Introduction to Future City Program Basics

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www.dfwfuturecity.org

4 Orientation Webinars

- This presentation covers
  - Basic information about FCC
  - Rules, procedures
  - Deliverables
- Orientation – Annual Introduction
  - Information specific to this year's program
  - Information specific to the North Texas region
- Orientation – Regional Competition Event
  - Process and procedures for competition day
- Orientation – Model slideshow
  - Pictures of models from regional and national competitions

Agenda

- Overview of program
- Understanding project phases
  - Specific rules and guidelines
  - Resources
  - Deliverables
  - Timeline
- Lessons learned

A Brief History

- Nationally
  - Sponsored by DiscoverE (formerly National Engineers Week) Foundation
  - Began in 1992
  - About 40 regions, 30,000 students involved annually
- North Texas
  - 17th year
  - More than 700 students involved annually
  - From ~50 schools and youth organizations across N TX
  - With support of > 100 volunteers from engineering organizations, companies

What is Future City?

- Project-based educational program
- Skills learned:
  - Problem solving
  - Teamwork
  - Public speaking
  - Research, writing
  - Math, science, engineering
  - Project and time management

What is Future City?

- The Challenge:
  - Design and Build a Livable City of the Future
- Project phases, goals
  - Form the team
  - Conceive an initial city plan, design
  - Simulate, refine solution
  - Research, write paper
  - Build physical scale model
  - Stay within budget
  - Present final solution to judges

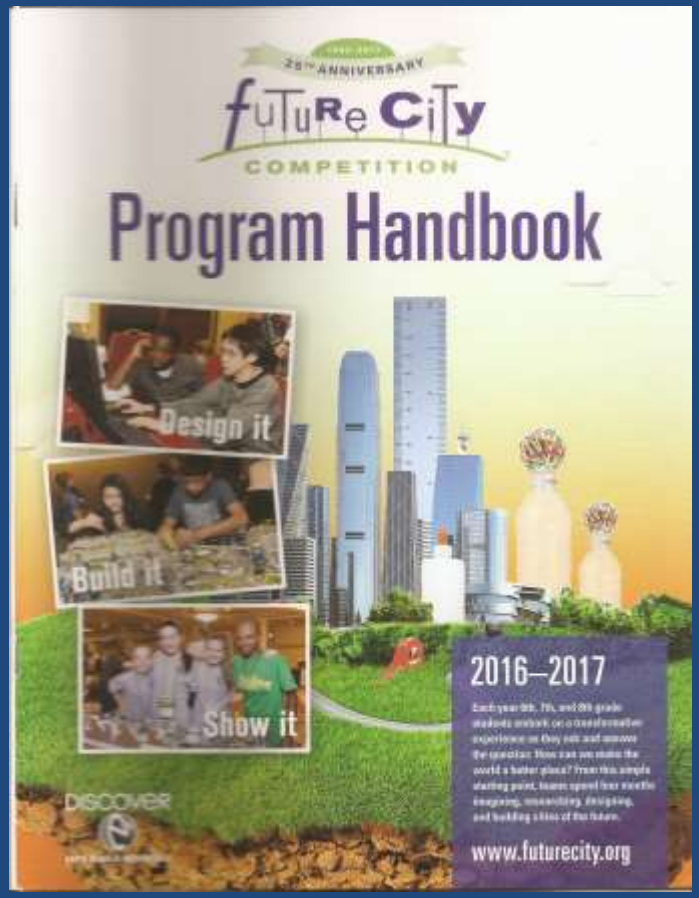
FC & The Engineering Design Process

Future City Stages	Engineering Design Process
– Form the team	
– Conceive an initial city plan, design	– Identify the problem
– Simulate, refine solution	– Learn the specifications
– Research, write paper	– Brainstorm solutions
– Build physical scale model	– Design
– Stay within budget	– Test, improve, redesign
– Present final solution to judges →	– Share

