NTX Future City Junior Competition

4th- 5th Grade

2025-2026

Annual Challenge Resources and Rubrics

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2025–2026 Future City Competition Theme: Farm to Table

Overview: Farm to Table Challenge

While humans once grew food wherever they lived, today most of our food travels to us from far away. Modern cities make it easy to get groceries from the store—but at a cost. The way we grow, package, and throw away food creates problems for our planet. In fact, about 40% of all food produced ends up wasted, even as 783 million people around the world go hungry.

Consider all the steps it takes to get food to your plate: farmers grow it, trucks move it, stores sell it, and finally, you eat it—or maybe you don't. But wasted food doesn't just disappear in a landfill—food waste takes up 28% of the world's agricultural area, uses 25% of all water used by agriculture each year, and creates about 8% of global greenhouse gas emissions.

That's why cities of the future need to rethink how food moves through our lives. One big idea is using the principles of circular economy along the food production pathway —a system where instead of throwing things away, we find ways to reuse, recycle, or repurpose them.

In recent years, engineers, scientists, farmers, manufacturers, and city planners are coming up with exciting new solutions like using waste products to feed livestock, designing reusable food packaging, and using smart bins that turn scraps into compost or energy. These systems don't just eliminate waste, they protect the planet and keep communities strong.

The students' challenge:

Design a city that eliminates food waste from farm to table and keeps your citizens healthy and safe.

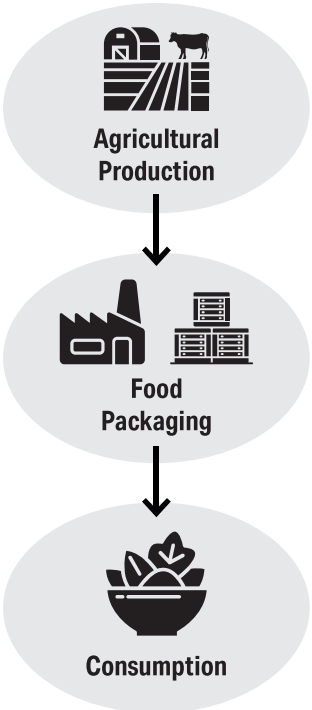
Farm to Table: Research Questions

For the competition, your team will design a city that utilizes the principles of circular economy to eliminate food waste. As you research, you will investigate three points along today's food production pathway: agricultural production, packaging, and consumption. Next, you'll focus on two different points along the pathway and design an innovative and futuristic food waste solution for each one. For example, you may decide to focus on agricultural production and consumption, or packaging and consumption. You don't need to provide an example for all three areas, just two of the three.

Use the questions below and in the **Future City Design Questions to Consider** handout as you start your research and brainstorming. And be sure to read and discuss the **City Essay Suggested Outline** and the **City Essay Rubric** with your teammates, as it provides a clear and detailed picture of what you'll need to include.

Food Production Pathway

As you research the food production pathway you may see additional points, such as post-harvest and distribution and retail. For this year's Future City Competition, we are narrowing the focus to the three featured here.



Today's Farm to Table Practices

Before you start designing your city, it is important to learn about current food production, packaging, and consumption practices, and discover where and how food waste occurs.

Agricultural Production

- Where does food come from? What mix of your city's food is grown locally? Regionally? Globally?
- How is food currently grown or produced on today's farms?
- How are farmers managing their crop yields?
- Do farms ever produce too much food or too little? Why?
- What kinds of waste do farms produce? What factors can lead to food waste?
- What are some innovative examples of how people are reducing waste in today's farming practices?
- What is biodiversity? Why is it important for farming and food production?
- How are today's farmers applying the principles of circular economy, like regenerative agriculture, on their farms?

Food Packaging

- How are today's foods typically packaged?
- Why is food packaged? How does it impact shelf life?
- How does today's food packaging contribute to waste?
- What are some innovative examples of sustainable and circular food packaging?
- What are the challenges and opportunities in using circular economy practices in food packaging?

Consumption

- How much food does a typical family throw away today?
- What happens to wasted food in your city?
- What is compost? How can composting benefit agriculture?
- What are innovative examples of how people are eliminating food waste in their homes?
- What happens to food that grocery stores and restaurants can't sell?
- What happens to food in your school that students don't eat?
- How does the shelf life of food affect whether it gets wasted?

Circular Economy, Regenerative Agriculture, and Circular Agriculture: What's the Difference?

