DELIVERABLE #3:
City Essay

Students write a 1,500-word essay that describes the unique attributes of their city and provides a solution to this year’s challenge.

The essay asks students to imagine what it would be like to walk down the main street of their city 100 years in the future. What would someone hear, see, smell, feel? How would the people who live in this future city describe it? How is this city futuristic and innovative?

As students draft their City Essay, they explore questions like these and more to develop their future city. Students will think deeply about their city, its population, geographical location, culture, unique characteristics, and community’s needs. In addition, the City Essay asks students to thoughtfully address this year’s challenge: The Age-Friendly City.

The Age-Friendly City Overview

“We have to stop building cities as if everyone is 30 years-old and athletic.”
Gil Penalosa, Executive Director, 8-80 Cities

What does it mean to be a senior citizen? The official definition in most countries is a person who is more than 60 or 65 years old. Beyond that, there is little else that seniors have in common. Today, a revolution in the “culture of aging” is underway, and timeworn notions of the elderly no longer fit. Older adults are living longer, staying in the workforce longer, and contributing to their communities in myriad ways.

But aging can have its challenges. As people get older, they may experience physical and cognitive changes. Loss of mobility, visual and hearing impairments, slowed reflexes, illness, and memory loss are a few examples of changes that can create barriers to independent living and sometimes lead to isolation and loneliness.

Because the number of older adults will exceed the number of all children under the age of 14 by 2050, the World Health Organization (WHO) developed a framework to help cities become more age-friendly. This entails designing and adapting a city’s natural and built environment to create accessible and safe transportation options, barrier-free access to homes and public buildings, and health care support and services so that people can maintain their health and independence for as long as possible. Such features do not just benefit the elderly, but people of all ages.

The students’ challenge: Identify an age-related challenge that exists in today’s urban environments and engineer two innovative solutions that allow your future city’s senior citizens to be as active and independent as they want to be.
City Essay Requirements

- Students should identify one age-related challenge older citizens have and engineer two solutions.
- The essay cannot exceed 1,500 words and should be free of grammatical and spelling errors.
- The essay can include a maximum of four graphics.
- The essay must cite at least three sources of information used during the idea development process. (MLA style is preferred; download guidelines from futurecity.org/resources (filter for Handbook & Student Handouts.).
- Students should use a variety of sources of information, such as interviews with experts, reference books, periodicals, and websites. (Note: Wikipedia is not accepted as a source of research.)
- The essay must be submitted as a Word document via the online submission center at futurecity.org. Check with your Regional Coordinator for the exact date.

City Essay Resources

Use these resources to help your students develop their essay. The first four items in this list are in the Appendix: Deliverables City Essay starting on page 58. They can also be downloaded at futurecity.org/resources (filter for Handbook & Student Handouts).

- City Design: Questions to Consider: These guiding questions will help students remember to research all the different aspects of their future city.
- The Age-Friendly City Overview and Research Questions student handout: This resource provides background information on creating age-friendly cities and guiding questions for student research.
- The Age-Friendly City Real World Case Studies student handout: Students will find these real-life examples of problems that were solved via innovative solutions both inspiring and instructive.
- City Essay Sample Outline: This outline explains what students should include in each section of their essay and how to organize their essay as well.
- The Age-Friendly City Age-Friendly Research Resources: Start your students research with this pre-selected set of websites, books, and videos. Download the list at futurecity.org/resources (filter for Research Resources & Websites.)

City Essay Rubric: Review this rubric with students so that they understand how their essays will be evaluated. See page 64 or futurecity.org/resources (filter for Rules & Rubrics).

City Essays from past Finals Winners: Analyzing essays from prior years will give students a strong sense of what they are aiming for in their own essays. Go to futurecity.org/gallery.

Research cards help students track and organize the information they want to use in their essays. Go to futurecity.org/resources (filter for Research Resources & Websites).

Final competition checklist: see page 80.