Before You Start
Where to look for answers

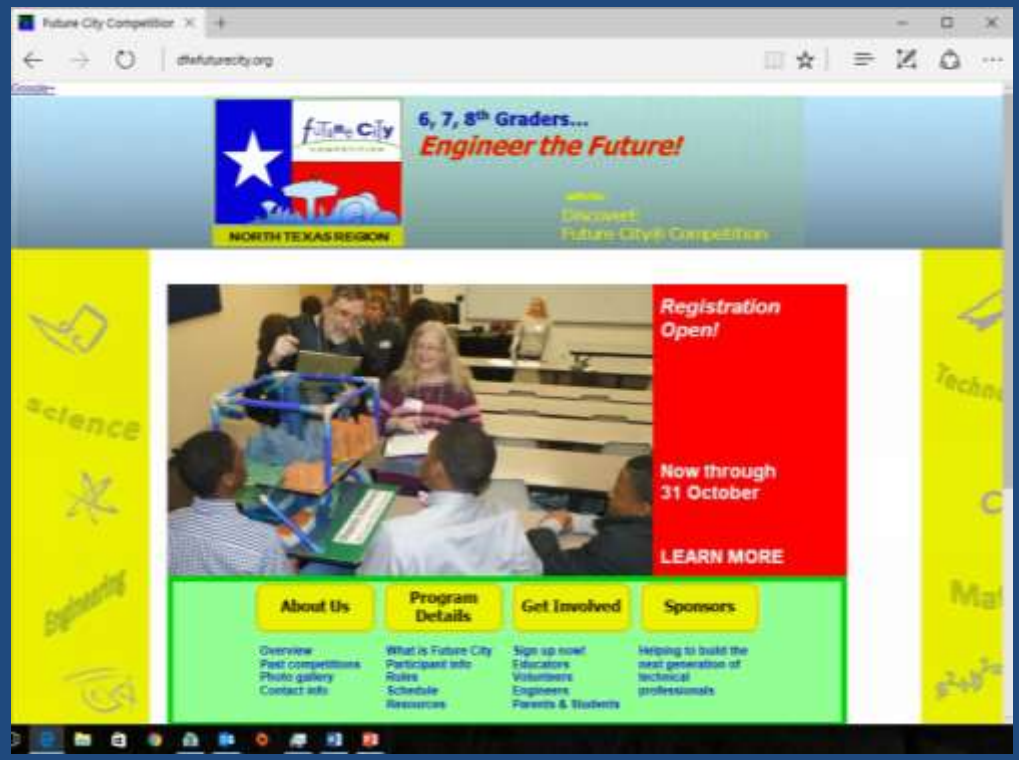
Program Handbook

- Program Handbook
  - Rules
  - Teaching points
  - Background information
  - Rubrics
  - Forms



Two Websites: NTX Region, National

- NTX Regional www.dfwfuturecity.org
  - Region-specific info
  - Schedule, due dates
  - Local resources
  - Program updates



FC NTX Team Center

www.dfwfuturecity.org/teamcenter.html

- Team Center – *Bookmark it!*
- First stop for all local information
  - Schedule, rules
  - Program updates
  - Resources

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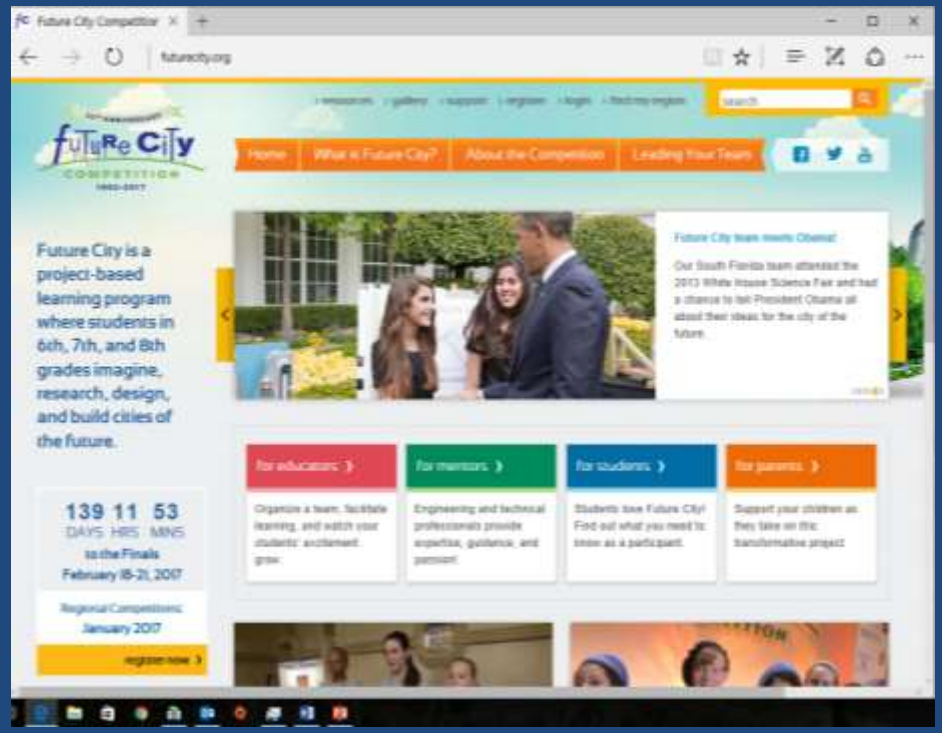
Enrolling Teams in the Team Center

