

# Life Cycle of a Pumpkin



**2014 Curriculum Resource**

*Mesilla Valley Maze/Lyles Farm Foundation*

[www.mesillavalleymaze.com](http://www.mesillavalleymaze.com)

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# Notes to the Teacher

Common Core State Standards and Texas Essential Knowledge and Skills (TEKS) are correlated with many of the lessons.

Many websites were used to compile these lessons. You may refer to certain websites to find out more information. Also, some of the websites are very helpful for additional lessons.

- <http://www.nmaitc.org/> New Mexico Ag in the Classroom website
- [www.mesillavalleymaze.com](http://www.mesillavalleymaze.com) Mesilla Valley Maze website
- <http://www.scholastic.com/teachers/lesson-plan/observing-pumpkin-cycle>
- [www.atozteacherstuff.com](http://www.atozteacherstuff.com)

This curriculum was adapted from various lessons by Tanna Miller, a teacher in the Las Cruces Public School District. Mrs. Miller received her Bachelor of Science in animal science from New Mexico State University and her Master of Education in elementary education from Western New Mexico University.



## Travel Tips-Before the Field Trip

Objective: The students will be introduced to or expand their knowledge of the Mesilla Valley Maze and the importance of agriculture.

Procedures:

1. Previewing activity: Visit the Mesilla Valley Maze website at [www.mesillavalleymaze.com](http://www.mesillavalleymaze.com) with your students. Read about the maze activities together. This would be a good time to discuss students' behavior for safety while visiting the maze. Discuss how the maze is cut out of a cornfield. Click on the "Mazes" link to find the answers. Show students pictures of the previous mazes by selecting the "Past Mazes" button.
2. Have students create a K-W-L chart, provided in the curriculum. Complete the K and W sections first. The L sections will be completed when they return from the field trip.
3. Have students complete the "A'maze'ing Mesilla Valley Maze" comprehension sheet found on the following page.

Name \_\_\_\_\_

## The A “Maze”ing Mesilla Valley Maze

Visit [www.mesillavalleymaze.com](http://www.mesillavalleymaze.com) and read about how the corn maze is created. Then, answer the questions below. Answer the questions in complete sentences.

1. When is the corn maze planted?
  
  
  
  
  
  
  
  
  
  
2. What do the initials GPS stand for?
  
  
  
  
  
  
  
  
  
  
3. What is used to cut out the pattern in the corn maze?
  
  
  
  
  
  
  
  
  
  
4. How many man-hours does it take to cut out the maze?
  
  
  
  
  
  
  
  
  
  
5. How do we use GPS systems in our everyday life?



## Lesson 2: Educational Opportunities at the Mesilla Valley Maze



A Field Trip to the Mesilla Valley Maze is fun, exciting and filled with learning possibilities. Whether exercising their bodies through play and exploration, or stretching their minds with a life size "I-Spy" and map reading in the corn maze, the learning opportunities are ample.

Our friendly School Tour staff can provide mini lessons on water, trees or the solar system, while the structured educational portion of the Field Trip is divided into 3 sections. Our visiting teachers have the option of having their students participate in any or all of the sections. These structures sessions include: The Outdoor Classroom, a traditional lesson that takes place on hay-bale seating, the Hayride to the Pumpkin Patch, a hands-on mini lesson taught by our knowledgeable tractor driving staff and the "Education Stations", static displays which your classroom teacher can facilitate.

No matter which options are chosen, children, parents and staff alike will come away with a new appreciation for agriculture and our world.

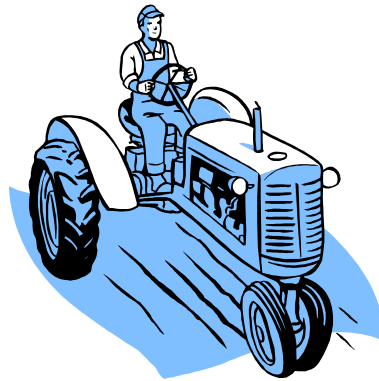
K-5, Educational Content for the 2014 Mesilla Valley Maze Field Trip:

### **Section 1: Outdoor Classroom**

The outdoor classroom lesson focuses on The Pumpkin, its growth cycle and uses, and a demonstration discussing the arable land on our planet. Complete with visual aids, this 20 minute lesson is highly recommended.

