National Engineers Week

Future City Competition

2009–2010 JUDGES MANUAL

NATIONAL ENGINEERS
WEEK FOUNDATION

APPROVED FOR LISTING
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2009–2010
STUDENT CONTESTS & ACTIVITIES

www.futurecity.org

Judge's Manual

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Welcome

Thank you so much for volunteering to judge the 2010 National Engineers Week Future City® Competition. You, along with thousands of other volunteers, make this program a reality. With your support we are able to expose over 30,000, seventh and eighth grade students to engineering in a real world, hands-on, setting. With all their hard work and dedication the entire program would be for naught without people like you who are willing to give their time to assess the work of the students. Again, thank you and welcome to the future.

Your Role as a Competition Judge

Your role as a judge is to draw on your expertise and resources to fairly assess the team's efforts. Your scores for the component that you judge will be tallied with the other judges' scores to select the overall Regional winner. Please remember that these students are in the seventh and eighth grades and all questions should be directed to them at their level of comprehension.

Competition Structure

Mission Statement:

The mission of the National Engineers Week Future City Competition is to provide a fun and exciting educational engineering program for seventh- and eighth-grade students that combines a stimulating engineering challenge with an inquiry-based application to present their vision of a city of the future.

BENEFITS OF THE NATIONAL ENGINEERS WEEK FUTURE CITY® COMPETITION:

The program offers students a fun way to learn about engineering and cities of the future while at the same time developing academic skills.

The National Engineers Week Future City® Competition provides a platform for students to increase their:

- Logical thinking skills,
- Problem-solving skills,
- Ability to work in teams,
- Research and technical writing skills
- Oral presentation skills,
- Application of coursework to practical problems,
- Technological skills, and
- An Awareness of community and business issues on the local and global levels.

Program Components Overview

1. ***Computer Design of a Future City.*** Students use *SimCity 4 Deluxe*™ software to design a city that has progressed at least 150 years in the future and has a population of at least 50,000. Students self-score their Future City computer design to ensure they have met all the required design elements. The teacher or mentor must attest to the accuracy of this score sheet.

2. ***Model of Future City.*** Students select an area of their Future City to be represented in the model they build following specific guidelines found in the Future City model rubric on page 18.

3. ***Research Essay.*** Students write a 700–1000 word essay citing at least 3 sources of information. This year's essay topic is; "Providing an affordable green living space for people who have lost their home due to a disaster or financial emergency."

4. ***Future City Narrative.*** Students write a 300–500 word City Narrative describing their Future City's key features. The engineer mentor or teacher must attest that the narrative was written by the students.

5. ***Oral Presentation.*** Students give a presentation describing key elements of their Future City.

Completing the Score Sheets

The National Engineers Week Future City® Competition Score Sheets are divided into four areas for the judges and one for student self-evaluation. You have volunteered to judge one or more of these areas listed below. Please carefully read over the areas that you have been asked to assess, including the area's rubric and score sheet. If you have any questions don't hesitate to contact your Regional Coordinator or the National Program Manager

1. Computer City Design Self-Evaluation (0–16 points)

This is the area in which the students assess their city's development by answering a series of questions. No further action is needed by the judges.

2. Computer City Design (0–84 points)

The computer design illustrates the different zoning sections, residential, manufacturing, and industrial; as well as infrastructure such as utilities and roads. You are asked to assess the city utilizing the Computer City Design Rubric on the following criteria: Social Service, Energy and Pollution, Transportation, and Recreation.

3. City Model (0–120 points)

Utilizing mostly recycled materials the team has built a scale model of a portion of their city. You are asked to assess the model using the Future City Model Rubric based on the following criteria: Creativity, Quality, Accuracy and Scale, Moving Component, and Use of Recycled Materials.

4. Oral Presentation (0–90)

The team will prepare a 5–7 minute presentation discussing the city and its amenities. The team will be assessed utilizing the Oral Presentation Rubric on the following criteria: Knowledge of the city and the essay question, Teamwork, and Presentation Skills.

5. Research Essay/City Narrative (Research Essay 0–70 points; City Narrative 0–20 points)

The team will write a 700-1000 word essay based on this year's engineering challenge question. The essay is assessed utilizing the Research Essay Rubric based on the following criteria: Selection of Living Space, Research, Use of Green Materials and Value, and Writing Skills. The City Narrative is assessed utilizing the City Narrative rubric based on the following criteria: Physical Description, Description of City Services, Description of Population, and Writing Skills.

Scoring Deductions

Penalty	Item	Description
5–10 pts.	Missing deadline for submission of the Computer City Design (Disk) and Computer Score Sheet. Deadline will be set by the regional coordinator.	The Computer City Design (CD_ROM) and Computer Score Sheet must be received in accordance with the deadline set by the regional coordinator.
5 pts.	Missing deadline for submission of the Essay and Abstract. Deadline will be set by the regional coordinator.	The Essay and Abstract must be received in accordance with the deadline set by the regional coordinator.
2 pts.	Computer Score Sheet incomplete.	A properly filled out Computer Score Sheet must be submitted with the Computer City Design (CD-ROM).
2 pts.	Essay Form incomplete or missing	A properly filled out Essay Form must be attached to the Essay and Abstract. Follow instructions on the form.
15 pts.	Competition Expense Form missing.	The Competition Expense Form with receipts attached to the back, must be brought to the competition.
5 pts.	Receipts missing from back of Competition Expense Form.	Receipts must be attached to the back of the Competition Expense Form. Follow instructions on the form.
1–5pts.	Missing all or part of the Model ID.	The Model ID should be identified by a 4" x 6" index card with: Future City name, school name, team members names (3 students, teacher, engineer-mentor), and scale used.
5 pts.	Exceeding presentation time.	Verbal presentation by team is 5–7 minutes. Presentation cannot exceed 7 minutes.
15 pts.	Exceeding model dimensions and weight	The maximum dimensions of the model are 20" (H) x 50" (L) x 25" (W). Height and width dimensions include all supporting structures, such as braces, and any model materials hanging below the tabletop. Weigh no more than 75 lbs.

Penalty	Item	Description
15 pts.	Exceeding Presentation dimensions.	Support materials may consist of either: 1. A single display not exceeding 60" (W) x 36" (H) OR; 2. Two displays not exceeding 30" (W) x 36" (H) each. 3. The size does not include the easel stand, if one is used.
15 pts.	Expenses exceeding $100.	The Competition Expense Form with receipts attached to the back, must be available the day of the competition.
20 pts.	Unsportsmanlike conduct by team members or guests.	This includes, but is not limited to: rude behavior to judges, competitors, or teammates; disruption of another team's judging session.
Disqualified	Destruction of another team's project.	