As you begin researching, Imagining, and designing your Future City and solution for this year's Farm to Table challenge, you'll come across important terms like circular economy, regenerative agriculture, and circular agriculture. These ideas all aim to reduce or eliminate waste—but they aren't exactly the same.

This year's challenge focuses on the three principles of circular economy:

- Designing Out Waste – Preventing waste before it happens
- Keeping Products and Materials in Use – Reusing, repairing, and recycling
- Regenerating Natural Systems – Restoring soil, air, and water through sustainable practices

Eliminating or Reducing Food Waste in Your Future City

Use the questions below as a guide and brainstorm some of your own. The answers may provide some inspiration:

- What do the three principles of a circular economy look like in real life? Can you find any examples in farming or food production?
- How could a circular economy approach help reduce food waste from farm to table?
- What is regenerative agriculture? What farming practices in regenerative agriculture help reduce waste?
- What is circular agriculture? How does it reuse waste?
- How are regenerative and circular agriculture similar? How are they different?
- Why build a city that eliminates food waste? What problem(s) does it address?
- Can a city completely eliminate waste along the food production pathway? Why or why not?
- What tradeoffs or risks are involved in building and maintaining a city with practices that reduce food waste?
- What advances or innovations are occurring in eliminating or reducing food waste in your Future City?
- What was life like in your city before you disrupted the food waste stream?
    - How has this change impacted your citizens and city?
- What roles do engineers play in reducing or eliminating food waste?

City Design: Questions to Consider

Your Farm to Table challenge is to design a future city—set 100 years from now—that eliminates food waste from farm to table while keeping its citizens healthy and safe.

Why did your city leaders choose to build a farm to table city? What challenges were they trying to solve? What makes your city's farm to table approach innovative and futuristic? And how does your city sustain itself in the future?

As you and your teammates begin to design your future city, use the topics and questions below to guide your research, brainstorming, and design decisions. Remember that 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 future city located?
- Who lives in your city?
- What is the climate like in your city?
- What are your city's distinctive natural features (e.g., mountains, oceans, rivers)?
- What makes your city futuristic and innovative?

Zoning, Government & Budget

- How is your city zoned? Are the zones separate or are there mixed-use zones (e.g., commercial and residential or commercial and industrial) in your city?
- How has your city used zoning to achieve its goals around eliminating or reducing food waste?
- How is your city governed? Who makes the laws and regulations?
- What regulations or incentives does your city impose on manufacturers and businesses to ensure they are working to halt or reverse food waste?
- How does your city fund its operations (i.e., utilities, infrastructure, and public services)?

Environment and Energy

- What energy source(s) powers your future city? For example: gas, solar, oil, wind, nuclear, biomass, biofuels, tidal, hydrogen, wave, etc?
- What are the costs and trade-offs of different power sources?
- What are the environmental impacts of a city with practices that reduce food waste?
  - Are there positive impacts that you can take advantage of?
  - How can you mitigate any negative impacts?

Food and Agriculture

- Where does your city's food supply come from?
- How are your city's local and regional farmers reducing or eliminating food waste?
- Are the farms in your city energy efficient or using clean energy in their production practices?

Industry, Manufacturing & Jobs

- What drives the economy in your city (e.g., tourism, manufacturing, education, agriculture, sports, medicine, the arts)?
- What types of jobs are available to your residents?
- How has reducing or eliminating food waste affected your city's economy? What new jobs or products have been created? Has your city lost any jobs?

Structures & Housing

- Where do your residents live, work, and go to school?
- What materials are used in your city's buildings? What makes them innovative? How are materials produced, used, and potentially reused?
- Are there any special features in your city's housing options that address reducing food waste?

Transportation

- What transportation options are available to your residents? Is there more than one way to get around?
- How are goods and materials moved around your city for use and reuse?
- How is your city designed to be accessible for people with mobility issues related to aging or physical limitations?
- Are there innovative ways your city is utilizing its transportation system to reduce or eliminate food waste?

Utilities & Services

- What services does your future city provide to its residents (e.g., medical, education)?
- How does your city address the needs of vulnerable populations, including the poor, the sick, the unhoused, and the elderly?
- How does your city manage, reduce, and reuse waste? What recycling capabilities does it have?
- What impact has your city's approach to eliminating food waste had on its utilities—such as water, sewer, waste management and recycling, electricity, etc.?

Health & Recreation

- How does your city support a healthy lifestyle for its residents throughout every stage of life?
- What does your city offer for entertainment, recreation, and cultural enrichment?
- What types of public spaces does your city have? What do people do there?

