Profile Sheet
PBL Lesson Plan for Diverse Learners

Teacher:  Jennifer Vaughn

Primary Subject Area:  Science

Outside Subject Area:  Language Arts

Class:  3rd Grade

Class Level:  Regular

Grade Level:  3rd Grade

PBL Title:  The A’s and “Bee’s” of Plant Reproduction

Description of Student Roles and Problem Situation:
Students become the hope and help for a desperate association in need when they assume a team role of scientists (bee scientist, plant scientist, agricultural scientist, wildlife scientist, disease scientist, weather scientist: simple job title that a 3rd grader can understand) at a fictitious U.S Agricultural Bee Research Service. The fictitious Farmers Association of Florida need help from the scientist on how to bring back the honey bees to pollinate their crops in order to improve their profits. The association sends a letter to the research service as well as an online article describing the problem.

Adaptations for a student from a non-Western culture:
To include a student from a non-Western culture and to accommodate different cultures I will include resources from the student cultures such as research time on the internet or going to the library to allow the student to be more informed with the information the rest of the class is learning. I will pair that particular student with another “friendly helper” student to guide and help student that is from a non-Western culture.

Adaptations for ESOL students:
I can help assist the student with books from the library about plants and bees to give them a better understanding about the subject. I can also allow the student to go to a translating website to translate the assignment.
Title; Characteristics of Learners; Sunshine State Standards
Teacher: Jennifer Vaughn
Primary Subject Area: Science
Outside Subject Area: Language Arts
Class: 3rd Grade
Class Level: Regular
Grade Level: 3rd Grade

PBL Title: The A’s and “Bee’s” of Plant Reproduction

SSS in Science:
SC.3.L.14.1: Describe structures in plants and their roles in food production, support, water and nutrient transport, and reproduction.

SC.F.2.3.1: Knows the patterns and advantages of sexual and asexual reproduction in plants and animals

SC.3.L.14.2: Investigate and describe how plants respond to stimuli (heat, light, gravity), such as the way plant stems grow toward light and their roots grow downward in response to gravity.

SSS in Language Arts:
LA.C.3.3: The student uses speaking strategies effectively.
LA.3.1.6.1: The student will use new vocabulary that is introduced and taught directly.

Learner Characteristics of Primary Grades
**Physical:** “Primary grade children are still extremely active. Because they are frequently required to participate in sedentary pursuits, energy is often released in the form of nervous habits – for example, pencil chewing, fingernail biting, and general fidgeting” (pg. 74).

Justification: In primary grades students are more likely to pay attention during hands on experiments, therefore reducing nervous habits. The children will be actively engaged in a moving and engaging setting rather than a sedentary position.

**Social:** “Children during this age span often like organized games in small groups, but they may be overly concerned with rules or get carried away by team spirit” (pg. 76).

Justification: Students will get more one on one attention in small groups which will reduce conflict. Students also learn better and pay more attention in small group settings.

**Cognitive:** “Primary grade children understand that there are different ways to know things and that some ways are better than others” (pg. 77).

Justification: Biehler and Snowman suggested that students at the primary age prefer explanation based on evidence. Students gain knowledge by doing experiments hands on rather than just hearing it in a lecture.

**Emotional:** “Most primary grade children are eager to please the teacher” (pg. 76).

Justification: Snowman and Biehler explains that in order to satisfy the need to please, children can be assigned certain roles. They feel like they are important resulting in a since of worth.
Learning Outcomes,Student Role and Problem Situation, Meet the Problem Method
PBL Lesson Plan for Diverse Learners

Original Title: The A’s and “Bee’s” of Plant Reproduction
Teacher: Jennifer Vaughn

Primary Sunshine State Standards with Learning Outcomes:

SC.3.L.14.1: Describe structures in plants and their roles in food production, support, water and nutrient transport, and reproduction.

LO#1: After practicing and reviewing the roles of plants, plant structures, and reproduction by animals, students will correctly summarize and explain to another student what he or she just learned correctly. (Comprehension)

SC.3.L.14.2: Investigate and describe how plants respond to stimuli (heat, light, gravity), such as the way plant stems grow toward light and their roots grow downward in response to gravity.

LO#2: After watching a video and reading pages from their science books, students will be able to illustrate a worksheet accurately. (Comprehension)

SC.F.2.3.1: Knows the patterns and advantages of sexual and asexual reproduction in plants and animals.

