complex solid object.

CALIFORNIA 3RD GRADE CONTENT STANDARDS COVERED IN *METROPOLIS*

VISUAL AND PERFORMING ARTS

1.0   ARTISTIC PERCEPTION

Processing, Analyzing, and Responding to Sensory Information through the Language and Skills Unique to the Visual Arts

Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.

Develop Perceptual Skills and Visual Arts Vocabulary

1.1   Perceive and describe rhythm and movement in works of art and *in the environment.*

1.3   Identify and describe how foreground, middle ground, and background are used to create the illusion of space.

Analyze Art Elements and Principles of Design

1.5   Identify and describe elements of art in works of art, emphasizing line, color, shape/ form, texture, space, and value.

2.0   CREATIVE EXPRESSION

Creating, Performing, and Participating in the Visual Arts

Students apply artistic processes and skills, using a variety of media to communicate meaning and intent in original works of art.

Skills, Processes, Materials, and Tools

2.1   Explore ideas for art in a personal sketchbook.

Communication and Expression through Original Works of Art

2.3   Paint or draw a landscape, seascape, or cityscape that shows the illusion of space.

5.0   CONNECTIONS, RELATIONSHIPS, APPLICATIONS

Connecting and Applying What Is Learned in the Visual Arts to Other Art Forms and Subject Areas and to Careers

Students apply what they learn in the visual arts across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They also learn about careers in and related to the visual arts.

SOCIAL STUDIES

HISTORICAL AND SOCIAL SCIENCES ANALYSIS SKILLS (GRADES K–5)

The intellectual skills noted below are to be learned through, and applied to, the content standards for kindergarten through grade five. They are to be assessed *only in conjunction with* the content standards in kindergarten through grade five.

In addition to the standards for kindergarten through grade five, students demonstrate the following intellectual, reasoning, reflection, and research skills:

Chronological and Spatial Thinking

3.   Students explain how the present is connected to the past, identifying both similarities and differences between the two, and how some things change over time and some things stay the same.

4.   Students use map and globe skills to determine the absolute locations of places and interpret information available through a map or globe's legend, scale, and symbolic representations.

5.   Students judge the significance of the relative location of a place (e.g., proximity to a harbor, on trade routes) and analyze how relative advantages or disadvantages can change over time.

SOCIAL SCIENCE STANDARDS SPECIFIC TO 3RD GRADE

3.1 Students describe the physical and human geography and use maps, tables, graphs, photographs, and charts to organize information about people, places, and environments in a spatial context.

1.   Identify geographical features in their local region (e.g., deserts, mountains, valleys, hills, coastal areas, oceans, lakes).
2.   Trace the ways in which people have used the resources of the local region and modified the physical environment (e.g., a dam constructed upstream changed a river or coastline).

HEALTH EDUCATION

PERSONAL AND COMMUNITY HEALTH

Standard 1: Essential Concepts

1.5.P   Describe how a healthy environment is essential to personal and community health.

1.6.P   Discuss how reducing, recycling, and reusing products make for a healthier environment.

Standard 7: Practicing Health-Enhancing Behaviors

7.2.P   Demonstrate ways to reduce, reuse, and recycle at home, at school, and in the community.

Standard 8: Health Promotion

8.2.P   Encourage others to promote a healthy environment.

Appendix 5

4TH GRADE STANDARDS
COVERED IN *METROPOLIS*

SUBJECT AREAS

Metropolis was designed as a standards-based, interdisciplinary unit of study for grades 3-6 (though it could be adapted for any grade level).

Standards in all states and at all grade levels are generally organized to cover the same subject areas and domains. *Metropolis* covers standards in the following subject areas and domains:

Language Arts:
Vocabulary, Reading Comprehension, Writing, Language Conventions (grammar), and Speaking and Listening

Mathematics:
Measurement and Geometry

Visual and Performing Arts:
Artistic Perception, Connections, Relationships, and Applications

Social Studies:
Social Science Foundational Skills (maps skills, geographical features, etc...)