NM Standards: SCIENCE: Strand II Standard II BM I; Strand II Standard III BM II

TEKS Science: 112.9.B; 112.10.D



## Section 2: Hayride to the Pumpkin Patch

The hayride to the Pumpkin Patch, one of our most requested activities, allows everyone participating in the field trip to choose and pick their own pumpkin, right from the vine; giving them an up-close look at how plants grow on a farm.

NM Standards Science: Strand I Standard I BM III; Strand II Standard II BMI

NM Health Standards: Content Standard 2. BM 1

TEKS Science: 112.9.B; 112.1.A; 112.1.B

TEKS Health: 115.b.1

## Section3: Education Stations

### 1. Seeds of Abundance

New Mexico K-4 Benchmark I #'s 1-3

K-4 Benchmark II # 1

1ST: MD #4

2nd: K-4 Benchmark III #1

3rd-5th Standard II: Life Science BII # 1

Data Analysis and Probability DI- 5.D.1.1, 5.D.1.2, 5.D.1.5



### Texas

Kinder: Science b 2A; 9B Social Studies: 15B Math: a2

1st: Science: a3

2nd: Science: 2 A-D

Texas 3rd-5th Science: 2C, Social Studies: 12B (agriculture) 24 B-C





## 2. The Flags and Anthem of the United States

### NM S&B-Social Studies

Kinder: I-C, III-B, 1-2

1st: I-B, I-C, III-B, 1-2

2nd: I-B, I-C, III-B

3rd-5th: I-A, 2202; 1-B, 1-4; II-B, 1-10; II-C, 1-4

I-A 1-2; I-B 1-3; I-D 1-4; II-C 1-3

### TEKS Language Arts & Social Studies

Kinder: B; 10 A, B 15, A-D 16 A-B

1st: B: 2 A-C, 12 A-C, 13 A-D, 17 A-E

2nd: B: 1A, 5B, 13 A-C, 14 A-C, 17 A-E

3rd-5th: 18 A-C, 23 A-B, 24 A-E, 25, 26

15 A-e, 23 A-B, 24 A-c, 25 A-B, 26 A-D

## 3. Life Cycle of a Pumpkin

### NM S&B—Science/Social Studies

Kinder: A1- History, B1 Science

1st: A1-History, B1 Science

2nd: A1- History, D2 Science

3rd: A1-History, D1 Science

4th: A1-History, B1 Science

5th: A1-History, E1 Science



### TEKS—Science/Social Studies

Kinder: B5: a-b, 6: c

1st: B5: a-b, 9: a-c / B3: a-b

2nd: B5: a-b, 9: a-b / B3: a, c

3rd: B9: a-b / B2: b

4th: B5: a, 8: a-d, 10: a / B3: a-b

5th: B5: a

Name \_\_\_\_\_ Date \_\_\_\_\_

## Life Cycle of a Pumpkin

### **Common Core State Standards:**

Reading: K-2 RI.1; K-2. RI.2; Science Standard: Standard II. Life Science BM II

### **TEKS:**

Reading: Standard II.2.4s; Standard IV.4.9s; Standard IV.4.17s

### **Measurable Learner Objectives:**

Science: The student will be able to recognize the plant life cycle.

Language Arts: The student will be able to correctly sequence a story or everyday events.

Assessment: The student will correctly sequence pictures of the pumpkin life cycle.

### **What You Will Need?**

*Life Cycle Of A...Pumpkin* by Ron Fridell and Patricia Walsh or *Pumpkin, Pumpkin* by Jeanne Titherington

1 Pumpkin Life Cycle printable <http://printables.atozteacherstuff.com/375/pumpkin-pumpkin-sequencing-activity/>

Crayons or Markers

1 foot piece of yarn

Tape or Glue

### **Activity Instructions:**

Before completing this activity, read the story *Life Cycle Of A...Pumpkin* by Fridell and Walsh.

