**Trellising, Roots, or Herbs:
A Colonial Gardening Adventure**

**Fall Module
Pumpkins, Marigolds, and Radishes**

**4th Grade**

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**Driving Question(s)**

Which plants will be the most successful within a classroom earthbox (trellising, root, or herb)?

Given specific crops, which will grow best during the fall months?

How can specific plants be turned into dyes?

**Overview**

During this module, students will be planting marigolds, pumpkins, and radishes. Throughout the module, they will be creating several different entries in their colonial garden journal (observations, notes, drawings, etc.). Students will be completing a pumpkin math unit that includes measurements, weight, and math vocabulary. They will also be creating dyes using the radishes and marigolds. The culminating activity for this module will be a PowerPoint presentation.

 **Major Products & Performances**

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| Group: | PowerPoint Presentation to ParentsDye ProjectGarden BlueprintEarthBox  |
| Individual: | Planting SeedsMath ActivitiesJournalingMaking predictions/observationsResearchingArt ProjectPhysical EducationMusic Lesson |

**Teacher Background
About the Plant(s):**

**Pumpkins:** http://www.almanac.com/plant/pumpkins

**Radishes:** http://www.mybalconyjungle.com/radishes.html

**Marigolds:** <http://www.almanac.com/plant/marigolds>

**Setting up an Indoor Garden:** Chapter 2 of GrowLab (see references) pages 24-35

Time to Get Your Hands Dirty! (Scenario)

**Part One:**

It’s been a long few weeks settling in to your new place.  The wagon company has been working day and night to get the settlement ready.  Other settlers from the area have been kind enough to visit your settlement and help get it set up, but there’s still a lot of work to do. Your company has used most of the food that they packed while traveling and over the past few weeks, and now your supplies are beginning to get low.  You still have enough to last you another month, but it’s time to start planning ahead and use the resources you brought with you to start setting up a garden.

You have a wide variety of seeds that you brought with you and a little bit of garden knowledge as well.  That Great Aunt Bertha of yours  had quite a green thumb, and she passed on a bit of her garden know how along to you before you started your journey.  Now it’s time for you to dig in and put that knowledge to use, especially now that the air is getting cooler. Summer is coming to an end, and Fall will be here before you know it so you will need to plant your seeds accordingly.

You will need to plant seeds that will allow you to have something to eat, but you will also need to think about what you can plant that will be useful to trade with other settlements.  These settlements have been here for some time now and already have a garden of their own, so they don’t really need food to trade.  However, they have expressed interest in trying to get their hands on dyes for their linens, and there is always a need for medicines.

**Part Two:**

You unpack the seeds from the covered wagon and narrow your selection down to the following seed selections:

* Marigold
* Radish
* Cucumber
* Pumpkin
* Tomato

Using your research, you must decide which of the three seeds (one root, one herb, and one trellising plant) to plant for the fall months. Once you have decided which seeds you will use in your garden, create a journal entry and detail which seeds you chose and why. It’s time to make Great Aunt Bertha proud!

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| **Title** | Lesson One: Fall Entry Event |
| **Overview** | Given a list of crops, the students must determine which will grow the best in the fall climate.  Duration: One-two days \*\*Teacher note: Cucumbers and tomatoes are spring crops and will not successfully grow in the fall.  Students should discover this when they are researching about their crops.  |
| **Standards** | M.4.MD.4 Make a line plot to display a data set of measurements in fractions of a unit(1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.ELA.4.W.C9.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g.,headings), illustrations, and multimedia when useful to aiding comprehension. Develop the topic with facts, definitions, concrete details, quotations, or otherinformation and examples related to the topic. Link ideas within categories of information using words and phrases (e.g., another, for example, also, because). Use precise language and domain-specific vocabulary to inform about or explain the topic. Provide a concluding statement or section related to the information or explanation presented. |
| **Materials/Advance Preparation Needed** | **Materials*** Biodegradable Containers
* Soil
* Pumpkin seeds (trellising crop)
* Radish seeds (root crop)
* Marigolds (herb crop)
* Grow Cart
* Tray
* Research materials
* Scenario

**Advanced Preparation:*** Students must have their Colonial Garden Journal to write predictions and take notes. Seeds must be ordered
* Order biodegradable containers (or collect milk cartons)
* Prepare soil as directed on the back of the bag of soil
* Check out computer lab or laptops
* Research material available:
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| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | **Introduction:** Provide students with the new fall scenario and tell them to read Part One with a partner.  Pose the question, “What does the seasonal change mean for your planned garden?”  Take student responses and list them on the board. **Lesson:** Read Part Two of the scenario.  Explain to the students that they will be researching plants given and should choose trellising, root, and herb crops that will grow best in the fall.  Students can take notes in their Colonial Journals.  After students have chosen the appropriate crops, students will create a line plot template in their Colonial Journals. They will include all parts (title, X and Y axis…) of a line plot. Over the duration of the fall scenario, students will take measurements of their plants and put the data on their line plot. Remember to focus on change over time. **Closure:**Pass out biodegradable containers to students and call them over to soil by small groups to put the soil into their containers.  Assign each student a specific seed and have them plant their seed into their container.  Have the students place the containers underneath of your grow cart.  |
| **Assessment (What will be the evidence of student learning?)** | The students will write a letter to Aunt Bertha about which crops that they chose and why.  The students can also include their experience with planting their seeds. Students will use appropriate domain specific vocabulary and details to prove their argument.  They will be assessed using the Letter to Aunt Bertha Rubric (see attached).  |

Letter to Aunt Bertha

Teacher Name:

Student Name:

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| Category | 4 - Above Standards | 3 - Meets Standards | 2- Approaching Standards | 1 - Below Standards |  Score |
| Attention Grabber | The introductory paragraph has a strong hook or attention grabber that is appropriate for the audience. This could be a strong statement, a relevant quotation, statistic, or question addressed to the reader. | The introductory paragraph has a hook or attention grabber, but it is weak, rambling or inappropriate for the audience. | The author has an interesting introductory paragraph but the connection to the topic is not clear. | The introductory paragraph is not interesting AND is not relevant to the topic. |   |
| Support for Position | Includes 3 or more pieces of evidence (facts, statistics, examples, real-life experiences) that support the position statement. The writer anticipates the reader\'s concerns, biases or arguments and has provided at least 1 counter-argument. | Includes 3 or more pieces of evidence (facts, statistics, examples, real-life experiences) that support the position statement. | Includes 2 pieces of evidence (facts, statistics, examples, real-life experiences) that support the position statement. | Includes 1 or fewer pieces of evidence (facts, statistics, examples, real-life experiences). |   |
| Evidence and Examples | All of the evidence and examples are specific, relevant and explanations are given that show how each piece of evidence supports the author\'s position. | Most of the evidence and examples are specific, relevant and explanations are given that show how each piece of evidence supports the author’s position. | At least one of the pieces of evidence and examples is relevant and has an explanation that shows how that piece of evidence supports the author\'s position. | Evidence and examples are NOT relevant AND/OR are not explained. |   |
| Accuracy | All supportive facts and statistics are reported accurately. | Almost all supportive facts and statistics are reported accurately. | Most supportive facts and statistics are reported accurately. | Most supportive facts and statistics were inaccurately reported. |   |
| Closing Paragraph | The conclusion is strong and leaves the reader solidly understanding the writer\'s position. Effective restatement of the position statement begins the closing paragraph. | The conclusion is recognizable. The author\'s position is restated within the first two sentences of the closing paragraph. | The author\'s position is restated within the closing paragraph, but not near the beginning. | There is no conclusion - the paper just ends. |   |
| Capitalization and Punctuation | Author makes no errors in capitalization or punctuation, so the essay is exceptionally easy to read. | Author makes 1-2 errors in capitalization or punctuation, but the essay is still easy to read | Author makes a few errors in capitalization and/or punctuation that catch the reader\'s attention and interrupt the flow. | Author makes several errors in capitalization and/or punctuation that catch the reader\'s attention and interrupt the flow. |   |

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| **Title** | Lesson Two: Introduction to Measuring  |
| **Overview** | The learning focus of this lesson is to have students review the relationship among metric units of length, to work with metric measurements, and know when to use different units.  Duration: 30 minutes\*\*Teacher Note: The students will be introduced to measuring/metric units today.  This will later be used when measuring our pumpkins. |
| **Standards** | M.4.MD.1 know relative sizes of measurement units within one system of units including km, m, cm, kg, g, lb., oz, …within a single system of measurement, express measurements in a larger unit in terms of a smaller unit, record measurement, record measurement equivalents in a two column table |
| **Materials/Advance Preparation Needed** | **Materials:*** Meter stick
* Rulers
* Centimeter ruler
* Pencils
* Exit Slips
* Assessment

**Advanced Preparation:*** Copy exit slips and assessment
* Bring in a plant (for the students to measure)
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| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | **Introduction:** Begin by checking students’ understanding with discussion by asking a variety of questions based off of the metric systems to get them engaged in the topic. “Where have you seen the metric system used before?  Do we use the metric system in the US?  Why is it important to understand it? **Lesson:** Pass out and have students examine rulers.  “What do the numbers represent?  What do the smallest marks stand for?  How many millimeters are in a centimeter?” Next pass out meter sticks and ask them to examine them in the same way they did the rulers (ask similar questions that you did with the ruler)Look around the classroom for everyday objects. Ask students to decide which unit would be the most appropriate to measure each object. Students must defend their answers. **Closure:**Once the students have examined the rulers/meter sticks and discussed when it would be appropriate to measure objects in mm, cm, and m, explain to the students that throughout our GPBL we will be measuring our plant growth over time.  Allow students one group at a time to come practice measuring a plant (measure the height of the plant, the width of the leaves, etc).  As the groups are coming up to practice measuring a plant --- the other students may be working on their exit slip - Why is it important to understand the metric system?   |
| **Assessment (What will be the evidence of student learning?)** | Students will complete the measurement assessment with teacher provided objects (ex: pencils, books, staplers, etc.)  |

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| **Title** | Lesson Four: Setting Up the Earthbox  |
| **Overview** | The students will set up their classroom EarthBox today.  They will make predictions about how much soil it will take to fill the EarthBox and work collaboratively to complete this task. Students will follow directions on the soil package to add the appropriate amount of soil in the EarthBox. (Read the soil package. Some soil must have water added prior to being put in the EarthBox.) Students will use the area and perimeter formula to help make predictions. Duration: 1-2 hours\*\*Teacher note: Modifications include allowing students to build the EarthBox as a class. This allows the students to see all parts of the EarthBox and make discoveries as to why each part is important. Write discoveries and questions in Colonial Garden Journal.  |
| **Standards** | M.4.MD.4 Make a line plot to display a data set of measurements in fractions of a unit(1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.M.4.MD.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system ofmeasurement, express measurements in a larger unit in terms of a smaller unit. Recordmeasurement equivalents in a two column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversiontable for feet and inches listing the number pairs (1, 12), (2, 24), (3,36).M.4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room giventhe area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor. Represent and interpret data. |
| **Materials/Advance Preparation Needed** | **Materials:*** Measuring tape and rulers
* String and tape
* EarthBox kit and trellis structures
* Soil
* Small cups
* Popsicle stick markers and permanent markers

