

## Guidelines for Designing and Building the Safe

### The Concept

- The safe opening mechanism will rely on a physics concept from the school's learning material, as indicated in the **list of topics**. Topics not included in the list require a mentor's approval at the beginning of the process.
- Cracking the safe will be based on the solution to a physics riddle, which can be reached within ten minutes. The mechanism will be based on an understanding of physics rather than on complex calculations or motor skills. The safe builders must ensure that it cannot be opened by any other means than solving the riddle. However, any form of opening the safe without the use of force will be considered legal.
- Each safe box may include up to **two physics riddles**. All the elements needed by the safe-cracking team to solve the riddles – such as tools they can use, significant components in the safe's structure, electrical circuitry – should be visible or detailed.
- Components not needed to solve the riddle and which may mislead (or distract) safe-crackers are prohibited.

### Reversibility

To allow an unlimited number of safe-cracking attempts, the possibility that the breakers will perform an irreversible operation which will prevent any further breaking must be avoided.

Note: Safe-crackers are allowed to make mistakes in the process; the safes must be able to withstand such errors and be ready for further cracking attempts.

### Robustness and Reliability

The safe must be sturdy and reliable to withstand a large number of hacking attempts and open only upon completing the steps in their planned order.

### Safety

Safety is a top priority, and the safe itself must not cause any health risk to the user. Any application of high voltage, gas, chemicals, fire, or any other risk factor will require the prior approval of the mentor team.

### Simplicity of Maintenance

Safe maintenance and its return to the locked state once cracked must be simple and possible to complete in less than three minutes. A quick opening option, without the need to solve the riddle, should be included for maintenance purposes. It must be ensured that the hacking teams do not have access to the quick opening.

### Materials required

Box sizes: 60cm x 30cm x 40cm ~ 24" x 12" x 16", consisting of a wooden box with a transparent door that closes with an off-the-shelf electro-mechanical locking device.