Farm to Table City Case Studies

Power from Produce: Kalfresh

In Queensland, Australia, the company Kalfresh is leading a project to turn farm waste into renewable energy. When vegetables are harvested, some parts don't make it to the grocery store—for example, the corn cob you eat, which is about 7 inches long, came from a plant that was probably over 5 feet tall! Instead of letting these leftovers rot, Kalfresh is using engineering to give them a second life.

At the center of this system is a bioenergy facility that uses anaerobic digestion, a process where bacteria break down organic waste without oxygen. As the vegetable waste breaks down, it produces biogas that can be used for electricity, natural gas, or even to power trucks. The leftover material becomes nutrient-rich biofertilizer, which can go back onto the fields to grow more crops.

This closed-loop system means almost nothing is wasted. The project will process around 388,000 tonnes of organic waste each year, reduce greenhouse gas emissions, and power local homes and businesses. It's a model that could help farms across Australia—and the world—use food waste as fuel for the future.

Source: **https://www.sraip.com.au/bioenergy/**

Transforming Leftovers into Tasty Chips: Pulp Pantry

In Los Angeles, Pulp Pantry is using food engineering to turn leftovers from juice bars into crunchy, healthy snacks. This company collects leftover fruit and vegetable pulp from cold-pressed juice factories—about 10,000 pounds at a time—and gives it a second life as a crunchy snack. This pulp, which includes carrot, beet, kale, and celery fibers, is full of fiber and nutrients, but most of it ends up as food waste, which contributes to more methane emissions than any other matter that ends up in landfills.

To avoid spoilage, the pulp is picked up using temperature-controlled trucks and taken straight to a facility where it's processed into chips. Since launching in 2020, Pulp Pantry has saved more than 174,000 pounds of vegetable pulp from becoming waste. By designing a supply chain and manufacturing process around rescued ingredients, the company shows how engineering can be used to repurpose what others throw away.

Source: **https://www.theguardian.com/environment/2024/feb/22/us-food-waste-upcycling-snacks**

Packaging: An Edible Solution to Plastic Waste: Evoware's Seaweed-Based Packaging

In Indonesia, plastic pollution from single-use packaging is a major issue. To address it, a company called Evoware developed an innovative solution: food-safe, edible packaging made from seaweed.

This packaging is biodegradable, compostable, and even nutritious. It dissolves in hot water, making it ideal for products like instant coffee or noodle seasonings- just drop the sachet in without unwrapping it. If you don't want to eat it, that's not a problem either; it safely breaks down in the environment with no waste left behind.

Seaweed grows quickly without fertilizers or freshwater, making it a renewable material. By sourcing it locally, Evoware also supports Indonesian seaweed farmers and sustainable coastal agriculture.

Evoware's seaweed-based products include packaging for burgers and sandwiches, single-use sachets for dry goods, and edible cups called "Ello Jello," which come in flavors like peppermint and green tea. The cups are sturdy enough to hold liquids, and are safe to eat after use.

By turning seaweed into functional, zero-waste packaging, Evoware shows how innovative engineering design and sustainable materials can reduce plastic pollution and support local communities.

Source: **https://rethink-plastic.com/home/**

DISCOVER PRESENTS

FUTURE CITY COMPETITION

Farm to Table Resources:

Food Waste & Circular Economy

- How Much Food Does the World Waste? (World Resources Institute)
  This article explores the staggering scale of global food waste and its impact on climate change, land use, and water consumption, highlighting key stats and solutions.
- Fighting Food Waste with Circular Economy (Skip Shapiro Enterprises)
  An overview of how circular economy principles can help reduce food waste by designing waste out of the system and keeping resources in use longer.
- Fighting Food Waste Using the Circular Economy (KPMG + Fight Food Waste CRC)
  This research-backed report looks at strategies to apply circular economy models to the food supply chain in order to reduce waste, improve efficiency, and create new business opportunities.

Agricultural Innovation & Energy

- Green Energy Powered by Agriculture (Kalfresh Bioenergy)
  Discover how an Australian farming community uses agricultural waste to power a biogas facility, producing renewable energy while reducing emissions.