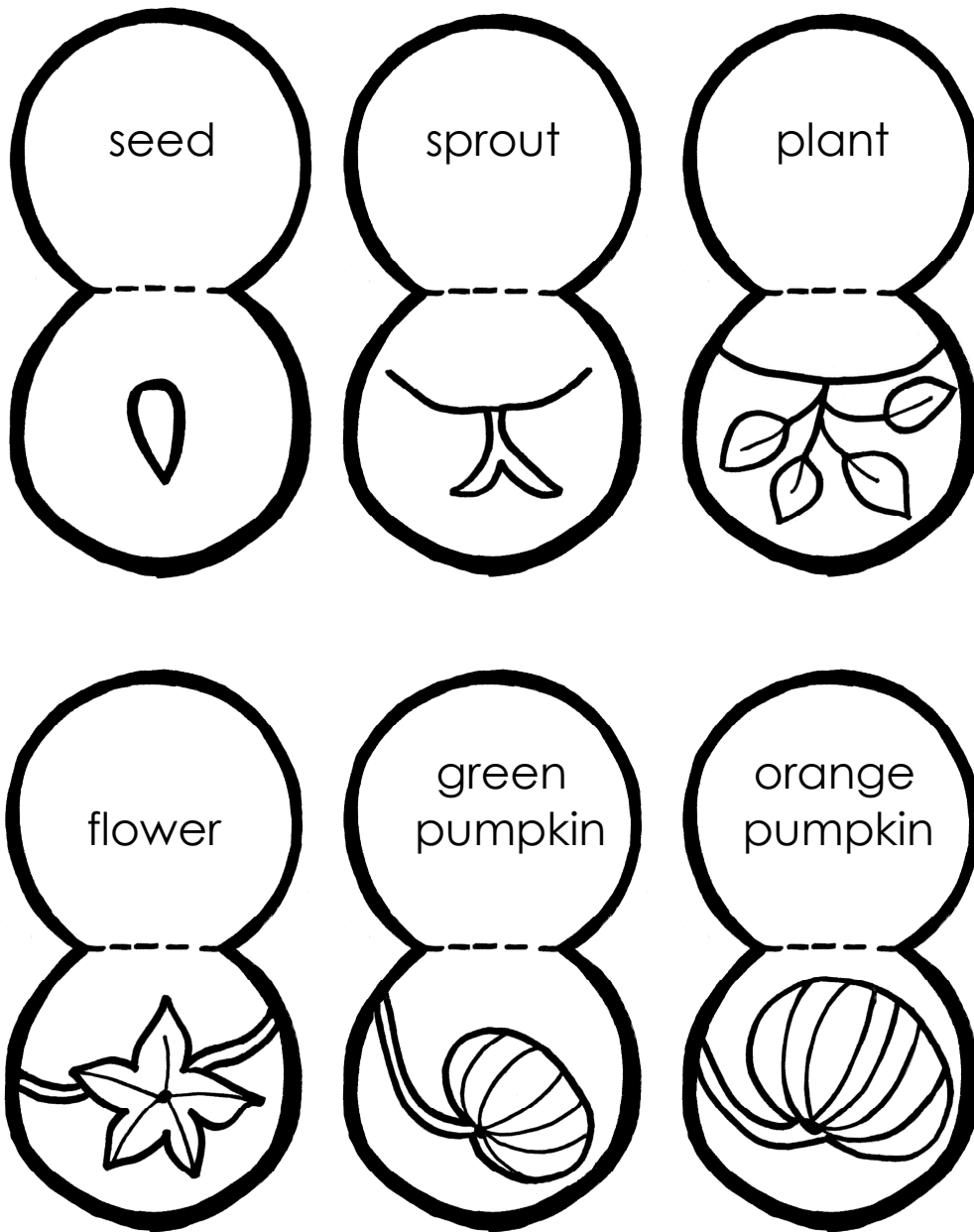
- . Color and cut out the life cycle stages from the printable below.
- . Make a jack-o-lantern for the last stage in the life cycle. You can staple two paper plates together and decorate it like a jack-o-lantern. Leave a section unstapled so the pieces can be stored inside the pumpkin.
- . Attach a piece of yarn to the inside of the pumpkin with tape.
- . Attach pictures to the yarn that represent each of the steps leading up to the jack-o-lantern. The pictures should be folded on the dashed line and glued to the yarn so that the picture is on one side and the word is on the other side.