Competition Scoring

Teams can earn up to 60 points for their City Essay. Make sure they have thoroughly covered these categories in the rubric to maximize points:

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduce City &amp; Define Problem</td>
<td>15</td>
</tr>
<tr>
<td>Specs and Solutions</td>
<td>21</td>
</tr>
<tr>
<td>Judge Assessment of Solution</td>
<td>12</td>
</tr>
<tr>
<td>Writing Skills</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
</tr>
</tbody>
</table>

Scoring Deductions

- 5–10 points Late submissions may be accepted with a penalty. Check with your Regional Coordinator before the deadline to find out if this is an option in your region.
- 10 points Be sure to check your word count and do not exceed the 1,500-word limit.
City Design: Questions to Consider

As you start to research today’s cities and brainstorm what your future city might look like, discuss these questions with your teammates. Remember, no city can provide everything. What are the most important elements in your city? What tradeoffs do you have to make?

City Features
- Where is your city located?
- When was your city founded? What problems has your city had to overcome?
- Who lives in your city?
- Does your city have any distinctive natural features (e.g., mountains, oceans, rivers)?
- What is the weather like in your city?
- How do your citizens relax? What do they do for fun?
- What makes your city futuristic and innovative?

Zoning & Budget
- How is your city zoned? Are the zones separate or are there mixed-use zones (e.g., commercial and resident or commercial and industrial) in your city?
- How does your city fund its operations (i.e., utilities, infrastructure, and public services)?
- SimCity connection: How did zoning impact your SimCity’s growth and development?

Industry & Jobs
- What drives the economy in your city? (e.g., tourism, manufacturing, education)
- What types of jobs are available to your citizens?

Transportation
- How do your citizens travel around your future city? Is there more than one way for citizens to get around?
- Is your city accessible for citizens with mobility issues related to aging or a handicap?
- How are goods and services delivered in your city?
- SimCity connection: What did you learn from how your Sims moved around your Virtual City?

Environment & Energy
- How does your city prevent/reduce water or air pollution?
- Where does your city get its energy? What are the costs and tradeoffs of different power sources?

Utilities & Services
- What types of services does your city provide (e.g., police, fire, medical, education)?
- How does your city provide various utilities (water, sewer, waste management, electricity, Internet, etc.)?
- SimCity connection: How did you power your SimCity? Were your Sims happy with the level of services available to them?

Health & Recreation
- How does your city help support a healthy lifestyle?
- How does your city design ensure equal access and opportunities for people with disabilities or older citizens?

Housing
- Where do your citizens live? Individual houses, apartments, a mix? Where is housing located?
- Are there any special features in your city’s housing options?

Age-Friendly Cities
- What does an age-friendly city look like? Are there special features, policies or practices that make a city age-friendly?
- What issues keep older citizens from living active and independent lives in today’s cities?
- How do today’s age-friendly cities engage their older citizens?
- Many recommendations for creating age-friendly cities focus on policy or providing services. What role does engineering play in making a city more age-friendly?
- What engineering disciplines might help you create an age-friendly city?
- What innovative or futuristic solutions are being explored today to help seniors stay active and independent?
The Age-Friendly City Overview and Research Questions

The Age-Friendly City Overview

“We have to stop building cities as if everyone is 30 years-old and athletic.”

Gil Penalosa, Executive Director, 8-80 Cities

What does it mean to be a senior citizen? The official definition in most countries is a person who is more than 60 or 65 years old. Beyond that, there is little else that seniors have in common. Today, a revolution in the “culture of aging” is underway, and timeworn notions of the elderly no longer fit. Older adults are living longer, staying in the workforce longer, and contributing to their communities in myriad ways.

But aging can have its challenges. As people get older, they may experience physical and cognitive changes. Loss of mobility, visual and hearing impairments, slowed reflexes, illness, and memory loss are a few examples of changes that can create barriers to independent living and sometimes lead to isolation and loneliness.

Because the number of older adults will exceed the number of all children under the age of 14 by 2050, the World Health Organization (WHO) developed a framework to help cities become more age-friendly. This entails designing and adapting a city’s natural and built environment to create accessible and safe transportation options, barrier-free access to homes and public buildings, and health care support and services so that people can maintain their health and independence for as long as possible. Such features do not just benefit the elderly, but people of all ages.

Research Questions

As you do your research you’ll see that many of the issues affecting seniors can be addressed through public policy, social welfare programs, or via small infrastructure changes (i.e., building better sidewalks, having working elevators in subway and train stations, etc.).