www.dfwfuturecity.org/teamcenter.html

- Team Center – *Bookmark it!*
  - First stop for all local information
    - Schedule, rules
    - Program updates
    - Resources
- Create and manage teams
  - Assign team members
  - Submit deliverables
    - Automatic confirmation of submission
  - Download team scores
    - Available after the competition

National Website

- National futurecity.org
  - Overall program info
    - General resources
    - Program description



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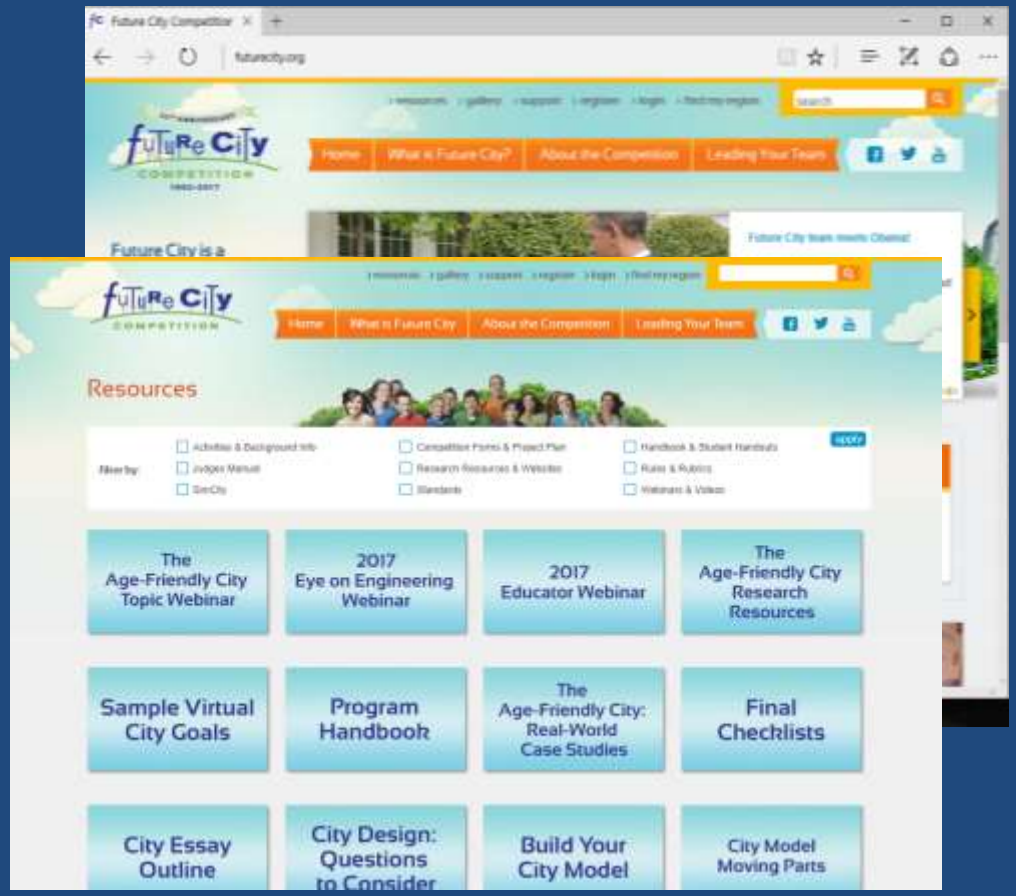