**Advanced Preparation:*** Have EarthBox instruction manual with copies.
* Have all materials set up in the areas for the students to work.
* Check seed packets for any seed preparation (this may change depending on the variety of seeds bought)
* Check out computer lab or laptops
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| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | **Introduction:** The teacher will show an empty EarthBox to the students and ask how they think that it works. Write predictions and questions in Colonial Journal. Have a discussion about why it is beneficial to use EarthBoxes for indoor gardening.  Also, make a connection to Colonial times (remind students that in Colonial times they would not actually have an EarthBox and they would be gardening outside).**Lesson:** In small groups, students willread copies of the EarthBox instructional manual and discuss the steps to plant in the EarthBox.  Students work in groups to estimate how much soil is needed to fill the box.  “When we ask ‘How much soil?”, what are the different ways that we can measure it? Can we take any measurements to help our estimate?” The students will then calculate the area and perimeter of the EarthBox. Using these measurements, do our predictions change?  Fill the box with hydrated potting soil (layer dolomite and make a trench for/layering in the fertilizer).**Closure:** Allow students time to set up the EarthBox.\*Teacher Note: Assign groups of students tasks in assembling the EarthBox.  While the other students are not completing their assigned task, they will research how deep to plant the seeds (pumpkin, radish, marigold) and how far apart they need to be from each other.  |
| **Assessment (What will be the evidence of student learning?)** | The teacher will check the completed EarthBoxes for correct assembly. The teacher will check students area and perimeter formula and answers ensuring they understand the mathematics.  |

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| **Title** | Lesson 3: Area and Perimeter |
| **Overview** | Students will be using the concepts of area and perimeter in order to design a blueprint for their garden. Duration: 1 hour |
| **Standards** | M.4.MD.2  use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects and money, including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit and represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. (CCSS Math.4.MD.2)M.4.MD.3 apply the area and perimeter formulas for rectangles in real world and mathematical problems. (For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.) (CCSS Math.4.MD.3) |
| **Materials/Advance Preparation Needed** | Materials:* Perimeter and Area Worksheets

Advanced Preparations:* Copy enough Graph Paper Worksheets for each student
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| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | Introduction:Before beginning the lesson, the teacher will ask students, “What is a blueprint?”  The teacher will give students think time to formulate a response, and then as the students give their responses, the teacher will list these on the chalkboard/whiteboard.  The students will most likely connect a blueprint to a building. The teacher will then ask students why a blueprint is important in the building process.  Again, the teacher will allow the students think time before taking responses.  The teacher will then explain that a blueprint is an important part of the design process when building something.  The teacher will then ask the students, "Would it be important to plan out the design of a garden?" Give students an opportunity to answer. Explain that today, they will be doing just that.Lesson:  Ask the students what they can remember about the word perimeter?  When we are talking about perimeter, what are we measuring?  How would we find the perimeter of their desk?Distribute the Perimeter and Area sheet to students.  Ask students "What unit will you be using on this paper (meters)?  "Are these squares actually a meter long (no)?  Explain that sometimes on blueprints and maps, people use a scale to show something small representing something bigger.  In this case, each side of a square will represent 1 meter.Work on finding the perimeter of the first shape together.  After completing this as a group, students will work at their tables to complete the other shapes.  Ask students what they remember about area?  What are we measuring when we are looking for area?  What do we do in order to find the area of a shape?  How would we find the area of their desk?  How is this different from the perimeter?On the graph paper, work together to find the area of the first shape.  Be sure to clue the students in to squaring their units.  Explain that they must square their units when dealing with area because they multiply the units together.  Have students count the number of squares inside the shape to check their math.  Did their calculations match up to the number of squares? Have students work in teams to find the area of the other shapes.The teacher will now explain to students that their colonial garden will only have a certain area in which they will plant their crops.  They must create a garden blueprint that has a garden with the area of 72 square meters.  Students will work independently in order to create their own shapes.  They will double check the area by counting the number of squares inside of their shape.Once students are finished, have them work to find the perimeter of their own garden.  After they have found their perimeter, have them look at a neighbors perimeter.  Ask the following:"Does your neighbor have the same perimeter as you?"  "Do they have the same area as you?""Why do you think that the perimeters of these shapes are different, but their area is the same?"Closure:Hold a discussion about how students use perimeter and area in their own lives, in and out of the classroom.   |
| **Assessment (What will be the evidence of student learning?)** | The teacher will observe students as they complete the graphic sheet independently, and support those who need help. Students will determine the area and perimeter of shapes on a teacher generated worksheet.  |

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| **Title** | Lesson Five: Planting into the Earthbox |
| **Overview** | The students will plant their pumpkin, radish, and marigold seeds into the EarthBox today.  They will make predictions about how to do this successfully. Students will discover how many plants will fit in the EarthBox to have a successful garden. Duration: 1 hour |
| **Standards** | M.4.MD.1 know relative sizes of measurement units within one system of units including km, m, cm, kg, g, lb., oz, …within a single system of measurement, express measurements in a larger unit in terms of a smaller unit, record measurement, record measurement equivalents in a two column table. M.4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor. Represent and interpret data. |
| **Materials/Advance Preparation Needed** | **Materials:*** Pumpkin seeds (Jack Be Little seeds, Wee Be Little seeds)
* Measuring tape and rulers
* String and tape
* Earth box kit
* Hydrated potting soil
* Popsicle stick markers and permanent markers
* Water and clean gallon jug or 2-liter soda bottle

