



2025-2026

NTX Future City Junior Competition

4th- 5th Grade

Rules and Program Description

The North Texas Regional Future City Junior Competition is a STEAM project-based learning program for 4th - 5th grades where students imagine, research and model a solution to a real-world problem in a city 100 years in the future. It is an abbreviated version of the award-winning Future City Competition for middle-schoolers.

Components of the Junior Program include the following deliverable to the city's solution to the annual challenge:

- a research essay
- a physical model of City
- presentation day

2025 - 2026 Challenge

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

Registration:

Schools and youth organizations with 4th - 5th grade students may register through 31 October by completing the online form at <http://futurecity.org>.

Registration fee is \$25 per school or organization.

Additionally, teachers and mentors must register their teams on the secure CMS site. Additional information to be provided after close of registration.

Teacher Link:

https://secure.dfwfuturecity.org/TeachBin/Login?TARGET=future&REASON=10&LOGIN_RESULT=Z

Mentor Link:

https://secure.dfwfuturecity.org/MentorBin/Login?TARGET=future&REASON=10&LOGIN_RESULT=Z

Teams

Students will work in teams. The team consist of

- Three 4th- 5th grade students (minimum)
 - Students must be from the same organization, but not necessarily from the same class or grade.
 - Organizations with Large groups may either
 - Enter multiple teams or
 - Work as a class or large group prior to the model showing. Three students must be selected to represent the team during Model/ Presentation day.
- an educator
- an engineer mentor
 - *Contact the region's coordinator if you need guidance to finding a mentor.*

National Program Handbook

The Future City Competition national program handbook (available for download from the National Future City Competition Educator Dashboard) has been written for the middle-school program and is a valuable guide for the teaching/leading the project. The Junior program has been simplified somewhat from the complete middle-school program described in the handbook.

Specifically, for the Junior Competition:

- The Project Plan, City-Team Presentation, and Q&A deliverables are NOT included in the Junior program.
- The Essay is shortened such that it need not include a detailed description of the city and the maximum word count is 1000.
- There will be no formal oral City Presentation. However, the student team-members will have the opportunity to talk to the judges during the model judging for a short Q&A.

- The Model, likewise, is simplified to focus primarily on demonstrating the annual theme, and to cost no more than \$50.

Keeping these changes in mind, the handbook information on Team-building, Engineering Design Process, Project Planning, and City Planning may be useful as background.

Overall Judging

Essay

- The essay and model will be judged by multiple judges (technical professionals) and the scores for each averaged then added together to come up with a composite/total score for each team.
- The essay will be judged during Dec-Jan.

Model

- Model judging will take place on-site at the NTX Regional Competition Day in January.
- While there will be no formal presentation by the students, the team will stand with their model during judging to briefly explain their research solution and answer the judges' questions.
- Judges will spend approximately 5 minutes with each model display.
- Adult team members (teachers, mentors) may observe, but are not allowed to participate.

Awards Ceremony and Announcement of Winners

The results of the NTX Future City Junior Competition will be announced during the awards ceremony at the end of the NTX Regional Competition Day. Scores for individual teams and deliverables will be available for educators following the announcements.

Prizes:

Future City Competition Junior will provide prizes for

- Best Essay
- Best Model
- Best Overall Junior Team.

Sponsors will also give out Special Awards recognizing accomplishments in various categories to be decided by the sponsors based on the annual challenge.

General Competition Rules:

- Participants will comply with the basic rules of the Future City Competition program as laid out in the handbook and as modified in this document and rubrics.
- Deadlines will not be extended. Teams making submittals after the deadlines will receive penalty points.
- Any conflicts will be resolved locally. There is no appeal.
- The judges' decisions are final.
- Prizes are not transferable or exchangeable.
- 20 Point deduction will be applied for unsportsmanlike conduct by team members or guests (includes rude behavior to judges, competitors, or disruption of another team's judging session).
- Disqualifications will occur due to:
 - Destruction of another team's model or presentation materials
 - Actions that malign, disparage or harass volunteers

2025-2026 :

In acknowledgement of our region hosting World Cup Soccer games in 2026, the model must include a stadium.

