

Curriculum Guide



Fifth Grade

Fifth Grade

GRADE LEVEL CONTENT EXPECTATION (GLCE) MATRIX

SCIENCE	1	2	3	4	5	6	7	8	9	10
SCIENCE PROCESS Inquiry Process K-7 Standard S.IP: Develop an understanding that scientific inquiry and reasoning involves observing, questioning, investigation, recording, and developing solutions to problems.	✓	✓	✓	✓	✓	✓	✓			
Inquiry Analysis and Communication K-7 Standard S.IA: Develop an understanding that scientific inquiry and investigations require analysis and communication of findings, using appropriate technology.	✓	✓	✓	✓	✓	✓	✓			
LIFE SCIENCE Organization of Living Things K-7 Standard L.OL: Develop an understanding that plants and animals (including humans) have a basic requirement for maintaining life which include the need for air, water and a source of energy. Understand that all life forms can be classified as producers, consumers, or decomposers as they are all part of a global food chain where food/energy is supplied by plants which need light to produce food/energy. Develop an understanding that plants and animals can be classified by observable traits and physical characteristics. Understand that all living organisms are composed of cells and they exhibit cell growth and divisions. Understand that all plants and animals have a definite life cycle, body parts, and systems to perform specific life functions.							✓	✓	✓	✓
Heredity K-7 Standard L.HE: Develop an understanding that all life forms must reproduce to survive. Understand that characteristics of mature plants and animals may be inherited or acquire and that only inherited traits are passed on to their young. Understand that inherited traits can be influenced by changes in the environment by genetics.			✓				✓			
Evolution K-7 Standard L.EV: Develop an understanding that plants and animals have observable parts and characteristics that help them survive and flourish in their environments. Understand that fossils provide evidence that life forms have changed over time and were influenced by changes in environmental conditions. Understand that life forms either changed (evolve) over time or risk extinction due to environmental changes and describe how scientists identify the relatedness of various organisms based on similarities in anatomical features.			✓				✓			

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SCIENCE	1	2	3	4	5	6	7	8	9	10
LIFE SCIENCE Ecosystems K-7 Standard L.EC: Develop an understanding of the interdependence of the variety of populations, communities and ecosystems, including those in the Great Lakes region. Develop an understanding of different types of interdependence and that biotic (living) and abiotic (non-living) factors affect the balance of an ecosystem. Understand that all organisms cause changes, some detrimental and other beneficial, in the environment where they live.			✓			✓	✓			
EARTH SCIENCE Earth Systems K-7 Standard E.SE: Develop an understanding of the warming of the Earth by the sun as the major source of energy for phenomenon on Earth and how the sun's warming relates to weather, climate, seasons, and the water cycle. Understand how human interaction and use of natural resources affects the environment.					✓	✓	✓	✓	✓	✓
Solid Earth K-7 Standard E.SE: Develop an understanding of Earth materials and how those properties make materials useful. Understand gradual and rapid changes in Earth materials and features of the surface of the Earth. Understand magnetic properties of Earth.					✓	✓	✓	✓	✓	✓



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SOCIAL STUDIES	1	2	3	4	5	6	7	8	9	10
HISTORY H2 Living and Working Together in Families and Schools Use historical thinking to understand the past.	✓			✓	✓					
GEOGRAPHY G1 The World in Spatial Terms Use geographic representations to acquire, process and report information from a spatial perspective.	✓			✓	✓		✓			
G2 Places and Regions Understand how regions are created from common physical and human characteristics.	✓			✓	✓		✓			
G5 Environment and Society Understand the effects of human-environment interactions.	✓			✓	✓		✓			
USHG ERA 1 - BEGINNING TO 1620 U1.4 Three World Interactions Describe the environment, political, and cultural consequences of the interactions among European, African, and American Indian people in the late 15th through the 17th century.	✓	✓								
PUBLIC DISCOURSE, DECISION MAKING, AND CITIZEN INVOLVEMENT P3.1 Identifying and Analyzing Public Issues Clearly state a problem as a public policy issue, analyze various perspectives, and generate and evaluate possible alternative resolutions.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
P3.3 Persuasive Communications About a Public Issue Communicate a reasoned position on a public issue.		✓	✓	✓	✓	✓	✓	✓	✓	✓
P4.2 Citizen Involvement Act constructively to further the public good.		✓	✓	✓	✓	✓	✓	✓	✓	✓

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ENGLISH LANGUAGE ARTS	1	2	3	4	5	6	7	8	9	10
READING						✓				
Word Recognition and Word Study										
Fluency						✓				
Vocabulary						✓				
Narrative Text						✓				
Informational Text						✓				
Comprehension						✓				
Metacognition						✓				
Critical Standards						✓				
Reading Attitude						✓				
SPEAKING	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conventions										
Discourse	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LISTENING & VIEWING	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conventions										
Response	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Understanding										
MATHEMATICS	1	2	3	4	5	6	7	8	9	10
MEASUREMENT	✓	✓	✓					✓	✓	✓
Understand the concept of volume										
VISUAL ARTS	1	2	3	4	5	6	7	8	9	10
Content Standard 1: All student will apply skills and knowledge to perform in the arts.	✓	✓			✓		✓	✓	✓	✓
Content Standard 2: All students will apply skills and knowledge to create in the arts.	✓	✓			✓		✓	✓	✓	✓
Content Standard 3: All students will analyze, describe and evaluate works of art.	✓	✓	✓		✓		✓	✓	✓	✓
Content Standard 4: All students will understand, analyze, and describe the arts in their historical, social and cultural contexts.	✓	✓	✓		✓		✓	✓	✓	✓
Content Standard 5: All students will recognize, analyze and describe connection among the arts, between the arts and the other disciplines; between the arts and everyday life.	✓	✓	✓		✓		✓	✓	✓	✓

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**FIFTH GRADE
LESSON NO. 1**

HISTORY OF CITIES

LENGTH OF LESSON:

30 - 60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

A. Develop an awareness of how and why cities began and what characteristics differentiate them

Social Studies

- Historical perspective
- Geographic perspective
- Economic perspective

English/Language Arts

- Meaning and communication
- Depth of understanding
- Inquiry and research

B. Understand the components of a city

English/Language Arts

- Meaning and communication
- Depth of understanding
- Inquiry and research

Social Studies

- Historical perspective
- Geographic perspective
- Economic perspective

C. Understand the importance of location, climate and geography in a city

English/Language Arts

- Meaning and communication
- Depth of understanding

Social Studies

- Historical perspective
- Geographic perspective
- Economic perspective

Science

- Use scientific knowledge from physical sciences in real-world contexts



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GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter.

ARCHITECTURAL PRINCIPLES:

Order is the arrangement and organization of elements to help solve visual and functional problems.

Balance is the creation of visual harmony through the use of color and the manipulation of form.

Nature is a model for architectural forms and shapes.

Symbolism is an important means of visual communication for architecture.

Sustainable design of the built environment protects the natural environment.

Climate and the natural environment influence design decisions.

Social structure, culture and the built environment have a direct influence on one another.

Architecture satisfies emotional and spiritual needs in addition to physical needs.

Past, current and future technologies influence design decisions.

MATERIALS

1. Crayons or markers
2. Pencils
3. Aerial photograph of a city (included)
4. Photographs of cities - "Types of Land Uses" (included)
5. Sketching paper and/or colored construction paper



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VOCABULARY (See glossary for definitions)

1. City
2. Civilization
3. Domesticated
4. Land Use
5. Nomad

BACKGROUND INFORMATION

The social studies classes students have had prior to fifth grade will provide some of the background for this lesson plan, as will the following information for class discussion:

1. Human beings have lived on earth for about 2 million years but developed permanent settlements only 10,000 years ago. In the beginning, people were nomads wandering in search of food, living off the land in tents or in caves. They were able to eat by hunting for meat, fishing and gathering fruits and edible plants. When farming of the land began, wandering to look for food became unnecessary, and villages began to develop.
2. The four main characteristics required for the development of a city:
 - a. Population Growth: Increases in population and exposure to other people of different tribes, cultural groups and nationalities helped the city grow in size and complexity.
 - b. Social Organization: Early villages assigned people to be responsible for surplus food, city defense planning and other functions needed by the city as a whole. Initially, small tribes or groups organized these city functions, which later developed into a more formalized governmental system.
 - c. Physical Environment: Cities needed a location that offered availability of food and water, good surrounding soils for crops, access to materials to provide for shelter, waterways for transportation, raw materials for industry and, in later years, a good climate for recreation. All of these characteristics are not necessary, but all cities require some combinations of these to develop.



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- d. **Advances in Technology:** Improved farming skills and the domestication of animals led to a surplus in food produced on family farms, beyond the amount needed to feed the farmer's family. This led to some people taking on other jobs, producing products they could barter — including crafts, clothing, baskets and tools — in exchange for food. The subsequent development of power sources, such as steam and electricity, led to manufacturing. Transportation systems, such as railroads and then the automobile, also developed. The use of iron and then steel for construction allowed tall buildings to be constructed. With the invention of the elevator, buildings in cities grew even taller.
3. Ancient cities set aside areas for markets, worship, public buildings, etc. Athens and Rome became famous for their public buildings. During the Middle Ages (from about 500 to 1400), protective walls became a common way to protect cities from invaders. Religion also was important; large churches became the center of many cities. During the Renaissance in Europe (1400s, 1500s and 1600s), plazas were created, incorporating artistic treatment in many buildings as well as public sculptures. In the 1700s, the Industrial Revolution began, with a factory system in and around cities that drew more people to them. Eventually, cities spawned suburbs; these "satellites" surrounding the cities grew as people yearned to escape crowded city life.
4. Over time, the physical environments of our cities needed to be maintained, restored, rebuilt, and cleaned up after years of use. In addition to taking care of buildings, this often involves cleaning lakes and rivers, removing pollution from the air, rebuilding roads and bridges, and restoring parks and other areas for recreation. Cities are always changing due to shifts in population, economic factors, and many other influences. We need to monitor the impact of those changes and make improvements, as necessary, to keep our cities healthy and beautiful for everyone.



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ACTIVITY

- A. A city can be better understood by looking at its parts. Using examples from your own city, describe to the students the components of a city. These components are described as "land uses."
1. Road system - main roads, smaller secondary roads
 2. Open public areas - parks, plazas, playgrounds
 3. Shopping areas - malls, strip centers, downtown business district
 4. Residential areas - apartments, houses
 5. Schools
 6. Factories
 7. Recreation centers - stadiums and arenas
 8. Municipal buildings - city halls, libraries, police and fire stations
- B. Show an aerial photograph (included) of a city to indicate the different components in that city plan. Next, show photographs (included) of examples of land uses in a city as listed in item "A" above.
- C. Have students draw their own small plan of a city, showing all of the components listed in "A" above. These will be discussed in more detail in future lessons; a general understanding of the parts of a city is the goal of this exercise.

TEACHER'S EVALUATION

- A. Analyze student drawings for a basic understanding of the parts of a city and how one area might relate to another area.
- B. Analyze student art work for:
1. Drawing skills;
 2. Ability to express geometric shapes and elements;
 3. Use of artistic skills, including aesthetic use of color and drawing from the visualization of an idea.



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Aerial Photograph from the Sears Tower - Chicago



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Roads - Washington Blvd. in Detroit



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Playground – Clawson, Michigan



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Shopping Center - Troy, Michigan



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Residential - Apartment Building in
Royal Oak, Michigan



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Schools - Tecumseh High School in
Tecumseh, Michigan



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Industrial - Small Factory in Troy, Michigan



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Recreation - Comerica Park Stadium
in Detroit, Michigan



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**Municipal Building - Waterford Public Works
Department in Waterford, Michigan**



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**FIFTH GRADE
LESSON NO. 2**

POLITICS AND ECONOMICS OF A CITY

LENGTH OF LESSON: 30 - 60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

A. Understand how politics and government have caused cities to develop certain physical layouts

English/Language Arts

- Meaning and communication
- Inquiry and research

Social Studies

- Historical perspective
- Geographic perspective
- Civic perspective
- Public discourse and decision making

B. Understand how the local economic system has affected city physical layouts

English/Language Arts

- Meaning and communication
- Inquiry and research

Social Studies

- Historical perspective
- Geographic perspective
- Economic perspective

C. Understand the relationship between politics and economics, and their joint influence on the physical development of cities

English/Language Arts

- Depth of understanding
- Ideas in action
- Inquiry and research

Social Studies

- Historical perspective
- Geographic perspective
- Civic perspective
- Economic perspective



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GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter.

ARCHITECTURAL PRINCIPLES:

Order is the arrangement and organization of elements to help solve visual and functional problems.

Symbolism is an important means of visual communication for architecture.

Visual thinking is a key to awareness of the built environment.

Sustainable design of the built environment protects the natural environment.

Social structure, culture and the built environment have a direct influence on one another.

Climate and the natural environment influence design decisions.

Past, current and future technologies influence design decisions.

MATERIALS

1. City photographs used in Lesson No. 1 (for play prop)
2. Text for the play "Tale of How Cities Began" (included)
3. Costumes and props for plays (as desired)

VOCABULARY (See glossary for definitions)

- | | | |
|--------------|--------------|---------------|
| 1. Bartering | 4. Economics | 7. Population |
| 2. Commerce | 5. Kingdom | 8. Sewers |
| 3. Craftsman | 6. Politics | 9. Taxes |



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BACKGROUND INFORMATION

1. Review Lesson No. 1:
 - a. Where and how did the first cities develop?
 1. Location: adjacent to water (along a river) or on a trade route
 2. Geography: flat land with soil that could grow food crops
 3. Climate: mild weather
 - b. Why did cities develop?
 1. An abundant food source that allowed the population to remain in one location
 2. Protection against animals and other groups of people
 3. Available building materials
2. General Discussion - Communities become trading centers and governmental centers:
 - a. The first cities date from around 6,000 B.C.E. and were located in the Middle East, in an area that is now Iraq. The cities were located near rivers that provided water for people and animals and for growing crops for food. When it was no longer necessary for everyone to work to provide food, some people became available to produce other goods and materials for living. Trade then developed between people within the city and among different cities.
 1. Skilled craftsman made better houses, tools, clothing, food, art, etc.
 2. A commerce system of bartering developed for the work of the skilled craftsman, and a money system developed to pay for work and goods.
 3. City living was not as difficult as when people had to wander over the land for sustenance. Therefore, the population increased. As it grew in an area, more cities developed, and the commerce created by trade among cities created wealth (and, therefore, power) for certain groups.
 - b. The marketplace was central to the city. Frequently, street patterns radiated from the marketplace. The marketplace allowed farmers from outlying areas to sell their goods inside the city.
 - c. As cities expanded, marketplaces, manufacturing and housing created the need for a more complex government. What began as tribal leaders and tribal councils expanded to form more complex governmental systems.
 1. Some became kingdoms with a king or queen.
 2. Sometimes, differences in ideas motivated some people to leave the group in power and create other political groups to challenge the ruling group.



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3. Sometimes, groups from outside the city tried to overtake the city, a factor that led to the walled cities of the Middle Ages, which developed for defensive purposes.
- d. City governments became more complicated as cities grew in size. A tribal chief became a mayor who was elected by the city's voters. Tribal councils became city councils that also were elected by voters. People living in the city needed services like water, sewers, police and fire protection. The city government expanded to appoint people whose job it was to provide these services. They were hired by the elected city mayor and city council, and paid through taxes that city residents paid to the city government. This entire process of electing and/or appointing governmental officials is called "politics."
- e. The manufacture of products and the central location for trading those products, as well the central area for selling farm crops, all became part of the economics of the city, the goal of which is increased prosperity.

ACTIVITY

- A. To illustrate this process, the teacher can ask the class to perform small plays, in which students assume the roles of mayor and city council members and vote on issues, such as the type of public services to provide for their city. These public services and issues can include roads, sewers, marketplace locations and the establishment of police and fire stations. Or, students can compete for office and develop a "platform" on how they would improve their city if elected. The students can use the aerial photography from Lesson No. 1 to use as a prop for their platform discussions. As an alternative, the students can act out the play "Tale of How Cities Began" (included).

