



NSDL/NSTA Web Seminar:

Flower Bulb Science: Activities for the Hands-On Classroom



Thursday, February 7, 2008

6:30 p.m. - 8:00 p.m. Eastern time



The Bulb Project

Today's NSDL Experts:



Marcia Eames-Sheavly, Garden-Based Learning Program, Department of Horticulture, Cornell University



Craig Cramer, Communications Specialist, Department of Horticulture, Cornell University



Elly Cramer, Research and Development, NSDL, Computer and Information Science, Cornell University



<http://nsdl.org>

<http://www.thebulbproject.org>





Where we're going ...

- Bulb basics
- Why bulbs?
- 3 activities
- The Bulb Project website





Which is **NOT** a flower bulb?
Stamp your answer





Which is **NOT** a flower bulb?



Tulips



Garlic



Ornamental
Allium



Tulipa dasystemon,
a 'species' tulip



Nectoscordum



*Anemone
blanda*



Amaryllis



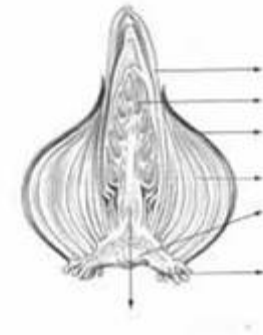
Dahlia



What is a flower bulb?

Modified leaves called scales serve as the primary storage tissue.

- Tulips
- Lilies
- Alliums (e.g. onion)
- Dutch iris
- Hyacinth
- Daffodils





Geophytes

Have storage reserves that allow rapid growth when environmental conditions are favorable.

- Corms (stem)
- Tubers (thickened underground stem)
- Rhizome (horizontal underground stem)





Spring-flowering bulbs

In the north, plant in fall, flower in spring.

- Tulips
- Daffodils
- Crocuses
- Snowdrops
- 'Minor' bulbs and spring ephemerals





Summer-flowering bulbs

Many tropical 'bulbs'
that won't overwinter
in cold areas.

- Dahlias
- Cannas
- Amaryllis
- Gladiolus





Summer-flowering bulbs

Others are hardy
perennials

- Oriental lilies
- Alliums





Fall-flowering bulbs

Foliage in spring,
flowers in fall

- Colchicum
- Fall crocuses





Let's pause for
two questions
from the
audience....



Why study flower bulbs with your students? How would this be useful to incorporate into curricula?

Write your ideas
on the chat



Why study flower bulbs?



Connecting with nature



Variety of subjects, topics, standards



Introducing the next generation of gardeners



Adaptable to preschool to adult



Well-timed with school year



Fascinating, beautiful, inspirational!



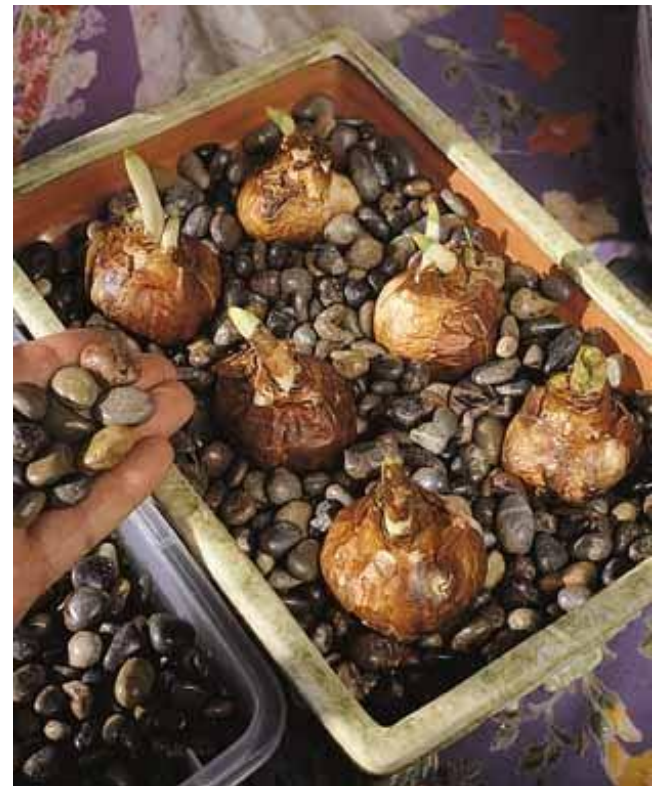
Forcing flower bulbs

- Making bulbs flower out of season
- Good activity for winter months
- Most spring-flowering bulbs require chilling
- Plant in containers in soil, gravel or water
- Grow in a cool area
- Enjoy!