Essay Assignment:

Students will research and write an essay of 700 - 1,000 words on: "Providing an affordable green living space for people who have lost their home due to a disaster or financial emergency." The living space should use sustainable materials, have a low-carbon emissions footprint, and achieve the "Green Ideals" of energy efficient building.

The living space design must consider the social, economic and ecological impact of the manufacturing and construction techniques. It should be constructed with the ideal of providing affordable homes to those facing disaster or financial crisis, and earning only 50% - 80% of the median income of the surrounding city.

The focus of this essay is meant to be on the green living space design. However, engineering is about more than designing a solution to a problem. The "problem" is often rooted much deeper in a societal need, or other less tangible issue. Engineering, in its purest essence, is about helping others, helping people, and making the world around us a better place. In order for students to see that aspect of engineering, the essay statement includes a societal need for the green building solution. With increasing numbers of people facing a housing crisis, because of homelessness or the recent foreclosure issues, this particular problem of designing a living space is rooted in assisting those facing a housing crisis. Therefore, we wish the student to focus on the living space design, but with the realization that the need was created from this housing issue. It is not meant for the student essay to focus on the housing crisis in depth, or any more than is addressed in the accompanying rubric.

Essay Requirements:

I. Select and define a living space of their choice (home, pod, orb, high rise, etc) using "green" materials, processes and standards. The living space must be easily expandable to accommodate various living requirements. It should also support the needs of the elderly or persons with disabilities. Students must:

- Define the living space type.
- Define the location of the living space within a city as pertains to quality of life, access to city amenities, and the needs of its citizens (e.g. homeless).
- Explain how the living space can be expanded (or reduced), the style of space created (stand alone, multi-family, clustered, etc), and the expected life of the housing.
- Explain the target demographic of the housing.

II. Research and analyze existing green building sustainable processes, materials, and technologies. Current aspects of some of the following topics should be investigated.

- Residential design
- Manufacturing and construction processes
- Materials and technologies for a living space
- Interior and exterior design features
- Processes in each element of the construction that assure a low-carbon footprint
- Innovations to create the living space
- Impact on landfill by the construction materials selected
- Methods to maximize the use of sustainable materials while maintaining a level of comfort or lifestyle quality of the inhabitants
- Locally sourced or recycled materials

III. Develop and investigate a new technology or improvement to a technology researched above to incorporate to the residential space to insure sustainable/green design. The technology or innovation should aim to satisfy the Materials and Resources "Green Ideal" as outlined below. Explain:

- What specific innovation in Materials and Resources is achieved?
- How the innovation will function?

- What key sustainable methods or materials were incorporated in the design?
- How do these material choices enable your building to fit within the community?
- What is the impact of your material on construction waste?
- How does your green material choice impact the appearance (exterior or interior) of your building?
- What makes your material innovation a good economic, efficient and sustainable choice?
- What tradeoffs were made to accommodate the economics of constructing your green living space?
- What is the environmental footprint or impact of your design?

IV. Describe in detail:

- How is the living space easily maintained?
- How does this design improve the quality of life of the occupants?
- How does this design improve the quality of the community?
- What are the key features and benefits of your design and its impact on the community, residents, or environment?

V. Discuss the role of the engineer:

- Identify a discipline of engineering.
- How does the engineer contribute to the development of the living space or some of its components?

VI. Demonstrate written communication skills:

- The essay will be evaluated on written organization, grammar, and spelling.

BACKGROUND INFORMATION

GREEN IDEALS:

Green building and LEED criteria are briefly encapsulated in the "Green Ideals" outlined below.

In general, green building is a far reaching process and methodology that encompasses the location, construction, and functioning of the building. While there are many topics designers, manufacturers and construction professionals of green buildings must consider (listed below), for the purpose of the essay requirement, students are asked to focus on Materials and Resources as outlined below.

Sustainable sites

- Access to public transportation
- Carpooling resources
- Reuse of existing buildings or developed land

Water

- Water use reduction features
- Water-efficient landscaping
- Innovative waste water technologies
- Storm-water management

Materials and resources

- Collection and storage of recyclables
- Reuse and recycling of previously used materials for construction
- Use of local materials
- Use of rapidly renewable materials
- Certified wood
- Zero- or low-VOC (volatile organic compound) paints, resins, glues and other materials
- Construction waste management
- Environmentally preferable material

Energy and pollution

- Use of renewable energy
- Hot water
- High performance windows and insulation
- Lighting, heating, and cooling
- High-efficiency appliances
- Daylight views
- Reduce heat islands
- Light pollution reduction

Helpful resources:

- National Association of Home Builders' (NAHB) model green home building guidelines, (www.nahbgreen.org)
- Leadership in Energy and Environmental Design (LEED) from the U.S. Green Building Council, (www.usgbc.org)
- World Business Council for Sustainable Development. www.wbcsd.org

Forms

Rubrics and Score Sheets for

- Computer City Design Self-Evaluation Sheet
- Computer Design Rubric
- Computer Design Score Sheet
- Model Rubric
- City Model Score Sheet
- Team Presentation and Model Rubric
- Team Presentation Score Sheet
- Research Essay Rubric
- City Narrative Rubric
- Score Sheet Summary

Computer City Design Self-Evaluation Sheet

(0–16 points)

Students must use SimCity 4 Deluxe software to create their Future City.

The Computer City Design and completed Computer Evaluation Sheet must be submitted to your regional coordinator.

Use instructions on the reverse of this sheet to help you evaluate your Future City.

