Core Skills Analysis

Technology and Engineering

- Understand the basic functionalities and interface of TinkerCad and Fusion 360 software for 3D modeling.
- Learned how to design digital 3D objects that can be prepared for printing, understanding spatial dimensions and scale.
- Developed skills in computer-aided design (CAD) crucial for prototyping and manufacturing.
- Gained familiarity with preparing files for 3D printing, including export formats and print orientation considerations.

Tips

To deepen Will's understanding and skill with 3D design and printing, encourage him to start with small projects such as creating keychains or simple household items. Incorporate lessons on the engineering design process, emphasizing iteration by having him redesign a failed print or improve a model. Introduce concepts of geometry and measurement by calculating volumes or surface areas of his designs. Additionally, exploring the history and applications of 3D printing in industries like medicine or aerospace can add context to his learning.

Book Recommendations

- 3D Printing Projects by DK: A practical guide with engaging projects for beginners to intermediate learners interested in 3D printing.
- Getting Started with Autodesk Fusion 360 by Gopi Ramaswamy: An accessible introduction on using Fusion 360 for CAD design tailored for middle and high school students.
- Invent to Learn: Making, Tinkering, and Engineering in the Classroom by Sylvia Libow Martinez and Gary S. Stager: Explores creative ways to integrate making and technology, like 3D printing, into learning for youth.

Learning Standards

- CCSS.MATH.CONTENT.6.G.A.1 - Solve problems involving area, surface area, and volume by relating to 3D model components.
- CCSS.ELA-LITERACY.W.6.6 - Use technology, including the internet, to produce and publish writing related to design projects.
- NGSS MS-ETS1-2 - Evaluate competing design solutions using a systematic process to determine how well they meet criteria.

Try This Next

- Design a simple household object or toy part using TinkerCad, then draw the design plan and label dimensions.
- Create a step-by-step guide or video tutorial explaining one feature in Fusion 360, focusing on how it improves 3D modeling.

Growth Beyond Academics

Will's engagement with software like TinkerCad and Fusion 360 likely fostered a sense of confidence and independence as he navigated complex tools. This activity supports patience and problem-solving when facing design challenges or failed prints. The project also may encourage curiosity and perseverance as he iterates to improve designs.