If you still can't find the answer …

- Ask
  1. Region coordinator
     regional@dfwfuturecity.org

  2. Region school coordinator
     jfreer@gmail.com

  3. National program manager
     info@futurecity.org

Program Details

Step 1: Build the Team

Teams

- Schools/organizations are represented by teams
  - 3 students, 1 educator/sponsor, 1 engineer-mentor
  - At the regional event (model-presentation judging) you need to have a team
- Student team members – must be from the same organization
  - Don’t have to be from the same class or same grade
  - 6th, 7th, and 8th grades eligible

Teams – Options for Large Groups

Prior to the presentation, educators and students may:

1. Work in large groups (classes, clubs, etc.)
   - Assign work equitably
   - Down-select to 3 students – “the Team” – to represent all
2. Work with multiple teams (groups of 3-4 students)
   - All teams complete all phases
   - Select some (or all) teams to send to regional
     - Max 8 teams from one school/organization
     - Select teams by: Intramural run-off competition, Grades, Lottery
     - Teams compete (present) in the preliminary round
     - *Only one team per school/organization may advance to the final round*

Teamwork

- Teamwork is an important part of the program
- Decisions are reached by consensus
- Everyone contributes
  - Agree on assignments
  - Agree on responsibilities
- Resources:
  - Team building activities on National FC website
    - Teambuilding, brainstorming, conflict resolution

Finding an Engineer-Mentor

- Parents of students, PTA newsletter
- Spouse or friend of educators
- School/organization business partner
- City bureau of engineers
- TX DoT
- US Army Corp of Engineers
- Local engineering firms
- National Engineers Week sponsors (www.discovere.org)
- Local Chapters of Engineering societies
- Regional Mentor Coordinator – Tom Hunt

Engineer-Mentor

- Involved in all phases of the competition
- Advisor, coach
  - Students do all the work, make all the decisions
- Provides real-life engineering experience
  - Project planning
    - Scheduling
    - Setting realistic goals
    - Helping to assign tasks
  - Understanding roles of engineers, engineering disciplines
- Resources:
  - Mentor coordinator
  - Online tips, advice, webinars

Ethics, Roles and the Honor Statement

- Future City is an educational program
- Rules are designed to ensure a fair competition
- Students envision the city and do all the work
  - Design, simulation, research, writing, model building, presentation
- Adults provide guidance and advice
  - Should be present when teams work with tools, build models
- Everyone adheres to the rules
- Team members sign and submit an Honor Statement

Step 2: Make a Plan

Project Planning

- Plan it before you build it…to help you
  - Establish goals
  - Stay organized
  - Focus on goals and results
  - Moving forward on schedule

Project Plan Deliverable

- Project Plan – 4 parts
  1. Set goals for the entire project
  2. Create a schedule
  3. Monitor progress periodically throughout project
  4. Reflect on team performance at end of project

- Project Plan (4 parts)
  - Single Word document file
- Submit through Team Center
- 10 points (not judged)
- Due January

- Resources
  - Project Management tutorial – recorded 2017
  - Team Center resources “Where to learn more”