TEACHER'S EVALUATION

- A. Analyze the student plays for an understanding of the most basic political and economic functions of a city.



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Tale of How Cities Began

As cities began, communities had practical reasons for their location. The first villages, towns and cities were located near fertile land and water sources, which also provided the easiest form of transportation before roads were built. River crossing points were particularly favored, and the first bridges were built. The proximity of established trade routes, and of natural resources such as coal and minerals, also have been key factors in the evolution of settlements.

Larger cities were prosperous enough to afford great buildings, such as palaces and temples, and to support an upper class liberated from the daily struggle for survival. Architecture became important, and the need for well-planned cities became a priority. Soon cities were developing independently in many parts of the world, creating distinct patterns of language, culture and architecture. Unlike hunter-gatherers before them, city dwellers quickly developed the diversity typical of human societies. As cities grew, their rulers became preoccupied with civic management.

Defense, religion and commerce often influenced the shapes of cities. In many of them, streets radiated outward from the central religious building or plaza, with the wealthy living in large houses on the main thoroughfares. In some cities the familiar grid pattern of cities was established.

Rome and other big cities were full of apartment buildings often built above shops in city centers; city centers were occupied by members of the mercantile, political and religious elite, surrounded by craftsmen such as metalworkers, weavers and potters.

The evolution of cities has taken place over a period of thousands of years, but our play examines what might have happened if a king of old had been open to the ideas of modern city government.



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Characters

King
Architect
Religious Leader
City Councilman #1
Farmer
City Manager
Citizen #1

Mayor
Tax Collector
Police Chief
City Councilman #2
Trader
Civil Engineer
Citizen #2

City Planner
Teacher
Fire Marshall
City Councilman #3
Merchant
King's Court Jester
Citizen #3

Scene #1 - A Day at the Castle

As the scene opens, the King sits on his throne, contemplating the state of his kingdom. The kingdom has grown greatly; it has attracted more subjects to the area in recent times (and thus put more tax dollars into the King's pocket), which pleases him.

Jester (to King): Your Highness, one of your subjects, the Mayor, is here to see you. He says he wants to discuss the growth of the kingdom with you.

King (puzzled, yet eager to hear more): The growth of the kingdom? Show him in.

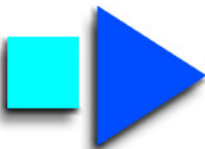
The Jester shows the Mayor into the King's chambers. The Mayor bows to the King.

King (to Mayor): Mayor, what brings you here today?

Mayor: Your Highness, I come here today to discuss the growth of your kingdom. It is my belief that the Kingdom can continue to grow and prosper, especially if you enlist the aid of some of your subjects.

King: And who might these subjects be?

Mayor: A City Planner, who can advise on the layouts for our streets and on where certain buildings are best placed; and the City Councilmen, who can develop, implement and oversee enforcement of rules for the buildings and streets; an Architect, who can design buildings to make the kingdom beautiful and long-lasting and help others see how all of the elements of the kingdom can work together to form a city ... and the Citizens, including the merchants, craftsman and farmers, all of whom have an interest in making sure the trade routes and farmlands figure into the plan, so they can continue to make money and provide goods and services for the kingdom.



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The King rubs his head as he thinks about what the Mayor has said. At first, he feels that by listening to the input of all of these subjects, he will lose control over his kingdom, but he decides to listen to what the Mayor has to say.

King: And what would be the benefit of seeking the input of the subjects you've mentioned?

Mayor: By seeking their input, you don't have to worry about figuring out how to do all of it yourself, and you'll have more time to rule and to collect taxes from all of the new subjects that come to live here because they've heard it's such a great city. And with such a great city, you'll be the envy of other kings in the area.

The King smiles and nods his head. He likes the idea that he'll have more free time, can make more money and that he'll have the input from experts on building a truly great city if he takes the Mayor's advice — he does hate dealing with the day-to-day operations of his growing kingdom.

King: Fine, then. I will listen to what each of them has to say. I am putting you in charge of meeting with them, gathering their ideas and their plans, evaluating each and presenting what you find out to me. I'll send the tax collector to the meeting as my representative. You are excused.

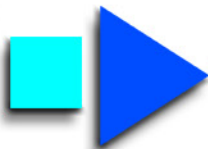
Mayor: Thank you, Your Highness. I think you will be pleased with the input I will bring back. (He bows to the King and leaves the castle.)

As the Mayor walks down the road, he spots two people on the roadway that leads to the river — a Farmer and a Trader. He decides to approach them and tell them of his meeting with the King.

Mayor: Hello, Farmer and Trader. I wanted to let you know that I just had a great meeting with the King about the growth of the kingdom. I proposed to him that I gather input from several subjects on how to best help the kingdom grow in a smart way.

Farmer: That sounds like a great idea, Mayor. I came to this area to farm the land because it's close to the water, has rich soil and a mild climate. I want to make sure that as the kingdom grows larger, my farmland will not have houses built upon it and that I will be able to continue to use the river water to irrigate my crops.

Trader: And I want to make sure I can travel easily between our kingdom and the surrounding communities so that I can trade furs and other goods to support my family. This ability to trade has brought commerce to our kingdom.



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Mayor: Your input will be important in the development of the kingdom. Please come to a meeting that will be held next Wednesday at the commons area in town.

Trader and Farmer (together): Thank you, Mayor. We'll be at the meeting.

The mayor then enters the schoolhouse, where the Teacher is preparing her lesson plan for the next day.

Teacher: Hello, Mayor. What brings you to the schoolhouse today?

Mayor: Teacher, we are gathering our citizens together for a meeting regarding the growth of the kingdom. As the person who teaches our students important information, we'd like you to be there to talk about how the growing kingdom can serve our children.

Teacher: Thank you, Mayor. I'll be at the meeting.

As he leaves the schoolhouse, the Mayor runs into the Architect and the City Planner. Excited, he tells them about the upcoming meeting.

Architect: Based on the beautiful structures that have been designed in our community to date, I know that good architecture is important to all of our residents. I'll come to the meeting.

City Planner: And I will, too. I can offer input on how to lay out the plans for our growing community.

Mayor: Thank you. Please invite other citizens of the kingdom. The input of everyone will be important.

Scene #2 - The Meeting

The residents of the kingdom start to congregate in the town commons. As they start to take their seats for the meeting to begin, the Mayor is pleased and smiles. He shakes hands with many of the residents as they file into the area.

Mayor: If everyone could please take his or her seat, we'll begin our meeting. I'd like to welcome all of you to our first meeting regarding the growth of the kingdom.

Citizen #1: I propose that we have another system of governance instead of the rule of the King. The King has been good to us, but he only seems concerned with collecting taxes, and not with how we'll feed our families, trade our goods, have suitable roads, good buildings and are protected in our homes.



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Mayor: It is in the interest of our citizens to keep the King happy by continuing to let him oversee the ruling of the kingdom, even though our citizens will handle the day-to-day operations of our new community. We also need to make sure we continue to provide the King with the taxes he has come to expect.

Citizen #2: The concept of something called a city worked as far back as 6,000 B.C.E. The current state of the kingdom very much resembles that of a city, where the people have more input in the way the community is run and how it develops.

Teacher: Following those guidelines ensures that we get a kingdom that serves the needs of everyone.

Citizen #3: I say we take a vote on modeling the growing kingdom on the concept of a city. (To the gathered crowd): Who else is in favor?

Remainder of crowd (in unison): I am!

Mayor: Then let's develop a plan to model the growing kingdom in the form of a city. To do that, we should vote on a leader.

Citizen #1: Since it was you who convinced the King that it would be a good idea to develop a committee of subjects to provide direction on the continued growth of the kingdom, I think you should be the one to govern the community. Who else is in favor?

Remainder of crowd (in unison): I am!

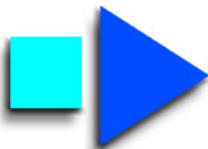
Mayor: Thank you. I accept the role of the governor of the community. But to ensure that good decisions are made, I'll need a council to assist me, much like the tribal councils of our predecessors. Let's take a vote to elect three council members.

Citizen #3 distributes "ballots" to the crowd. The crowd pretends to check off names of those they consider the best candidates for the council, thus establishing the first political system in the newly formed city.

Mayor: The votes have been cast, and our new city council members are Councilman #1, Councilman #2 and Councilman #3. (The three councilmen stand up, and the crowd claps.)

Mayor: It will be the responsibility of the council to make decisions about how the city operates and what services will be needed. The residents are counting on you.

Councilman #2: I propose the first item we discuss is the economics of the city. To make sure citizens can provide for themselves, we should establish a central area in the city where everyone can come to sell surplus farm crops, barter and trade products.



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Merchant: Why don't we set up this very area as a central marketplace for doing so? We could call it the "Town Square." It could also serve as the common gathering place for council meetings and for community interaction.

Mayor: Let's take a vote. Who is in favor?

Remainder of crowd (in unison): I am.

Mayor: Next, I'd like to introduce the City Planner.

The planner stands up and approaches the podium to address the crowd.

City Planner: To make the central marketplace and the development of the city beneficial to all, we need to build a system of roadways that will suit the needs of the residents. (The City Planner holds up a drawing that resembles a "wagon wheel" with a central area and spirals that radiate out, and shows it to the crowd.) By building a street pattern that radiates from the central marketplace, it will be easier to deliver goods to town and to travel from one place to the next.

The mayor and the three city council members nod.

Mayor: Please draw up a more complete plan, City Planner, and we'll vote on it at the next City Council meeting.

The City Planner nods in agreement and sits down. Citizen #1 raises his hand and is called on by the Mayor.

Mayor (to Citizen #1): It is your turn to address the crowd.

Citizen #1: We need a system to keep waste from running into our streets and contaminating our land and water supply. How will we address this important issue?

Civil Engineer: I can design a sewer system that will allow waste to run into an underground tank and keep our land and drinking water clean and our citizens healthy.

Tax Collector: We can set up an appropriate system of taxation that will bring income to the King, but also will provide a source of funding to pay our teachers, maintain our new roads and pay for police and fire services to protect our new city.

The Citizens (in unison): We don't mind paying taxes that will protect our people.

City Councilman #3: What about controlling crime and putting out fires?



Fifth Grade ♦ Lesson Two



Policeman: We'll add members to our police force, using some of the new taxes to pay for them.

Fireman: And we can use tax money to add more firefighters to protect our citizens as well.

Tax Collector: Using tax money instead of the King's money for these services would make him happy as well.

Mayor: Next, I'd like to introduce our Architect. Not only does our Architect design beautiful, functional buildings, she can tell us how we can design cities that will live on for our descendants to enjoy and how all of the elements of the city we've discussed so far can work together to form a better built environment.

The architect stands and approaches the podium.

Architect: We've had some great ideas presented today, and a big part of making the ideas work — building our new city into a place where people want to live and that will last — is making sure they work together.

The Architect takes out a plan showing a drawing of several buildings making up a city.

Architect: By taking the suggestions of the City Planner and plotting a grid marking out lots of land — as well as building a road system that brings traffic into the central marketplace from the farmlands — we can ensure that farmers and others can come into the city to sell and trade, while protecting their land from being built upon. In other words, if we use responsibility in our built environment, we'll be able to protect our natural environment and make it sustainable.

City Planner: And establish a city that is beautiful and timeless, and will last for generations to come.

Religious Leader: The Architect is right — good buildings with meaning are important to our citizens. Our church is designed to make people feel spiritual and is an important part of our new city.

Teacher: And good buildings, like schools, provide a great place for children to learn.

Mayor: Then it is decided - we will begin our city, using the input of everyone we heard today. We will gather again tomorrow to start planning our new city. All in favor say "yes."

Citizens (in unison): Yes!



Fifth Grade ♦ Lesson Two



Mayor: I will let the King know about our ideas and inform him we will start the planning for our city tomorrow.

Scene #3 – Back at the Castle

The Mayor leaves the meeting and heads towards the King's castle. The King's Court Jester shows the Mayor into the castle.

Mayor (to King): Your Highness, I just finished meeting with many of your subjects regarding the growth of the Kingdom - an Architect, a City Planner, a Teacher, and others. We think that by forming a city, and a city council to manage information and make decisions, it leaves you time to enjoy your kingdom. The new city also will generate additional taxes to pay for its operation, as well as make additional tax money for you to keep. Do you approve of our plan to go forward with forming the city?

King: What a great idea! Go ahead and start the plans for the city, and keep me informed on the decisions that are made.

Mayor: Thank you, Your Highness.

The End



Fifth Grade ♦ Lesson Three



**FIFTH GRADE
LESSON NO. 3**

CITY PLANNING

LENGTH OF LESSON:

30 - 60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

- A. Become aware that cities change over time through growth and contraction and demographic and economic shifts
- English/Language Arts
 - Meaning and communication
 - Social Studies
 - Historical perspective
 - Geographic perspective
 - Economic perspective
- B. Understand that changes in cities can be controlled through the city planning process
- Social Studies
 - Historical perspective
 - Geographic perspective
 - Economic perspective
 - Civic perspective
 - Visual Arts
 - Arts in context
 - Analyzing in context

GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter.

ARCHITECTURAL PRINCIPLES:

Form follows function is a design approach whereby the form of a building is determined by the function of its spaces and its parts.



Fifth Grade ♦ Lesson Three



Mass creates form, which occupies space and brings into being a spatial articulation.

Social structure, culture and the built environment have a direct influence on one another.

Order is the arrangement and organization of elements to help solve visual and functional problems.

Balance is the creation of visual harmony through the use of color and the manipulation of form.

Symbolism is an important means of visual communication for architecture.

Sustainable design of the built environment protects the natural environment.

Climate and the natural environment influence design decisions.

Nature is a model for architectural forms and shapes.

Social structure, culture and the built environment have a direct influence on each other.

Past, current and future technologies influence design decisions.

MATERIALS

1. Visual aids for "city planner" presentation (provided by your local planning official)
2. 8 1/2 x 11-inch "Undeveloped Land Use Map" (included - teacher will need to enlarge to 11" x 17" format) for each student
3. Pencils and eraser

VOCABULARY (See glossary for definitions)

- | | | |
|-----------------|-------------------|---------------------|
| 1. City planner | 4. Infrastructure | 6. Master Plan |
| 2. Demographer | 5. Land Use | 7. Zoning Ordinance |
| 3. Geographer | | |



Fifth Grade ♦ Lesson Three



BACKGROUND INFORMATION

1. City planning is the process for guiding the development of cities. City planners are people who advise local governmental officials about how to improve their city. City planners generally are involved in the physical layout of the city, and sometimes they are also specialists in economics and finance or social programs as well.
2. Frequently, city planners develop master plans that reflect the desired goals for the community's physical plan. The master plan is a map that shows where various land uses should be located within the city. These uses include streets, parks, governmental facilities, residential structures, shopping areas, offices, schools, religious institutions, factories and other types of buildings.
3. To prepare a master plan, many experts work with the city planner as part of the city-planning process:
 - a. Engineers study roads, underground utilities and above ground utilities.
 - b. Finance specialists advise on paying for changes.
 - c. Geographers study natural land features.
 - d. Demographers study population characteristics.
 - e. Wetlands and woodlands specialists advise on the impact the development will have on lakes, streams, forest and wildlife.
 - f. Environmental consultants advise on other impacts to the natural environment, such as soil contamination and soil erosion.
4. Master plans are implemented after being adopted by the city council. They are implemented with a document called a "zoning ordinance," which gives development guidelines for all land in the city.

ACTIVITY

- A. Contact the local planning official to have him/her meet with the class to discuss city planning in the students' own community. The city planner may have visual aids available to illustrate the discussion.



