Drip Irrigation Basics
Drip irrigation is a simple concept:

A method of directing water from a home water source to selected plants and shrubs at a carefully controlled rate by a means of flexible tubing with tiny drippers, sprayers, hoses, and bubblers attached to it. A rapidly expanding specialty, drip irrigation can involve a myriad of small pieces each with its own special use.

In an actual irrigation layout, you would need to be concerned with many details ranging from the maximum amount of tubing allowed per main line to the actual dripper output relative to plant size.

However, for today's purpose, you need only concern yourself with the following drip items and specifications. You can also "just pretend" that all of these will run from the same hose.

Of course, if you want to extend this activity into real practice, you will need to acquaint yourself with all the intricacies involved in drip irrigation installation.
<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 gph/dripper</td>
<td>Delivers 2 gallons of water per water; attaches to end of 1/4&quot; hose run off 1/2&quot; hose</td>
<td>On medium size shrubs</td>
</tr>
<tr>
<td>1 gph/dripper</td>
<td>Delivers 1 gal. water per hr; attaches to end of 1/4&quot; hose run off 1/2&quot; hose</td>
<td>On large perennials or small shrubs</td>
</tr>
<tr>
<td>bubbler</td>
<td>Delivers 5 gal. water per hr; run directly off of 1/2&quot; hose</td>
<td>On trees &amp; large shrubs</td>
</tr>
<tr>
<td>360° sprayer</td>
<td>Covers 20-ft diameter with 17 gal. water per hr; attaches to 1/2&quot; hose</td>
<td>On large populations such as ground covers</td>
</tr>
<tr>
<td>full circle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>180° sprayer</td>
<td>Covers 180° of 20 ft diameter at 14 gph; attaches to 1/2&quot; hose</td>
<td>same as above except along border area</td>
</tr>
<tr>
<td>half circle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser hose</td>
<td>Drill every 6&quot; by laser to drip 1/2 gph from each hole; attaches to 1/2&quot; hose</td>
<td>Small areas of ground covers or flowers</td>
</tr>
<tr>
<td>1/2&quot; hose</td>
<td>Used to carry water from source to 1/4&quot; hose or bubblers</td>
<td></td>
</tr>
<tr>
<td>1/4&quot; hose</td>
<td>Delivers water from 1/2&quot; hose to drippers</td>
<td></td>
</tr>
</tbody>
</table>
OBJECTIVE:
Participants will learn to use the tools contained in an integrated package by designing a xeriscape landscaping proposal for a school site.

MATERIALS:
- Copies of Participant Xeriscape Landscaping Packet
- Floppy discs for each participant
- For each group
  - Colored pencils
  - #2 pencils
  - Large graph paper
  - Templates for school building, sloped area, and drainage area
- “Living On a Xeriscape” video

DIRECTIONS:
1. Watch the “Living On a Xeriscape” video OR have participants view the following sites and take notes to share with the group.
   - Water Conservation Office
   - Xeriscaping Information
2. Discuss with large group, “What is xeriscape landscaping?” and “Why is it important in this area?”
3. Divide into groups of 4-5 members.
4. Create a landscaping company name.
5. Groups construct surveys for civic (teachers) input for developing a school playground.
6. Use the Participants’ Xeriscape Landscape Packet to work collaboratively on the completion of your group’s tasks.
7. At the end of the working period, your firm should be prepared to give a ten-minute presentation highlighting their day’s work. The presentation should include the following elements:
   - Company Logo
   - Firm prospectus
   - Survey results
   - Final landscaping/irrigation plan
XERISCAPE LANDSCAPING
Integrated Packages Lesson

Student Instructions

Objective:
Students will learn to use the tools contained in an integrated package by designing a xeriscape landscaping proposal for a school site.

Materials:
• Copies of Student Xeriscape Landscaping Packet
• Floppy discs for each participant
• For each group
  • Colored pencils
  • #2 pencils
  • Large graph paper
  • Templates for school building, sloped area, and drainage area
• “Living On a Xeriscape” video

Directions:
8. Watch the “Living On a Xeriscape” video OR have participants view the following sites and take notes to share with the group.
   • Water Conservation Office
     http://www.cabq.gov/waterconservation/xeric.html
   • Xeriscaping Information -
     http://www.suite101.com/welcome.cfm/xeriscaping
9. Discuss with large group, “What is xeriscape landscaping?” and “Why is it important in this area?”
10. Divide into groups of 4-5 members.
11. Create a landscaping company name.
12. Groups construct surveys for civic input for developing a school playground.
13. Use the Student Xeriscape Landscape Packet to work collaboratively on the completion of your group’s tasks.
14. At the end of the working period, your firm should be prepared to give a ten-minute presentation highlighting their day’s work. The presentation should include the following elements:
   • Company Logo
   • Firm prospectus
   • Survey results
   • Final landscaping/irrigation plan
Site Specifications & Worksheet

Landscaping is problem solving. Prepare a fact base - the site analysis. Then set objectives: Site modifications and a working materials list.