Sustainable Packaging & Edible Alternatives

- The Very Last Bite: Edible Packaging Made from Seaweed (RESET)
  Learn about seaweed-based packaging innovations that are both edible and biodegradable, aimed at reducing plastic waste in the food industry.
- #RethinkPlastic with Evoware (Evoware)
  Evoware showcases their mission to eliminate plastic waste through seaweed-based, edible, and compostable packaging solutions designed for the food sector.
- Seaweed-Based Packaging to Eliminate Waste: Evoware (Ellen MacArthur Foundation)
  This case study explores how seaweed packaging can contribute to a circular economy by replacing single-use plastic in everyday food products.
- Edible and Nutritious Packaging with Seaweed-based Material to Decrease Plastic Waste (AIM2Flourish)
  Highlights an innovative business that creates nutritious, edible packaging from seaweed, reducing plastic waste and improving food access.
- Eat This Food Packaging Instead of Throwing It Away (EcoWatch)
  A roundup of edible food packaging solutions that aim to reduce landfill waste and promote sustainability across the food supply chain.

Upcycling & Sustainable Food Packaging

- From Trash to Table: Will Upcycled Food Save the Planet? (The Guardian)
  This article discusses the growing movement to transform food waste into edible, marketable products, and how it can help feed a growing population sustainably.
- Sustainable Reusable Packaging in Frozen Foods
  Explores how reusable packaging solutions are emerging in the frozen food industry, reducing waste and extending shelf life.
- Compostable Packaging in Frozen Foods
  Highlights companies adopting compostable packaging for frozen food items, offering an alternative to traditional plastic films.
- ProAmpac Flexible Packaging
  Showcases sustainable flexible packaging innovations for food storage, including recyclable and compostable options designed to prevent spoilage and reduce waste.
- Bonduelle, ExxonMobil, and Drukpol collaborate on recyclable freezer film | Packaging Europe
  An example of industry collaboration to develop recyclable packaging films for frozen vegetables, supporting sustainability in cold-chain logistics.
- Packaging Can Work Harder to Prevent Food Waste
  Looks at how smart packaging design, from portion control to temperature indicators, can directly help reduce consumer food waste.

Sustainable Transport, Energy, & Agriculture

- Shell Cows Driving Trucks
  A fun look at how manure from dairy cows is being used to power trucks, showcasing the potential of agricultural waste in clean energy solutions.
- Shell Eco Marathon Ethanol
  This student innovation challenge features biofuel-powered vehicles and encourages young engineers to design sustainable transportation solutions, including ethanol made from agricultural sources.
- Driving Decarbonisation in Food Production (Partnering with Yara International)
  Shell and Yara International are partnering to cut carbon emissions in agriculture, using renewable energy and low-carbon fertilizers in food production.
- Sustainable Feedstock (Transportation and Agriculture)
  Details Shell's initiatives in using sustainable feedstocks like used cooking oil and agricultural waste, to produce lower-carbon fuels and materials.
- Shell and Raizen Deal
  Explains Shell's investment in Raízen, a leading bioenergy company producing ethanol from sugarcane, and its role in advancing sustainable agriculture and transport fuels.

DISCOVER PRESENTS

FUTURE CITY COMPETITION

2025-2026 Future City Theme Webinar Resources

Shared Resources:

- **Jose Lopez, Shell, USA:**
  - Understanding Global Warming Potentials | US EPA)
  - Water in Circular Economy and Resilience (WICER)
- **Jimmy Ehne, Packaging R&D Manager, Dairy Foods, Land O'Lakes, Inc:**
  - Institute of Packaging Professionals Resource Library
  - Sustainable Packaging Coalition Resource Library and Knowledge Book

Additional Questions Answered by the Expert Panelists:

- **Couldn't indoor and vertical farming be expensive? How much money would we need to set up several of these farms?**
  - **Lori Duncan, Univ. of Tennessee:** Yes, it can be costly - specifically the initial capital then the energy costs. Some people are retrofitting old shipping containers or warehouses which could keep the costs down. You generally would only produce high-value crops in this manner. I would suggest thinking through the nutritional needs of your population and then deciding the best way to grow (or raise) that crop that can be resilient.

- **Does the methane that comes from the cow manure still get released into the air as biofuel?**
  - **Jose Lopez, Shell, USA:** The methane (CH4) will be converted to carbon dioxide (CO2) in the truck engine, and it will be released to the atmosphere as such. The advantage of converting the methane to CH4 to CO2 before releasing it back into the air is the global warming potential of the molecule, with CH4 having 28 times the global warming potential of CO2 (consider this resource: Understanding Global Warming Potentials | US EPA).

- **How long does it take to make biodiesel?**
  - **Jose Lopez, Shell, USA:** Not my area of expertise. Also, consider that biodiesel and renewable diesel (what I talked about in the webinar) are different products and rely on very different processes.