The "vine" can be stuffed inside the pumpkin and gradually pulled out as students retell the *Pumpkin, Pumpkin* story, or recite the steps of the pumpkin life cycle. Be sure the pieces are in order so that it starts with the seed and ends with the jack-o-lantern: Seed, sprout, plant, flower, green pumpkin, orange pumpkin, jack-o-lantern.

### **Suggested Learning Activities:**

- . Shared reading of *Pumpkin, Pumpkin* by Jeanne Titherington
- . Sentence strips telling the story are displayed. The students are given □cards with pictures to fill in the blanks and are invited to come up and place them on the chart. □Jamie planted a pumpkin \_\_\_\_\_, □and the pumpkin seed grew a pumpkin \_\_\_\_\_, □and the pumpkin sprout grew a pumpkin \_\_\_\_\_, □and the pumpkin plant grew a pumpkin \_\_\_\_\_, □and the pumpkin flower grew a pumpkin. □And the pumpkin \_\_\_\_\_, and \_\_\_\_\_, and \_\_\_\_\_, until Jamie \_\_\_\_\_ it.

Pumpkin Life Cycle



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**Resources:**

Life Cycle of a... Pumpkin by Ron Fridell and Patricia Walsh

Big Book: Pumpkin, Pumpkin by Jeanne Titherington Sentence strips, word/picture cards Pumpkin life cycle sheet, paper plates Pumpkins

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# Beanie Baby

Adapted from Illinois Ag in the Classroom

**Objective:** Upon completion of this activity, students will have a better understanding of the plant germination process.

**New Mexico State Standards:**

Science Standard: Standard II. Life Science BM II

**Suggested Reading Material:**

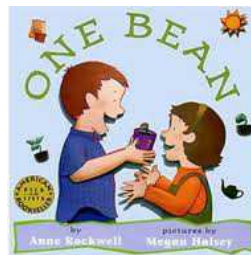
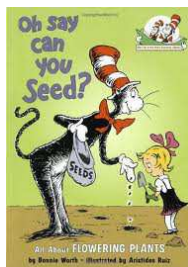
*Oh Say Can you Seed*

by Bonnie Worth

*One Bean* by Anne Rockwell

*Life Cycle of a Pumpkin*

by Fridell and Walsh



[www.google.com](http://www.google.com)

**What You Will Need:**

Jewelry size re-sealable bag (found in craft stores)

Crystal Soil

Hole Punch

Water

Measuring spoons

Pumpkin Seeds

Yarn

**Activity Instructions:**

1. Punch a hole in the top of your bag
2. Place a small  $\frac{1}{4}$  teaspoon of Crystal Soil into the bag.
3. Add 2 or 3 pumpkin seeds.
4. Add 1 tablespoon of water.
5. Seal your bag firmly.
6. Insert the yarn into the hole to make a necklace.
7. Wear your Beanie Baby around your neck and under your shirt to keep it in a warm, dark place.
8. Check your Beanie Baby several times a day for germination and record the growth.

**Lesson Extenders:**

1. Try this experiment with other seeds and record the similarities and differences.
2. Experiment with other controls like light, heat, soil medium, water and record the similarities and differences.

## Garden in a Glove

Adapted from Illinois Ag in the Classroom

**Objective:** Students will conduct a scientific experiment and record data in order to explain the simple life cycle as well as the need of plants.

