

Model 8: Encryption

Objectives and classification

Overview

After the introduction to message transmission in Model 7, this model deals with the protection of transmission by encryption. Two simple encryption methods introduce the functionality of a substitution cipher and the concept of key-controlled encryption.

Topics

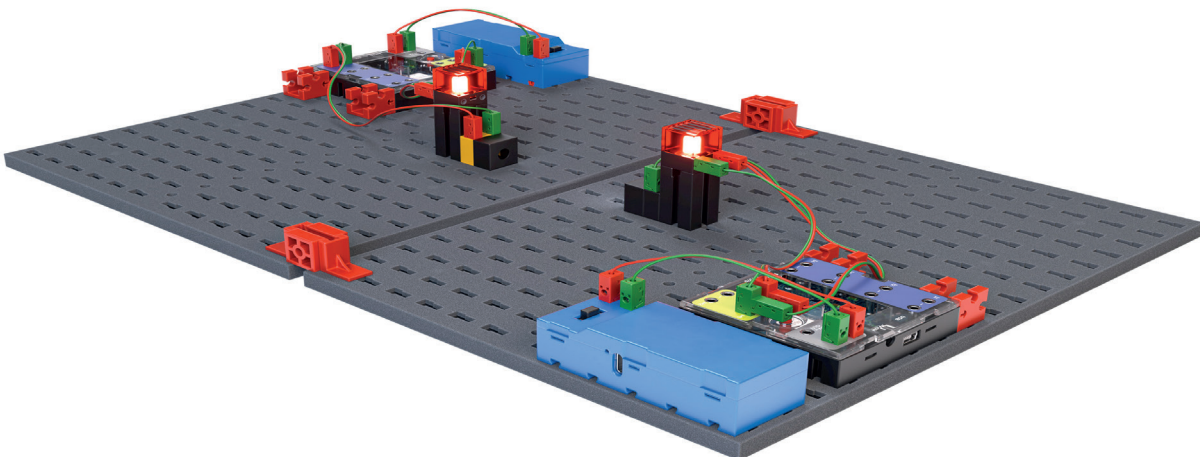
How can data transmission be protected from „eavesdroppers“? How does encryption work? What is a „key“?

Learning objectives

- Encryption as protection against „eavesdropping“
- Principle of the „shared secret“
- Principle of a key-based cipher
- Programming an encrypted transmission
- Determination of the „key space“ of a cipher

Time required

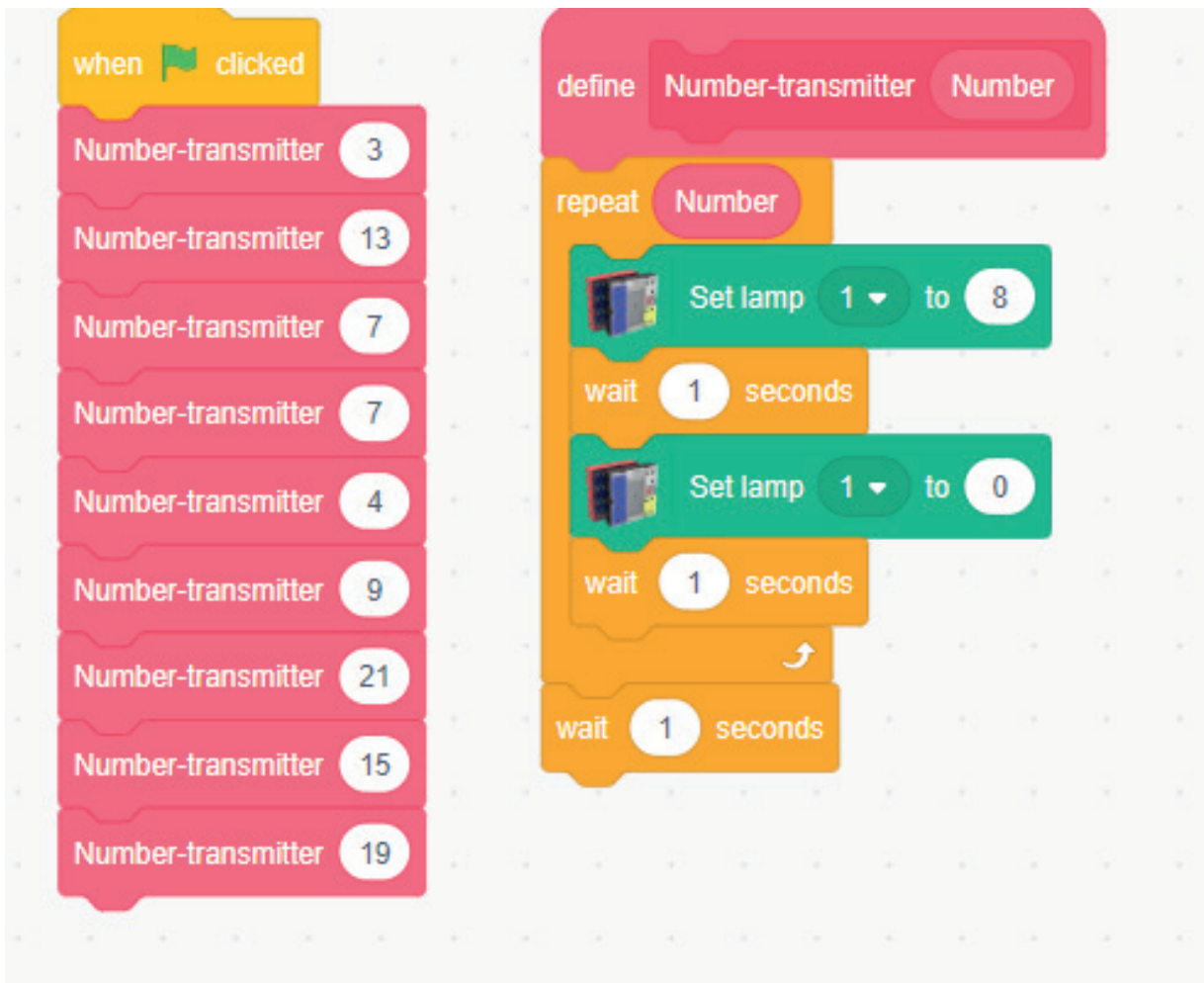
The „Encryption“ model is developed using two separate building instructions for the Receiver model and the Transmitter model. Please pay attention to both tasks and let the teams build one model each.



