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| Title | A Worm Bin |
| Overview | Students will be introduced to the worm bin. A See-Think-Wonder is used to encourage student thinking and questioning. One question is used for the investigation. Students will use a garden journal to record observations and data.  |
| Standards | 1 LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.M.1.MD.4 organize, represent, interpret data with up to three categories, ask and answer questions about the total number of data points, how many in each category and how many more or less are in one category than in another. |
| Materials/Advance Preparation Needed | -Worm bin- you can purchase through amazon [http://www.amazon.com/Worm-Factory-DS3GT-3-Tray-Composter/dp/B000S6LZBO/ref=sr\_1\_2?ie=UTF8&qid=1407517244&sr=8-2&keywords=worm+bin](http://www.amazon.com/Worm-Factory-DS3GT-3-Tray-Composter/dp/B000S6LZBO/ref%3Dsr_1_2?ie=UTF8&qid=1407517244&sr=8-2&keywords=worm+bin) This will come with soil to prepare for the trays. You can also order the red worms from amazon ([http://www.amazon.com/Uncle-Jims-Worm-Farm-Composting/dp/B000Q5S7RM/ref=pd\_bxgy\_lg\_text\_y](http://www.amazon.com/Uncle-Jims-Worm-Farm-Composting/dp/B000Q5S7RM/ref%3Dpd_bxgy_lg_text_y) )- fruit/vegetable scraps-chart paper for graph |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Leave the worms in the bucket and have students close their eyes. Give each student a chance to feel inside the bucket without looking. Ask students to guess what they are touching. (You could use cooked spaghetti noodles if you would like.)
2. Introduce students to the worm bin. As a class complete a See-Think-Wonder chart on the board. Remind students’ only one student shares at a time. They can say what they see, think, or wonder about the worm bin.
3. My class wondered which food the worms would like best so we investigated this “wonder”, but you could investigate any one you choose. After you pick what you will be investigating I ask the students to brainstorm ideas of how we could find the answer to our question. Students decided to make a graph of different foods we wanted to feed the worms and mark how many days it took for the food to decompose or disappear.
4. We made a chart to take turns feeding and checking on the worms. Students were in charge of checking off the graph for the day or picking a new fruit/vegetable to try.
5. Make sure to check back on the worm bin a couple times a week to feed the worms and complete the graph.

**Extension*** Each student could make and record their own graph in their science journal.
* Each student could be assigned a different week to bring in an assigned food for the worms.
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| Assessment (What will be the evidence of student learning?) | After 8-12 weeks, students will check their graph to see which food decomposes the fastest. We will discuss their answers as a class. Why do they think \_\_\_\_ decomposed the fastest? What would make \_\_\_\_\_ decompose faster?IMG_0127.JPG |

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| Title | “Bob and Otto” |
| Overview | Students will listen to the story “Bob and Otto” and discuss similarities and differences between worms and caterpillars. In their garden journals they will list traits that make a good friend.  |
| Standards | 1 LS3-1 Make observations to construct an evidence-based account that young plants and animals are alike, but not exactly like, their parents.ELA.1.R.C1.1 ask and answer questions about key details in a literary textELA 1.R.C2.3 identify who is telling the story at various points in a literary textELA.1.W.C9.3 write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use transitional words to signal even order and provide some sense of closure.  |
| Materials/Advance Preparation Needed | -book “Bob and Otto”-garden journals |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Read the story “Bob and Otto” as a class. Ask questions along the way to make sure students are comprehending.
2. Discuss traits of a worm vs. traits of a caterpillar. Make a poster as a class.
3. Ask students what made Bob and Otto good friends. List qualities that make a good friend on the board. Have students write a sequel in their garden journal for “Bob and Otto” about another adventure the two friends could go on. They can share their story with the class when they are done.
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| Assessment (What will be the evidence of student learning?) | Assess as students discuss the traits of a worm vs. a caterpillar. Ask students the difference between an adult caterpillar and an adult worm. Check students’ sequel in their garden journal for details and transitional words.  |

