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Planting a Seed for Problem Solving

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Math and Science; Science and Math. Some say the two subjects go together as part of the "STEM" core within education. If this is the case, then why are they taught separately?

Introduction

I have taught second grade at Springdale Elementary in Tulsa, Oklahoma for the past eight years. My school has around six hundred students, which consist of four percent American Indian, nine percent African American, seventy-five percent Hispanic, twelve percent Caucasian and five percent multi-racial. They are mostly from low income, high poverty families. Ninety-five percent of our students are on free or reduced lunch. Most of my students are from first generation Hispanic families. For the most part, my students come to my second grade classroom one or even two years below grade level. In our elementary school, which serves grades Pre-kindergarten to sixth grade, we focus mainly on reading and math, and so consequently our students lack science skills. However they are tested on science in the fifth grade. I do not feel confident that most of the students have the knowledge that they should have about science. This curriculum unit will look at math word problems from a gardener's point of view.

Rationale

Several times I've heard from students "Why do I need to learn this?" or "I'm never going to use this again." With my curriculum unit I plan on changing that attitude with everyday math usage. The unit I have prepared will focus on including both math and science in an integrated way to help my students use math when faced with everyday activities like building a container garden for our school. Our original garden is being torn up, due to some construction at our building, so that is why I'm choosing a container garden over a regular garden, but you are most definitely able to do this in a regular garden at your school. In the eight years that

I've taught second grade, I've noticed that the math curriculum teaches the students addition first and then subtraction second. In my unit, I will teach students that addition and subtraction go together, in the context of living organisms of plants, I will create an understanding for my students. The reason I'm taking this approach of teaching both addition and subtraction at the same time is because kids need to know that the two have a relationship with each other. My students also need to know that a lot of word problems could be thought of as being about addition or about subtraction. It is the way that you approach the problem and how you solve it, and not the wording of the problem. There are no "magic words" to help solve the problem. The approach of integrating both math and science can include activities that they can use to help with feeding their families and the community around our school. We will be planting some vegetables and fruits that are very familiar to the students and some that they have never heard of or tried before.

My unit will be composed of two sections. The first section will contain a collection of word problems for the class to discuss, analyze, and solve. The second section will contain the actual hands-on gardening activities. The scenarios for my math problems will use real life gardening activities, to show my students that they can use math in different aspects of their lives. For example, using scenarios that they can actually manipulate can help all of my students, especially my English Language Learners. Keeping the same scenarios and just changing the numbers that we use in the problems will help students with their reading skills because they will be practicing the same words. Reading the same scenarios over and over again will help students recognize words that might have been too hard in a regular text that they are asked to read, but when put in a word problem that we will go over several times they will get used to those uncommon words. It will also help the students that need to do hands-on activities to keep them motivated in learning math. The article "Three Pillars of First Grade Mathematics, and Beyond" by Roger Howe explains the importance of presenting a well-rounded collection of situations where addition or subtraction can be used (1). I am also adding lots of books to use as read aloud to excite my students about this unit and just to read to them.

Objectives

This unit is designed to help my students better understand word problems in our everyday class using items that they can actually create with their own hands. They will learn one-step word problems at first and eventually two-step word problems. My students will be able to use addition and subtraction within 100 to help solve these problems. My students will build a garden using scenarios from our word problems. My students will learn good habits of reading and thinking and writing while creating their own word problems. My students will explore plants and what plants need to grow and produce fruits and vegetables. My students will dissect and explore the parts of a flower.

Math Content Background

The Common Core State Standards in Mathematics ask students to use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for

the unknown number to represent the problem. In this unit, I will be teaching my students how to think about one-step addition and subtraction math problems. My approach to this in the past has been teaching my students the “magic words” and have them pick them out so that we could decide if we were going to add or subtract. Now I will be teaching my kids that addition and subtraction are related, and some problems can be thought of either in terms of addition, or subtraction. Later on in the unit, if students are ready, we will work with some two-step problems using the knowledge from the one-step problems.

