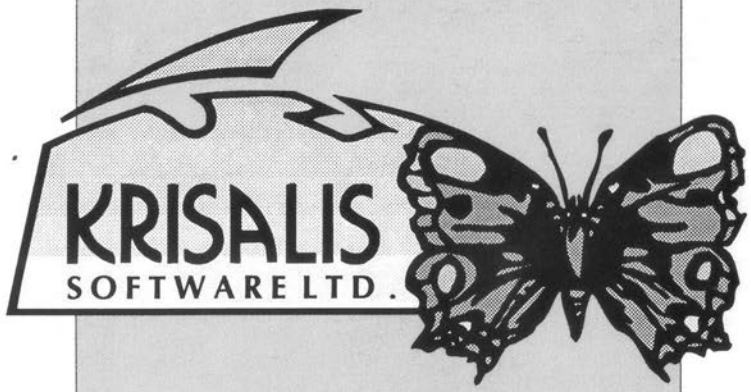

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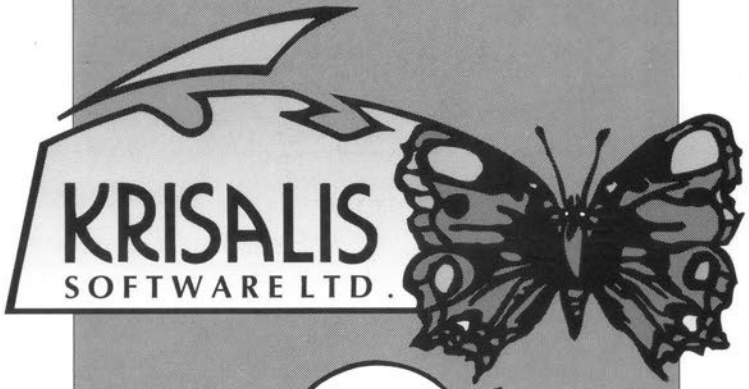
SIM CITY®
THE CITY SIMULATOR

TEACHER'S GUIDE

ACORN 32 BIT



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INTRODUCTION

What is SIMCITY?

SimCity is a city simulator, a dynamic model of urban life. Its graphic interface makes it easy enough for use by young children. Its modelling accuracy makes it suitable for adults. The fact that it is presented in game format takes the tedium out of learning - and teaching.

SimCity is the first of a new type of education/entertainment software, called SYSTEM SIMULATIONS. In a system simulation, we provide a set of RULES and TOOLS that describe, create and control a system. In the case of SimCity, the system is a city. A more in-depth description of system simulations can be found in the SimCity Instruction Manual.

Enjoy yourself

SimCity was designed as a game. Enjoy it. Have fun. Relax.

Accuracy

SimCity's accuracy is limited to the generic 20th century market driven city.

The NIMBY factor

SimCity's residents do not show the "Not In My Back Yard" effect. Where real people would protest, yell and scream at having a nuclear power plant placed in their neighbourhood, or get upset at having their home or work place bulldozed, Sims will just quietly move out.

Simulation Speed

SimCity is really two programs running at once. The SIMULATION is a complex mathematical model running in the background, to generate the data for the maps, graphs, growth, decline, etc. The INTERFACE is waiting for the user to tell it what to do. When doing demonstrations, remember that the simulation will lag behind the interface. In other words, give it some time to calculate and re-draw maps, graphs etc. after you make changes.

The amount of lag, as well as the overall simulation speed depends on the computer you're using.

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This guide was prepared for use at the elementary school level.

This guide is intended to be used with the SimCity Instruction Manual.

Manual Structure

Each activity is divided into three parts, Instruction Material, Simulation Experiments, and Discussion Questions.

The Instruction Material Section is a list of related topics that can be covered in a lecture/discussion before the computer is turned on.

The Simulation Experiments are activities to be performed on the computer. These can be demonstrations by the teacher, individual or group activities, or both.

The Discussion Questions are guides for beginning class discussions.

Basic Computer Literacy

Disk Use - Loading and Saving
Use of Mouse
Use of Menus and Sub-Menus

Simulation Concepts

What is a simulation?
Types of simulations
Uses for simulations
Limitations of simulations

City Concepts

Civics
Politics
Public Opinion
Budgeting
Taxes
History
Getting information from Maps and Graphs
How all the above factors are related

Critical Thinking

Problem Solving

Read the Instruction Manual that comes with the program and play the game. At least work through the tutorial.