Future City Name						
City Size	Small		Medium		Large	
Teacher Name						
Engineer-Mentor Name and Employer:						
Engineer-Mentor Address						
Engineer-Mentor E-mail						
Engineer-Mentor Professional Society Affiliation:						
School Name						
School Address						
School Phone Number			School Fax Number			
Teacher E-mail Address						

Verified for Accuracy (Signed by teacher or engineer-mentor) _____ Date _____

Computer Evaluation of Your Future City			
Each "yes" is worth 2 points -- Maximum number is 16 points			
	Enter Values	Yes	No
1. Has your city progressed at least 150 years (year 150) into the future? Above?			
2. Does your city have a population of at least 50,000?			
3. Is your city clear of any loans?	N/A		
4. Are your residential, industrial, and commercial tax rates all Under 8%? List your max tax rate for each.	R =		
	I =		
	C =		
5. Does your city have a balanced budget? Your budget is balanced if your income is greater than your expenses.	Income		
	Expenses		
6. Are the Sims happy with your performance as Mayor of your City? (Four or more City Opinion Polls are Green).	N/A		
7. Are there no complaints from your Sims about traffic problems?	N/A		
8. Do you have at least 2 connections to neighboring cities in your region?			
Add number of check marks in the Yes column and multiply by 2 Computer Evaluation Sheet Total Points (0 –16) Insert numbers in "Enter Values" column.	Total Point (0–16)		

Computer Design Rubics

	City Layout Criteria	0 (Points)	1 (Points)	2 (Points)	3 (Points)	4 (Points)	5 (Points)	Score
1	What are the property values within the city?	Majority (> 50%) of the city is "light red" - very low values	Majority (> 50%) of the city is "red" - low values	Majority (> 50%) of the city is "dark red" - low to medium values	Majority (> 50%) of the city is "dark green" - medium values	Majority (> 50%) of the city is "green" - medium to high values	Majority (> 50%) of the city is "light green" - high values	5
2	Is there adequate police coverage within the city?	Little (<50%) police coverage	Some (approx 50% to 95%) police coverage	Adequate (>95% to 99%) police coverage - not all populated areas covered	Complete (100%) police coverage - all populated areas covered			3
3	Is there adequate fire coverage within the city?	Little (<50%) fire coverage	Some (approx 50% to 95%) fire coverage	Adequate (>95% to 99%) fire coverage - not all populated areas covered	Complete (100%) fire coverage - all populated areas covered			3
4	Are there factories located in the city?	No factories	One (1) type of factory	Two (2) different types of factories	Three (3) different types of factories	Four (4) different types of factories	Five (5) or more different types of factories	5
5	Are there high-tech industries located in the city?	No high tech industries	One (1) type of high-tech industry	Two (2) different types of high-tech industry	Three (3) different types of high-tech industry	Four (4) or more different types of high-tech industry	Five (5) or more different types of high-tech industry	5
6	Are there agricultural areas located within the city?	No farms	One (1) or two (2) farms	Three (3) or four (4) farms	At least five (5) farms			3

Computer Design Rubics (continued)

	City Layout Criteria	0 (Points)	1 (Points)	2 (Points)	3 (Points)	4 (Points)	5 (Points)	Score
7	Are there sufficient form(s) of garbage disposal for the city?	No forms of garbage disposal	One (1) form of garbage disposal	Two (2) forms of garbage disposal	Three (3) or more forms of garbage disposal			3
8	Is there a sufficient number of recycling facilities located within the city?	No recycling centers	One (1) or two (2) recycling centers	Three (3) or four (4) recycling centers	Five (5) or more recycling centers			3

	Social Services	0 (Points)	1 (Points)	2 (Points)	3 (Points)	4 (Points)	5 (Points)	Score
1	What is the average life expectancy of the Sims over the last 10 years?	Average life expectancy of 40 or below	Average life expectancy 40 to 49	Average life expectancy 50 to 69	Average life expectancy of at least 70			3
2	What is the average education level of the Sims over the past 10 years?	Average education level below 80	Average education level 80 to 119	Average education level 120 to 159	Average education level at least 160			3

	Energy and Pollution Criteria	0 (Points)	1 (Points)	2 (Points)	3 (Points)	4 (Points)	5 (Points)	Score
1	Is there power to all areas within the city?	Few areas (< 50%) have power	Some areas (approx. 50% to 95%) have power	Most areas (> 95% to 99%) have power	All (100%) areas have power			3
2	Is there water to all areas within the city?	Few areas (< 50%) have water	Some areas (approx. 50% to 95%) have water	Most areas (> 95% to 99%) have water	All (100%) areas have water			3
3	Is water pollution under control within the city?	Majority (> 50%) of the city is "red" - high water pollution	Majority (> 50%) of the city is "light red"	Majority (> 50%) of the city is "orange"	Majority (> 50%) of the city is "light orange"	Majority (> 50%) of the city is "yellow"	Majority (> 50%) of the city is "light yellow" - low water pollution	5
4	Is air pollution under control within the city?	Majority (> 50%) of the city is "red" - high air pollution	Majority (> 50%) of the city is "light red"	Majority (> 50%) of the city is "orange"	Majority (> 50%) of the city is "light orange"	Majority (> 50%) of the city is "yellow"	Majority (> 50%) of the city is "light yellow" - low air pollution	5

Computer Design Rubics (continued)

	Transportation Criteria	0 (Points)	1 (Points)	2 (Points)	3 (Points)	4 (Points)	5 (Points)	Score
1	Are the Sims using the following Public Transportation Systems? 1. Bus 2. Subway 3. Monorail 4. Passenger Train 5. Ferry	No public transportation systems	Sims using one (1) public transportation system	Sims using two (2) public transportation systems	Sims using three (3) public transportation systems	Sims using four (4) public transportation systems	Sims using all five (5) public transportation systems	5
2	Does the passenger train, bus, or subway system provide adequate coverage throughout the city?	No bus, passenger train, or subway system in the city	Bus, passenger train, or subway system covers only part (<50%) of the city	Bus, passenger train, or subway system covers most (>50%) of the city				2
3	What is the average commute time for the Sims over the past 10 years?	Commute time of 60 minutes or more	Commute time of 60 minutes or less	50 minutes or less	40 minutes or less	30 minutes or less		4
4	Are the Sims using the freight truck system?	No freight truck system used	Minimal freight truck system usage, majority (>50%) of usage "white"	Adequate freight truck system usage, majority (>50%) of usage "grey"	Significant freight truck system usage, majority (>50%) of usage "blue"			3
5	Are the Sims using the freight train system?	No freight train system used	Minimal freight train system usage, majority (>50%) of usage "white"	Adequate freight train system usage, majority (>50%) of usage "grey"	Significant freight train system usage, majority (>50%) of usage "blue"			3
6	Is there an airport in the city?	No airport is present	A landing strip is present	A small municipal airport is present	An international airport is present			3
7	Is there an seaport in the city?	No seaport present		A developed seaport is present				2

Computer Design Rubics (continued)

	Recreation Criteria	0 (Points)	1 (Points)	2 (Points)	3 (Points)	4 (Points)	5 (Points)	Score
1	Are there different types of recreation areas within the city?	No recreation areas	One (1) to three (3) different types of recreation areas	Four (4) to six (6) different types of recreation areas	Seven (7) to Eleven (11) different types of recreation areas	Twelve (12) to fourteen (14) different types of recreation areas	Fifteen (15) different types of recreation areas	**5**
2	Have the Sims received any rewards?	No rewards	One (1) reward	Two (2) rewards	Three (3) rewards	Four (4) rewards	Five (5) or more rewards	**5**
								84

Computer Design Score Sheet (0–84 points)

Judge's Name						
Future City Name						
School Name						
City Size	Small		Medium		Large	

The judging teams will complete this section.
Judges will answer these questions and assign a point value of 0–5 points for each question.