Fifth Grade ♦ Lesson Three



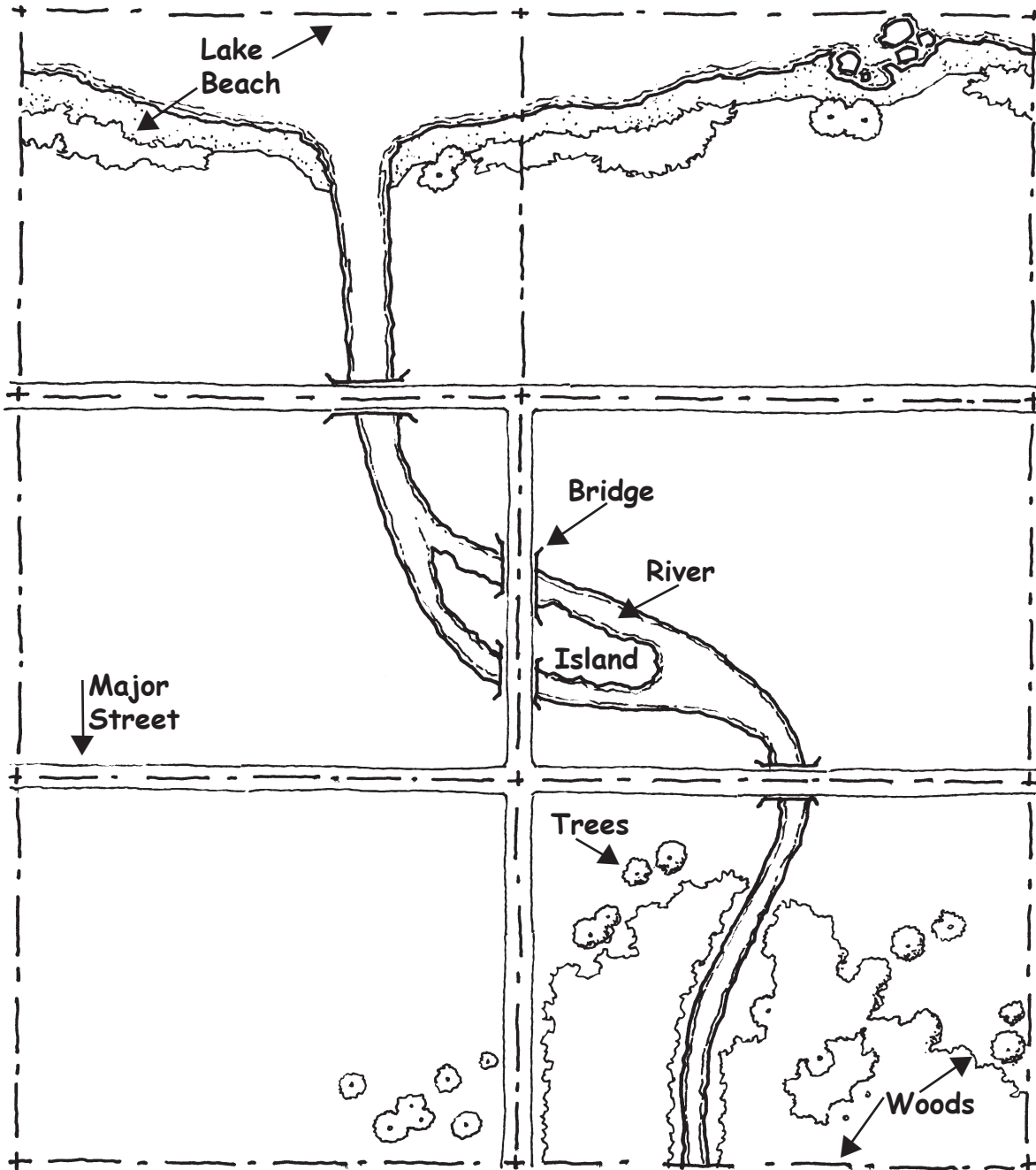
- B. Provide each student with a copy of the "Undeveloped Land Use Map" in an 11 x 17-inch format. The edge of the paper will be the boundary of each student's city. Using the land uses from Lesson No. 1, have the students locate all the land-use components on their map. They should locate land uses that relate to one another in an organized manner. For example, residences should be near shopping. Use a dotted line to identify the edges of each land use area. Label each area with a pencil. The labels may be erased and relocated in the final layout in Lesson No. 4. Save this "Land Use Map" for use with Lesson No. 4.

TEACHER'S EVALUATION

- A. Utilize class discussion to analyze students' awareness and understanding of planning processes and requirements.
- B. Evaluate their "Land Use Maps" to see if each student understands the concepts of city planning.



Fifth Grade ♦ Lesson Three



Undeveloped Land Use Map for City Model
Note Scale:FIFTH GRADE



Fifth Grade ♦ Lesson Four



FIFTH GRADE LESSON NO. 4

INFRASTRUCTURES

LENGTH OF LESSON:

30 - 60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

- A. Understand the various components of a city infrastructure
 - Social Studies
 - Geographic perspective
 - Science
 - Use scientific knowledge from physical sciences in real-world contexts
- B. Begin to develop an understanding of the relationship of infrastructure to city planning
 - English/Language Arts
 - Inquiry and research
 - Social Studies
 - Geographic perspective
 - Science
 - Construct mass scientific and personal knowledge
 - Use scientific knowledge from the physical sciences in real-world contexts

GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter.

ARCHITECTURAL PRINCIPLES:

Design is accomplished by composing the physical characteristics of size, shape, texture, proportion, scale, mass and color.

Order is the arrangement and organization of elements to help solve visual and functional problems.



Fifth Grade ♦ Lesson Four



Visual thinking is a key to awareness of the built environment.

Nature is a model for architectural forms and shape.

Sustainable design of the built environment protects the natural environment.

Social structure, culture and the built environment have a direct influence on one another.

Climate and the natural environment influence design decisions

Past, current and future technologies influence design decisions.

MATERIALS

1. "Land Use Map" (11 x 17-inch size) made in Lesson No. 3
2. Erasers, colored pencils and markers
3. Three-Dimensional Cut-Away View of an Infrastructure (included)

VOCABULARY (See glossary for definitions)

1. Infrastructure
2. Sanitary
3. Sewer
4. Utilities

BACKGROUND INFORMATION

1. Infrastructure is the organization of utility systems, road systems and public services in a city or a region. These include the following:
 - a. Roads, bridges, highways, sidewalks and bikepaths
 - b. Sanitary and storm-water sewers
 - c. Water, electric and gas supplies
 - d. Telecommunications, telephone and cable TV
 - e. Cell phone, radio, TV and internet
 - f. Police, fire and ambulance systems
 - g. Garbage and recycling services



Fifth Grade ♦ Lesson Four



- h. Recreational services like parks and golf courses
- i. Natural infrastructure such as lakes and streams

These elements have distribution systems that reach every place (or nearly every place) in a community. It is what people have come to expect as part of the services that every community provides.

ACTIVITY

- A. Using the Three-Dimensional Cut-Away View of an Infrastructure, discuss with students how each of these elements has a component that must be distributed throughout the city. Some are visible and some are not. Examples:
1. Transportation System: Including streets and sidewalks as well as parking facilities, bus services, light rail systems, etc. Development of residences and businesses often follow available transportation routes and capabilities. Streets may be paved, or may be dirt or gravel.
 2. Sanitary and storm-water sewers: Underground pipes that carry away the wastewater from our homes and businesses are sanitary sewers. Rainwater that is not absorbed into the ground is carried away in storm water pipes. The sanitary sewers lead to water treatment plants that clean the water before it is allowed to go into lakes and streams. Storm water also flows into the lakes and streams, but since it is rainwater, it often does not need treating. Old communities, however, may have combined sanitary and storm sewers that all lead to a water treatment plant.
 3. Water supply pipes: These are underground pipes that bring fresh water to our buildings. In cities they usually come from a water plant that takes water from lakes or from under the ground, uses chemicals to treat impurities, and then distributes the purified water through the underground pipes. In rural areas, the water may come from a well which is fed by underground aquifers, and the water supply comes from the rainwater absorbed by the ground.
 4. Natural gas can be piped long distances through pipelines that lead to buildings in order to provide heat. Many changes will be made in the near future as communities prepare for the incorporation of newer technologies like solar panels and electric cars.
 5. Electrical Power: Whether overhead on poles or buried underground, wires bring electricity from large electrical generators to our buildings. Generators can be powered by burning coal or gas, the water pressure of dams, wind turbines, and nuclear fuel.



Fifth Grade ♦ Lesson Four



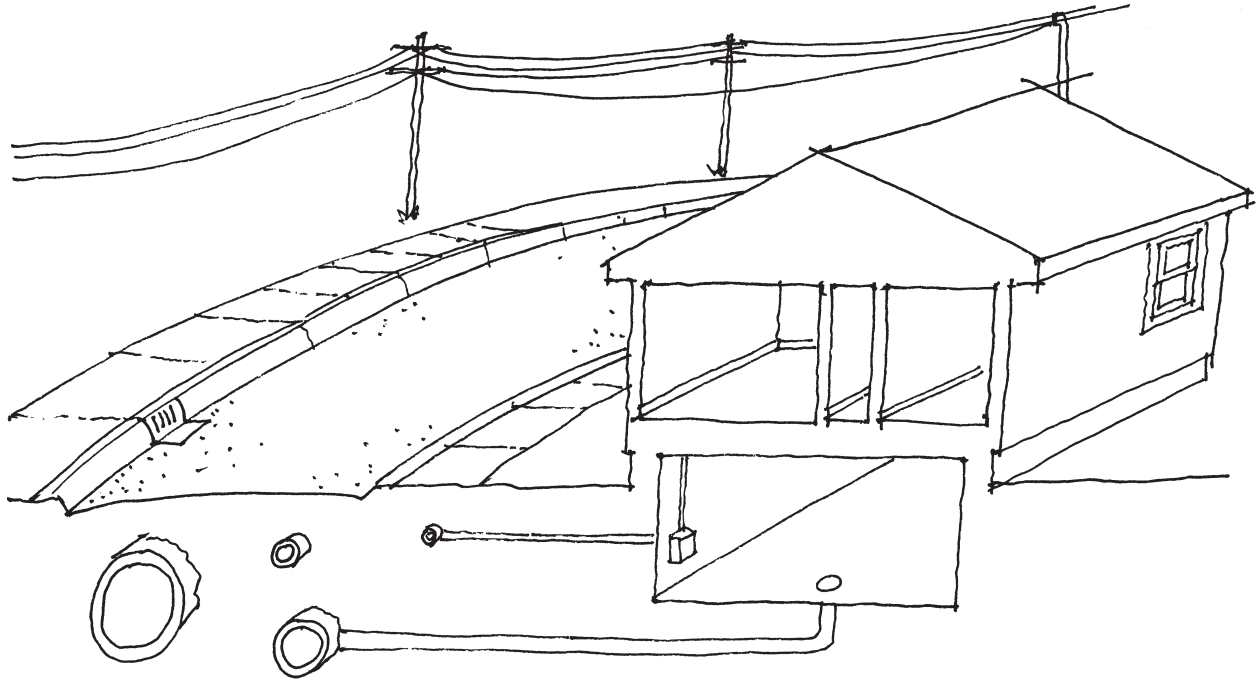
6. Telecommunication: Includes TV, phone and internet. These typically include a combination of wired and wireless connections.
 7. Cell-phone towers and broadcast radio and television towers: These towers are spread throughout the area and distribute their signals through invisible waves in the air. The towers are connected by wires to the power and communication grids.
 8. Police, fire and ambulance systems: Using the street systems, these are the people and vehicles that help to keep order, ensure safety, and provide assistance to people who have emergencies.
- B. Explain that infrastructure items — such as water and sewer lines, electrical, telephone and cable-television lines — often are located near the street and follow the direction of the streets. Once the street network has been designed, all the other infrastructure elements follow the same layout (either above or below ground), in accordance with the relationship indicated in the three-dimensional cut-away view (Activity "A"). Therefore, the street layout is the primary infrastructure element in city planning, ensuring access to both utility and emergency service infrastructure for all properties.
- C. Discuss which changing technologies allow services that are not limited by street layout, such as wireless (Wi-Fi) internet.
- D. Discuss which infrastructure and infrastructure services can help support the environmental sustainability of a community, such as recycling.
- E. To demonstrate their understanding of how infrastructure needs to reach all parts of the city, have students lay out the transportation systems, as described in Paragraph "A-1" above, on their Land Use Map (11 x 17-inch size) prepared in Lesson No. 3.

TEACHER'S EVALUATION

- A. Analyze students' drawing work on their "Land Use Map." Does their infrastructure show a basic understanding of the concepts?
- B. Analyze the students' art work for:
 1. Drawing skills;
 2. Use of artistic skills, including aesthetic use of color and drawing from observation techniques.



Fifth Grade ♦ Lesson Four



Three-Dimensional Cut-Away View
of an Infrastructure



Fifth Grade ♦ Lesson Five



FIFTH GRADE LESSON NO. 5

PRESERVATION

LENGTH OF LESSON:

30 - 60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

- A. Become aware of the role of historical preservation in the community
Social Studies
- Geographic perspective
 - Civic perspective
- B. Understand what a "historical" building is
English/Language Arts
- Meaning and communication
 - Inquiry and research
- Social Studies
- Geographic perspective
 - Civic perspective
- C. Be able to identify historical buildings in the community
English/Language Arts
- Meaning and communication
 - Inquiry and research
- Social Studies
- Geographic perspective
 - Civic perspective
- Visual Arts
- Arts in context
- D. Be able to determine historic/preservation value of an existing building
English/Language Arts
- Meaning and communication
 - Inquiry and research
- Social Studies
- Geographic perspective
 - Civic perspective
- Visual Arts
- Arts in context



Fifth Grade ♦ Lesson Five



GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter.

ARCHITECTURAL PRINCIPLES:

Order is the arrangement and organization of elements to help solve visual and functional problems.

Balance is the creation of visual harmony through the use of color and the manipulation of form.

Nature is a model for architectural forms and shapes.

Visual thinking is a key to awareness of the built environment.

Sustainable design of the built environment protects the natural environment.

Social structure, culture and the built environment have a direct influence on one another.

Climate and the natural environment influence design decisions.

Past, current and future technologies influence design decisions.

MATERIALS

1. Sketch of "Old Town Streetscape" (included) for each student
2. Copy of "Background Information" (make a copy for each student from Lesson No. 5)
3. Photographs of historic building types (included - for Optional Activity "C")



Fifth Grade ♦ Lesson Five



VOCABULARY (See glossary for definitions)

- | | | |
|--------------------|-----------------|-----------------|
| 1. Adaptive re-use | 3. Dilapidation | 5. Preservation |
| 2. Demolish | 4. Historic | 6. Restoration |

BACKGROUND INFORMATION

1. What makes buildings or neighborhoods "historic" and therefore worth preserving? This can be a complicated question, but in simple terms, historic preservation is essentially about saving and maintaining old buildings and places because they have value to us today, in one way or another.
 - a. In some cases, old buildings may be aesthetically pleasing to look at and therefore provide visual enhancement to an area.
 - b. Old buildings are worth preserving if they have sound structure and can be adapted to a new use. This is known as "adaptive re-use" and is a form of recycling, avoiding unnecessary demolition and new construction. This contributes to a reduction in landfill use and therefore aids in preserving the environment.
 - c. In other cases, old buildings have played an important role in history and are worth preserving because they provide a link to the past or to some historical event. They provide a place for people to visit, remember and learn about their history. In some instances, it may be appropriate to restore these buildings to their original condition, perhaps to serve as a museum. Their value may be as a record of a historic architectural style, of which there are few remaining examples.
2. What should we preserve? Any kind of building, from factories to mansions, can be considered worth preserving, as can any size or scale of building, structure or neighborhood.
3. What are the advantages of historic preservation?
 - a. Old buildings enhance the appearance of the streetscape by introducing character through their variety of styles and texture of materials.
 - b. "Adaptive re-use" of suitable old buildings into new functions is usually more economical than demolishing them and constructing new buildings.