### New Mexico State Standards:

Science Standard: Strand I, Standard I. Scientific Thinking and Practice, BM I; Standard II. Life Science BM I and II

### Suggested Reading Material:

*Our Generous Garden* by Anne Nagro  
Tagliaferro

Our Generous Garden



By Anne Nagro

*The Life Cycle of a Pumpkin* by Ron Fridell  
and Patricia Wals



### What You Will Need:

Clear Plastic Food Service Glove  
piece of string  
5 Cotton Balls  
Marker  
5 Types of Seed  
(optional)

Pencil or Popsicle Stick

Water

Plant Diary

Twist Tie or

Permanent

Microscope

### Activity Instructions:

1. Write your name on a clear plastic food service glove.
2. Using the permanent marker, write the name of a seed you will be planting on each finger.
3. Wet five cotton balls and wring them out.
4. Dip each cotton ball into 1 seed type. The seeds should stick to the cotton ball.
5. Put the cotton ball with the seeds attached into the finger of the glove that is labeled with that type of seed. **Hint:** For younger students, you may choose to use one type of seed for all 5 fingers. A pencil or a popsicle stick may also be handy in pushing the cotton ball to the bottom of each finger.
6. Blow up the plastic glove and close it with a twist tie or tie a piece of string around the top.

7. Tape the glove to a window, chalkboard or wall. You may want to hang a clothes line under a chalk tray and use clothes pins to hold the gloves on. **Hint:** *Do not tape to the window in the winter because the window will be too cold to allow for germination.*
8. The seeds will germinate in 3 to 5 days. Keep a plant diary and look at the seeds under the microscope.
9. Transplant the seeds in about 1  $\frac{1}{2}$  to 2 weeks by cutting the tips of the fingers off the glove. Transplant the cotton ball and small plants into soil.
10. After growing to full size, vegetables can be harvested to use in your soup!

## Three Sisters Salad

Adapted from LCPS Teaching Center "Three Bean Salads"

**Objective:** Students will work in teams to determine how many of each of the "three sisters" is needed to create a salad.

**New Mexico State Standards:**

CCSS: MATH: 4.OA.3; 4.OA.5; 5.OA.3; 6.RP.1-3;

NM Science Standard: Strand I, Standard I. Scientific Thinking and Practice, BM I; Standard II. Life Science BM I and II

TEKS: MATH: Standard II.2.1s; Standard II.2.4s

**Suggested Reading Material:**

*In the Three Sisters Garden: Native American stories and seasonal activities for the curious child* by Joanne Dennee



helps

hold a spiritual meaning for Native Americans.

**Background Knowledge:**

Native Americans have traditionally grown three crops together-corn, beans and squash-for hundreds of years. A genius solution, each plant the other grow. Called "companion planting," the Threes Sisters also

**What You Will Need:**

3 types of dry seeds: Corn, beans, pumpkin (or other squash)

Paper plates to hold small portions of seeds

Three Sisters Salad Activity Sheet

**Activity Instructions:**

1. Divide the class into teams of 3-4 students
2. Explain to students that the following activity includes fairly difficult algebra problems, which can be solved easily by trial and error using the seeds.
3. Encourage your students to guess and adjust as they work.
4. Each "salad" must contain ALL THREE TYPES of seeds.
5. Use the Three Sisters Activity Sheet to create each salad.

**Additional Information:**

A *ratio* is the numerical relation between two quantities, usually determined by dividing one of the numbers by the other and expressing the result as a fraction or a percent.

*Proportion* is a statement showing that two ratios are equal. For example, the ration  $\frac{1}{2}$  is the same as the ratio  $\frac{3}{6}$  or  $\frac{2}{4}$ . This is an important idea in algebra since if any three of the numbers in a proportion are known, the fourth can be found-this is the "unknown" in algebra problems.