**Advanced Preparation:*** Seedlings are sprouting
* EarthBox made
* Grow Lights assembled
* Students will review their research about the plants so they can identify characteristics of a healthy plant
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| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | **Introduction:** Pose the question, “What would happen if I took your seeds and you threw them into the EarthBox?”  Have a discussion about the importance of spacing out your seeds and planting the ones that should be planted (composting or disposing of those that we should). In Colonial Journals, students will explain why certain plants were chosen to plant and other plants were composted. Make sure students review their research and can identify characteristics of a healthy plant. Collect the seedlings that will be transplanted. **Lesson:** Discuss with students how to tell how a plant is healthy.  Have students refer back to their Colonial Garden Journal to find answers as to what is a healthy seedling.  If available, compost seedlings that are dead.  Redo lesson three.  The blueprints will need to include seedling placement as well as spacing.  This should be discussed with the students (refer back to the importance of spacing the seedlings out) and allow students to predict what they think would be most appropriate. What would happen if we planted too many seedlings? **Closure:** Students will need to decide as a class which blueprint to use.  \*\*Teacher note: If the students did the blueprints in teams, have them present their blueprint to the class and defend why theirs should be chosen.  |
| **Assessment (What will be the evidence of student learning?)** | Have the students use their blueprint to plant their crops into the EarthBox in the same layout as the blueprint. Were students able to apply the area and perimeter formula in the real world application of designing their blueprint?  |

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| **Title** | Lesson Six: Writing Throughout the GPBL |
| **Overview** | The students will be writing throughout our GPBL. This will consist of observations, comparing and contrasting, drawing/labeling, note taking, and summarizing. They will be taught strategies to appropriately write/take notes and will be expected to write a summary at the end of the GPBL of which crops were most successful within the classroom EarthBox.Duration: Entire school year |
| **Standards** | ELA.4.W.C9.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, andmultimedia when useful to aiding comprehension. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related tothe topic. Link ideas within categories of information using words and phrases (e.g.,*another*, *for example*, *also*, *because*). Use precise language and domain specificvocabulary to inform about or explain the topic. Provide a concluding statement or section related to the information or explanation presented.ELA.4.L.C15.1 Demonstrate command of the conventions of Objective English grammar and usage when writing or speaking. Use relative pronouns (*who, whose,**whom, which, that*) and relative adverbs (*where, when, why*). Form and use the progressive (e.g., *I was walking; I am walking; I will be walking*) verb tenses. Use modal auxiliaries (e.g., *can, may, must*) to convey various conditions. Order adjectives within sentences according to conventional patterns (e.g., *a small red bag* rather than *a**red small bag*). Form and use prepositional phrases. Produce complete sentences, recognizing and correcting inappropriateELA.4.W.C10.2 With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing (See Language Objectives for conventions of English).ELA.4.W.C10.1 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade specific expectations for writing types are defined in Objectives 1-3 in Text and Types and Purposes) |
| **Materials/Advance Preparation Needed** | **Materials:*** Colonial Garden Journals
* Pencils and crayons
* EarthBoxes
* Plants (trellising, root, and herb)

**Advanced Preparation:*** Make Colonial Garden Journals (composition notebooks that say “Colonial Garden Journal” on the front or simply staple paper together)
* Students must be able to write appropriate journal entries including date, details, descriptions, illustrations and illustration labels.
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| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)**  | **Introduction:** The students will be planting a variety of plants in both biodegradable containers as well as an EarthBox. They will be asked to observe and reflect in their Colonial Garden Journals during stations once a week.**Lesson:** Students will be taught strategies to appropriately take notes, summarize, use descriptive writing, and draw and label. Throughout the course of our GPBL the students will use these strategies to record their findings in their journals.Example of lesson: Teacher will draw a picture of the growing pole beans in a biodegradable container on the board and then label each part. The students then that day in stations can each draw and label their specific plastic bag using the example on the board.**Closure:** Students will be given a certain amount of time to work in their journals (this will be decided by teacher), when this allotted time is nearing its end the teacher will need to remind students to finish up their work |
| **Assessment (What will be the evidence of student learning?)** | The students will keep all of their recordings in their Colonial Garden Journal. Towards the end of the GPBL the students will be asked to use their notes and entries to write a culminating summary of which grew better.\*\*Teacher Note: Teacher will periodically check the students’ journals during this part of the module. |

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| **Title** | Lesson Seven: Making Dye Using Plants  |
| **Overview** | The students will be using their radish and marigold plants to create dye.   They will then need to use sequencing skills to write a detailed essay of the steps to follow in order to dye washcloths using plants.Duration: Two days  |
| **Standards** | ELA.4.W.C11.1 Conduct short research projects that build knowledge through investigation of different aspects of a topic.ELA.4.L.C15.1 Demonstrate command of the conventions of Objective English grammar and usage when writing or speaking. Use relative pronouns (who, whose, whom, which, that) and relative adverbs (where, when, why). Formand use the progressive (e.g., I was walking; I am walking; I will be walking) verb tenses. Use modal auxiliaries (e.g., can, may, must) to convey various conditions. Order adjectives within sentences according to conventional patterns (e.g., a small red bag rather than a red small bag). Form and useprepositional phrases. Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons. Correctly use frequently confused words (e.g., to, too, two; there, their).ELA.4.W.C12.1 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.ELA.4.W.C10.1 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. |
| **Materials/Advance Preparation Needed** | **Materials:*** Radish and Marigold plants
* Crock pot
* Water
* Strainer
* Washcloths
* Scissors
* Sequencing Graphic Organizer