For the purposes of the Future City Competition, we would like your team to identify an issue seniors face in 2017 that can be addressed through engineering. Remember your seniors live 100 years in the future. Your engineering solutions should reflect this and be innovative, futuristic, and scientifically plausible.

Senior Citizens

Engineers need to know as much as they can about the people for whom they are designing solutions. Start your research by learning more about senior citizens:

- At what age do you consider someone a senior citizen? Is being a senior citizen purely a factor of age or something else?
- What stereotypes are associated with the label “senior citizen”?
- Are there differences in the abilities of someone who is 65 and someone who is 85? Or differences between someone who is 75 and someone who is 95?
- What are some of the typical physical and cognitive issues a senior citizen may face?
- What might keep a senior citizen from being active and independent in their community?
- How might these limitations affect their ability to live independently and engage in the activities of your city?
- What are the consequences now, and in the future, when large numbers of people reach their senior years—and, thanks to modern medicine, live as senior citizens for 30, 40, or more years?
Challenges Seniors May Face

This next section highlights some areas where seniors may face challenges. This is not a complete list. As you do your research you may find another issue your team would like to address. This is okay.

1. LIVING INDEPENDENTLY

Where to live is a critical element that can have an impact on our happiness and sense of security. But seniors may need extra assistance or have different requirements than younger people. As you do your research look into the following:

• Many seniors want to “age in place,” which means they want to stay in their own homes for as long as possible. Why do you think some seniors want to stay in their homes?
• Other seniors look forward to living in senior communities. What features of independent living or assisted living residences are attractive and helpful to seniors?
• What factors could make a typical home difficult to live in for a person with physical or cognitive issues?
• What existing technologies can you point to that help seniors live more independently?
• What adaptive technologies would make it easier/possible for seniors with health issues to live independently?

2. TRANSPORTATION

Moving freely and safely around a city is often a challenge as people age. If this is an area of interest, consider:

• What does “impaired mobility” mean, especially in regard to older people?
• How might mobility issues affect an older person’s ability to get around their city?
• Why do you think it is hard for a senior to give up driving? What can be done to make public transportation an attractive alternative to driving?
• What are the various modes of transportation available? How do they interconnect or work together? What are the advantages and disadvantages of each in regard to senior citizens, especially those with mobility issues?
• How important is a robust public transportation system to the life and economy of a city?
• In addition to the transportation mode itself, what other features are important considerations in a successful public transit system for senior citizens? (Remember to consider the various physical and cognitive issues seniors deal with including vision problems, hearing loss, mobility issues, slowed reaction time, and memory loss.)

3. STAYING HEALTHY

As people age, they may begin to experience various health challenges. Start your research here:

• Seniors often have issues that affect their physical mobility. How can engineers or specialized technologies help seniors maintain their mobility?
• Cognitive exercise, which basically means using your brain, has been shown to play a role in helping seniors’ brain fitness. What role can technologies play in helping seniors continue to learn new things and exercise their brain?
• Smart technology and sensor systems are two types of technology that hold great promise in helping seniors live more independently. How can these two technologies:
  - Help seniors stay healthy?
  - Help seniors with physical and cognitive disabilities (such as arthritis, stroke, low vision, or memory loss) carry out necessary tasks of daily life?

THE AGE-FRIENDLY CITY RESEARCH RESOURCES

Start your research with a suggested set of websites, books, and videos. Download the list at futurecity.org/resources (filter for Research Resources & Websites).
Case Study: Sensors for Seniors

Imagine a “magic” carpet that can sense when someone has fallen and summon help. Or a “smart” pill bottle that can sense when it hasn’t been opened and send a reminder to a patient to take her medication. In the future, entire houses can be wired with sensors to alert caretakers if the heat isn’t working, or if a door opens in the middle of the night, or to alert a senior that his oven has been on for more than an hour. Sensors can also be wearable, and they can even be scattered throughout a city sending warnings and safety information to fire, police, or health officials. Do sensors hold the key for elderly independence? Or are they too intrusive—putting seniors under a surveillance that invades personal privacy?