According to the Common Core State Standards in Mathematics, word problems fall into three main categories. The “Three Pillars” article explains in-depth the three categories that are needed to help students understand the different kinds of word problems (2). These can also be found in Table I at the end of the Common Core State Standards for Mathematics.
(http://www.corestandards.org/Math/Content/mathematics-glossary/Table-1/)

Change Problems

The first category is change problems: these are problems where some numbers change at some time in the problem. According to how you word your problem, they can have an increase or a decrease. You could have the initial amount unknown, the change unknown, or the final amount unknown. The combinations of these possibilities leads to six different types of problems. Some examples of these problems are represented in the following chart.

Change plus (add to) increase	**Result Unknown-***These problems are taking two alike things and putting a change in the problem. This problem would be a regular addition problem.* Three seeds are in a package. We found four more seeds on the floor that had fallen out of the package. How many seeds can we plant now? 3 + 4 =__	**Change Unknown***-These problems are taking two alike things and having the change be unknown. This problem could be expressed using adding or subtracting.* Three seeds are in a package. We found some more seeds that had fallen on the floor. We were then able to plant seven seeds. How many seeds did the class find on the floor? 3 +__ = 7, or 7 – 3 =__	**Start Unknown-** *These have the starting amount unknown. This problem can be expressed using adding or subtracting.* Some seeds were in a package. We also found four seeds on the floor. Then we hade seven seeds to plant in the garden. How many seeds were in the package to start with? __+ 4 = 7, or 7 – 4 =__
Change minus (take from) decrease	**Result Unknown***-In these you are just removing something from the original amount.* Seven seeds were on the table. I planted three. How many seeds are on the table now? 7 – 3 = __	**Change Unknown-***In these problems the change is unknown from the problem, but you still know the beginning and the end.* Seven seeds were on the table. I planted some. Then there were four seeds left on the table. How many seeds did I plant? 7 - __ = 4, or 4 + __ = 7	**Start Unknown-***In these problems the beginning of the problem is unknown therefore you must use the change and the ending to figure out the starting amount.* Some seeds were on the table. I planted three. Then there were four. How many seeds started out on the table? __ - 3 = 4, or 4 + 3 = __

Comparison Problems

The next category is comparison problems: these problems involve differences between two quantities. One quantity can be described either as greater than or less than the other one. You can have the smaller amount unknown, the difference unknown or the greater amount unknown. Using the combinations of these can lend

to six more different types of problems. Some examples of these problems are represented in the following chart.

Comparison More/greater	**Difference Unknown-***These are problems that are comparing like things to find the unknown which is the difference. These problems can be added and/or subtracted.* Justin has three tomato plants. Dawn has seven tomato plants. How many more tomato plants does Dawn have then Justin? 3 + __ = 7, or 7-3 =__	**Bigger Unknown-***These are problems that are comparing like items with the bigger item unknown.* Dawn has four more tomato plants than Justin. Justin has three tomato plants. How many tomato plants does Dawn have? __– 3 = 4, or 3 + 4 = _	**Smaller Unknown-***These are problems that are comparing like items with the smaller item unknown.* Dawn has four more tomato plants than Justin. Dawn has seven tomato plants. How many tomato plants does Justin have? __+ 4 = 7, or 7 – 4 = _
Comparison Less/fewer	**Difference Unknown**-*These are problems that are comparing like things to find the difference.* Justin has three tomato plants. Dawn has seven tomato plants. How many fewer tomato plants does Justin have than Dawn? 7 - __=4, or _ + 4 = 7	**Bigger Unknown-***These are problems that are comparing like things with the bigger amount unknown. You can express the answer using either adding or subtracting.* Justin has four fewer tomato plants than Dawn. He has three tomato plants. How many tomato plants does Dawn have? 7 - 4 =__, or _+ 4 = 7	**Smaller Unknown-***These are problems that are comparing like things with the smaller comparison unknown. These problems can be written using either addition or subtraction.* Justin has four fewer tomato plants than Dawn. Dawn has seven tomato plants. How many tomato plants does Justin have? 7 – 4 =__, or __+ 4 = 7

Part-Part Whole Problems

The last category is part-part whole: these problems combine two parts to get to the whole thing. Some examples of these problems are represented in the following chart.