- **Given water is often a scarce resource, can the speakers talk about innovations about how the circular economy is better using this resource?**
  - **Jose Lopez, Shell, USA:** Consider using this resource: Water in Circular Economy and Resilience (WICER)
  - **Lori Duncan, Univ. of Tennessee:** There are great innovations in both outdoor and indoor agriculture. With outdoor: drip irrigation, precision irrigation, rainwater capture, tailwater recovery. Indoor systems can be closed loop, meaning the water can be recycled again and again.

- **What type of engineer would be a good source for more information within each of the pathway points (Agricultural Production, Packaging, and Consumption)?**
  - **Lori Duncan, Univ. of Tennessee:** Agricultural, biological, biosystems, processing, and packaging engineers

City Essay Rubric

JUNIOR

Deliverable: City Essay

	0 **Poor** Majority of requirements are missing.	1 **Fair** Fair quality. Fulfills less than 50% of requirements.	2 **Good** Above average quality. Fulfills at least 85% of requirements.	3 **Excellent** Excellent quality. Fulfills all requirements with additional distinctive features.
I. Introduce City and Define the Problem 18 points	**0**	**1**	**2**	**3**
1. City Basics • Location • Benefits and/or drawbacks of location • Population	No description.	Underdeveloped description with limited details.	Clear description with a good level of detail.	Clear and thorough description with extensive details.
2. City Life • Description of resident population • Daily life: recreation, jobs	No description.	Underdeveloped description with limited details.	Clear description with a good level of detail.	Clear and thorough description with extensive details.
3. City Infrastructure • Could include housing, transportation, utlitites, agriculture, etc. • Incorporates advanced technology	No description.	Underdeveloped description with limited details.	Clear description with a good level of detail.	Clear and thorough description with extensive details.
4. City Services • Could include education, healthcare, fire, public transport, etc.	No description of city services.	Underdeveloped description of services.	Clear and thorough description of one or more city services.	Clear and thorough description of two or more services.
5. City Innovation and Futuristic Elements	No description of innovations and futuristic elements.	Underdeveloped description. Seems like a random collection of information.	Clearly developed description of innovations and futuristic elements.	Description is clear and thorough and supported with details.
6. Define the Problem • Discussion of impact food waste had on city before solutions were implemented	No description.	Underdeveloped description with limited details.	Clear description with a good level of detail.	Clear and thorough description with extensive details.
II. Theme Solution 15 points	**0**	**1**	**2**	**3**
7. Overview of the City's Food Waste Solutions • Showed how circular economy, regenerative agriculture, or circular agriculture influenced solutions • Discussed environmental impacts • Explained how their solutions eliminated or reduced food waste	No description.	Underdeveloped description. No discussion of environmental impacts. No discussion of solutions.	Clear description. Good discussion of environmental impacts. Good discussion of solutions.	Clear and thorough description. Excellent discussion of environmental impacts. Excellent discussion of solutions.

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City Essay Rubric

JUNIOR

0	1	2	3
Poor Majority of requirements are missing.	**Fair** Fair quality. Fulfills less than 50% of requirements.	**Good** Above average quality. Fulfills at least 85% of requirements.	**Excellent** Excellent quality. Fulfills all requirements with additional distinctive features.

II. Theme Solution (Continued) 15 points	0	1	2	3
8. Example One: • Identifies 1st point: Ag production, packaging, or consumption • How solution works • Innovative and futuristic • Discusses planning & design descisions	No description.	Underdeveloped description. Not futuristic or innovative.	Clear description with a good level of detail. Futuristic and innovative.	Clear and thorough description with extensive details. Very futuristic and innovative.
9. Example Two: • Identifies 2nd and different point: Ag production, packaging, or consumption • How solution works • Innovative and futuristic • Discusses planning & design descisions	No description.	Underdeveloped description. Not futuristic or innovative, or identifies the same point as the first example.	Clear description with a good level of detail. Futuristic and innovative.	Clear and thorough description with extensive details. Very futuristic and innovative.
10. Risks, Trade-offs, & Compromises within City • Benefits, risks • Trade-offs & compromises • Assessment & analysis of risks and trade-offs	No description.	Underdeveloped description of at least one benefit, risk, or trade-off. Lacks assessment and analysis.	Clear description of two or more benefits, risks, or trade-offs. Good assessment and analysis.	Clear and thorough description of two or more benefits, risks, or trade- offs. Excellent assessment and analysis.
11. Engineering Disciplines Involved & Roles of Engineers	No discussion.	Underdeveloped description of one discipline or role.	Clear description of at least two disciplines and roles.	Clear and thorough description of more than two disciplines and roles.
III. Writing Skills (6 Points)	**0**	**1**	**2**	**3**
12. Organization & Writing	No clear structure. Simplistic skills and style.	Organization mostly makes sense but could be better. Good skills and style.	Essay has a logical order and details are presented effectively. Excellent skills and style.	
13. Grammar & Spelling	Many spelling and grammatical errors.	Some spelling and grammatical errors.	Minimal grammatical errors and spelling errors if any.	

