**Name of Participant**: Rebecca Welch

**Instructional Coach**: Chis Gibler and Jane Brown

**Lesson Title**: No Waste Lunch

The Impact of Student Choices

**Rational:** Students typically acquire their resource management habits from their families. In our local community recycling is rare habit. I would like students to learn that recycling can be a manageable and worthwhile practice. Students will learn how they as consumers can have good habits that will impact the sustainability of our planet’s resources.

**Lesson Narrative**:

Students learn how to plan a “no-waste” lunch by exploring the differences between re-usable, recyclable, and waste materials. Engage the students by displaying a collection of used materials associated with a common sack lunch as well as purchased school lunch. Shock your students with literature that includes statistics about a typical American student lunch. Explore the concept of recycling by using web based resources and a hands on classification of materials. Expand the students’ knowledge of waste management as you guide the practice of science note booking skills. Students practice their skills as they collect, display, and analyze data about their own teacher’s lunch habits. The students will identify and make judgments about the teacher’s best use of resources related to lunch consumption. Students will individually demonstrate newly acquired knowledge in a formative assessment. The students will observe another individual student’s lunch habits and develop educational pamphlets to promote a “no-waste” program for their elementary school specifically targeted to changing one student’s lunch at a time. Students who successfully complete their pamphlet will be ready to play an on-line recycling game. Students who need more opportunity for understanding will participate in a re-teaching project. Students will use lower level high interest reading material and participate in another hands on classification model. Students elaborate their understanding of re-usable packaging by participating in a Benefits of Reusable Lab. Students will determine the benefits of re-usable packaging compared to single serve disposable packaging. As a summative evaluation students will engage in a MAP like performance event. Students practice science process skills by categorizing, comparing, estimating, and analyzing the waste habits of a fictional elementary class. Students apply written communication skills as they prepare a formal letter to report their findings to the school district superintendent.

**Grade Level**: 3-4th

**Student Learner Goals/Objectives**:

53Ab. Processes and Interactions of the Earth’s Systems

(Geosphere, Atmosphere, and Hydrosphere)

b. Propose ways to solve simple

environmental problems (e.g.,

recycling, composting, ways to

decrease soil erosion) that result

from human activity

71Aa.b.c. Science Inquiry

a. Formulate testable questions and

explanations (hypotheses)

b. Recognize the characteristics of a

fair and unbiased test

c. Conduct a fair test to answer a

question

71Bd.e. Science Inquiry

d. Compare amounts/measurements

e. Judge whether measurements

and computation of quantities are

reasonable

71Ca.b.c.d. Science Inquiry

a. Use quantitative and qualitative

data as support for reasonable

explanations

b. Use data as support for observed

patterns and relationships, and to

make predictions to be tested

c. Evaluate the reasonableness of an

explanation

d. Analyze whether evidence

supports proposed explanations

71Da Science Inquiry

Scope and Sequence - All Units

a. Communicate the procedures and

results of investigations and

explanations through:

⇛ oral presentations

⇛ drawings and maps

⇛ data tables

⇛ graphs (bar, single line,pictograph)

⇛ writings

83Aa. Impact of Science, Technology and Human Activity

a. Identify a question that was asked,

or could be asked, or a problem

that needed to be solved when

given a brief scenario (fiction or

nonfiction of people working alone

or in groups solving everyday

problems or learning through

discovery)

**Featured Scott Foresman’s Textbook**:

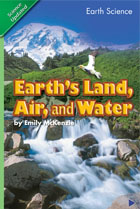
**3rd Grade Chapter 3 pg 70-76 What are Ecosystems**

**Chapter 9 pg 241-261 Natural Resources**

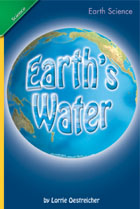
**4th Grade Chapter 10 pg 281-304 Using Natural Resources**