Put together	**Total Unknown**-*These problems are where you are taking different items and adding them together.* Three tomato seeds and four pepper seeds are in the garden. How many seeds are in the garden? 3 + 4 = __	**Addend Unknown**-*These problems are where you are taking different items and finding out how many of one you have. You are missing a part in these problems.* Seven seeds are in the garden. Three are tomato seeds and the rest are pepper seeds. How many seeds are pepper seeds? 3 + __ = 7, or 7 – 3 = __

Science Content Background

After studying a range of one-step problems using all three categories in realistic scenarios, my class and I will create a container garden for our school. It will be the source of the ideas for our word problems, to help the students create a hands-on experience. With this container garden I would like to show the students how they can use everyday words and numbers to talk about something they can use for survival for themselves and

their families. We will also be talking about where to put our containers after doing some research in *Square Foot Gardening with Kids* by Mel Bartholomew *(3).* This unit will include some knowledge on just basic plant care and what a plant is and how to take care of it. As explained in *Small Wonders* by Linda Garrett and Hannah Thomas, plants need water, sunlight, air and nutrients to grow and reproduce (4). Without reproduction plants would cease to exist. This must also be taught to my students so that they understand the life cycles of living organisms. I will also be teaching the parts of a plant: roots, stem, leaves, flowers, fruits, and the seeds. We will read several books and talk about the different ways that plants grow. One book that would be great would be *Tops and Bottoms* by Janet Stevens. Some other books are *Planting a Rainbow* by Lois Ehlert; *Seed to Plant* by Kristin Baird Rattini; *From Seed to Plant* by Gail Gibbons; *How Do Plants Grow?* by Julie K. Lundgren and Kristi Lew; and *Plant a Seed* by Kadir Nelson. Those are just some of the books that you could use with this unit. Some of them might be too young for your grade, make sure to look at them before introducing them to your class.

After the plants have started to grow we can go back and make more word problems using the current things that are happening in the container gardens. I will have my students do that in small cooperative groups in their math journals. We will plant the kind of plants that will grow best in our region. To find that information out we will use Red Dirt Ramblings which is a website that tells the right kind of plants to plant in Oklahoma (5). Some plants that grow well in Oklahoma are asparagus, beets, broccoli, cabbage, carrots, cauliflower, chard, lettuce, onions, peas, potatoes, radishes, rhubarb, spinach, and turnips, lima beans, green beans, cantaloupe, cucumbers, eggplant, okra, peppers, pumpkins, squash, sweet corn, sweet potatoes, tomatoes, watermelon. Several different kinds of herbs are good for containers like spearmint, chocolate mint, sage, rosemary, parsley, thyme, basil, oregano. For the best plants in your region I suggest Googling it to seek local suggestions.

Classroom strategies with activities

First strategy

In the first part of my unit we will be talking about planting lettuce and kale, because both can be grown as early as the end of February. All of my math word problems will be using lettuce and kale so that we can then go plant what we learned. To get my students excited about working with lettuce we will watch a short read aloud about lettuce and a butterfly: http://www.playrific.com/m/7862/book-lettuce-and-the-butterfly. Since this book has a butterfly in it you can also talk to your students about the importance of animals that help pollinate the flowers for reproduction. Other books that you can read to get your students excited about this topic could be *Lettuce* by Diana Kizlauskas and/or *Garden Safari Vegetable Soup* by Eluka Moore, Larry Puzniak and Marianne Welsh. This book uses kale in the vegetable soup so you can then make the soup once your kale comes up in your garden. Since these plants will be planted at the same time, they should be ready for harvest around the same time so that my students can write their own problems in their garden math journal. The students could also compare and contrast the two using their five senses.

