1. Which aspect of the bitcoin blockchain protocol consumes the most energy?

   1 / 1 point

   ○ Creating the genesis block

   ◯ Broadcasting a new transaction to the nodes in the network

   ⦿ Solving the proof-of-work problem (SHA-256 hash) required to add a new block to the chain

   ○ Verifying a miner's solution to a proof-of-work problem

   ✓ **Correct**
   The proof-of-work consensus mechanism enforces the security of the network, making it difficult and costly for malicious miners to attack. However, the secure hash algorithm (SHA-256) used in bitcoin mining consumes more than 4.41 billion kilowatt hours (kW·h) of energy - a Godzilla-sized carbon footprint.

2. What approaches can be used to improve the sustainability of blockchain technologies? Select all that apply.

   1 / 1 point

   ☑ Improving the efficiency of computing hardware and architecture

   ✓ **Correct**
   Improvements to computing hardware and architecture, combined with new approaches to recycling computer parts, will help make blockchain technologies more sustainable.

   ☐ Building new mining operations in places where fossil fuels are cheapest

   ☑ Implementing alternative consensus mechanisms, such as proof of stake

   ✓ **Correct**
   Experts have been exploring alternatives to the proof-of-work consensus mechanism, including proof-of-stake and proof-of-disk, which would reduce the amount of energy needed to secure the network while still retaining decentralization.

   ☑ Powering blockchain technologies using renewable energy sources

   ✓ **Correct**
   Powering blockchain technologies using renewable energy sources, such as wind or solar power, would make them more sustainable.