A 10 point deduction will be applied for any model without a stadium.

Research Essay

This component will describe the team's solution to the annual challenge. Students write a 1,000-word essay that introduces their city and provides a solution to this year's challenge.

Research Essay Requirements

- Present their future city at least 100 years in the future, describe its location and share its innovative features.
- Explain what their city was like in the past (before a solution to challenge was implemented).
- Describe the overall design and innovative technology that addresses the challenge.
- Discuss how these technologies protect their citizens from environmental impacts and protect the environment.
- The essay cannot exceed 1,000 words and should be free of grammatical and spelling errors.
- May include a maximum of four graphics.
- Cite a minimum of three sources of information used during the idea developments process. MLA style preferred. See "Research Strategies" Document in the resources Tab for more information.
- Use a variety of sources of information, such as interviews with experts, reference books, periodicals and websites. (Wikipedia is not accepted as a source.)

Competition Scoring

Essay must be submitted as a word document not PDF via the CMS system.

Competition Scoring

Refer to Rubric for detailed breakdown. Make sure they have thoroughly covered these general categories to maximize points:

Criteria

- ☐ Introduce City
- ☐ Problem and Solution
- ☐ Judge Assessment of Solution
- ☐ Writing Skills

Scoring Deductions

- 5 points – Late submissions are accepted with a point deduction.
- 60 points - Essays submitted after the Late Deadline *will not* be scored.
- 10 points – For essays that exceed the 1,000-word limit.

Suggestions for Completing the Essay Assignment

- Review the suggested outline with students.
- Brainstorm and list what they would like to say in each section.
- Suggest that they divide the sections so that everyone writes at least one part of the draft.
- Proofread each section and combine to be one cohesive document.
- Remind students they can include up to 4 graphics in their essay.
- Review Resources located in on the resources tab on our website.

Note on the document “Questions to Consider”:

Students in the Junior Competition are not required to design a complete city – focus on the solution to the challenge. The questions in this handout cover a wide range of city issues but will help guide students to consider all of the related aspects of their city solution.

Suggested Essay Outline

In the Research Essay, you will share your vision of your future city and your futuristic and innovative solution to floating the city. You can use the following outline as a guide to help you organize and draft your essay.

Introduction

Briefly describe your future city. Include the location, geographic features, climate, population, etc.

Include any unique, futuristic features of your city.

Define the Problem:

Describe what your city was like in the past and the effect that your solution to the challenge had to the city's infrastructure and people.

Describe the Solution:

Describe the overall design and the innovative technologies employed you implemented.

Describe how these technologies and methods:

- Work to reduce health and environmental impacts on city and citizens.
- Affect the environment.
- Address and solve the major issues from the past.
- Highlight the futuristic and innovative aspects of this technology and solution.
- Describe some of the benefits, risks and tradeoffs associated with the technology.
- Explain what types of engineering were involved and what types of engineers or technicians were most helpful.

Conclusion

Share why people want to live in your city. Summarize how your solution to the annual challenge will make it a healthy, safe and satisfying place to live.

Physical Model of City & Presentation

Students build a physical scale model of a section of their city using recycled materials. This is the opportunity for the team to realize their vision of the city and see their ideas for the future come to life.

- The Model will be built to scale (scale chosen by team).
- It will illustrate the team's concept of their future city.
- It will be focused on demonstrating the team's solution to the annual challenge.
- It should include at least one moving part.
- The model will be built primarily of recycled materials. The total value of the materials used may not exceed \$50 and must be reported on the *Junior Competition Expense Form*.

Presentation

The model will be on display for the judges and the student presenting team (max of 3 students) will stand with their model to answer questions from the judges. The purpose is to briefly explain the model, their city concept and their solution to the annual challenge. No formal, rehearsed presentation is required or expected. Each set or panel of judges will spend about 5 minutes with the model and team.

Adults (educators, mentors) may observe, but not participate in the Q&A process.