Change plus (add to) increase	**Result Unknown** A red container held eight lettuce seeds. We planted four more lettuce seeds. How many lettuce seeds were planted in the red container?	**Change Unknown** A red container held eight lettuce seeds. We planted some more lettuce seeds. We had a total of twelve lettuce seeds in the red container. How many lettuce seeds did we plant in the red container?	**Start Unknown** A red container held some lettuce seeds. We planted four more lettuce seeds. We had a total of twelve lettuce seeds in the red container. How many seeds did we start with in the red container?
Change minus (take from) decrease	**Result Unknown** The red container had twelve lettuce seeds planted. Four of the lettuce plants didn't make it. How many plants actually grew?	**Change Unknown** The red container had twelve lettuce seeds planted. Some of the lettuce plants didn't make it. There were eight plants that actually made it. How many plants didn't grow?	**Start Unknown** The red container had some lettuce seeds planted in it. Four of those seeds didn't grow. Eight of them did grow into yummy lettuce plants. How many lettuce seeds were started in the red container?
Comparison More/greater	**Difference Unknown** There are four kale plants in the container. There are eight lettuce plants. How many more lettuce plants than kale plants are there?	**Bigger Unknown** There are four more lettuce plants than kale plants in the container. There are four kale plants in the container. How many lettuce plants are there in the container?	**Smaller Unknown** There are four more lettuce plants than kale plants in the container. The container has eight lettuce plants. How many kale plants does it have?
Comparison Less/fewer	**Difference Unknown** There are eight lettuce plants in the container. There are four kale plants there. How many fewer kale plants than lettuce plants are there?	**Bigger Unknown** There are four fewer kale plants than lettuce plants in a container. There are four kale plants. How many lettuce plants are there?	**Smaller Unknown** There are four fewer kale plants than lettuce plants in a container. There are eight lettuce plants in the container. How many kale plants are in the container?
Put together	**Total Unknown** There are eight lettuce plants in the container, and four kale plants. How many plants are there in all in the container?	**Addend Unknown** There are twelve lettuce and kale plants in the container. There are eight lettuce plants. How many kale plants are there?	

First activity

My students and I will be using the same kind of containers for both our lettuce and kale plants. We will start the plants in our classroom by using a "Jump-Start Garden". A jump-start garden is just getting a jump on your garden by starting the seeds inside before putting them outside. We will plant in peat pots, which are special containers made from peat moss. An empty egg carton, or cardboard milk carton, like the milk cartons that we get at our school at breakfast and lunch, makes a good seedling tray for tiny seeds. When it is time to plant the seedlings we will use the compost dirt that our Pre-Kindergarten has been making in the classroom. If you aren't able to get your hands on compost make sure you use good soil for your plants for best results. After planting and watering and giving it sunshine your plant should then grow. Once it starts growing, use it to have students make new word problems. I will have them work in groups, so that all of my students can experience it, regardless of their reading and writing ability. This will make even my ELL students feel involved.

Second strategy

The second part of my unit we will use the herbs spearmint and chocolate mint to show the kids a different kind of item to grow. To get my students excited we will talk about different ways that we can use these two herbs in their kitchens. We will read through recipes to find ways to use them once they start growing. We will compare and contrast how herbs and lettuce and kale are different and the same.

Change plus (add to) Increase	**Result Unknown** A blue container had five mint plants in it. Our class planted seven more plants into the container. How many mint plants are in the container now?	**Change Unknown** A blue container had five mint plants in it. Our class planted some more mint plants into the container. Then there were twelve mint plants in the blue container. How many mint plants did our class plant?	**Start Unknown** A blue container grew some mint plants in it. Our class planted seven more mint plants into the container. Then there were twelve mint plants in the blue container. How many mint plants were in the container to begin with?
Change minus (take from) decrease	**Result Unknown** The blue container had twelve mint plants planted. Five of the mint plants didn't make it. How many plants actually grew?	**Change Unknown** The blue container had twelve mint plants planted. Some of the mint plants didn't make it. There were seven plants that actually made it. How many plants didn't grow?	**Start Unknown** The blue container had some mint plants planted in it. Five of those seeds didn't grow. Seven of them did grow into yummy mint plants. How many mint plants were started in the blue container?
Comparison More/greater	**Difference Unknown** There are five spearmint plants in the container. There are seven chocolate mint plants. How many more chocolate mint plants than spearmint plants are there?	**Bigger Unknown** There are two more chocolate mint plants than spearmint plants in the container. There are five spearmint plants in the container. How many chocolate mint plants are there in the container?	**Smaller Unknown** There are two more chocolate mint plants than spearmint plants in the container. The container has seven chocolate mint plants. How many spearmint plants does it have?
Comparison Less/fewer	**Difference Unknown** There are seven chocolate mint plants in the container. There are five spearmint plants there. How many fewer spearmint than chocolate mint plants are there?	**Bigger Unknown** There are two fewer spearmint plants than chocolate mint plants. There are seven chocolate mint plants. How many spearmint plants are there?	**Smaller Unknown** There are two fewer spearmint plants than chocolate mint plants in one container. There are seven chocolate mint plants in the container. How many spearmint plants are in the container?
Put together	**Total Unknown** There are seven chocolate mint plants in the container, and five spearmint plants. How many plants are there in all in the container?	**Addend Unknown** There are twelve spearmint and chocolate mint plants in the container. There are five spearmint plants. How many chocolate mint plants are there?	