**Leveled Readers**

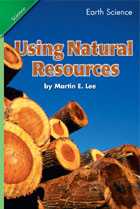
**2nd Grade**

** Earth’s Land, Air, and Water**

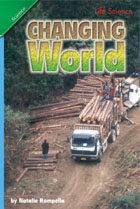
**3rd Grade**

** Earth’s Natural Resource  Earth’sWater**

**4th Grade**

** Using Natural Resources  Resources**

**5th Grade**

** Changing World**

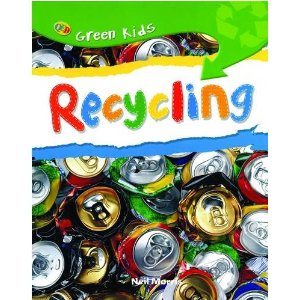
**Featured Trade Books:**

** Recycle Everyday!**

**Written and Illustrated by Nancy Elizabeth Wallace**

**Common Ground The Water, Earth, and Air We Share**

**by Molly Bang**

**Recycling by Neil Morris Something Old, Something New Recycling by Anita Ganeri**

**Academic Vocabulary Words**:

Environment, reduce, re-use, recycle, packaging, disposable, refuse, waste, solid waste, household waste, landfill, dump, compost, consumption, raw material, sustainability, natural resources, fossil fuel, pollution, aluminum, steel

**Safety**: Children should not handle garbage directly. If “real” lunch waste is used appropriate care should be taken not to spread germs from one person’s waste to those observing it. Food handler gloves would be an additional safety step precaution necessary. It is critical to direct students to not touch anything they are unsure of. Additional care should be taken in order to not collect broken or dangerous waste materials for student observation and sorting.

**Bibliographies of more information**:

Websites

A kid friendly Eco foot print quiz [www.**kidsfootprint.org**/BobbieIndex.html](http://www.kidsfootprint.org/BobbieIndex.html)

EPA Environmental Kids Club: <http://epa.gov/kids>

EEK (Environmental Education for Kids): <http://www.dnr.state.wi.us/eek/>

US Dept. of Energy: <http://www.eere.energy.gov/kids/games.html>

Earth Matters for Kids: <http://www.earthmatters4kids.org/main.html>

Additional Trade Books

Galko, Francine Earth Friends at the Grocery Store Reduce Reuse Recycle

Galko, Francine Earth Friends at Home Reduce Reuse Recycle

Galko, Francine Earth Friends at Play

Walker, Kate Household Waste

Mackenzie, Anne L Let’s Recycle

Nelson, Sara Let’s Reduce Garbage

Turnbull, Stephanie Trash and Recycling

Trumbauer, Lisa We Need Garbage Collectors

Miller, Heather What does a Sanitation Worker Do?

Dorian, Christiane Earth’s Garbage Crisis

Reilly, Kathleen M Planet Earth 25 Environmental Projects You Can Build Yourself

**Backwards by Design “No Waste Lunch”**

**\* Formative Assessments prior to Engage activity (DOK 1)**

Students plan artwork for a My Family Recycles Calendar. This will become a gift for the holiday season later in the year. The drafted illustrations will show the students’ schema regarding recycling.

Begin the project by reading the first two pages of Recycle EveryDay! Written and Illustrated by Nancy Elizabeth Wallace. The fictional story is about a young rabbit whose school is having a recycling poster contest. The winning recycling posters will be combined into a Community Recycling Calendar. Tell the students that similar to the rabbit in the story. They will be creating a My Family Recycles Calendar to give as a holiday gift. To start the project today students will begin by brainstorming ideas for the twelve calendar pages of their calendar. Tell the students that is planning or drafting stage of the project and sketches are appropriate. This should be treated just like the beginning parts of the writing process sketches are similar to the pre-writing stage. Each student will be given a large sheet of chart paper. Tell students that you would like to see as many ideas as possible. One way to elicit multiples sketches is to divide the paper into a 4x4 array therefore creating a minimum of 16 boxes to brainstorm inside. Students will need to narrow their ideas down to twelve later, but today you‘d like to see as many as possible. After giving students an adequate time for planning the calendar artwork, the group will do a gallery walk to see the others student’s ideas. This activity will inform the teacher of the students’ current level of knowledge pertaining to recycling. The calendar plans will then be saved for a revision activity as a post assessment activity.

After the calendar drafting activity, the students will also be given a pre-assessment E-Instruction Clicker Survey to collect classroom data about family recycling habits. The survey will be repeated at the conclusion of the lesson. This data will help the teacher determine if the lesson had an impact on community recycling. **(DOK1)**

Clicker Survey

How many bags of trash does your family produce each week?

A just 1

B 2-4

C more than 4

How often does your family use the recycling containers outside our school?

