

# WATER WORKS

A GREAT SHOW ON EARTH



ADMISSION  
IS  
FREE  
(SOME  
ATTENTION  
REQUIRED!)

Classroom Activities for  
Third & Fourth Grades



# WATER WORKS

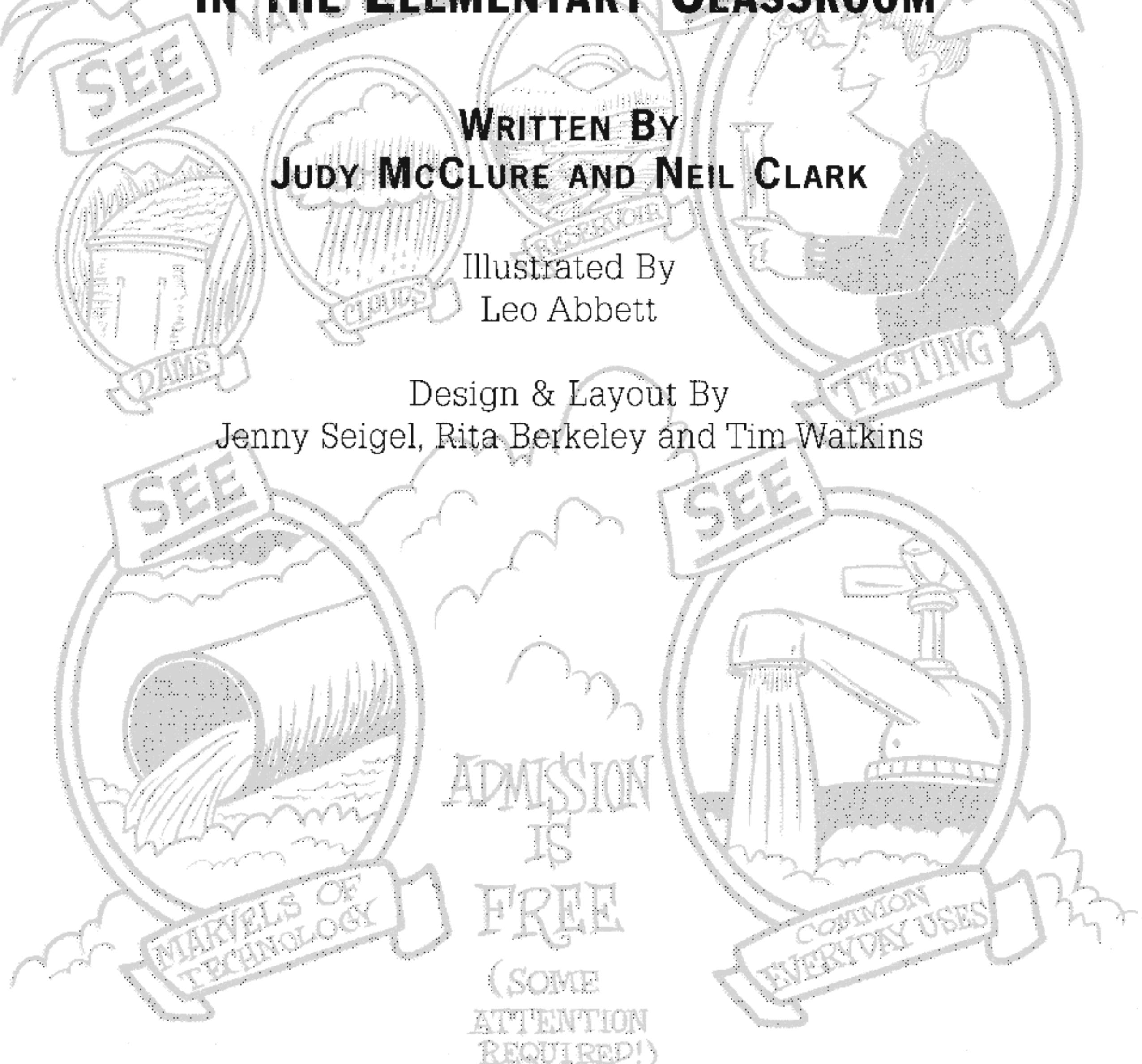
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## WATER WORKS . . . IN THE ELEMENTARY CLASSROOM

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# WATER AS A LEARNING TOOL

Water supply is no miracle. It is the result of science and technology applied to our most fundamental needs and dedicated to community health and safety. Understanding the importance of water systems is part of modern citizenship. Water Works is intended to lay the foundation of responsible water use for elementary students, leading them to look beyond the faucet to the natural and human-made systems which support that stream of clean, reliable water.