Team Members \_\_\_\_\_

Date \_\_\_\_\_

## Three Sisters Salad Adapted from LCPS Teaching Center "Three Bean Salads"

<b>Salad ONE contains:</b> 2 Corn Seeds Twice as many Beans as Corn Seeds 10 seeds in all	<b>Salad FIVE contains:</b> 12 seeds in all $\frac{1}{2}$ of the seeds are Beans Corn seeds make up $\frac{1}{4}$ of the salad
<b>Salad TWO contains:</b> 4 Beans $\frac{1}{2}$ as many Squash seeds as Beans 10 seeds in all	<b>Salad SIX contains:</b> Contains at least 12 seeds One more Corn seed than Bean seed One more Bean than Squash seed
<b>Salad THREE contains:</b> Corn makes up $\frac{1}{2}$ of this salad The salad has exactly 2 Beans The number of Corn seeds is double the number of Beans	<b>Salad SEVEN contains:</b> 3 times as many Beans as Squash seeds One more Corn seed than Bean seed 8 seeds in all
<b>Salad FOUR contains:</b> The same number of Beans as Corn seeds 3 more Squash seeds than Beans A total of 18 seeds	<b>Salad EIGHT contains:</b> An equal number of Beans and Squash seeds 5 more Corn seeds than Bean Seeds No more than 20 seeds
<b>EXTENSION:</b> Make up different salads. Write instructions for someone else to make your salads.	



# Three Sisters Salad Solutions

Adapted from LCPS Teaching Center "Three Bean Salads"

**NOTE:** Some salads can contain other possible solutions

<p><b>Salad ONE Contains:</b>            2 Corn Seeds            Twice as many Beans as Corn Seeds            10 seeds in all  <b><u>POSSIBLE SOLUTION:</u></b>            2 CORN SEEDS            4 BEAN SEEDS            4 SQUASH SEEDS            10 TOTAL SEEDS</p>	<p><b>Salad FIVE contains:</b>            12 seeds in all  <math>\frac{1}{2}</math> of the seeds are Beans            Corn seeds make up <math>\frac{1}{4}</math> of the salad  <b><u>POSSIBLE SOLUTION:</u></b>            6 BEAN SEEDS            3 CORN SEEDS            3 SQUASH SEEDS            12 TOTAL SEEDS</p>
<p><b>Salad TWO contains:</b>            4 Beans  <math>\frac{1}{2}</math> as many Squash seeds as Beans            10 seeds in all  <b><u>POSSIBLE SOLUTION:</u></b>            4 BEAN SEEDS            2 SQUASH SEEDS            4 CORN SEEDS            10 TOTAL SEEDS</p>	<p><b>Salad SIX contains:</b>            Contains at least 12 seeds            One more Corn seed than Bean seed            One more Bean than Squash seed  <b><u>POSSIBLE SOLUTION:</u></b>            5 CORN SEEDS            4 BEAN SEEDS            3 SQUASH SEEDS            12 TOTAL SEEDS</p>
<p><b>Salad THREE contains:</b>            Corn makes up <math>\frac{1}{2}</math> of this salad            The salad has exactly 2 Beans            The number of Corn seeds is double the number of Beans  <b><u>POSSIBLE SOLUTION:</u></b>            2 BEAN SEEDS            4 CORN SEEDS            2 SQUASH SEEDS</p>	<p><b>Salad SEVEN contains:</b>            3 times as many Beans as Squash seeds            One more Corn seed than Bean seed            8 seeds in all  <b><u>POSSIBLE SOLUTION:</u></b>            1 SQUASH SEEDS            3 BEAN SEEDS            4 CORN SEEDS            8 TOTAL SEEDS</p>
<p><b>Salad FOUR contains:</b>            The same number of Beans as Corn seeds            3 more Squash seeds than Beans            A total of 18 seeds  <b><u>POSSIBLE SOLUTION:</u></b>            5 BEAN SEEDS            5 CORN SEEDS            8 SQUASH SEEDS</p>	<p><b>Salad EIGHT contains:</b>            An equal number of Beans and Squash seeds            5 more Corn seeds than Bean Seeds            No more than 20 seeds  <b><u>POSSIBLE SOLUTION:</u></b>            4 BEAN SEEDS            9 CORN SEEDS            4 SQUASH SEEDS</p>

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## Pumpkin Plant Maze

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**Objective:** Students will discover how plants find the light.

