# **Core Skills Analysis**

## **Engineering and Design**

- Elijah observed fundamental engineering principles by watching how a bridge structure can be adapted into a vehicle within the Poly Bridge 2 game context.
- He gained insight into structural integrity and load distribution as the video likely showcased how the bridge's design handles movement as a car.
- The activity involved understanding creative problem solving by repurposing an existing structure (a bridge) into a dynamic vehicle.
- Elijah learned about physics concepts such as balance, force, and motion as demonstrated through the game simulation.

## **Technology and Gaming**

- Elijah experienced the use of simulation software (Poly Bridge 2), which models real-world physics in a digital environment.
- He became familiar with how video games can be tools for learning engineering concepts through interactive and visual mediums.
- Watching the video allowed Elijah to visually follow the step-by-step process of building complex structures within a game context.
- He explored digital creativity by seeing how game mechanics enable unconventional design and function implementations.

### Tips

To deepen Elijah's understanding of engineering and physics, encourage him to try designing his own bridges and vehicles within Poly Bridge 2 or other similar simulation games. He can then compare different designs and observe how changes affect performance and stability. Hands-on activities such as building simple physical bridges or vehicles with household materials can help connect virtual concepts to real-world phenomena. Discussing the physics principles at play (like forces and motion) through experiments or demonstrations will strengthen his conceptual grasp. Finally, inviting Elijah to explain his design choices or the mechanics observed in the video can boost his ability to articulate technical ideas.

#### **Book Recommendations**

- Engineering Elephants: Building with Bridges and More by Dave Ruch: An engaging introduction to basic engineering concepts and bridge building for middle schoolers using accessible language and fun activities.
- <u>The Way Things Work Now</u> by David Macaulay: A visually rich book explaining the mechanics behind machines and structures, making complex ideas like force and motion understandable for young teens.
- <u>How Vehicles Work</u> by Tom Newton: This book explores the principles of vehicle design and mechanics, connecting concepts of physics and engineering to everyday cars and machines.

## **Learning Standards**

- CCSS.ELA-LITERACY.RST.6-8.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- Next Generation Science Standards (NGSS) MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution.
- CCSS.ELA-LITERACY.WHST.6-8.2: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Exploring Engineering and Physics Through Poly Bridge 2's Creative Vehicle Design / Subject Explorer / LearningCorner.co

## **Try This Next**

- Create a worksheet where Elijah sketches and labels parts of the bridge-car design explaining the function of each component.
- Write a short explanation or video review summarizing what happens when the bridge shifts into a car, focusing on physics concepts like force and balance.