LO #3: After reading an article about how bees are not pollinating farm plants as they used to from Discovery Kids will construct an explanation of how asexual reproduction is different from sexual reproduction, giving at least 2 accurate differences and providing at least 2 examples of asexual reproduction. (Synthesis)

Outside Subject Area Sunshine State Standards from Language Arts with Learning Outcomes:

LA. LA.C.3.3: The student uses speaking strategies effectively.

LO#4: After reading the article about the problem with honey bees the student will be asked to develop a plan to the class on how he/she will solve it. (Application)

LA.3.1.6.1: The student will use new vocabulary that is introduced and taught directly.

LO#5: Given vocabulary words, students should be able to define them with 95% accuracy. (Knowledge)
**Description of Student Roles and Problem Situation:**
Students become the hope and help for a desperate association in need when they assume a team role of scientists (bee scientist, plant scientist, agricultural scientist, wildlife scientist, disease scientist, weather scientist: simple job title that a 3rd grader can understand) at a fictitious U.S. Agricultural Bee Research Service. The fictitious Farmers Association of Florida need help from the scientist on how to bring back the honey bees to pollinate their crops in order to improve their profits. The association sends a letter to the research service as well as an online article describing the problem.

**Meet the Problem Documents:**
The memo and internet article (attached) are both utilized as “meet the problem” documents.

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**Honey Bees**

**Online Article from Discovery Kids.com**

All across the United States, honeybees are flying away from their hives and dying. Empty hives are causing a lot of worry about some important food crops.

Bees give us a lot more than delicious honey. They are pollinators—they enable plants to produce the fruits and nuts we enjoy by carrying pollen from one plant or flower to the next. The wind pollinates oats, corn, and wheat, but many other plants (like apple and cherry trees and melon vines) depend on insects, bats, and birds.

Animals pollinate about one out of every three bites of food we eat. And in the U.S., millions and millions of bees kept by human beekeepers fly around doing a lot of this important work for food crops.

Professional beekeepers raise honeybees, box them up, and send them on trucks to fields where farmers grow food. Bees live in groups of about 40,000 individuals called colonies.

California’s almond crop alone depends on about half the bees in the country, about 1.5 million colonies! The bees pollinate in the almond groves for about six weeks, and then are sent on to work other crops. But now the almond crop and many others could be in trouble with so many bees dying.
“The colony is what we call a super-organism,” says Dr. Jeff Pettis of the Bee Research Laboratory at the U.S. Agricultural Research Service in Beltsville, Maryland. “When a lot of the bees die, the whole colony is at risk.” Researchers like him at government and university labs all over the country are trying to figure out why so many bee colonies are dying.

However, explains Pettis, bees are hard to study. Most die away from the hive, so researchers don’t have dead bodies to examine. And when researchers return to a hive after two weeks, about half the bees they studied on their first visit will be dead, replaced by new ones in the natural life cycle of bees.

Making detective work even harder, these busy insects fly up to two miles away from their hive in search of pollen and nectar from flowers. So when bees pick up diseases or get exposed to poisons in their environment, it is hard to know exactly where that happened.

“It isn’t like studying a large animal like a cow that doesn’t move around much and is easy to find out in the cow field,” says Pettis.

Researchers do have some ideas about what could be affecting bee health. They could be sick from poisons widely used to kill insects, or they might not be getting enough good food to stay strong. Also, tiny insects called mites feed on bees. “Any or all of these things could be weakening the honey bees,” explains Pettis, “and then a virus or bacteria could be doing the killing.”

Pettis is hoping for a solution, because bees are so important. “Here’s a good example of what pollinators like bees give us,” he says. “You can eat plain oatmeal every day and get by, and oats are pollinated by the wind. But if you want to add some blueberries or strawberries or nuts to your daily oatmeal, those are the things you have to thank pollinators for. Bees are worth protecting because their work adds so much to our diet.”
TO: U.S Agricultural Bee Research Service Scientists
FROM: Farmers Association of Florida
DATE: January 20, 2010
RE: HELP!! NO POLLINATION = NO CROPS

The Farmers Association of Florida has a concern that their crops are not being pollinated from honey bees like they had been in the previous years. The honey bees are dying out for some reason and therefore there are not enough honey bees to pollinate the farmers’ crops resulting in slower growth and lower profits. This is not only a problem locally but is also happening in California. The association is in desperate need of help for your services before this problem worsens. We have a budget of $10,000 and a time frame of one year. We are asking your research team to help determine the problem, meet the problem, and guide us in a direction to solve the problem.

