

**Student Work Annotations**

**Based upon the Science ERQ Rubric**

Planning for a

Playground

**Grade Level:**

3

Designed and revised by Kentucky Department of Education staff

in collaboration with teachers from Kentucky schools and districts.

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# Background Information About the Task

**Task Overview**

Students will **analyze and interpret data** about the advantages and disadvantages of different types of grass and describe *how artificial grass* may affect *the plants and animals* in an environment in order to **construct a design solution about which grass provides the best solution.**

**Dimensions**

*Disciplinary Core Idea**(DCI)*

* LS4.D Biodiversity and Humans
  + Populations live in a variety of habitats, and change in those habitats affects the organisms living there.

**Science and Engineering Practice (SEP)**

* Constructing Explanations and Designing Solutions
  + Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution
* Analyzing and Interpreting Data
  + Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings

Crosscutting Concepts(CCC)

* Cause and Effect
  + Cause and effect relationships are routinely identified, tested, and used to explain change

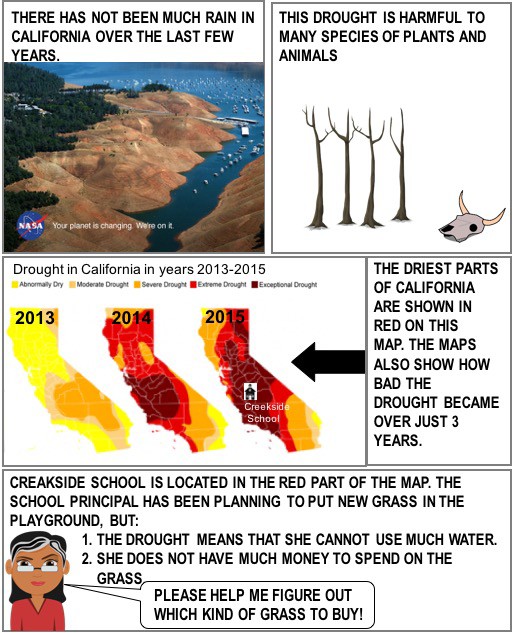
**Performance Expectations (PE) to which task is correlated**

* **3-5 ETS1-2**
  + Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
* **3-LS4-4**
  + Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

**Planning a Playground Task**

The original version of this Life Science & Engineering 3rd grade task may be found at: <https://snapgse.stanford.edu/snap-assessments/short-performance-assessments>

# Planning for a Playground



THE PRINCIPAL IS TRYING TO CHOOSE BETWEEN FOUR DIFFERENT TYPES OF GRASS TO USE ON THE PLAYGROUND. SHE STUDIES DATA TO HELP HER DECIDE WHICH ONE IS BEST FOR THE PLAYGROUND.

1. DATA THAT COMPARES HOW MUCH WATER EACH GRASS NEEDS:

Data shows grass types from needs most water to needs less water.  The order is Augstine, Bermuda, Centipede, Artificial



2. DATA THAT COMPARES HOW MUCH EACH GRASS COSTS

**Question 1.** SHE USES THE DATA TO DESCRIBE THE REASONS EACH GRASS COULD BE A GOOD CHOICE (ADVANTAGES) AND THE REASONS IT COULD BE A BAD CHOICE (DISADVANTAGES). USE THE DATA TO HELP HER COMPLETE THE TABLE.

|  |  |  |
| --- | --- | --- |
| **Grass** | **Advantages** | **Disadvantages** |
| AUGUSTINE |  |  |
| BERMUDA | None | Needs a lot of water AND |
|  |  | costs a lot of money |
| CENTIPEDE |  |  |
| ARTIFICIAL |  |  |

# Question 2:

ARTIFICIAL GRASS IS NOT REALLY GRASS. IT IS NOT A PLANT AT ALL—IT’S MADE OF PLASTIC!

