

Fifth Graders  
Create the Future  
Manzanita Elementary School

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CLE conference, June 2000

Waters Grant Project  
Catalina Foothills School District

# Catalina Foothills Challenge Curriculum

## Objectives:

### *Corresponding Systems Concepts:*

- Future problem-solving requires planning, discussion, decision-making, research, and critical thinking.  
*Dialogue, team learning*
- The negative impact of change and chaos can be addressed through forecasting. *Behavior over time, structure generates behavior, leverage*
- Knowing our paradigms helps us to understand how we view the world and be open to alternative solutions. *Mental models*
- The causes and solutions to future problems are interdependent. *Interdependencies, feedback, structure generates behavior*

### Systems Thinking Tools Used:

- Behavior-over-time graphs
- Causal loop diagrams
- Tragedy of the Commons  
Archetype
- Stock/Flow maps
- Iceberg

1. Excerpt taken from **Pedestrian Paradise**, Sierra Magazine, May/June 1999

- “In the Pacific Northwest, as elsewhere on the continent, access through mobility has involved incredible numbers of cars. In 1994, there were nearly 11 million motor vehicles in British Columbia, Idaho, Oregon, and Washington. The motor vehicle fleet was growing faster than the economy, and almost twice as fast as the population. Indeed, vehicles were steadily gaining on humans, with four vehicles for every five people. Vehicles have outnumbered licensed drivers since the late 1960s. If all the drivers in the region today took to the roads at the same time, there would still be a million parked cars.

After 1983, the amount of driving increased even faster than the number of autos. The average vehicle in Idaho, Oregon, and Washington covered 11 miles per person a day in 1957; by 1993 the figure was up to 25. People were driving longer distances, but most of the increase was due to people getting in their cars more often. In fact, they were driving on 90 percent of the trips they took, a figure that had been rising for decades at the expense of trains, bicycles, buses, and travel by foot. And the reason for this shift was sprawl. The share of people in Idaho, Oregon, and Washington who live in suburbs has risen from just 7 percent in 1950 to 30 percent in 1990—a change that parallels national trends. Northwest suburbs overtook towns in population in the 1960s. They passed cities in the 1970s, and exceeded rural areas in the 1980s. In Washington, 70 percent of the residences put up between 1960 and 1990 were on the urban fringe.

This mass migration was made possible by the automobile; now it has made the automobile indispensable. People who live in sprawl lack alternatives: people in typical households in Northwestern suburbs own one car per driver and get in their cars ten times a day. Per person, suburban dwellers drive three times as far as those who live in pedestrian-friendly urban neighborhoods such as the West End. They are, in transportation lingo, “auto dependent.”-

2. Quote also taken from **Pedestrian Paradise**, Sierra Magazine, May/June 1999

“Motor vehicles, and the industries that build, fuel, repair, and support them, are the nation’s worst air polluters. And dirty air kills roughly 50,000 Americans each year by inducing asthma attacks, worsening respiratory diseases, and causing lung cancer. In most major cities, you can track air quality from data on hospital admissions: bad-air days send children with asthma and seniors with lung conditions gasping to the emergency room. Auto emissions are also a leading contributor to global warming, second only to electric power plants nationwide as a source of carbon dioxide, the principal greenhouse gas. Each car on the road emits its own weight in carbon annually in the form of CO<sub>2</sub>.”

# Current Reality of the System

Events

What happened?

What is seen

Patterns of Behavior

What are the trends?

What is generally unseen

Underlying Structures

What is influencing the patterns? (e.g. policies, laws, physical structures)

What are the relationships among the parts?