Second activity

Since mint is such an invasive herb they will be put into separate containers so that they don't take over the other plants. Since they can also be grown indoors these might be some of the first plants that we plant to

start our unit. We will use a window box to plant these herbs. We will line the bottom with moss and a few pebbles for drainage and for the roots to hold water longer. Herb seeds take several weeks to sprout so if they don't grow soon, give them a chance. Don't give up!! The students will draw what happens over the weeks in the math journals so that we can construct word problems for our herbs. We will also work on recipes for the two herbs that we are growing, since part of the reason for this unit is to show my students how they can use the stuff we are growing in their own homes. We can also put into just water so that they can see how it flavors stuff.

Third strategy

The next part of our unit will be planting tomatoes and peppers. They should be planted between April 10th and the 30th of April. Since I would like to get some fruits off of these plants we will also start these as seedlings. We will start the plants in our classroom so that we can start them right after spring break. For growing tomatoes, you will need lots of sun and rich loose soil and lots of water. Make sure to water the roots, not the leaves. Tomato plants grow very tall so they will need to be tied to a pole or be staked. All of my math word problems will be using tomatoes and peppers so that we can then go and plant what we learned. These problems will be taught before and after spring break time, which for us is around March 14th . To get the my students excited about this we will read some books about tomatoes and peppers and talk about how we can us them in our kitchens at home and the things that we can make with them. Some books that might be fun to read *Growing Vegetable Soup* by Lois Ehlert, *I will never not ever eat a Tomato* by Lauren Child, *Green is a Chili Pepper* by Roseanne Greenfield Thong, *The Traveling Jalapeños Meet Tripp Halstead* by Donna Nolan-Wilson. These are just some fun books to entertain the students during math read aloud.

Change plus (add to) increase	**Result Unknown** A yellow container held nine tomato seeds. We planted three more tomato seeds. How many tomato seeds were planted in the yellow container?	**Change Unknown** A yellow container held nine tomato seeds. We planted some more tomato seeds. We had a total of twelve tomato seeds in the yellow container. How many tomato seeds did we plant in the yellow container?	**Start Unknown** A yellow container held some tomato seeds. We planted three more tomato seeds. We had a total of twelve tomato seeds in the yellow container. How many seeds did we start with in the yellow container?
Change minus (take from) decrease	**Result Unknown** The yellow container had twelve tomato seeds planted. Three of the tomato plants didn't make it. How many plants actually grew?	**Change Unknown** The yellow container had twelve tomato seeds planted. Some of the tomato plants didn't make it. There were nine plants that actually made it. How many plants didn't grow?	**Start Unknown** The yellow container had some tomato seeds planted in it. Three of those seeds didn't grow. Nine of them did grow into yummy tomato plants. How many tomato seeds were started in the yellow container?
Comparison More/greater	**Difference Unknown** There are three tomato plants in the container. There are nine pepper plants. How many more pepper plants than tomato plants are there?	**Bigger Unknown** There are six more pepper plants than tomato plants in the container. There are three tomato plants in the container. How pepper plants are there in the container?	**Smaller Unknown** There are six more pepper plants than tomato plants in the container. The container has nine pepper plants. How many tomato plants does it have?

Comparison Less/fewer	**Difference Unknown** There are nine pepper plants in the container. There are three tomato plants there. How many fewer tomato plants than pepper plants are there?	**Bigger Unknown** There are six fewer tomato plants than pepper plants in the container. There are three tomato plants. How many pepper plants are there?	**Smaller Unknown** There are six fewer tomato plants than pepper plants in the container. There are nine pepper plants in the container. How many tomato plants are in the container?
Put together	**Total Unknown** There are three tomato plants in the container, and nine pepper plants. How many plants are there in all in the container?	**Addend Unknown** There are twelve tomato plants and pepper plants in the container. There are three tomato plants. How many pepper plants are there?	