The scenario cities will be timed, and most will have a disaster soon after you load them. If you want to use these cities in a class demonstration without being interrupted by a disaster, then before class, load in the scenarios, and before the disaster, save them to disk as regular city files. When you load them in again, they will not be timed or have the disasters.

You may also want to pre-build a number of cities to use in demonstrations and workshops. The larger the city, the slower time will pass in the simulation. For quick visible simulation results, keep your city size down.

Always save your city in progress often, whether building a city for demonstration, doing a demonstration, or just playing, every so often, SAVE YOUR CITY TO DISK.

As part of the game aspect of SimCity, there will be random disasters. To avoid these while building demonstration cities or doing class demonstrations, keep the game in easy mode, and if there is a menu item allowing you to disable disasters, use it.

NOTE: You cannot disable individual functions of SimCity. While you are demonstrating traffic, you may still get warnings about crime, pollution, disasters, etc.

Some additional materials that may be of use to you are:

Maps of cities around the world

A printer for your computer

Crayons, markers or paint

Other computer simulations (flight, automobile, etc.)

'Phone books to locate and call local government offices, police and fire departments, etc.

ACTIVITIES

Instruction

1. Define Simulations and Models.
2. Compare Computer Simulations and other types of simulations, pointing out the advantages and disadvantages of each.
3. Uses of Simulations
   - Learning
   - Testing ideas before you commit to them
   - Doing things that you can't do in real life
   - Examining things in contracted or expanded time scales
   - Examining things that are normally too large or small to view directly
4. Limitations of Simulations.
   - Accuracy.

Simulation Experiments

1. Demonstration of SimCity
   - A. Give a short tour of a city or two
   - B. Point out the traffic, houses and people moving in and out.
2. Demonstrations of other simulations, such as flight or driving.

Discussion Questions

1. What are simulations good for?
2. What other simulations already exist?
3. What else could be simulated?

Instruction

1. Define and describe zones
   - Residential
   - Commercial
   - Industrial
2. City/government owned or built areas and items
   - Power plants
   - Power lines
   - Roads
   - Rails and public transport
   - Parks
   - Police Stations
   - Fire Departments
   - Stadia
   - Sea Ports
   - Airports
   - Other
3. People
   - Citizens
   - Mayors
   - City planners
   - City council
   - Civil service workers
   - Policemen
   - Firemen
   - Other

Simulation Experiments

1. Introduction to the SimCity program
   - A. Starting the program
   - B. Loading in a city
   - C. Starting a new city
   - D. Saving a city
   - E. Tour one or more of the scenario cities
   - F. Introduce and describe the tools (menu items)
   - G. Quitting the program

Discussion Questions

1. Why are there zones?
2. Who decides where zones go?
3. Who should decide where zones go?
4. Who decides what the city spends money on?
5. Who should decide what the city spends money on?
6. Which is more important: the city or the people in it? Why?
7. Who is your mayor?
8. Who are your city council members?
9. Does your city have a planner?
10. Where do cities form? Why?

Instruction

1. Discuss types of maps.
   Maps that filter out certain items, such as roads or a power grid are called "Layer Maps."
   Maps that display statistical data, such as crime, traffic, population growth, etc., are called "cartograms" or "demographic maps."

2. Define demographics.

3. Show various types of maps to the class.

Simulation Experiments

1. Dynamic Mapping
   - A. Load in a city or scenario.
   - B. Bring up the Map Window.
     Go through each type of map display.
   - C. Go back to the Edit Window. Make radical changes in the city: build lots of zones and/or roads or cause earthquakes to destroy lots of zones.
     Let the simulator run for a few minutes.
   - D. Go back to the Map Window, and note the changes in each type of map display.

Discussion Questions

1. How many types of maps are there?
2. Why are there so many types of maps?
3. How can each type of map help someone?

Instruction

1. Define Graphs.
2. Compare the type of information conveyed by maps and graphs.
3. SimCity has only one type of graph. Show examples of other types.