Solutions and notes

Programming tasks Model 8: Encryption

Solution:



Message encrypted sender.sb3

A	
B	
C	
D	13
E	13
F	

G	
H	13
I	
J	
K	
L	13

M	
N	
O	13
P	
Q	
R	13

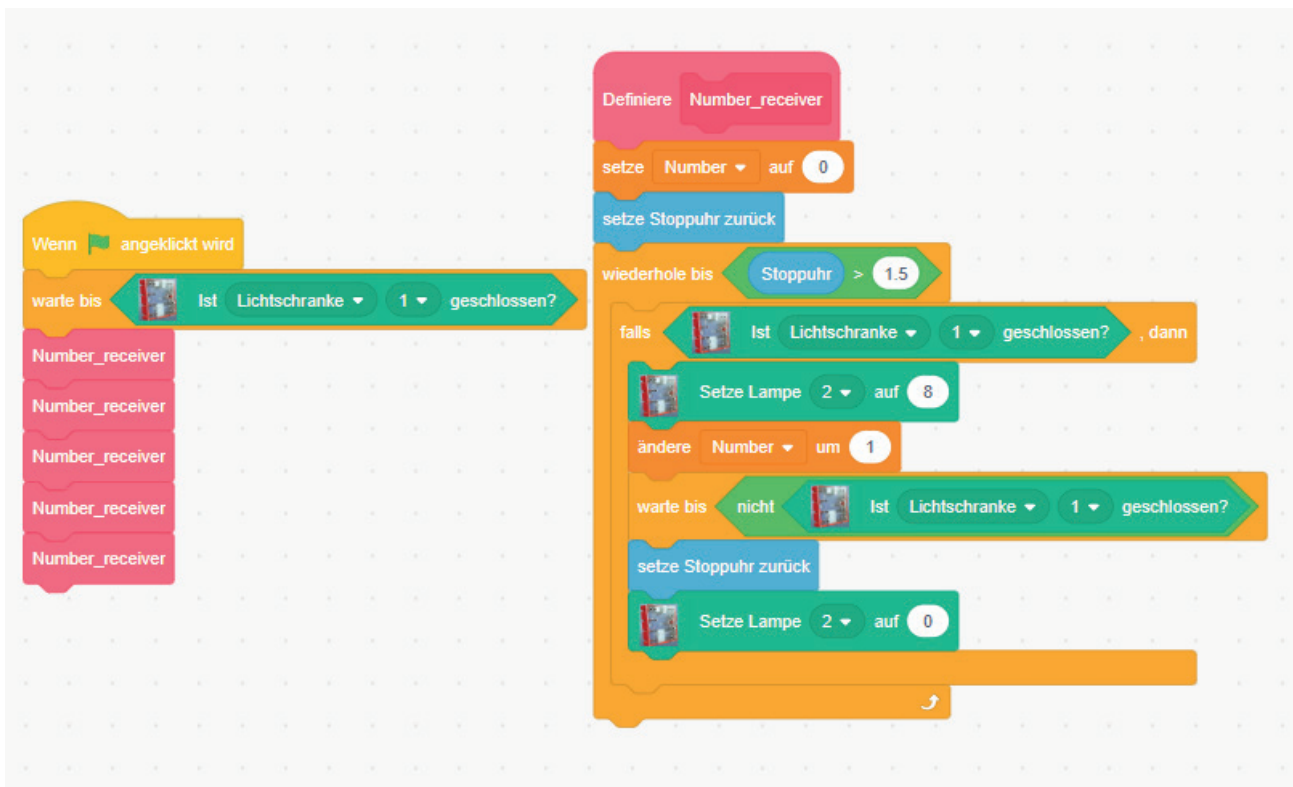
S	
T	
U	
V	
W	13
X	

Y	
Z	

Solutions and notes

Programming tasks Model 8: Encryption

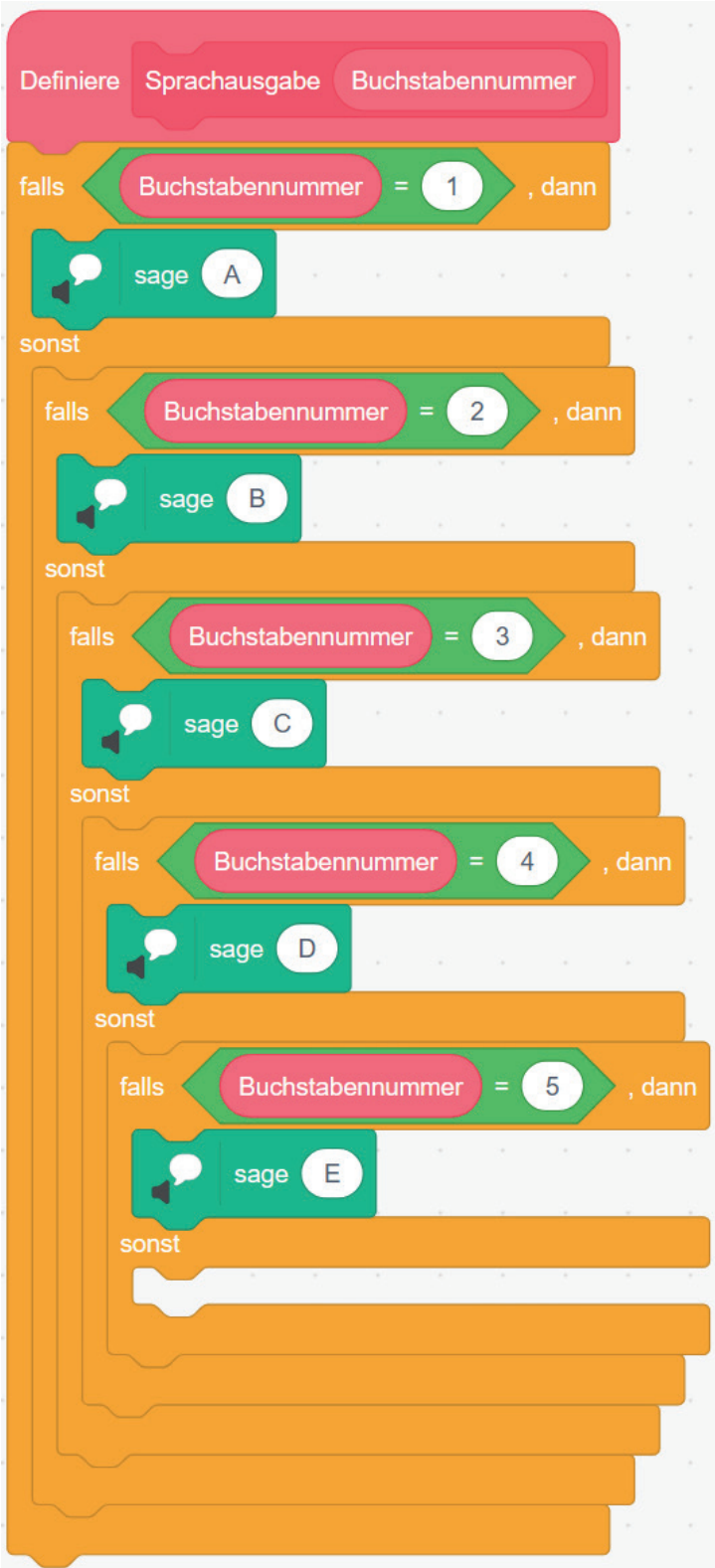
Solution:



Message encrypted recipient.sb3

Solutions and notes

Programming tasks Model 8: Encryption



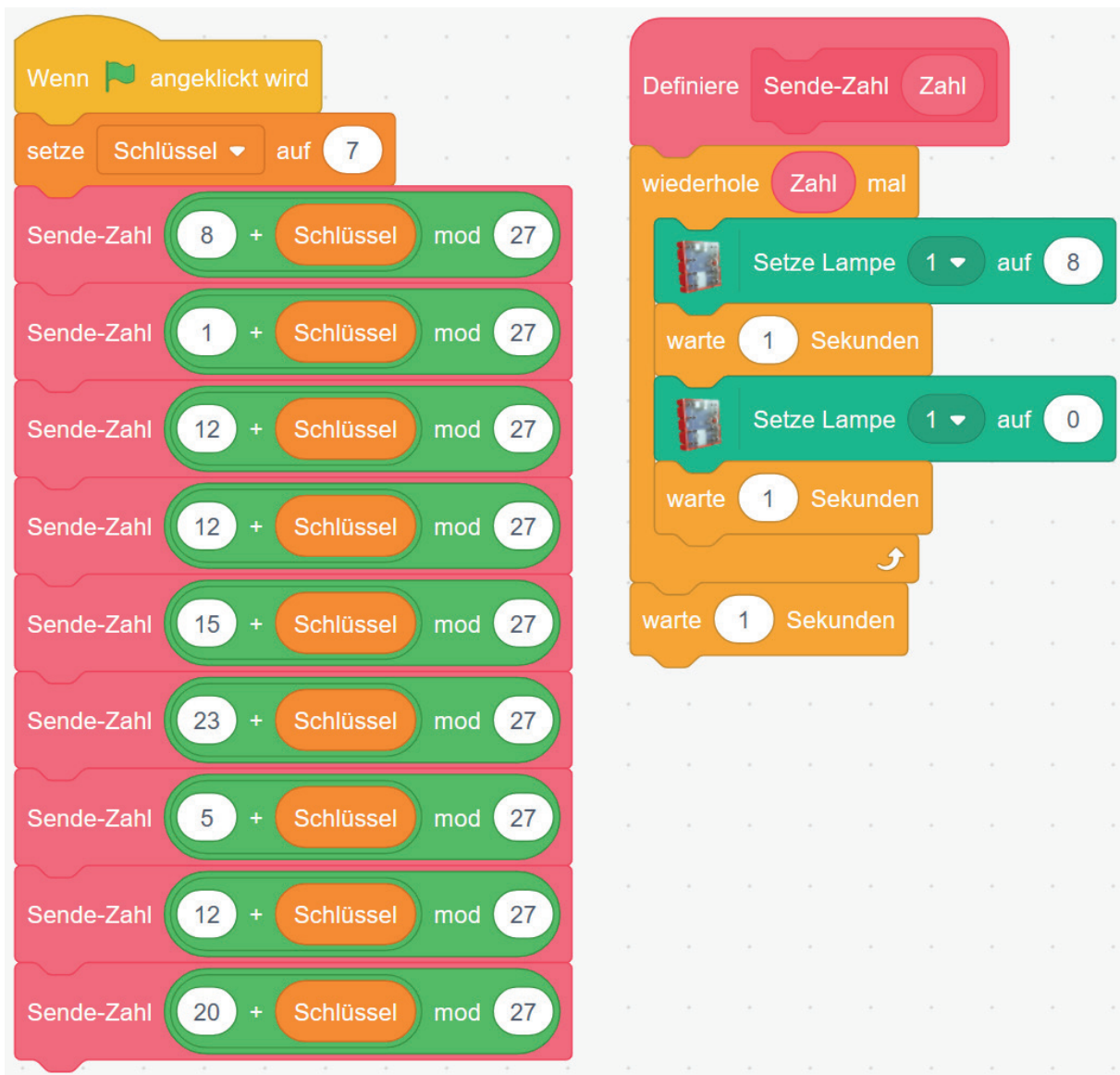
The image shows a Scratch script for an encryption task. It starts with a pink 'Definiere' block containing 'Sprachausgabe' and 'Buchstabennummer'. Below this is a series of five 'falls' (if) blocks, each with a condition 'Buchstabennummer = [number]', followed by a 'sage' (say) block with a letter (A, B, C, D, E). Each 'falls' block is followed by a 'sonst' (else) block, which is currently empty. The 'falls' blocks are nested, with the first being the outermost and the fifth being the innermost.