Competition Scoring

Refer to Rubric for detailed breakdown. Make sure they have thoroughly covered these general categories to maximize points:

Criteria

- City Design
- Quality & Scale
- Materials & Moving Part (s)
- Judge Assessment of Model
- Presentation & Team Work

Scoring Deductions

- 2 points – Remember your Model Identification Index Card and proofread it to make sure it includes all the required information.
- 5 points – Late submission (per item).
- 5 points – Incomplete expense form - missing receipts, not accounting for all major items, missing teacher signature.

- 15 points – A missing Competition Expense Form.
- 15 points – Reusing past model or using prohibited materials.
- 15 points – Exceeding the max dimensions for the model.
- 15 points – Model costs exceeding \$50 or missing Expense Form

2025-2026 :

In acknowledgement of our region hosting World Cup Soccer games in 2026, the model must include a stadium.

A 10 point deduction will be applied for any model without a stadium.

Suggestions and Resources for Completing the Model Assignment

Building the model is one of the most exciting aspects of the competition. It is where to get to see your ideas come to life. Engineers, architects, scientists, and city planners all use models to help them communicate their ideas, share their research, and predict the success of their design. Emphasize to the students that the ideas represented in their Model should be in alignment with their Essay and reflect the overall vision that they have for their city.

You want to be sure to start early collecting recyclables and potential building materials for the model. Before you've even decided what the model will look like. You will need to have a variety of materials to choose from when you do finally decide on the scale and start to build.

Physical Model Resources: Begin by reviewing the Physical Model Requirements, below.

In addition, you will find these resources useful:

Note on the document "Questions to Consider":

Students in the Junior Competition are not required to design a complete city – focus on the solution to the challenge. The questions in this handout cover a wide range of city issues but will help guide students to consider all of the related aspects of their city solution.

- Review the Physical Model Rubric to make sure you understand what the judges will be looking for in your model.

You might also want to check out these activities related to model design and construction (download from Future City Competition National Educator Dashboard <http://futurecity.org>):

- Understanding Scale:
 - Introduction to Scale, Scale: Background Information, Scale: Key Terms & Concepts
 - Plan and Elevation View
 - Proportions, Ratios, and Scale Drawings
 - Scale Map

- Practice designing and building:
 - What Is a Model?
 - Model Construction: Key Terms & Concepts, Model Construction: Basic Information
 - Plan-Relief and Architectural Models
 - Building Strong
 - Tower Building Activity and Lego Structure Activity

Physical Model Assignment

Students will build a scale model of a section of their city that illustrates the solution to this year's challenge.

Physical Model Requirements

- The model should be built primarily of recycled materials and be no larger than 25" (w) x 36" (l) x 20" (h) and contain at least one moving part.
 - Model can be no larger than 20" high, 36" long, and 25" wide.
- Scale: Each model segment must be built to scale as determined by the team. A model may use up to two distinct scales if they are clearly defined, easily determined by sight and indicated on the Model ID card.
- Moving Part(s): Each model must contain one or more moving part(s). Any electrical power must be self-contained (e.g., a household battery and a simple circuit).
- Model Materials: Although a small number of individual pieces from previous competition model may be reused, models must be a new representation of a future city and built from the bare baseboard up.
- Models **cannot** use or contain:
 - Power from electrical outlets
 - Live animals, perishable items, or hazardous items (e.g., dry ice)
 - Drones or other flying objects
 - Audio or sound
- Budget: The total value of the materials used in the model may not exceed \$50 and must be reported on the Junior Competition Expense Form.
- A Model Identification Card must be included on your model. This 4" x 6" index card is used by the judges and photographer to identify your team and model. The card should include:
 - City name (must be the same as the team's name)
 - Scale(s) used for the model
 - School/Organization name
 - Names of the three presenting students, educator, and mentor.

Collect Recycled Materials

Remind students that they only have a \$50 budget and need to think creatively about their building materials. In addition to the recycled materials (valued at \$0), consider these sources:

- Flea markets and garage sales are excellent sources for old toys, bottles, tins, and buttons.
- Old toys, such as Lego pieces, gears, Tinker Toys, and blocks, are excellent materials.
- Builders and plumbers may have discarded pieces of pipe, wire, and wood.
- Home improvement companies and remodelers may be willing to part with obsolete materials from houses they are remodeling. Old parts from stoves, cabinets, and plumbing fixtures may be sources for moving parts or may provide unusual shapes for your buildings.
- Obsolete or outdated electronic equipment may be reused and can provide visual interest in your city.