**Advanced Preparation:*** Plants must be cut
* Crockpot warmed and ready
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| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | **Introduction:** The teacher will tell the students that they will be using some of their plants in order to make dye to sell to neighboring settlements. Ask students which of the three plants do they think would work best for this experiment?   (Lead students’ discussion to radish and marigolds)  **Lesson:** To make dye solution: Chop the plant material into small pieces using scissors and place in a crock pot.  Double the amount of water to plant material and turn on pot.  Let this sit for an hour and then strain.  Now add fabric to be dyed (in our case washcloths, these can be donated from families by sending home a parent letter).  \*For a stronger shade, allow material to soak in the dye overnight!\*DO NOT let it soak for too long (over two days) it will begin to ferment and smell. **Closure:** Using the sequencing graphic organizer, students will describe and illustrate the steps needed to dye their washcloths.   |
| **Assessment (What will be the evidence of student learning?)** | Students will write a reflection about their dying experience demonstrating their command of conventions of English Grammar.  They will include detailed directions explaining the steps/procedures we took so that someone else would be able to complete this task. |





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| **Title** | Lesson Eight: Math with Pumpkins Packet |
| **Overview** | The focus of this lesson is to assess the students’ ability to use measuring skills used earlier in the unit. Students will also be expected to recognize appropriate vocabulary when completing the Pumpkin Math assignment (circumference, radius, diameter, weight, difference, conversions…)Duration: One week  |
| **Standards** | M.4.MD.1 know relative sizes of measurement units within one system of units including km, m, cm, kg, g, lb., oz, …within a single system of measurement, express measurements in a larger unit in terms of a smaller unit, record measurement, record measurement equivalents in a two column table.M.4.NBT.4 fluently add and subtract multi-digit whole numbers using the standard algorithm M.4.MD.2 use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects and money, including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit and represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale |
| **Materials/Advance Preparation Needed** | **Materials:*** Pumpkins
* Scale
* Newspaper
* Yarn
* Construction paper
* Measuring tape
* Calculator
* Carving Kits
* Math with Pumpkins Packet

**Advanced Preparation:*** Pumpkins must be grown. If there are not enough pumpkins for each student, students may be in partners, or a note must be sent home to parents asking for donations
* Students must have an understanding of measurement and geometric vocabulary
* Cut out yarn in advance
* Set up stations in the classroom for measuring, weighing, and gluing
* Collect newspapers prior to carving day
 |
| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | **Introduction:** Begin by checking students’ understanding with discussion by asking a variety of questions that involve predicting and estimating. Which pumpkin will have the most seeds? Which will have the fewest? Which pumpkin weighs the most/least? Estimate circumference and weight of pumpkins. Engage students in a discussion around why colonial settlers may want to make these measurements.  **Lesson:** Students can work in pairs to complete the Pumpkin Math packet (if there are not enough pumpkins) The teacher will walk around and assist students in measurements and conversions. \*\*Teacher note: Cover desks with newspapers \*\*Teacher note:  There is a modified version of each activity in the pumpkin packet (this is the sheet that has vocabulary words with fill in the blank definitions instead of lines to write out the whole definition)**Closure:** Reflect on what you learned that day/classroom clean up each day.  |
| **Assessment (What will be the evidence of student learning?)** | Completion of the Math with Pumpkins Packet and correctly expressing measurements in real world applications. |

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| **Title** | Listening and Speaking (Culminating Activity)  |
| **Overview** | The focus of this lesson is to have students articulate thoughts and ideas effectively through oral, written, or multimedia communications to demonstrate what they have learned.* Students will work with their partner
* Students will create a PowerPoint, poster, or pamphlet explaining:
* Estimating pumpkin sizes
* Planting and drying of seeds
* Conversions
* EarthBox (division of EarthBox into planting “plots”
* Describing Pumpkin Math Packet

Duration: 3 days  |
| **Standards** | 21C.O.3-4.1.LS.3 Student, cognizant of audience and purpose, articulates thoughts and ideas accurately and effectively through oral, written or multimedia communications.21C.O.3-4.3.LS.4 Student appreciates, accepts and works cooperatively with others, in both academic and social contexts, shares responsibility for continued improvement of the academic performance and climate of the school, and exhibits ethical behavior while working alone or communicating with others.21C.O.3-4.3.LS.5 Student uses his/her interpersonal skills when in an assigned leadership role, helps others stay focused and successfully moves the group toward the goal.     |
| **Materials/Advance Preparation Needed** | **Materials:*** Pumpkin Math Packet
* Any work from previous lessons (math from EarthBox lesson, research from seed drying…)
* Computers

**Advanced Preparation:*** Check out computers or computer labs
* Stations areas must be created for students to work
* Make sure students have Colonial Garden Journal and other Unit work to complete PowerPoint
 |
| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | **Introduction:** Begin by checking students’ understanding with discussion by asking a variety of questions reviewing previous lessons. Teacher will also discuss the audience for the presentation. Students will invite parents in to watch their presentations. What do we remember about conversions? What do we know about planting and drying seeds? How do we make educational estimations? How do we successfully transplant seedlings? During our entry event, which was the most successful way for a seed to sprout (natural light, heat lamp, grow lab)?**Lesson:** Students will create a PowerPoint presentation that reflects upon their Fall gardening unit. They should include slides on each of the experiences they had. (experiences include, but are not limited to: estimating pumpkin sizes, planting and drying of seeds, conversions, Earthbox experiments, dying plants, measuring and creating line plots…) **Closure:** Students will share their projects with classmates for peer editing. When all edits are complete, students will present to the whole class and parents.  |
| **Assessment (What will be the evidence of student learning?)** | Students will present their PowerPoint presentation to an audience of their peers and other students. Students will be provided a rubric for their PowerPoint Presentation. See Attached. |

