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
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://www.thebulbproject.org
Where we’re going …

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

http://nsdl.org
Which is **NOT** a flower bulb?
Stamp your answer

http://nsdl.org
Which is NOT a flower bulb?

- Tulips
- Garlic
- Tulipa dasystemon, a 'species' tulip
- Ornamental Allium
- Nectoscordum
- Anemone blanda
- Amaryllis
- Dahlia

http://nsdl.org
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

http://nsdl.org
Summer-flowering bulbs

Many tropical ‘bulbs’ that won’t overwinter in cold areas.

- Dahlias
- Cannas
- Amaryllis
- Gladiolus

http://nsdl.org
Summer-flowering bulbs

Others are hardy perennials

- Oriental lilies
- Alliums
Fall-flowering bulbs

Foliage in spring, flowers in fall

• Colchicum
• Fall crocuses

http://nsdl.org
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

http://nsdl.org
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

http://nsdl.org
Plant a diversity of bulbs at their required depths for an interesting display

http://nsdl.org
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

http://nsdl.org
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:

<table>
<thead>
<tr>
<th>5,400</th>
<th>54,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>14,000</td>
<td>84,000</td>
</tr>
</tbody>
</table>

Stamp your answer
Labyrinths and secret messages

http://nsdl.org
A terrific labyrinth resource...

From the Labyrinthos website:  www.labyrinthos.net
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....

http://nsdl.org
More naturalizing and creativity…

http://nsdl.org
If the Dutch can create Rembrandt, who could we honor?

http://nsdl.org
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

http://nsdl.org
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

http://nsdl.org
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
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 and informal educational settings.

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 …
Activities: Home

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.
Activities: Paperwhites

'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
   1.2 Materials
   1.3 Logistics and timing
   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

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.
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!
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'](http://nsdl.org) - Grow bulbs without creating planting beds -- even in your lawn.
- ['Best Bulbs for Naturalizing'](http://nsdl.org) - The best varieties for year after year results.
- ['Forcing' bulbs](http://nsdl.org) - Grow bulbs indoors in pots in winter and
Garden-Based Learning
Cornell University

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?** [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 we're familiar with all the merits...
Research that supports our work

http://www.hort.cornell.edu/gbl/groundwork/researchsupports.html
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
THANK YOU!
For more information: thebulbproject@gmail.com

http://www.thebulbproject.org

http://nsdl.org
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/
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.

Learn More.

http://learningcenter.nsta.org
National Science Teachers Association
Gerry Wheeler, Executive Director
Frank Owens, Associate Executive Director
Conferences and Programs
Al Byers, Assistant Executive Director e-Learning

NSTA Web Seminars
Flavio Mendez, Director
Danielle Troiano, Project Coordinator
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