

4565: Computing Foundations for a Digital Age
Unit 5

Algorithm Sorting Challenge – Teacher Key

Scenario	Traditional or AI/ML?	Why? (Suggested Reasoning)
1. A calculator solving $345 \div 5$	Traditional Algorithm	Follows exact, fixed steps to compute.
2. Spotify recommending your next playlist	AI/Machine Learning	Uses user data and listening patterns to make personalized suggestions.
3. An app sorting student names alphabetically	Traditional Algorithm	Uses a fixed sorting method like A–Z.
4. Google Translate improving over time based on user input	AI/Machine Learning	Learns from user edits and feedback to improve accuracy.
5. A traffic light following a set cycle (red → green → yellow)	Traditional Algorithm	Follows a pre-programmed, repeated sequence.
6. Snapchat suggesting filters based on your face	AI/Machine Learning	Uses facial recognition models trained on image data.
7. A robot vacuum that maps your house and avoids obstacles	AI/Machine Learning	Learns room layout and adapts to avoid obstacles.
8. A vending machine giving correct change	Traditional Algorithm	Uses a known, fixed logic for change calculation.
9. YouTube auto-captioning a video based on audio	AI/Machine Learning	Uses speech recognition models trained on large datasets.
10. Typing “2 + 2” into a website calculator	Traditional Algorithm	Executes a direct computation.
11. Gmail sorting your inbox into “Primary” and “Promotions” folders	AI/Machine Learning	Learns from user behavior to sort emails more effectively.
12. A digital thermometer displaying the temperature	Traditional Algorithm	Reads and displays sensor input directly without learning.

Discussion Prompts for Ethics Section

Encourage students to go deeper with one AI/ML scenario. Possible ethical concerns might include:

- **Spotify Recommendations** – Can reinforce music bubbles and limit exposure to new genres.
- **Snapchat Filters** – Risk of bias or reinforcement of appearance standards; concerns about facial data privacy.
- **YouTube Auto-Captions** – Inaccurate captions can misrepresent spoken content, especially for accessibility.
- **Gmail Sorting** – Could hide important emails or reinforce certain communication patterns unfairly.