Health Education:
Personal and Community Health

On the following pages is an example of how *Metropolis* has been used to meet California's fourth grade standards in language arts, mathematics, visual and performing arts, social studies and health education. You can easily look up specific standards for your grade level and state on the Internet.

CALIFORNIA 4TH GRADE CONTENT STANDARDS COVERED IN *METROPOLIS*

ENGLISH LANGUAGE ARTS

I. READING

1.0 Word Analysis, Fluency, and Systematic Vocabulary Development

Students understand the basic features of reading. They select letter patterns and know how to translate them into spoken language by using phonics, syllabication, and word parts. They apply this knowledge to achieve fluent oral and silent reading.

Word Recognition
1.1 Read narrative and expository text aloud with grade-appropriate fluency and accuracy and with appropriate pacing, intonation, and expression.

Vocabulary and Concept Development
1.2 Apply knowledge of word origins, derivations, synonyms, antonyms, and idioms to determine the meaning of words and phrases.
1.3 Use knowledge of root words to determine the meaning of unknown words within a passage.
1.4 Know common roots and affixes derived from Greek and Latin and use this knowledge to analyze the meaning of complex words [e.g., *international*].
1.5 Use a thesaurus to determine related words and concepts.
1.6 Distinguish and interpret words with multiple meanings.

2.0 Reading Comprehension

Students read and understand grade-level-appropriate material. They draw upon a variety of comprehension strategies as needed (e.g., generating and responding to essential questions, making predictions, comparing information from several sources). In addition to their regular school reading, students read one-half million words annually, including a good representation of grade-level-appropriate narrative and expository text (e.g., classic and contemporary literature, magazines, newspapers, online information).

Structural Features of Informational Materials
2.1 Identify structural patterns found in informational text (e.g., compare and contrast, cause and effect, sequential or chronological order, proposition and support) to strengthen comprehension.

Comprehension and Analysis of Grade-Level-Appropriate Text
2.2 Use appropriate strategies when reading for different purposes (e.g., full comprehension, location of information, personal enjoyment).
2.3 Make and confirm predictions about text by using prior knowledge and ideas presented in the text itself, including illustrations, titles, topic sentences, important words, and foreshadowing clues.
2.4 Evaluate new information and hypotheses by testing them against known information and ideas.
2.5 Compare and contrast information on the same topic after reading several passages or articles.
2.6 Distinguish between cause and effect and between fact and opinion in expository text.
2.7 Follow multiple-step instructions in a basic technical manual (e.g., how to use computer commands or video games).

II. WRITING

1.0 Writing Strategies

Students write clear, coherent sentences and paragraphs that develop a central idea. Their writing shows they consider the audience and purpose. Students progress through the stages of the writing process (e.g., prewriting, drafting, revising, editing successive versions).

Organization and Focus
1.1 Select a focus, an organizational structure, and a point of view based upon purpose, audience, length, and format requirements.
1.2 Create multiple-paragraph compositions:

   a. Provide an introductory paragraph.

   b. Establish and support a central idea with a topic sentence at or near the beginning of the first paragraph.

   c. Include supporting paragraphs with simple facts, details, and explanations.

   d. Conclude with a paragraph that summarizes the points.

   e. Use correct indention.

1.3 Use traditional structures for conveying information (e.g., chronological order, cause and effect, similarity and difference, posing and answering a question).

Penmanship
1.4 Write fluidly and legibly in cursive or joined italic.

Research and Technology
1.5 Quote or paraphrase information sources, citing them appropriately.
1.6 Locate information in reference texts by using organizational features (e.g., prefaces, appendixes).
1.7 Use various reference materials (e.g., dictionary, thesaurus, card catalog, encyclopedia, online information) as an aid to writing.
1.8 Understand the organization of almanacs, newspapers, and periodicals and how to use those print materials.
1.9 Demonstrate basic keyboarding skills and familiarity with computer terminology (e.g., cursor, software, memory, disk drive, hard drive).

Evaluation and Revision
1.10 Edit and revise selected drafts to improve coherence and progression by adding, deleting, consolidating, and rearranging text.