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| **Oral Presentation Rubric : Fall Unit**Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| CATEGORY | **4** | **3** | **2** | **1** |
| **Enthusiasm** | Facial expressions and body language generate a strong interest and enthusiasm about the topic in others. | Facial expressions and body language sometimes generate a strong interest and enthusiasm about the topic in others. | Facial expressions and body language are used to try to generate enthusiasm, but seem somewhat faked. | Very little use of facial expressions or body language. Did not generate much interest in topic being presented. |
| **Volume** | Volume is loud enough to be heard by all audience members throughout the presentation. | Volume is loud enough to be heard by all audience members at least 90% of the time. | Volume is loud enough to be heard by all audience members at least 80% of the time. | Volume often too soft to be heard by all audience members. |
| **Vocabulary** | Uses vocabulary appropriate for the audience. Extends audience vocabulary by defining words that might be new to most of the audience. | Uses vocabulary appropriate for the audience. Includes 1-2 words that might be new to most of the audience, but does not define them. | Uses vocabulary appropriate for the audience. Does not include any vocabulary that might be new to the audience. | Uses several (5 or more) words or phrases that are not understood by the audience. |
| **Listens to Other Presentations** | Listens intently. Does not make distracting noises or movements. | Listens intently but has one distracting noise or movement. | Sometimes does not appear to be listening but is not distracting. | Sometimes does not appear to be listening and has distracting noises or movements. |
| **Collaboration with Peers** | Almost always listens to, shares with, and supports the efforts of others in the group. Tries to keep people working well together. | Usually listens to, shares with, and supports the efforts of others in the group. Does not cause \"waves\" in the group. | Often listens to, shares with, and supports the efforts of others in the group but sometimes is not a good team member. | Rarely listens to, shares with, and supports the efforts of others in the group. Often is not a good team member. |

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| **Title** | Specialist Extension Lesson (PE): Hungry, Hungry Harvesters! |
| **Overview** | The learning focus today will be for students to use their kicking skills to move balls into goals. The goals will represent the “harvesters” waiting to eat their crops. The balls will represent the “crops.” The team who gets the most “crops” to the “harvesters” will win the game.  |
| **Standards** | WE.4.5.01- while moving, dribble and kick an object.WE.4.6.01- demonstrate critical elements or components for the kick, catch, throw, dribble with hands, and jumping/landing.M.4.NBT.4- Fluently add and subtract multi-digit whole numbers using the standard algorithm.  |
| **Materials/Advance Preparation Needed** | **Materials:*** Four goals (trash cans or other similar objects)
* Several tennis balls
* Gymnasium or flat outdoor space
* Paper
* Pencils

**Advanced Preparations:** * Arrange time to use gymnasium with physical education teacher
* Acquire goals and tennis balls from physical education teacher
 |
| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | **Introduction:** Ask students what it means to harvest a crop. Ask students to recall what kind of crops they have been growing. Tell students that they will be playing a game in the gymnasium. **Lesson:** Have students sit on the gymnasium floor. Demonstrate how to properly kick a ball. Divide students into four teams. Assign each team a goal. Tell students that the goals represent, “harvesters.” Ask students what a harvester is. Next, tell students that the tennis balls represent the different crops they have been growing. Tell students that when you say “go” they must work with their teams to get the tennis balls into their assigned goal.The team with the most tennis balls in their goal at the end of the game wins.**Closure:** Each team count the number of tennis balls in their goals. Record the totals for each team on a large sheet of paper. Have student find the difference between the highest amount of balls in a goal and the lowest amount balls in a goal. Next, have students find the total number of balls used during the game. Discuss students’ answers and how they generated their answers. Finally, students will collect materials and return to the physical education teacher; return to classroom.  |
| **Assessment (What will be the evidence of student learning?)** | The students will use proper form when kicking the tennis balls. The teacher will observe students’ abilities when kicking the tennis balls using a checklist. The teacher will also collect the students’ work from the math problems. The teacher will check the students’ work.  |

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| **Title** | Specialist Extension Lesson (Music) - Pumpkin Vine |
| **Overview** | The learning focus today will be for students to focus on rhythmic pentameter of The poem “Pumpkin Vine”Pumpkin Vine Poem“Looked out my window and what did I find?Green leaves a-growing on my pumpkin vine.Gree-een leaves, gree-een leaves,Green leaves growing on my pumpkin vine”\*\*Yellow flowers growing, \*\*Black bugs a-crawling,\*\*Pumpkins growing on my pumpkin vine |
| **Standards** | MU.O.GM3-5.1.02 Sing or perform an ostinatoMU.O.GM3-5.1.05 Perform rhythmic patterns from notationRLA.O.4.1.01 Identify and practice appropriate vocabulary:* multiple meaning words
* synonyms
 |
| **Materials/ Needed** | **Materials:** * Variety of orff instruments
* Example what pumpkin sparts will look like
* Variety of 2 beat rhythm card visuals
* Class set of rhythm instruments
* Visual of poem
 |
| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | **Introduction:** To begin the music lesson, have students recall previous knowledge about plants and plant parts. Next, teacher will read a picture book about pumpkins. Students keep simple ostinato and teacher introduces poem, by way of student selected 2 beat rhythm card visuals.Students will identify and practice appropriate vocabulary discussing multiple meaning words and synonyms.**Lesson:** The teacher will begin with asking students to speak poem aloud, then focus on the importance of each student synergizering with one another to complete a common task. Music only works if we work together. After establishing the necessary rhythm concept patterns from notation, the class will then compose the ostinatos that will be used during the song and practice them on orff instruments. Students will play instruments after they master the form of the song. All students will play instruments to continue working together. Students will create the form of the musical composition.**Closure:** Students will work together to create a musical composition by the conclusion of music class. Teacher will video and/or audio record to allow students to self-assess their class. Students will return all items used to their home in the music room. Once the materials have been returned, the class will line up to return back to the classroom.  |
| **Assessment (What will be the evidence of student learning?)** | The students will use self-assessment to assess the learning and understanding of the concepts taught. The students will both see and/hear their final product and clearly distinguish whether or not the students have a grasp of the information or not. |