Thank you again for your time and services. We are committed to provide healthy and safe food for the American people and are concerned about the health of our consumers.
Problem Statement, Know/Need to Know Boards and Possible Resources

Original Title: The A’s and “Bee’s” of Plant Reproduction
Teacher: Jennifer Vaughn

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SC.3.L.14.1: Describe structures in plants and their roles in food production, support, water and nutrient transport, and reproduction.
LO#1: After practicing and reviewing the roles of plants, plant structures, and reproduction by animals, students will correctly summarize and explain to another student what he or she just learned correctly. (Comprehension)

SC.3.L.14.2: Investigate and describe how plants respond to stimuli (heat, light, gravity), such as the way plant stems grow toward light and their roots grow downward in response to gravity.
LO#2: After watching a video and reading pages from their science books, students will be able to illustrate a worksheet accurately. (Comprehension)

SC.F.2.3.1: Knows the patterns and advantages of sexual and asexual reproduction in plants and animals

LO #3: After reading an article about how bees are not pollinating farm plants as they used to from Discovery Kids will construct an explanation of how asexual reproduction is different from sexual reproduction, giving at least 2 accurate differences and providing at least 2 examples of asexual reproduction. (Synthesis)

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LA.3.1.6.1: The student will use new vocabulary that is introduced and taught directly.

LO#5: Given vocabulary words, students should be able to define them with 95% accuracy. (Knowledge)
Problem Statement

How can we, as scientists, return the bee population to normal to insure farmers that the bees will pollinate their crops in such a way that

We will aid in wildlife food production

We will come to a conclusion on how to solve the problem and have an idea on why the honeybees are dying in the first place.

We will do this in such a way that there is no harm to the bees or will not negatively impact the environment.

We will stay within our budget and will hopefully solve the problem over a year.

Know Board: After reading the article “What’s happening to the honeybee?” from Discovery Kids Online

1. We have $10,000 to spend on this project.

2. Farmers are complaining that their crops are not being pollinated due to bee pollination.

3. Previous years crops have had no problems with pollination and the bees were the main cause.

4. There is a one year cap on this project

5. According to the article we know that animals pollinate about one out of every three bites of food we eat.

6. According to the article we know that bees are pollinators and they enable plants to produce the fruits and nuts we enjoy by carrying pollen from one plant or flower to the next.

7. According to the article we know that honeybees are flying away from their hives and dying.

8. According to the article and according to the Bee Research Laboratory at the U.S. Agricultural Research Service in Beltsville, Maryland states that bees are hard to study because a lot of the bees die away from the hive and they don’t have dead bodies to examine.
Need to Know Board

1. Why the honeybees are flying away from their hives and dying?
2. How are professional beekeepers raising honeybees?
3. How are plants pollinated?
4. How much of the honeybee population really depend on the pollution of crops?
5. Does the climate have anything to do with the decrease of honeybees?
6. The stages of plant growth?
7. Are the honeybees being exposed to poisons or picking up diseases from the crops?
8. Is there a shortage of food for the honeybees?
9. What is the price for this research?
10. How honeybees pollinate flowers

Resources

Books

“The Life Cycle of a Honey Bee”, By: Bobbie Kalman

“Honey Bees: Letters from the Hives” By Stephen Buchmann, Banning Repplier - Random House


Online

http://www.scribd.com/doc/2538442/Pollination-of-Flowers

http://www.ebeehoney.com/Pollination1.html

http://www.surfnetkids.com/honey_bees.htm

Online Video

http://www.ebeehoney.com/Pollination1.html
Video

City of Bees By: Laila Hodell
Capstone Performance Description

The capstone performance for this problem will contain 2 parts: each student will write a half page persuasive essay and the also give a performance as a group. Both parts of the problem will be graded using one rubric.

In the persuasive essay students will be take on the role of a member of the U.S Agricultural Bee Research Service that have been asked to make a research team to help determine the problem of the honey bees not pollinating farmers crops as they have in previous years, meeting that problem, and guiding the Florida Farmer’s Association in a direction to solve the problem. After each student writes their persuasive essay they will read it to the others in their group and as a group they will choose the best solution. The team can combine solutions to come up with the best.