2.0 Writing Applications (Genres and Their Characteristics)

Students write compositions that describe and explain familiar objects, events, and experiences. Student writing demonstrates a command of standard American English and the drafting, research, and organizational strategies outlined in Writing Standard 1.0.

2.3   Write information reports:

     a.   Frame a central question about an issue or situation.

     b.   Include facts and details for focus.

     c.   Draw from more than one source of information (e.g., speakers, books, newspapers, other media sources).

1.0 Written and Oral English Language Conventions

Students write and speak with a command of standard English conventions appropriate to this grade level.

Sentence Structure
1.1 Use simple and compound sentences in writing and speaking.
1.2 Combine short, related sentences with appositives, participial phrases, adjectives, adverbs, and prepositional phrases.

Grammar
1.3 Identify and use regular and irregular verbs, adverbs, prepositions, and coordinating conjunctions in writing and speaking.

Punctuation
1.4 Use parentheses, commas in direct quotations, and apostrophes in the possessive case of nouns and in contractions.
1.5 Use underlining, quotation marks, or italics to identify titles of documents.

Capitalization
1.6 Capitalize names of magazines, newspapers, works of art, musical compositions, organizations, and the first word in quotations when appropriate.

Spelling
1.7 Spell correctly roots, inflections, suffixes and prefixes, and syllable constructions.

III. LISTENING AND SPEAKING

1.0 Listening and Speaking Strategies

Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.

Comprehension

1.1 Ask thoughtful questions and respond to relevant questions with appropriate elaboration in oral settings.

1.2 Summarize major ideas and supporting evidence presented in spoken messages and formal presentations.

Organization and Delivery of Oral Communication

1.5 Present effective introductions and conclusions that guide and inform the listener's understanding of important ideas and evidence.

1.6 Use traditional structures for conveying information (e.g., cause and effect, similarity and difference, posing and answering a question).

1.7 Emphasize points in ways that help the listener or viewer to follow important ideas and concepts.

1.8 Use details, examples, anecdotes, or experiences to explain or clarify information.

1.9 Use volume, pitch, phrasing, pace, modulation, and gestures appropriately to enhance meaning.

Analysis and Evaluation of Oral Media Communication

1.10 Evaluate the role of the media in focusing attention on events and in forming opinions on issues.

2.0 Speaking Applications (Genres and Their Characteristics)

Students deliver brief recitations and oral presentations about familiar experiences or interests that are organized around a coherent thesis statement. Student speaking demonstrates a command of standard American English and the organizational and delivery strategies outlined in Listening and Speaking Standard 1.0.

2.2 Make informational presentations:

  a. Frame a key question.
  b. Include facts and details that help listeners to focus.
  c. Incorporate more than one source of information (e.g., speakers, books, newspapers, television or radio reports).

2.3 Deliver oral summaries of articles and books that contain the main ideas of the event or article and the most significant details.

CALIFORNIA 4TH GRADE CONTENT STANDARDS COVERED IN *METROPOLIS*

MATHEMATICS

MEASUREMENT AND GEOMETRY

1.0 Students understand perimeter and area:

1.1 Measure the area of rectangular shapes by using appropriate units, such as square centimeter (cm²), square meter (m²), square kilometer (km²), square inch (in²), square yard (yd²), or square mile (mi²).

1.2 Recognize that rectangles that have the same area can have different perimeters.

1.3 Understand that rectangles that have the same perimeter can have different areas.

1.4 Understand and use formulas to solve problems involving perimeters and areas of rectangles and squares. Use those formulas to find the areas of more complex figures by dividing the figures into basic shapes.

c) 3.0 Students demonstrate an understanding of plane and solid geometric objects and use this knowledge to show relationships and solve problems:

3.1 Identify lines that are parallel and perpendicular.

3.2 Identify the radius and diameter of a circle.

3.3 Identify congruent figures.

3.4 Identify figures that have bilateral and rotational symmetry.

3.5 Know the definitions of a right angle, an acute angle, and an obtuse angle. Understand that 90°, 180°, 270°, and 360° are associated, respectively, with 1/4, 1/2, 3/4, and full turns.

