



BUILD BEYOND

Invent Tomorrow Challenge



Competition Rubrics

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City Model Rubric

City Model Rubric

0 No Points Requirements missing	1 Poor Poor-fair quality. Fulfills at least 20% of Requirement s	2 Fair Fair-average quality. Fulfills at least 50% of the requirements.	3 Good Average quality. Fulfills at least 85% of the requirements.	4 Very Good Above average quality. Fulfills 95% of the requirements.	5 Excellent Excellent quality. Fulfills 100% of the requirements with additional distinctive features.
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<i>1. City Design (30 Points)</i>	0	1	2	3	4	5
1. City Zoning Includes the three primary zones: residential, commercial, and industrial	There is no evidence of zoning. There is no variety of structures.	Zoning unclear. There is little variety of structures. Only one type of zone is presented.	Somewhat clear zones. Small variety of structures. Only two types of zones presented.	Fairly clear zones, some variety of structures. At least three zones.	Clear zones and some variety of structures. Could be more comprehensive. At least three zones.	Clear and thorough zones. Excellent variety of recognizable structures. At least three zones.
2. City infrastructure - Could include housing, utilities, water, etc. - Connection to electrification solution.	No infrastructure examples.	Poor examples. Unrelated to electrification solution.	Some examples. Limited connections to electrification solution.	Fairly clear examples. Some connection to electrification solution.	Multiple examples. Direct connection to electrification solution.	Multiple, clear and thorough examples. Direct and relevant connection to electrification solution.
3. City Service - Could include healthcare, education, etc. - Essential to city operations	No city service examples.	Poor examples of services. Unrelated to city operations.	Some examples of services. Barely related to city operations.	Fairly clear examples of services. Slightly related to city operations.	Clear examples of services. Moderately related to city operations.	Clear and thorough examples of services. Essential to city operations.
4. Transportation - Variety of transportation modes. - Transportation system(s) addresses the city's needs and its residents.	No transportation system	Poor description of one mode of transportation. Does not address the transportation needs of the city.	Fair description of one or two modes. Overall the system does not meet the needs of the city.	Good description of one or two modes of transportation. Overall system meets most needs of the city.	Very good description of at least two modes of transportation. System addresses needs of city and its residents but could be more thorough.	Excellent description of two or more modes of transportation. System fully and thoroughly addresses needs of city and its residents.
5. Model Demonstrates Theme: Electrify Your Future Electrification solution showcased in model	No example of electrification solution.	Few examples of electrification solution.	Some examples of electrification solution.	Multiple examples of electrification solution.	Multiple and clear examples of electrification solution.	Multiple excellent examples of electrification solution.
6. City Design - Well planned. Considers: - Neighborhoods, green spaces, mixed zones - Interconnectivity - Sustainable - Accessibility	No Planning	Little planning. Very little demonstration of livability concepts.	Some planning is demonstrated	Planned design. Fair representation of livability concepts.	Well-planned design. Good representation of livability concepts	Clear and thorough planning and design. Excellent representation of livability concepts.

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II. Built It: Quality, Scale, & Materials (20 Points)	0	1	2	3	4	5
7. Innovative Construction - Variety of materials - Imaginative, unusual, or noteworthy materials - Creative modifications of recycled materials	No creativity or innovation. No recycled/repurposed materials.	Very little creativity and modification of materials. Very little variety of materials. Many materials are purchased.	Fairly creative modifications. Some variety of materials, but could be improved. Few recycled/repurposed materials.	Good creativity shown via modified materials. Good variety of materials. Features recycled/repurposed materials.	Very good creativity. Very good variety of materials that are creatively modified. Many materials are recycled/repurposed.	Excellent creativity. Wide variety of materials that are creatively modified. Few purchased items. Most materials are recycled/repurposed.
8. Appearance - Use of color, graphics, shapes, etc. - Realistic elements (flora, fauna, landscapes) - Age appropriate for 6th, 7th, 8th grades	No aesthetics.	Poor aesthetics.	Fair aesthetics. Age appropriate.	Good aesthetics. Age appropriate.	Very good aesthetics that enhance the overall city feel. Age appropriate.	Excellent and realistic aesthetics that enhance the overall city feel. Age appropriate.
9. Model scale - Accurate demonstration of scale - Up to four different scales may be used, but all should be clearly identifiable and consistently applied	Scale not provided. Or more than 4 different scales are used.	Scale(s) are not accurate or consistent.	Scale(s) somewhat consistent and accurate. Multiple mistakes.	Scale(s) mostly consistent. Mistakes are minimal.	Scale(s) consistently and chosen to demonstrate the scope and context of the city clearly.	Scale(s) are extremely consistent and chosen to demonstrate the scope and context of the city clearly and thoroughly.
10. Moving part - Related to the design or function of the city. - Quality workmanship, durability - Description of part - Successful demonstration of movement	No moving part	Moving part cosmetic; not related to city function. No description of how the team built the moving part.	Moving part not relevant to city function. Unclear or confusing description of how the part was built.	Moving part somewhat related to city function. Good description of how the team built the moving part.	Moving part is related to city function. Very good description of how the team built the moving part.	Moving part is essential to the city function. Excellent description of how the team built the moving part.