Requirements

**General:** You must consider all the elements in the site analysis worksheet.

**Site Limitations:** Templates for buildings, sloped area and the drainage-problem area may be placed anywhere on the site. You do need to use all three-template areas in your site.

**Landscape Solutions:** Consider this workshop as a unique opportunity to create a totally new environment for children, such as outdoor "rooms" that define space for children. You are limited only by your imagination.
SITE ANALYSIS

• SITE LIMITATIONS
  Style of architecture (Main building- red brick 1922; gym-beige stucco)
  Placement of structures on site (Playground equip, benches, fields)
  Solar orientation
  Exposures (strong Eastern winds in spring)
  Grade (Largely level with exception of one sloped area)
  Traffic patterns
  Access (driveways and paths)
  Patios / Common areas

• HUMAN CONSIDERATIONS
  Number of children at school (325)
  Ages of children (elementary: k-5)
  Level of maintenance desired (Low to moderate)

• AESTHETIC CONSIDERATIONS
  Symmetrical / formal versus asymmetrical / casual
  Focal points
  Seasonal interests
  Color preferences (intensity, hue)
  Smell

• ORGANIZE SPACE
  Expand or enclose
  Create outdoor "room" / ecosystems
    Environmental Center
    Community Garden
    Shade
    Windbreaks, Screen, Barriers
    Paving
    Ground covers

• Develop the following plant list on separate paper:
ZONE 1 : Arid
Function (Shade, screen, carpet):

Appearance (Shade, color, texture):

Adaptability (Soil, exposure, scale, and size and size at maturity):

ZONE 2 : Transition
Function (Shade, screen, carpet):

Appearance (Shade, color, texture):

Adaptability (Soil, exposure, scale, and size and size at maturity):

ZONE 3 : Mini-Oasis
Function (Shade, screen, carpet):

Appearance (Shade, color, texture):

Adaptability (Soil, exposure, scale, and size and size at maturity):

• DEVELOP DRIP IRRIGATION SYSTEM
  Placement of Drippers
  Placement of Bubblers
  Placement of Sprayers

Site, Community Garden or Environment Center Ideas
(Use the back to jot down ideas)
Guidelines to Create and Administer a Survey

Create a survey to “show evidence of civic input on design elements”. This survey should be designed to help your Landscape Firm better understand the needs and wishes of the community served by Camino Real Elementary School. Ideally this survey would, of course, cover educators, students, and parents. For today’s purpose, your question should be aimed at teachers only.

- Limit your survey to only 10 questions, which can be answered yes, or no by the Participants. Thus, a question might look like this:

  I think children need no playground equipment at all.  
  Yes  No

  I think a swamp area is a neat idea.  
  Yes  No

- Your survey should be completed and printed no later than 10:35.
- Multiple copies will be made and distributed to the whole group for completion at 10:45.
- Be sure to include the name (though perhaps temporary) of your landscaping firm on the survey so that it can be returned to you.
- Upon receiving all your surveys back, you will use a spreadsheet to tally and graph results.
- Create three different graphs to present your information.
Don’t forget to use these results to aid in designing your landscape plan!
What is Xeriscaping?

**Xeriscaping to Reduce Your Use**

Nationally, communities have been faced with increased demands on existing water supplies. Consequently, there is a greater focus on water conservation, not just in times of drought, but in anticipation of future population growth. Water can no longer be considered a limitless resource. A philosophy of conservation of water through creative landscaping has engendered the new term, xeriscape.

The term xeriscape is derived from the Greek word xeros meaning dry, combined with landscaping, thus xeriscaping. The term was coined by the Front Range Xeriscape Task Force of the Denver Water Department in 1981. The goal of xeriscape is to create a visually attractive landscape that uses plants selected for their water efficiency. Properly maintained, a xeriscape can easily use less than one-half the water of a traditional landscape. Once established, a xeriscape should require less maintenance than turf landscape.

**The Advantages of Xeriscape**

- Xeriscaping saves water.
  - Using native and other drought-tolerant plants can significantly reduce water use.
- Xeriscaping saves time.
  - It de-emphasizes the use of bluegrass lawns and other thirsty plants. This common-sense approach can reduce the time you spend watering, fertilizing and mowing.
- Xeriscaping saves money.
- Reducing water use can lower your water bill. Xeriscaping can also reduce maintenance costs and increase the beauty and value of your property.

RETA Training Module
Xeriscaping

Created by
Janet Green

Objective
To have the opportunity work with the local school district and assist in developing a xeriscape landscapin for Camino Real Elementary School.

Experience
1999 – 2000 Business Owner
Owner of Studio Green Landscape Architecture
• Formed new landscaping firm establishing location, staff, equipment, inventory, and advertising
• Manage staff of 7 employees
• Write proposals for landscaping jobs
• Obtained 32 jobs during first year

1997 – 1999 College of Marin Marin, Calif.
Landscape architecture and design instructor
• Instructor of landscaping development
• Developed City of Marin’s City Park landscaping plan
• Awarded Certificate of Merit from American Society of Landscape

1993–1997 City College of San Francisco San Francisco, Calif.
Landscape architecture and design instructor
• Worked with Ornamenta Horticulture Department
• Designed large scale commercial development
• Served on committee for Ecological Home Landscaping sponsored by U.C. Davis

Education
• B. S. in Landscaping Architecture
• Graduated Summa Cum Laude.