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City Essay Rubric

JUNIOR

0
Poor
Majority of requirements are missing.

1
Fair
Fair quality. Fulfills less than 50% of requirements.

2
Good
Above average quality. Fulfills at least 85% of requirements.

3
Excellent
Excellent quality. Fulfills all requirements with additional distinctive features.

III. Writing Skills (6 Points) (Continued)	0	1	2	3
14. Graphics, References, & Word Count • If used, max. of 4 graphics/ illustrations (count does not include tables) • At least 3 acceptable references (Wikipedia is not an acceptable reference) • All words except the title and reference list are included in the 1,000-word count. Word count includes captions and words in graphics, illustrations, and tables.	No references: or word count is missing or inaccurate; or exceeds maximum of 4 graphics or illustrations.		At least three acceptable references. Accurate word count that is within limit. Does not exceed maximum of 4 graphics of illustrations.	

City Model Rubric

JUNIOR

0	1	2	3	4
No Points Requirements missing.	**Poor** Poor–fair quality. Fulfills at least 20% of requirements.	**Fair** Fair–average quality. Fulfills at least 50% of requirements.	**Good** Average quality. Fulfills at least 85% of requirements.	**Very Good** Above average quality. Fulfills 95% of requirements.

I. City Design (30 Points)	0	1	2	3	4

1. 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.

2. City Zoning • Includes the three primary zones: residential, commercial, and industrial	No evidence of zoning. No variety of structures.	Zoning unclear. Little variety of structures. Only one type of zone 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.
3. City Infrastructure • Could include housing, utilities, water, etc.	No infra-structure examples.	Poor examples of city infrastructure.	Some examples of city infrastructure.	Fairly clear examples of city infrastructure.	Multiple examples of city infrastructure.
4. City Services • 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.
5. Transportation System • Variety of transportation modes • Transportation system(s) addresses the needs of the city and its residents	No trans-portation 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 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.
6. Model Demonstrates Theme (Farm to Table): • Showcases food waste solutions	No examples of food waste solutions.	Few examples of food waste solution.	Some examples of food waste solutions.	Multiple examples of food waste solutions.	Multiple and clear examples of food waste solutions.

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City Model Rubric

JUNIOR

0
No Points
Requirements missing.

1
Poor
Poor–fair quality. Fulfills at least 20% of requirements.

2
Fair
Fair–average quality. Fulfills at least 50% of requirements.

3
Good
Average quality. Fulfills at least 85% of requirements.

4
Very Good
Above average quality. Fulfills 95% of requirements.

II. Build It: Quality, Scale, & Materials (20 Points)	0	1	2	3	4
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 creatively 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.
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 overall city feel. Age appropriate.
9. Model Scale • Accurate demonstration of scale • Up to 2 different scales may be used, but all should be clearly identifiable and consistently applied	Scale not provided. Or more than 2 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) consistent and chosen to demonstrate the scope and context of the city clearly.
10. Moving Part • Related to design or function of 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.

City Model Rubric

JUNIOR

0	1	2	3	4
No Points Requirements missing.	**Poor** Poor–fair quality. Fulfills at least 20% of requirements.	**Fair** Fair–average quality. Fulfills at least 50% of requirements.	**Good** Average quality. Fulfills at least 85% of requirements.	**Very Good** Above average quality. Fulfills 95% of requirements.

III. Judge Assessment of Model (15 Points)	0	1	2	3	4
11. Application of Futuristic, Advanced Technologies • Includes futuristic technologies • Important to function of the city	No futuristic examples.	Poor futuristic examples. Not important to the function of the city.	Fair futuristic examples. Somewhat related to the function of the city.	Good futuristic examples. Related to the function of the city.	Very good futuristic examples. Important to the function of the city.
12. Overall Innovation • City design • Addresses Farm to Table solution.	No innovation.	Innovation is poorly presented overall in model.	Innovation is presented fairly well overall in model.	Innovation is presented well overall in model.	Innovation is presented very well overall in 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. Function and purpose of most elements is evident.

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