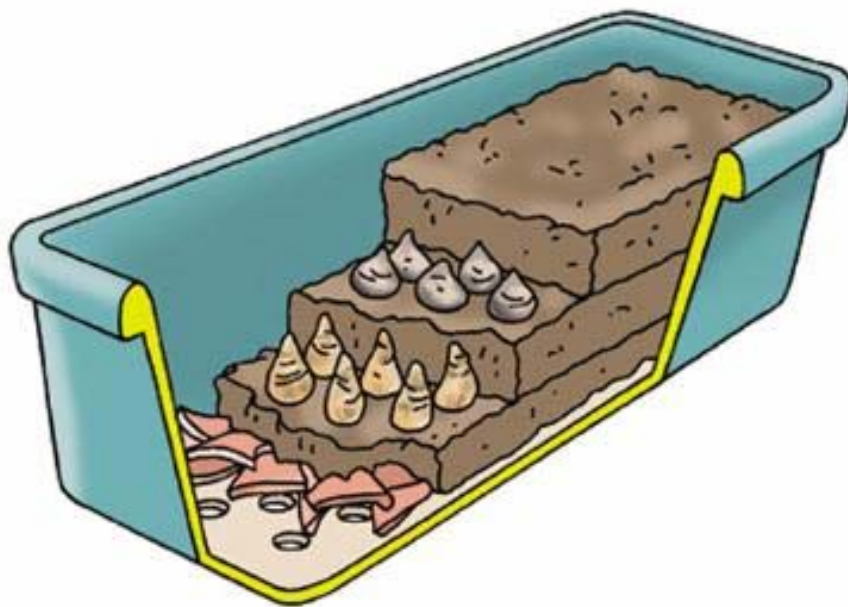


Adaptable to different growing media, containers





Plant a diversity of bulbs at their required depths for an interesting display





Recycle and use creativity!





“Forcing” doesn’t mean boring....





Poll Question!

Why are these forced bulbs different heights?



- A. Temperature
- B. Light
- C. Alcohol
- D. Nutrients





The science of forcing flower bulbs

Vary:

- Chilling period
- Chilling temperatures
- Growing temperatures
- Light
- Moisture
- Materials added to water (soft drinks? Wiper fluid?)

Observe and record effects



Tulip time-lapse

Warm vs. cool growing temperature

http://www.remarc.com/craig/images/video/forcing_temp.mov





Due to a math error, we over-ordered the number of bulbs by:



5,400	54,000
14,000	84,000



Labyrinths and secret messages





A terrific labyrinth resource...



From the Labyrinthos website: www.labyrinthos.net



<http://nsdl.org>





Simplifying for a younger audience...





Secret messages and surprises

- Words: Spring! School name
- Symbols: Hearts, stars, formula
- Images: School mascot, something special to your school community.

Calculate how many bulbs it will take.
Engage the community in planting!





You can “naturalize” bulbs....





More naturalizing and creativity...





If the Dutch can create Rembrandt,
who could we honor?





Let's pause for
two questions
from the
audience....



Phenology

- The study of the times of recurring natural phenomena.
- For example: Plants flowering in spring
- Record flowering dates for outdoor plantings



Phenology websites

Journey North:
www.learner.org/jnorth



Project BudBurst:

www.windows.ucar.edu/citizen_science/budburst



Track the Arrival of Spring 2008!

Why plant and study tulips? Students across the northern hemisphere track the growth of the *same plant* as the season changes from winter to spring. They discover how temperatures, sunlight, geographic location, and other variables influence the growth of plants — and the full array of seasonal changes that take place in the springtime. These observations set the stage for a better understanding the impact of a **changing climate** >>

<p>Get Started Background information about the tulip study. >></p>	<ul style="list-style-type: none"> • Map: live map • Data: for classroom mapping • Raw Data: planted/emerged/bloomed 	<p>News Spring 2008 Updates Weekly updates every Thursday from February through May. >></p>



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Which is **NOT** a Dutch Master?