Fifth Grade ♦ Lesson Five



- c. Successful historic preservations can often draw visitors to an area, enhancing tourism and contributing to the local economy.
- d. Historic places inform communities about their roots and their past. They also can be a means of passing memories from one generation to the next.

ACTIVITY

- A. Divide the class into groups of 4-6 students each to represent the members of several city-planning boards. Present them with the "Old Town Streetscape" drawing, which shows a series of different buildings in elevation. Below each building is a brief description of some of its characteristics, relating to all or some of the following:

- Age/date of construction
- Association with historic events
- Condition
- Internal planning configuration and use
- Property size and site characteristics

Also give students a copy of the "Background Information" for this lesson plan to use as a reference for Activity "B."

- B. The "Old Town Streetscape" is in the process of being redeveloped, and the planning board has to make a decision for each building about whether it should be demolished for new development, preserved and restored as a museum, preserved for "adaptive re-use," or preserved for its architectural or historical significance. Have the students on each planning board come to a consensus about each building's fate, and giving their reason(s), have a member from each group present their group's decision to the class.
- C. Optional activity: Most communities have a local preservation group. Contact a speaker from the local historical society or a preservation architect. If your community has an area with historic buildings, a field trip with a speaker could help the students develop an awareness of the history of their community and its buildings.



Fifth Grade ♦ Lesson Five



1. Discuss specific old buildings that the students saw on the field trip, or find photographs of old buildings in your community that still exist today and show them to the class. Example photographs of old buildings are included.

TEACHER'S EVALUATION

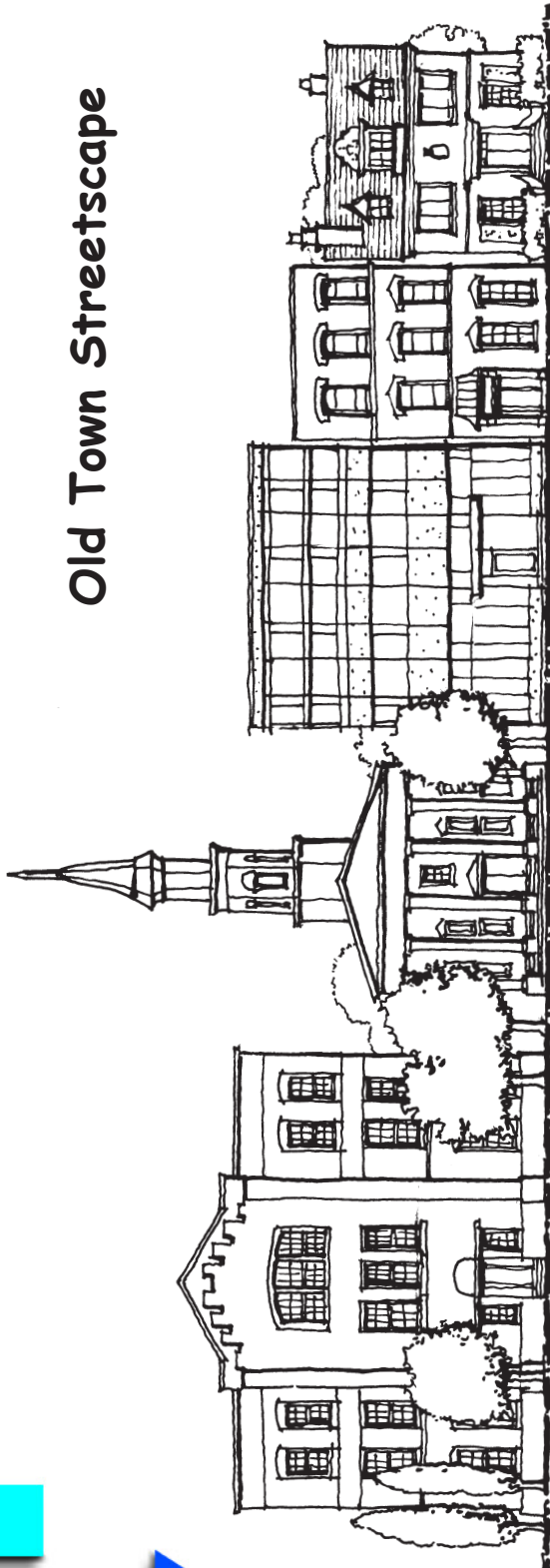
- A. Compare and contrast the planning boards' decisions, noting any differences, and discuss the validity of the decisions to gain an understanding of the students' grasp of the material.



Fifth Grade ♦ Lesson Five



Old Town Streetscape



- Traditional old mill building
- Built in early 1900s
- Masonry construction, using brick made from local clay quarries
- Structure is sound and sturdy
- Large interior spaces
- Mill is no longer in operation and building is vacant

- Traditional style community church building
- Built in late 1800s
- Wooden structure and siding is in sound condition
- Paint and finishes are peeling and flaking, and need maintenance
- Church is currently used by a local congregation
- Attached to the rear of the church is a large garden with mature trees

- Modern office building
- Built in the 1950s
- Steel frame sound
- Exterior building cladding is in disrepair and has degraded as a result of moisture damage
- Many roof leaks
- Exterior glazing and cladding has poor insulation, contributing to high energy usage

- Historic style house
- Built in mid 1800s
- Wood frame structure with brick exterior in good condition except for isolated patches of deterioration due to age
- Interior finishes are worn
- One of a few remaining examples of this architectural style in the town
- Site of the inaugural speech of the first elected mayor

- Traditional style single family house
- Built in late 1800s
- Wood frame structure with wood siding in poor and deteriorated condition
- Shingle roof with many leaks
- Interior is severely damaged
- Broken windows allow in the weather
- Large overgrown yard at rear
- Dwelling is uninhabited/abandoned

Fifth Grade ♦ Lesson Five



Dilapidation



Fifth Grade ♦ Lesson Five



Historic - Victorian Hackley House



Fifth Grade ♦ Lesson Five



**Preservation of a House -
Clawson Historical Society
(Museum That Needs Restoration)**



Fifth Grade ♦ Lesson Five



**Adaptive Re-Use - Schoolhouse
Converted into a Home (Restored)**



Fifth Grade ♦ Lesson Five



Preservation - Victorian House
Restored into Apartments



Fifth Grade ♦ Lesson Six



**FIFTH GRADE
LESSON NO. 6**

BUILDING MATERIALS

LENGTH OF LESSON

30 - 60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

- A. Become familiar with different building materials
Science
 - Construct new scientific and personal knowledge
- B. Learn what building materials are most available locally
English/Language Arts
 - Inquiry and research
 - Skills and processes
Social Studies
 - Geographic perspective
Science
 - Construct new scientific and personal knowledge
 - Use scientific knowledge from physical sciences in real-world contexts
- C. Develop an awareness of the importance of utilizing building materials that are energy efficient and sustainable
English/Language Arts
 - Meaning and communication
 - Depth of understanding
Science
 - Construct new scientific and personal knowledge
 - Use scientific knowledge from physical sciences in real-world contexts

GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter.



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Fifth Grade ♦ Lesson Six



ARCHITECTURAL PRINCIPLES:

Design is accomplished by composing the physical characteristics of size, shape, texture, proportion, scale, mass and color.

Order is the arrangement and organization of elements to help solve visual and functional problems.

Balance is the creation of visual harmony by light, shadow, edges and contrast.

Symbolism is an important means of visual communication for architecture.

Visual thinking is a key to awareness of the built environment.

Sustainable design of the built environment protects the natural environment.

Aesthetics is the artistic component of architecture.

Climate and the natural environment influence design decisions.

Past, current and future technologies influence design decisions.

MATERIALS

1. "Building Materials Definitions" (included). Make copies for student teams.
2. "Building Materials" worksheet (included). Make copies for student teams.

VOCABULARY (See glossary for definitions)

A. Recycle

B. Renewable Materials

C. Building Materials Vocabulary:

- | | |
|----------------------------|-----------------|
| 1. Acoustical ceiling tile | 4. Brick |
| 2. Aluminum | 5. Ceramic tile |
| 3. Asphalt | 6. Concrete |



Fifth Grade ♦ Lesson Six



- | | |
|---------------|----------------------------|
| 7. Drywall | 12. Stone |
| 8. Glass | 13. Vinyl composition tile |
| 9. Insulation | 14. Waterproofing |
| 10. Plaster | 15. Wood |
| 11. Steel | |

ACTIVITY

- A. Briefly review Lesson No. 1, "History of Cities." When people started to live together in groups, they required housing and/or buildings that were portable and made from light materials (like a teepee) for their nomadic life. These buildings were temporary and did not have a long life. Permanent cities required stronger building materials like wood, brick and stone. Are some materials used more than others for particular types of buildings?
- B. Divide the class into pairs to study the "Building Materials Definitions" (included). Assign a building material to each pair for study. The students' understanding should include where the material comes from and how it is produced. Each team will next answer the questions on the "Building Materials" worksheet (included). The following list encompasses some important building materials for study:

Acoustical ceiling tile	Concrete	Steel
Aluminum	Drywall	Stone
Asphalt	Glass	Vinyl composition tile
Brick	Insulation	Waterproofing
Ceramic tile	Plaster	Wood

- C. The groups should present what they've learned about their building material to the class. Each oral presentation should be brief, so the entire class can learn about all the building materials.

TEACHER'S EVALUATION

- A. Check student worksheets
- B. Utilize question-and-answer period to analyze student awareness and understanding of building materials and their use.



Fifth Grade ♦ Lesson Six



BUILDING MATERIALS

Team Members: _____

Material Researched: _____

1. Source: Where does it come from? (For example, bricks are made from clay, which comes from the ground).

2. Production: How is it shaped or formed for use as a building material?

3. Life span: How long can it be expected to last?

4. Recycling: Is it reusable? If so, how is it recycled?

5. Use: How is it used as a building material (for decoration, to support the structure, etc.)?



Fifth Grade ♦ Lesson Six



BUILDING MATERIAL DEFINITIONS

ACOUSTICAL CEILING TILE

The tile itself is made from gypsum or mineral fiber. Gypsum is a mineral that is mined from the earth. Mineral fiber is a wood fiber infused with a mineral called slag, which is a by-product of the steel process. The gypsum or mineral fiber is formed into boards and cut into tiles. Acoustical ceiling tiles can also be made from recycling old ceiling tiles. Reclaiming waste can help preserve natural resources. Another environmentally sound alternative includes manufacturing ceiling tiles with recycled paper and corn or wheat binders. Corn and wheat binders are renewable agricultural materials that differ from traditional binders because they aren't made from petroleum-based chemicals. Small holes are then punched into the tiles to help absorb sound. This helps prevent the sound waves from bouncing off hard surfaces, creating echoes. Acoustical tile is generally used on ceilings of rooms where the control of noise is important. It can also be used on walls with special acoustical requirements, such as in recording studios.

ALUMINUM

Aluminum is a metallic element found in silicate compounds in clay and feldspar. It is often combined with other metals to form alloys, which have greater strength than pure aluminum. Alloys are formed by combining the metals in appropriate proportions, then heating the mixture to a high temperature, where it becomes a molten substance that is formed into shapes by being forced through a mold and then rapidly cooled. This is called extrusion. Aluminum also can be formed into sheets. It resists rusting and is very lightweight.

Aluminum can be used as a structural component or as the outer covering of a building. It is widely used in the automotive industry, as well as for sports equipment (baseball bats) and recreational equipment (boats, planes, bleacher seating). It is popular in home use, for outdoor furniture and cooking utensils, as well as in packaging (aluminum cans).

It is highly recyclable in its original form or can be re-melted to make new items.



Fifth Grade ♦ Lesson Six



ASPHALT

Asphalt is a tar-like substance, found in the earth in a natural state or produced by evaporating petroleum. Petroleum is an oil liquid solution of hydrocarbons. When the liquid is removed (through evaporation), what is left is the tarry substance called asphalt.

Asphalt is used primarily as a surface for roads and playground areas.

Asphalt can last for up to 30 years or so, depending on its use. It can be recycled by grinding it up and reforming it.

BRICK

Brick is made from clay, which comes from the earth. The clay is molded into shapes and then baked in a kiln at a very high temperature, until it is dry and hard.

Bricks come in many different colors and often are used for the exterior finish of buildings. Bricks also are used for the interior walls of buildings, for fireplaces and even as pavers in walkways and for streets. Brick has been known to last for hundreds of years on buildings and about half that when used for roads, where they are subjected to heavy traffic and wear.

When brick buildings are demolished, the bricks can be reclaimed for reuse in other buildings, if properly cleaned by removing the old mortar from their surface. They also can be crushed and used as material for drainage.

CERAMIC TILE

Ceramic tile is made from clay and/or porcelain minerals. The material is fired into various tile shapes and sizes. Some tiles have a glazed finish. Glazing the tile provides a hard, shiny surface that is fused to the clay by using a silicate (sand that is melted to a liquid state).

Ceramic tiles are used for decoration on walls and floors, as well as for countertops and tabletops. The addition of certain metallic ores can create a variety of colors and finishes.

Ceramic tile may be recycled by breaking it into pieces and creating mosaics for art works.



Fifth Grade ♦ Lesson Six



CONCRETE

Concrete is a mixture of sand, aggregate (stone or gravel), cement and water. When the ingredients are mixed in the proper proportions, the result is concrete, which is in a liquid form that is poured, then cured until the water has evaporated and it becomes a solid, strong material.

Concrete can be poured to create roads, driveways, sidewalks, floors and roofs. In its liquid state, it also can be poured in types of molds that form concrete blocks. It can be used to make columns and beams, as well as walls that support a building. Concrete can be formed into many different shapes, including arches and domes. It can be used to make stairs or swimming pools.

Concrete can last for an average of 60 years, if not exposed to great amounts of salt or environmental cycles of freezing and thawing. The older concrete gets, the stronger it becomes. If crushed, concrete can be reused as a base for road and utility construction. Recycling concrete can save energy and landfill costs from construction debris.

DRYWALL

Drywall is made from the mineral gypsum, which is mined from the earth as a powdery substance. It is mixed, compressed and dried into a sheet. Then a thin layer of dense cardboard, made from wood, is placed on both sides of the gypsum. These three layers together make up the final product called "drywall." This process does not use plaster, which requires water; therefore, the term "drywall."

Drywall board is used as a finishing material for ceilings and walls. Drywall is usually nailed or screwed into place. Then drywall cement (putty) is placed over the nail heads and joints between adjacent drywall boards. After the cement is sanded smooth, the surfaces are usually painted. Used drywall can be recycled.

GLASS

Glass: A hard, brittle, transparent substance, sometimes translucent, not too often opaque, that is made by fusing silicates (usually sand), potash (potassium carbonate) and lime; all the elements in glass come from the earth.

Fusing: To melt, to liquefy by heat, to make fluid.



Fifth Grade ♦ Lesson Six



Silica: Silicon dioxide, a hard mineral found in the form of sand, quartz, opal.

Potash: Potassium carbonate, a hard, white, brittle crystalline compound.

Lime: A hard, white substance, calcium oxide, obtained by applying heat to limestone, which is a rock composed of the minerals calcite or dolomite or both.

Glass comes in many forms, such as plate glass for windows and mirrors. When heated, it becomes very supple and can be blown into vases and bottles, and rolled or molded to create other forms. Depending on what is added to the heating process (metallic oxides or pigments), glass can take on different colors and characteristics. It often is used, for example, to create stained glass.

Glass can last forever, but it is always in a liquid state, a very slow, thick, liquid state. Glass can be reheated and reused to make more glass, or it can be broken up and used as mosaics in art work.

INSULATION

Insulation comes in a variety of forms. It can be a "cementitious" (hard but very porous) material made from concrete that can be attached to other materials with nails, or it can be a fibrous material "blown" into an attic or wall. Insulation also comes in batt form, which is usually made from fiberglass (fine threads of glass) with a paper or foil backing. Batt insulation comes in rolls for easy installation. Another form of insulation is styrofoam, a lightweight plastic-like material that comes in solid sheets or balls.