3.6 Visualize, describe, and make models of geometric solids (e.g., prisms, pyramids) in terms of the number and shape of faces, edges, and vertices; interpret two-dimensional representations of three-dimensional objects; and draw patterns (of faces) for a solid that, when cut and folded, will make a model of the solid.

3.7 Know the definitions of different triangles (e.g., equilateral, isosceles, scalene) and identify their attributes.

3.8 Know the definition of different quadrilaterals (e.g., rhombus, square, rectangle, parallelogram, and trapezoid).

VISUAL AND PERFORMING ARTS

1.0   ARTISTIC PERCEPTION

Processing, analyzing, and responding to sensory information through the language and skills unique to the visual arts

Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.

Develop Visual Arts Vocabulary

1.1   Perceive and describe contrast and emphasis in works of art and *in the environment.*

Analyze Art Elements and Principles of Design

1.5   Describe and analyze the elements of art (e.g., color, shape/form, line, texture, space, and value), emphasizing form as they are used in works of art and found in the environment.

2.0   CREATIVE EXPRESSION

Creating, performing, and participating in the visual arts

Students apply artistic processes and skills, using a variety of media to communicate meaning and intent in original works of art.

Skills, Processes, Materials, and Tools

2.1   Use shading (value) to transform a two-dimensional shape into what appears to be a three-dimensional form (e.g., circle to sphere).

3.0   HISTORICAL AND CULTURAL CONTEXT

Understanding the historical contributions and cultural dimensions of the visual arts

Students analyze the role and development of the visual arts in past and present cultures throughout the world, noting human diversity as it relates to the visual arts and artists.

Role and Development of the Visual Arts

3.1   Describe how art plays a role in reflecting life (e.g., in photography, quilts, architecture).

Diversity of the Visual Arts

3.2   Identify and discuss the content of works of art in the past and present, focusing on the different cultures that have contributed to California's history and art heritage.

3.3   Research and describe the influence of religious groups on art and architecture, focusing primarily on buildings in California both past and present.

5.0   CONNECTIONS, RELATIONSHIPS, APPLICATIONS

Connecting and applying what is learned in the visual arts to other art forms and subject areas and to careers

Students apply what they learn in the visual arts across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They also learn about careers in and related to the visual arts.

Visual Literacy

5.3   Construct diagrams, maps, graphs, timelines, and illustrations to communicate ideas or tell a story about a historical event.

CALIFORNIA 4TH GRADE CONTENT STANDARDS COVERED IN *METROPOLIS*

SOCIAL STUDIES

HISTORICAL AND SOCIAL SCIENCES ANALYSIS SKILLS (GRADES K–5)

The intellectual skills noted below are to be learned through, and applied to, the content standards for kindergarten through grade five. They are to be assessed *only in conjunction with* the content standards in kindergarten through grade five.

In addition to the standards for kindergarten through grade five, students demonstrate the following intellectual, reasoning, reflection, and research skills:

Chronological and Spatial Thinking

3.   Students explain how the present is connected to the past, identifying both similarities and differences between the two, and how some things change over time and some things stay the same.

4.   Students use map and globe skills to determine the absolute locations of places and interpret information available through a map or globe's legend, scale, and symbolic representations.

5.   Students judge the significance of the relative location of a place (e.g., proximity to a harbor, on trade routes) and analyze how relative advantages or disadvantages can change over time.

Appendix 6

5TH GRADE STANDARDS
COVERED IN *METROPOLIS*

SUBJECT AREAS

Metropolis was designed as a standards-based, interdisciplinary unit of study for grades 3-6 (though it could be adapted for any grade level).

Standards in all states and at all grade levels are generally organized to cover the same subject areas and domains. *Metropolis* covers standards in the following subject areas and domains:

Language Arts:
Vocabulary, Reading Comprehension, Writing, Language Conventions (grammar), and Speaking and Listening

Mathematics:
Measurement and Geometry

Visual and Performing Arts:
Artistic Perception; Connections, Relationships and Applications

Social Studies:
Social Science Foundational Skills (maps skills, geographical features, etc. . . .)

