

Teacher Guide for ODYSSEY, *Science and the City*

February 2009

Betty Lou Askin, a retired educator, who lives in Toronto Ontario, prepared this guide.

Science Scoops

Your Very Own Jet Pack (page 2)

- Describe the Martin Jetpack.
- Explain what you would do with your own Jetpack.

Heat Islands (page 3)

- Explain "Urban Heat Island"
- How can we reduce the high temperatures in urban areas?

Hidden Gorilla City (page 4)

- Describe how scientists went about counting the gorillas.

Salty Secrets (pages 4-5)

- Why is salt on Mars "a welcome, friendly sight"?
- Explain why the cellulose found in New Mexico was an important discovery.

A Little Seed in a Big City (page 5)

- How has the *Crepis sancta* flower adapted to its environment?

Mega Cities with Mega-Challenges (pages 6-10)

Reading for Understanding:

New York and the Underground City

- Describe the underground infrastructure of New York.
- Why is it so difficult to update the underground utilities?
- What is trenchless technology?

Tokyo, Japan a Shaky Situation

- Why is it sitting in a precarious position?
- How is it trying to protect itself?

Mumbai, India Megawatts for Millions

- Explain how Mumbai maintains power when it is lost on the national grid.
- Describe two other methods of conserving energy.

Shanghai, China Reshaping the Urban Environment

- What programs are in place to reduce pollution in Shanghai?
- Write a paragraph to describe the plans for eco-city, Dongtan.

Dubai: A Rising Megacity

- Why do you think that Dubai is building so many huge skyscrapers?

Landscape Urbanism (pages 8-10)

- Describe the benefits of landscape urbanism.

Cool Roofs (pages 11-14)

Questions for discussion:

- Why is Jackman Public School very proactive?
- Why is the EPA concerned about our cities?
- Explain how a green roof helps the environment.
- What is a cool roof?
- Do you think that you would like to have a green roof on your building? Explain your answer.

The Hidden Order within Cities (pages 15-19)

Before reading this article, ask the students to suggest what they think are the qualities of a healthy city. Compare their list with the one found on page 18.

- What do M. Batty's models study?
- Describe a fractal.
- Explain why Batty's models are important for the future.
- Describe the things that influence the shape of a city.

Can You Solve the World's Most Famous Traffic Problem? (pages 20-22)

- Tell what was not included on Euler's graph.
- What did he include on his grid?
- Explain how his grid was used.
- Describe some uses that can be made with Euler's graph.

Solving Traffic Problems in Roundabout Way (page 23)

- Describe how a roundabout works.
- Why are roundabouts safer than intersections?
- Name some other benefits of roundabouts.

A Mile High in the Sky (pages 24-26)

- What are some of the benefits to skyscrapers?
- Tell how three tall buildings have developed ways to counteract the wind sway.
- News Report: Choose one of the new mile-high buildings in this article. Write a report expounding the merits of that structure to readers. Include a drawing of the building.

Mapping Our Cities (pages 28-29)

- Think-Pair-Share: Ask the students to pair up with another classmate. They are to read and discuss this article. When they have completed this task, hold a class discussion about what they have read and their impression of the material.
- Ask the students to work again with a partner. This time they are to brainstorm about other possible uses for the concepts in this article. They should prepare to share their ideas with the rest of the class.

Podway Bound (pages 32-35)

- Creative Story Writing: Ask the students to create a story of their own, using the concepts provided in this piece of fiction.

Building for the Future (pages 36-37)

- This could be a project for your classroom if it seems feasible. The students might already be familiar with SimCity. They may also be interested in creating a model city.

Venice: City on the Edge (pages 38-40)

- One suggestion for use with this article is to use a **co-operative** strategy, such as a **Jigsaw** or a **Literacy Circle**. Each group would be responsible to read the article, make notes and be prepared to make a presentation to the rest of the class.

Questions to focus their reading might be the following:

1. What was Venice built on?
2. How was Venice built?
3. How are the canals used?
4. How is Venice being threatened?
5. Describe some of the problems that have been going on for years.
6. Explain how MOSE works.
7. Describe the concerns of the No MOSE critics.
8. What is your opinion of MOSE?

Beez in the Hood (pages 41-43)

- Why are bees so important to the food industry?
- What are possible water sources for urban bees?
- Describe what is happening when bees swarm.
- Why would a queen bee become vicious?