As a building material, insulation is used to keep hot air out during the summer and cold air out during the winter. It is used in walls, ceilings and roofs. Styrofoam insulation is used as an insulator against impact during shipping of breakable or delicate items. It absorbs the energy of impact that could dent, bend or break items being transported. Insulation material also is used for coolers; it helps retain the cold inside the cooler for food or drinks. Some insulation helps absorb sound waves from penetrating through walls or roofs. This is important in theaters and auditoriums.

Most insulation will last as long as the building in which it is found, unless damaged by water.



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PLASTER

Plaster is a pasty mixture of lime, sand and water that is spread on a base form. This base form is called "lath," and can be either a special gypsum board lath or a metal lath that looks like chicken-wire fencing. The plaster is smoothed out and, when dry, is sanded to a smooth finish. This surface forms the wall or ceiling of a room. It is usually painted for the final finish.

As a surface material, plaster has generally been replaced with drywall. Traditional plaster, more often found in older buildings, is now typically used to create fancier finishes like archways or coves in ceilings and walls.

Plaster can also be used to create sculptures in art.

STEEL

Steel is made from natural materials of iron ore, carbon and nickel. These materials are mixed together in appropriate proportions and then heated together until they become a red-hot molten liquid, which is then cooled down to a solid. During cooling, the steel can be pushed through forms (extruded) to create different shapes of steel.

These shapes are used to form the steel frame structure of buildings. The shapes can be in the form of a beam that looks like an "I," known as an "I-beam," or in square "L" shapes, known as angles. They also can be square, rectangular and round shapes. These shapes are used to support buildings. They become the beams and columns of a building.

Steel has strength and durability. It can be used in buildings, cars, furniture and as a material for sculptures (art work). Existing steel can be melted down and re-used to make new steel.

Steel can last hundreds of years if protected from the elements and from the process called oxidation, which causes rust. Rust can slowly eat away (erode) the steel and make it weak.



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STONE

Stone is a natural material found in the earth. It is formed from the earth's pressure, which makes it hard and durable.

Stone, in its natural state, is excavated or removed from the ground. Usually, it is in a very large three-dimensional form of irregular shape. A stone cutter can cut stone into a variety of shapes. Some stone shapes can be cut with the same thickness, like slices of bread, and used as a decorative pattern for walls and floors. Some stones, when used as a decorative finish for a wall or floor, can be polished and given a very smooth, shiny surface. Stone also can be left as a natural "boulder" and used to form a "retaining wall" for holding the earth back on one side of an area.

Stone can last for hundreds of years. When crushed to pebble size, it can be re-used for drainage material.

VINYL COMPOSITION TILE

Vinyl composition tile is a mix of special plastic binder, fillers and colored pigments, and is used primarily for floor covering. It is usually cut into uniform squares of 12 x 12 inches. The vinyl is made from polyvinyl chloride, which is formed by the joining of two or more like molecules to form a more complex molecule. This special plastic in its liquid state is dried by heat that fuses the raw materials into a durable sheet. The durable sheet is then bonded to a felt backing. A clear layer of polyvinyl chloride is then added to the top of the colored durable sheet to protect the coloring.

Vinyl composition tile can last for 30 years, but often is replaced sooner because of new colors and patterns. It can be recycled to make more vinyl composition tile.

WATERPROOFING

Waterproofing prevents water from entering and damaging the exterior and interior of buildings.



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One type of waterproofing is sheet waterproofing; it is usually a fused plastic called polyvinyl that is attached to the outside of a wall or under a floor. Another type of waterproofing is a rubberized liquid or an oil-tar type substance that is rolled onto outside surfaces.

Waterproofing is attached to the exterior of basement walls, underneath concrete floor slabs, under showers in a bathroom and in other areas where water damage could be a problem.

WOOD

Wood comes from trees. Wood is used for framing buildings and for supporting the building itself. It also is used for flooring, decking, doors, stairways, furniture, window frames, bridges, artwork, boats and trim work around windows, doors and baseboards. Some of the species of trees that are used for constructing the framework of a building are Southern pine, Douglas fir and white pine. Species of trees that are employed for decorative use include maple, oak, birch, redwood and cedar.

Trees are cut down in the forest and sent to the sawmill as cylinder-shaped logs. There they are stripped of their bark and cut into uniform planks. The most common plank size is a "2 by 4" or a "2 by 6." Planks can come in a variety of widths and lengths.

Wood lasts for an average of 80 years, depending on if it is protected from repetitive wetting and drying cycles and from insects such as termites.

The bark of wood can be used in landscaping as wood chips to give a finished look around plants and trees. It also helps to keep moisture in the ground around plants, so less watering is needed. Wood can be recycled as fiber for making composite board.

Sustainable wood comes from forests that are managed so that we don't deplete our wood supply.



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**FIFTH GRADE
LESSON NO. 7**

OUR ENVIRONMENT

LENGTH OF LESSON:

30 - 60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

- A. Become aware of the major environmental issues that affect our communities
- English/Language Arts
- Inquiry and research
 - Depth of understanding
- Social Studies
- Geographic perspective
- Science
- Use scientific knowledge from the physical sciences in real-world contexts
 - User scientific knowledge from earth and space sciences in real-world contexts
- B. Understand ways of preventing pollution and over-consumption of natural resources.
- English/Language Arts
- Inquiry and research
 - Depth of understanding
- Social Studies
- Geographical perspective
- Science
- Use scientific knowledge from the physical sciences in real-world contexts
 - User scientific knowledge from earth and space sciences in real-world contexts

GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter



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ARCHITECTURAL PRINCIPLES:

Design is accomplished by composing the physical characteristics of size, shape, texture, proportion, scale, mass and color.

Order is the arrangement and organization of elements to help solve visual and functional problems.

Balance is the creation of visual harmony through the use of color and the manipulation of form.

Visual thinking is a key to awareness of the built environment.

Sustainable design of the built environment protects the natural environment.

Climate and the natural environment influence design decisions.

Past, current and future technologies influence design decisions.

Nature is a model for architectural forms and shapes.

Social structure, culture and the built environment have a direct influence on one another.

MATERIALS

1. A copy of the "Community Care for our Environment" chart (included) for each student
2. A copy of the "Personal/Family Care for our Environment" chart (included) for each student
3. Eight standard poster boards, titled as follows:
 1. "Community Land Use"
 2. "Community Water Use"
 3. "Community Air Supply"
 4. "Community Energy Supply"
 5. "Personal Land Use"
 6. "Personal Water Use"
 7. "Personal Air Supply"
 8. "Personal Energy Supply"
4. Pencils and paper
5. Glue



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VOCABULARY (See glossary for definitions)

- | | | |
|----------------------|-------------------|-------------------|
| 1. Environment | 3. Overpopulation | 5. Wilderness |
| 2. Natural Resources | 4. Pollution | 6. Sustainability |

BACKGROUND INFORMATION

1. As our nation developed and our cities grew, we have relied on our natural resources. Natural resources are things that are made by nature, not manufactured by people. They include:
 - a. Water
 - b. Trees
 - c. Rocks
 - d. Air
 - e. Oil
 - f. Coal
 - g. Iron Ore
 - h. Other minerals in the ground (diamonds, gold, silver, copper, etc.)
2. As we have built our cities, some of these natural resources have been depleted more quickly than they can be reproduced by nature. Forests have been cleared for construction of cities. Mining has produced large open pits in the ground. Some resources, like oil, are available in great quantity only from distant areas that make their transportation costs very expensive. With the development of manufacturing plants, industrial processes have produced byproducts that have escaped into the air, making it unsafe to breathe, and entered the water, making it unsafe for drinking and/or use for recreation. This is called "pollution," and it damages the environment.

ACTIVITY

- A. Hand out copies of the "Community Care for our Environment" chart to each student. Discuss how we can preserve and make more efficient use of our land, water, air and energy. This is called Sustainability. Students should be aware of environmental issues and have some of their own ideas to add to the following lists.



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1. Land use:
 - a. Control suburban sprawl with less destruction of our wilderness and wild-life areas;
 - b. Alternate means of transportation. Allow for mass transit to cut down on parking lots for cars.
 - c. More efficient land-use planning for residential, shopping, office, manufacturing, school and park areas.
 - d. Combine areas and mix uses so that people can easily walk from home to shopping and work.
 2. Water use:
 - a. Stop pollution into rivers and lakes;
 - b. Recycle water by filtration; use rainwater for irrigation and flushing toilets;
 - c. Less water use by private citizens and industry by using water-efficient fixtures;
 3. Air supply:
 - a. Stop air pollution caused by building waste and vehicle emissions. Recycle and promote clean sources of energy;
 - b. Use of equipment that reduces air pollution;
 - c. Develop materials that do not pollute the air when used.
 4. Energy supply:
 - a. Build more energy-efficient buildings;
 - b. Design more fuel-efficient transportation vehicles;
 - c. Promote renewable energy sources like the wind and sun;
 - d. Develop more efficient industrial production.
- B. On their student handout of the "Community Care for our Environment" chart, have students write their ideas under each of the four categories in the space provided.
- C. Hand out copies of the "Personal/Family Care for our Environment" chart to students. Ask them what they personally can do to assist in energy conservation and air and water pollution control in their homes and everyday lives. Have each student discuss his/her ideas and write them in the space provided for each category.



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- D. Have the class prepare 8 individual poster boards, one for each category on the two charts. The students should transpose their comments from their hand-out charts to the appropriate poster boards, for display. The boards should be titled for each category, and they can be enhanced by the students with art-work and graphics, based on the graphic ideas illustrated on the handouts.

TEACHER'S EVALUATION

- A. Analyze each student's awareness and understanding of the environmental issues that affect cities and the way we live.



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Community Care For Our Environment

Land Use



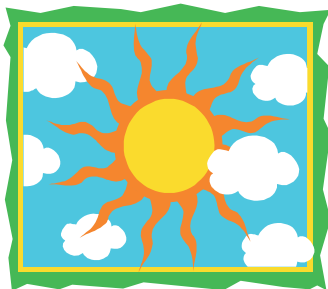
- Control suburban sprawl
- Fewer roads

Water Use



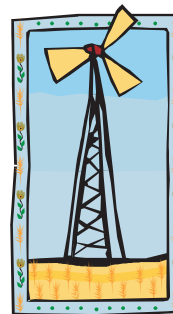
- Stop 'dumping' in rivers and lakes
- Recycle water by filtration

Air Supply



- Stop air pollution
- Use equipment to clean the air

Energy Supply



- Build energy efficient buildings
- Design energy efficient vehicles
- Develop new energy sources, like the wind and sun



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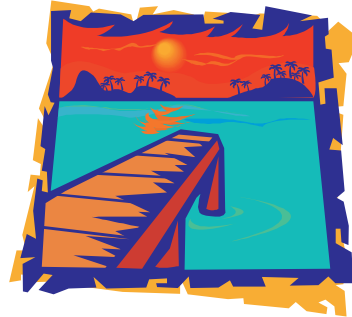
Personal/Family Care For Our Environment

Land Use



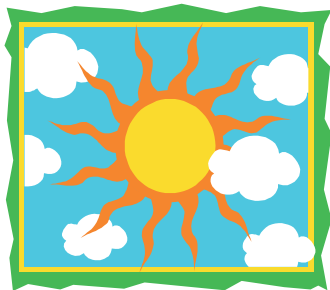
- Reduce littering
- Recycle household items (to reduce landfill)
- Careful use of fertilizers to reduce chemical run-off into waterways
- Cultivate lawn to reduce rainwater run-off

Water Use



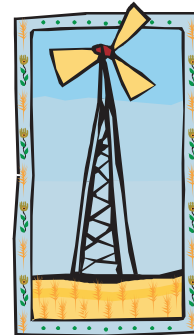
- Turn off faucet; do not leave running when not in use
- Replace leaky washers
- Shower in preference to a bath, and limit the length of time

Air Supply



- Do not refuel vehicles in very hot temperatures to reduce ozone
- Do not use gas lawn mowers in very high temperatures

Energy Supply



- Switch off lights when leaving a room
- Reduce winter furnace temperatures in the home
- Reduce air conditioning use in summer
- Use hot water only when necessary
- Do not shower longer than necessary

Fifth Grade ♦ Lesson Eight



**FIFTH GRADE
LESSON NO. 8**

DESIGN A CITY - PART 1

LENGTH OF LESSON

60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

A. Develop an understanding of the importance of organizing the elements of a city as part of the planning process

Social Studies

- Historical perspective
- Geographic perspective
- Civic perspective
- Public discourse and decision making

Science

- Reflect on the nature, adequacy and connections across scientific knowledge
- Use scientific knowledge from the physical sciences in real-world contexts

B. Understand the relationship of different physical components of a city

English/Language Arts

- Meaning and communication
- Depth of understanding

Social Studies

- Geographic perspective

Visual Arts

- Arts in context

C. Integrate the previous lessons into the "Design of a City," including history, politics, economics, preservation, infrastructure, building materials and environmental issues

English/Language Arts

- Meaning and communication
- Depth of understanding

Social Studies

- Historical perspective
- Geographic perspective
- Economic perspective
- Civic perspective
- Public discourse and decision making



Fifth Grade ♦ Lesson Eight



GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter.

ARCHITECTURAL PRINCIPLES:

Design is accomplished by composing the physical characteristics of size, shape, texture, proportion, scale, mass and color.

Order is the arrangement and organization of elements to help solve visual and functional problems.

Balance is the creation of visual harmony through the use of color and the manipulation of form.

Form follows function is a design approach where the form of the building is determined by the function of its spaces and its parts.

Symbolism is an important means of visual communication for architecture.

Visual thinking is a key to awareness of the built environment.

Sustainable design of the built environment protects the natural environment.

Climate and the natural environment influence design decisions.

Sustainable design of the built environment protects the natural environment.

Nature is a model for architectural forms and shapes.

Social structure, culture and the built environment have a direct influence on one another.

The creative process is basic to design.

Architecture satisfies emotional and spiritual needs in addition to physical needs.

Past, current and future technologies influence design decisions.



Fifth Grade ♦ Lesson Eight



MATERIALS

1. "Undeveloped Land Use Map" for city model (included)
2. "Sample Poster Board of One Major City Block"
3. Standard poster boards (approximately 18 x 24 inches) (See Activity "C" for quantity of poster boards)
4. Colored pencils or markers

VOCABULARY (See glossary for definitions)

1. Land use
2. Master plan

BACKGROUND INFORMATION

1. Lessons No. 8, 9 and 10 are a sequence of lesson plans that conclude the fifth- grade program. The class will plan and build a city during the three final lessons. The length of the lessons may need to be adjusted by the teacher as the project progresses toward completion. These lessons will use information students learned in Lessons No. 1-7 of the fifth grade, as well as lessons of previous grades.



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ACTIVITY

- A. The class will plan a city that will contain many of the land uses that have been studied in previous lessons (see Lesson No. 3 for reference). On a large sheet of paper or on an overhead projector, show the class the "Undeveloped Land Use Map." The teacher should lead the class in discussing a simple master plan for their new city. Decide what the city will look like. Should they add a railroad line or large freeway? List the land uses that will be included in the city on the chalkboard. This list may include:
- | | |
|------------------------|------------------------------|
| 1. Individual homes | 7. Libraries |
| 2. Apartment buildings | 8. Factories |
| 3. Shopping areas | 9. City Hall |
| 4. Parks | 10. Police and fire stations |
| 5. Schools | 11. Office buildings |
| 6. Religious buildings | 12. Hospitals |
- B. As a class, discuss and locate the land uses on the master-plan drawing ("Undeveloped Land Use Map") of the city. The class should decide where all land uses should be located based on how they relate to one another, and explain their reasons why. For example, neighborhood schools should be located in the residential area. Also locate the major roads, railways, etc.
- C. Divide the class into groups, assign each group related land uses, and hand out poster board(s). Near the edge of each poster board, the students should draw a line around the entire perimeter. The inside rectangle represents the four sides of a city block. The outside rectangle represents one-half of the surrounding streets. The students should draw other elements, such as railroads, large freeways, lakes, etc., on their poster boards.
- D. Decide the location of each land-use (poster board) in the master plan. Place the poster boards together. This will form the total city plan. In order to reassemble the city map for future lessons, make sure to keep a record of how the master plan boards are assembled.
- E. The development of the city master plan will continue in Lesson No. 9.