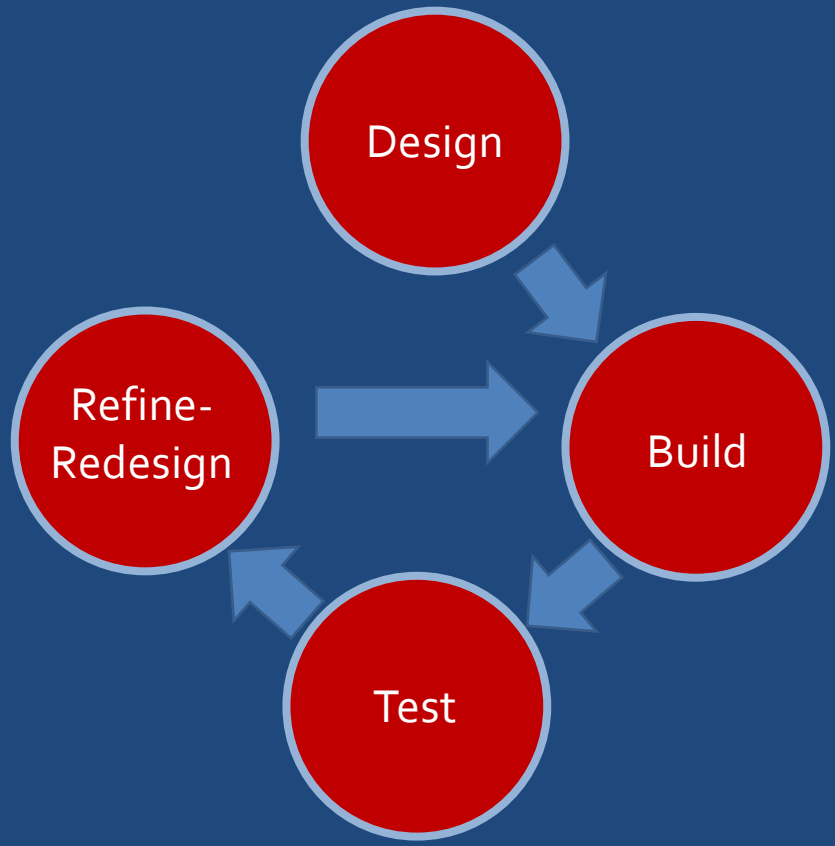
Step 3: Virtual City – Planning, Simulation

Goal of the Virtual City Exercise

- You should learn … how to
  - Establish meaningful long-term goals for your future city
  - Develop a city design for achieving those goals
  - Use the simulation tool to test the design
  - Accurately assess progress based on simulation results
  - Refine the design as necessary to improve progress
- *Goal of exercise is NOT to*
  - Create the perfect city
  - Win the SimCity game

Engineering Design Process

Design – Test – Refine/Redesign



You decide – What will the future be like?

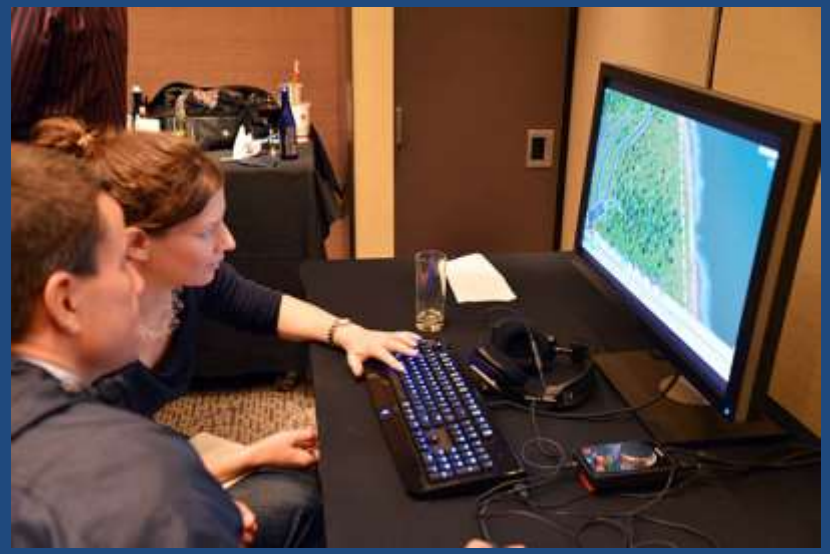
- Your city goals
  - Cheap, renewable, sustainable energy sources
  - Efficient, effective public transportation
  - Green technologies, industries and utilities
  - Heathy and clean : no pollution, recycle/reuse garbage
  - Safe: low crime, immediate emergency response
  - Instant global communication
  - Recreation: Parks, amusements

City Planning & Design

- Plan before you play
  - Decide on where your city will be located (geography, climate, environment)
  - Develop goals for your city (keep in mind the yearly theme)
    - Green utilities, no pollution
    - Public transit, no cars
    - Healthy city, parks, recreation, walkable
  - Develop a basic city plan or layout
    - Zones, neighborhoods, downtown, commercial areas, suburbs
    - Traffic patterns
    - Industry, special services
  - Pick an imaginative, meaningful name