In the oral presentation, one student will take on the role of the lead scientist and the other 3 students will be the research assistants. The group will present their solution to a few administrators who will act as The Florida Farmers Association. The group will present the decision with justifications of their decision. They should include 3 justifications and answer the questions of why are the honey bees not pollinating, how to solve the problem and how to come up with solutions to make the honey bees pollinate farmer’s crops again. Questions will be asked the scientist research team by the administrators which will be given to them by the teacher.
# Rubric for Assessing the Capstone Performance

## Essay Rubric

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>Superior</th>
<th>Average</th>
<th>Poor</th>
</tr>
</thead>
</table>
| **Standards Identified**  | 8 points  
Essay contains descriptions of all listed science standards with 90% accurately. Also give 2 explanations on why they had to know this information to solve the problem. | 6 points  
At least two standards were described and only one reason why they had to know this information to solve the problem. | 2 points  
Less than 75% of the essay addresses the standards and explanations on why they had to know the information to solve the problem. |
| **Information Research**  | 12 points  
Essay cites at least four pieces of accurate information from their Know, and four pieces from their Need to Know research pertaining to their area of “expertise.” | 8 points  
Essay cites at least three pieces of accurate information from their Know, and three pieces from their Need to Know research pertaining to their area of “expertise.” | 2 points  
Essay cites fewer than three pieces of accurate information from their Know, and/or fewer than three pieces from their Need to Know research pertaining to their area of “expertise.” |
| **Analysis**              | 12 points  
Two possible solutions to the problem are addressed that are appropriate to their role.  
AND  
At least four justifications are given as to why they are recommending one solution over the other. | 6 points  
Two possible solutions to the problem are addressed that are appropriate to their role.  
AND  
At least two justifications are given as to why they are recommending one solution over the other. | 2 points  
Student failed to provide two possible solutions to the problem that are appropriate to their role.  
OR  
Student failed to provide at least two justifications as to why they are recommending one solution over the other. |
| **Determine the problem** | 8 points  
At least three accurate statements were made as to how the honey bees are possibly not pollinating farmers’ crops. | 6 points  
Two accurate statements were made as to how the honey bees are possibly not pollinating farmers’ crops. | 2 points  
One accurate statement was made as to how the honey bees are possibly not pollinating farmers’ crops. |
| **Resources**             | 8 points  
At least two sources are cited for information utilized in the essay. | 6 points  
One source cited for information utilized in the essay | 2 points  
Not all sources are cited for information utilized in the essay. |
<table>
<thead>
<tr>
<th>Structure, Grammar, And Spelling</th>
<th>8 points</th>
<th>6 points</th>
<th>2 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essay is well structured (an introduction with a statement identifying the student’s role and audience, body, and conclusion) with a maximum of 3-4 grammatical or spelling errors.</td>
<td>Essay is well structured (an introduction with a statement identifying the student’s role and audience, body, and conclusion) with a maximum of 6-8 grammatical or spelling errors.</td>
<td>Essay is well structured (an introduction with a statement identifying the student’s role and audience, body, and conclusion) with more than 8 grammatical or spelling errors. OR Essay’s structure is not well structured (as defined above).</td>
<td></td>
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</tbody>
</table>

Grade Conversion

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-56</td>
<td>A</td>
</tr>
<tr>
<td>45-50</td>
<td>B</td>
</tr>
<tr>
<td>40-44</td>
<td>C</td>
</tr>
<tr>
<td>34-39</td>
<td>D</td>
</tr>
<tr>
<td>0-33</td>
<td>F</td>
</tr>
</tbody>
</table>
# Presentation Rubric

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<thead>
<tr>
<th>CATEGORY</th>
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<th>Average</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation Authentic to Assigned Role</td>
<td>10 points Presenter stays in their assigned “role” 100% of the time.</td>
<td>6 points Presenter stays in their assigned “role” at least 75% of the time.</td>
<td>2 points Presenter stays in their assigned “role” less than 75% of the time.</td>
</tr>
<tr>
<td>Accuracy of Presentation</td>
<td>20 points Student presents their position with 100% accuracy in both their content presentation and while answering questions.</td>
<td>14 points Student presents their position with at least 75% accuracy in both their content presentation and while answering questions.</td>
<td>8 points Student presents their position with less than 75% accuracy in one/both their content presentation and while answering questions.</td>
</tr>
<tr>
<td>Justifications</td>
<td>12 points Student should give three justifications by answering the question: Why are the honey bees not pollinating? Give 2 examples on how they would solve the problem of getting the honey bees to pollinate the farmers’ crops again.</td>
<td>8 points Student only give two justifications by answering the question: Why are the honey bees not pollinating? Only giving 1 examples on how they would solve the problem of getting the honey bees to pollinate the farmers’ crops again.</td>
<td>4 points Student only answers one of the questions.</td>
</tr>
<tr>
<td>Participation</td>
<td>8 points When not verbalizing their position, the student actively listens during 100% of the discussion.</td>
<td>6 points When not verbalizing their position, the student actively listens during 75% of the discussion.</td>
<td>2 points When not verbalizing their position, the student actively listens during less than 75% of the discussion.</td>
</tr>
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## Grade Conversion