Note: All these items have value and need to be listed on the Junior Competition Expense Form.

Review the Junior Competition Expense Form

Students must list the costs of all items used for their model. Common recycled materials, such as plastic tubs and glass jars may be assigned a zero-cost value. Other used, donated, or borrowed items must be assigned a fair market or salvaged value, which may be determined by pricing found at a yard sale, auction, classified ad, or surplus store, for example

Building Your Model- Questions to Consider

- How will your team divide up responsibilities?
- What recycled materials could you use? How could you use them in creative ways?
- What scale works best for your model? (Remember: scale must be consistent throughout the model.)
- Remember to choose a scale that works best for your city design and the materials your team has available. A second model scale might be used to highlight or show off a specific area or design detail in the city.
- How are your different city zones visually distinctive?
- Think about your city's infrastructure.
 - Where are the energy production facilities?
 - What does your city's transportation system look like?
 - How does your floating city influence your infrastructure choices?
- What are some of the services in your city? How will you represent them in the model?
- How can you make your model look as realistic as possible?
- Think about your city's moving part:
 - What will the moving part do?
 - How is it related to an aspect of your city's design or function?
 - How will the moving part be powered?
 - Designing your own moving part, or creatively modifying an existing item, will earn more points than using a prefabricated or purchased item. The moving part is an excellent opportunity to explore the physics of simple sources of power, such as rubber bands, weights, heat, springs, pulleys, simple circuitry, light, and/or solar power.
- What makes your city innovative and futuristic? How can you show your futuristic ideas are based on real science and engineering?

Scale Measurements

Consider a scale that works for both large items, such as buildings, as well as smaller items, such as windows and traffic signs. These measurements below can be used as a general guide for scaling basic city features.

Research dimensions for other features that you plan to include in the model.

12 feet Width of traffic lane

8 feet Height of stop sign

10 feet Height of a building story

4 feet Minimum width of residential sidewalk

Model Enhancement Ideas

- Trees: These can be made from twigs and sticks with cotton balls (can be painted green), lichen from a hobby store, dried flowers or weeds, or sponges with food coloring.
- People: These can be made from sticks, toothpicks, mat board, pins, dowels, pipe cleaners, and so on.
- Cars: These can be made from layers of mat board or cardboard glued together, toy cars that are the right scale, Styrofoam, and so on.
- Glass: You can use clear plastic dividers, sleeves, or sheets. Remember to put this on last so that it doesn't get scratched.
- Bricks/Pavers: You can use colored paper or other colored material that matches what you want it to look like and then draw on the pattern or you can take white paper or material and color it with markers, crayons, or similar, remembering to show the pattern.
- Asphalt: You can take black paper or color white paper black and then draw on the lane markers with a white and/or yellow colored pencil or crayon and then cut to size.
- Cement: You can use gray paper or color white paper and then cut to size.
- Grade changes (like hills or craters): You can use Styrofoam that is cut/shaped to what you want and use layers of cardboard or mat board to form contours or slope the model. Water: You can use blue colored paper or color white paper blue. For added affect, you can put clear plastic or plastic wrap (the kind you use for foods) over it.
- Building material look: To make something look realistic, you can draw on joint lines.
- Sand/beach/lunar soil: You can use sandpaper (very fine grit).

Moving Part Mechanisms

Your moving part must be able to have the motion repeated and must be related to a function of the city or this year's challenge. Ideas for moving part mechanisms include:

- Rubber bands
- Heat
- Light/Solar
- Weights
- Springs
- Pulleys
- Batteries
- Simple circuitry

Creatively engineered or innovatively modified moving parts garner more points. For example: a storebought, electric, handheld fan that is glued to a model is technically a moving part, but it will not receive as many points as a moving part whose team put time, effort, and engineering thought into its construction or development.