Activity: Digital collage

- Indoor activity
- Combines art and technology
- Use what you've grown
- Can be used for recording data
- Promotions for larger projects

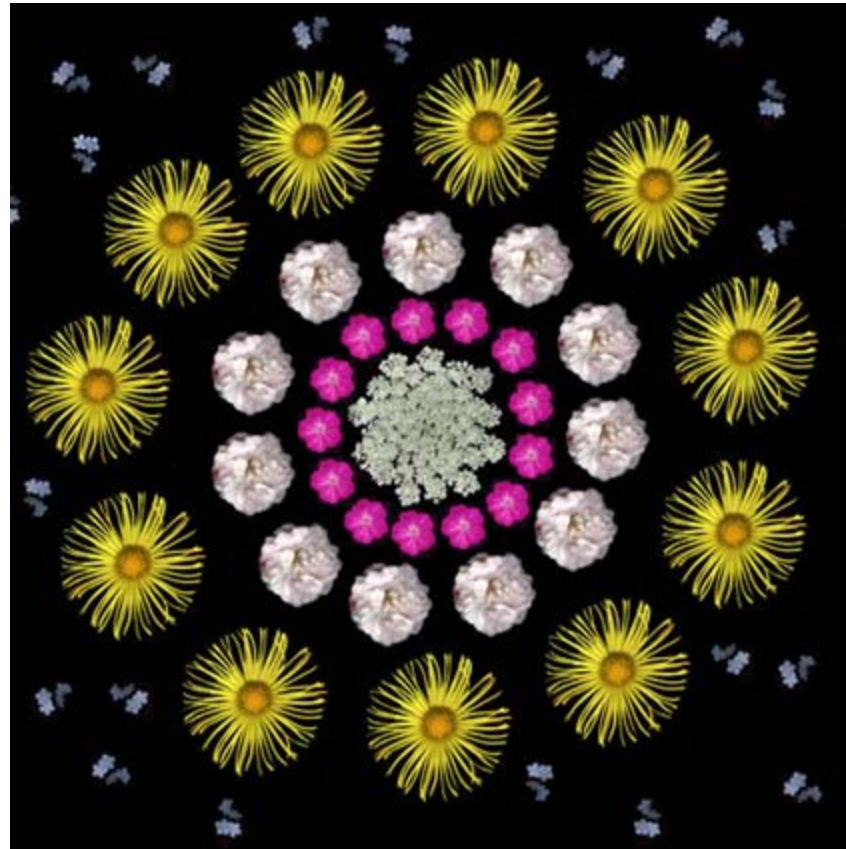


Activity: Digital collage

- Arrange subject on scanner bed
- Preview as you arrange
- Scan ~300 dpi for life size
- Use imaging program to fuel creativity



Activity: Digital collage





The Bulb Project

- [Home](#)
- [Activities](#)
- [Growing Bulbs](#)
- [Resources](#)
- [Retail Partners](#)
- [Share Ideas](#)

Featured Activity

[Grow bulbs in winter](#)



Enjoy the color and fragrance of spring-flowering bulbs while there is still snow on the ground, while learning more about the biology of bulbs.

Welcome to the Bulb Project

- [Activities](#):** Creative plans for educators.
- [Growing Bulbs](#):** How-to information.
- [Resources](#):** Additional information to help you plan and execute your bulb activities.
- [Retail partners](#):** Information for bulb project collaborators.
- [Share ideas](#):** Read how others have used these activities, and contribute your own ideas.

This site features [creative projects](#) to help educators share the joys of growing flower bulbs with children and youth, and use bulbs to help teach science, art, history and other subjects.

The activities can be used in many settings, including the classroom, after-school programs, home schooling, 4-H, community projects and other formal in informal educational settings.

Bulb Pictures



We also include [resources](#) to help you forge partnerships with local retailers and garden centers who can share their expertise and serve as a source of flower bulbs for you project. (There are also [resources to help retail partners](#) publicize their collaborations.)

Tuber Talk

- ['Smart' bulbs](#)**
12/30/2007
Some flower bulbs — including lilies and tulips — are 'smart' enough to ...
- [Labyrinths featured in NY Times](#)**
12/30/2007
In her New York Times Home and Garden column, On the Ground, in the Wild, a Path to Inner Peace, ...
- [Not-so-random act of bulb kindness](#)**
11/25/2007
Kim, a garden blogging friend of mine in Ohio, had a problem. Her grandmother refused to accept ...
- [Bulb quotes](#)**
11/25/2007
Friday night, we watched the animated feature film Shrek the Third. One of the subthemes was that ...