Third activity

A little history lesson in a science unit, as told in the book *Kids Garden* by Avery Hart and Paul Mantell. In 1820, Robert Johnson stood on the courthouse steps of Salem, New Jersey, and shocked his neighbors by eating a big, red, ripe, juicy tomato. The people who watched were horrified! Everybody back then knew that tomatoes were deadly poisonous! Mr. Johnson ate not one, but a whole pailful of tomatoes. Then, with a lively spring in his step, he walked down the stairs, got in his horse-drawn buggy, and drove off. Since then, people have been eating tomatoes by the bushelful-and no one has ever gotten sick from a tomato as far as we know! Thank you, Robert Johnson, for clearing up a misunderstanding about one of our favorite foods! After teaching the kids a little history about tomatoes we will plant some tomato and pepper plants. We will plant these two plants as we did the lettuce and kale. We will use stakes or poles for the tomatoes when the plants start growing big.

Fourth strategy

The next part of our unit will be planting and working with eggplant and okra. These plants also should be planted between April10th and the 30th of April. In order to get vegetables from these plants before the end of school we will start them as seeds into seedlings in our classroom, probably around the time that we do the tomatoes and peppers. We could also compare and contrast all four plants. Starting with the difference in seeds to the seedlings to the plants and how they look alike and different. Once again these problems will be introduced around spring break, so that we can get them planted early hopefully to produce vegetables before the end of the year. I will introduce these two vegetables by reading Autumn the Eggplant by Anna Corriveau, and Grandma's Gumbo by Deborah Ousley Kadair.

I will construct a set of problems of all fourteen types for eggplant and okra, similar to the sets given above for lettuce and kale, and for tomatoes and peppers, but I will not give the set here. The reader can enjoy constructing them for her/himself.

Fourth activity

We will use our eggplant in our classroom for taste testing. If our tomato plants produce fruit maybe we can make tomato sauce to go on top of some cooked eggplant. When the okra plants produce fruit we will make some baked okra with a toaster oven.

Fifth strategy

The final part of this unit will be planting some more herbs. I chose basil and oregano because that is something that the students can learn to use in their homes with their parents. It will also be good with tomatoes and eggplant. If everything grows well we can make eggplant pizzas using items from our garden. Like the mint, oregano is very invasive, so we will need to make sure that we separate it from the rest of the plants, so that it does not take off in another container. As for the basil, I will purchase a few plants to get started, and then we will add basil seeds to the container.

Again, there will be a collection of problems, of all 14 types, about basil and oregano. These problems are given in Appendix II.

Fifth activity

We will use our word problems to plant these herbs into containers for our garden. When they grow we will use them in cooking to show the kids how to use what we grew in their everyday lives. If we produce enough herbs and vegetables we will make baskets for the teachers and the families to use in their kitchens.

Teacher's Notes

My plans for our garden are to add more vegetables using word problems that my students make up as we are getting our hands dirty. By the time we have done the problems from this unit my expectation is that the students will be able to come and write their own problem scenarios for different types of vegetables and fruits. Have fun with it don't make it stressful or expensive. Find grants in your local towns to help with expenses or ask parents or teachers if they have extra gardening supplies lying around. For example different kinds and sizes of containers also watering cans to carry water especially if you don't have available water outside. This unit is to teach and learn about math and science make it FUN!!!

Notes

1. Howe, Roger. "Three Pillars of First Grade Mathematics, and Beyond." *Mathematics Curriculum in School Education Advances in Mathematics Education*: 183-207.
2. Howe, Roger. "Three Pillars of First Grade Mathematics, and Beyond."
3. Bartholomew, Mel. *All New Square Foot Gardening with Kids: Learn Together : Gardening Basics : Science and Math, Water Conservation, Self-sufficiency, Healthy Eating*. Minneapolis, Minn.: Cool Springs Press, 2014.
4. Garrett, Linda, and Hannah Thomas. *Small Wonders: Nature Education for Young Children*. Woodstock, Vt.: Vermont Institute of Natural Science ;, 2005.
5. "Red Dirt Ramblings® - Firmly Rooted and Growing in Oklahoma Soil." Accessed September 13, 2015.