A every week

B a few times a month

C every few months

D never

If you said “Never” answer the following question

Do you take recyclables to another location?

A yes

B no- everything is trash

Do you know what materials you can recycle?

A yes

B I think so

C nobody has showed me

Do you need more ideas for you’re My Family Recycles Calendar?

A yes

B no

**Engage (DOK2)**

Engage students in thinking about waste by displaying a pile of common waste from student lunches. Be sure to combine waste from sack lunches as well as a typical school cafeteria lunch.   
Inventory the waste by having students identify the materials by doing a Kit Inventory. Ask questions such as What color is it? What is it used for? Where do we find this? Create a word wall with graphic representations of the items you cannot display directly.

Read the “Did you know?” text from the book Recycling by Neil Morris. These non-fiction text boxes contain a variety of shocking facts about waste. Use these facts to establish a clear need for managing waste more appropriately.

Read Common Ground The Water, Earth, and Air We Share by Molly Bang or the Featured Scott Foresman text. “What is an Ecosystem?” Define sustainability and have students add it to their science notebook.

**Explore (DOK2)**

Start a science note booking session with the question: How can we categorize waste?

Give groups of students a collection of materials. Encourage students to set up a data table in their notebooks to explain how their group sorts the materials. (Be sure to follow appropriate safety steps when students are in contact with waste materials)

Allow students to create their own data charts and appropriate labels for the charts. At this point in time a variety of labels may fit the materials given.

**Explain (DOK2-3)**

Review the term natural resources by reading the featured Scott Foresman text   
Natural Resources” Introduce the terms recyclable, re-usable, solid waste, household waste by reading Something Old, Something New Recycling by Anita Ganeri or by using the featured Scott Foresman text “Using Natural Resources“.

Use the EPA publication Trash and Climate Change to establish the need for waste management. The publication describes multiple reasons for reducing, reusing, and recycling. The publication also gives specific examples of ways that students can positively impact environment change.

Guide students through a more in-depth note booking session to answer the question: Which day did the teacher plan the best “no-waste” lunch? Display waste from a typical week of lunches. Students will create a data chart labeling the types of materials used each day. The teacher will direct students through the process of categorizing the materials as recyclable, re-useable, or waste. After completing the data chart, students will answer the posed question. Students will cite data as evidence of their conclusion.

Sample Chart \* Lunch Choices- Use of Material

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Monday |  | Tuesday |  | Wednesday |  | Thursday |  | Friday |  |
| Lunchable  (Plastic, Cardboard Packaging) | R | Brown Bag  Ziploc bags for Sandwiches, Chips, Cookies | R  R | Styrofoam Tray | S | Plastic Container with Salad | RU | Styrofoam Tray | S |
| Plastic Spreader | R | Plastic Fork |  | Plastic Milk Jug | R | Metal Spoon | RU | Plastic Milk Jug | RU |

Key R= Recyclable

RU=Reusable

S= Solid Waste

**Evaluate \* Formative Assessment Project (DOK 3-4)**

Notebook Question: What types of resources do 2nd graders use at lunch?

Students will observe a younger student buddy at lunch time. The students will observe and collect data in their science notebook about the student’s lunch. This observation data would simply look like a list of the resources used. The students will then organize their data into a table communicating whether the items are re-usable, recyclable, or waste. This is a direct application of the same skills used in the Explain project. Students data charts may look similar to the example above.

Discuss with students the idea of starting a “No-Waste” lunch initiative at the school. In order promote a “No-Waste” lunch program students will make pamphlets to use as education material for their buddies. Each pamphlet should suggest what students can do with the materials or what alternative might be a better choice. Students will draft a copy of their pamphlet to share with the teacher prior to final production. The teacher will use the drafted pamphlets to guide individualized instruction for any students who need to repeat the Explain cycle of the lesson.

Students who successfully plan an education pamphlet will be given time to complete a final copy with detailed illustrations. Students may also use this time to play the Earth Matters4Kids Recycling Game On-line. During this time the teacher can work to differentiate instruction.

**(DOK 1-2)** For those who need additional re-teaching read the books Let’s Recycle, Let’s Reduce Garbage, and Trash and Recycling. These books are written one to two grade levels below grade level. Then the teacher will guide students through a second classification of materials associated with student lunches. Have students sort the real objects. The groups of students will review their pamphlet project with the teacher to correct misconceptions and add details.