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www.thebulbproject.org





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Activities:Home

[Share ideas](#) about this page.

Activities

Creative bulb activities for children and youth.

- [Create a digital photo 'collage'](#)
- ['Force' paperwhites](#)
- [Grow bulbs in winter](#)
- [Build a bulb labyrinth](#)
- [Explore the weird history of 'Tulip Mania'](#)

Share [new ideas for bulb activities](#) on our blog.



Engage children and youth in exciting activities that go beyond just planting bulbs.



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Activities:Paperwhites

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'Force' paperwhites

Paperwhites are easy to 'force' – or grow indoors out of season from Thanksgiving through spring.

Contents [\[hide\]](#)

- [1 'Force' paperwhites](#)
 - [1.1 Objectives](#)
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 - [1.4 Background/introduction](#)
 - [1.5 Activity](#)
 - [1.6 Going further](#)
 - [1.7 Web resources](#)
 - [1.8 Growing bulbs info at this site](#)
 - [1.9 More info at this site](#)
 - [1.10 Interact](#)



Paperwhites (*Narcissus tazetta*) are a great introduction to bulbs because they are easy to observe and don't require chilling to grow and flower. You can use them for a simple science fair project to make them grow shorter (and less likely to fall over) while still flowering abundantly.

Objectives

- Learn to plant bulbs.
- Watch the growth of bulbs from planting through flowering.
- Produce an indoor plant that can be given as a gift.
- Learn a process that makes an excellent springboard for a science fair project.



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- [Nursery school adapts labyrinth activity](#)
- [Content review feedback](#)
- [Order bulbs now for fall projects](#)
- [Welcome user testers!](#)
- [Planning: Share](#)

Grow bulbs in winter: Share ideas

By **Craig Cramer** | July 4, 2007

Share your ideas and experiences with the activity [Grow bulbs in winter](#) in the comments to this post.

Topics: [Activities](#) |

7 Responses to “Grow bulbs in winter: Share ideas”

Marcia Says:

[September 12th, 2007 at 1:28 pm](#)

I really liked the way this activity doesn't require you to put pots in the fridge — I've tried that and it takes up a TON of room. This approach looks much easier!

Aaron Says:

[September 18th, 2007 at 8:42 pm](#)

Video of bulbs growing under different conditions was fascinating

Deb Austic Says:

[October 16th, 2007 at 10:27 pm](#)

Just testing the site — like the photos!



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Growing Bulbs:Home

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- [1 How to Grow Flower Bulbs & More!](#)
 - [1.1 Bulb basics](#)
 - [1.2 Bulb history](#)
 - [1.3 Working with kids](#)

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How to Grow Flower Bulbs & More!

Growing flower bulbs is easy, there are tips here to help you get the most out of the bulb activities. There's also other interesting stuff including the fun history of flower bulbs and more.

Bulb basics

- [What is a bulb?](#) - What really is a flower bulb? The question is answered here.
- [Spring-flowering bulb basics](#) - Plant bulbs in fall for flowers in spring.
- ['Naturalizing'](#) - Grow bulbs without creating planting beds -- even in your lawn.
- ['Best Bulbs for Naturalizing'](#) - The best varieties for year after year results.
- ['Forcing' bulbs](#) - Grow bulbs indoors in pots in winter and



There are many kinds of bulbs and many ways to grow them. It's simple. These pages will help you learn how.





Garden-Based Learning Cornell University

Cornell University Search Cornell

Garden-Based Learning

Resources for educators, volunteers, and parents working with children and youth.



About

Philosophy - How we approach garden-based learning

Activities - Quick & easy activities

Projects - On-line lesson plans and more-involved projects

Resources - Our publications and other resources


Evaluation - How to evaluate your work

Links - Other programs and resources at Cornell and elsewhere


Latest from the GBL blog:

- **Pass the Plate!**
In a recent e-list to youth educators, Celeste Carmichael said, "Have you watched the Disney C..."
- **Greener Beginnings, an Early Childhood and the Garden Conference**
Save the Date! Saturday, March 1, 2008
Join us for: Greener Beginnings: Early Childhood and the Ga...
- **Children Eat More Homegrown Fruits And Vegetables**
If you're looking for a way to encourage children eat their fruits and vegetables, search no f...