Health Education:
Personal and Community Health

On the following pages is an example of how *Metropolis* has been used to meet California's fifth grade standards in language arts, mathematics, visual and performing arts, social studies, and health education. You can easily look up specific standards for your grade level and state on the Internet.

ENGLISH LANGUAGE ARTS

I. READING

1.0 Word Analysis, Fluency, and Systematic Vocabulary Development

Students use their knowledge of word origins and word relationships, as well as historical and literary context clues, to determine the meaning of specialized vocabulary and to understand the precise meaning of grade-level-appropriate words.

Word Recognition
1.1 Read aloud narrative and expository text fluently and accurately and with appropriate pacing, intonation, and expression.
Vocabulary and Concept Development
1.2 Use word origins to determine the meaning of unknown words.
1.3 Understand and explain frequently used synonyms, antonyms, and homographs.
1.4 Know abstract, derived roots and affixes from Greek and Latin and use this knowledge to analyze the meaning of complex words (e.g., *controversial).*
1.5 Understand and explain the figurative and metaphorical use of words in context.

2.0 Reading Comprehension (Focus on Informational Materials)

Students read and understand grade-level-appropriate material. They describe and connect the essential ideas, arguments, and perspectives of the text by using their knowledge of text structure, organization, and purpose. The selections in *Recommended Literature, Kindergarten Through Grade Twelve* illustrate the quality and complexity of the materials to be read by students. In addition, by grade eight, students read one million words annually on their own, including a good representation of grade-level-appropriate narrative and expository text (e.g., classic and contemporary literature, magazines, newspapers, online information). In grade five, students make progress toward this goal.

Structural Features of Informational Materials

 2.1 Understand how text features (e.g., format, graphics, sequence, diagrams, charts, and maps) make information accessible and usable.

2.3 Discern main ideas and concepts presented in texts, identifying and assessing evidence that supports those ideas.

II. WRITING

1.0 Writing Strategies

Students write clear, coherent, and focused essays. The writing exhibits the students' awareness of the audience and purpose. Essays contain formal introductions, supporting evidence, and conclusions. Students progress through the stages of the writing process as needed.

Organization and Focus
1.2   Create multiple-paragraph expository compositions:
a. Establish a topic, important ideas, or events in sequence or chronological order.

b. Provide details and transitional expressions that link one paragraph to another in a clear line of thought.

c. Offer a concluding paragraph that summarizes important ideas and details.

Research and Technology
1.5 Use a thesaurus to identify alternative word choices and meanings.

Evaluation and Revision
1.6 Edit and revise manuscripts to improve the meaning and focus of writing by adding, deleting, consolidating, clarifying, and rearranging words and sentences.

2.0 Writing Applications (Genres and Their Characteristics)

Students write narrative, expository, persuasive, and descriptive texts of at least 500 to 700 words in each genre. Student writing demonstrates a command of standard American English and the research, organizational, and drafting strategies outlined in Writing Standard 1.0. Using the writing strategies of grade five outlined in Writing Standard 1.0, students:

2.3 Write research reports about important ideas, issues, or events by using the following guidelines: a. Frame questions that direct the investigation. b. Establish a controlling idea or topic. c. Develop the topic with simple facts, details, examples, and explanations.

2.4 Write persuasive letters or compositions: a. State a clear position in support of a proposal. b. Support a position with relevant evidence. c. Follow a simple organizational pattern. d. Address reader concerns.

1.0 Written and Oral English Language Conventions

Students write and speak with a command of standard English conventions appropriate to this grade level.

Sentence Structure
1.1 Identify and correctly use prepositional phrases, appositives, and independent and dependent clauses; use transitions and conjunctions to connect ideas.

Grammar
1.2 Identify and correctly use verbs that are often misused (e.g., *lie/lay, sit/set, rise/raise*), modifiers, and pronouns.