Case Study: Tubeless London

In 2014, NBBJ, an architectural design firm, submitted a radical plan to improve transportation within the city of London and make it more age-friendly. Their idea was to get rid of the subway cars that served London for more than a century and replace them with moving walkways. This is the way NBBJ imagined the new London transit:

The track is divided into three lanes. A “slow” lane travels at 5.5 miles per hour, a “medium” lane at 7.45 mph, and a “fast” lane at 9.3 mph. As the walkways enter tunnels, they pick up even more speed. When people enter the underground, instead of boarding a train they’ll immediately hop onto one of the three tracks. Accommodations for elderly and disabled riders will include benches to sit on, and easy methods to get on and off the moving belts. According to the designers, much of the cost of totally gutting the existing tube system would be recouped in revenue from cafes and food carts located on the side of the tracks.
Case Study: The Virtual Senior Center

At 93 years old, Rose Binder of Queens, NY lives alone and is house-bound. There are no stores in her neighborhood, and taking an accessible taxi service makes her “very nervous.” “Sometimes they come late,” she says, “or they don’t show up and I have to keep calling.” Even speaking on the telephone is difficult for her. For many people in Rose’s circumstances, life would be lonely and isolating. But Rose’s time is filled with intellectual and cultural riches and friends that she gathers with regularly thanks to the Virtual Senior Center. Each week, the Virtual Senior Center offers some 30 online classes to homebound clients, from tai chi and exercise to contemporary history discussions and gallery talks with museum curators, as well as music appreciation, singing, and even foreign language classes. Participants use a simple touch-screen computer to join in, play games, or use the Internet. “I especially like any classes that give you information like history or art, so I try to do as many as I can,” says Binder. “But unfortunately I have to eat lunch and I skip something. Where else can you get such a wonderful array of classes without going to class?”

Research has found that loneliness contributes to many physical ills, among them heart disease, poor immunity and Alzheimer’s. To help counter loneliness, the Virtual Senior Center is all about participation and relationships. Unlike other distance learning where people often sit anonymously at their computer screens, participants engage here not only with the instructor but with each other, and friendships form.

Case Study: Human Factors Engineering

Most young people are very comfortable with technology. They usually have an easy time learning to use new products and technologies. Older people, on the other hand, sometimes have a hard time with new or unfamiliar tools and technologies, such as a new smartphone, an ATM, a new parking meter, or a self-checkout stand at the supermarket.

Human Factors Engineers help design tools and technologies that are easy to use. The field of Human Factors Engineering helps ensure that new products and technologies are a good match for people’s abilities and the environments where the products and technologies will be used. Human factors engineers consider human strengths and weaknesses, both physical and cognitive, when designing new technology. Human factors engineers consider the skills a person needs to perform tasks with a new product. For example, when human factors engineers help design an inhaler, they ensure that all users, including elderly users, are strong enough to push down on the inhaler button to release a dose of medicine. When human factors engineers help design the dashboard of a car or a plane, they make sure that the buttons and indicator lights are clearly labeled so that users don’t have to spend extra time interpreting vague symbols or colors. It is also important to make products as intuitive and “user-friendly” as possible to reduce the chance that people make mistakes when using them.

Overall, human factors engineers focus on how technology works in actual practice, with real human beings at the controls. They try to design products that maximize safety, reduce the chance of mistakes, and are satisfying to use.
Tell your students to ask questions and take notes as you review the competition’s suggested city essay outline and discuss how they can use it to draft their essay.

**Part 1: The Introduction**

Briefly introduce your future city by including the basic information about it. Your city’s name, how old it is, where it is, and how many people live there all go in the introduction.

**Part 2: A Closer Look**

Paint a picture of life in your future city—as if you are describing it to someone who has never been there. Share details about:

- The climate and any natural features (like rivers, mountains, or a nearby ocean)
- Who lives in your city and what kind of work do they do
- Any innovative or futuristic aspects of your city’s infrastructure (like housing, transportation, energy, pollution control, etc.)
- What services your city provides (such as education, healthcare, etc.)
- The average age and life span of your citizens, and your city’s definition of senior citizen.
- Briefly share the features and services that make your city age-friendly.