City Layout		
1. What are the property values within the city?	(0–5 points)	
2. Is there adequate police coverage within the city?	(0–3 points)	
3. Is there adequate fire coverage within the city?	(0–3 points)	
4. Are there factories located within the city?	(0–5 points)	
5. Are there high-tech industries located within the city?	(0–5 points)	
6. Are there agricultural areas located within the city?	(0–3 points)	
7. Are there sufficient form(s) of garbage disposal for the city?	(0–3 points)	
8. Is there a sufficient number of recycling facilities located within the city?	(0–3 points)	

Social Services Criteria		
1. What is the average life expectancy of the Sims over the last 10 years?	(0–3 points)	
2. What is the average education level of the Sims over the past 10 years?	(0–3 points)	

Energy and Pollution Criteria		
1. Is there power to all areas within the city?	(0–3 points)	
2. Is there water to all areas within the city?	(0–3 points)	
3. Is water pollution under control within the city?	(0–5 points)	
4. Is air pollution under control within the city?	(0–5 points)	

Transportation Criteria		
1. Are the Sims using the following Public Transportation Systems? a. Bus ___ b. Ferry ___ c. Monorail ___ d. Passenger Train ___ e. Subway ___	(0–5 points)	
2. Does the passenger train, bus, or subway provide adequate coverage throughout the city?	(0–2 points)	
3. What is the average commute time for the Sims over the past 10 years?	(0–4 points)	
4. Are the Sims using the freight truck system?	(0–3 points)	
5. Are the Sims using the freight train system?	(0–3 points)	
6. Is there an airport in the city?	(0–3 points)	
7. Is there an seaport in the city?	(0–2 points)	

Recreation Criteria		
1. Are there different types of recreation areas within the city?	(0–5 points)	
2. Have the Sims received any rewards?	(0–5 points)	

Please use whole numbers, not fractions. Please add all points together and write in score.	**Total (0–84 points)**	

Future City Model Rubric

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

I. CREATIVITY (20 points)	0	2	4	6	8	10
1. Illustration of Futuristic Designs • Buildings and/or structures • Infrastructure (mag-lev, space elevator) • Location (outer space, underwater, ice cap, desert) • Plausible and recognizable as a city	No futuristic designs that are plausible.	Includes 1-2 futuristic designs that are plausible.	Includes few futuristic designs, 1-2 are plausible.	Several futuristic designs, few plausible.	Many futuristic designs, most plausible.	Highly futuristic. Very plausible.
2. Appearance • Use of color, graphics, shapes, etc. • Realistic elements (flora, fauna, landscapes) • Pleasing, not distracting	Not complimentary, distracting.	Fulfills at least 20% of requirements: Fair aesthetics, somewhat distracting.	Fulfills at least 50% of requirements: Fair aesthetics, not distracting.	Fulfills at least 90% of requirements: Good aesthetics enhance the model.	Very good aesthetics enhance the model.	Excellent aesthetics enhance the model.
II. QUALITY & SCALE (20 points)	**0**	**2**	**4**	**6**	**8**	**10**
3. Quality Workmanship and Age Appropriateness • Age appropriate for 7—8th grade • Quality construction • Reasonably durable	Poor quality.	Mediocre quality.	Fair to good quality.	Good quality. Age appropriate.	Very good quality. Age appropriate.	Excellent quality. Age appropriate.
4. Model Scale: • Consistent scale throughout model • Applied horizontally and vertically • Appropriate scale chosen to create a good city model	Inappropriate, inconsistent scale.	Inconsistent scale for majority of model.	Fair scale choice. Some inconsistencies.	Good scale choice. Consistently applied.	Very good scale choice; city elements easy to identify. Consistent application.	Exceptional scale, layout; City elements easy to identify. Consistent application.

Future City Model Rubric (continued)

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

III. CITY DESIGN (50 points)	0	2	4	6	8	10
5. City Design and Livability • Well planned design and layout (neighborhoods, green spaces, streets) • Accessibility, functionality, mixed-use • Eco-management: sustainability, landscape	Fails to include expected requirements.	Little planning.	Some planning.	Planned design, accessible, mixed-use. Considers environment.	Well planned design. Accessible and mixed-use areas. Considers environment.	Excellent planning, accessibility, and environmental management.
6. Zones & Interconnectivity • Variety of city zones, structures, infrastructure components • Interconnectivity of zones and components • Transportation: pedestrian, personal, public, goods & services	Zoning unclear.	One zone, few structures. Little interconnectivity.	At least one zone, variety of structures. Some interconnectivity, but some awkward design.	1-2 zones, variety of structures. Some good interconnectivity.	Two or more zones. Good variety of structures. Good interconnectivity.	Two or more zones, good variety of structures. Very good interconnectivity.
7. Futuristic Technologies • Examples of futuristic technologies, components • Scientifically sound	No futuristic examples.	1-2 futuristic examples. Artistic, but not scientifically sound.	Few futuristic examples. At least one scientifically sound.	Some futuristic examples which are scientifically sound.	Several futuristic examples, many of which are scientifically sound.	Highly futuristic, but based on sound scientific principals.
8. Innovative Solutions • Examples of solutions to problems: transportation, environment, services, etc. • At least one original, innovative solution	No solutions.	One solution, not innovative.	At least one solution. Somewhat innovative.	More than one solution. Innovative and plausible.	More than one solution that is innovative.	Several innovative solutions.
9. Affordable Living Structure Illustration • Incorporating essay topic into model • At least one example of affordable living space • Strives to meet "Green Ideals" of building	No living structures.	One living space. Not clear whether affordable, green.	One living space. Appears either affordable or green.	At least one affordable living space. Somewhat green.	At least one affordable living space. Green.	More than one affordable living space. Very green.