Punctuation
1.3 Use a colon to separate hours and minutes and to introduce a list; use quotation marks around the exact words of a speaker and titles of poems, songs, short stories, etc.

Capitalization
1.4 Use correct capitalization.

Spelling
1.5 Spell roots, suffixes, prefixes, contractions, and syllable constructions correctly.

III. LISTENING AND SPEAKING

1.0 Listening and Speaking Strategies

Students deliver focused, coherent presentations that convey ideas clearly and relate to the background and interests of the audience. They evaluate the content of oral communication.

Comprehension
1.1 Ask questions that seek information not already discussed.
1.2 Interpret a speaker's verbal and nonverbal messages, purposes, and perspectives.
1.3 Make inferences or draw conclusions based on an oral report.

Organization and Delivery of Oral Communication
1.4 Select a focus, organizational structure, and point of view for an oral presentation.
1.5 Clarify and support spoken ideas with evidence and examples.
1.6 Engage the audience with appropriate verbal cues, facial expressions, and gestures.

2.0 Speaking Applications (Genres and Their Characteristics)

Students deliver well-organized formal presentations employing traditional rhetorical strategies (e.g., narration, exposition, persuasion, and description). Student speaking demonstrates a command of standard American English and the organizational and delivery strategies outlined in Listening and Speaking Standard 1.0.

Using the speaking strategies of grade five outlined in Listening and Speaking Standard 1.0, students:

2.2 Deliver informative presentations about an important idea, issue, or event, and:

a. Frame questions to direct the investigation.
b. Establish a controlling idea or topic.
c. Develop the topic with simple facts, details, examples, and explanations.

CALIFORNIA 5TH GRADE CONTENT STANDARDS COVERED IN *METROPOLIS*

MATHEMATICS

MEASUREMENT AND GEOMETRY

1.0 Students understand and compute the volumes and areas of simple objects:

1.1 Derive and use the formula for the area of a triangle and of a parallelogram by comparing it with the formula for the area of a rectangle (i.e., two of the same triangles make a parallelogram with twice the area; a parallelogram is compared with a rectangle of the same area by cutting and pasting a right triangle on the parallelogram).

1.2 Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area for these objects.

1.3 Understand the concept of volume and use the appropriate units in common measuring systems (i.e., cubic centimeter [cm^3], cubic meter [m^3], cubic inch [in^3], and cubic yard [yd^3]) to compute the volume of rectangular solids.

1.4 Differentiate between, and use appropriate units of measures for, two- and three-dimensional objects (i.e., find the perimeter, area, volume).

2.0 Students identify, describe, and classify the properties of, and the relationships between, plane and solid geometric figures:

2.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, and triangles by using appropriate tools (e.g., straightedge, ruler, compass, protractor, drawing software).

2.2 Know that the sum of the angles of any triangle is 180° and the sum of the angles of any quadrilateral is 360°, and use this information to solve problems.

2.3 Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids.

CALIFORNIA 5TH GRADE CONTENT STANDARDS COVERED IN *METROPOLIS*

VISUAL AND PERFORMING ARTS

1.0 ARTISTIC PERCEPTION

Processing, Analyzing, and Responding to Sensory Information through the Language and Skills Unique to the Visual Arts

Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.

Develop Perceptual Skills and Visual Arts Vocabulary:

1.1 Identify and describe the principles of design in visual compositions, emphasizing unity and harmony.

Communication and Expression through Original Works of Art:

2.7 Communicate values, opinions, or personal insights through an original work of art.

5.0 CONNECTIONS, RELATIONSHIPS, APPLICATIONS

Connecting and applying what is learned in the visual arts to other art forms and subject areas and to careers.

Students apply what they learn in the visual arts across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They also learn about careers in and related to the visual arts.

Connections and Applications
5.1 Use linear perspective to depict geometric objects in space.

Visual Literacy
5.2 Identify and design icons, logos, and other graphic devices as symbols for ideas and information.