WHAT COULD HAPPEN TO OTHER LIVING THINGS IF THE SCHOOL TAKES REAL GRASS (PLANTS) OUT OF THE PLAYGROUND AND PUTS IN ARTIFICIAL GRASS (PLASTIC)?

DESCRIBE ONE WAY THAT CHANGING FROM REAL GRASS TO ARTIFICIAL GRASS COULD AFFECT OTHER PLANTS OR ANIMALS IN THE PLAYGROUND. EXPLAIN YOUR ANSWER.

# Question 3

THE PRINCIPAL SAYS THAT IT IS IMPORTANT THAT THE PLANTS AND ANIMALS AROUND THE SCHOOL ARE NOT AFFECTED BY HAVING A NEW TYPE OF GRASS IN THE PLAYGROUND.

WHICH GRASS DO YOU THINK WOULD BE THE BEST FOR THE PRINCIPAL TO BUY? USE **ALL** OF HER CONSTRAINTS (BELOW) TO MAKE YOUR DECISION.



The principal’s constraints:

1. The drought means she cannot use a lot of water.
2. She does not have a lot of money to spend on the grass.
3. She does not want other plants and animals to be harmed by the new grass.



Circle one:

AUGUSTINE

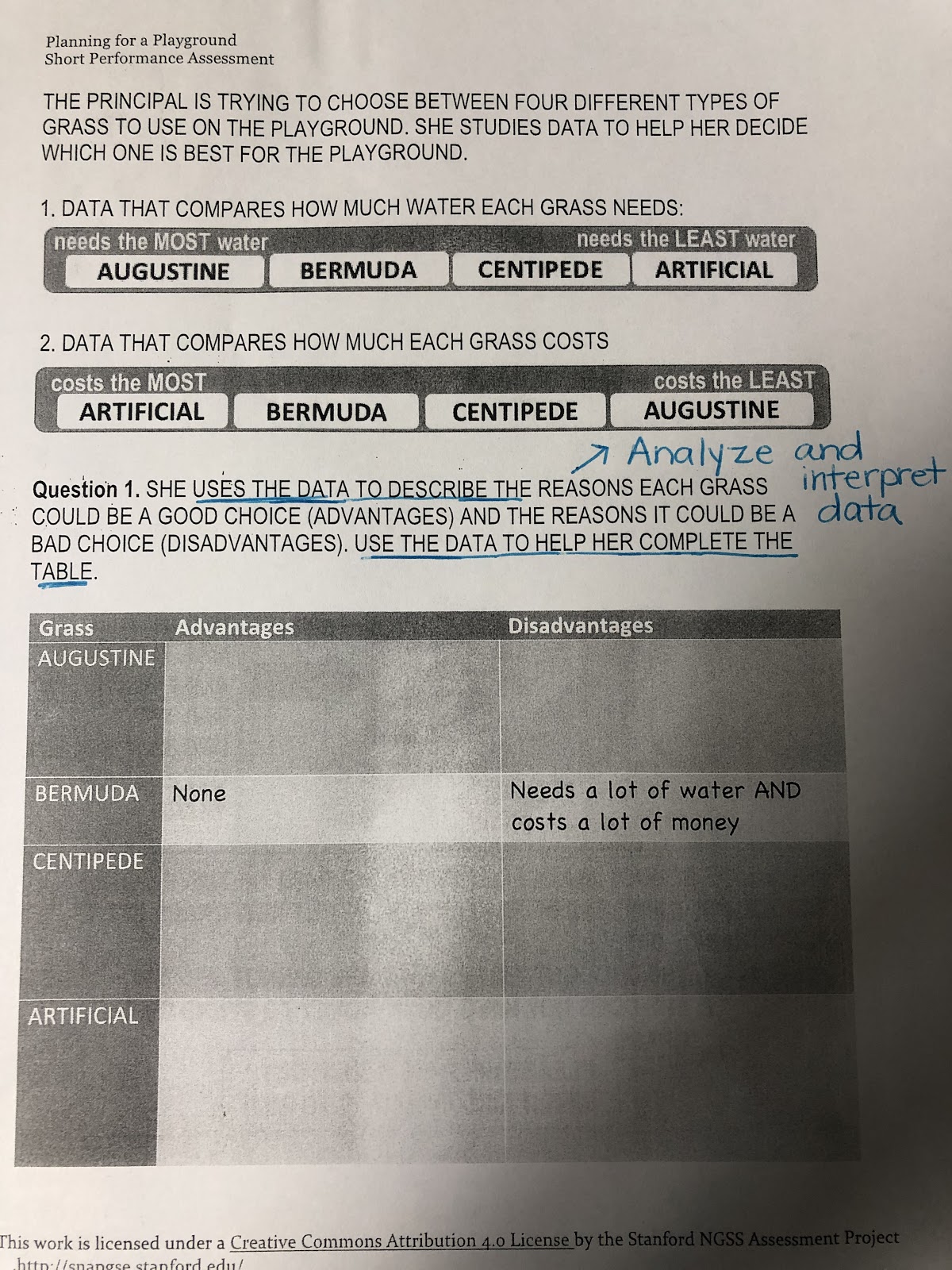
BERMUDA

CENTIPEDE

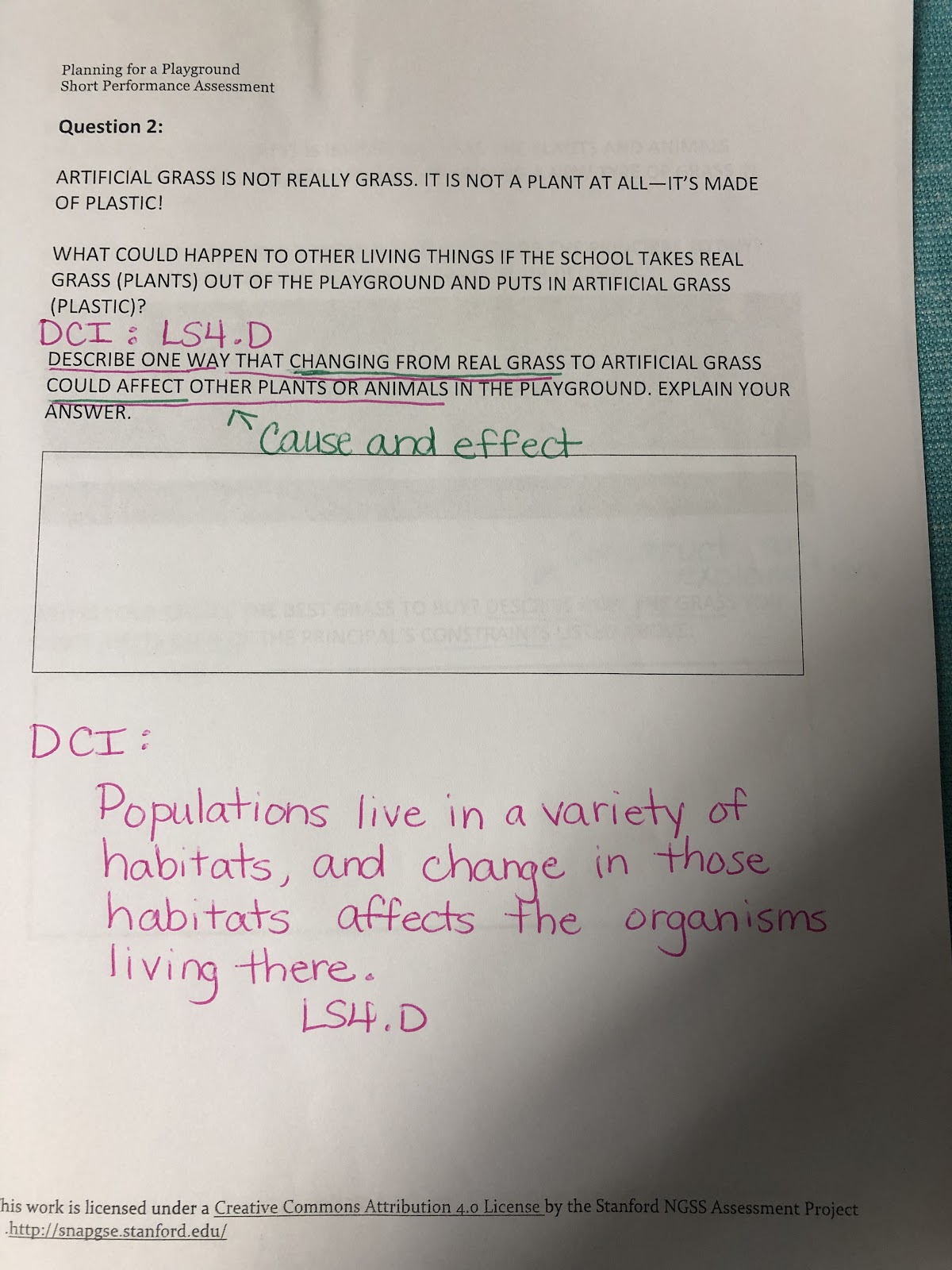
ARTIFICIAL

WHY IS YOUR CHOICE THE BEST GRASS TO BUY? DESCRIBE HOW THE GRASS YOU CHOSE MEETS EACH OF THE PRINCIPAL’S CONSTRAINTS LISTED ABOVE:

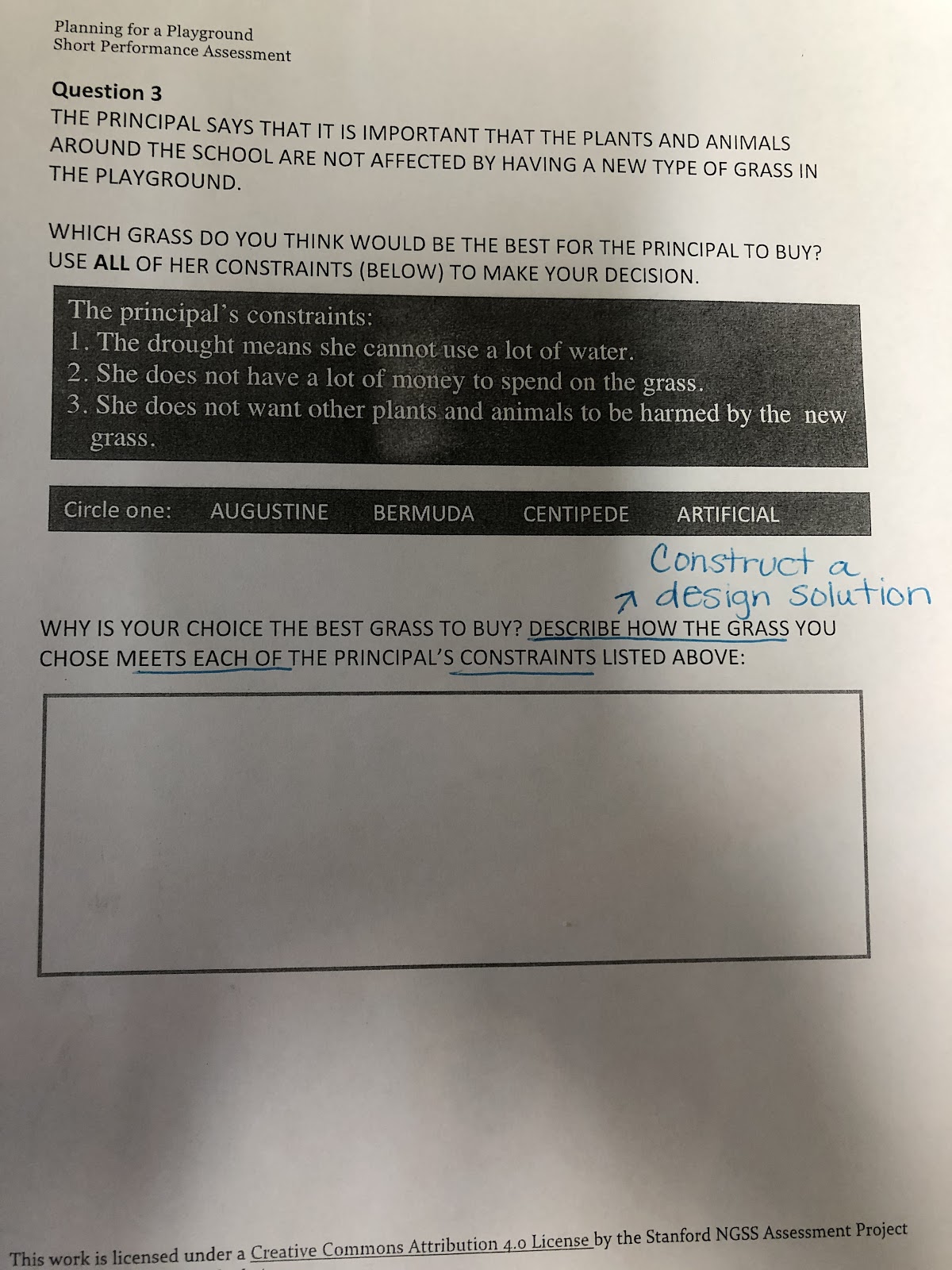
# Annotated Task



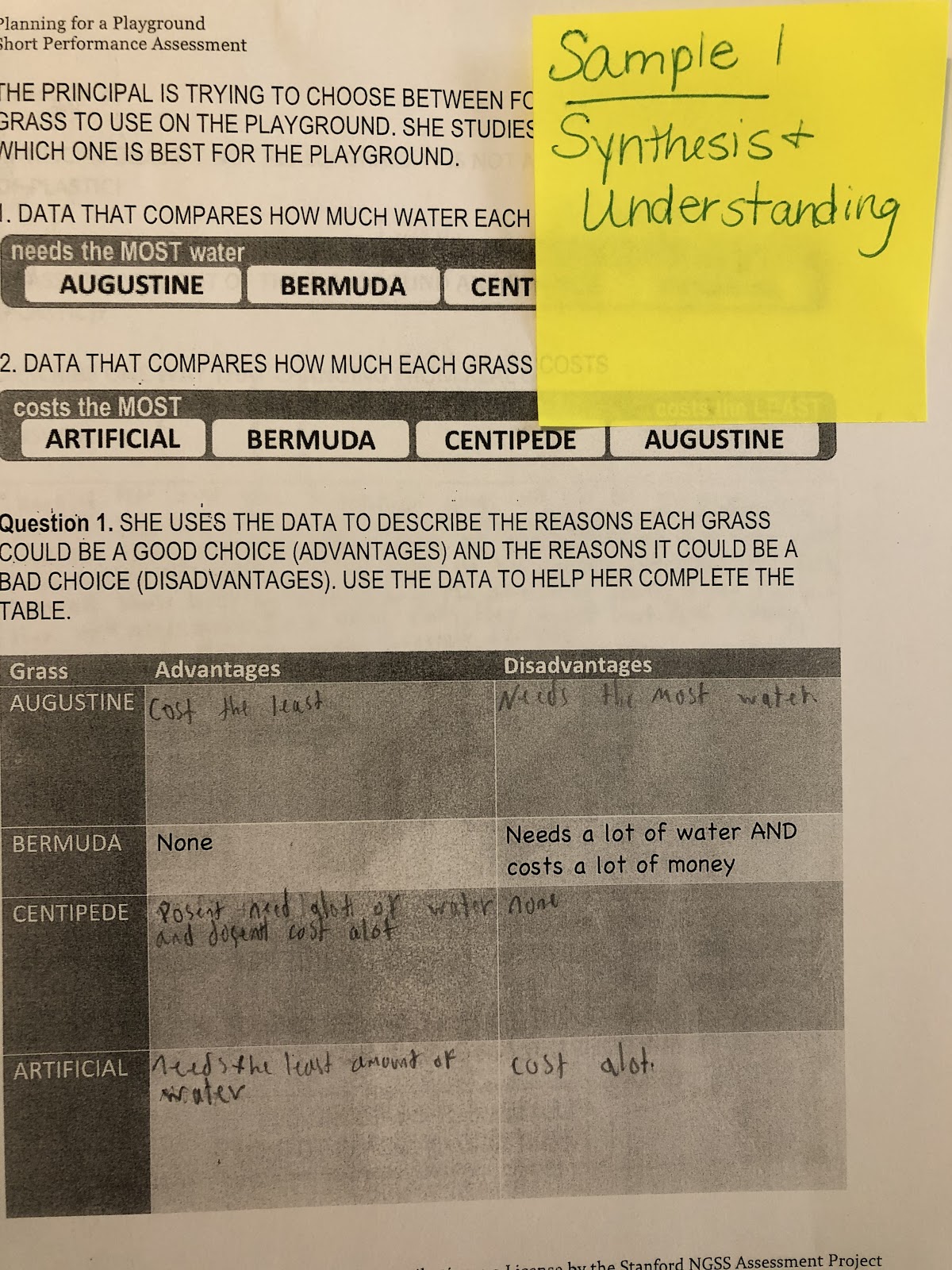
Question one: Students will analyze and interpret data about four different types of grass. They will complete a data table in order to show similarities and differences (advantages and disadvantages) of each type of grass.