Simulation – testing the design

- Simulator = SimCity
- Testing your city plan/design
  - You are the mayor, you control the budget
  - Input your design, add the infrastructure
    - Test different options, choose the best
  - Program supplies the Sim citizens
  - The better you design it, the more citizens will move in



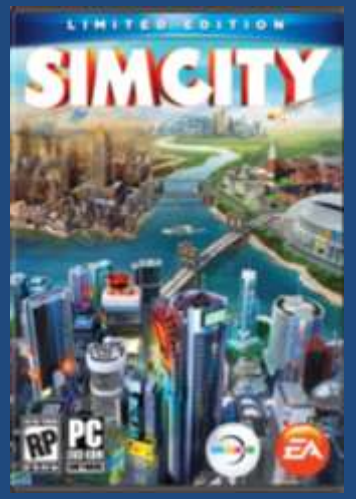
Virtual City Rules

- SimCity rules
  - Offline mode
  - Choose any SC region, any city site
  - Do NOT use sandbox mode
  - Turn off random disasters
- Develop a realistic, functional city
  - No pasting in (or otherwise adding) features not earned
  - Don’t outsource expensive services like utilities or major polluters
  - Cheat codes & gifts discouraged, but allowed w/ appropriate documentation

Virtual City Materials

- Download codes for SimCity software
  - Request codes: Team Center, teacher menu
  - Additional codes may be available (limited number)

- Virtual City Slideshow materials
  - Slideshow template – fill in with data and screenshots
  - Sample slideshow
  - Benchmark chart for monitoring your progress
  - Sample goals (handbook)



Virtual City Slideshow

- Choose two goals for virtual city design and work toward those goals
- Document your city development at two points in time
  - Assess progress
  - Take screenshots to document development
  - Refine design to correct problems
- Rubric
  - Understanding and following the template
  - Testing and refining the design
  - Lessons learned
  - Judge's assessment of design and process

City Planning and SimCity Resources

- NTX Webinars
  - City Planning – recorded in 2014
  - SimCity Tips for Success – recorded in 2014
  - The Virtual City Deliverable – recorded Oct 2016
- NTX Team Center – “Resources” page
  - City Planning resources
    - “Where to learn more”
    - City Planning Exercises (National website)
  - SimCity resources
    - Download instructions for Origin and SimCity
    - NTX SimCity Tips
  - Virtual City deliverable resources
    - Links to templates and forms

Virtual City Design Deliverable

- Virtual City slide show
  - created per template with PowerPoint, Google Docs, Word, etc.
- Submit through Team Center
- Scored on: testing and refining design, learning outcomes
- 48 points
- Due early December

Step 4: Research Essay

Research Essay

- Goal of the writing exercise
  - Verbally describe the city of the future
  - Develop effective research skills
  - Investigate solutions to the assigned topic
    - Analyze tradeoffs of possible solutions
    - Select the best solution
  - Understand technology required
  - Become familiar with engineering roles in city design and operation

Research Essay

- Topic – changes yearly
  - Describe the problem in your future city
  - Use futuristic technology to solve the problem
- Rules
  - Word limit: 1500 max; Graphics: 4 max
  - Include bibliography with min of 3 sources
  - Plagiarism not allowed
- Resources
  - List of topic resources online and in handbook
  - Examples of past best essays online
  - Tutorial webinar recording

Essay Outline

- Introduction and overview
- City basics – description of the city
- Describe the problem (yearly theme)
- Describe the solution
  - Futuristic technology
  - Engineering involved
  - Benefits, tradeoffs
- Conclusion

Research Essay Deliverable

- Document (doc format)
- Upload through Team Center
- 60 points
  - Scored on creativity, how well you explore/explain the issues, use of new technologies, role of engineers, writing skills
- Due December (before holidays)