**Part 3: Define the Problem**

Describe the typical challenges older adults in 21st century cities faced in remaining active and independent. Then identify one challenge in particular, describe its impact, and why your city decided this was the most important problem to address (with your two innovative solutions).

**Part 4: Describe Your Solutions**

Here’s where you get to detail the two innovative solutions (to the problem you identified) that make your future city more age-friendly. Be sure to:

- Describe your two engineered solutions and how they work.
- Emphasize the innovative, futuristic features of your two solutions.
- Explain how your solutions improve your citizens’ ability to remain active and independent.
- Describe some of the risks connected with using the solutions and how the solutions reduce these risks.
- Provide examples of how both solutions benefit other members of your future city (not only senior citizens) and/or enhances the quality of life in general.
- Explain why you made the choices you did and what tradeoffs, if any, were involved.
- Explain what types of engineering were involved and what kinds of engineers were most helpful.

**Conclusion: The Impact of The Age-Friendly City**

Summarize how your age-friendly solutions make your city a great place to live, especially for older adults, and how they keep your citizens active and independent in your future city.
### I. Introduce City and Define the Problem (15 points)

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<tbody>
<tr>
<td><strong>1. City overview</strong>&lt;br&gt;• Basic city information: population, age, location&lt;br&gt;• Climate and/or natural features&lt;br&gt;• City economy</td>
<td>No description of city.</td>
<td>Brief description of city.</td>
<td>Good description of the city.</td>
<td>Detailed description of city.</td>
</tr>
<tr>
<td><strong>2. Infrastructure</strong>&lt;br&gt;• Types of infrastructure could include: housing, transportation, energy, pollution control or others.</td>
<td>No description of city infrastructure.</td>
<td>Brief description of one type of city infrastructure.</td>
<td>Good description of two different types of infrastructure.</td>
<td>Detailed description of two or more types of infrastructure.</td>
</tr>
<tr>
<td><strong>3. City services</strong>&lt;br&gt;• Types of city services could include: education, healthcare, fire or police protection, elder services, etc.</td>
<td>No description of city services.</td>
<td>Brief description of one type of city service.</td>
<td>Good description of two different types of city services.</td>
<td>Detailed description of two or more types of city services.</td>
</tr>
<tr>
<td><strong>5. Describes the age related problems in 2017</strong>&lt;br&gt;• Identify problems in general, describe problem areas</td>
<td>No description of any present-day challenges.</td>
<td>Brief description of present-day challenges.</td>
<td>Good description of present-day challenges.</td>
<td>Detailed description of present-day challenges.</td>
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### II. Specs and Solution (21 Points)

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<tr>
<td><strong>6. Describes the selected problem</strong>&lt;br&gt;• One problem selected (i.e., housing, transportation, health, other)&lt;br&gt;• Why problem is important to solve&lt;br&gt;• Description of impact on citizens&lt;br&gt;• Importance to city to address</td>
<td>No description of challenge city addressed.</td>
<td>Brief description of problem city decided to address. Touched on problem’s impact, why important.</td>
<td>Good description of problem city addressed. Clearly states impact on seniors and why important.</td>
<td>Excellent description of problem city addressed. Thoroughly details impact on seniors and why important.</td>
</tr>
<tr>
<td><strong>7. Describes two innovative, futuristic &amp; engineered solutions</strong>&lt;br&gt;• Describes how they are innovative and futuristic.</td>
<td>No description.</td>
<td>Brief description of only one solution or describes two solutions but lacks details on how innovative or futuristic.</td>
<td>Good description. Clearly outlines two solutions and how they are innovative and futuristic.</td>
<td>Excellent description. Thoroughly describes two solutions and how they are innovative and futuristic.</td>
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</table>
### City Essay Rubric

#### II. Specs and Solution (21 Points) (Continued)

<table>
<thead>
<tr>
<th>No Points</th>
<th>1 Poor</th>
<th>2 Good</th>
<th>3 Excellent</th>
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</thead>
<tbody>
<tr>
<td>No discussion.</td>
<td>Brief discussion of impact. Few details on how seniors’ ability to be active and independent improved.</td>
<td>Good discussion on impact. Provides some details on how seniors’ ability to be active and independent improved.</td>
<td>Excellent discussion on impact. Provides many details on how seniors’ ability to be active and independent improved.</td>
</tr>
</tbody>
</table>

