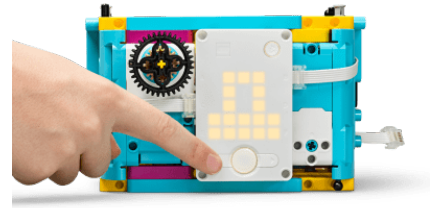


Keep It Safe

Use conditions to lock or unlock the door of a safe-deposit box.

🕒 90–120 min. 📦 Intermed. 🎓 Grades 6–8



Teacher Support

Key objectives

Students will:

- Explore conditional programming
- Be able to explain the principles of digital security

Things you will need

LEGO® Education SPIKE™ Prime Set

Additional resources

[Building instructions](#)

[Building instructions](#)

[Python Programs](#)

Educational standards

CSTA

2-AP-12 6-8

Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.

2-NI-05 6-8

Explain how physical and digital security measures protect electronic information.

Common Core

CCSS.ELA-LITERACY.L.7.6

Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Lesson plan

1. Prepare

- Read through the student material in the LEGO® Education SPIKE™ App.

2. Engage (5 Min.)

- Use the ideas in the *Ignite a Discussion* section below to engage your students in a discussion related to this lesson.

- Use the video to explain the lesson.

3. Explore (20 Min.)

- Have your students work in pairs to build the build the safe-deposit box.
- Ask them to play the program to see how the lock works.

4. Explain (5 Min.)

- Facilitate a discussion about how adding conditions can make the safe-deposit box even more secure.

5. Elaborate (15 Min.)

- Ask your students to make their safe-deposit boxes even more secure by adding more conditions to their programs.
- Don't forget to leave some time for cleanup.

6. Evaluate

- Give feedback on each student's performance.
 - You can use the assessment rubrics provided to simplify the process.
-

Ignite a Discussion

Start a discussion about iteration or fixing things by asking relevant questions, like:

- Can anyone give an example of a safety device?
- What makes a password strong or weak?
- What's a condition?

Have your students watch this video to see what they're about to do.

Building Tips

Tandem Build

Split each team's building tasks to ensure that everybody is actively involved:

Student A: Safe Deposit Box Design

- Student A: Safe-Deposit Box Door
- Student B: Safe-Deposit Box Box

Ready to go for the next lesson!

This model is also used as the base model for the next lesson, Keep It Really Safe. That's why there's a motor that isn't being used in this model. The motor's wire is clipped to the back of this version of the model.

Manual Unlock

This model has a manual key to unlock the door if needed.

Coding Tips

Main Program

Possible Solution

Other Programs

Differentiation

Simplify this lesson by:

- Using the Dashboard to explain to your students how many degrees the motor has been turned (Find more information about the Dashboard in the Help Section of the SPIKE App)

Take this lesson to the next level by:

- Having your students modify the Light Matrix and Sound file to customize their safe-deposit box
- Asking each team to modify their program and challenge another team to unlock their safe-deposit box

Assessment Opportunities

Teacher Observation Checklist

Create a scale that matches your needs, for example:

1. Partially accomplished
2. Fully accomplished
3. Overachieved

Use the following success criteria to evaluate your students' progress:

- Students understand what a condition is.
- Students are able to use conditions in their program.
- Students can discuss digital security in detail and with precision.

Self-Assessment

Have each student choose the brick that they feel best represents their performance.

- Blue: I've used one condition in my program.
- Yellow: I've used two conditions in my program.
- Violet: I've used more than two conditions to create a super cool and safe program!

Peer-Assessment

Encourage your students to provide feedback to others by:

- Having one student score the performance of another using the colored brick scale above.
- Asking them to present constructive feedback to each other so that they can improve their group's performance during the next lesson.

Language Arts Extension

To incorporate language arts skills development:

- Have your students explore the meaning of digital security terminology, like:
 - ▷ Boolean
 - ▷ Conditions

- ▷ Encryption
- ▷ Case-sensitive

Note: This will make for a longer lesson.

Career Links

Students who enjoyed this lesson might be interested in exploring these careers pathways:

- Information Technology (Computer Programming)
- Information Technology (IT Applications)
- Information Technology (Oracle / Database Programming)
- Information Technology (Web Design)