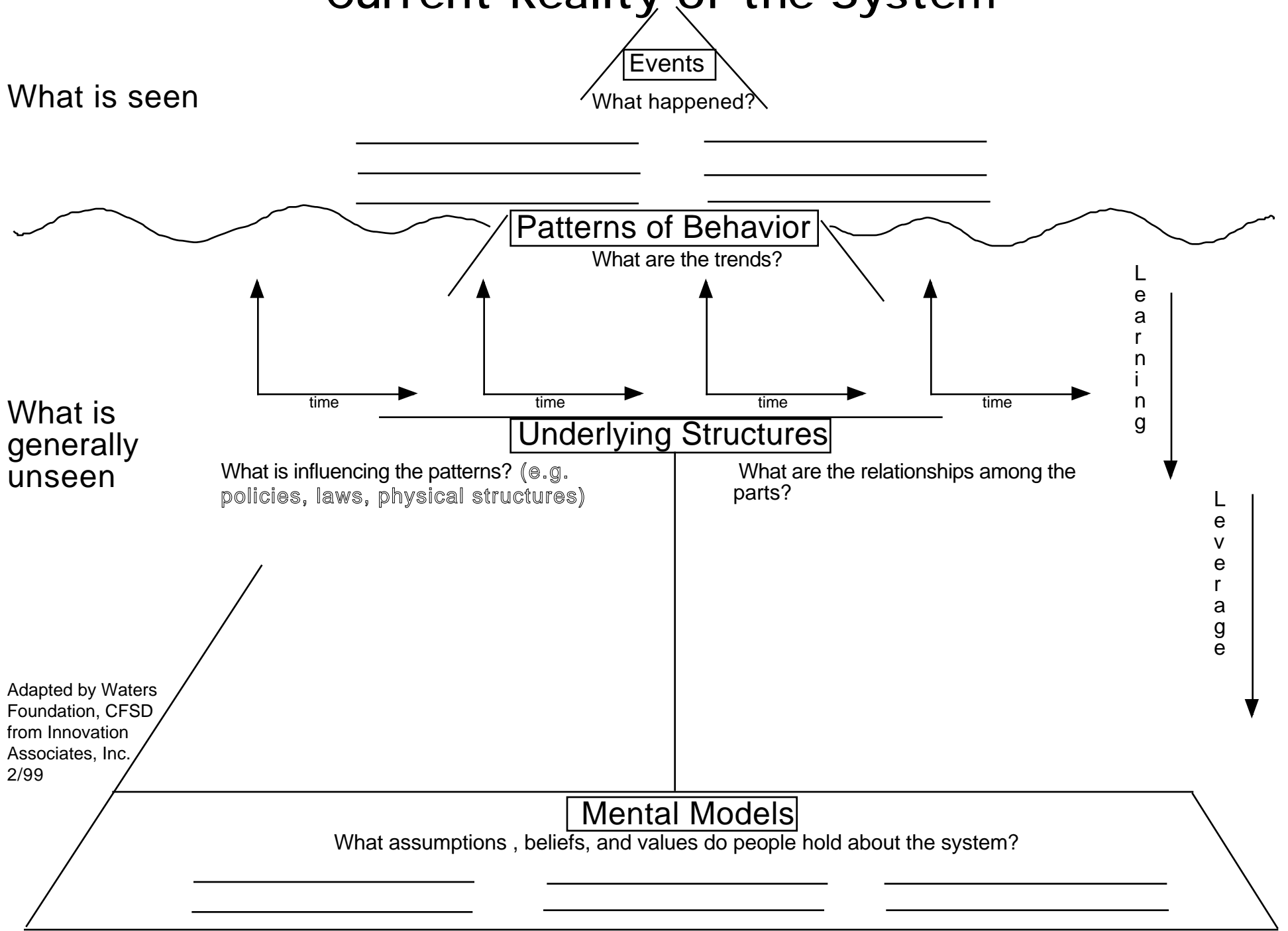
Learning

Leverage

Mental Models

What assumptions, beliefs, and values do people hold about the system?

Adapted by Waters Foundation, CFSD from Innovation Associates, Inc. 2/99



# Desired Results for a System

What is seen



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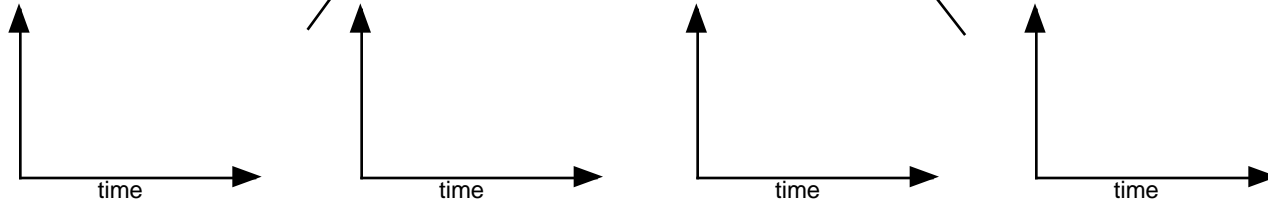
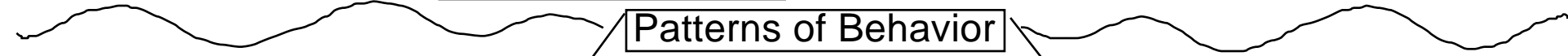
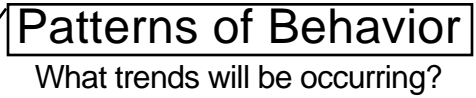
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What is generally unseen



What will influence the patterns? (e.g. policies, laws, physical structures)

What will be the relationships among the parts?

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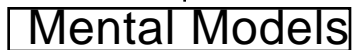
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What assumptions, beliefs, and values will people hold about the system?

