



Name: _____

Date: _____

Class: _____

Alan Turing & The Birth of Computing

Modern Computing Worksheet Series

Long before smartphones, laptops, or even the first electronic calculators, a British mathematician named Alan Turing was imagining how a computer might work. Born in London in 1912, Turing was a brilliant thinker. In 1936, he published a paper proposing a theoretical device known today as the "Universal Turing Machine." He imagined a machine that could read instructions from a long tape and alter its behavior based on those instructions. This theoretical concept—a single machine that could be programmed to solve any computable problem—is the foundational idea behind all modern computers and software.

During World War II, Turing's theoretical genius was put to a very practical and urgent test. He worked at Bletchley Park, the secret center for British codebreakers. The German military was using a complex device called the Enigma machine to encrypt their messages. Turing designed an electromechanical machine called the "Bombe," which rapidly searched through possible combinations to crack the Enigma code. Historians estimate that the work of Turing and his team shortened the war in Europe by more than two years and saved millions of lives.

After the war, Turing continued to push the boundaries of what machines could do. He became fascinated by the idea of Artificial Intelligence (AI). In 1950, he published a famous paper titled "Computing Machinery and Intelligence," where he asked a simple but profound question: "Can machines think?" To answer this, he proposed the "Imitation Game," now known as the Turing Test. If a human interacting with a machine couldn't tell whether they were talking to a human or a computer, the machine would have passed the test.

Tragically, despite being a national hero and the father of computer science, Turing's life was cut short by prejudice. In 1952, he was prosecuted for being gay, which was illegal in the UK at the time. He was stripped of his security clearance and forced to undergo chemical treatment. He died in 1954 from cyanide poisoning in what was ruled a suicide. It wasn't until 2013 that Queen Elizabeth II granted him a posthumous royal pardon. Today, Alan Turing is universally celebrated as a visionary who laid the groundwork for the digital age and artificial intelligence.

PART 1: MULTIPLE CHOICE

Circle the letter of the best answer.

1. What was the theoretical device Alan Turing proposed in 1936 that laid the groundwork for modern computers?

- A. The Enigma Machine
- B. The Universal Turing Machine
- C. The Bombe
- D. The Imitation Game

2. How did Alan Turing significantly contribute to the Allied victory in World War II?

- A. He invented the first atomic bomb.
- B. He cracked the German Enigma code using a machine he designed.
- C. He designed new fighter jets for the British Royal Air Force.
- D. He served as a frontline commander in Europe.

3. What is the primary purpose of the "Turing Test" (or Imitation Game)?

- A. To test how fast a computer can calculate complex math equations.
- B. To determine if a machine can exhibit human-like intelligence.
- C. To check a computer for digital viruses.
- D. To translate German military messages into English.

PART 2: SHORT ANSWER

Write your answers in complete sentences based on the reading passage.

4. Based on the passage, what is the main difference between the "Universal Turing Machine" and the "Bombe"?

5. Why is Alan Turing often considered the "father of theoretical computer science"? What core idea did he introduce?

PART 3: CRITICAL THINKING

6. Alan Turing's life ended tragically due to discriminatory laws, despite his massive contributions to saving millions of lives and inventing modern computing. What does his story teach us about how society treats its brilliant minds, and why is it important to ensure STEM (Science, Technology, Engineering, and Math) fields are inclusive and accepting of everyone today?