The study of water can accomplish many things in the elementary classroom. It teaches students that if they look carefully at familiar things, there is more to learn, deeper understanding to be gained. Further, it is a rich topic for developing basic skills. As they do Water Works activities, students will predict, experiment, observe and draw conclusions. They will read, calculate, and communicate. Activities in Water Works address many of the Learning Standards set forth by the Massachusetts Curriculum Frameworks.

Water systems are an instructive example of technology for third and fourth graders. Technology, these days, conjures up "high tech," wires carrying electrical charges which no one can see. Low tech water pipes carry water, with which students are entirely familiar. Water systems are science and technology in service to families, businesses and the community. The technology is in their homes and under their streets, bringing them essential services.

Finally, water systems can help students consider distant and local human history. Not many generations have enjoyed the hot water and flush toilets that we take for granted. When and why did people decide to concentrate resources on water supply systems? What benefits did they gain? Though Water Works concentrates more on the science and technology of water supply, other areas of inquiry are readily available. Whether it's town history or the Roman Aqueducts, fruitful connections and extensions abound.

Just as we benefit today from planning done a century ago, today's young people will soon be responsible for community decisions with far reaching consequences. We hope Water Works will help build a foundation that serves the community today and tomorrow.

# TEACHER'S NOTE – USING WATER WORKS

This curriculum guide is divided into five Lessons, each containing several activities, reflecting the natural path of inquiry that third or fourth graders might take in considering the water that arrives faithfully in their bathroom sink each morning. Starting from the familiar faucet, we encourage them to reflect upon their own habits and to analyze community water use. The next lessons trace water from the faucet to the reservoir, investigating the systems that deliver water to our homes and neighborhoods. Then come the natural systems and cycles that support not just reservoirs, but life itself. Finally, students explore how water is cleaned by suppliers and how they can take simple measures to protect their own resources.

At each stage we encourage students to hypothesize, to observe, to think carefully, to record and study data -- to practice good science. We also encourage them to apply other intelligences, to act out or draw pictures, to communicate. The program is designed with the Massachusetts Science and Technology Frameworks in mind, enabling teachers to accomplish those curriculum goals within a unit of study that clearly has relevance to students' daily lives.

The water cycle presents an instructive case of inquiry-based learning. Evaporation is a difficult idea, because we can't often see it. Inquiry requires us to present the phenomenon, help students observe systematically, and to support them through the disquiet of something that is both real and difficult to observe directly. We hope you will resist the temptation to answer kids' questions with the familiar mantra of the water cycle. Rather, listen to their questions, help them articulate them, and use the activities to expand the experiences they can draw upon to explain rainfall. If they are left with unanswered questions, fine. It is better to leave something for a later month or year when students can figure it out or grasp it for themselves than to provide a facile set of terms that don't have direct meaning to them. Evaporation presents you with a clear choice: do you stay with experiential education and inquiry learning, and leave some questions unanswered, or do you rush in with formulaic answers to make everyone (yourself, the kids, the school board, and parents) feel more comfortable? We strongly encourage you to stand by the first approach.

Water Works is activity based, because students remember better what they experience than what they merely read or hear about. The activities are structured and fun. Teachers in the MWRA service area can borrow activity kits from us for individual lessons in the guide. In the Teacher Pages, materials that will be included in the lending kits are designated by "(kit)."

What do teachers need to know to use Water Works? You needn't be a water professional. Knowing how to structure and manage classroom activities, and understanding the capabilities of third and fourth grade learners, are far more important skills. None of the content is sufficiently technical to put a teacher on thin ice. And if students do come up with arcane questions, MWRA School Program staff are only a phone call away.

The MWRA School Program can support Water Works in other ways. We often visit schools in our service area to make classroom presentations, doing one of the activities from Works or explaining water systems in greater detail. The Water Matters newsletter will keep you up on water issues and other environmental education resources to enrich your programs. It is our goal to form partnerships with area teachers that are mutually beneficial: MWRA's messages of conservation and stewardship reach young people, and teachers have an array of resources that help them meet their curriculum goals.

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