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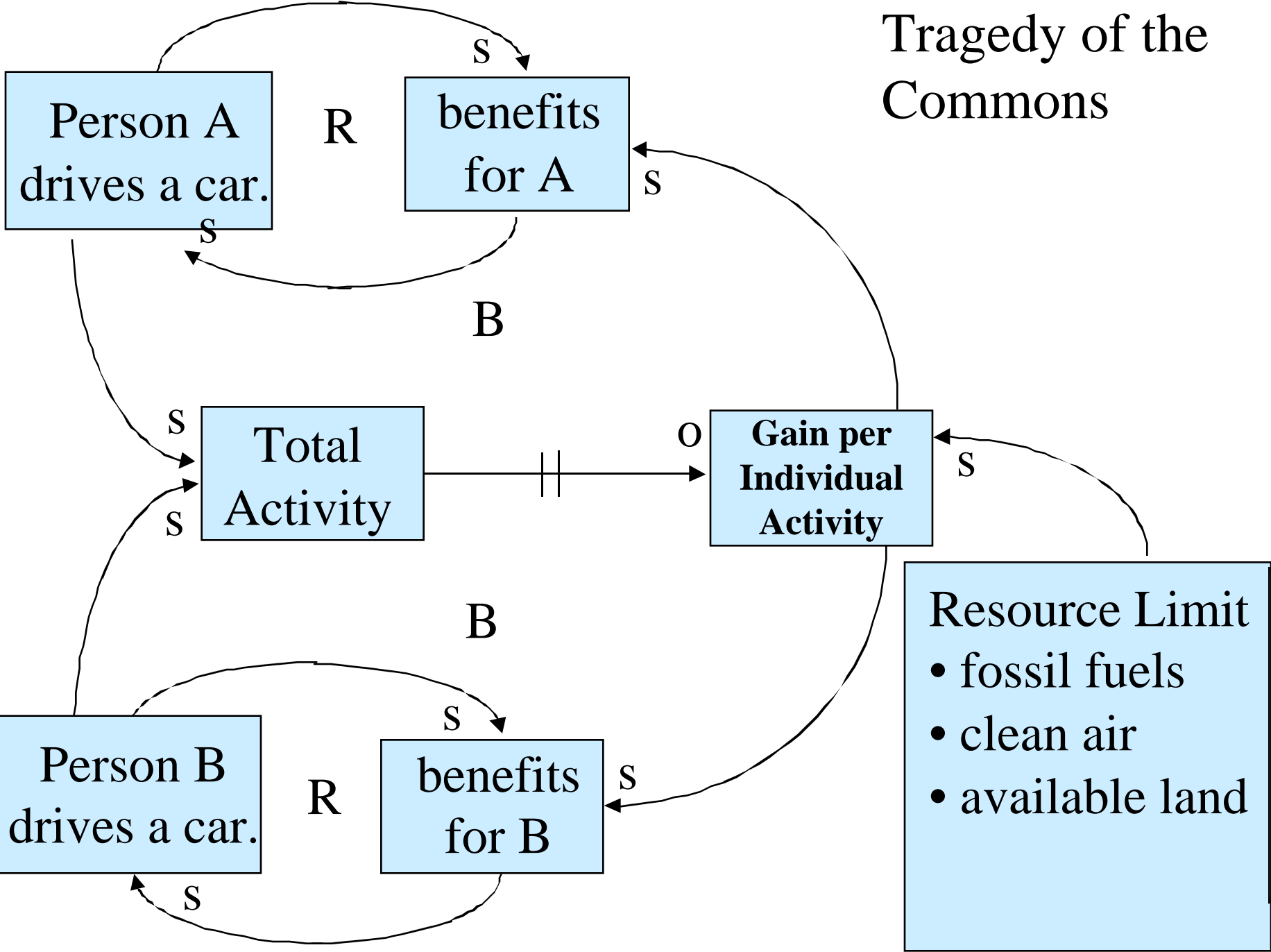
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# Tragedy of the Commons



# Pamphlet Write-up

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Things to remember:

- Make sure all the ideas included in your write-up are “internally consistent”, e.g. The mental models support the structures and trends. The structures support the inventions, etc.
- Feel free to use any systems tools, e.g. causal loop diagrams, stock/flow maps, iceberg diagram, that may assist in describing the system.

**Type of system:** Include your inventions.

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**Description of how it operates:** Include a summary of the physical structures, policies, laws etc.

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**Reasons for selection:** Include...

- belief/value statements that summarize the mental models underlying the system.
- goals for the system which address the desired patterns of behavior and the desired increase/decrease of the effects on a “commons”.

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# City Choices

Each group will complete all of the following:

- Naming Your City
- Location
- Physical Features
- Demographics
- Pamphlet
- Finalized iceberg from each expert

Each group member will complete one of the following:

- Government
- Education
- Recreation
- History
- Create a Budget
- It's Travel Time/Travel Poster
- Business and Industry
- Cultural Life

Each group will:

- Map Your City

Options for early finishers:

- Create a professional sports team
- City Mural
- City Poetry
- The Big Story
- Annual Events
- Wish You Were Here