Question two: Students are asked to describe how artificial grass would affect the plants and animals on the playground. They must show how one change in the environment affects the other organisms that live there.



Question three: The students compare multiple solutions (types of grass) to generate a design solution based on the principal’s criteria and constraints about which type of grass is best. The student must include evidence to support the claim.



Question 2 sample demonstrating synthesis and understanding.

In this response, the student demonstrates a general understanding that a change to the ecosystem would affect both the plants and animals living there.  The response demonstrates a general synthesis and understanding of complex ideas.  There is a general understanding of the DCI and the CCC (cause and effect).
• “Any seeds that land on the ground could not grow”
• “The animals who look for flowers, nuts, and plants could not eat”
• “The bees and the hummingbirds could not drink nectars.”
• “Plastic is bad for the ocean, especially turtles.”


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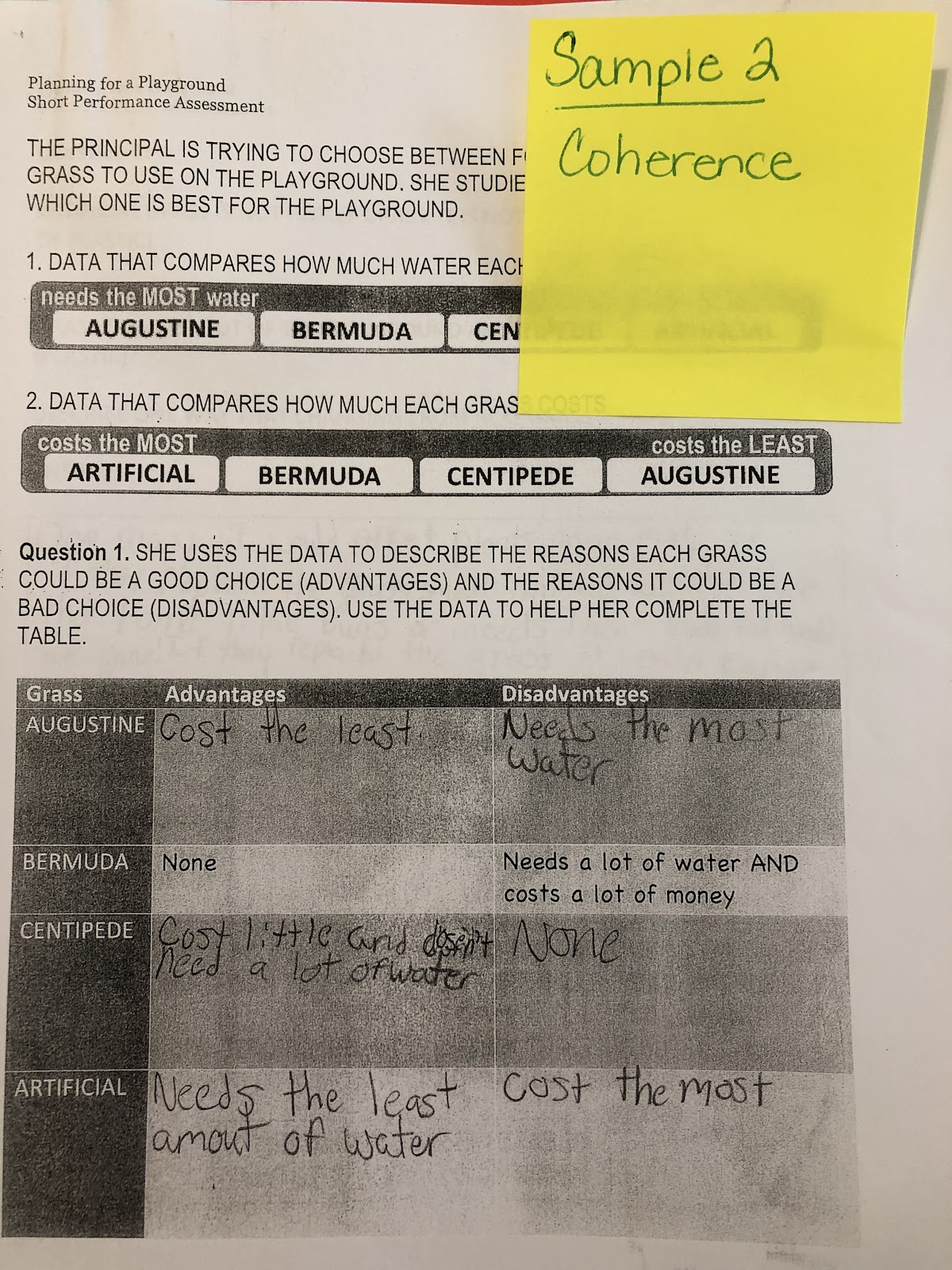
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Student response demonstrating synthesis and understanding between the DCI and the SEP.

In this response, the student refers to the information in the chart to construct a design solution that fits the principal’s constraints.  The response shows a general coherence and understanding of the practices (analyzing and interpreting data and constructing a design solution).
“According to the chart, centipede grass has no disadvantages.  The advantages are that centipede grass doesn’t cost a lot of money.  Centipede grass doesn’t use a lot of water.  Centipede grass doesn’t hurt the animals.”


