Core Skills Analysis

Mathematics

- The student applied measurement skills to determine the appropriate lengths of PVC pipes needed for the trellis, reinforcing concepts of linear measurement.
- They calculated the perimeter and area of the base of the trellis, enhancing their understanding of two-dimensional geometry.
- By estimating the number of PVC joints required, the student practiced skills in estimation and addition, providing a practical application for these mathematical concepts.
- The project involved basic algebra when determining the total cost of materials, teaching the student how to set up simple equations based on known quantities.

Science

- The student explored the properties of materials, specifically the flexibility and durability of PVC, which ties into lessons on material science.
- They learned about the importance of weather resistance in materials used outdoors, fostering an understanding of environmental science.
- In constructing the trellis, the student considered plant growth patterns and the structure's role in supporting plant life, linking biology concepts to real-world applications.
- The project provided an opportunity to discuss concepts of physics, such as stability and gravity, as the student assessed how to build a trellis that could withstand various weather conditions.

Art

- The student used design principles to create an aesthetically pleasing trellis, applying knowledge of symmetry and balance in their structure.
- They made creative decisions about the arrangement of the trellis components, exercising their artistic judgment and enhancing their design skills.
- Color and finishes for the PVC could have been considered, allowing for exploration of color theory even within a construction project.
- By visually planning the trellis, the student practiced sketching and drafting skills, which are foundational to many artistic disciplines.

Technology and Engineering

- The student engaged in problem-solving when deciding how to assemble different parts of the PVC trellis, applying engineering principles.
- They discovered the importance of tool safety and usage, learning about hand tools and power tools used in construction projects.
- This activity underscored the engineering design process, encouraging the student to plan, build, test, and modify their structure based on performance.
- The construction of the trellis helped the student understand project management skills, including time management and resource allocation.

Tips

To enhance the student's learning experience, consider encouraging them to document the entire process through a project journal or video. This can foster reflective learning and improve communication skills. Explore further concepts such as sustainable materials in construction and the ecological impacts of garden design. Additional activities, like creating different plant supports or even designing a garden layout, could provide more hands-on learning opportunities related to math, science, and art.

Book Recommendations

- <u>The PVC Project Book</u> by Samantha Clarke: A practical guide filled with innovative ideas for projects utilizing PVC, from garden designs to home decor.
- Engineering for Kids: Bridges and Buildings by Jennifer Kelly: This book introduces essential engineering concepts through engaging projects and illustrations that encourage creativity.
- <u>The Garden Jungle: Designing and Planting Your Eco-Adventure</u> by Mark Green: An inspiring resource on creating ecological gardens, focusing on design elements and sustainable practices.

Learning Standards

- Common Core Math Standard 7.G.B.6: Solve real-world and mathematical problems involving area, volume, and surface area.
- NGSS HS-ETS1-2: Design a solution to a complex problem by breaking it down into manageable sub-problems.
- Visual Arts Standard VA:Cr2.1.8: Brainstorm multiple approaches to a creative art or design problem.
- NGSS HS-LS2-4: Use mathematical representations to describe and support claims for the cycling of matter and flow of energy among organisms in an ecosystem.