\*Sample Line of the Educational Pamphlet

|  |  |  |
| --- | --- | --- |
| MC900290914[1] | Your bag is made of paper.  Please recycle your brown paper lunch sack…  Or  Use a re-usable Lunchbox | BMC900366652[1] |

**Elaborate/Extend (DOK2-3)**

Extend the students knowledge of re-usable materials by conducting the Benefits of Re-usable Applesauce Lab. Students will learn that re-usable containers keep waste from going to landfills. Filling the re-usable containers has a cost savings benefit for the consumer. Students will compare learn how many disposable packaging cups can be filled from a re-usable or recyclable bulk packaging container. The students will do a cost comparison between disposable packaging vs. recyclable and re-usable packaging.

**Evaluate MAP Style Performance Event (DOK 2 3 4)**

See the Summative Assessment Project Pages and Key

**Evaluate (DOK1)**

Conduct the Post-Assessment Clicker Survey to collect data on recycling habits.

My Family Recycles Calendar Project

Allow students to revise their drafts in order to incorporate things they have learned. The classroom teacher can use the final project as a informal assessment of students learning.

**Evaluate (DOK 4)**

**\* Summative Assessment**

**Performance Event MAP Practice**

**Senario:**

**You are an “Eco-Consultant” who has been hired by the school district. Your job is to observe current waste management practices in the local elementary school. After observing students you will report your findings back to the local superintendent along with suggestions for making beneficial changes to BeTree Elementary.**

**Observing all the students would be a difficult task for just one person so you start with one boy and one girl. Jackie and Tim are 4th graders in Mrs. Welch’s class at BeTree Elementary. You observe them at lunch time on Wednesday, Thursday, and Friday and sketch the items they use in your notebook.**

**These are the observations you made.**

**MC900359565[1] MC900290233[1] MC900384344[1]**

**MC900237730[1] MC900363736[1] MC900053589[1]**

**MC900149912[1] MC900232682[1]  MC900348865[1]**

**Organize this information into a chart to share with the superintendant.**

**Remember title your chart.**

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

|  |  |  |
| --- | --- | --- |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

**Suggest two ways that Tim and Jackie can change to a “No Waste” style lunch.**

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**After observing Jackie and Tim you decide that more data is needed to represent the student population. You discuss with Mrs. Welch the best way to observe the whole class. You decide to involve the students in data collection. The students are asked to keep a list of the items they use at lunch time for a whole week. You collect their data and compile it into the following data table. Use the data table to answer the multiple choice questions below.**

**Lunch Resources from 1 Class During 1 Week**

|  |  |
| --- | --- |
| **Item** | **Quantity** |
| **Brown Bags** | **13** |
| **Styrofoam Trays** | **72** |
| **Lunch Boxes** | **17** |
| **Plastic Silverware** | **160** |
| **Re-usable Silverware** | **12** |
| **Plastic Milk /Juice Jugs** | **80** |
| **Juice/Milk Boxes** | **17** |
| **Aluminum beverage cans** | **6** |
| **Zipper baggies** | **68** |
| **Chip or Cookie bags** | **56** |
| **Plastic Cups (applesauce, fruit, pudding,etc.)** | **14** |
| **Napkins** | **274** |

**Which beverage container did the students use the least?**

* **Brown bag**
* **Juice/Milk Box**
* **Aluminum beverage can**
* **Plastic Milk or Juice Jug**

**Which two items did the students use the most?**

* **Plastic Milk/Juice Jugs and Zipper Bags**
* **Plastic Milk and Juice Jugs and Napkins**
* **Napkins and Styrofoam Tray**
* **Plastic Silverware and Napkins**

**To save resources which of the following groups of items could be recycled?**

* **Plastic Milk/Juice Jugs**
* **Aluminum beverage cans**
* **Plastic Cups**
* **Brown Bags**
* **All of these**

**Based on the data from Mrs. Welch’s class you estimate the quantities of items used by 2 classes. Finish the chart below to estimate the waste produced by 4 classes.**