Future City Model Rubric (continued)

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

IV. MOVING PART COMPONENT (20 points)	0	2	4	6	8	10
10. Moving Part Innovation and Quality • At least one moving part • Quality workmanship, durability • Repeatability of movement • Innovative execution	No moving parts.	One moving part. Fair quality. One time movement.	One moving part. Good quality.	At least one moving part. Good quality. Repeatable movement. Somewhat innovative.	More than one moving part. Very good quality. Repeatable movement. Innovative.	More than one moving part. Excellent quality, repeatable movement, highly innovative.
11. Moving Part Relationship to the Design or Function of the City • At least one moving part • Closely related to function of the city	No moving parts.	Moving part cosmetic; not relevant to city design.	Moving part loosely related to city design.	Moving part relevant to city design.	At least one moving part intrinsic to city design.	More than one moving part essential to city design.

V. USE OF RECYCLED MATERIALS (10 points)	0	2	4	6	8	10
12. Use of Recycled Materials • Most of model made from recycled materials • Variety of materials, imaginative or unusual materials • Creative modification or application of materials	No recycled materials used.	Few recycled materials. Some creative materials. No modifications.	At least 50% recycled materials. Little or no variety. Some attempt to modify.	More than 75% recycled. Some variety. Some creative materials. Some creatively modified.	More than 75% recycled. Good variety. Many creative materials and modifications.	Almost all recycled. High level of creative and creatively modified materials.

City Model Score Sheet (0–120 points)

Judge's Name
Future City Name
School Name

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

I. CREATIVITY (20 points)	0	2	4	6	8	10	Score
1. Illustration of Futuristic Designs • Buildings and/or structures • Infrastructure (mag-lev, space elevator) • Location (outer space, underwater, ice cap, desert) • Plausible and recognizable as a city							
2. Appearance • Use of color, graphics, shapes, etc. • Realistic elements (flora, fauna, landscapes) • Pleasing, not distracting							
II. QUALITY AND SCALE (20 points)	**0**	**2**	**4**	**6**	**8**	**10**	**Score**
3. Quality Workmanship and Age Appropriateness • Age appropriate for 7—8th grade • Quality construction • Reasonably durable							
4. Model Scale: _____ • Consistent scale throughout model • Applied horizontally and vertically • Appropriate scale chosen to create a good city model							
III. CITY DESIGN (50 points)	**0**	**2**	**4**	**6**	**8**	**10**	**Score**
5. City Design and Livability • Well planned design and layout (neighborhoods, green spaces, streets) • Accessibility, functionality, mixed-use • Eco-management: sustainability, landscape conservation							
6. Zones & Interconnectivity • Variety of city zones, structures, infrastructure components • Interconnectivity of zones and components • Transportation: pedestrian, personal, public, goods & services							

City Model Score Sheet (0–120 points) (continued)

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

III. CITY DESIGN (50 points)	0	2	4	6	8	10	Score
7. Futuristic Technologies • Examples of futuristic technologies, components • Scientifically sound							
8. Innovative Solutions • Examples of solutions to problems: transportation, environment, services, etc. • At least one original, innovative solution							
9. Affordable Living Structure Illustration • Incorporating essay topic into model • At least one example of affordable living space • Strives to meet "Green Ideals" of building							

IV. MOVING PART COMPONENT (20 points)	0	2	4	6	8	10	Score
10. Moving Part Innovation and Quality • At least one moving part • Quality workmanship, durability • Repeatability of movement • Innovative execution							
11. Moving Part Relationship to the Design or Function of the City • At least one moving part • Closely related to function of the city							

V. USE OF RECYCLED MATERIALS (10 points)	0	2	4	6	8	10	Score
12. Use of Recycled Materials • Most of model made from recycled materials • Variety of materials, imaginative or unusual materials • Creative modification or application of materials							
TOTAL SCORE (0–120 points)							

Team Presentation of Future City Design and Model Rubric

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

I. CREATIVITY (50 POINTS)	0	2	4	6	8	10
1. Organization • Clear intro, body, and conclusion. • Body logically organized • Supporting statements evident • Transitions between sections	No organizational pattern. No transitions; missing conclusion; very little information.	Listed information ; little or no support or transitions. Intro, body, conclusion somewhat unclear.	Fair amount of information, structure of presentation body is present; missing either or both introduction or conclusion; few transitions.	Good amount of information and generally good organization . Could use smoother transitions and better supporting facts.	Organized with transitions; broad range of information but could use more details.	Extremely well organized, clear transitions; very broad information range with excellent support; creative introduction, conclusion.
2. Presentation Content • City features, benefits, and aesthetics described • Geography, demographics or distinctive characteristics • Discusses infrastructure such as transportation, energy, waste disposal or pollution control • Innovations in technology and futuristic concepts explained	No city benefits, aesthetics, technology or innovation mentioned.	Few benefits or innovations discussed. Little explanation or not believable.	Fair description of the city. Some distinctive benefits and innovations explained. Somewhat futuristic and believable.	Good overall description of the city. Many distinctive benefits and innovations explained. Somewhat futuristic and believable.	Very good description of city. Many benefits and innovations explained. Futuristic and believable.	Excellent description of city. Highly innovative technology applied throughout. Explained in detail. Futuristic and believable.
3. Essay Topic (affordable green building) • Discusses essay topic: design affordable living spaces using sustainable and green techniques. • Explains how the yearly theme influenced the city design	No discussion of affordable, green living spaces or other program components.	Refers to essay briefly; little or no discussion of other program components.	Briefly discusses essay topic and solution. No real supporting facts. Explains how their city design incorporates the theme.	Discusses the essay topic and solution; some supporting facts. Solution is adequate, somewhat innovative. Somewhat explains how their city design incorporates the theme.	Discusses the essay topic and solution. Good supporting facts. Solution innovative or futuristic. Fully explains how their city design incorporates the theme.	Discusses the essay topic and solution with excellent supporting facts. Excellent explanation of how their city design incorporates the theme.
4. Knowledge of Engineering Roles & Design Process • Discusses the engineering field and/or engineering roles • Understands engineering design process: problem definition, tradeoffs, testing, etc. • Has applied process to FC project	No discussion of engineering.	Mentions engineering, but lacks understanding of roles or design process.	Briefly discusses and understands engineering and role of engineer. Little discussion of engineering process.	Discusses and understands engineering role and presents some knowledge of engineering process.	Good understanding of engineering role and engineering process. Attempts to apply engineering process to part of the project.	Excellent understanding of engineering and engineering process. Applies engineering process throughout the project.

