helps design efficient rainwater harvesting systems, and knowing energy conversion principles optimizes solar panel efficiency.

ii. **Developing Innovative Sustainable Technologies:** Scientific research drives the innovation of new and improved sustainable technologies (e.g., more efficient solar cells, advanced water filtration systems, energy storage solutions). This is crucial for overcoming current environmental challenges and creating practical, scalable solutions for a sustainable future.

iii. **Assessing Environmental Impact and Risk:** Environmental science provides methods to assess the life cycle impact of sustainable technologies, ensuring that the solutions themselves don't create new environmental problems. It also helps understand the long-term ecological benefits of such projects.

iv. **Informed Decision-Making and Policy:** Scientific data and research provide the evidence needed to make informed decisions about sustainable practices, influence environmental policies, and educate communities on their benefits.

c) How does this project demonstrate the value of interdisciplinary approaches, typical of Integrated Science? (2 marks)
i. **Integration of Multiple Scientific Disciplines:** The project clearly combines knowledge from **Physics** (solar energy conversion, electricity generation), **Environmental Science/Hydrology** (rainwater collection, water quality, sustainable resource management), **Chemistry** (water purification methods, material science for building components), and even **Engineering** (system design, efficiency).

ii. **Addressing Complex Real-World Challenges:** Solving a multifaceted problem like sustainable living and resource management requires insights from various scientific fields. No single discipline can fully address aspects like energy generation, water conservation, and ecological impact on its own. Integrated Science teaches students to draw connections and apply diverse knowledge to comprehensive solutions.

iii. **Holistic System Design:** It encourages students to view the house as an interconnected system, understanding how changes in one part (e.g., energy use) affect others (e.g., water consumption, environmental footprint), fostering a holistic problem-solving mindset.

Here are comprehensive answers to the questions regarding laboratory safety, including multiple possible options where appropriate.

Sub-strand 1.2: Laboratory Safety