

Core Skills Analysis

Science

- The student learned about the principles of hydraulic systems through hands-on experimentation with the lego technic hydraulics, understanding how fluid pressure can move objects.
- Exploring concepts of force and motion, the student engaged in building different structures using the hydraulics, understanding how the application of force affects movement.
- By tinkering with the lego technic hydraulics, the student gained knowledge about basic engineering concepts such as leverage and mechanical advantage.
- Understanding the importance of precision and control in fluid mechanics was evident as the student navigated the intricacies of the hydraulics system.

Technology

- The student delved into practical applications of technology by manipulating the lego technic hydraulics to create functional models, showcasing digital skills in a hands-on environment.
- Through trial and error in building the hydraulic mechanisms, the student honed their problem-solving abilities, learning to troubleshoot technical issues independently.
- Exploring the integration of mechanics and programming, the student gained insight into how technology can automate processes using hydraulic systems.
- By engaging with the lego technic hydraulics, the student grasped the interdisciplinary nature of technology, blending mechanics, electronics, and design.

Mathematics

- Applying mathematical concepts, the student calculated gear ratios and hydraulic pressures to ensure the effective functioning of the lego technic hydraulics models.
- The student gained a practical understanding of measurement and scale while constructing different hydraulic mechanisms, reinforcing mathematical skills through real-world application.
- By analyzing the relationship between piston sizes and movement, the student explored mathematical concepts of geometry and spatial reasoning in a tangible way.
- Understanding the mathematical precision required for fluid transfer in hydraulics, the student honed their arithmetic skills in a dynamic, hands-on setting.

Tips

Encourage further exploration by challenging the student to design more complex hydraulic systems with multiple functions. Integrate principles of physics and engineering to enhance problem-solving skills. Encourage documentation of design processes and outcomes to foster creativity and innovation.

Book Recommendations

- [LEGO Technic Idea Book: Simple Machines](#) by Yoshihito Isogawa: Explore mechanical principles using LEGO models to understand simple machines and mechanisms.
- [The LEGO Power Functions Idea Book, Vol. 2: Cars and Contraptions](#) by Yoshihito Isogawa: Discover how to integrate power functions and motorized elements into LEGO projects, including vehicles and moving contraptions.
- [Engineering LEGO-Based Robotics: Build, Code, and Create with LEGO Mindstorms](#) by Mario Ferrari, Giulio Ferrari: Learn to build and program robots with LEGO Mindstorms, introducing robotics and coding concepts in a fun and educational manner.