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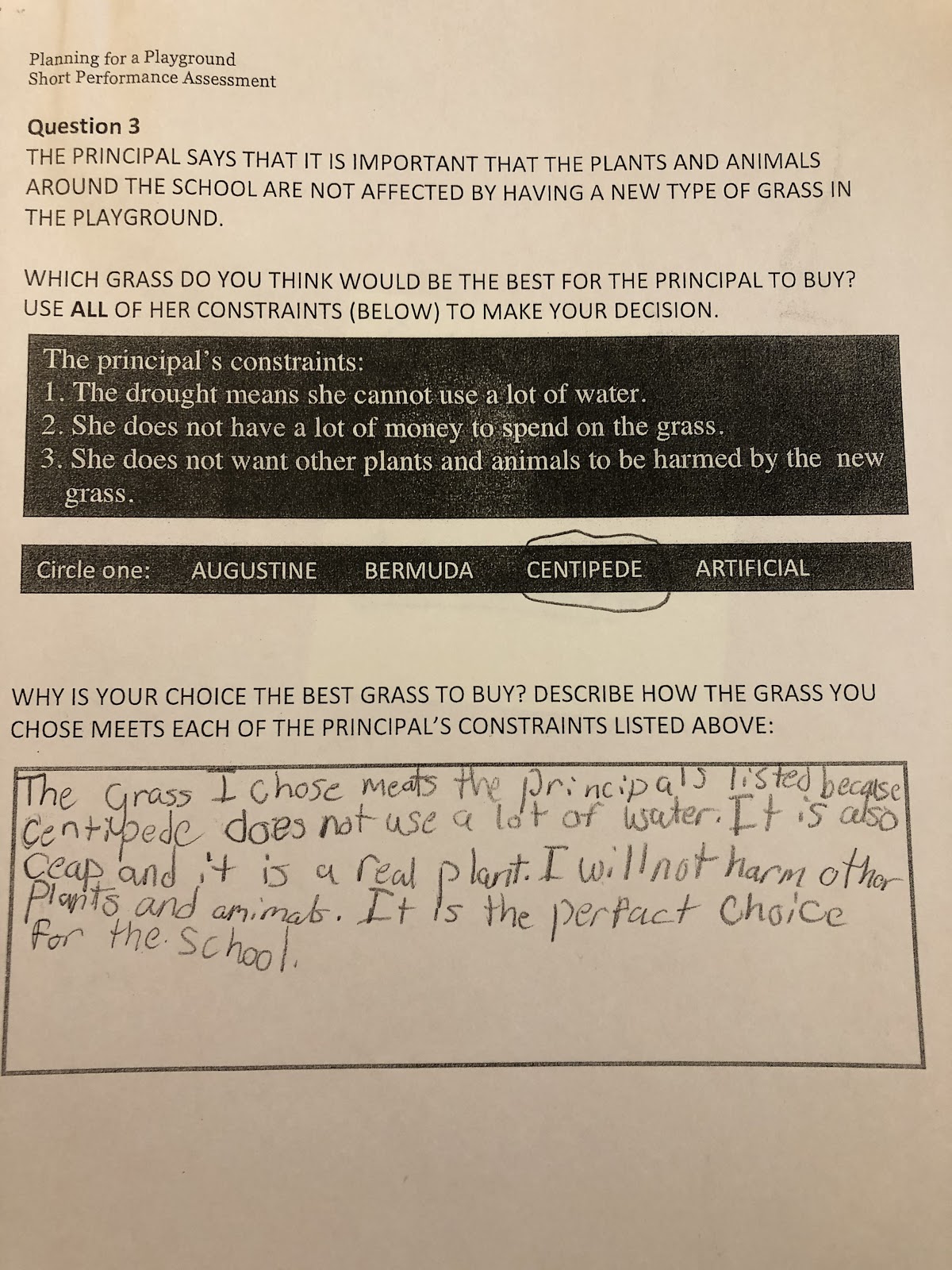
Question 2 in this student sample demonstrates some level of coherence.

In this sample, there is evidence of a general understanding of the DCI.  “If you replace the grass, small animals would lose their home.”  The response does not address how replacing real grass with artificial grass would affect the plants on the playground.
There is some evidence of coherence when the student identifies “effects” of changing the grass (CCC).  The student does not develop these ideas.
• “Bugs and insects would be gone.”
• “It could change a lot like the food chain.”
• “Animals would overpopulate.”


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Sample 3 student work showing errors in logical thinking.

In the sample, the student demonstrates a limited understanding of the DCI and the CCC.  The response shows significant errors and flaws in logical thinking.
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Sample 4

**Sample 4 response showing a flaw in logical thinking.
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