Careers and Career-Related Skills
5.3 Research and report on what various types of artists (e.g., architects, designers, graphic artists, and animators) produce and how their works play a role in our everyday environment.

CALIFORNIA 5TH GRADE CONTENT STANDARDS COVERED IN *METROPOLIS*

SOCIAL STUDIES

HISTORICAL AND SOCIAL SCIENCES ANALYSIS SKILLS (GRADES K–5)

The intellectual skills noted below are to be learned through, and applied to, the content standards for kindergarten through grade five. They are to be assessed *only in conjunction with* the content standards in kindergarten through grade five.

In addition to the standards for kindergarten through grade five, students demonstrate the following intellectual, reasoning, reflection, and research skills:

Chronological and Spatial Thinking

3. Students explain how the present is connected to the past, identifying both similarities and differences between the two, and how some things change over time and some things stay the same.

4. Students use map and globe skills to determine the absolute locations of places and interpret information available through a map or globe's legend, scale, and symbolic representations.

5. Students judge the significance of the relative location of a place (e.g., proximity to a harbor, on trade routes) and analyze how relative advantages or disadvantages can change over time.

HEALTH EDUCATION

NUTRITION AND PHYSICAL ACTIVITY

1.9. N Explain how good health is influenced by healthy eating and being physically active.

1.10. N Describe how physical activity, rest, and sleep are related.

1.11. N Identify physical, academic, mental, and social benefits of regular physical activity.

Standard 8: Health Promotion

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

PERSONAL AND COMMUNITY HEALTH

Standard 1: Essential Concepts

1.3. P   Describe how environmental conditions affect personal health.

1.6. P   Explain that all individuals have a responsibility to protect and preserve the environment.

Standard 2: Analyzing Influences

2.1. P   Identify internal and external influences that affect personal health practices.

Standard 5: Decision Making

5.1. P   Use a decision-making process to determine personal choices that promote personal, environmental, and community health.

Standard 6: Goal Setting

6.1. P   Monitor progress toward a goal to help protect the environment.

Standard 8: Health Promotion

8.1. P   Encourage others to minimize pollution in the environment.

Bibliography & Resources

For Children

Ames, Lee J.
Draw 50 Buildings and Other Structures
Broadway Books (1980), New York

Beaty, Andrea
Iggy Peck Architect
Abrams Books (2007), New York

David, Laurie, and Cambria Gordon
Get Down to Earth! What You Can Do to Stop Global Warming
Orchard Books (2008), New York

Dunn, Jerry Camarillo
The World's Greatest Landmarks
Publications International, Ltd. (2002), Lincolnwood, Ill.

Greenberg, Daniel
Julia Morgan, Master Architect
McGraw-Hill School Division (1990), New York

Gutman, Bill
Bicycling
Capstone Press (1995) Minneapolis

Hayden, Kate
Amazing Buildings
DK Readers (2003), New York

Hopkins, Lee Bennett
City I Love (Book of Poems)
Abrams Books for Young Readers (2009), New York

Lassieur, Allison
Subways
Capstone Press (2000), Minneapolis

Lopez, Jean
Tell Me About: World Heritage
UNESCO Publishing (2002), Paris

MacDonald, Fiona
Cities, Citizens and Civilisations

The Salariya Book Co. Ltd (1992), London
(Spanish version: *Las ciudades a través del tiempo* 1994 Grupo Anaya, S.A. (1994), Madrid)

Owen, Claire
Building Blocks
2005 Weldon Owen Education Inc./ETA/Cuisenaire (2005), Vernon Hills, Ill.
(Spanish version: *Bloques de construcción*)

Press, Judy
All Around Town; Exploring Your Community Through Craft Fun
Williamson Publishing (2002), Charlotte, Vt.

Pringle, Laurence
Global Warming: The Threat of Earth's Changing Climate
Sea Star Books (2001), New York

Royston, Angela
Transportation
Steck-Vaughn Company (1999), Austin, Tex.