Easy activity:

 **Turtle Sprouts** - Join educators around New York State with this easy, introductory garden-based learning activity for children.
[More easy activities.](#)

New resources:

 **Why Garden in New York State Schools?** [Why Garden in New York State Schools? \[14MB .ppt\]](#) - Are you looking for ways to share the excitement of school gardening with other teachers and educators? Need to convince your administrators of the benefits of beginning a garden in your school? Although you're familiar with all the merits are

About Garden-Based Learning

The Garden-Based Learning Program is based in the [Department of Horticulture](#) at [Cornell University](#). We partner with faculty and staff in other departments at Cornell, educators in county [Cooperative Extension associations](#), and with other agencies throughout the U.S.



<http://nsdl.org>

<http://www.hort.cornell.edu/gbl>





Research
that
supports
our work

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Garden-Based Learning

Resources for educators, volunteers, and parents working with children and youth.

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Research that Supports our Work

One of the realities of working within the world of garden-based learning is that inevitably, you may need to write a proposal to support a program or help you initiate a new project. Fortunately, there is research that you can draw on to bolster up and advocate for your efforts. The following is a summary of research findings that you can cite in proposals, share with your board of directors, and use in countless other ways to support the important work that you are carrying out. Know of a great article that's missing? Please send it along to us.

- **Children's garden consultants is a new model designed to give teen-aged youth the opportunity to actively research children's garden design and educational programming,** then present recommendations to an adult audience. Surveys, observations, and discussions with youth, adults in attendance, and program organizers indicated the approach was highly valuable and worth repeating. It provided a new learning opportunity for youth, and it also gave adults new perspectives on gardens. (Lekies, Kristi S., Marcia Eames-Sheavly, Kimberly J. Wong, and Anne Ceccarini. 2006. Children's Garden Consultants: A New Model of Engaging Youth to Inform Garden Design and Programming. *HortTechnology* 16(1): 139-142.)
- **Gardening can be an ideal vehicle for introducing elements of multicultural education.** Eames-Sheavly, M. 1994. Exploring horticulture in human culture: An interdisciplinary approach to youth education. *HortTechnology* 4(1).
- **A study on a youth gardening program in Detroit reports that after gardening, kids have an increased interest in eating fruit and vegetables, possess an appreciation for working with neighborhood adults, and have an increased interest for improvement of neighborhood appearance.** In addition, they made new friends, and showed increased knowledge about nutrition, plant ecology, and gardening. (Pothukuchi, K. (2004). Hortiliza: A Youth "Nutrition Garden" in Southwest Detroit. *Children, Youth and Environments*. 14(2): 124-155.)



<http://www.hort.cornell.edu/gbl/groundwork/researchsupports.html>



<http://nsdl.org>





The Bulb Project



Bulb project: Help us grow!

The challenge: it seems as if we all have topics we *don't* enjoy teaching. What topic/standard do you have a hard time bringing to life?

Tell us in the blog and we'll work on activities.
See link on homepage:

www.thebulbproject.org



<http://nsdl.org>





The Bulb Project



Marcia Eames-Sheavly



Craig Cramer



Elly Cramer

**THANK
YOU!**

**For more information:
thebulbproject@gmail.com**

<http://www.thebulbproject.org>



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Go to <http://nsdl.org> and click on the K-12 audience page to:

- Download our Seminar Resource List
- Utilize our blog featuring our presenters for the Seminar Series sharing their insights on careers in science and science education:
<http://expertvoices.nsdl.org/2007fall-nsta-sems/>



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Welcome to The NSTA Learning Center

Get the Help, When You Need It

NSTA developed the Learning Center as a professional development website to help address your classroom needs and busy schedule. Using this site, you can gain access to more than 1,200 different resources and opportunities, such as:

- Over [1,000 NSTA Journal articles](#) (230 of them available FREE of charge)—many containing high-quality lesson plans.
- More than [35 FREE Science Objects](#) (one- to two-hour interactive simulation-based learning experiences).
- More than [125 e-chapters](#) from selected books and series (40 chapters FREE of charge).
- FREE weekly [live Web Seminars](#) where you can interact with experts from NASA, NOAA, FDA, NSF, and the NSDL Community.
- More than [20 SciGuides](#) (A resource to help teachers integrate the internet into the classroom).



PLUS: NSTA has also developed a suite of practical tools called [My Library](#), [My Notepad](#), and [My Transcript](#). Use these tools to organize, personalize, and document your professional growth within the Learning Center.

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