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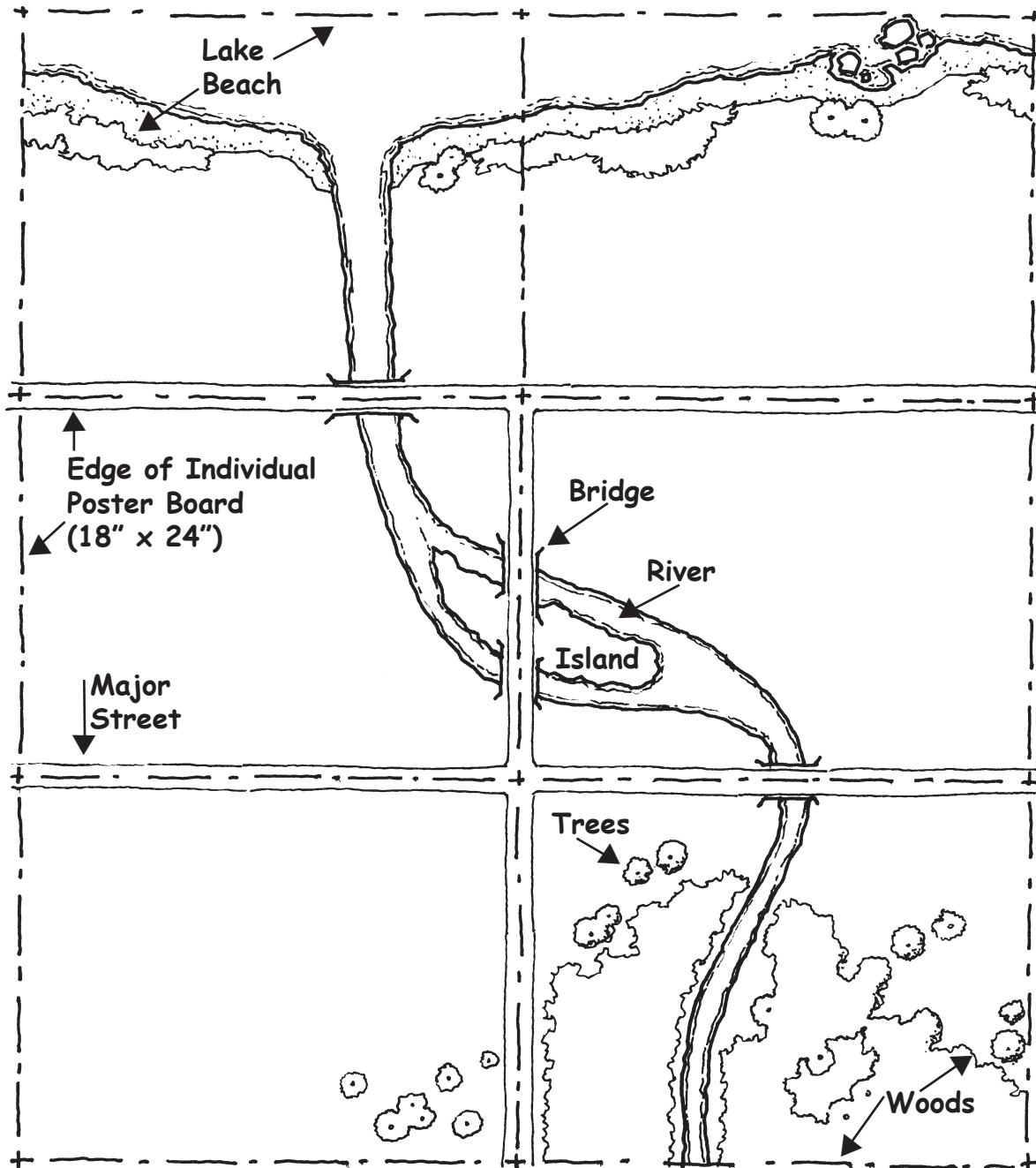


TEACHER'S EVALUATION

- A. Evaluate the development and progress of the students' planning and construction of the city master plan, as well as their understanding of the concepts.



Fifth Grade ♦ Lesson Eight



Undeveloped Land Use Map for City Model

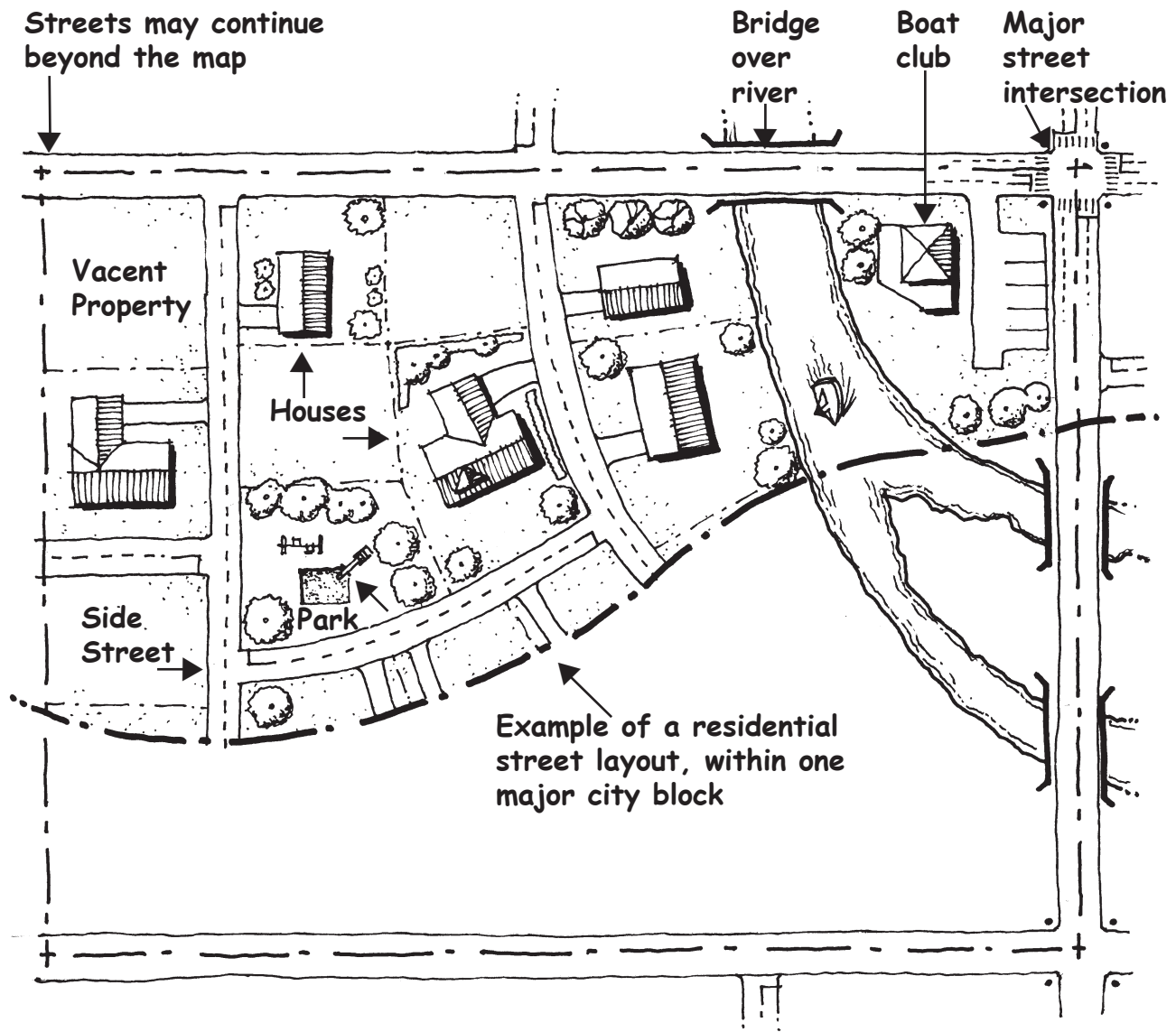
Note Scale: $\frac{1}{8}$ " on the map = 1" on poster board
(1" on poster board = 20 feet in real life)



Fifth Grade ♦ Lesson Eight



Note: The cut out building patterns provided are sized (scaled) to relate to the actual poster board size



Sample Poster Board of One Major City Block

Note Scale: $\frac{1}{4}$ " on the map = 1" on poster board
(1" on poster board = 20 feet in real life)



Fifth Grade ♦ Lesson Nine



**FIFTH GRADE
LESSON NO. 9**

DESIGN A CITY - PART 2

LENGTH OF LESSON

60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

- A. Understand the relationship of different physical components of a city
- English/Language Arts
 - Meaning and communication
 - Depth of understanding
 - Social Studies
 - Geographic perspective
 - Mathematics
 - Geometry and measurement
 - Numerical and algebraic operations and analytical thinking
 - Visual Arts
 - Perform
 - Arts in context
- B. Be able to understand the city in three dimensions and recognize differences in size, proportion and scale
- Mathematics
 - Geometry and measurement
 - Visual Arts
 - Perform
 - Arts in context

GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter.

ARCHITECTURAL PRINCIPLES:

Design is accomplished by composing the physical characteristics of size, shape, texture, proportion, scale, mass and color.



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Order is the arrangement and organization of elements to help solve visual and functional problems.

Visual relationships are determined by light, shadow, edges and contrast.

Balance is the creation of visual harmony through the use of color and the manipulation of form.

Form follows function is a design approach where the form of the building is determined by the function of its spaces and its parts.

Nature is a model for architectural forms and shapes.

Mass creates form, which occupies space and brings into being a spatial articulation.

Symbolism is an important means of visual communication for architecture.

Visual thinking is a key to awareness of the built environment.

Sustainable design of the built environment protects the natural environment.

Social structure, culture and the built environment have a direct influence on one another.

Design is experienced through human sensory perception.

The creative process is basic to design.

Aesthetics is the artistic component of architecture.

Climate and the natural environment influence design decisions.

Architecture satisfies emotional and spiritual needs in addition to physical needs.

Past, current and future technologies influence design decisions.



Fifth Grade ♦ Lesson Nine



MATERIALS

1. Paint and brushes to create roads, lakes, etc.
2. Colored pencils
3. Building cutout sheets with tabs for gluing or taping (included); photocopy for student use
4. Tape and glue
5. Scissors

VOCABULARY (See glossary for definitions)

1. Land use planning
2. Master plan

BACKGROUND INFORMATION

1. Lessons No. 8, 9 and 10 are a sequence of lesson plans that conclude the fifth-grade program. The class will plan and build a city during the three final lesson plans. The time allotted for the lesson plans may need to be adjusted by the teacher as the project progresses toward completion.

ACTIVITY

- A. In the previous lesson, each group was assigned a separate land use(s) as part of the city master plan. In this lesson, each group will design the location of and construct buildings, all reflecting their assigned land use(s), which will then be placed on their city block(s) (poster board(s)).
- B. Have the groups from Lesson No. 8 plan their individual city block(s). The students will need to incorporate side streets and locations of different land uses, which may cross over from one poster board to another. Various groups should work together where necessary.



Fifth Grade ♦ Lesson Nine



NOTE:

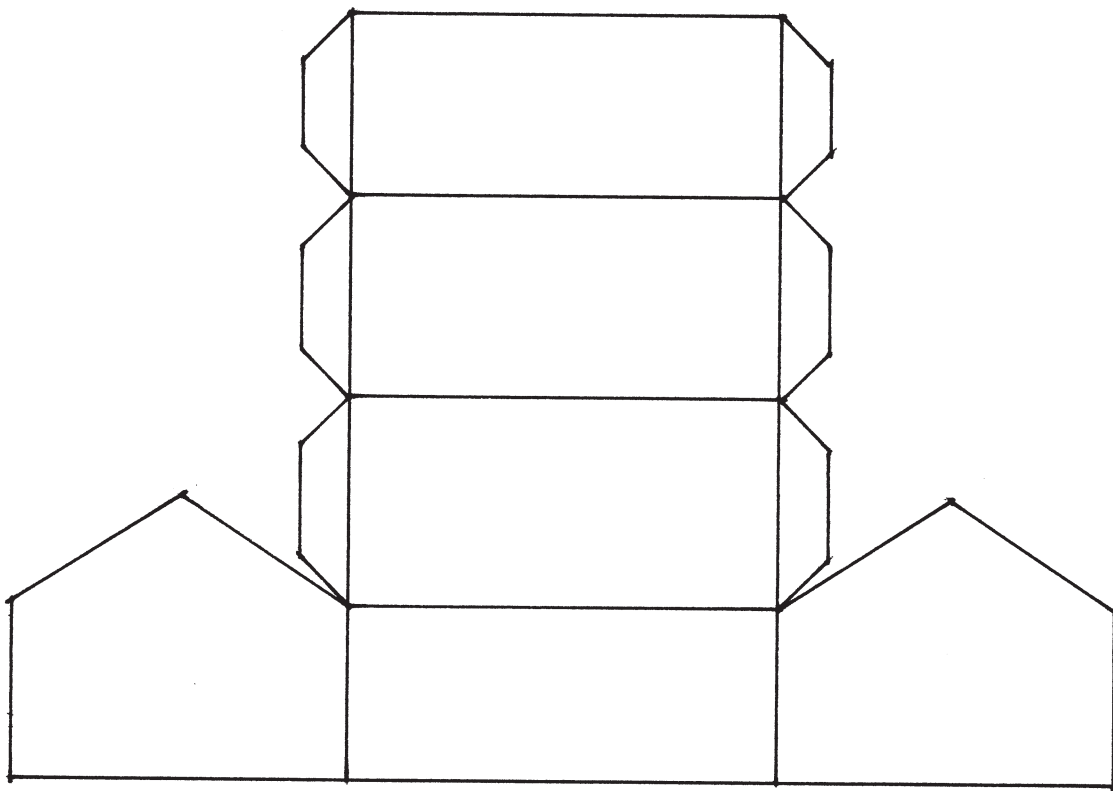
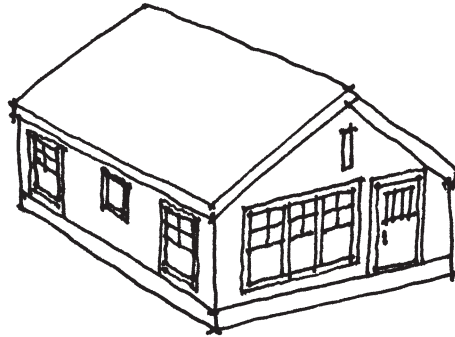
1. The students may start with the poster boards laid on the floor and spaced apart so that each group can plan their boards in the same relationship to one another as in the final assembly.
 2. The teacher may offer guidance in the spacing of side streets within each block, based on the size of the cutout buildings.
- C. The students in each group should determine how many buildings are necessary for their master plan.
- D. Using the building cutout sheets, the students should color the building shapes before they cut them out; then cut out the building shapes.
- E. Have the students assemble their buildings and other constructions (trees, cars, telephone poles, etc.).
- F. Have the students place their buildings on their city block(s), but do not attach them to the poster boards.
- G. The city master plan will continue in Lesson No. 10.

TEACHER'S EVALUATION

- A. Monitor the development and progress of the student planning and construction of the city master plan.