Message postponed sender.sb3

Solutions and notes

Programming tasks Model 8: Encryption

Solution:

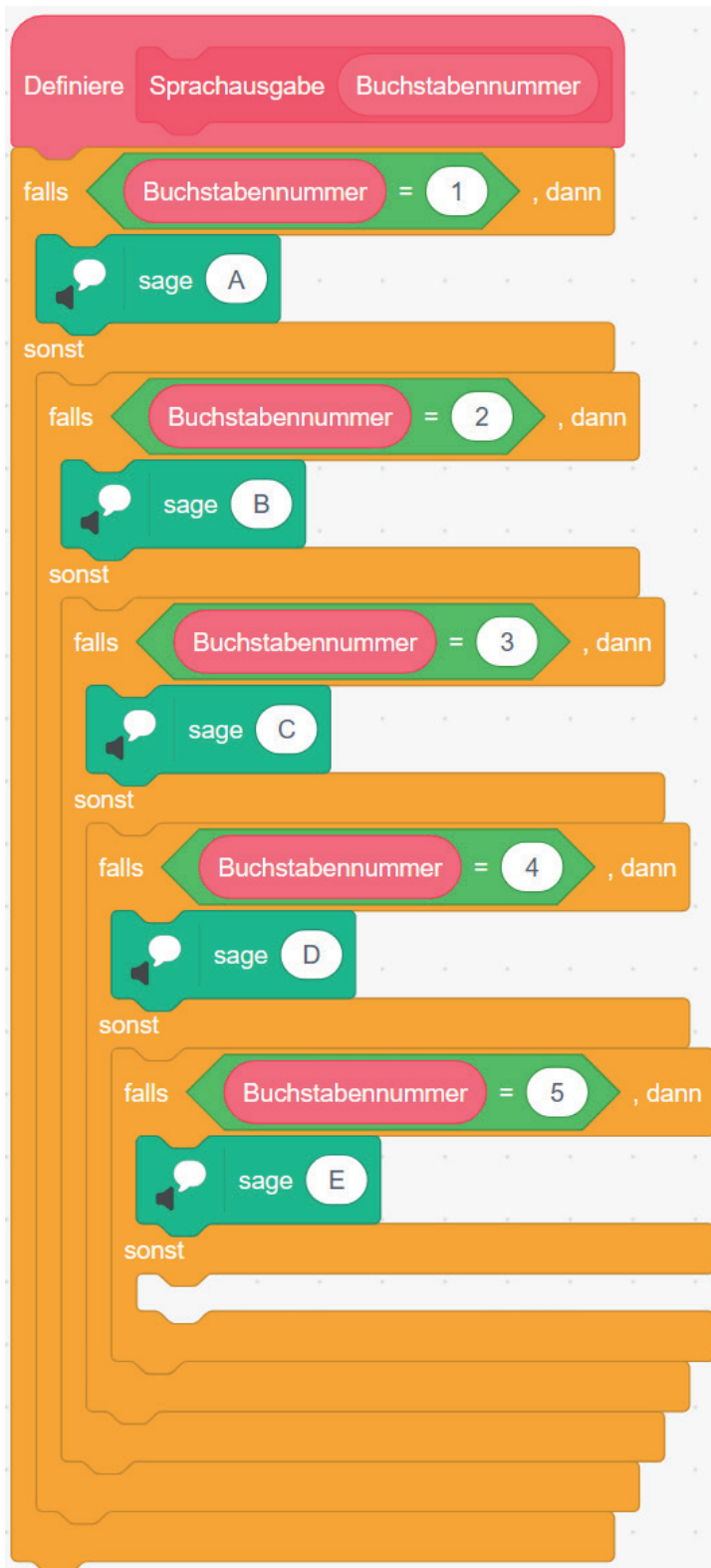


Message postponed recipient.sb3

Solutions and notes

Programming tasks Model 8: Encryption

Suggested solution Task Voice output - extract subroutine:



Voice output receiver with encryption.sb3