**NM State Standards:**

Science Standard: Strand I, Standard I. Scientific Thinking and Practice, BM I; Standard II. Life Science BM I and II

**What You Will Need?**

Small carton or large shoebox  
Small flowerpot filled with potting soil  
1 or 2 pumpkin seeds  
Cardboard  
Journal

**Background Knowledge:**

Plants stretch in the direction of light. This process is called *phototropism*.

**Activity Instructions:**

1. Cut a hole in one end of the box.
2. Add two pieces of cardboard inside with holes in them to create a maze for the seedling.
3. Plant the seed about an inch deep in the pot.
4. Water your seed to allow it to sprout.
5. Place the pot on the other side of the box from the hole to give that little seed a challenge.
6. Keep the box covered, with light entering only through the end hole,
7. Keep a journal to record how your plant is growing.

**Questions to ask:**

1. Did your plant reach for the sun?
2. How do you think the plant knew where to go?
3. If your plant didn't make it out the hole, Why?
4. How would you change this experiment so your plant will have more of a challenge?



## Baked Pumpkin Seeds

### Directions

**Seed the pumpkin:** Preheat the oven to 300 degrees F. Use a spoon to scrape the pulp and seeds out of your pumpkin into a bowl.

**Clean the seeds:** Separate the seeds from the stringy pulp, rinse the seeds in a colander under cold water, and then shake dry. Don't blot with paper towels; the seeds will stick.

**Dry them:** Spread the seeds in a single layer on an oiled baking sheet and roast 30 minutes to dry them out.

**Add spices:** Toss the seeds with olive oil, salt and your choice of spices (see below). Return to the oven and bake until crisp and golden, about 20 more minutes.

**Sweet Toss** with cinnamon and sugar (do not use salt in step 4).

**Indian Toss** with garam masala; mix with currants after roasting.

**Spanish Toss** with smoked paprika; mix with slivered almonds after roasting.

**Italian Toss** with grated parmesan and dried oregano.

**Barbecue Toss** with brown sugar, chipotle chile powder and ground cumin.

Read more at: <http://www.foodnetwork.com/recipes/food-network-kitchens/pumpkin-seeds-recipe.html?oc=linkback>



## Recommended Reading/Additional Websites

Last, First M. *Book*. City: Publisher, Year Published. Print.

Fridell, Ron and Walsh, Patricia. *Life Cycle of a... Pumpkin* Chicago: Heinemann Library, 2001,2009

Kroll, Jeni *The Biggest Pumpkin Ever*. New York: Scholastic, 1984C

Titherington, Jeanne. *Pumpkin Pumpkin*. New York: Greenwillow Books. 1986

Pfeffer, Wendy. *From Seed to Pumpkin*. China: HarperCollins. 2004

Cook, Deanna F. *Kids' Pumpkin Projects*. Charolette: Williamson Publishing. 1998

Levenson, George. *Pumpkin Circle*. Berkeley: Tricycle Press. 1999

Karas, G. Brian and McNamara, Margaret. *How Many Seeds in a Pumpkin?* New York: Schwartz & Wade. 2007

- <http://projectsbyjen.com/Projects/pumpkincount/activities.htm>
- <http://www.leapfrog.com/en-us/learning-path/activities/pumpkin-seed-solutions-kids-activities-using-pumpkin-seeds.html>
- <http://handsonaswegrow.com/40-pumpkin-activities-for-kids/>
- <http://www.growingajeweledrose.com/2013/09/fall-activities-for-kids-with-pumpkin.html>
- <http://4everateacher.blogspot.com/2012/10/vomiting-pumpkins.html>
- <http://www.moorefarms.com/downloads/MooreFarmsTEKSLessonPlans.pdf>