Team Presentation of Future City Design and Model Rubric (continued)

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

I. CREATIVITY (Cont'd)	0	2	4	6	8	10
5. Questions and Answers • Answers questions with confidence • Accurate, complete answers	Unable to answer questions.	Answers a few questions accurately. No supporting facts.	Answers at least 50% of the questions accurately, few supporting facts.	Answers 90% of questions with accuracy and some supporting facts.	Answers 100% of the questions accurately with some supporting detail.	Fully, accurately and confidently answers 100% of the questions with many supporting details.
II. DELIVERY/PRESENTATION SKILLS (30 POINTS)	**0**	**2**	**4**	**6**	**8**	**10**
6. Presentation Skills • Verbal skills: Fluent, clear, audible delivery • Verbal skills: Correct grammar and appropriate language use • Non-verbal skills: Upright posture with practiced use of visual aids • Overall confident, direct, and animated delivery	Poor skills throughout the presentation.	A few verbal and nonverbal skills are fairly well done but needs more practice to improve in most areas.	Fair to good skills for the majority of the presentation.	Good use of most of the verbal and nonverbal skills; somewhat confident and direct.	Very good verbal and nonverbal skills by most of team throughout most of the presentation.	All verbal and nonverbal skills demonstrated with excellence throughout the entire presentation. Very confident, direct, and animated delivery.
7. Model as a Demonstration Aid • Model is a key element of entire delivery • Creatively uses model to illustrate city features • Model enhances, rather than distracts, from presentation	Little or no use of the model as a demonstration aid.	Model referenced but does not enhance presentation.	Model is used and is partially effective and fairly enhances presentation. Little innovation shown.	Good use of the model as an illustration of city design and function; little illustration of innovations.	Very good model use; integrated smoothly into the presentation and helped to illustrate city design, function and innovations.	Extremely creative, integrated use of model; contributed significantly to the understanding of city design, function and innovations.
8. Visual and Other Aids • Standard visual aids (posters, charts) neat, well-prepared • Additional visual aids (props, costumes, handouts) enhance, rather than distract, from overall presentation • Delivery with all visual aids is well practiced and confident	No visual aids or visual aids distract from presentation.	Poorly designed visual aids, do not enhance presentation.	Fair to good visual aids ; somewhat add to presentation. Fair to good design and construction.	Good visual aids that generally added to the presentation; well designed and good use of visual aids to enhance the presentation.	Very good visual aids that enhanced the presentation of the city design and function. Well used, designed, and constructed.	Excellent, well designed, constructed and creatively used visual aids that integrated well into the presentation and enhanced understanding city design and function.

Team Presentation of Future City Design and Model Rubric (continued)

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

III. TEAMWORK (10 POINTS)	0	2	4	6	8	10
9. Teamwork During Presentation and Q&A • Team members supported each other • Team members shared time equally • Team members displayed an equal amount of knowledge • Full complement of team members (three students)	Little or no collaboration or support among team members.	A small amount of collaboration among team members but more support of one another is needed; one or two tend to dominate during both presentation and Q&A.	Some collaboration, some support and sharing among some team members. Amount of knowledge is unequal. One or two tend to dominate during either the presentation or Q&A.	Good collaboration; support and sharing among most members. Full complement of three team members. Some team members have more knowledge and dominate.	Very good collaboration, support and sharing among the team on both Q & A and presentation. Equivalent knowledge level for most of team. Full complement of three team members.	Excellent collaboration, support and sharing among all of the team members on everything. Equivalent knowledge level for all. Full complement of three team members. No one team member dominates.

Team Presentation Score Sheet (0–90 points)

Future City Name

Directions: This score sheet is designed to be used in conjunction with the Team Presentation Rubric. Indicate (check, x, or number) the appropriate box and place score in right score column.

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

I. KNOWLEDGE AND ORGANIZATION (50 points)	0	2	4	6	8	10	Score
1. Organization • Clear intro, body, and conclusion. • Body logically organized • Supporting statements evident • Transitions between sections							
2. Presentation Content • City features, benefits, and aesthetics described • Geography, demographics or distinctive characteristics • Discusses infrastructure such as transportation, energy, waste disposal or pollution control • Innovations in technology and futuristic concepts explained							
3. Essay Topic (affordable green building) • Discusses essay topic: design affordable living spaces using sustainable and green techniques • Explains how the yearly theme influenced the city design							
4. Knowledge of Engineering Roles & Design Process • Discusses the engineering field and/or engineering roles • Understands engineering design process: problem definition, tradeoffs, testing, etc. • Has applied process to FC project							
5. Questions and Answers • Answers questions with confidence • Accurate, complete answers							
II. DELIVERY/PRESENTATION SKILLS (30 points)	**0**	**2**	**4**	**6**	**8**	**10**	**Score**
6. Presentation Skills • Verbal skills; fluent, clear, audible delivery • Verbal skills; correct grammar and appropriate language use • Nonverbal skills; upright posture with practiced use of visual aids • Overall confident, direct, and animated delivery							

Team Presentation Score Sheet (0–90 points) (continued)

Directions: This score sheet is designed to be used in conjunction with the Team Presentation Rubric. Indicate (check, x, or number) the appropriate box and place score in right score column.

0 No Points	2 POOR	4 FAIR	6 GOOD	8 VERY GOOD	10 EXCELLENT
Requirements missing	Poor-Fair quality. Fulfills at least 20% of requirements.	Fair-Average quality. Fulfills at least 50% of requirements	Average quality. Fulfills at least 90% of requirements.	Above average quality. Fulfills 100% of requirements.	Excellent quality. Fulfills 100% of requirements. Additional distinctive features.

II. DELIVERY/PRESENTATION SKILLS (30 points)	0	2	4	6	8	10	Score
7. Model as a Demonstration Aid • Model is a key element of entire delivery • Creatively uses model to illustrate city features • Model enhances, rather than distracts, from presentation							
8. Visual and Other Aids • Standard visual aids (posters, charts) neat, well-prepared • Additional visual aids (props, costumes, handouts) enhance, rather than distract, from overall presentation • Delivery with all visual aids is well practiced and confident							
III. TEAMWORK (10 points)	**0**	**2**	**4**	**6**	**8**	**10**	**Score**
9. Teamwork During Presentation and Q&A • Team members supported each other • Team members shared time equally • Team members displayed an equal amount of knowledge • Full complement of team members (three students)							
TOTAL SCORE (0–90 points)							

Judge's Sample Questions

Formulating the Concept

1. When conceiving your city, were you open to creative and possibly impractical ideas or did you focus on what you knew was possible?
2. What makes your city stand out from other future cities?
3. In planning a city of the future, what is the most important thing to consider?
4. What role did your imagination play in planning your Future City?
5. Explain whether "fantasy" or "reality" better describes your Future City.
6. Where did you get your inspiration for your Future City concept?