8. Discusses the impact on senior population
   • Ability to remain active and independent

9. Discusses futuristic technology involved in solution
   No discussion of technology. | Some discussion of technology involved. | Good discussion of technology involved. | Excellent discussion of technology involved. |

10. Describes risks and tradeoffs of solutions
    No discussion of risks or tradeoffs. | Briefly describes one risk and/or tradeoff. | Good description of one risk, how it was reduced, and one tradeoff or compromise. | Excellent description of two risks, how they were reduced, and two tradeoffs or compromises. |

11. Describes solutions’ benefits to citizens
    • Other citizens (not just seniors)
    • Enhances quality of life in general
    No description of how solutions benefit other citizens and/or enhance quality of life. | Short description of how solutions benefit other citizens and/or enhance quality of life. | Good description with two examples of how the solutions benefit other citizens and/or enhance quality of life. | Excellent description with three or more examples of how solutions benefit other citizens and/or enhance quality of life. |

12. Engineering disciplines involved and role of 1-2 engineers
    Engineering disciplines are not identified. | Discusses one engineering discipline or role of one engineer. | Discusses more than one engineering discipline and role of engineers. | Good discussion of more than one engineering disciplines and roles of the engineers. |

#### III. Judge Assessment Of Solution (12 points)

<table>
<thead>
<tr>
<th>No Points</th>
<th>1 Poor</th>
<th>2 Good</th>
<th>3 Excellent</th>
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<tbody>
<tr>
<td>Not effective.</td>
<td>Solution is somewhat effective, technology and design can be better, with fair impact on seniors’ ability to remain active and independent.</td>
<td>Solution is effective, but technology and design could be improved, with good impact on seniors’ ability to remain active and independent.</td>
<td>Solution is highly effective, with excellent technology application, with high impact on seniors’ ability to remain active and independent.</td>
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</table>

13. Effectiveness and quality of solution
    • Effective solutions to stated problems
    • Clever design and application of technology
    • Ability to remain active and independent

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### III. Judge Assessment Of Solution

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<tr>
<th>(12 points) (Continued)</th>
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<th>2</th>
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<tr>
<td><strong>14. Innovative and futuristic solution</strong></td>
<td>Not innovative or original.</td>
<td>Somewhat innovative, original and somewhat futuristic. Some engineering involved.</td>
<td>Solution is highly innovative, original and futuristic. Extensive engineering involved.</td>
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<td>- Reasonable extrapolation and application of technology</td>
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<td>- Degree to which solution involves engineering</td>
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<tr>
<td><strong>15. Plausibility of solution</strong></td>
<td>Implausible or not scientifically sound.</td>
<td>Solution is not very plausible (science fiction).</td>
<td>Solution is somewhat plausible.</td>
<td>Solution is highly plausible and scientifically sound.</td>
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<tr>
<td>- Based on sound scientific principles</td>
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<td>- Accounting for risks and tradeoffs</td>
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<td>- Assessing consequences and making logical decisions</td>
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### IV. Writing Skills (12 Points)

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<tr>
<td><strong>17. Organization</strong></td>
<td>Poorly organized.</td>
<td>Fair organization.</td>
<td>Good organization.</td>
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<tr>
<td><strong>18. Writing skills</strong></td>
<td>Poor writing.</td>
<td>Fair writing.</td>
<td>Good writing.</td>
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<tr>
<td><strong>20. Maximum number of graphics</strong></td>
<td>Exceeds maximum of 4 graphics, illustrations.</td>
<td>Does not exceed maximum of 4 graphics and/or illustrations.</td>
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<td>- If used, max of 4 (does not include tables)</td>
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<tr>
<td><strong>21. List of references</strong></td>
<td>No references.</td>
<td>Less than three acceptable references.</td>
<td>At least three acceptable references.</td>
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<td>- At least three acceptable references</td>
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<td>- Wikipedia not recognized as an acceptable reference</td>
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<tr>
<td><strong>22. Word count</strong></td>
<td>No word count at end of document or inaccurate count.</td>
<td>Accurate word count at end of document.</td>
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<tr>
<td>- Does not include title, references</td>
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