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| **Title** | Specialist Extension Lesson (Art) - Building a Garden Bird Bath |
| **Overview** | This project is a component of an overarching goal that includes a combination of classroom core instruction utilizing school garden.  This connection links science, language arts, and math to develop and create a school garden the spectrum will be incorporated.  |
| **Standards** | Content standard 6/making connections between the visual arts and other disciplines.  This project connects science, math, language arts, and visual arts as well as cultural enrichment.  |
| **Materials/Advance Preparation Needed** | 4th grade students continue the International Garden from their previous school year.  Mosaic birdbath will be apart of the “palette”.  |
| **Procedures/Steps:****(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)** | We will look at and discuss many mosaic pieces of environmental art… how will our birdbath look?  How will it best function?  Students will learn proper technique for cutting glass, arranging, attaching, and grouting to a finished piece.  |
| **Assessment (What will be the evidence of student learning?)** | Follow safety standards, use cutting, gluing and grouting in a safe manner.  |

From Jack B. Littles to

Jack-o-Lanterns

(Math with Pumpkins)



Crease

**Vocabulary**

**Crease -** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Estimate**-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Vertical -** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Horizontal -** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I estimate that my pumpkin has \_\_\_\_\_\_\_\_\_\_\_\_\_ creases.

My pumpkin really has \_\_\_\_\_\_\_\_\_\_\_ creases.

Crease

**Crease -** A \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the line that runs \_\_\_\_\_\_\_\_\_\_\_\_\_ along the pumpkin.

**Estimate**-An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ guess.

**Vertical -** Positioned \_\_\_\_\_ and \_\_\_\_\_\_\_\_ as opposed to \_\_\_\_\_\_\_

to \_\_\_\_\_\_\_\_\_\_

**Horizontal -** Positioned \_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_ as opposed to

 \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_.

I estimate that my pumpkin has \_\_\_\_\_\_\_\_\_\_\_\_\_ creases.

My pumpkin really has \_\_\_\_\_\_\_\_\_\_\_ creases.

Circumference

**Vocabulary**

**Circumference - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Conversions**- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Inches -** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Centimeters -** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* I estimate the circumference of my pumpkin will be \_\_\_\_\_\_\_\_\_\_\_\_\_ inches.
* My pumpkin has a circumference of \_\_\_\_\_\_\_\_\_\_\_\_ inches.
* Convert your measurement in inches to centimeters. SHOW YOUR WORK! To convert inches to centimeters, I must multiply the total inches by 2.54
* \_\_\_\_\_in. x 2.54 = \_\_\_\_\_cm.
* The circumference of my pumpkin is \_\_\_\_\_\_\_\_\_\_ centimeters.
* \*Measure the circumference of your pumpkin with a piece of yarn and glue to a piece of construction paper in the form of a circle.

Circumference

**Vocabulary**

**Circumference -** The \_\_\_\_\_\_\_\_\_\_\_ all the way around the edge of a

\_\_\_\_\_\_\_\_\_\_.

**Conversions**- To \_\_\_\_\_\_\_\_\_\_ in form.

**Inches -** A unit of linear \_\_\_\_\_\_\_\_\_ equal to one twelfth of a foot.

**Centimeters -** A unit of \_\_\_\_\_\_\_\_ equal to one hundredth of a meter

* I estimate the circumference of my pumpkin will be \_\_\_\_\_\_\_\_\_\_\_\_\_ inches.
* My pumpkin has a circumference of \_\_\_\_\_\_\_\_\_\_\_\_ inches.
* Convert your measurement in inches to centimeters. SHOW YOUR WORK! To convert inches to centimeters, I must multiply the total inches by 2.54
* \_\_\_\_\_in. x 2.54 = \_\_\_\_\_cm.
* The circumference of my pumpkin is \_\_\_\_\_\_\_\_\_\_ centimeters.
* \*Measure the circumference of your pumpkin with a piece of yarn and glue to a piece of construction paper in the form of a circle.

Diameter

**Vocabulary**

**Diameter- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Center point**- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* I estimate that my pumpkin will have a diameter of \_\_\_\_\_\_\_\_\_\_\_\_ inches
* Get a new piece of yarn and your circle paper.
* Hold the new yarn on one edge of the circle, run it through the center point to the opposite edge of the circle. Cut the yarn.
* To measure the diameter of your pumpkin in inches measure your new piece of yarn.
* My pumpkin has a diameter of \_\_\_\_\_\_\_\_\_\_.
* Convert your diameter in inches to centimeters. SHOW YOUR WORK! To convert inches to centimeters, multiply the total inches by 2.54.

\_\_\_\_\_\_\_\_\_in. x 2.54 = \_\_\_\_\_\_\_\_\_\_cm.

* The diameter of my pumpkin is \_\_\_\_\_\_\_\_\_\_ centimeters.

Diameter

**Vocabulary**

**Diameter-** A line that cuts a \_\_\_\_\_\_\_\_\_\_\_\_\_\_directly in \_\_\_\_\_\_\_\_\_\_\_.

**Center point**- The \_\_\_\_\_\_\_\_\_of a circle.

* I estimate that my pumpkin will have a diameter of \_\_\_\_\_\_\_\_\_\_\_\_ inches
* Get a new piece of yarn and your circle paper.
* Hold the new yarn on one edge of the circle, run it through the center point to the opposite edge of the circle. Cut the yarn.
* To measure the diameter of your pumpkin in inches measure your new piece of yarn.
* My pumpkin has a diameter of \_\_\_\_\_\_\_\_\_\_.
* Convert your diameter in inches to centimeters. SHOW YOUR WORK! To convert inches to centimeters, multiply the total inches by 2.54.