Schaefer, Lola M.
Ferries
Capstone Press (2000), Minneapolis

Steinberg, Adria, and David Stephen
Cityworks: Exploring Your Community
The New Press (1999), New York

Stevenson, Robert Louis (Illustrated by Daniel Kirk)
Block City
Simon & Schuster Books for Young Readers (2005), New York

Thornhill, Jan
This Is My Planet: The Kids' Guide to Global Warming
Maple Tree Press, Inc. (2007), Toronto

United Nations Economic Commission for Europe
Daddy You Can Save the Planet!
United Nations (2009) New York/Geneva

Van Deelen, Fred
Get Lost in Paris, Sydney, London and More...
Little Hare Books (2005), Surry Hills, Australia

Ventura, Piero
Book of Cities
Universe Publishing (2009), New York

Walsh, Danny, Jake, and Niall

The Cardboard Box Book
Watson-Guptill Publications (2006), New York

Wilkinson, Philip
Building
Dorling Kindersley (1995), New York

For Educators

A+DEN Website: www.adenweb.org
Architecture + Design Education Network

Checkoway, Barry N., and Gutierrez, Lorranine M. (Editors)
Youth Participation and Community Change
The Haworth Press, Inc. (2006), Binghamton, N.Y.

Driskell, David
Creating Better Cities with Children and Youth
UNESCO Publishing (2002), Paris/Earthscan Publishing, London and Sterling, Va.

Guenewald, David A., and Gregory A. Smith (Editors)
Place-Based Education in the Global Age: Local Diversity
Taylor & Francis Group, LLC (2008), New York/London

Linsner, Jean, and Masengarb, Jennifer
Schoolyards to Skylines; Teaching with Chicago's Amazing Architecture
Chicago Architecture Foundation (2002), Chicago

National Building Museum (www.nbm.org)
"City by Design"
2002

Race, Bruce, and Carolyn Torma
Youth Planning Charrettes
APA Planners Press (1998), Chicago

For Background Information and Images

Bacon, Edmund, N.
Design of Cities
Penguin Books (1967), New York

Beatley, Timothy
Green Urbanism: Learning from European Cities
Island Press (2000), Washington, D.C.

Chawla, Louise (Editor)
Growing Up in an Urbanising World
UNESCO Publishing (2002), Paris/Earthscan Publishing, London and Sterling, Va.

Correa, Antonio Bonet
Las claves del urbanismo
Editorial Ariel, S.A. (1989) Barcelona

DK Eyewitness Travel
Travel guides published by Dorling Kindersley, New York

Ecocity Websites: www.ecocityprojects.net; www.ecocitybuilders.org

Frederick, Matthew
101 Things I Learned in Architecture School
MIT Press (2007), Cambridge, Mass.

Gauthiez, Bernard
Espace Urbaine
Éditions du Patrimoine (2003), Paris

Google Images: www.google.com

Gore, Al *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It*
Rodale Press (2006), Emmaus, Pa.

Hayden, Dolores
A Field Guide to Sprawl
W. W. Norton & Company (2004) New York/London

Knopf Guides
Travel guides published by Alfred A. Knopf

Krier, Leon
Drawing for Architecture
MIT Press (2009), Cambridge, Mass.

Krier, Leon
Houses, Palaces, Cities
Architectural Design AD Editions, Ltd (1984), London

Lopez Marchena, Emilio
Artwork in *Chapter 1 Edges* (has completed an amazing assortment of architecture and urban landscape sketches from around the world) euroyo@hotmail.com

Lynch, Kevin
The Image of the City
MIT Press (1960), Cambridge, Mass.

National Geographic Magazine
National Geographic Society, Washington, D.C.

Panerai, Philippe
Analyse Urbaine
Éditions Parenthèses (1999), Marseille, France

Project for Public Spaces Website: www.pps.org

Sitte, Camillo
L'Art de Bâtir les Villes
Éditions du Seuil (1996), Paris

Whyte, William H.
City: Rediscovering the Center
Anchor Books/Doubleday (1988), New York

WORKac
49 Cities
Storefront for Art and Architecture (2010), New York