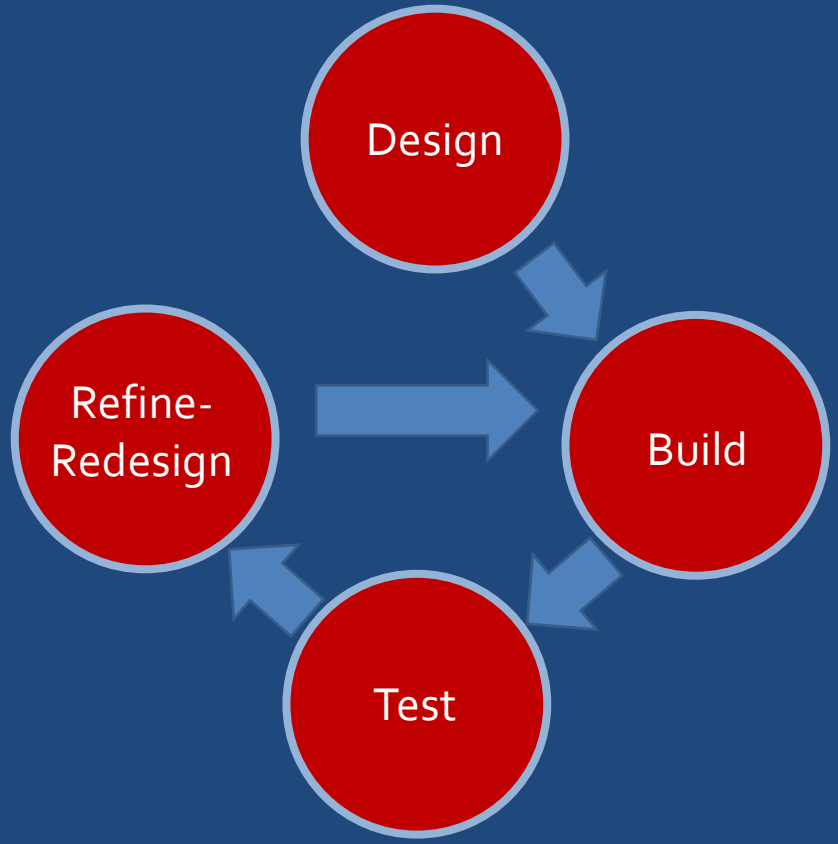
Step 5: Physical Model

Goal of the Physical Model

- Final opportunity to Design → Build → Refine the city
- Learn about scale and how to apply it
- Implement a moving part
- Study power sources to drive the movement
- Work within constraints of a budget

Engineering Design Process

Design – Test – Refine/Redesign



Physical Model Rules

- A *creative* representation of a section of your city
  - Does not have to be an exact duplication of the SimCity
- Built to scale
  - You select the scale
    - No more than two different scales
    - Depends on the city section you are modeling and amount of detail
  - Apply scale consistently in all three dimensions
- Model size: 25” (w) x 50” (l) x 20” (h)
  - Not to exceed
  - Includes all supporting structures, all moving parts, all extension parts (hinged doors, drawers, access panels, etc.)

Physical Model Rules

- Model Weight – no specific limit
  - Kids have to be able to move it
  - Going to National Competition: Models > 75 lbs (including shipping container) will incur additional charges
- Building Materials
  - Recycled materials encouraged
  - No live animals, no perishable items (e.g., no Jello)
- Moving part
  - Manually moved, blown on, spring driven
  - Electric – self-generated, battery powered, NO plugs

Model Budgeting

- Cost of materials for model *plus* presentation cannot exceed $100
  - Recycled materials (plastic bottles, cans, boxes, etc.) — $0
  - Used items (toys, building materials, etc.) — Fair market value *
  - Donated items, Borrowed items — Fair market value *
  - Purchased items — Receipts
  - 3D printed items — Valued per handbook
- Document expenses on Expense Form
  - Bring to competition with model

** Fair market value = garage sale or E-bay price*

Physical Model Resources

- NTX Team Center Resources
  - Where to learn more – pictures and material lists of top models
  - Pictures of past models
- FC activities
  - Understanding scale
  - Model construction

Physical Model Deliverable

- 3-D scale model of a section of your city
  - Must have a moving part and be self-powered
  - Cannot spend more than $100 on materials
- Expense Form
- Model ID card
  - City name, team member names, school/org name
  - Scale
- 70 points
  - Scored on creativity, realism, accuracy and scale, quality of workmanship
- Due late January