\_\_\_\_\_\_\_\_\_in. x 2.54 = \_\_\_\_\_\_\_\_\_\_cm.

* The diameter of my pumpkin is \_\_\_\_\_\_\_\_\_\_ centimeters.

Radius

**Vocabulary**

**Radius- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* I estimate that my pumpkin will have a radius of \_\_\_\_\_\_\_\_\_\_\_\_ inches
* Hold a new piece yarn on one edge of the circle, run it through the center point and cut the yarn.
* Measure this piece of yarn using a ruler.
* My pumpkin has a radius of \_\_\_\_\_\_\_\_\_\_.
* Convert your radius in inches to centimeters. SHOW YOUR WORK! To convert inches to centimeters, multiply the total inches by 2.54.

\_\_\_\_\_\_\_\_\_in. x 2.54 = \_\_\_\_\_\_\_\_\_\_cm.

* The radius of my pumpkin is \_\_\_\_\_\_\_\_\_\_ centimeters.

Radius

**Vocabulary**

**Radius-** Half the distance of the \_\_\_\_\_\_\_\_\_\_\_\_\_

* I estimate that my pumpkin will have a radius of \_\_\_\_\_\_\_\_\_\_\_\_ inches
* Hold a new piece yarn on one edge of the circle, run it through the center point and cut the yarn.
* Measure this piece of yarn using a ruler.
* My pumpkin has a radius of \_\_\_\_\_\_\_\_\_\_.
* Convert your radius in inches to centimeters. SHOW YOUR WORK! To convert inches to centimeters, multiply the total inches by 2.54.

\_\_\_\_\_\_\_\_\_in. x 2.54 = \_\_\_\_\_\_\_\_\_\_cm.

* The radius of my pumpkin is \_\_\_\_\_\_\_\_\_\_ centimeters.

Weight

**Vocabulary**

**Weight- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Pounds- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Grams- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* I estimate that my pumpkin weighs \_\_\_\_\_\_\_\_\_\_ pounds
* Place your pumpkin on the center of the scale
* Record the weight of your pumpkin in pounds (lbs)
* Convert pounds into grams. SHOW YOUR WORK!
	+ To convert pounds into grams, multiply \_\_\_\_\_\_\_\_lbs x 454.
	+ \_\_\_\_\_\_\_\_lbs x 454 = \_\_\_\_\_\_\_\_\_\_ grams
* My pumpkin weighs \_\_\_\_\_\_\_\_\_ grams

Weight

**Vocabulary**

**Weight-** The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a thing

**Pounds-**a unit of \_\_\_\_\_\_\_\_ in general use equal to 16 oz (about the

size of a \_\_\_\_\_\_\_\_\_\_\_\_\_)

**Grams-**a \_\_\_\_\_\_\_\_\_ unit of mass equal to one thousandth of a kilogram (about the size of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

* I estimate that my pumpkin weighs \_\_\_\_\_\_\_\_\_\_\_ lbs.
* Place your pumpkin on the center of the scale
* Record the weight of your pumpkin in pounds (lbs)
* Convert pounds into grams. SHOW YOUR WORK!
	+ To convert pounds into grams, multiply \_\_\_\_\_\_\_\_lbs x 454.
	+ \_\_\_\_\_\_\_\_lbs x 454 = \_\_\_\_\_\_\_\_\_\_ grams
* My pumpkin weighs \_\_\_\_\_\_\_\_\_ grams

Design your Jack-o-Lantern!

Jack B Little to Jack-o-Lanterns!

* Use your design page to carve your pumpkin.
* Upon completion, place your jack-o-lantern on the scale.
* Record the weight of your jack-o-lantern in pounds.
* My jack-o-lantern weighs \_\_\_\_\_\_\_\_\_\_ pounds.
* Convert pounds into grams. SHOW YOUR WORK! To convert pounds to grams, multiply \_\_\_\_\_\_\_\_\_lbs x 454

\_\_\_\_\_\_\_\_lbs x 454 = \_\_\_\_\_\_\_\_\_\_grams

* My jack-o-lantern weighs \_\_\_\_\_\_\_\_ grams.
* The difference in weight between my pumpkin and jack-o-lantern is
* \_\_\_\_\_\_\_\_\_\_lbs
* or \_\_\_\_\_\_\_\_\_\_grams

Seeds

* I estimate that my pumpkin has \_\_\_\_\_\_\_\_\_\_ seeds.
* Count the number of seeds in your pumpkin.
* My pumpkin actually has \_\_\_\_\_\_\_\_\_ seeds.
* I estimate my pumpkin seeds weigh \_\_\_\_\_\_\_\_\_\_ grams.
* Use the scale to weigh your seeds.
* My pumpkin seeds actually weigh \_\_\_\_\_\_\_\_\_ grams.

Vocabulary

Crease - A crease is the line that runs vertically along the pumpkin

Estimate - An educated guess

Vertical - Positioned up and down as opposed to side to side

Horizontal - Positioned side to side as opposed to up and down.

Circumference - The length all the way around the edge of a circle.

Conversion - To change in form

Centimeters - A unit of length equal to one hundredth of a meter

Inches - A unit of linear measure that is equal to one twelfth of a foot

Diameter - A line the cuts a circle directly in half

Center point - The center of a circle.

Radius - Half the distance of the diameter

Weight - the heaviness of a thing

Pounds - a unit of weight in general use equal to 16 oz (about the size of a loaf of bread or a football)

Gram - a metric unit of mass equal to one thousandth of a kilogram (about the size of a paperclip)