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| Title | “Yucky Worms” |
| Overview | Students will listen to a story and discuss the events in that story. We will compare the story to the worms in our bin. Students will record worm facts in their garden journals.  |
| Standards | ELA 1.R.C1.4 ask and answer questions about key details in an informational textELA 1.R.C2.2 explain major differences between books that tell stories and books that give information, drawing on a wide reading of a range of literary text typesELA.1.W.C9.2 write informative/explanatory texts in which they name a topic, supply some facts about the topic and provide some sense of closureELA.1.SL.C13.2 ask and answer questions about key details in a text read aloud or information presented orally or through other media |
| Materials/Advance Preparation Needed | -Book “Yucky Worms”-garden journals-camera-sentence strips |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Read the story “Yucky Worms” as a class. Discuss worm facts along the way.
2. On the board make a Can/Have/Are chart about worms. Ask students to help you fill in facts about worms.
3. Take a picture of each student holding a worm. Then give students a sentence strip to write one fact about worms. You can assign facts from the board so there are not a lot of duplicates. We made a bulletin board with our pictures and facts.
4. Summarize with students the good things about worms and revisit the title asking, “Are worms really yucky?”

Extension:Students can fill in their own Can/Have/Are chart in their garden journals.  |
| Assessment (What will be the evidence of student learning?) | Check student’s sentence strips or garden journals for facts about worms. Make sure students are participating in class discussion. |
| Title | Worm Study |
| Overview | Students will be able to look at a worm up close and record their thoughts. |
| Standards | 1 LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.M.1.MD.2 express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end and understand that the length measurement of an object is the number of same-size length units that span it with not gaps or overlaps. ELA.1.W.C9.2 write informative/explanatory texts in which they name a topic, supply some facts about the topic and provide some sense of closure |
| Materials/Advance Preparation Needed | -worms-garden journals-rulers-magnifying glasses |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Discuss the proper way to hold and care for a worm. Model how to use a ruler and measure a worm. Generate a word bank on the board of words they think they might need to describe their worms.
2. Place wet paper towels on students’ table. Then place a handful of worms on the paper towels. Instruct students to become scientists and really discover what their worm is like.
3. Have the students glue the following questions into their journal and answer them as they study their worm:
* What does your worm feel like?
* What color is your worm?
* How long is your worm?
* Can you tell which end is the head? How?
* What else did you notice about your worm?
1. Using their worm as the main character have students write a story about their pet worm. It can be fiction or nonfiction. First give students a four square organizer to help them get started. They can share their stories when they finish.
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| Assessment (What will be the evidence of student learning?) | Check their worm questions; make sure they measured their worm correctly and that they wrote answers in complete sentences. Read students’ stories and check for a topic and some facts about worms.  |
| Title | “Diary of a Worm” |
| Overview | Students will listen to the book “Diary of a Worm” and pick out adjectives or verbs about worms. Then they will write a diary entry from a worm’s point of view in our worm bin.  |
| Standards | ELA.1.R.C1.1 ask and answer questions about key details in a literary textELA.1.W.C9.3 write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use transitional words to signal even order and provide some sense of closure.  |
| Materials/Advance Preparation Needed | -book “Diary of a Worm” -garden journals |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Using Tumblebooks have the students listen to the story “Diary of a Worm.” Ask students to explain why this book is fiction. Discuss facts that may be true in this story even though it is a fictional book.
2. On chart paper write the words “verb” and “adjectives”. Ask a student to remind the class what these words mean. Then go back through the book and pick out verbs or adjectives about worms and add them to the chart.
3. Discuss what a day in the life of a worm in our worm bin might be like. Ask students to write a diary entry in their garden journal from a worm’s point of view. When they are finished they can share them with the class.