Step 6: Presentation

Team Presentation

- Goal of the Oral Presentation:
  - Speak confidently in front of audience
  - Organize and express ideas clearly
  - Think on your feet responding to Q&A
  - Demonstrate teamwork
  - Manage time during presentation
  - Create and effectively use visual aids

Presentation Rules

- Team presentation
  - Max 7 minute oral presentation
    - There will be timers in the rooms
  - Explain the design and function of the city
  - 5-8 minutes of Q&A follow formal presentation
- Visual aids: model, posters, flipcharts, display board
  - No laptops, overhead projectors, videos, tablet computers, cell phones
  - No audio equipment
- Resources
  - Team Center Resources page – “Where to learn more”
  - Presentation Skills webinar (2013) – recorded session
  - NTX team presentation at national finals

Presentation Rules

- Visual aids
  - Size limit, quantity limit
    - No more than 2 displays of poster board (24”x36”) or flip chart (25”x30”)
    - Multiple display boards can be stacked on the easel
  - We supply one easel
- Additional demonstration aids
  - Must collectively fit within a 6” x 6” x 12” volume (e.g., a shoe box)
    - Includes pointers, brochures, handouts, small mockups, etc.
    - Handouts are limited to one page
- Cost of presentation materials plus cost of model materials cannot exceed $100
  - Presentation costs include all materials: display boards, flip charts, costumes, uniforms, props, pointers, handouts, etc.

Presentation Deliverable

- 5-7 minutes of presentation
  - 7 minutes maximum
  - Followed by 5-8 minutes of Q & A (total max time = 15 minutes)
- Expense Form
  - Shared with Model
- 70 points
  - Scored on technical knowledge, city design/features, innovation, teamwork
- Due late January

To Sum Up

To Review – Deliverables and Forms

Home school affidavit (homeschools only)	Mail to Regional Coord.
Virtual City Slideshow	Upload to Teamcenter
City Essay	Upload to Teamcenter
Project Plan	Upload to Teamcenter
Honor Statement	Upload to Teamcenter
Physical Scale Model	Bring to Regional Event
Expense Form	Bring to Regional w/ model
Model ID card	Attach to model
City Presentation	At Regional Event
Media Waiver Form	Upload or Bring to Regional

All forms available on Team Center Resources page

Program Timeline

Oct 31	Registration deadline
Sep-Nov	*Students work on City Plan/Design and SimCity*
Early Dec	Virtual City slide show due
Oct-Dec	*Students begin essay research and writing*
Mid Dec	City Description due
Dec-Jan	*Students work on model and presentation*
Mid Jan	Project Plan due, Honor Statement due
Late Jan	Competition at UT Arlington, Award ceremony
Feb	National Finals in Washington, DC

Special Note – Potential Conflicts

- Duke Talent Search SAT (7th grade)
  - Don't select the January test date!
    - Option: UTA is a test site (reduce travel time)
- UIL competitions
- Options for those with conflicts
  - Notify Regional Coordinator by 20 December
    - Limited number of late Prelim Round presentation times allocated on first-come, first-served basis
  - Arrange for other team members to handle Special Awards judging Q&A
- Note: there is a letter to parents on website (Team Center Resources)
  - Outlines FC program and dates

Lessons Learned

- Engineer-Mentor is necessary
- This project takes time
  - Educators – 30-40 hours
  - Mentors – 20-40 hours
  - Students
    - Design city – 18-20 hours
    - Build model – 40-60 hours
    - Essay, Narrative – 8 hours
    - Presentation – 7 hours
- Don’t wait until January to start model and presentation pieces
  - Start collecting recyclable “building” materials now

Lessons Learned (cont'd)

- Keep parents informed
  - Letter to parents (sample on website)
- Winning teams are successful on all phases
- But, Penalties for late work won't kill your chances
  - All late penalties combined are less than 7% of total score
- Read the handbook and rules for N TX competition
- Educator and mentor act as advisors, not designers
- Consider bringing in topic-area experts

Regional Committee

Regional Coordinator	Jean Eason
Judging Coordinator	Richard Reppert
Mentor Coordinator	Tom Hunt
Event Coordinator	Jacquie White
Photos, Prizes	Diane Collier
Special Awards	John Colotta, Tamara Cook
Public Relations	Katia Gomez
Facilities	Dave Davis