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III. Judge Assessment of Model (15 Points)	0	1	2	3	4	5
11. Application of Futuristic, Advanced Technologies - Includes futuristic technologies - Important to the function of the city	No futuristic examples.	Poor futuristic examples. Not important to the function of the city.	Fairly futuristic examples. Somewhat related to the function of the city.	Good futuristic examples, Related to function of the city.	Very good futuristic examples. Important to the function of the city.	Excellent futuristic examples. Very important to the function of the city.
12. Overall innovation - City design - Addresses electrification solution.	No innovation.	Innovation is poorly presented overall in model.	Innovation is presented fairly well overall in the model.	Innovation is presented well overall in the model.	Innovation is presented very well overall in the model.	Innovation is presented excellently throughout the model.
13. Model Effectiveness - Serves as a stand-alone representation of city - Function and purpose of model elements is evident and work well together	Not effective	Poor representation. For many elements, one asks, "What is this, and why is it here?"	Fair representation. Function and purpose of many elements is not evident.	Good Representation. Function and purpose of a few elements is not evident.	Very Good representation. The function and purpose of most elements are evident.	Excellent representation. Function and purpose of all elements is evident.

City Presentation Rubric

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I. Content & Delivery (35 Points)	0	1	2	3	4	5
1. Overall Presentation Content - Major elements: intro, body, and conclusion - Logical flow and transitions - Supporting details	Disorganized, and no major elements were addressed.	Poorly organized and missing major elements. Few supporting details.	Fair organization. Contains major elements. Some details and transitions, but ideas could be more developed.	Contains all major elements and good transitions. Details could be clearer.	Well organized and contains all major elements. Very good supporting details.	Extremely well organized. Effective variety of supporting details. The overall presentation is thoroughly developed.
2. Overall Presentation Delivery - Clear and audible. - Confident and creative - Balance of people and visual aids	Unclear and inaudible. Delivered with no confidence or creativity.	Not very creative. Needs more practice. Poor balance of student presenters and visual aids.	Somewhat creative and confident. Poor balance of presenters and visual aids.	Creative and confident. Good Balance of student presenters and visual aids.	Most of the team delivered very creative and confidently. Good balance of student presenters and visual aids.	The entire team delivered extremely creatively and confidently. Good balance of student presenters and visual aids.
3. City Overview & Chosen Climate Impact - Location - What makes the city special, and why do people want to live there? - Overview of climate change impact on city and resident's lives	No description	Underdeveloped overview does not provide basic information.	Fair overview. Lack of sufficient details.	Good overview supported by sufficient details.	Very good overview supported by many details.	Excellent overview supported by a variety of thorough details.
4. Infrastructure & Services - Futuristic city features and infrastructure - Innovative city services (could include education, health care, fire, etc.)	No description	Underdeveloped description. Lack of detail about infrastructure and services.	Fair description. Some details about infrastructure and services. Not very futuristic or innovative.	Good description. Many details about infrastructure and services. Somewhat futuristic.	Very good description. Many details about infrastructure and services. Futuristic.	Highly detailed and thorough description of infrastructure and services. Very futuristic.
5. Climate Change Challenge Solutions - Adaptation (reduction of harmful impacts) - Mitigation strategy	No description	Brief mentions of adaptation and mitigation, but offers little detail.	Fair explanation of adaptation and mitigation but lacks necessary detail.	Good description of adaptation and mitigation. Supporting details could be improved.	Very good description of adaptation and mitigation. Many supporting details.	Excellent description of adaptation and mitigation, variety of thorough, supporting details.