Extension:After going through the book looking for verbs or adjectives students could come up with own verb and adjectives in their garden journal and share them with a partner.  |
| Assessment (What will be the evidence of student learning?) | Assess students’ list of verbs and adjectives. Also check their diary entries in the garden journal for signs of using transitional words using sequenced events.  |

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| Title | Estimate Worms |
| Overview | Students will estimate how many worms are in the worm bin. Then we will take out sections and count them.  |
| Standards | M 1.OA.1 use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking part and comparing, with unknowns in all positions, e.g., by using objects, drawings and equations with a symbol for the unknown number to represent the problem. M1.OA.2 solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. M.1.NBT.1 count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.  |
| Materials/Advance Preparation Needed | -worm bin-paper towels-garden journals |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Ask students what the word “estimate” means. Ask students how many worms they think are in the worm bin. As a class brainstorm ways we could find out.
2. If you are only using one tray take out half of the worms and dirt. Divide them up into 5 groups. Allow the students to count the worms in their piles. Remind students that there is more than one right way to count a large group of objects.
3. Once all the groups have finished ask each group for their totals and write the numbers on the board. Ask students what we should do next.
4. After you find the total for half of your worm bin ask the students how we could find the total number of worms in our bin. Hopefully they will say to double our answer. Write the problem on the board and have the students help you solve it.
5. Ask students to get out their garden journals and write 3 worm story problems. Then find a partner to solve them.

Extension:-Students could count the worms by two in the beginning so we don’t have to double at the end.  |
| Assessment (What will be the evidence of student learning?) | Walk around the room and make sure students are counting correctly. Check students’ story problems to see what strategies they are using to solve the problem.  |

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| Title | Worm Facts |
| Overview | Students will distinguish the difference between a fact or opinion using the worm facts from the internet.  |
| Standards | 1 LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.1 LS3-1 Make observations to construct an evidence-based account that young plants and animals are alike, but not exactly like, their parents.ELA 1.R.C1.4 ask and answer questions about key details in an informational textELA.1.R.C4.2 with prompting and support, read informational texts appropriately complex for grade 1ELA.1.W.C11.1 participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).ELA.1.SL.C13.1 participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groupsELA.1.SL.C13.2 ask and answer questions about key details in a text read aloud or information presented orally or through other media |
| Materials/Advance Preparation Needed | -Worm facts from <http://www.wormfarmingrevealed.com/fun-facts.html> -garden journal-note cards |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Today students will distinguish between fact or opinion. Using your See, Think, Wonder chart tell the students that you will try to answer their wonderings about worms today. Refer back to some of their questions from the chart or come up with new questions they may have about worms.
2. As a class read the facts from <http://www.wormfarmingrevealed.com/fun-facts.html> and discuss what they mean.
3. Ask students to compare the worms to humans. You could complete a Venn Diagram as a class or in their garden journals.
4. Ask students to explain the difference between fact or opinion. Say several sentences and ask students to stand up if it is a fact. Once you feel that most students understand the difference give each student 6 note cards and ask them to write 3 worm facts and 3 worm opinions.
5. When their cards are complete ask them to find a buddy to sort their cards.

Extension: -Students can write fact or opinion cards with a buddy if they need extra help. --Students could research more worm facts online if they finish early and share with the class what they learned.  |
| Assessment (What will be the evidence of student learning?) | Go around the room and check that students are sorting the cards correctly between fact or opinion. .  |

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| Title | Worm Measuring  |
| Overview | Read “Inch by Inch” as a class and discuss what the inch worm can do. Then assign students to cut out their own inch worm using a ruler and measure items around the room. |
| Standards | ELA.1.R.C1.1 ask and answer questions about key details in a literary textM.1.MD.2 express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end and understand that the length measurement of an object is the number of same-size length units that span it with not gaps or overlaps.  |
| Materials/Advance Preparation Needed | -rulers-book “Inch by Inch”-paper to make inch worm-items to measure-garden journals |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. As a class read and discuss the book, “Inch by Inch.”
2. Ask students what things the inch worm could measure in their classroom.