Simulation Experiments

1. Dynamic Graphing
   A. Load in a city or scenario.
   B. Bring up the Graph Window. Go through each type of graph display.
   C. Go back to the Edit Window. Make radical changes in the city: either build lots of zones, or cause earthquakes to destroy lots of zones. Let the simulator run for a few minutes.
   D. Go back to the Graph Window, and note the changes in each type of graph display.

Discussion Questions

1. How many types of graphs are there?
2. Why are there different types of graphs?

Instruction

1. What are Power Plants?
2. What types of Power Plants are there?
3. What are the advantages and disadvantages of each?
4. What about solar power?
5. What about Nuclear power, safety and politics?

Simulation Experiments

1. Modern city with and without power
   A. Start a new City, and place a few zones.
   B. Connect them with roads, but place no power plant.
   C. Not much will happen.
   D. Place a power plant near, but not adjacent to the zones. Do not connect power to the zones.
   E. Watch what doesn't happen.
   F. Connect Power to the zones.
   G. Watch what happens.

Discussion Questions

1. What type of Power Plant do you prefer?
2. What type of Power Plant produces power for your city?
3. How do you feel about Nuclear Power Plants?
4. What kind of power and Power Plants might there be in the future?
5. How did people live in Cities before there was electricity?
6. How many things in your house use electricity?
7. How does power get from the Power Plant to your house?

Instruction

1. Commuting
   People need to get to work, school, stores, etc.
   How far do they have to go?
   How can they get there?
2. Automobiles
   Pollution
   Traffic problems
   Insurance
3. Public Transport
   Buses
   Trains
   Subways
4. Bicycles
   Advantages:
      Health
      No Pollution
      No Insurance
   Disadvantages:
      Speed limitations
      Distance limitations
      Lack of good bicycle paths
5. Other

Simulation Experiments

1. Long commute
   A. Start a new city.
   B. Zone the residential areas very far away from the industrial and commercial areas.
   C. Connect all the zones with roads.
   D. None of the areas will develop very far or fast.
2. Short commute
   A. Start a new city.
   B. Place the zones closer together
   C. Connect the zones with roads.
   D. Compare the development speed.
3. Heavy traffic example
   A. Load the Bern city file.
   (You can use the Scenario, but it is timed.)
   B. Look at the Traffic density map.
   C. Replace all the roads in one section of the city with rails.
   D. Look at the map again.

Discussion Questions

1. Which city grew faster - the spread out one or the compact one? Why?
2. How far would you like to commute? How long will it take?
3. How can a city planner help reduce traffic problems?
4. How can a city planner help reduce pollution?
5. How can a city planner improve and increase the use of bicycles?
6. What other means of transportation are there?
7. What other means of transportation might there be in the future?
8. Could suburbs exist without commuting? Without cars?

Instruction

1. Explain the concept of land value
2. Discuss things that make land more valuable:
   Proximity to places to work and shop
   Proximity to ocean, lake or river
   Proximity to transportation
   Proximity to power
   Proximity to parks, forests and recreation areas
   Low crime
   Low pollution
3. Discuss things that make land less valuable:
   Far from places to work and shop
   Far from parks, forests and recreation areas
   High crime
   High pollution
   Proximity to "dangerous sites", such as toxic waste dumps and nuclear power plants.

Simulation Experiments

1. Exploring land value
   A. Load in a city.
   B. Using the Land Value Map, and the Query function, explore the land values.
   C. See how proximity to amenities such as water, parks, etc. affect land value.
2. Increasing land value
   A. Find a low value area
   B. Clear away polluting factories, add parks. If it is also a high crime area, add a police station nearby.
   C. In a few minutes, check the map and Query function again to see if the land value has improved

Discussion Questions

1. Is high land value good?
2. Is low land value bad?
3. What happens if all the land value is high?

Instruction

1. For what does a city need money?
2. Where does it get the money?
3. Who decides what the city does with the money?
4. What kinds of taxes are there?
5. Who pays taxes?

