“Colorful Greens from the Purest of Seeds” Concept Map

Created by Emily Holden of Oregon State University

Description
With a climate perfectly suited for seed production, Oregon has earned the reputation for producing some of the world’s highest quality seeds. Oregon growers are working to develop practices that prevent cross-pollination in order to maintain their reputation. “Colorful Greens from the Purest of Seeds” provides a starting point for conversations about pollination, plant breeding and cooperation.

The concept map will improve students’ literacy and comprehension. The concept map encourages students to reach a higher level of Bloom’s Taxonomy of Cognitive Thinking. Concept mapping is used before, during and after reading to provide students with a way of focusing their reading and connecting like concepts.

Time Estimate
One 45- to 50-minute class period

Student Outcomes and Objectives
• Students will summarize why seed production is an important industry in Oregon.
• Students will explain the effects of cross-pollination.
• Students will examine the debate over genetically modified organisms.
• Students will investigate how growers are preserving Oregon’s dominance of the seed industry.

Standards
Science
H.4D.5: Describe how new technologies lead to scientific inquiry are responsible for changes in the ways people live and work.
H.4D.6: Evaluate how ethics, public opinion and government policy influence engineers and scientists and how their results impact human society and environment.

Language Arts
EL.HS.RE.01: Read at an independent and instructional reading level appropriate to grade level.
EL.HS.RE.02: Read and understand a wide variety of informational text.
EL.HS.RE.05: Match reading to purpose.
EL.HS.RE.06: Understand and use a variety of comprehension strategies as needed, such as summarizing, class and group discussions and making predictions.
EL.HS.RE.08: Understand, learn and use new vocabulary that is taught through informational text.
EL.HS.RE.15: Read magazines and news stories.
EL.HS.RE.19: Identify and summarize sequence of events, main ideas, facts, supporting details and opinions.
EL.HS.RE.20: Clarify understanding of informational texts by creating graphic organizers.
Career-Related Learning Standards
CS.PM.02: Plan, organize, and complete assigned tasks on time, meeting standards of quality.
CS.HS.01: Locate, process and convey information using traditional tools.

Materials
• Copies of “Colorful Greens from the Purest of Seeds” from the 2009 issue of Oregon’s Agricultural Progress magazine, a special issue on Food in Oregon
• Copies of the “Colorful Greens from the Purest of Seeds” Concept Map.

Vocabulary

Cross-pollination: to fertilize a flower with the pollen from a different organism.

Genetically Modified Organism (GMO): organisms with artificially altered genetic information that provides a desired characteristic.

Isolation Zones: areas surrounding a seed crop where farmers do not plant organisms that could cross-pollinate with the seed crop.

Organic: grown without the use of chemicals and avoiding adverse effects in the surrounding ecosystem.
Procedure for “Colorful Greens from the Purest of Seeds” Concept Map

1) Hand out copies of the concept map to students.
2) Read over the concept map as a class, to give students a focus for their reading.
3) Have students read the article “Colorful Greens from the Purest of Seeds”.
   a. Students can use their concept maps to take notes as they read.
4) After students have completed the reading and taken a few minutes to take notes on their concept map, conduct a class discussion to help students fill in blanks.

*There are other possible answers for completing the map
“Colorful Greens from the Purest of Seeds”
Concept Map

Seed Production:

Why produce seeds in Oregon?
- 
- 
- 
- 

Why worry about cross-pollination?
- 
- 
- 
- 

Pinning maps
- 
- 

What seeds are grown in Oregon?
- 
- 
-
“Colorful Greens from the Purest of Seeds” Concept Map

Example

**Seed Production:** farming crops to harvest the seed, not the final product. For example, carrot seed farmers harvest the seed, not the carrot.

<table>
<thead>
<tr>
<th>Why produce seeds in Oregon?</th>
<th>Pinning maps</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Location on the 45th parallel</td>
<td>• Have prevented cross-pollination so far</td>
</tr>
<tr>
<td>• Fertile soils</td>
<td>• Are voluntary: farmers mark their seed crops with a pin on the map, and other farmers cooperate</td>
</tr>
<tr>
<td>• Mild wet winters = growth and flowering</td>
<td>• Maps are found in Linn and Benton counties</td>
</tr>
<tr>
<td>• Long dry summers = ripe and dry seed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Why worry about cross-pollination?</th>
<th>What seeds are grown in Oregon?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Wind and bees can carry pollen.</td>
<td>• Central Oregon = carrot seed</td>
</tr>
<tr>
<td>• Years of research go into the breeding of new plant species, and a cross-pollinated gene can hamper these efforts.</td>
<td>• Columbia and Snake Basins = corn and bean seed</td>
</tr>
<tr>
<td>• Genetically modified species have been introduced with a new set of genetic information.</td>
<td>• Willamette Valley = spinach, chard, lettuce, cabbage and broccoli seed</td>
</tr>
<tr>
<td>• Foods sold as organic must not contain any GMOs.</td>
<td></td>
</tr>
</tbody>
</table>