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<tr>
<td>0-29</td>
<td>F</td>
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</table>
Two Alternative Solutions; “Best” Solution Analysis
Jennifer Vaughn
PBL Lesson Plan for Diverse Learners

Original Title: The A’s and “Bee’s” of Plant Reproduction
Teacher: Jennifer Vaughn

Primary Sunshine State Standards from Science with Learning Outcomes

SC.3.L.14.1: Describe structures in plants and their roles in food production, support, water and nutrient transport, and reproduction.
LO#1: After practicing and reviewing the roles of plants, plant structures, and reproduction by animals, students will correctly summarize and explain to another student what he or she just learned correctly. (Comprehension)

SC.3.L.14.2: Investigate and describe how plants respond to stimuli (heat, light, gravity), such as the way plant stems grow toward light and their roots grow downward in response to gravity.
LO#2: After watching video and reading pages from their science books, students will be able to illustrate a worksheet accurately. (Comprehension)

SC.F.2.3.1: Knows the patterns and advantages of sexual and asexual reproduction in plants and animals

LO #3: After reading an article about how bees are not pollinating farm plants as they used to from Discovery Kids will construct an explanation of how asexual reproduction is different from sexual reproduction, giving at least 2 accurate differences and providing at least 2 examples of asexual reproduction. (Synthesis)

Outside Subject Area Sunshine State Standards from Language Arts with Learning Outcomes:

LA. LA.C.3.3: The student uses speaking strategies effectively.
LO#4: After reading the article about the problem with honey bees the student will be asked to develop a plan to the class on how he/she will solve it. (Application)

LA.3.1.6.1: The student will use new vocabulary that is introduced and taught directly.
LO#5: Given vocabulary words, students should be able to define them with 95% accuracy. (Knowledge)

Problem Statement:
How can we, as scientists, return the bee population to normal to insure farmers that the bees will pollinate their crops in such a way that:

-We will aid in wildlife food production
-We will come to a conclusion on how to solve the problem and have an idea on why the honeybees are dying in the first place.
-We will do this in such a way that there is no harm to the bees or will not negatively impact the environment.
-We will stay within our budget and will hopefully solve the problem over a year.

**Solution 1:**

The U.S Agricultural Bee Research Service Scientists recommend the following possible solutions to the problem. The recommendation is based on the budget of $10,000, identified needs of keeping the environment safe, completing the project within means and the given time limit, and aiding in crop reproduction. Scientists are proposing a solution to the problem by taking the following action. The scientists need to do at least 9 months worth of research of the bee population and why they are not pollinating the crops. Bees from outside areas will be brought in around the area to increase the bee population. A 12 month hold will be put on production of honey. New plants will be tested and planted that attracts bees. After completed research scientist can relay their gathered information to local farmers and suggest possible solutions on how to keep the bees in their area and practicing way on how to keep the bees around.

<table>
<thead>
<tr>
<th>Study of bee population and research</th>
<th>$ 6,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buying bees</td>
<td>$ 700</td>
</tr>
<tr>
<td>Experiment with different plants</td>
<td>$ 3,000</td>
</tr>
</tbody>
</table>

**Total Estimated Cost:** $ 9,700

<table>
<thead>
<tr>
<th>Pro</th>
<th>Con</th>
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<tbody>
<tr>
<td>The estimated costs are slightly under budget within the $10,000 budgeted amount.</td>
<td>Because the costs are only estimates, the cost may go over the allotted $10,000.</td>
</tr>
<tr>
<td>An increase amount of honey bees</td>
<td>More time might be needed to research the bees.</td>
</tr>
<tr>
<td></td>
<td>Decrease in honey farmers’ profits</td>
</tr>
<tr>
<td></td>
<td>Research and solutions might not be effective</td>
</tr>
</tbody>
</table>
Consequences:

The problem might be far from the allocated factors. Climate, weather, area, predators, etc. might be factors on to which the farmers’ crops are not being pollinated.