Simulation Experiments

1. Budgeting and Taxes
   A. Start with a small, thriving city. It will only need to have 15 or 20 zones, lots of roads and rails, and two police and two fire stations. For this demonstration, you will want to have only $1000-$2000 in your treasury. If you have too much, then build and bulldoze some zones to use up the money.
   B. Note the tax rate, and record the amount of taxes collected for a few years.
   C. Raise the tax rate to 20%. Many of the Sims will leave town.
   D. Record the amount of taxes collected for a few years.
   E. Lower the tax rate to 0%. The town will grow fast and thrive, ...for a while.
   F. Record the lack of taxes collected for a few years.
   G. Look at the Budget Window, and make sure all funding levels are at 100%.
   H. Open the Map Window. Check the City Services Map to see the Police and Fire Department coverage.

I. Soon, your city funds should run out. If you still have a lot of money in your treasury, build some more zones, roads and rails until you run out.

J. After a few years of city time, check the City Services Map again. There will be much less coverage.

K. Explore the city, looking at the roads and rails. After a few years with no maintenance funding, they will begin to deteriorate.

Discussion Questions

1. What are taxes for?
2. What happens in SimCity when taxes get too high?
3. What happens in a real city when taxes are too high?
4. What happens when taxes get too low?
5. Why did the police and fire coverage decrease without funding?
6. Why did the roads deteriorate without funding?
7. Besides fire and police stations and transportation, what other costs does your city have?
8. What is your city's budget?

Instruction

1. Who is the public?
2. What is public opinion?
3. How is public opinion expressed?
4. How important is public opinion?
5. What are statistics?
6. What is a census?
7. How is a census taken?

Simulation Experiments

1. Public Opinion and Statistics
   A. Load in a city with no rails, no police, £2000-£3000 in the treasury, and a low tax rate (3%). Give it a few minutes to update its information.
   B. Bring up the Evaluation Window.
   C. Look at both the Public Opinion Poll and the Statistics. There should be a good percentage of people complaining about crime and traffic.
   D. Replace the roads with rails to help alleviate the traffic problems.
   E. Build a few police stations to help alleviate crime (and use up all your money).
   F. Since your tax rate is low, and your maintenance costs are high, your treasury will soon be empty. Your police coverage will decrease due to lack of funding, and your transportation system will begin to deteriorate.
   G. You need more money, so raise taxes to 15%.
   H. Wait a few minutes for the simulator to update, and check the Evaluation Window again. Now what are the people complaining about?

Discussion Questions/Activities

1. Why did the people complain about crime and transportation, and then complain some more when they had to pay for a rail system and police stations.
2. What happens if the public never expresses its opinion?
3. What happens if politicians don't listen to public opinion?
4. What ways can you think of to express your opinion?
5. Write a letter to your local newspaper expressing your opinion about an issue that is important to you.
6. How many people are in your city?
7. What else can you learn from a census?
8. How accurate can a census be with people being born and dying and moving in and out of a city?
9. Why do people move into or out of a city?

Instruction

1. Define Pollution
2. Discuss various types of pollution
3. Discuss various causes of pollution
4. Discuss local pollution laws

Simulation Experiments

1. Pollution exploration
   A. Load in a city with lots of roads and industry.
   B. Bring up the Map Window
   C. Find the places on the map where there is high pollution.
   D. Explore the city in these places.

Discussion Questions

1. How can you stop pollution?
2. Can you stop all pollution?
3. What would happen if there was a law that said no cars are allowed in your city? Would it help cut down pollution? How would people get to work or school?
4. If you tore down all polluting factories, would that help cut down pollution? Where could the people who used to work in the factories work now?

Instruction

1. Define crime
2. Define types of crime
3. Point out that crime is a very complex issue and that SimCity treats it in a very simplified way. SimCity only indicates a "general crime level," and does not deal with specific crimes. It also has no prisons, rehabilitation program, or educational program to help reduce crime.

Simulation Experiments

1. The Short-term approach
   A. Load in Detroit, in city or scenario form.
   B. Open the Map Window and locate high crime areas.
   C. Put a police station in all high crime areas.
   D. Check the map and see how the crime abates.
   E. Open the Budget Window and see what it costs to maintain this police force.
   F. How long can you support this force without raising taxes?
2. The Long-term approach
   A. Load in Detroit, in city or scenario form.
   B. Open the Map Window and locate areas that are high crime and low property value.
   C. In these areas, bulldoze many of the residential and industrial zones.
   D. Replace them with fewer zones, and add lots of parks. Add just a few police stations.
   E. This will take longer, but should reduce crime.
3. The Crazy approach.
   A. Load in Detroit, in city or scenario form.
   B. Bulldoze the whole city, until you have a population near zero.
   C. If you have no people, you have no crime.