Working as A Team

1. What did you learn about your teammates and yourself during this project?
2. Is a FC team best composed of similar thinking members or does disagreement play a role in formulating and refining ideas?
3. If a team member came up with a terrible idea how did you handle the situation?
4. Describe how "the team dynamics" contributed to the design of your Future City.
5. What process did you use for dividing the tasks efficiently?

Technical Research

1. In looking back, what research was critical in refining your city?
2. Cite field trips that helped you formulate your city.
3. Are the transportation systems in your city accessible for individuals with disabilities? Provide examples.

Engineering and Operations

1. Identify the different types of engineering employed in your city and explain which one is most critical to its operation.
2. What insight did you gain from your project on maintaining a balance between future planning and preservation of the past?
3. Explain one part of your city that depends more on engineering for its day-to-day operation than its design?
4. How did you integrate the city-wide systems so they were easier to manage?
5. How did the peculiarities of your city's environment impact your city's systems?
6. Did the environment of your city dictate creative solutions for growth?
7. Are there any real factors that limit the size of your city?
8. What made the communication system you selected the best choice?
9. Overburdened transportation systems are universally a problem for cities—what approach did you take to prevent this problem from happening in your city?
10. How do construction materials and goods efficiently and with minimal environment impact reach a site in your city?
11. Explain what alternative energy sources you employed in your city's design?
12. How were your utilities developed? What considerations were given to your power resources?
13. What would you say was your biggest engineering design challenge to solve in this project?

Judge's Sample Questions (continued)

Building the Model

1. In building the model of your city, what was the most difficult aspect to overcome?
2. What factors went into determining the scale of your model?
3. What were some of the challenges in working with the scale you selected?
4. Why did you choose this particular section of your computer city design to build?
5. What were some of the factors that went into laying out the various zones in your city?
6. If you began again, what one thing would you have done differently to improve your model?

Budgeting Issues and Incentives

1. How did you approach budgeting for growth in your city?
2. How do you generate revenue to pay for your city services?
3. What does your future city have as an enticement to offer potential business investors?

Resident Needs and Profiles

1. How does your city help support a healthy lifestyle for its residents?
2. Why does your city need a diversity of people to run effectively?
3. Explain why you would want to live in your city?
4. Detail some of the features you have incorporated in your city design to provide access for people with disabilities?
5. Describe what provisions you have made in your city for low to moderate income families.
6. What specific training needs to be offered in your city to help future economic stability?
7. How does your city help people with disabilities get to and from work?

Benefits to Team Members

1. Why would you encourage other students to participate in the Future City Competition?
2. How has the Future City Competition helped you plan for your future?
3. What is the most valuable experience you gained from the Future City Competition?

Benefits to Society

1. From a global perspective how will humanity profit from your city?
2. Why do we need fresh and innovative ideas for cities?
3. What insights did you gain about your own city or town from working on the Future City™ project?
4. What would be the benefits of having an engineer included on your city's Town Council?
5. What did the Future City™ Competition teach you about the role of engineering in society?
6. Who benefits from having curb cuts on sidewalks?

Your Engineer-Mentor and Teacher

1. What insights did you gain from working with your engineer-mentor on the Future City™ Competition?
2. What one thing did your teacher do that helped you learn the most?

Essay Rubric

City Layout Criteria			0 (Points)	1 (Points)	2 (Points)	3 (Points)	Score
I. Selection of Living Space:							
Select and define a living space of their choice using "green" materials, processes and standards to address a societal need.							
1	Does the essay define the living space and its location as it pertains to the citizens in need (e.g. homeless)?	a.	Living space is NOT defined	Living space is defined/named			
		b.	Location is NOT identified	Location is briefly identified	Location is well identified		
		c.	Does NOT address the needs of the citizens	Briefly relates to the needs of the citizens	Adequately relates to the needs of the citizens	Relates well to the needs of the citizens	
2	Does the essay explain how the living space can adapt to various sizes and styles, and what is the expected lifespan of the living space?	a.	NO explanation of variation in size, style or lifespan	One of the three characteristics is briefly addressed	Two characteristics are briefly addressed	Three characteristics are briefly addressed	
		b.	NO in depth explanation of any characteristic	In depth explanation of at least one characteristic	In depth explanation of all three characteristics		
3	Does the essay discuss the target demographic of the living space/housing?		Living space target demographic is NOT identified	Target demographic is briefly discussed	Target demographic is adequately discussed	Target demographic is well discussed	
II. Research:							
Research of existing green building sustainable processes, materials, and technologies.							
4	Is there evidence of research into existing green building technologies and criteria used today?	a.	NO evidence of research	Research of one green technology	Research of at least two green technologies		
		b.	Research is NOT in depth	Research of one green technology topic is in-depth	Research of at least two green technology topics is in-depth		
		c.	NO examples are presented	Examples are presented			

Essay Rubric (continued)

City Layout Criteria			0 (Points)	1 (Points)	2 (Points)	3 (Points)	Score
III. Green Materials and Resources:							
Develop and investigate a new technology or improvement to a technology to incorporate into the residential space to insure sustainable/green design. The technology or innovation should aim to satisfy the "Green Ideals".							
5	Does the essay describe innovation in "Green" materials and resources and how they function?	a.	A "Green" material/resource innovation is NOT identified	A "Green" material/resource innovation is identified			
		b.	NO description of how the material/resource innovation will function	Material/ resource innovation function briefly described	Material/resource innovation function adequately described	Material/ resource innovation function well described	
		c.	NO examples are presented	Examples are presented			
6	Does the essay describe how the chosen materials will enable the living space to adapt to the community?		NO description of how the living space adapts to the community	Brief description of how the living space adapts to the community	Adequate description of how the living space adapts to the community	How the living space adapts to the community is well described	
7	Does the essay discuss the impact of the chosen materials on construction waste?		NO discussion of impact on waste	Brief discussion of impact on waste	Adequate discussion of impact on waste	Impact on waste is well discussed	
8	Does the essay describe the impact of the chosen materials on the living space aesthetics (interior and exterior)?		NO description of the living space aesthetics	Brief description of the living space aesthetics	Adequate description of the living space aesthetics	The living space aesthetics are well described	
9	Does the essay describe what makes the chosen material an economic, efficient and sustainable choice?	a.	Economy and efficiency are NOT discussed.	Economy and efficiency are briefly discussed	Economy and efficiency are adequately discussed	Economy and efficiency are well discussed	
		b.	Sustainability is NOT discussed	Sustainability is briefly discussed	Sustainability is adequately discussed	Sustainability is well discussed	
10	Does the essay describe the tradeoffs made between economic, efficient and sustainable in the selection of the chosen building materials?		Tradeoffs between economics, efficiency, and sustainability are NOT discussed	Tradeoffs between economics, efficiency, and sustainability are briefly discussed	Tradeoffs between economics, efficiency, and sustainability are adequately discussed	Tradeoffs between economics, efficiency, and sustainability are well discussed	
11	Does the essay discuss the environmental footprint or impact of the living space?		NO discussion of environmental footprint	Brief discussion of environmental footprint	Adequate discussion of environmental footprint	Environmental footprint is well discussed	