Discuss the skills of measuring, (no gaps or overlapping) as a class. 1. Introduce students to a ruler and model how to make an inch worm on scrap paper. Students can color their inchworm if they want to.
2. Allow students to investigate items around the room and find out how many inchworms long they are. They can record their discoveries in their garden journals.

Extension: -Students could be given a sheet with lines on it that they need to measure using their inchworm. - Students could measure the length of a few worms for the worm bin and discuss: How does the length of our worm bin worms compare to the inch worm. Teacher should model how to measure so as not to arm the worms while measuring them.  |
| Assessment (What will be the evidence of student learning?) | Observe the students as they measure. Check for proper use of a ruler.  |

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| Title | Worm Art |
| Overview | Students will create a pattern on a paper worm.  |
| Standards | M.1.G.1 distinguish between defining attributes (e.g., triangles, are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size), build and draw shapes to possess defining attributes  |
| Materials/Advance Preparation Needed | -Art supplies-paper |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Ask students to list the different types of patterns. (AB, ABBA, etc.) Write the list on the board.
2. Instruct students to draw an outline of a worm on their paper. It can be a long squiggly worm, or even a worm that spirals. Direct the students to try to fill the entire page with their worm.
3. Next have students divide their worm into separate parts about ½ inch long. Finally the students can design their worm using different shapes, colors, and patterns.

Extension: Students can name their pattern on their artwork.  |
| Assessment (What will be the evidence of student learning?) | Check students’ work for understanding of patterns and shapes.  |

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| Title | Worm Experiments |
| Overview | Students will engage in making scientific observations to learn more about a worm’s behavior.  |
| Standards | 1-PS4-3 Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. 1 LS3-1 Make observations to construct an evidence-based account that young plants and animals are alike, but not exactly like, their parents.ELA.1.W.C11.2 with guidance and support from adults, recall information from experiences or gather information from provided sources to answer a questionELA.1.SL.C13.1 participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups |
| Materials/Advance Preparation Needed | -flashlight-wet paper towel-nail polish remover-vinegar-perfume-cotton balls-colored light \_science journal -Set up six stations according to the science journal found here: Stem Mom: Can Worms Smell? <http://www.stemmom.org/2012/10/can-worms-smell-wormy-experiment.html#comment-form>   |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Explain and model all six worm stations set up around the room.
2. Station 1: Can worms see light? Using a flashlight shine the light on the worm and see if the worm moves towards or away from the light.
3. Station 2: Wet or Dry? Using a wet paper towel and a dry paper towel see which towel the worm prefers to be on.
4. Station 3: Can worms smell? Using the presoaked perfume or vinegar cotton balls see if the worms are attracted to any sort of scent.
5. Station 4: Where on a worm’s body are the most sensitive to light? Using a flashlight observe where the worm is most sensitive, the head, middle, or tail.
6. Station 5: Are worms sensitive to touch? Using a qtip observe if a worm is sensitive to touch on their head, middle, or tail.
7. Station 6: How do worms react to colored light? Using flashlights covered with colored saran wrap observe if the worm is most interested in the white, red, or green light.
8. If students finish a station early they can work on the back page- a drawing of their worm house.
9. Divide students up into 6 groups and set a 10 minute timer. Students will rotate through each station and then share results.
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| Assessment (What will be the evidence of student learning?) | Check students’ science journals to see if they are making observations and predictions about their worm experiments.  |