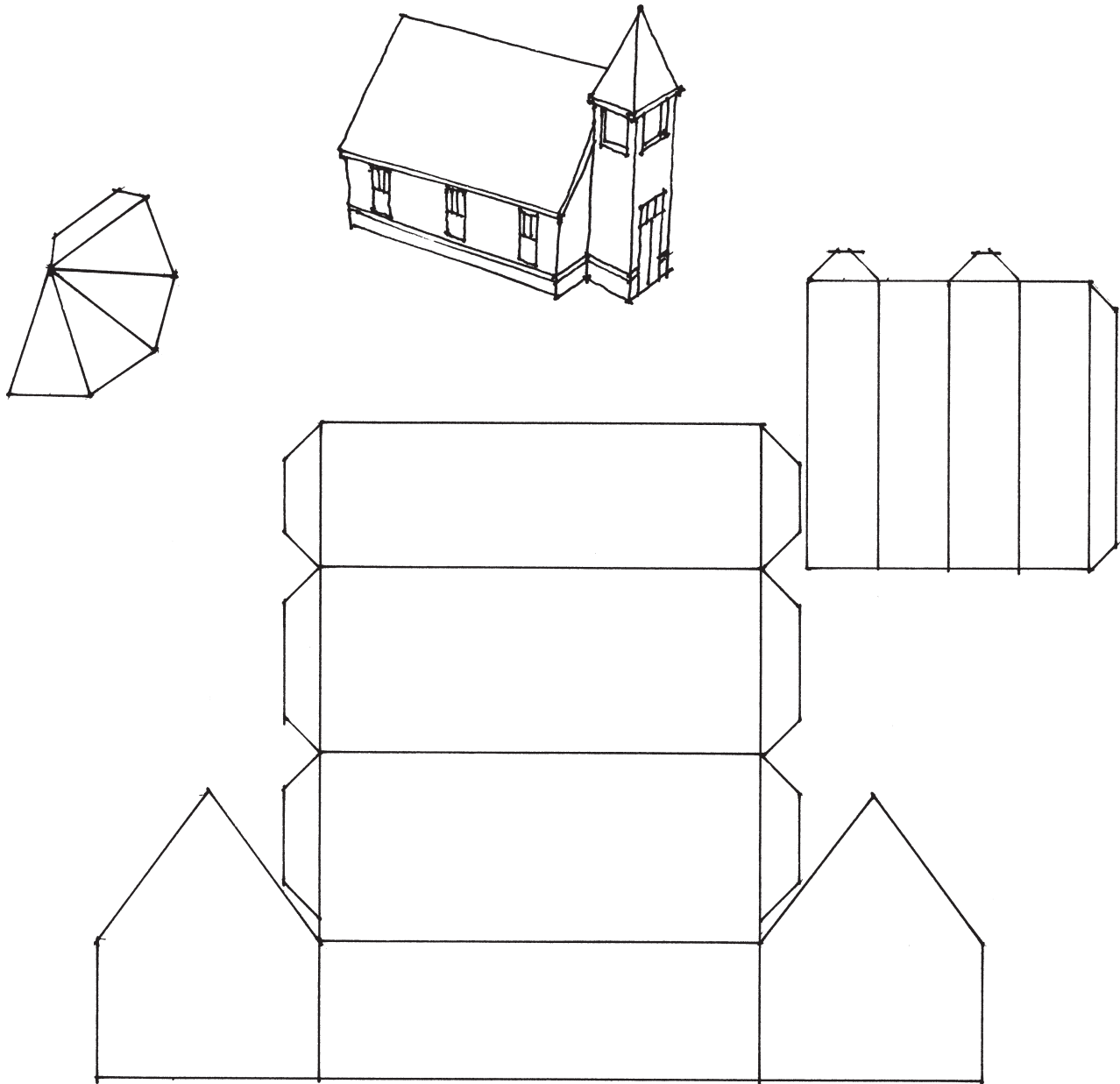
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Building Cutout Pattern #1 - A House



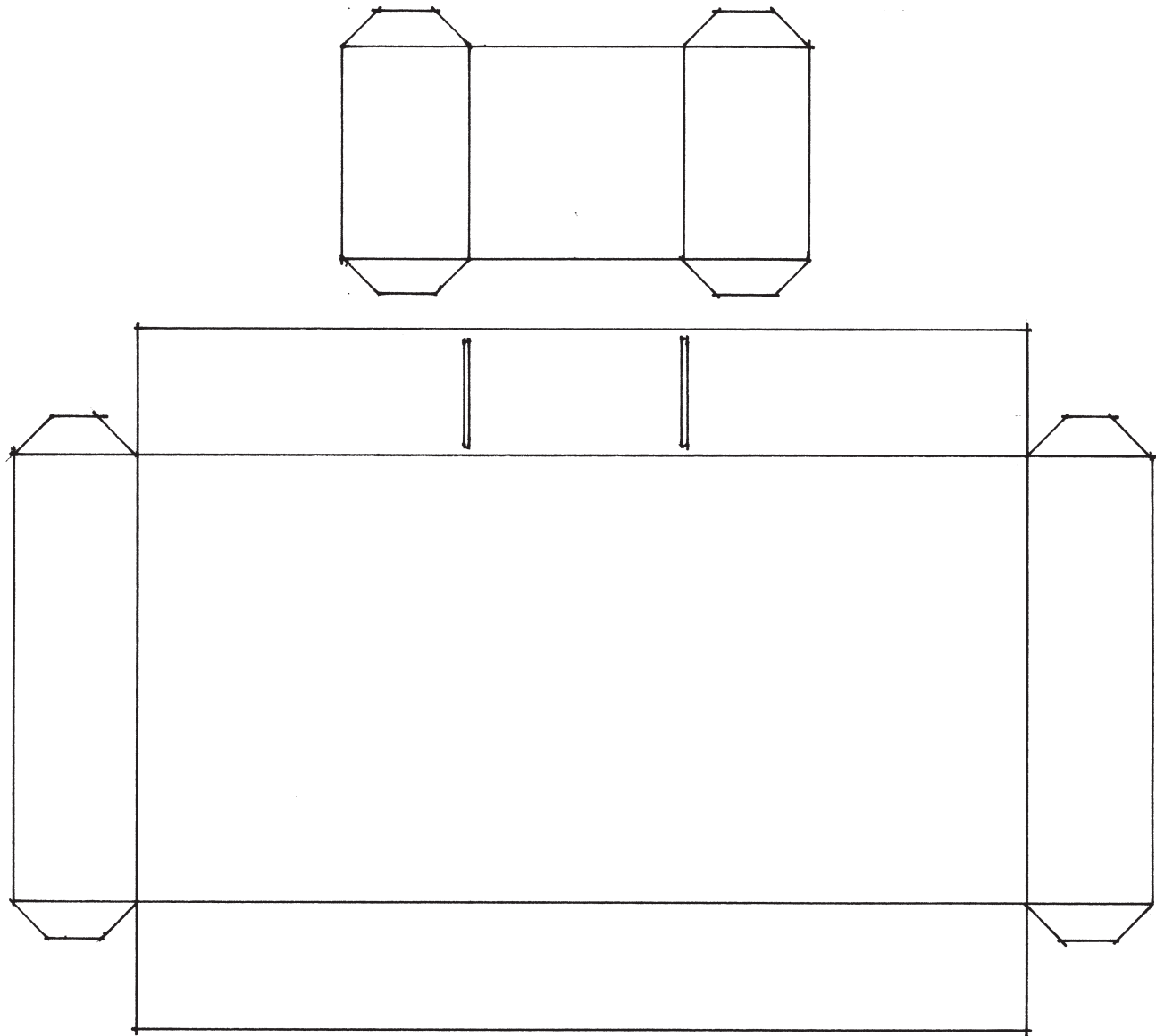
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Building Cutout Pattern #2 - A Church



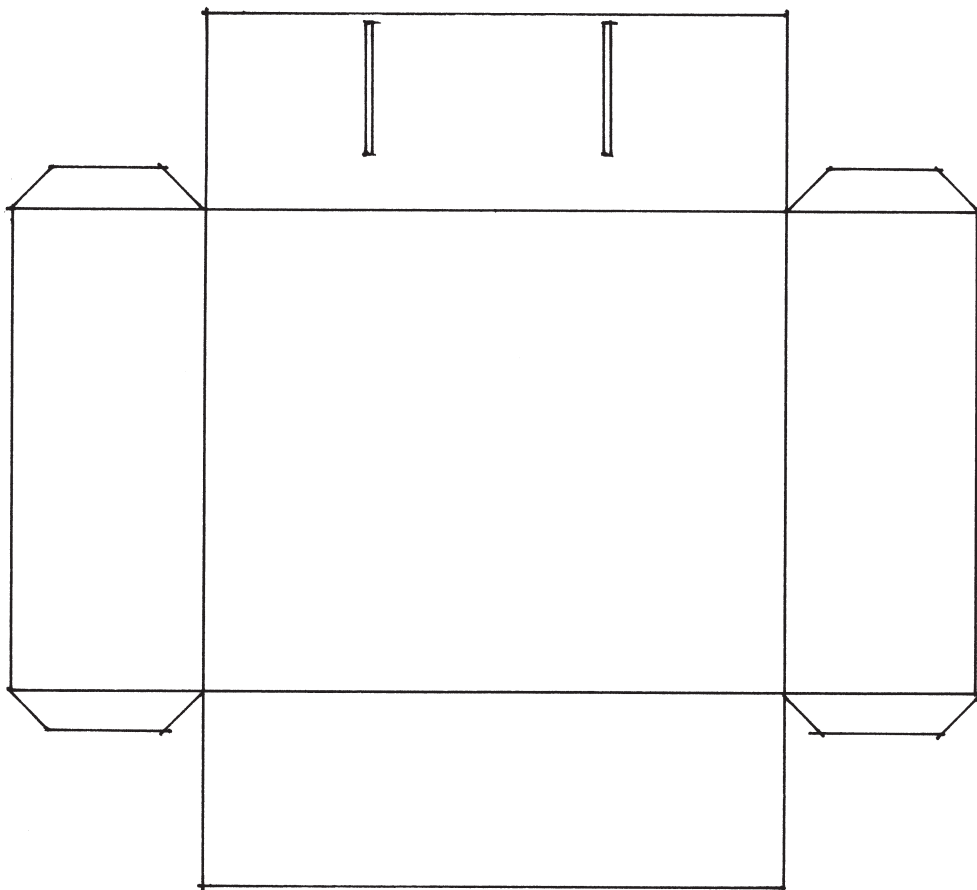
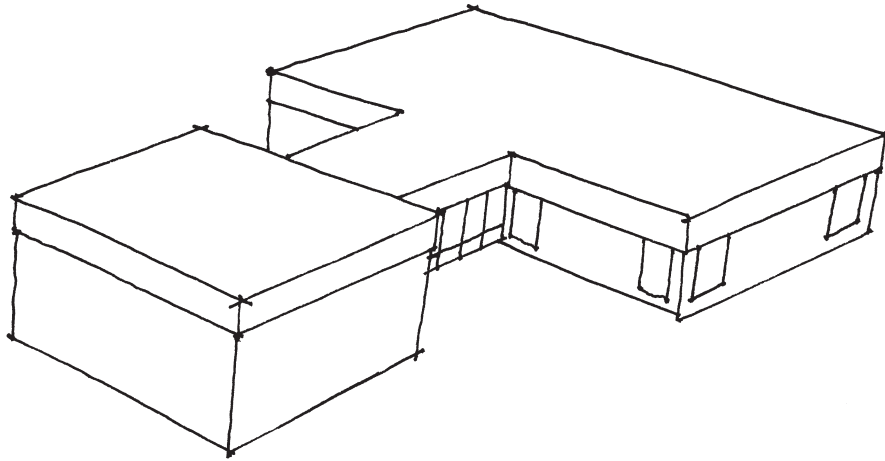
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Building Cutout Pattern #3 - An Elementary School
or Portion of a High School



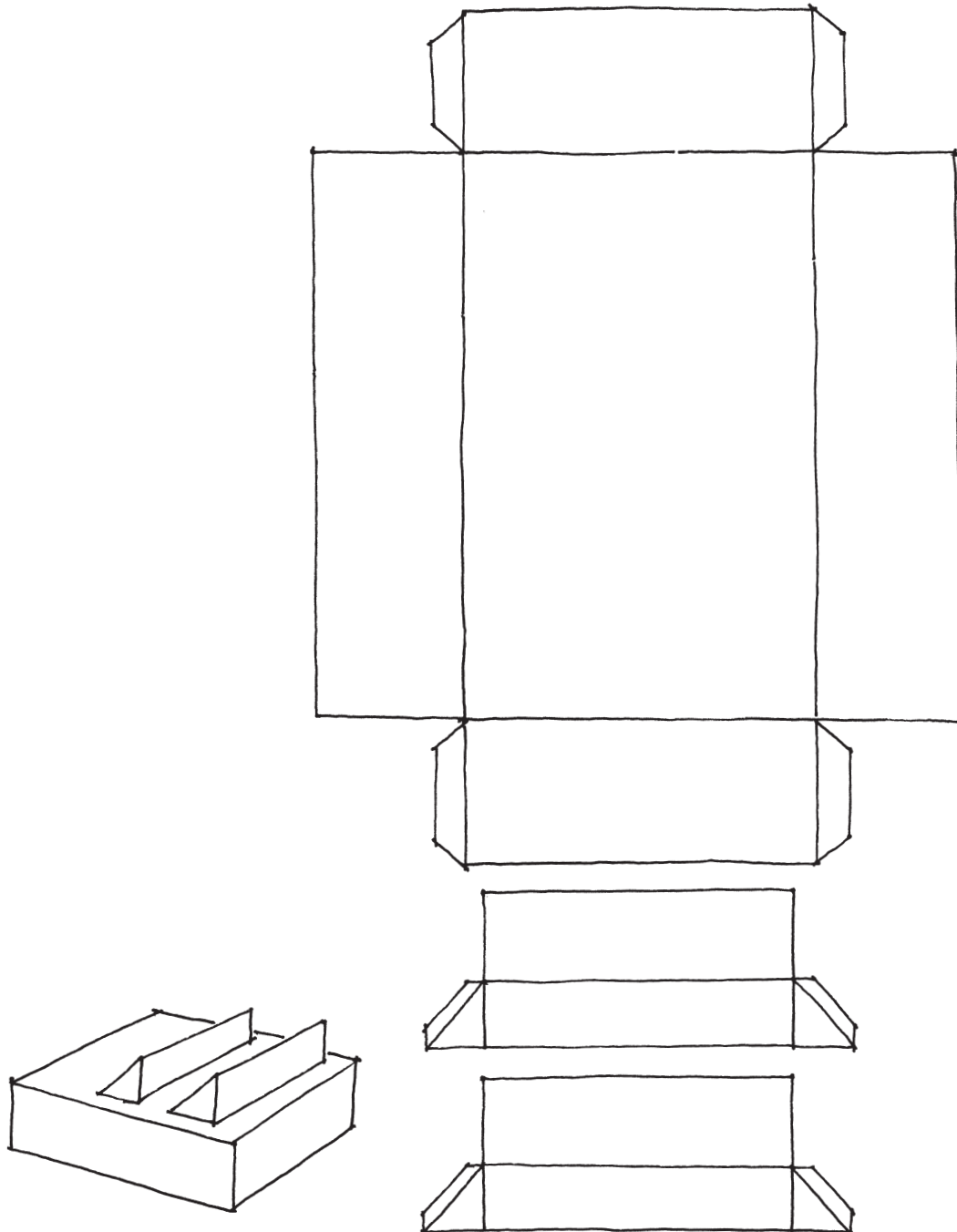
Fifth Grade ♦ Lesson Nine



Building Cutout Pattern #4 - A Gym, to be Added to an Elementary School to Make a High School