**Estimated Lunch Resources**

**Mrs. Welch’s Class**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Quantity** | **Estimate of 2Classes** | **Estimate of 4 Classes** |
| **Brown Bags** | **13** | **26** |  |
| **Styrofoam Trays** | **72** | **144** |  |
| **Lunch Boxes** | **17** | **34** |  |
| **Plastic Silverware** | **160** | **220** |  |
| **Re-usable Silverware** | **12** | **24** |  |
| **Plastic Milk or Juice Jugs** | **80** | **160** |  |
| **Juice/Milk Boxes** | **17** | **34** |  |
| **Aluminum beverage cans** | **6** | **12** |  |
| **Zipper baggies** | **68** | **136** |  |
| **Chip or Cookie bags** | **56** | **112** |  |
| **Plastic Cups (applesauce, fruit, pudding,etc.)** | **14** | **28** |  |
| **Napkins** | **274** | **548** |  |

**Use the Estimated Data from your chart to finish the bar graph.**

**Next write a letter to the superintendent explaining the urgency of starting a “No-Waste Lunch” initiative at BeTree Elementary. Use details from your data as evidence of this need. Describe specific ways the students can reduce solid waste. Give suggestions for ways student’s can reduce, re-use, and recycle. Conclude your letter by sharing potential benefits of starting this program.**

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**No Waste Map Practice Key**

**Evaluate (DOK 4)**

**\* Summative Assessment**

**Performance Event MAP Practice 20 pts Possible**

**Senario:**

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**Organize this information into a chart to share with the superintendant.**

**Remember title your chart.**

**(3 pts)**

**1. \_\_\_\_\_(appropriate title)\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **2.\_categories appropriate**   1. **At least 3 correct items in each group** | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

**Suggest two ways that Tim and Jackie can change to a “No Waste” style lunch.**

**(2 pts) All or nothing two separate suggestions that demonstrate an understanding of recycling or re-using**

**1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Napkins** | **274** |

**(3 single pts)**

**Which beverage container did the students use the least?**

* **Brown bag**
* **Juice/Milk Box**
* **Aluminum beverage can**
* **Plastic Milk or Juice Jug**

**Which two items did the students use the most?**

* **Plastic Milk/Juice Jugs and Zipper Bags**
* **Plastic Milk and Juice Jugs and Napkins**
* **Napkins and Styrofoam Tray**
* **Plastic Silverware and Napkins**

**To save resources which of the following groups of items could be recycled?**

* **Plastic Milk/Juice Jugs**
* **Aluminum beverage cans**
* **Plastic Cups**
* **Brown Bags**
* **All of these**

**Based on the data from Mrs. Welch’s class you estimate the quantities of items used by 2 classes. Finish the chart below to estimate the waste produced by 4 classes.**

**4pts all data correct**

**3pts only 1-3 estimates incorrect**

**2pts 4 or more estimates incorrect**

**1pt incomplete chart**

**Estimated Lunch Resources**

**Mrs. Welch’s Class**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Quantity** | **Estimate of 2Classes** | **Estimate of 4 Classes** |
| **Brown Bags** | **13** | **26** | **52** |
| **Styrofoam Trays** | **72** | **144** | **288** |
| **Lunch Boxes** | **17** | **34** | **68** |
| **Plastic Silverware** | **160** | **220** | **440** |
| **Re-usable Silverware** | **12** | **24** | **48** |
| **Plastic Milk or Juice Jugs** | **80** | **160** | **320** |
| **Juice/Milk Boxes** | **17** | **34** | **68** |
| **Aluminum beverage cans** | **6** | **12** | **24** |
| **Zipper baggies** | **68** | **136** | **272** |
| **Chip or Cookie bags** | **56** | **112** | **224** |
| **Plastic Cups (applesauce, fruit, pudding,etc.)** | **14** | **28** | **56** |
| **Napkins** | **274** | **548** | **1096** |

**3 pts All 4 missing bars correct**

**2 pts 1 graphing bar incorrect**

**1pt 2 or more incorrect**

**Use the Estimated Data from your chart to finish the bar graph.**

**Next write a letter to the superintendent explaining the urgency of starting a “No-Waste Lunch” initiative at BeTree Elementary. Use details from your data as evidence of this need. Describe specific ways the students can reduce solid waste. Give suggestions for ways student’s can reduce, re-use, and recycle. Conclude your letter by sharing potential benefits of starting this program.**

**(5pts) 1pt for correct letter format**

**3 pts for content (specific data cited from scenario)**

**1pt for writing voice to match prompt and benefit described**

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