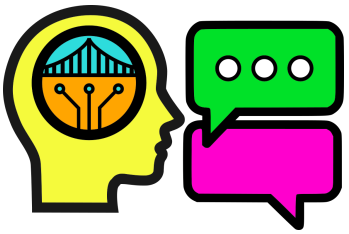

Guess the Password

Lesson summary

Target Audience: *12-14 years old. No previous experience needed, starter level.*

Duration: *45 minutes*

Learning goals:
Students engage in a fun and interactive challenge where they try to deduce a secret password based on logical clues and patterns. The objective is to help students develop computational thinking skills by:

- Decomposing the problem into manageable parts.
- Recognizing and analyzing patterns.
- Creating and testing hypotheses (Algorithmic thinking).
- Applying logic and deduction to rule out possibilities.
- Abstracting unnecessary information to focus on what matters

Online or offline: offline/online

Computational Thinking:

- **CT-foundations**:
    - Decomposition: Breaking down clues and steps to isolate password components
    - Pattern Recognition: Identifying recurring structures or rules in passwords
    - Abstraction: Ignoring irrelevant clues or distractions
    - Algorithmic Thinking: Systematically testing possibilities to uncover the correct password
    - Logical Reasoning: Deducing correct choices based on logical elimination

Materials

- Pre-made password clue slides or printable PDFs
- Shared document or quiz platform (Google Forms or Kahoot for evaluation)

Preparation

1. **Design 2–3 Password Challenges**, each with a 3–6 character password and a set of clues. Example:
    - Password: "MOM”.
    - Charset: uppercase letters only.
    - Clues:
        - The password has three letters.
        - The password has one vowel in the middle.
        - The last letter is the same as the first letter..
        - The consonants look like mountains.
        - The vowel looks like a ring.
2. **Create slides or cards** with the password challenge and clues.
3. **Set up**
    - A shared online board for group guesses and collaboration.
    - An optional quiz or feedback form at the end.

Lesson Description - Guess the Password

Introduction (5 minutes)
Welcome students, briefly introduce Computational Thinking and explain the challenge:

"Today, you're going to be codebreakers! Your mission is to guess a secret password using logical clues. This will require careful thinking, teamwork, and smart deduction."

"This activity builds skills like breaking problems into steps, spotting patterns, and testing ideas—these are the same skills computer scientists and coders use!"

Core

Warm-up Activity (5 minutes)

- Present a simple puzzle or riddle involving logic. Use for example the puzzle:

  “I’m thinking of a number between 1 and 10 that’s even and greater than 4. What could it be?”

- Discuss with the students how they figured it out using elimination and logic.

Main Activity – Password Challenge (25 minutes)

Round 1 (10–12 minutes)

- Share the first password challenge (see challenges in the appendix).
- Divide students into small breakout groups (or keep them together if the group is small).
- Ask them to:
  - Analyze clues together
  - Make guesses
  - Use the collaborative board to record eliminated options and possible passwords.
- After 10 minutes, discuss as a class:
  - What was the correct password?
  - How did you eliminate options?
  - Which clues were most helpful?

Round 2 (Optional or Advanced – 10–12 minutes)

- Share a trickier password puzzle.
- Encourage students to apply learning from Round 1.

Debrief and Evaluation (10 minutes)

- Ask reflection questions:
    - What strategies worked best?
    - Did you use trial and error, or logic first?
    - How did your group collaborate?
- Discuss how this applies to real-world computing:
    - Password systems
    - Logic in programming
    - Cybersecurity
- Use a short quiz or poll to check understanding:
    - Match a clue to a possible letter.

Appendix 1 - Password puzzles

Password Puzzle 1: "Code Crackers"

Password Length: 3 letters
Character Set: Capital English letters only (A–Z)
Clues:

1. The password has one vowel in the middle.
2. The last letter is the same as the first letter..
3. The consonants look like mountains.
4. The vowel looks like a ring.

Password Puzzle 2: "Digital Doors"

Password Length: 4 characters
Character Set: Digits from 0 to 9.
Clues:

1. The password starts and ends with even numbers.
2. The password has exactly two odd numbers.
3. No digit is repeated.
4. The sum of the digits is 18.
5. Digits are in descending order.
6. There is no 0 in the password.

Password Puzzle 3: "Word and year" (Advanced)

Password Length: 7 characters
Character Set: Mix of lowercase letters and digits (a-z, 0-9)
Clues:

1. The password combines an English word and a year.
2. The year is from the 18th century.
3. The last two digits are even and add up to 10.

4. The last digit is a prime number.
5. The English word contains no vowels.
6. The first letter looks like a 9.
7. The last letter is in the middle of the alphabet.

Appendix 2: Puzzles' answers

Password Puzzle 1: "Code Crackers"

Answer: MOM

- The password has one vowel in the middle: CONS1-VOWEL-CONS2
- The last letter is the same as the first letter.: CONS-VOWEL-CONS
- The consonants look like mountains: M-VOWEL-M
- The vowel looks like a ring: M-O-M.

Password Puzzle 2: "Digital Doors"

Answer: 8532

- The password starts and ends with even numbers: EVEN-X-X-EVEN
- The password has exactly two odd numbers: EVEN-ODD-ODD-EVEN
- No digit is repeated: EVEN1-ODD1-ODD2-EVEN2
- The sum of the digits is 18: EVEN1 + ODD1 + ODD2 + EVEN2 = 18
- Digits are in descending order EVEN1 > ODD1 > ODD2 > EVEN2
- There is no 0 in the password.

Password Puzzle 3: "Word and year" (Advanced)

Answer: gym1782

- The password combines an English word and a year: WORD-YEAR
- The year is from the 18th century: $L_1L_2L_3$-17N_1N_2
- The last two digits are even and add up to 10: $N_1 + N_2 = 10$
- The last digit is a prime number: N_2 is prime
- The English word contains no vowels: $L_1L_2L_3$ has no a, e, i, o, u
- The first letter looks like a 9: gL_2L_3

- The last letter is in the middle of the alphabet: gL_2m