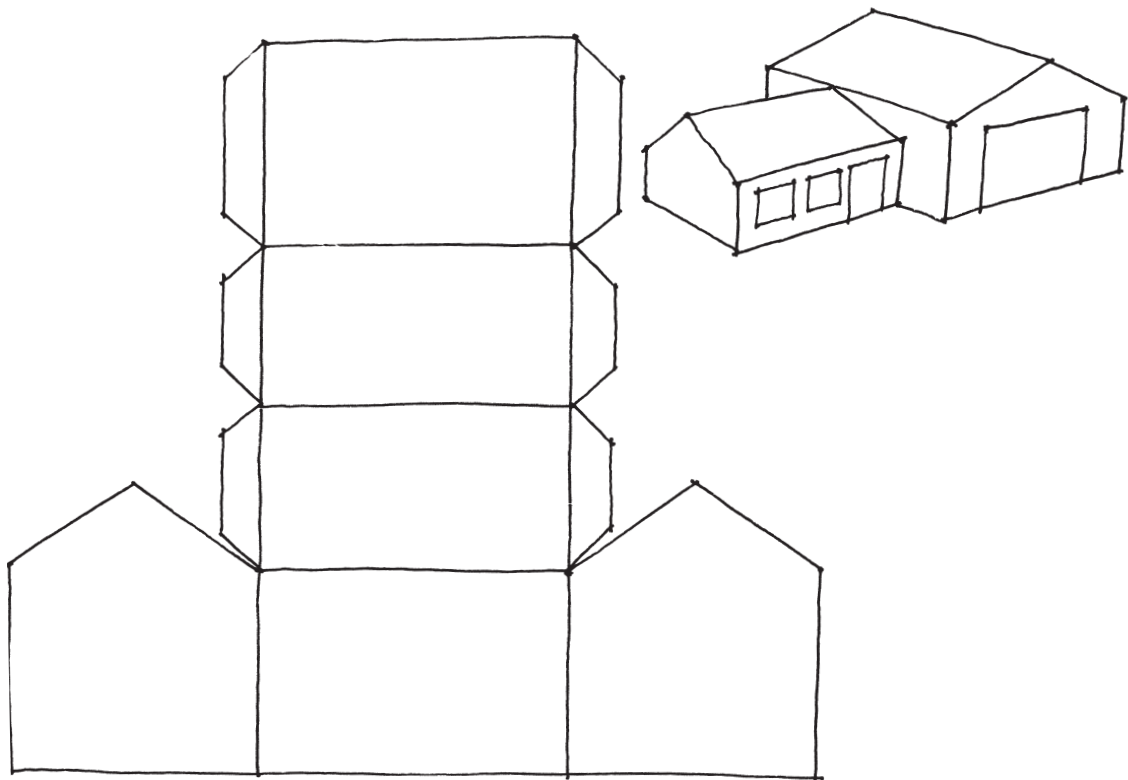
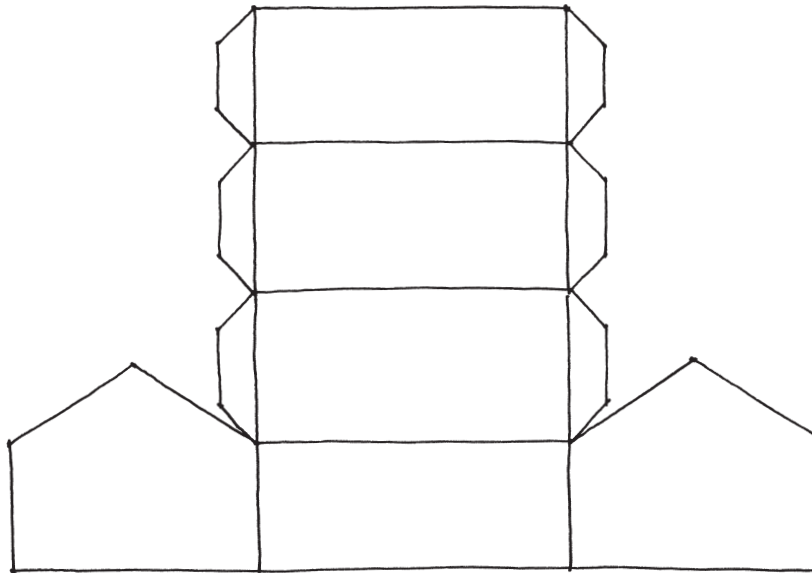
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Building Cutout Pattern #5 -
Commercial Buildings/Shops



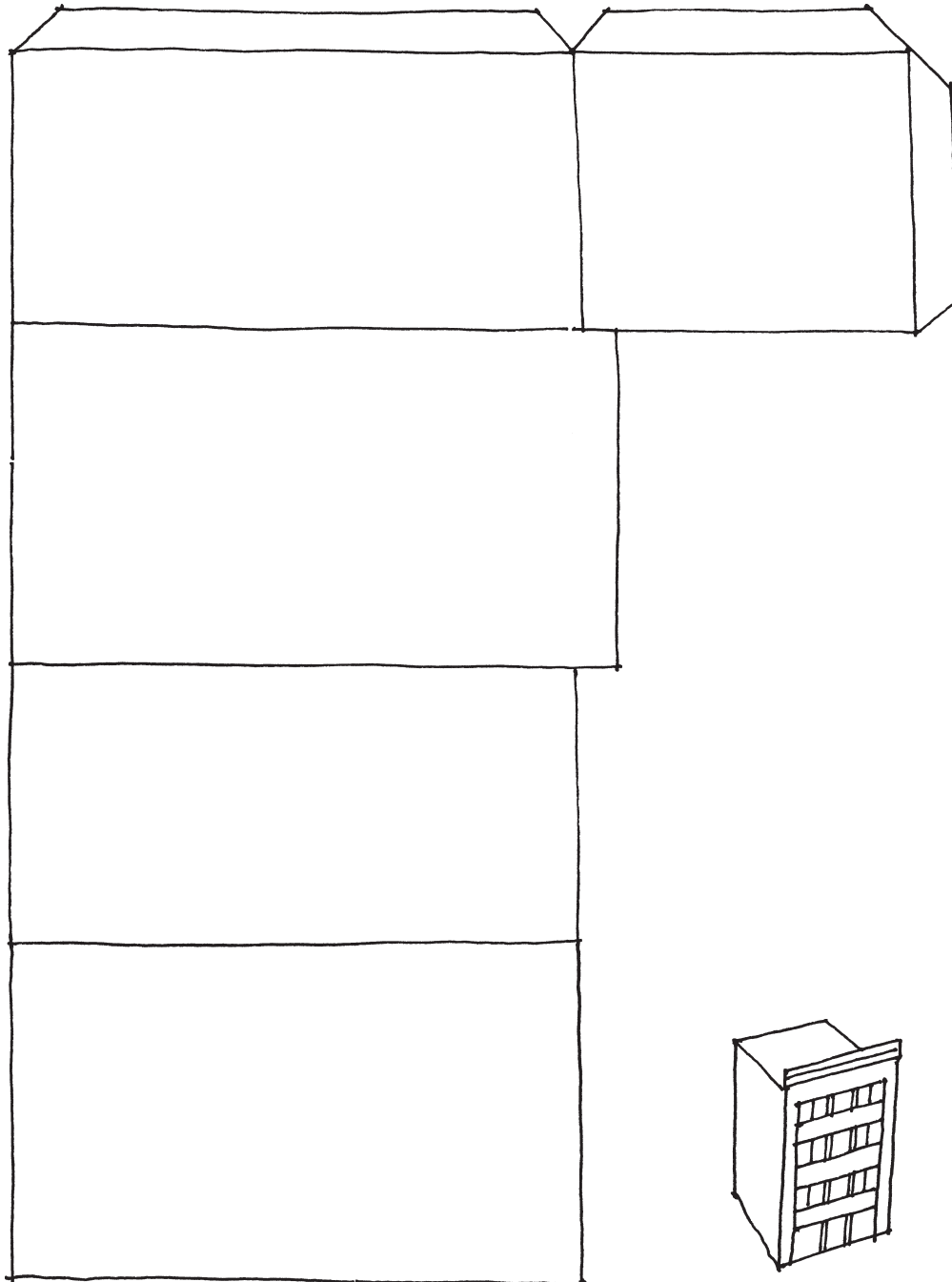
Fifth Grade ♦ Lesson Nine



Building Cutout Pattern #6 - A Library,
Police Station or Community Building



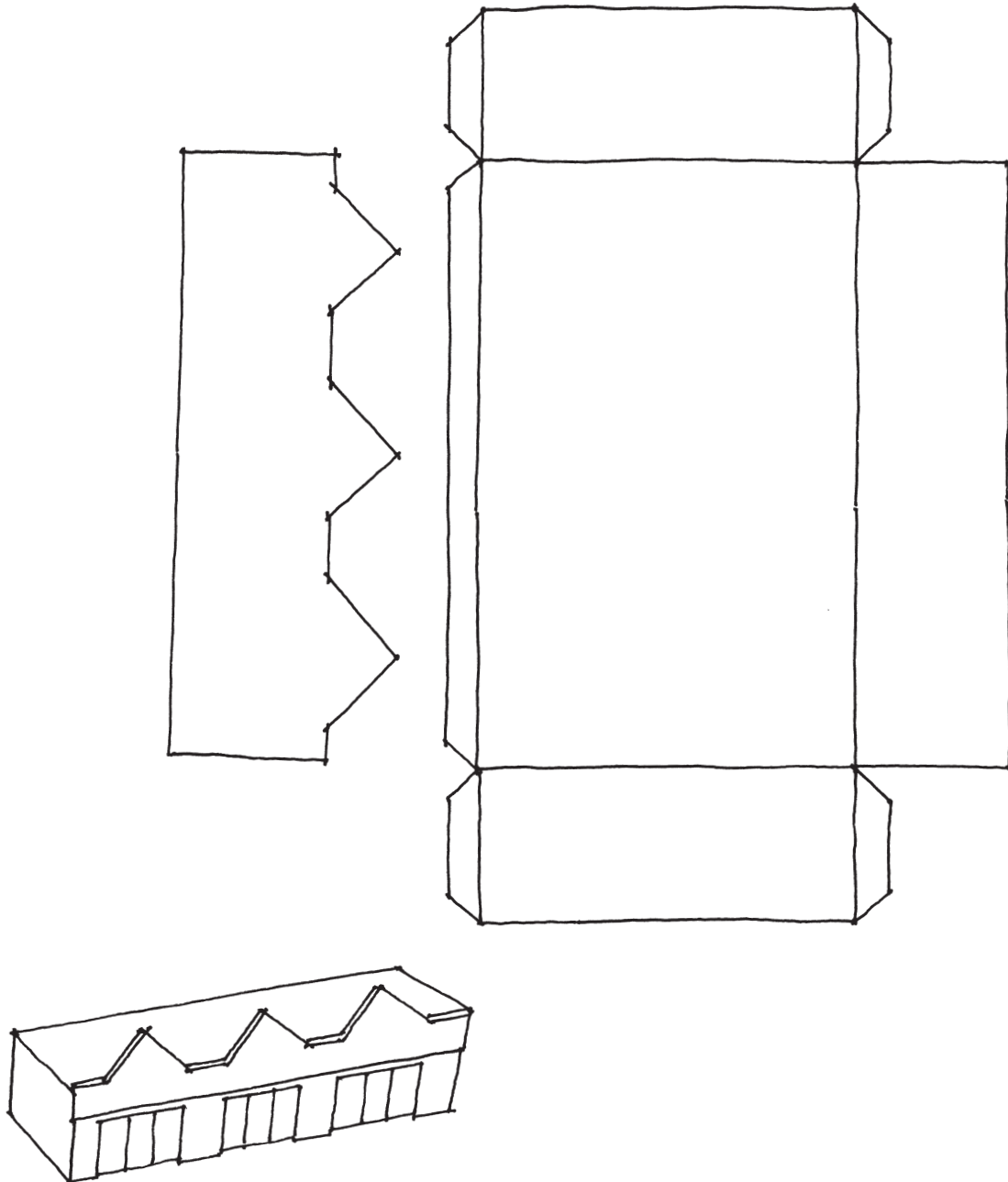
Fifth Grade ♦ Lesson Nine



Building Cutout Pattern #7 - Office Building



Fifth Grade ♦ Lesson Nine



Building Cutout Pattern #8 - Shopping Center



Fifth Grade ♦ Lesson Ten



**FIFTH GRADE
LESSON NO. 10**

DESIGN A CITY - PART 3

LENGTH OF LESSON

60 Minutes

EDUCATIONAL OBJECTIVES & MICHIGAN CURRICULUM FRAMEWORK CONTENT STANDARDS:

- A. Develop an understanding of the importance of organizing the elements of a city as part of the planning process
- Social Studies
 - Historical perspective
 - Geographic perspective
 - Economic perspective
 - Civic perspective
 - Public discourse and decision making
 - Science
 - Reflect on nature, adequacy and connections across scientific knowledge
 - Use scientific knowledge from the physical sciences in real-world contexts
- B. Understand the relationship of different physical components of a city
- English/Language Arts
 - Meaning and communication
 - Depth of understanding
 - Social Studies
 - Geographic perspective
 - Mathematics
 - Geometry and measurement
 - Numerical and algebraic operations and analytical thinking
 - Visual Arts
 - Perform
 - Arts in context
- C. Be able to understand the city in three dimensions and recognize differences in size, proportion and scale
- Mathematics
 - Geometry and measurement



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Visual Arts

- Perform
- Arts in context

D. Be able to explain the reasons for decisions about the design of a city and how the city layout affects its functioning

English/Language Arts

- Meaning and communication
- Language
- Voice
- Inquiry and research

Social Studies

- Historical perspective
- Geographic perspective
- Economic perspective
- Civic perspective
- Public discourse and decision making

GRADE LEVEL CONTENT EXPECTATIONS

Please see the applicable Grade Level Content Expectations (GLCEs) at the beginning of the Fifth Grade chapter.

ARCHITECTURAL PRINCIPLES:

Design is accomplished by composing the physical characteristics of size, shape, texture, proportion, scale, mass and color.

Order is the arrangement and organization of elements to help solve visual and functional problems.

Visual relationships are determined by light, shadow, edges and contrast.

Balance is the creation of visual harmony through the use of color and the manipulation of form.

Form follows function is a design approach where the form of the building is determined by the function of its spaces and its parts.



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Nature is a model for architectural forms and shapes.

Mass creates form, which occupies space and brings into being a spatial articulation.

Symbolism is an important means of visual communication for architecture.

Visual thinking is a key to awareness of the built environment.

Sustainable design of the built environment protects the natural environment.

Social structure, culture and the built environment have a direct influence on one another.

Design is experienced through human sensory perception.

The creative process is basic to design.

Aesthetics is the artistic component of architecture.

Climate and the natural environment influence design decisions.

Architecture satisfies emotional and spiritual needs in addition to physical needs.

Past, current and future technologies influence design decisions.

MATERIALS

1. Assembled buildings
2. Any accessory construction (i.e. street lamps, telephone poles, cars, trees, etc.)
3. Tape, glue

VOCABULARY (See glossary for definitions)

1. Land-use planning
2. Master plan
3. Sustainability



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BACKGROUND INFORMATION

Lessons No. 8, 9 and 10 are a sequence of lesson plans that conclude the fifth-grade program. The class will plan and build a city during the three final lesson plans. The time of the lesson plans may be adjusted by the teacher as the project progresses toward completion.

This lesson plan allows students to finish and assemble all the structures for their model city block(s) and to prepare for a final presentation.

ACTIVITY

- A. Allow the students to view their "master planned" city before attaching buildings and other constructions.
- B. The teacher and the students should discuss the relationship of the buildings to one another. Tell the students to look at their finished city and see if they are satisfied with the locations and sustainability of their buildings, amenities, parks, etc. They should make any necessary changes. Students should also discuss how well they addressed issues of sustainable design.
- C. When decisions are final, attach buildings.
- D. The students may add trees, cars, street lamps, telephone poles, etc. at this time.
- E. A final presentation of the project can be held for the school's entire student body and/or for the parents of the fifth-grade students, possibly at a Family Night.

TEACHER'S EVALUATION

- A. Does the construction and development of the city master plan show an understanding of the architecture and sustainability concepts? Depending upon the complexity of the project, the teacher may determine whether local city planners should be invited for an informal presentation.