Essay Rubric (continued)

City Layout Criteria			0 (Points)	1 (Points)	2 (Points)	3 (Points)	Score
IV. Function and Value of the Living Space:							
Provide in-depth discussion of the function of the living space design or component(s) and its influence on the occupants and community.							
12	Does the essay discuss the durability and maintenance of the living space?		NO discussion of durability and maintenance is provided	Brief discussion of durability and maintenance is provided	Adequate discussion of durability and maintenance is provided	Durability and maintenance are well discussed	
13	Does the essay provides a description of the improvements to the quality of life of the living space occupants (including elderly and disabled)?		NO description of improvement in the quality of life for the occupants.	Brief description of improvement in the quality of life for the occupants.	Adequate description of improvement in the quality of life for the occupants.	Improvement in the quality of life for the occupants is well described	
14	Does the essay discussion include benefits of the living space design and its impact on the community and environment?	a.	NO discussion of benefits to the community provided by the living space	Brief discussion of the benefits to the community	Adequate discussion of the benefits to the community	The benefits to the community are well discussed	
		b.	NO discussion of benefits to the environment provided by the living space	Brief discussion of the benefits to the environment	Adequate discussion of the benefits to the environment	The benefits to the environment are well discussed	
V. Role of the Engineer:							
Identify an engineering discipline and its role in developing the living space design or components of the living space.							
15	Does the essay discuss the role of one engineering discipline in the development of the living space?	a.	An engineering discipline is NOT identified	An engineering discipline is identified			
		b.	The role of the engineer in developing the living space or its components NOT discussed	The role of the engineer in developing the living space or its components is briefly discussed	The role of the engineer in developing the living space or its components is adequately discussed	The role of the engineer in developing the living space or its components is well discussed	

Essay Rubric (continued)

City Layout Criteria			0 (Points)	1 (Points)	2 (Points)	3 (Points)	Score
VI. Written Communications:							
Assessment of the overall written presentation.							
16	Well Written		Poorly written and organized	Satisfactorily written and organized	Exceptionally written and organized		
17	Grammar		Many grammatical errors	Some grammatical errors	No grammatical errors		
18	Spelling		Many spelling errors	Some spelling errors	No spelling errors		
19	Length		Fewer than 700 words or more than 1000 words	Between 700 and 1000 words			
20	List of References	a.	Less than three appropriate references	At least three appropriate references			
		b.	References are NOT correctly listed	References are correctly listed			
Total Essay Points (0–70 points)							

City Narrative Rubric

Future City Name

The judging teams will compete this section. Judge's will answer these questions and assign a point value for each question.

Criteria	0 pts.	1 pts.	2 pts.	3 pts.	4 pts.	5 pts.	Score
1. Describe the City's physical components & infrastructure. (Physical components of the city could include but are not limited to parks and landmarks, recreation opportunities or attractions, and other highlights.)	No description	Poor description of City and its physical components & infrastructure	Fair description of City and its physical components & infrastructure	General description of City and its physical components & infrastructure meets expectations	Good description of City and its physical components & infrastructure	Excellent description of City and its physical components & infrastructure	
2. Describes the City and its services including information such as an overview of their city's quality of life and issues of health, safety, education, etc.	No description	Poor description of City and services	Fair description of City and services	General description of City and some of its services meets expectations	Good description of City and some of its services	Excellent description of City and many of its services	
3. Description of the City's basic information such as population, year, and location?	No description	Some description	Exceptional description				
4. Organized and well written	Poorly organized and written	Satisfactorily organized and written	Exceptionally organized and well written				
5. Grammatical Errors	Many grammatical errors	Some grammatical errors	No grammatical errors				
6. Spelling Errors	Many spelling errors	Some spelling errors	No spelling errors				
7. Length	Fewer than 300 OR more than 500 words		Between 300 and 500 words				
Total City Narrative Points (0—20 points)							

Score Sheet Summary

Future City Name
School Name
Points Name

1. Computer City Design Self-Evaluation Sheet (0-16 points) _____
2. Computer City Design (0–84 points) _____
3. Future City Model (0–120 points) _____
4. Team Presentation (0–90 points) _____
5. Research Essay (0–70 points) _____
6. Narrative (0–20 points) _____

Subtotal (0–400 points) _____

Scoring Deduction:

1. Missing Deadline for submission of the Computer City Design and Computer City Design Self-Evaluation Sheet. Deadline is set by the Regional Coordinator. (minus 5–10 points) _____
2. Missing Deadline for submission of the research essay. Deadline is set by the Regional Coordinator (minus 5 points) _____
3. Incomplete Forms: Computer City Design Self-Evaluation Sheet (minus 2 points) _____
   Essay Form (minus 2 points) _____
   Competition Expense Form: Missing expense form (minus 15 points) _____
   Missing receipts (minus 5 points) _____
4. Missing all or part of the Model ID information (minus 1–5 points) _____
5. Exceeding presentation time (minus 5 points) _____
6. Exceeding model dimension (minus 15 points) _____
7. Exceeding visual display dimension (minus 15 points) _____
8. Expenses exceeding $100 (minus 15 points) _____
9. Unsportsmanlike conduct (minus 20 points) _____
10. Destruction of another team's project (team disqualified) _____

Total Score (Maximum = 400 points) _____

Total Points (0–400 points)

Comments: _____

Prepared by:

Regional Coordinators

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