Appendix I: Academic standards

Academic standards

Common Core Math Objectives

CCSS.MATH.CONTENT.2.OA.A.1

Common Core Science Objectives

2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.

Appendix II: Basil and oregano problems

	Result Unknown A turquoise container held eleven basil plants. We planted one more basil plant. How many basil plants were planted in the turquoise container?	**Change Unknown** A turquoise container held eleven basil plants. We planted some more basil plants. We had a total of twelve basil plants in the turquoise container. How many basil plants did we plant in the turquoise container?	**Start Unknown** A turquoise container held some basil plants in it. We planted one more basil plant. Then we had a total of twelve basil plants in the turquoise container. How many basil plants did we start with in the turquoise container?
Change minus (take from) decrease	**Result Unknown** The turquoise container had twelve basil plants planted in it. One of the basil plants didn't make it. How many plants actually grew?	**Change Unknown** The turquoise container had twelve basil plants planted in it. Some of the basil plants didn't make it. There were eleven basil plants that actually made it. How many basil plants didn't grow?	**Start Unknown** The turquoise container had some basil plants planted in it. One of those seeds didn't grow. Eleven of them did grow into yummy basil plants. How many basil plants were started in the turquoise container?
Comparison More/greater	**Difference Unknown** There is one basil plant in the container. There are eleven oregano plants. How many more oregano plants than basil plants are there?	**Bigger Unknown** There are ten more oregano plants than basil plants in the container. There is one basil plant in the container. How many oregano plants are there in the container?	**Smaller Unknown** There are ten more oregano plants than basil plants in the container. The container has eleven oregano plant. How many basil plants does it have?
Comparison Less/fewer	**Difference Unknown** There are eleven oregano plants in the container. There is one basil plant there. How many fewer basil plants than oregano plants are there?	**Bigger Unknown** There are ten fewer basil plants than oregano plants in a container. There is one basil plant. How many oregano plants are there?	**Smaller Unknown** There are ten fewer basil plants than oregano plants in a container. There are eleven oregano plants in the container. How many basil plants are in the container?

	Total Unknown	Addend Unknown
Put together	There are eleven oregano plants in the container, and one basil plant. How many plants are there in all in the container?	There are twelve basil and oregano plants in the container. There are eleven oregano plants. How many basil plants are there?

Annotated Bibliography

Aston, Dianna Hutts, and Sylvia Long. *A Seed Is Sleepy*. San Francisco: Chronicle Books, 2007.

Good for read aloud.

Bartholomew, Mel. *All New Square Foot Gardening with Kids: Learn Together : Gardening Basics : Science and Math, Water Conservation, Self-sufficiency, Healthy Eating*. Minneapolis, Minn.: Cool Springs Press, 2014.

This book is awesome for schools with small spaces.

Blackaby, Susan, and Charlene DeLage. *Plant Packages: A Book about Seeds*. Minneapolis, Minn.: Picture Window Books, 2003.

Good for read aloud.

Blackaby, Susan, and Charlene DeLage. *Plant Plumbing: A Book about Roots and Stems*. Minneapolis, Minn.: Picture Window Books, 2003.

Good for read aloud.

Carle, Eric. *The Tiny Seed*. Natick, MA: Picture Book Studio :, 1987.

Good for a read aloud.

Cook, Deanna F., and Michael P. Kline. *The Kids' Multicultural Cookbook: Food & Fun around the World*. Charlotte, Vt.: Williamson Pub., 1995.

Fun for recipes.

Creasy, Rosalind, and Ruth Heller. *Blue Potatoes, Orange Tomatoes: How to Grow a Rainbow Garden*. San Francisco: Sierra Club Books for Children, 1994.

Good for a read aloud.

DePaola, Tomie. *Strega Nona's Harvest*. New York: Puffin Books, 2012.

Good for read aloud.

Ehlert, Lois, and P. J. Verhoest. *Planting a Rainbow*. CT.: Weston Woods, 2005.

A good book about plants.

"Find Textbook Support Materials." Education Place®. Accessed September 16, 2015.

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Lots of outdoor ideas.

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