Discussion Questions

1. Did the Short-term approach work?
2. What was good about it?
3. What was not so good about it?
4. What new problems were caused by trying to solve an old problem?
5. Did the Long-term approach work?
6. What was good about it?
7. What was not so good about it?
8. What new problems were caused by trying to solve an old problem?
9. Did the Crazy approach work?
10. What was good about it?
11. What was not so good about it?
12. What new problems were caused by trying to solve an old problem?
13. Crime is a much more complex issue in real life than it is in SimCity. What other factors are involved?
14. Do prisons help reduce crime?
15. Do rehabilitation program help reduce crime?
16 Can educational program help reduce crime?

Instruction

1. Explain about the Scenarios, what they are and how they work.
2. Cover the advantages of trying out ideas in a simulation before doing it in real life

Simulation Experiments

1. Non-disaster scenarios
   A. Load in a non-disaster scenario (Bern - traffic problems, Detroit - crime problems).
   B. Play out the Scenario, and try to win. If it doesn't work, try something else.
   C. Try anything. If all else fails read the manual.

NOTE: Problems can have strange if not practical answers. These two scenarios can actually be won by bulldozing the entire city: there can be no crime or traffic problems if there are no people.

Discussion Questions

1. How did you deal with the city's problem?
2. Did it help?
3. Did what you did cause other problems?
4. What else could you try?
5. Does your city have any of the same problems?
6. If the cities were properly planned could they still have the same problems?
7. Is it easier to start a city with careful planning, or go back and fix a city that already has problems?
8. Is it more or less expensive to start a city with careful planning, or go back and fix a city that already has problems?

Instruction

1. Define disaster.
2. Discuss types of disasters.
3. What do you do in a disaster?
4. What do government officials do about disasters?
5. What can you do to prepare for a disaster?

Simulation Experiments

1. Disaster scenarios
   A. Load in one of the disaster scenarios (San Francisco, Hamburg, Tokyo, Boston, or Rio de Janeiro).
   B. The Disaster will occur automatically.
   C. Look at the map to see the overall damage caused by the disaster.
   D. Play out the simulation, and try to win.
   E. Repeat for other Scenarios.

Discussion Questions

1. Did you win the scenarios?
2. If not, why not?
3. What could you try next time that might help you win?
4. If the city was prepared for the disaster would there have been less damage?
5. If San Francisco had more fully-funded fire stations, would the fires have caused less damage?

Instruction

1. Go over the Growing of a city within the Manual.
2. Explain the Demand Indicator.

Simulation Experiments

1. Demonstrate beginning a new city.

Discussion Questions

1. What are the most important things to remember when building a city?
2. How big do you want your city to be?
3. How many people should live there?
4. What kind of transportation system do you want to use?
5. What problems do you expect to face?
6. What will you do about them?
7. What happens if a simulated city is planned badly?
8. How easy is it to fix?
9. What happens if a real city is badly planned?
10. How easy is it to fix?

Instruction

1. Briefly review beginning a new city.

Simulation Experiments

1. As a whole class, in groups or individually, let the students design a city, making all the decisions.

Discussion Questions

1. What is your city's name? Why?
2. How many people live in your city?
3. How many people do you want to live in your city?
4. How close is your city to the city you wanted? What went wrong?
5. What problems does your simulated city have?
6. Does your city have any of the same problems as your real city?
7. What can you do about your simulated city's problems?
8. What can you do about your real city's problems?
9. How will you plan differently next time you design a city?

Instruction

1. Bring in and show maps of various cities around the world.
2. Cover the History of Cities and City Planning.
3. What do real cities have that SimCity doesn't?
   - Water lines to houses
   - Sewage lines
   - Buses
   - Garbage dumps
   - Toxic waste dumps
   - Schools, etc.

Discussion Questions

1. In what ways are real cities like SimCity?
2. What do real cities have that SimCity doesn't?
3. What would you like SimCity to have that it doesn't?
4. Is a city better if it is bigger?
5. What makes one city better than another?
6. What would your dream city be like?