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| Title | Fluency |
| Overview | After students have researched and experimented with worms they will now read a series of short fictional worm books. After reading these books with a partner they will create their own easy reader using nonfiction facts about worms.  |
| Standards | ELA 1.R.C2.2 explain major differences between books that tell stories and books that give information, drawing on a wide reading of a range of literary text typesELA.1.R.C2.6 distinguish between information provided by pictures or other illustrations and information provided by the words in an informational textELA.1.R.C4.2 with prompting and support, read informational texts appropriately complex for grade 1ELA.1.R.C7.1 know and apply grade-level phonics and word analysis skills in decoding wordsELA.1.W.C9.2 write informative/explanatory texts in which they name a topic, supply some facts about the topic and provide some sense of closure |
| Materials/Advance Preparation Needed | -books: Caple, K. (2000) “Worm is Hot” Candlewick Pr Caple, K. (2000) “Worm Paints” Candlewick PrCaple, K. (2000) “Worm Smells” Candlewick PrCaple, K. (2000) “Worm Builds” Candlewick PrCaple, K. (2000) “Worm Watches” Candlewick PrCaple, K. (2000) “Just Right” Candlewick Pr* Blank template of easy reader book
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| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Assign students partners to read 3 or more of Kathy Caple’s easy readers about worms.
2. As a class discuss what students may have noticed about these books. Each book follows a pattern and is easy to follow.
3. Instruct students to write their own worm book using facts they have learned about worms. They can look back through their garden notebook for ideas. After they have made a rough draft of their story in their garden notebook edit together.
4. Finally give each student a template to make their own easy reader book.
5. Share with the class.
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| Assessment (What will be the evidence of student learning?) | Listen as students read the stories with their partner. Check students’ rough draft for informative/explanatory facts.  |

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| Title | Worm Songs |
| Overview | Practice fluency by singing these songs as a class. Then let students pick which song they would like to perform for the parent program. Students will make posters for the parent program to explain how to make a worm bin and what to feed your worms.  |
| Standards | ELA 1.R.C4.1 with prompting and support, read prose and poetry of appropriate complexity for grade 1 in literary textsELA.1.R.C7.1 know and apply grade-level phonics and word analysis skills in decoding wordsELA.1.W.C11.1 participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).ELA.1.W.C11.2 with guidance and support from adults, recall information from experiences or gather information from provided sources to answer a questionELA.1.SL.C13.1 participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups |
| Materials/Advance Preparation Needed | -songs on PowerPoint-poster boards-art supplies- songs from Enviro Challenger [www.envirochallenger.com](http://www.envirochallenger.com)Songs: Worm Bin Boogie (Hokey Pokey)You the put **the worms** in and take some worm dirt out, you put **the worms** in and COMPOST all about, you do the Worm Bin Boogie and you save the environment, that’s what it’s all about. (clap, clap)You put some water in and keep the worms in the dark, you put some water in but give your worms some air, you do the Worm Bin Boogie and save the environment, that’s what it’s all about. (clap, clap)Substitute these phrases for “**the worms**” and repeat the rest of the song-some fruit scraps-some veggie scraps-some leafy greens. Kindergarten\* Had Some Worms (Old MacDonald’s Farm)\*substitute your gradeKindergarten had some worms,In a compost bin.And all these worms made healthy soilIn a compost bin.With a squiggle, squiggle here and a squiggle squiggle there,Here a squiggle, there a squiggle everywhere a squiggle, squiggle.Kindergarten loved their wormsIn their compost bin. The Worms in Our Bin (The Wheels on the Bus)The worms in our bin they eat our trash,Eat our trash, eat our trash.The worms in our bin they eat our trashAnd help to save the Earth.Little Worms (Twinkle, Twinkle, Little Star)Little worms in our bin so neat.How I wonder what you eat.Apples, egg shells, veggies too.All these things are good for you.Don’t give ‘em eggs, don’t give ‘em cheese.No matter what, no meat please!Little worms in our bin so neat, Now I know just what you eat! |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | 1. Introduce one song a week and sing it every morning to practice fluency.
2. After learning each song let students divide themselves up equally into 3 groups. (First Graders Had Some Worms, The Worms in Our Bin, and Little Worms) They practice singing the songs with their group and adding actions if they want to.
3. Help students complete invitations to invite parents to attend the Worm Bin Presentation.
4. To prepare for the presentation ask students to design posters about how to take care of a worm bin. (what worms eat, steps to building a worm bin, graph of days it took for the food to decompose, etc.)
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| Assessment (What will be the evidence of student learning?) | Check students’ posters for facts they recalled from the songs.  |