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I. Content & Delivery (35 Points) (Continued)	0	1	2	3	4	5
6. Use of Demonstration Aids - Use of model - Additional visual aids (if used) are well-prepared, legible, and relevant - Enhance rather than distract from presentation	Model not referenced. No other visual aids.	Model is not used effectively. Other demonstration aids poor or nonexistent.	Model is partially effective at enhancing the presentation. Other visual aids are fair to good.	Good use of the model as an illustration of city design and function. Other visual aids are effective and generally add to the presentation.	Model used effectively to illustrate city design, function, and innovations. Other visual aids are very good and enhance the presentation.	Extremely creative, integrated use of model contributed to the understanding of city design and function and innovations. Other visual aids are excellent.
7. Team Work - Team members supported each other - Team members shared time equally	No evidence of teamwork.	A small amount of collaboration among team members but more support of one another is needed; one or two tend to dominate.	Some collaboration, support and sharing among some team members. Amount of knowledge appears unequal. One or two tend to dominate.	Good collaboration, support, and sharing among most members.	Very good collaboration, support, and sharing among the team. Equivalent knowledge level for most of the team.	Excellent collaboration, support, and sharing among team members. All members display thorough knowledge.
II. Engineering and Technology (15 Points)	0	1	2	3	4	5
8. Engineering Design Process Discusses the application of the engineering design process to their project	No discussion.	Little or no discussion of the engineering design process.	Underdeveloped discussion of the engineering design process.	Good discussion of the engineering design process and how they applied it.	Very good discussion and understanding of the engineering design process and application to Future City projects.	Excellent discussion and understanding of the engineering design process and application to Future City project.
9. Engineering and Roles Demonstrates knowledge of engineering roles in city design and operation	No mention of engineering roles.	Mentions engineering, but little discussion of roles.	Demonstrates limited knowledge and understanding of engineering and roles.	Demonstrates good knowledge and understanding of engineering and roles.	Demonstrates very good knowledge and understanding of engineering and roles.	Demonstrates excellent and thorough knowledge and understanding of engineering and roles.
10. Risks, Trade-offs, & Compromises - Discusses potential risks and benefits - Analyzes trade-offs	No mention of risks, benefits, or trade-offs.	Little mention of risks, benefits, or trade-offs.	Some discussion of risks, benefits, and trade-offs.	Good analysis of risks, benefits, and trade-offs.	Very good analysis of risks, benefits, and the trade-offs made.	Excellent and thorough analysis of risks, benefits, and trade-offs.

City Q&A Rubric

0
Inadequate
Quality

1 or 2
Poor – Fair
Quality

3 or 4
Satisfactory –
Average
Quality

5 or 6
Good – Great
Quality

7
Exemplary
Quality

SCORES

I. Knowledge & Understanding (28 Points)	0	1 – 2	3 – 4	5 – 6	7	
1. Engineering & Technology Demonstrates understanding of engineering & technology	Provides little or no details & shows no understanding	Answers questions with limited details. Understanding of concepts seems to be lacking.	Answers questions adequately, but detail could be better. Decent understanding of concepts	Answer questions clearly with sufficient details. Good Understanding of concepts.	Answer questions clearly & thoroughly. Elaborates with related details. Excellent understanding of concepts.	
2. Team Work Demonstrates understanding of climate change impact, adaptation, and mitigation strategies	Answer questions with little or no details. Shows little or no understanding of concepts.	Answer questions with limited details. Understanding of concepts seems to be lacking.	Answers questions adequately, but details could be better. Decent understanding of concepts.	Answer questions clearly with sufficient detail. Good understanding of concepts.	Answers questions clearly and thoroughly. Elaborates with related details. Excellent understanding of concepts.	
3. Teamwork & Project Management - Demonstrates understanding of teamwork - Demonstrates knowledge of PM concepts	Answers questions with little or no details. Show little or no understanding of concepts.	Answers questions with limited details. Understanding of concepts seems to be lacking.	Answers questions adequately, but details could be better. Decent understanding of concepts.	Answers questions clearly with sufficient details. Good understanding of concepts.	Answers questions clearly and thoroughly. Elaborates with related details. Excellent understanding of concepts.	
4. City Design, Systems, & Operations - Demonstrates understanding of components that make a city livable - Understanding of systems and operations needed for city to function	Answers questions with little or no details. Show little or no understanding of concepts.	Answers questions with limited details. Understanding of concepts seems to be lacking.	Answers questions adequately, but details could be better. Decent understanding of concepts.	Answer Questions clearly with sufficient details. Good understanding of concepts.	Answers questions clearly and thoroughly. Elaborates with related details. Excellent understanding of concepts.	

City Q&A Rubric

0
Inadequate
Quality

1 or 2
Poor – Fair
Quality

3 or 4
Satisfactory –
Average
Quality

5 or 6
Good – Great
Quality

7
Exemplary
Quality

SCORES

1. Risks, Trade-offs, & Compromises Team refers to model (or visual representations) while presenting	Model/model segments are not referenced at all.	Few references to model/model segments	Some references to model/model segments.	Some references to model/model segments. References	Frequent references that enhance the team's answer.	
2. Collaboration - Team Members displayed a similar amount of knowledge - Team members shared time equally	Little or no collaboration and sharing. Unequal levels of knowledge.	Below–average collaboration and sharing. Unequal knowledge: one or two dominate.	Average collaboration and sharing. Knowledge level seems similar among team.	Very good collaboration, support, and sharing among the team. Equivalent knowledge level for most of team.	Excellent collaboration and sharing among team members. All three team members display thorough knowledge.	
						Total Score