**Solution 2:**

The U.S Agricultural Bee Research Service Scientists recommend the following possible solutions to the problem. The recommendation is based on the budget of $10,000, identified needs of keeping the environment safe, completing the project within means and the given time limit, and aiding in crop reproduction. Scientists are proposing a solution to the problem by taking the following action. Scientist will study the weather and climate or the area; they will analyze soil samples, study the local plants, and study the predator to the local bees. After their research they will come up with solutions on to how to pollinate more crops. Using different possible plants around the farm to possibly keep the bees in the area and work with local honey bee farmers to maybe move their bee colonies to or around the farms.

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>Soil Analysis</td>
<td>$1,000</td>
</tr>
<tr>
<td>Plant Study</td>
<td>$2,000</td>
</tr>
<tr>
<td>Predator Study</td>
<td>$3,000</td>
</tr>
<tr>
<td>Plants that attract bees</td>
<td>$4,000</td>
</tr>
</tbody>
</table>

**Total Estimated Cost:** $10,000

<table>
<thead>
<tr>
<th><strong>Pro</strong></th>
<th><strong>Con</strong></th>
</tr>
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<tbody>
<tr>
<td>The estimated costs are within the $10,000 budgeted amount.</td>
<td>Honey bee farmers might not want to move their bee colonies.</td>
</tr>
<tr>
<td>Bee population will increase</td>
<td>Bees might now stay for a long period of time</td>
</tr>
<tr>
<td>Farmers can plant plants that attract and more bees will pollinate their plants.</td>
<td>Climate and weather could be the main problem</td>
</tr>
</tbody>
</table>

Consequences:

The study could show that the problem is way more complex and out of scientists hands. It could be other factors such as climate and there can be nothing done to prevent this problem from happening.
If the final costs are greater than 20% over the estimated costs, something from the solution will have to be eliminated which will be frustrating to citizens.

**Justification:**

Best solution: Solution 2. Both solution 1 and solution 2 are within budget, they both keep in mind of protecting the environment, planting plants that attract honey bees, and both do research to study and find ways or solutions to end the problem and come up with very helpful solutions. I think Solution is the best because there is more research compiled and more data to work with.
Debriefing Plan and Coaching Questions
PBL Lesson Plan for Diverse Students

Teacher’s Name: Ms. Vaughn
Title:

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We will aid in wildlife food production

We will come to a conclusion on how to solve the problem and have an idea on why the honeybees are dying in the first place.

We will do this in such a way that there is no harm to the bees or will not negatively impact the environment.

We will stay within our budget and will hopefully solve the problem over a year.

Debriefing Plan:

Each team will act as a U.S Agricultural Bee Research Service that have been asked to make a research team to help determine the problem of the honey bees not pollinating farmers crops. There will be a mock meeting which students will then present their solutions orally to the panel of 6 representatives from the Florida Farmers Association aka teachers, parents, and administrators. Everyone will hear each group’s solutions presentations. Every student in the audience will record information about each best solution from each group. This information will be used for rating each group’s best solution. Also, each student will list strengths and weaknesses and discuss which solution will be the best.

Rating the solutions:

Each student will be given a short form what will be used for ranking and grading the solutions. There will be criteria and ranking numbers 1-5. One being “Could be better” and five being “Great Idea”. The number will be circled under each criterion. After all questions are circled there will be a total number score. After all of the presentations each student should be able to tell me what they think is their best choice to their least choice. Before the form is turned in as a class we will determine which presentation is the best solution or what solutions we could use from each group to make another solution.

Coaching Questions:

Key to Question Type: C = cognitive, M = metacognitive, E = epistemic cognitive

Meet the Problem:
C- Why is it so critical that the Florida Farmers Association need a solution to their problem?
M- What are some strategies you could use to define the problem?
E- What will happen to the farmers crops if nothing is done about the problem?
Know/Need to Know:

C – How could you find out about the price of the research?
M- How do you know what is important to other local farmers?
E-What problems do you see?

Problem Statements:

C- What is your role in this problem?
M- Why do you think this is important?
E- What might be a better request to solve the problem?

Research:

C- How are you going to find out the information you need?
M- How do you know that the research is reliable?
E- If you choose one solution over the other how do you know which one is better?

Generating Possible Solutions:

C- What are the positives and negatives of this solutions?
M- Is this a problem that can be solved and why do you feel this way?
E- Who will benefit from the solved solution?