1990 Florence, Italy
• Studied urban design

Projects
• Published in Northern New Mexico Home and Garden Magazine, San Antonio Chromicle, and Marin Independent Journal.
• Developed large scale commercial developments as well as residential gardens in San Jose, San Mateo, San Francisco, Marin and Navada Counties.
SAMPLE Drip Irrigation Plan

On your plan today...
...this will be drawn by hand, not computer
...it may coded in with colored pencils with an appropriate key
El Palacio Landscaping, Inc. uses the latest technology in drip irrigation techniques and specializes in xeriscaping. We visit the site and conduct an extensive needs assessment to match the client's vision as to what the location will support.

The company has achieved a net profit of over $275,000 during the 1995 fiscal year. We have increased our sales and landscaping staff in 1996. We are expecting to increase our profit for the 1996 fiscal year.

All of our professional staff have been educated in New Mexico with one relocated Texan.

We are an equal opportunity employer.
Design a Company Prospectus

In order to bid on this project, you need to create a landscaping design firm by deciding on a name and designing a company logo. The company name and logo should appear on a prospectus which you will create to present your company to prospective clients. This prospectus may also tell a little something about each member of your firm. It may be a simple bi-fold brochure or you may prefer to use a single sheet approach - almost like a flyer. Sample ideas follow.

SunScape Designs

-landscape design-
-educational sites a speciality-

Living Beauty with Less Water

"XERISCAPE"
New Technology for Cost Efficient Conversions

Janice Cohoe ASLA  Lee Quantrro ASLA
Principal  Associate

This sample gives some ideas of "catch phrases" and simple use of graphics combined with word processing. As a prospectus, it falls short on providing information about the company and telling a little about its members. See following examples for more ideas.
We, the School Board governing the Camino Real School District, became profoundly aware of our civic responsibility to address the effects of the 1996 drought which focused public and institutional awareness on the scarce water resources of New Mexico. As a result of this increased awareness, board members directed district officials to seek funding to substantially modify existing landscaping at existing sites throughout the district.

The Camino Real School District is proud to announce that a grant of 5.3 million dollars has been awarded to the District through the New Mexico State Engineer Office's Water Conservation Program. These grant monies are available to purchase services, plants and materials to convert existing landscaping to xeriscaping. Site preparation costs are to be absorbed with District funds.

The initial site to receive funds for landscaping refurbishment shall be the Camino Real Elementary School. As the oldest site in the district, this school shall serve as a model of xeriscaping applied to educational sites. Unlike some of the newer facilities in the district which will require only minimal upgrading, Camino Real Elementary will necessitate a total overall of the exterior grounds to be completed during the 1997 summer break.

Proposals are sought for this redesign effort. Each proposal shall contain the following elements:
- Prospectus listing information about the landscape design firm submitting the proposal.
- Evidence of civic input on design elements.
- Site worksheet and specifications
- Completed site plan with drip irrigation components included

Proposals are due at the Camino Real School District offices no later than 2:45 on this day. Oral presentations before the School Board will commence immediately at that time. These presentations should cover all the required elements of the proposal.
Vegetable Garden

"Buffalo" Junipers

Grapes

"Barranco" Pink Desert Willow

Giant Four O'Clocks

Buffalograss Lawn

Lap Pool

Chamisa

Creeping Mahonia

"Spartan" Columnar Junipers

Quaking Aspen

Prostrate Threeleaf Sumac

"Hope" White Desert Willow

"Broadmoor" Juniper

Low-Growing Meadow:
Buffalograss interplanted with Desert Zinna, Fernleaf Verbena, Tilted Evening Primrose, Scarlet Globemallow, and Blackfoot Daisy

Alghan Pines

"King Red" Russian Olives

"Spartan" Columnar Juniper

Arizona Cypress

Bark Mulch Ground Cover
LARGE SPACES: ZONING/MASS PLANTING. This home is located on the West Mesa above Albuquerque. The soil is mostly sandy with a few large clay pockets underlaid with volcanic rock, providing moderate to rapid drainage. Except for the walled entry and driveway, which are fairly level, the land slopes eastward one vertical foot for every ten horizontal feet. The expansive hacienda-style adobe is owned by a real-estate developer and an artist, and serves as office and studio space for the couple. The structure and landscape accommodate frequent business and social gatherings. The typical use areas are modified somewhat on this site. The walled entry and driveway enclose what is usually a public area, providing sheltered access and off-street parking for guests. The southwest-facing drive is shaded by Cottonwoods and Arizona Sycamores, used both to temper the hot exposure and to provide large-scale plant material in keeping with the proportions of the site.